Introductory Biogeography to Bees of the Eastern Mediterranean and Near East

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This book is an introduction to the bee species to be found in the regions of the Eastern Mediterranean and Palearctic Near East.

The Eastern Mediterranean. This is a vast, biologically rich region of the world, comprising mediterranean ecosystems, arid and semi-arid coastal and inland ecotones and landscapes of faunistic and floristic richness set in a geographical and culturally diverse mosaic. Topography is varied, with many mountainous regions but also low lying plains and coastal strips.

The Palearctic Middle East has a great biodiversity of bees which is associated with the diverse flora, topographical irregularity and the xeric landscapes. The influence of geographical features on Mediterranean species distribution is profound.
Presently the human influences of land usage, through population and economic pressures, are imposing changes on the natural and semi-natural environment which have continued through the historical period from the prehistoric.

This Book hopes to sketch the invaluable natural resources of the Regions involved by representing the diversity of bee species there and hopes to be an aid to all of those engaged in nature conservation and sustainable land management in the countries involved.

The Eastern Mediterranean in this context is defined as Continental Greece and archipelagoes south and eastward as well as the Mediterranean coasts and islands of Turkey and Mediterranean and Montane ecotones inland. The Island of Cyprus, the extensive mediterranean habitats within Syria. The coastal Levant and areas of mediterranean landscape there and to the Sinai, and from there areas of mediterranean habitat in Egypt and Libya. The Sinai Peninsula, the Mediterranean Sea Coasts of Egypt and also of Libya as far west as Cyrenaica furnish the southern boundaries of this eastern Mediterranean geography.

Beyond the eastern Mediterranean, the Palearctic Middle East continues to desert and semi-desert lands of Lebanon, Syria, Jordan and Israel and the Palestinian Territories to the central Syrian Desert. Iraq and Iran form the boundaries of this diverse and vast regions of mountain, lush irrigated lowlands, wetland and desert. In addition the desert areas of Egypt can be viewed as belonging to this part of the biogeography.

The level of recording of bee species in the region has varied, with some areas being better studied and documented. However, there even now remain large areas where knowledge of bee distribution and abundance is less than it should be for a proper knowledge to guide conservation and land management programmes.

The comments made here on the distribution of species are for within the Eastern Mediterranean and Middle Eastern regions covered by this work. Many species have a wider distribution in the Palearctic and other bioregions, although there are many species where the Region is the centre of their distribution. A significant proportion of species are only found within the Region.

This book serves as an introduction to the bee faunal diversity of the following countries;-

A brief Biogeography.

The evolution of the Angiosperm plants proceeded from the Lower Cretaceous so that by the Middle Cretaceous there were several defined floras. By the late Cretaceous the northern Holarctic flora adjoined a subtropical to tropical flora. At this time our Region was dominated by the Tethys Sea and land areas were islands. The shores of the Tethys determined the migration of plant species and floral communities. During the Tertiary the climate moved from tropical in the Eocene to very cold conditions during the Pleistocene. The tropical and subtropical communities retreated southwards. These changes had great influences on the type and pattern of distribution of the flora. Many plant species died out in
northern regions but survived in refugia in the Caspian lowlands and Alborz and Black Sea areas. The Arctic Tertiary flora comprised a xeric element which today can be found as the Iranian and Anatolian forest communities. Other influences included an Indo-Malesian element, an African and a Mesogean.

The Mesogean element today encompasses the Mediterranean, Saharo-Arabian and Irano-Turanian floral regions which dominate most of this Region. Much of this flora is xeromorphic and has evolved over a long time span, pre-Tertiary. The significance of this is also that the withdrawal of the Tethys Sea has affected distribution and patterns of subsequent speciation. As the Tethys diminished so a great desert basin appeared, reaching from Syria across Iraq and Iran into Afghanistan. This formed a boundary or barrier between the Holarctic and Palaeotropical Kingdoms which persists to this day. Some members of the Indo-malesian flora survived in the Black and Caspian Sea areas during the southerly withdrawal. As the Tethys retreated further the Mesogean Irano-Turanian flora was exposed to new arid and often saline land in the Near and Middle east. This colonisation was followed by a process of speciation in the new lands.

Akhani (2007) in a detailed analysis of biodiversity in some of the Boraginaceae notes that orogenic activity in the Oligocene creating the Alborz and Zagros Mountains at a time when the Tethys still separated Asia from Africa and Arabia and created conditions for speciation in many plant families and many Irano-Turanian endemics evolved at this period. Most of these endemics are xerophytes evolved in conditions of increasing aridity. The theory then is that Central Asia, including Iran, is the geographic source of the xeric flora of Eurasia and the Mediterranean.

The beginning of the Quaternary and the Ice Ages.

By the end of the Tertiary the main geographic aspects of the Region are as they can be found today. The processes of uplift and orogeny and changes to the levels of seas continued to interact with periods of colder, wetter or drier, warmer climate.

During the early Pleistocene evidence of human habitation of the Near East is present. The diet of early Man encouraged a selective pressure on edible plants. The extent to which plant communities and natural vegetation climaxes have been influenced by Man’s early history are still being researched and is of course a huge subject, involving the development of medicines and crafts as well as farming.

Agriculture developed in Mesopotamia by 10,000 BP. New plant communities were forced into being by the exploitation and management of edible varieties and species and the clearing of land for farming on a huge scale. Edible plants became distributed along with Man’s increased population and distribution. Plants able to live in the farmed environments were able to spread. The plants themselves fed Man and with animal domestication and grazing the spread of new ecological habitats and processes replaced some of the earlier environments.

Islands of the Eastern Mediterranean.

The present-day appearance of the eastern Mediterranean is the outcome of tumultuous processes throughout vast periods of time. A brief outline alone here must suffice of something of what has been discovered about the more ancient history.
The palaeohistorical scene involves processes of Tectonic drift and the creation of two seas between two great masses of land. The seas were the Palaeotethys and the Neotethys and the great archaic Continents were Gondwanaland and Laurasia. The demise of these ancient seas has left a geographical heritage that influences the distribution of surface geology today.

The two great islands of Cyprus and Crete are rather like Continents themselves, and yet also the numerous smaller islands of the Ionian, Aegean and Cyclades, some of which are large enough to exhibit a diversity of landscape equal to the continental landmasses themselves. The Mediterranean islands have been created out of flooded basins and have retained in isolation Balkan and sometimes Asiatic forms. Indeed, in much of the Aegean and the Continental Greek Peloponnese there is a strong Asiatic element in the flora. Cyprus and Crete are quite different in their biological heritages and Crete once belonged to the outer arc of Aegean Mountains whereas Cyprus is more strongly connected to Syria. Both islands have a magnificent flora and bee fauna. A good introduction to these islands is found in Vogiatzakis, I. N., Pungetti, G. & Mannion, A. M. (2008).

An excellent example of a larger Aegean island is Lesbos. This island is close to the Continent of Turkey but has a distinctive character ecologically with representatives of Balkan and Asian connectivity. Lesbos along with Chios and Samos are leading examples of the Eastern Aegean group whereas further south lie the Dodecanese group of Kalymnos, Kos, Tilos and Rhodes. Lesbos has no sedimentary rock and is formed from complex powerful stresses created by the westward movement of the Anatolian Plate and northward move of the African Plate, the processes of subduction and profound seismic and volcanic activity which has allowed of lower stratas and magma. Lesbos is like Continental Greece a strongly indented coastline of limestone or metamorphic rock meeting the sea. Erosion only proceeds at any pace where sands silts or marls are exposed to sea action. On Lesbos half of the coast consists of Tertiary bedrock lava and metamorphic rocks (at a ratio of 3:1) The remaining half of the coastline is of beach and marsh. Beach materials include beach rock and gravel and sand in only 17 %. Mud and salt flats and pans are also widespread. Often beach rock is formed during periods of uplift. Here we see a strange feature of the coasts of the Mediterranean, the interplay between local landform movements and periods of rising and falling sea levels (induced by differing means and at differing rates of change) which have influenced geology locally in addition to tectonic and other processes.

Lesbos has a bee fauna of over 550 bee species despite being only 70 km wide. The island is deeply indented and topographically varied. The surface geology too is diverse which informs a large number of different plant communities and habitats. The flora is a mixture of Continental Balkan and Near Eastern plants with the addition of deliberate and accidental introductions some of which have become invasive. Generalist bee species exploit the floral resources of a range of plant Families and also form a generalist community visiting some of the invasive plant species while at the other end of the scale there are a number of oligolectic bees attached to a small number of indigenous plants within one family, sometimes more exclusively reliant on even a single flower species for pollen.
Coasts of the eastern Mediterranean and southern Black Sea.

The Greek coastline is 16,000 kilometres long. 70% of this length is rocky, sometimes vertical sea cliff and presently exaggerated by the high sea level of the Mediterranean where the coast retains features of a drowned landscape. However, the remainder is home to coastal plains and deltas, lagoons marshes and strandline and sand dune habitats of critical importance for the bee fauna of the Region and for plant communities adapted to these habitats. Sand habitats provide bees with two sets of partial habitats, ground nesting surface strata and floral foraging resources. The first sand zone, regularly covered by the sea, is mostly bare of flora. The second comprises a dynamic dune system beginning with motile white sand, then low dunes at a distance of 5 to 10 metres from the sea then a zone of higher mobile dune and finally an area of stabilised grey dune at furthest distance from the sea. Often the beach has the appearance of low dunes on a narrow front and organic debris from Zostera and Posidonia and decaying algae provide nutrient resources for halophytes of the Cakiletea maritimae plant community. This community experiences an annual cycle.

At the zone of upper sand or gravel beach into low motile dunes rich in calcium carbonate the community of rhizomatous geophytes and hemicryptophytes develops, often dominated by plants with deep or strong and interlacing root systems which functions to trap and hold fine sand. These plants have to exploit a nutrient poor and hostile environment exposed to strong weathers and salt spray. Characteristic plants of this domain are *Ammophila arenaria*, *Calystegia soldanella*, *Convolvulus persicus*, *Cyperus capitatus*, *Elymus farctus*, *Eryngium maritimum*, *Euphorbia paralias*, *Leymus racemosus*, *Medicago marina*, *Otanthus maritimus*, *Pancratium maritimum* and *Polygonum maritimum*. Where there is sheep grazing close to the sea the plant community is joined by *Otanthus maritimus*. Where there is a higher level of organic waste a community typified by *Eryngium maritimum* and *Medicago marina* occurs. In similar cases the most halophytic community is characterised by the dominance of *Sporobolus pungens* along with the Eryngium but also Elymus farctus. In cases of Eutrophication of organics washed ashore here then *Cakile maritima* and *Euphorbia peplis* will be more frequent as they are halonitrophilous species also adapted to this zone.

In Corfu and parts of the Peloponessos eastwards *Echinophora spinosa* appears on the more unstable dune formation.

Further from the sea where yellow mobile dune reaches above 1 metre *Ammophila arenaria* occurs within a more diverse and speciose set of plant communities dependent on particular environmental features. On older stabilised dune an association of *Silene colorata*, *Hedypnois cretica*, *Scabiosa atropurpurea* and *Pseudorlaya pumila* is found. In areas of steeper dune *Centaurea pumilio* and *Silene succulenta* are also found.

On the Black Sea coastal dunes at this zone there is a community of Ammophilines typified by *Leymus racemosus*, *Salsola kali*, *Centaurea kilaea* and, less frequently by *Convolvulus persicus*, *Silene thymifolia* and *Xanthium strumarium*. The Black Sea beach sand and dune coast maintains a greater proportion of endemic and disjunct flora than the Aegean and a characteristic plant community has evolved of a southern Pontic (Euxinian) origin inhabiting young dune on the seaward side. This
community is also characterised by the deep-rooted stabilising plant *Leymus racemosus* but here associated with *Cynodon dactylon* and *Eryngium maritimum*.

A special case of an early sand community has evolved on the extremely arid eastern and southeastern coast of Crete on fast draining flat pebble and gravel banks with sand. Characteristic plants are *Triplachnetum nitensis* and *Limonium graecum*. These are joined with *Lotus halophilus*, *Erodium laciniatum*, *Plantago lagopus* and *Parapholis incurva*. Less common plants in this association are *Centaurea aegialophila*, *Silene pinetorum*, *Chrysanthemum coronarium*, *Polycarpon tetraphyllum*, *Silene gallica* and *Bromus fasciculatus* whilst a further set of plant species are common to all of these community types.

200 meters or more from the sea dunes of fine sand containing calcium become stable and reach 5 metres in height. By now there is artificial fixing from the planting of hedges or trees and also the building of houses. There is a succession to evergreen sclerophyllous shrubbery with *Pistacia lentiscus*, *Myrtus communis*, *Spartium junceum*, *Arbutus unedo*, *Erica arborea* and others.

Otherwise there is a development on older grey dunes with enrichment and a water retaining clay content of an association of *Pancratium maritimum*. This spectacular flower has been driven into scarcity by collecting, but the entire ecology of this kind of more compacted and older dune is also under threat from development from construction, intensive tourism and sand extraction. As with the more stable white dune formations there has been a spread of building and also dune fixing involving the plantation of *Pinus halepensis* and *Pinus pinaster*. Where *Pancratium* survives it is in association with *Lagurus ovatus*, *Hedypnois cretica*, *Anthemis tomentosa*, *Cynodon dactylon*, *Matthiola tricuspidata*, *Glauclium flavum*, *Pseudorlaya pumila*, *Calystegia soldanella* and sometimes also with the plants *Medicago littoralis*, *Puccinellia distans* and *Allium obtusiflorum*.

The destruction of the dunes, the overbuilding and trampling but also the removal of sand will be complemented by a cessation or diminution of sand supply from freshwater drainage as streams are blocked, diverted and rivers dammed and freshwater flows are diverted for irrigation. These influences have an overall negative effect but also a particular cumulative negative influence of breaking up landscape scale communities of plants and insects into fragments.

The building of settlements in these areas also serves to facilitate invasive plant species and ruderal plant communities. This has an additional detrimental effect on the bee community as generalist species benefit over oligoleges and coastally adapted more vulnerable psammophilous bees.

It is noticeable that where the older dunes are more compacted there is much more nesting habitat suitable for the fossorial bee species whereas in the initial stages of the psammosere ground-nesting sites are often confined to the proximity of the root systems of the pioneer halophytic plant species.

On the landward side of these stable grey dunes a plant association of the Asian semi-desert has formed, especially on the coasts of the northern Aegean, Thessaly and Thrace. This is a florally rich progressive community identified by the presence of *Centaurea cuneifolia*, *Ephedra distachya*, *Jasione heldreichii*, *Silene dichotoma* and *Silene congesta* among more universal species.

In some other and more restricted areas of the Aegean an association of plants on older dune comprises *Alyssum minus*, *Fumana thymifolia* and *Erysimum repandum* amid a good covering of *Artemisia campestris*.

A further described plant community of the grey dune communities is a floral community of damp hollows typified by *Hypericum olympicum*, *Corynephorus divaricatus*, *Dasypryrum villosum*, *Elymus
hispidus and a selection of less common species. By this stage the dunes have an ability to contain a freshwater lens.

Another kind of sand ecology occurs where instead of dune formation sand is deposited at a distance from the sea onto rock strata or gravels. Cusions of Centaurea spinosa occur and can attain large dimensions. The appearance becomes one of coastal phrygana. Along with this resource which is very attractive to a range of bee species grows Elymus farctus, Pancratium maritimum, Medicago marina and Reichardia picroides. In the most phryganic aspects this association involves Coridothymus capitatus, Linum strictum, Phagnalon graecum, Helichrysum stoechas and with a lower frequency of Paronychia macrosepala, Teucrium polium and Anagallis arvensis.

Finally a further Steppic element appears with a settlement of Artemisia campestris on inner dunes. Flowers such as Nigella arvensis, Daucus broteri and Eryngium campestre are found amongst the steppic grasses alongside the Artemisia and at this stage of the psammosere the dune evolution merges to some degree with the steppic semi-desert.

**Mediterranean Egypt**

The emergence of a steppic semi-desert from a coastal psammosere is also notable on the Mediterranean coast of Egypt where the vegetation communities have been studied. There remains a great need to research the distribution and ecology of the bee communities associated with them and with the terrestrial formations. Mashaly et al (2008) recognise four vegetation groupings for the Deltaic Nile coastal habitat which conform to three classes of vegetation type using Braun-Blanquet's plant community analysis. The first class represents level sand and dune landscapes of the Delta and is of two alliances. The first alliance refers to newer coastal sand formations and is characterised by Pancratium maritimum, Silene succulenta, Senecio glaucus, Launaea fragilis, Cyperus capitatus, Echium angustifolium and Alhagi graecorum. The second alliance of psammophilous flora is found on older dune at distance from the sea and of which the commonest members are Plantago squarrosa, Echinops spinosus, Ononis serrata, Lycium schweinfurthii, Pseudoralya pumila, Erodium laciniatum, Launaea fragilis, Silene pseudoacteon, Lotus halophilus and Rumex pictus. The second and third vegetation classes refer to saline and fresh water habitats respectively and no doubt support a number of bee species. These plant communities are themselves distributed under the influences of variables in soil salinity, moisture, fertility, texture and chemistry, including the actions of Sodium, Potassium and Calcium and also of electric conductivity.

Some of the oldest dune formation in coastal Egypt is referred to as Black dunes, containing scarce heavy metals drawn down from the Ethiopian drainage and vulnerable to mining activities. Galal and Fawzy (2007) note that harsh weather conditions mean that dunes often have more plant species on the southern slopes sheltered from the denuding effects of strong northerly winds. Although the vegetation communities here are mediterranean with a therophytic constitution there is generally a wide influence from other floral zones and with some cosmopolitan element. Furthermore, the Mediterranean coastal zone is narrow and from southern Palestine to Libya the Saharo-Arabian belt closely intrudes to the coastline.
The Mediterranean dunes of Egypt are grazed and the floral community is also influenced by the relationship of plant species to one another combined with the effects of selective grazing. Floral resources are strongly influenced by grazing pattern. Abbas et al (1989) describes the relative palatability of the commonest plant species in these dunes. Of twenty plant species (other than four members of the Poaceae) included in their study of the calcareous coastal dunelands, nine are unpalatable to livestock, including Moricandia nitens, Silybum marianum, Varthemis candicans, Eryngium campestre, Silene succulenta, Euphorbia paralias and Pancratium maritimum. Palatable members of the flora include Ononis vaginalis which has been recommended as an included forage crop for the grazing lands. Where a managed strategy for grazing can allow attractive fodder crops for bees and the survival of other plants the bee diversity can be maintained.

The Interdune areas support a wider variety of floral resources many of which are spring annuals and these areas are prone to floral invasives from human influences.

The great freshwater system of the Nile although not a free flooding system is now a vast network of drainage ditches and canals 47,000 km long supporting the farmed lands of the Delta. This drainage system itself undoubtedly provides additional nesting and foraging habitats for some of the bee fauna of the Delta. The floral communities of this drainage system are described in Mashaly et al (2009).

**Mediterranean Cyrenaica**

The three main coastal environments of Cyrenaica have similar qualities to those in the other Mediterranean coastal areas. Sand beaches, saltmarshes and rocky coastlines. The sand habitats have eastern Mediterranean floral elements ut also species of the Saharo-Arabian and South Mediterranean flora such as Centaurea dimorpha and Echinops spinosissimus. Brullo and Furnari (1981) note that where natural processes are unimpeded there is a typical landward progression. These sand areas support many bees such as members of Dasypoda, Anthophora, Colletes and Andrena which nest in the sand substrate. In Salt marsh areas ground-nesting species must survive winter inundation. However, I find that salt marshes in the Mediterranean support a very rich and special bee fauna. In Cyrenaica Mediterranean and Irano-Turanian floral elements are conspicuous. The relationship between bee species assemblages and halophytic vegetation communities has not yet been fully researched.

In Cyrenaica calcareous rocks and cliffs support a chamaephyte community and others and there is a good presence of Mediterranean flora including Reichardia picroides, Lotus cytisoides, Silene sedoides, Limonium oleifolium, Sonchus glaucescens, Senecio leucanthemifolius and Frankenia laevis. The rocky coasts of the Mediterranean support a special assemblage of bee species and there is often a great diversity of bee and flower species active later into the summer season. Nomiapis will nest right within the spray zone among rocks. Chalicodoma nest among rocks further away from the sea. As soon as succession allows the presence of woody species then wood-nesting bees become frequent. Species of snail-shell nesting Osmia are found in the treeless areas of the coast.

**Sand Desert environment**

Deserts are characterised by a critical shortage of water.
It is in Egypt that we find a broad transition from the Mediterranean littoral into the full Desert landscape.
The Western Desert of Egypt is a vast arid expanse extending from the Mediterranean coast south to the Sudanese border, a distance of 1000 km. The surface area accounts for two thirds of the land surface of Egypt. An outline of the geology and morphology is given in Bornkamm & Kehl (1990) in their intensive account of the floral ecology. The narrow Mediterranean sector of the coast receives an average of 150 mm of annual rainfall, but even this meagre total shrinks so that in the extreme regions of the interior yearly rainfall is practically zero. Bornkamm & Kehl (1989) outline research expeditions into this area to study the Landscape ecology beginning in the 1980s and continuing as a rich history of ecological investigations.

**Five zones for desert plant communities of Egypt.**

Five zones of rain fed desert vegetation exist interior from the littoral zone, excluding oases which are maintained by the Sudanic water table.
The first plant vegetation zone is semi-desert which begins away from the littoral areas. This zone has a Saharo-Arabian vegetation with a strong Mediterranean component. Dwarf shrubs are frequent with *Thymelaea hirsuta* as a dominant species and other floral communities signified by *Asphodelus microcarpus*, *Plantago albicans*, *Hamada scoparia* and *Lycium europaeum*. Already conditions are such that although vegetation is permanent and diffused, high shrubs are only found in the *wadis*. This first zone is occupied by the human population and there is agriculture of orchard trees such as dates, figs, olives and almonds, the arable areas are of barley and woody plants are used for firewood and there are floral resources such as *Asphodelus microcarpus* in the fields. Grazing is also widespread and influences the development of a number of plant associations.
The second zone of precipitation dependent vegetation lies inland for 100 kms and relies on an average rainfall of as low as 10 to 20 mm. Annuals become scarce, Saharo-Arabian species remain dominant but there is an increasing Irano-Turanian element and even Sudanic influence. Important species being *Pituranthus tortuosus*, *Artemisia inculta*, *Gymnocarpus decandrum* and *Carduncellus mareoticus*. This zone is vulnerable to Camel grazing on a periodic basis. There is a transition towards plant communities comprised of islands of vegetation. However, Ashraf *et al* (2009) studied roadside vegetation plots using a long highway in this zone and found that therophytes predominated on flats and non-saline depressions. Here many of the perennial species are unpalatable to grazing animals, as they are in dune areas of grazing. The long regime of grazing has selected for the domination of vegetation by chemically obnoxious unpalatable species. Despite this, 27 species of flowers in the Asteraceae were recorded, four members of the Apiaceae and three of the Boraginaceae, 17 members of the Fabaceae and a wide range of other flowers of actual or potential usefulness to bees. This floral biodiversity is hidden by the differential selection of the heavy and long-term grazing regime so that the floral resources available to bee species is less than it otherwise would be under a managed regime of sustainable grazing.

The greatest extent of the Western Desert falls into the following two zones of extreme desert. Vegetation is temporary and scarce. There are no permanent water bodies. 99% of the plants present are actually dead. However, in the first of these categories *Acacia raddiana* grows and Tamarix species also can be found. However, the conditions in the fourth zone are stringent except
for areas of elevation. The vegetation is more Sudanic and the Irano-Turanian component becomes small. These woody associations may provide conditions for other plants providing resources for some bee species. However, the Acacia communities are often browsed or cut and there is a need to study natural growth of these plant communities.

Morsy et al (2008) analysed the ecophysiology of a selection of xerophytic plants from this desert and showed that inorganic chemical properties of soils had a determining effect on the presence of particular plant species within the overall plant community. Desert plants have to endure a regime of salinity as well as drought and the chemistry of the desert surface sands have a major role in allowing osmotic adjustment to these extreme environmental variables. It is the pattern of variation in these chemical properties which affect the pattern of distribution of the plants. The potential for this zone to provide nesting and foraging resources for a desert bee community is certain. What is also especially interesting is the degree to which slight elevations in annual precipitation may influence the bee community of this zone of the desert.

Finally, the fifth zone is of sand plains with an annual rainfall of near zero. Ecosystem processes are allochthonous. (Bornkamm 1987). Devoid of producers and even primary production and decomposition. This ecosystem is reliant on wind drifted organic debris, detrivores and the droppings of migratory birds and weathering often takes the place of decomposition. Here is the extreme environment beyond the level where xeric habitat can support flowering plants or bees.

**Oases and Irrigation features**

Phoenix, Tamarix, Alhagi, Juncus and Phragmites associate with other species to form substantial waterside communities in wild oases, which are supplied from below ground water resources. Wells also provide a source of groundwater to plants in their vicinity. Otherwise there are systems of artificial drainage which supports a varied plant community, often colonising following arable irrigation.

In parts of the southern Western Desert rare and possibly relictual plant communities and single species stands are associated with oases in the escarpment of the Nubian tableland. Bornkamm et al (2000) review the researches of Zahran and others in these areas where in places palm species support understory plants and there are areas of Tamarix woodland.

**Wadis**

Wadis are usually dry but are river beds which come to life following a period of rain. In the extreme desert zones annual rainfall is so low that rare downpours of rain occur less than annually but when they do plant life develops. This plant life however has a short lifetime as after the rainfall event the water drains and evaporates quickly. The possibility is that some at least of the larger wadis developed during periods when rainfall was higher. During present day conditions the floral ecology of the wadis will be influenced by the frequency and general level of annual precipitation, so that in this regard the facility of the environment for bees is determined by the climatic regime in which the wadi is situated. Landscape relief will provide local differences and patterning and the geological qualities of the surfaces.
In a study of an extreme desert wadi in the Eastern desert of Egypt Springuel et al (2006) carefully researched the appearance of vegetative growth following a period of rainfall. They noted that the onset of a flood following a downpour can move a seed bed, destroy existing vegetation and displace large quantities of surface material. This more powerful episode will damage existing bee ecology by removing nesting strata. However, where the downpour is less severe fine sediment and diaspores from adjacent areas can permeate the wadi and allow the development of vegetation. This vegetation has a typical life history. In the initial stages annuals appear such as Astragalus vogelii, Euphorbia granulata and Glinus lotoides. There is then the emergence of perennial therophytic communities with Lotonosis platycarpa, Morettia philaeana, Pulicaria incisa and Zygophyllum simplex and also the appearance of Crotalaria aegyptiaca, Fagonia, Pulicaria crispa and others. These plants have to adjust their reproductive cycles to the severe and uncertain conditions, otherwise they exist as accidental communities. In such an environment the first emerging accidental vegetation represents the climax plant community.

In this study area the only two woody perennials present were Acacia ehrenbergia and Tamarix nilotica. The former species is a member of the Sudanic flora appearing in monotypic stands in the Western desert. Here in the Eastern desert their presence in the Wadi areas is uncertain. They need a ready supply of water and yet are vulnerable to displacement by excessive flood. The significance for the landscape ecology for bees in this instance would be the development of an Acacia scrubland if a more regular rainfall pattern emerged.

The Eastern desert often follows the zonation described by Bornkamm above for the Western Desert. However, the Eastern desert although immense is narrower and in the East is bordered by the Red Sea. Hassan (2002) studied the plant communities of a protected wadi in the extreme desert there and confirmed that soils often made up of eroded rock material have a varying thickness and porosity which, allied with chemical characteristics of the parent material, combine with small-scale topography to determine the pattern of floral community present. Perennial species are accompanied by ephemerals during periods of rain which however are less than annual in occurrence. In the most southeasterly areas of the eastern desert towards the Sudan border high ground is interspersed with sandy plains and orographic rainfall on higher peaks coupled with sometimes permanent springs also influences floral patterns of distribution. Sheded (2002) gives a record of earlier floristic studies of this region and notes that shrubs and Annuals benefit from higher rainfall on the slopes and a range of Annuals accompany a more diverse but still desertic community of perennial plants. The commonest Perennials are Acacia tortilis, Aerva javanica, Panicum turgidum, Polycarpacea repens, Fagonia indica, Launaea cassiniana, Forsskaolea tenacissima, Lycium shawii and Senna italica. The commonest Annuals are listed as Zygophyllum simplex, Aristida mutabilis, Lotonosis platycarpa, Aizoone canariense, Caylusea hexagyna, Triraphis pumilio, Euphorbia granulata and Amaranthus graecizans.

Danin (1974) also describes the vegetation of the Eastern desert and gives a thorough reference to works establishing the geobotanical study of this region. He notes that the depth of windblown sand has a significant effect in some wadi areas. Ironically the deeper sands protect moisture more readily due to their porosity. This is an interesting aspect and suggests that for bees nesting in areas of deep sand their local habitat may be conducive to water retention provided there is stability at a deeper level. The surface sands take in water yet protect from evaporation. Danin follows Davis (1953) in noting that individual wadis have a climax vegetation which is the outcome of plant competition in differing local climates and edaphic conditions. Danin describes the importance of water
microcatchments and their relation to soil patterns in surface holding rock strata in providing resources for plants.

The biogeography of bees in both the Saharan and Arabian Deserts is strongly influenced by the level of moisture in the environment. The present day distribution of bee species here is affected by the present availability of water and historic geographic changes. Patiny and Michez (2007), examining the recorded distributions of a selection of bee species in the Saharan and Arabian Deserts shows that although bees have a xeric affinity the distribution of moisture is critical at the geographical as well as local ecological scale. The studied bee species are recorded mostly in the Mediterranean and other pre-Saharan areas. None of the selected bees occurred primarily in the extreme desert regions. The xerophilous nature of the bees was limited by an absolute necessity for a minimum moisture gradient. Following this, within the entire North African region bee populations are concentrated in favourable areas which exist as the outcome of geological processes over long periods of time. In our area of study these are the northwestern Libyan Plateau, the streams and riverine zones of the Nile and Jordan, and the Mediterranean coastal zones. This requirement for a moisture gradient is critically linked to the ability of an area to support forage plants for the bees themselves. Over geological time the climate of North Africa has undergone substantial changes and this has influenced the present-day fragmented nature of some bee species distributions. The authors show that the vast extreme desert areas of North Africa have created gaps in the distribution of such species as Panurgus dentatus, Dasypoda sinuata and Promelitta alboclypeata.

In considering the Western Desert as a whole, plant associations can generally be assigned to an order represented by the following characteristic plant species; Pituranthus tortuosus, Helianthemum lippii, Astragalus trigonus, Salvia aegyptiaca, Farsetia aegyptiaca and Stipagrostis plumosa. Following this, it could be hypothesised that although the Western desert may be geomorphologically rather uniform and immense, it has the potential to maintain plant communities which are ecologically capable of sustaining communities of solitary bees. Under the present climate regime the largest extent of both the Western and eastern Deserts is extremely severe for plant growth and this condition reduces the potential for bee diversity away from the Mediterranean coastal influence and permanent water bodies. However, where extreme xeric conditions are relieved by a higher input of moisture allowing a stronger floral ecology then the conditions for bees is greatly improved.

An implication here is that any change in the climatic regime in these hyperarid regions will restore moisture levels to a level capable of supporting a richer flora and bee community without removing the xeric nature of the habitat.

**West Asian sand and stone deserts**

After our resume of the Northwestern African desert of our region we can look at some of the main plant community aspects of the deserts from the Sinai north and eastwards, away from the Mediterranean coastal zone. In Palestine and Sinai a plant community order led by Varthemia montana and Phagnalon rupestre is frequent and supports a range of floral resources.
Elsewhere in these deserts *Anabasis articulata* is joined with other plants often on stony ground. Widely in the Negev on Hammada desert the plant *Zygophyllum dumosum* is characteristic of a number of floriarily important plant community associations. On soft calcareous features *Salsola tetrandra, Suaeda* and others lead a rich floral community. On sandy desert and littoral areas including the vast dune areas of Iran the coastal sands and desert areas of Iraq there are a number of psammophiilous plant communities with affinities to the Egyptian Desert outlined above. Otherwise we have stone or gravel deserts widely in Central Iran, Syria, the Judean, Negev and parts of the Sinai Desert. Cliffs and outcrops of rock support plant life where some water is retained and shade provided. Hammada desert is made up of stones on sloping lands, whereas Reg Deserts are pavement like, comprised of compacted gravels overlying the soil.

Plants of the Hammadas of the Negev and parts of the Sinai and Judean desert are influenced in their distributions by chemical qualities of the bedrock of the stones;- some of the plants listed for this landform by Zohary are:-

*Zygophyllum dumosum, Odontospermum pygmaeum, ranunculus asiaticus, Scabiosa aucheri, Lappula spinocarpos, Diplotaxis acriis, Diplotaxis harra, Helianthemum kahiricum, Picris damascena, Bellevalia desertorum, Tetrapogon villosus, Atractylis phaeoleptis, Asparagus stipularis, Farsetia aegyptiaca, Limonium pruinosum, Limonium thouinii, Fagonia mollis, Scilla hanburyi, Allium desertorum, Muscari inconstrictum, Colchicum tunicatum, Centaurea aegyptiaca and Euphorbia isthmia.*

The Judean desert also supports an important number of other floral communities.

**Steppe**

The exact definition of Steppe has been debated. It is here taken to refer to large habitat units of grasslands, sometimes partly wooded and sometimes treeless, and with semi-desert attributes and sometimes with a saline edaphic character. Following Zohary (1973) we can see Steppe as an environment with more complete vegetation cover than that of true Desert. However, the category of Semi-Desert will also be used and there are examples of land where semi-desert shades into Steppe. Semi-Deserts are more vegetated than Deserts but as Zohary points out there is no exact definition for the term semi-desert.

Rainfall pattern is critical for maintaining the distinctions in ecological categories and from this we can deduce that rainfall pattern has a profound effect on the distribution of bee communities. With evidence of the onset of recent climatic change any change in rainfall amount on a periodic landscape scale will be likely to have profound consequences for future vegetation cover patterns in the Region and through these changes the distribution and composition of the bee faunas will change.

The Steppe ecological units are sometimes identified with large geographic categories. In this case the various areas of the Irano-Turanian phytogeographical Region. Steppe is also present at differing altitudes and landforms so that we need to consider montane plateau and lowland steppes.
For the purposes of this review it may be best to firstly outline the Irano-Turanian Region and then to look at some of the essential plant communities found there, especially the more widespread plant communities which have an actual or potential ability to sustain a diverse community of bees.

Lowland Steppe

*Artemisia* is the leading Genus of the soft-leaved steppe vegetation which covers vast parts of our area. In the Southern Judean Desert and Northern Negev a typical plant association is dominated by *Artemisia herba-alba* and with co-dominants of *Salvia lonigera* and *Noaea mucronata*. Where there is no cultivation in the hills of the Northern Negev this association is joined by a valuable selection of other plant species. These plants are listed by Zohary (1973) as;


Of significance for the understanding of bee communities in the region of this plant association is the effect of grazing and fuel collection. *Artemisia herba-alba* becomes rare and *Asphodelus microcarpus* becomes the dominant flower species. These are joined by the following;


It is interesting to note that such a transformation benefits the appearance of a number of flowers which are known elsewhere to be very attractive to species of bees from a number of Families. The less pressurised association is also rich in floral resources but an interesting question is the extent to which the pressure of heavy grazing and collecting of firewood leads to changes in the composition of the original bee community of this habitat.

This steppe runs from western Jordan and through much of Syria into northern Iraq. In the area there are a number of plant associations within the steppe. Climate is Continental with cold winters and frosty nights and warm summers. To the east of this great expanse of the Irano-Turanian conditions become so dry that eventually the steppe merges with the Syrian Desert.

Iranian Plateau Steppelands

Zohary paints a rather bleak picture of the Central Plateau of Iran. A vast region of steppe and desert where *Artemisia herba-alba* again leads a good number of plant associations but in a region where the processes of Tragacanthis and Ruderal invasion has altered the botanical profile. For the sake of understanding what are the latent natural resources available to bee species in this region it is important to look at some of the most representative floral associations described by Zohary for the Iranian central Plateau. Four Associations representative of thousands of square miles of Central Iran are given. The first Association exists where the soil surfaces are protected from grazing and human influences and the remaining three Associations include a range of valuable floral resources amongst
the steppic grasses. Among the flower species in these widespread *Artemisia* Associations occur the following:-

Noaea mucronata, Stachys inflata, Convulvulus chondrilloides, Buhsea coluteoides, Astragalus glaucacanthus, Astragalus gossypinus, Astragalus calliphysa, Astragalus jubatus, Astragalus phylloketron, Lucta orientalis, Euphorbia connata, Euphorbia turcomanica, Pteropyrum olivieri, Pycnocycla spinosa, Echinophora platyloba, Celsia aucheri, Dianthus tabrisianus, heteranthilium piliferum, Boissiera squarrosa, Taeniatherum crinitum, Scrophularia benthamiana, Launaea acanthodes, Stellera lesertii, Heliotropium dissitiflorum, Cornulaca leucacantha and *Salsola incanescens*.

Zohary gives thirteen Associations under this Class and suggests that the floral poverty of the Iranian Steppe compared to steppic areas elsewhere may be due to ecological factors other than just human land-use pressures.

Where the steppe is post-segetal or post-pastoral – areas abandoned by farming and having been denuded of *Artemisia* by fuel collecting as well, then a process of Tragacanthicisation has occurred. *Astragalus* becomes co-dominant with *Artemisia* and the recorded sample communities contain floral elements sometimes reminiscent perhaps to aspects of garrigue habitats:- *Teucrium polium*, *Phlomis aucheri*, *Convulvulus chondrilloides*, *Acantholimon leucanthum*, *Echinops persicus*, *Stachys inflata*, *Thymus serpyllum*, *Ephedra strobilacea*, *Euphorbia connata* and others. All these communities are led by one or more of the numerous species of *Astragalus* of which more than 600 occur in Iran. Zohary describes the great tracts of steppe where overgrazing reduces competition and has allowed the entry of these Tragacanths into the plant communities. *Astragalus* and *Acantholimon* even become ruderal alongside plants that are toxic to livestock such as *Euphorbia*, *Cousinia*, *Centaurea*, *Onopordon*, *Eryngium* and some of other genera.

It is interesting to note that grazing on a landscape scale leaves behind a legacy of an altered plant community ecology which must itself have influenced the development of the wild bee communities since the evolution of pastoralism and other forms of livestock management in the Region.

**Highland Steppe**

There seems to be a point at which the Steppe at elevation in montane landscape interacts with the Tragacanthic shrublands. In the subalpine and alpine regions of Turkey dwarf Juniper leads a varied plant community rich in high altitude flora where humidity and rainfall is high.

**Eastern Anatolian montane steppe**

This ecoregion lies within the Irano-Turanian phytogeographic region. The montane steppe lies between 1500 to 2200 mtrs elevation with a rich flora of tragacanthic communities or in other areas steppic grasslands. Higher up are umbellifers of a number of genera are dominant until the alpine regions where a rich flora of geophytes is found. There are also steppe forests in this ecoregion. In some places typified by Almond and Juniper with a shrub layer of Roses with Berberis and Pistacia and amongst them a rich herb flora led by *Artemisia* and *Astragalus*. The topographical diversity is one of the features allowing for Eastern Anatolia as a centre of floral endemism. *Astragalus*, *Acantholimon*, *Cousinia*, *Centaurea* and *Onobrychis* have speciated here. Tree species diversity is
also very high with endemic taxa including Amygdalus kotschyi, Amygdalus cardauchorum, Crataegus davisii, Pyrus hakiarica and Pyrus salicifolia serratula.

It is very likely that these trees support a special assemblage of bees including many short-tongued Andrenas and some species in the Halictidae.

This Steppe vegetation community of Eastern Anatolia was recently revised and analysed by Hamzaoğlu (2006) with a new defined plant Order, climatic data and plant associations given with life form analysis.

Elsewhere through the Region in the high mountain zones the tragacanthic dwarf shrub communities include hundreds of flower species – Astragalus and Acantholimon predominate as they do on the plateau grazed steppe and along with spiny domed evolved elements in the genera Euphorbia, Erinacea, Genista and Cytisus (Zohary 1973), but here also they support numerous other flowers in the genera Acanthophyllum, Onobrychis, Gypsophila, Minuartia, Tragopogon, Ononis, Noaea and others.

Mediterranean Tragacanthic subalpine steppe could be seen sometimes as a part of the montane slope phrygana. Astragalus plays a leading role in the class of subalpine Mediterranean habitat from Sinai and Jordan into the Taurus and Aegean. There are a number of very important floristic communities here. In the Aegean region of Turkey the Tragacanthic community forms a continuous layer of thorn-cushion plants resistant to grazing. These leading plants cohere with the following flowers:-


There are a number of other communities in these landscapes which must be vital in determining the bee communities of the montane expanses above the tree-line. However, in Iraq and Iran another type of thorn-cushion community exists and in the Zagros and Elburz Mountains into Northeastern Anatolia supports a great richness of flower species and plant communities which undoubtedly support the rich diversity of bee species found in these mountain regions. The significance of these communities for the rich bee diversity of the Irano-Turanian is such that it is worth listing some of the flower species which are mentioned in Zohary’s account of the floral communities of these vast areas. In addition to a number of species of Astragalus and Acantholimon which often typify these communities the following occur as members of particular associations or communities:-

brachyactis, Sameraria armena, Pimpinella tragium, Aethionema grandiflorum, Minuartia recurva, Minuartina juniperina, Amygdalus carduchorum, Acanthophyllum microcephalum, Acanthophyllum glandulosum, Taeniatherum crinitum, Trifolium pratense, Ziziphora clinopodioides, Helichrysum armenium, Secale montanum, Lamium tomentosum, Arenaria gypsophiloides, Arenaria lessertiana, Arenaria polycnemifolia (these Arenaria sandworts also signify their own communities in terrains of particular edaphic qualities in some areas of the mountains), Aethionema stenopterum, Aethionema trinervium, Marrubium kotschyi, Salvia atropetala, Nepeta daenensis, Alyssum sibiricum, Fibigia multicaulis, Vicia persica, Euphorbia decipiens, Hypericum scabrum, Prangos uloptera, Stellaria orientalis, Scrophularia variegata, Asperula glomerata, Asperula setosa, Galium humifusum, Galium hyrcanicum, Campanula stevenii, Achillea vermicularis.

Steppe Forest of Temperate regions

Temperate steppe forest is widespread in the Euxinian and in the Irano-Turanian. However, there has been a great depletion of this kind of habitat, often through tree felling. Selective tree felling has produced a thinly wooded parkland structure populated by wild fruit trees. This is the typical forest steppe structure in the dry Euxinian of Inner Anatolia. Between 750 and 2000 mtrs Quercus species lead a sometimes very damaged community with Rosaceous trees and otherwise a steppic ground flora. Often the land is just dotted with individual trees of Pyrus eleagrifolius and Crataegus laciniata in a steppe of grasses and flowers.

The Irano-Turanian open steppe forest has also an open structure, again led by Quercus species and with scattered Juniperus, Pistacia and Amygdalus.

Alpine Meadow Steppe

The high mountain tops are snow covered for much of the year. Here in the Alpine regions and on rocky scree is a specialised flora of meadow plants which maintains a particular profile of wild bee species including a special fauna of Bumblebees. These habitats are the home of diverse bee communities and are of conservation concern.

The Zagros and Alborz Mountains support a transitional flora between the Anatolian, Caucasian and the Hindu Kush. Noroozi et al (2007) note that 58% of the alpine flora of Iran is endemic or subendemic and that the Zagros in particular may warrant being considered as a separate floristic Province. These alpine communities are gravely threatened by overgrazing and development.

Saline Desert and marshland

Saltmarshes form an ecologically important part of the coastlines we have already looked at in the chapter on Coasts. But as well as these coastal habitats which are sometimes rich in bee and plant species there are great tracts of land away from the coasts which are saline. The major examples of saline deserts are in the vicinity of the Dead Sea and elsewhere in the Palestinian Rift Valley. The Jafr Depression of Jordan. The Syrian Desert contains some areas of saline marshland. However, in Anatolia there are extensive saline wetlands of global ecological importance. Iraq contains saline
regions especially in Lower Mesopotamia and southern Jazira. In Iran there are very large areas of salt lands. Most of these salines are automorphous (Zohary 1962) and are maintained by groundwater. The remainder are termed hydromorphous and are the result of seasonal flooding. Sodium ions and other salts degrade the soil structure and impeded the osmotic processes of plant roots as well as being damaging to the plant tissues. These stresses have enabled the evolution of halophytic plant species and communities which need to be assessed when researching the bee faunas of such regions as they provide the resources for the pollinator communities within these regions.

The Mediterranean saline wetlands are represented by plant communities typified by *Salicornia*. There are diverse associations.

In the Rift Valley and large areas of Iraq and Southern Iran Zohary describes the Class of halophytic communities led by species of *Suaeda* where winters are warmer. This genus is present with a variety of other plants including a diverse number of *Tamarix* species, a Genus of significant resource for bees in these regions.

In such habitats vegetation is arranged in circles or concentric zones and there is a seasonality as well which means that plant community pattern and boundaries can vary according to the time of year. The regime of water deposition and evaporation or drainage influences the appearance of these areas greatly.

The most severe salines of Iraq were only briefly and partly described by Zohary, who noted that the conditions were extreme enough for some areas to be devoid of plant life. However, away from those areas other Iraqi salt lands were in cooler or temperate inland regions and supported a good flora. Some of the characteristic plants of these inland areas of Iraq include the following:-


More recently the saline plant communities of Iran have been studied in greater depth and detail. More advanced classification of the vegetation communities, maps of the surface geology and analysis of the soil chemistry and other factors can be found in Akhani, (2004), Akhani & Ghorbanli (1993) and Breckle (2002) and references therein.

In Turkey such saline communities are present around Tuz Golu which has a solontchak character, drying up in summer after the winter rains leaving a thick crust of chloride salts. *Salsola inermis*, *Limonium iconicum*, *Artemisia fragrans*, *Frankenia hirsuta* and many others make up the various ecological plant communities around this region. There are other saline wetland habitats in Anatolia. Together there is sense in treating these all together as the **Central Anatolian Steppe**. This is the treatment applied by the WWF in their creation of ecoregions for the globe. Here the Tuz Golu saline system is a centrepiece for the surrounding river basin saline steppes. In the Karapinar River basin less saline plant communities are led by *Limonium anatolicum*, and joined by *Frankenia hirsuta* and others. Wetter areas have *Tamarix gracilis*, *Juncus* and *Limonium globuliferum*. These habitats support an endemic flora of the following taxa:-

- *Gladiolus halophilus*, *Acanthalimon halophilum*, *Ferula halophila*, *Asparagus lyconicus*, *Allium vuralii*, *Verbascum pyroliforme*, *Salvia halophila*, *Limonium iconicum*, *Limonium anatolicum*, *Limonium tamaricoides*, *Hypericum salsugineum*, *Onosma halophilum* and *Taraxacum mirabile*. 
In Iran solonchak and solonetz saltlands occupy vast areas. There are substantial areas which are
desert in that there are no plants seemingly due to the absence of moisture. Zohary noted that it
appeared that there were plant genera not known for salt tolerance which had halophytic ecotypes
near to these regions. The genus *Tamarix* in these parts of Iran is most speciose and represents an
important pollinator resource. Zohary lists 22 species of *Tamarix* for these areas many but not all of
which are halophytes. This genus is very attractive to many species of bee and in dry conditions is a
vital foraging resource.

**Syrian Semi-Desert and Desert**

Where *Hammada scoparia* or *Hammada eigii* survives on the Irano-Turanian fringes and in the
Syrian Desert often on Alluvial soils there is sometimes a rich consort of segetal annuals and ruderal
flowers. Otherwise *Hammada* is co-dominant with *Anabasis syriaca* in sometimes florally rich areas
of the Negev and Syrian Desert. There are a number of other diverse floral community associations
in these regions, some but not all of which have been altered by past or present arable farming.

**Interrelationship of the Topography and Climate features in Iran**

Heshmati (2007) reviews the four ecological zones of Iran. The Hyrcanian, Irano-Turanian and
Zagrosian zones are included in my Introduction however the fourth zone, the Khalidj-Omanian,
borders upon the Arabian to the extent that this zone requires much more research in the context of
the Arabian Region. It extends throughout the south of Iran including the Provinces of Khosistan,
Boushehr, Hormozgan and Sistan-Baluchistan. The climate is sub-equatorial, altitude is from sea
level to 1000 mtrs and representative plant species are *Medicago*, *Acacia*, *Prosopis*, *Euphorbia* and
others. Warncke’s records of the bees of Iran include this zone.
The Hyrcanian Zone of Iran borders the Caspian Sea and extends eastwards. The geography allows
three vegetation subdivisions. Firstly forest Steppe of the Alborz, then Hyrcanian Forest, and thirdly
Lowland Caspian Desert.
The Alborz forest steppe is woodland of *Juniperus sabina* and *Juniperus communis* supporting a good
shrub and herb layer. However, felling of woodland has depleted the original nature of this habitat
and there are a number of human pressures at the landscape level as well.
The mixed forest of the Hyrcanian once covered a vast area of the middle elevations of the Alborz.
The high rainfall, spring snow melt waters and humidity allow for a high productivity and much of
the forest has been felled and converted into agriculture.. Typical forest tree species are *Fagus
orientalis*, *Carpinus betulus*, *Tilia rubra*, *Taxus baccata*, *Ulmus glabra*, *Quercus castaneifolia*, *Parrotia
persica*, *Alnus glutinosa*, *Punica granatum* and *Paliurus spina-christi*.
Caspian Desert on the fringes of the Caspian Sea is often grazed or otherwise farmed. Here there is a
halophytic community of *Artiumisia*, *Salsola*, *Anabasis* and other genera and doubtless the bee
community requires study. Heshmati (1999) has described the main plant species in detail.
The Zagros has a semi-arid climate with a temperate winter. There is a steppe forest community and
Quercus woodland, with subalpine areas above the forest zone, as described under Steppe.
The Irano-Turanian Plateau of Iran of deserts, sand dunes, salines and steppes.
The dwarf scrub communities can be rich in plant species, especially where annual rainfall exceeds 100mm. Heshmati (2007) gives a succinct and very useful summary of key plant species of Iran in relation to altitude, average annual rainfall and ecological zone.

**Phrygana, Garrigue, Batha, Maquis and Forest**

The following account is based on Chapter 15 of Zohary (1973) volume 2 for an overview of the Mediterranean vegetation. The definition here is based on the Mediterranean climatic vegetation including some mountain floral communities where summer drought and winter rainfall are of the Mediterranean pattern. Our area is the Eastern Mediterranean where rainfall is already lower than that of the West. winters are far less cold than nearby steppe and desert regions and summers usually not as hot.

Soils are of two main types. The terra rossa hard limestones and the white or grey rendzinas derived from Chalk. Locally there are volcanic or sand soils. Soil profiles are often of a humiferous underlayer above mineral subsoil prone to eradication in the event of the removal of the vegetative cover.

Many of the plants have tough deep root systems able to penetrate into the harder subsoil ground.

There are two main categories; a lowland zone and a mountain zone.

Eastern Mediterranean vegetation are of a number of classes, the ones below are truly Mediterranean whereas some closely related plant communities are really steppe formations;-

**Quercetea calliprini**

This is typical of lowlands within 150 km of the coasts. This Mediterranean lowland band decreases in width southwards and in the southeastern Mediterranean is sometimes narrow or completely absent.

Here are several plant community Orders;-

**Maquis and Forest.**

The forest woodland species are led by arboreal species within the following genera;-

Pistacia, Quercus, Crataegus, Styrax, Cercis, Arbutus, Rubia, Lonicera, Aristolochia, Bryonia, Ceratonia, Laurus, Rhamnus, Phillyrea, Spartium, Calycotome, Genista, Pinus, Cupressus, Juniperus and Smilax.

The Mediterranean maquis and forests are rich in plant species and this has been encouraged by interference in the habitats. The winter-deciduous life strategy is seen to be somewhat at odds with the present environmental conditions and some tree species are survivals from Tertiary tropical conditions. Leading arboreal species often have deep roots as well as some lateral roots and many are able to regenerate from dormant buds after experiencing fire or cutting. Osmotic values and transpiration rates of this woodland flora is adapted to the Mediterranean bimodal climatic conditions.
In the Eastern Mediterranean plant species have often been prevented from westward spread by the extent of desert from Palestine to Libya which has ruptured the littoral continuity of the Mediterranean. This desert barrier was in place during the Pliocene by the time of the development of the Eastern Mediterranean maquis following upon the regression of the Tethys. The adjacent Irano-Turanian has had an enduring influence on this lowland Mediterranean flora. There are significant biregional species of the arboreal communities including Quercus boisseri, Pyrus syriaca, Amygdalus communis, Amygdalus orientalis, Cercis siliquastrum and Crataegus aronia which have spread westwards. Eastern Mediterranean maquis species have conversely influenced the Irano- Turanian such as Rubia tenuifolia, Juniperus oxycedris and Jasminum fruticans. Otherwise many of the eastern Mediterranean maquis members are circum-Mediterranean or are closely related to congeners in the Western Mediterranean.

Where this Maquis is not reduced by human activity then Quercus calliprinos tends to become dominant and overall floral diversity diminishes as woodland becomes more uniform. However, in historic times such extent of woodland is so fragmentary that it is uncertain what identity a true landscape scale forest of this type would unfold. One aspect is that with the depletion of much of the Mediterranean woodland regrowth is not assured or on the same trajectory due to factors such as soil depletion or change, the removal of the seed store and the invasion by other plant species or communities. In the Judean Mountains Zohary reported that a 20 year study of the vegetation on abandoned terraces did not find a reestablishment of a tree climax community. A dwarf shrub pioneer community appeared but there was no successful succession to forest. This could also suggest that original woodland establishment was predicated on particular climatic conditions or a pattern of weather over a number of seasons at least which would allow successful germination or the growth of saplings of the forest species. However, evidence from other areas suggests that forest regrowth can take 50 years or more to develop following the end of agriculture. In many areas surviving patches of mature woodland are evidence of the former climax vegetation, but the surrounding land has often lost soil to the extent that regeneration would not conform to the original woodland community.

A further savannah-like vegetation alliance of the Mediterranean maquis is evidenced by often solitary trees in an open landscape. Species are Pistacia lentiscus allied with Ceratonia siliqua, Olea europea, Juniperus and some others. Some of these trees have tropical affinities. There are a number of varieties of this kind of open forest association, the most typical found in Palestine contains the following characteristic additional plant species:-

Rhamnus palaestinus, Phillyrea media, Asparagus aphyllus, Rubia tenuifolia, Clematis cirrhosa, Crataegus aronia, Smilax aspera, Pistacia palaestina, Tamus communis and Quercus calliprinos.

This is an outstanding Association floristically with 250 plant species recorded. The floral diversity is such an important resource for the wild bee communities of the region. The following plants are among the frequent members of this open maquis:-

Phagnalon rupestre, Sarcopoterium spinosum, Calycotome villosa, Dactylis glomerata, Andropogon distachyus, Teucrium polium, Micromeria nervosa, Coridothymus capitatus, Majorana syriaca, Alcea
setosa, Teucrium divaricatum, Salvia hierosolymitana, Helichrysum sanguineum, Cistus salviifolius, Cistus creticus and Fumana thymifolia.

There are other types of this maquis found on Crete and on Cyprus, where there are several related Associations. Within Syria and Lebanon Pistacia lentiscus and Ceratonia siliqua form an Association with Myrtus communis. Again this open maquis structure includes a great floral biodiversity which is critical for the bee communities of the Mediterranean. The associating plants here include;-

Styrax officinalis, Sarcopoterium spinosum, Quercus calliprinos, Coridothymus capitatus, Inula viscosa, Rhamnus palaestinus, Cistus creticus, Satureja thymbra, Phagnalon rupestre, Teucrium polium, Carlina involucrata, Prasium majus, Pimpinella peregrina, Rubia tenuifolia, Salvia hierosolymitana, Centaurea iberica and others.

In Anatolia Olea europea takes the place of Pistacia lentiscus in this type of Association. In Aegean Anatolia Quercus coccifera joins this kind of maquis and a number of other Quercus species form maquis associations through the northeastern and northern Mediterranean.

Evergreen trees also play the role of lead arboreal members of florally rich maquis through large areas of the Mediterranean, the three leading species being Pinus halepensis, Pinus brutia and Cupressus sempervirens.

On the southeastern fringes of the Anatolian maquis and on the junctures of the Mediterranean with the Irano-Turanian in Syria, Jordan, Palestine and Lebanon the tree Crataegus aronia associates with Pyrus syriaca, Rhamnus palaestinus, Amygdalus korschinskii, Amygdalus webbii and Pistacia atlantica to form a further distinctive maquis association.

**Mediterranean dwarf shrub communities of Batha, Phrygana and Garrigue.**

These are evergreen chamaephytic communities often short-term but sometimes climactic. The arboreal components are continually interrupted or destroyed. In Palestine, Lebanon, Syria and Turkey this Association is signified by Sarcopoterium spinosum and is florally very important. Typical species on calcareous surfaces especially include the following;-

Cistus creticus, Fumana thymifolia, Fumana arabica, Calycotome villosa, Teucrium polium, Teucrium divaricatum, Hyparrhenia hirta, Andropogon distachyus, Osyris alba, Dactylis glomerata, Rhamnus palaestinus, Micromeria nervosa, Lotus peregrinus and Salvia triloba.

This kind of garrigue association is widespread and maintains a large bee community on the Mediterranean lowlands throughout the regions. There are many variations and on Cyprus for instance Sarcopoterium is joined typically by the following;-

Genista fasselata, Galium suberosum, Noaea mucronata, Lithospermum hispidulum, Urginea maritima, Fumana thymifolia, Coridothymus capitatus, Vicia palaestina, Vicia senocarpa, Salvia
verbenacea, Trifolium stellatum, Trifolium procumbens, Trifolium clypeatum and Anthemis cretica among many others.

On Crete this type of Sarcopoterium Association has a different character again. Zohary gives a Cretan example which includes the following plants;-

Anthyllis hermanniae, Satureja thymbra, Phlomis lanata, Phlomis fruticosa, Teucrium microphyllum, Euphorbia acanthothamnos, Erica verticillata, Genista acanthoclada, Rhamnus prunifolius, Hypericum empetrifolium, Dactylis glomerata, Thymelaea hirsuta, Helichrysum siculum and Trifolium angustifolium.

On rocky ground from Israel northwards, a sometimes sparse Alliance of garrigue flora is characterised by Coridothymus capitatus and closely allied with Cistus. This community typically grows on rendzina soils and is relatively poor in Annual species. Typical plants include;-


This community varies through the range which extends to Lebanon, Syria and Anatolia.

In other parts of the region one or other species of Cistus and sometimes Helianthemum stipulatum lead associations.

In some areas of sandy soils or terra rossa the plant Calycotome villosa is dominant, leading a plant community of great richness and significance for the ground-nesting bee fauna.

A further Association in Palestine and Cyprus is dominated by Genista fasselata. Zohary gives an example from Cyprus which has the following additional species;-

Rhamnus oleoides, Thymelaea tartouraira, Fumana arabica, Fumana thymifolia, Galium suberosum, Cistus creticus, Pistacia lentiscus and Pistacia palaestina.

Various related communites are dominated sometimes by either Salvia trilobata, Satureja thymbra or Phlomis viscosa.

**Semi-Steppe dwarf shrubs.**

This is an order of plant communities of the Batha, often Mediterranean but with Irano-Turanian elements, situated on the fringes of the eastern Mediterranean and Irano-Turanian regions and comprised of very diverse assemblages of Annuals and hemicyrptophytes in xeric environments. There are many Associations here and the plant species occupying dominant niches in some of them are as follows;-

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Ononis natrix, Salvia dominica, Ballota undulata, Echinops polyceras, Convolvulus dorycnium, Psoralea bituminosa, Alkanna strigosa, Thymelaea hirsuta, Euphorbia hierosolymitana, sarcopoterium spinosum, Centaurea damascena and Coridothymus capitatus.

In Palestine, southern Anatolia, southern Syria and parts of Cyprus the plant Ziziphus lotus which is a Tertiary invasive of former Tropical savannah now leads segetal plant communities as well as some garrigue types. Another Tertiary invasive is Hyparrhenia hirta, sometimes co-dominant with Ziziphus spina-christi in relict savannah communities in Palestine. These Tertiary invasive species support rich communities of flowers as they have colonised xeric Mediterranean habitats denuded in the past of their primary vegetation coverings.

Mediterranean and semi-Steppic orders on stony ground (Varthemietea).

These are the plant communities of the rocks, chasms, walls and scree within the Mediterranean zone. True lithophytes and chasmophytes make up the plant societies of these habitats. Within quite small areas four basic types of habitat can be found. Intact rock surfaces inhabited by a small number of robust chaemophytes, rock with shallow cavities containing soil, rock with fissures and finally rock with chasms. These rock habitats will be of especial importance to bee species able to construct nests on the rock surfaces or within small rock fractures or amongst scree and rock debris. Typical plant species of these domains are Varthemia montana, Onosma orientale, Ballota saxatalis, Stachys palaestina, Micromeria fruticosa, Sedum nicaeense, Umbilicus intermedius and Hyoscyamus aureus.

This habitat is most important also for the high level of plant species endemicity it supports.

The Montane Mediterranean

This Mediterranean vegetation zone lies above the lowland Mediterranean and begins at 1000 mtrs rising to 1600 mtrs where it joins the subalpine. The altitudinal limits can vary and the natural boundaries have been strongly influenced by the history of human land management of this environment.

The Mediterranean Montane zone is naturally forest and a further essential habitat for invertebrate faunas of the region, including many bee species.

Typical tree species of the montane Mediterranean forests are some members of the genera Quercus, Juniperus and Acer, also the following;-

Ostrya carpinifolia, Cotinus coggygria, Colutea arborescens, Fontanesia phillyreaoides, Crataegus monogyna, Pyracantha coccinea, Eriolobus trilobatus, Prunus ursina, Fraxinus ornus, Castanea sativa and Pinus nigra.

These tree species support a special community of perennial herbs and shrubs including the following species;-

24
Blechnum spicant, Asplenium trichomanes, Asplenium adiantum-nigrum, Phyllitis sagittata, Pteris vittata, Calamintha clinopodium, Adenocarpus complicatus, Cornus australis, Buxus longifolius, Scutellaria diffusa, Salvia grandiflora, Cytisus drepanolobus, Hypericum hircinum and many others.

Deciduous tree groupings are often typified by Quercus cerris whereas in the upper areas conifer forests are more prevalent, characterised by Cedrus or Abies cilicica and Juniperus excelsa each of which also lead important forest communities.

Genetic diversity within plant species is a critical aspect of Mediterranean plant diversity and the chemical profile of essential oils can vary across the geographical range of a particular species in a way which reveals patterns of dispersal, evolution and adaptation. This is a most important subject for bee biogeography and conservation and is described and thoroughly referenced in Thompson (2005). Distribution patterns are themselves the outcome of repeated geological events and cold and warm periods which has caused faunas and floras to survive and change in refuge areas.

Agricultural environments.

Late Pleistocene domestication of animals and plants by Man was followed by a segetal stage where there was a balance between man and nature but in the neo-segetal the agricultural processes came to dominate the landscape and food surpluses led to the expansion of the human population and diversification of activities.

Faunas were transformed and many large herbivores became extinct.

Zohary believes that many edible plants in the wild became extinct because of man’s overuse of them for food.

Man’s activities are a part of nature. He is a product of evolution and an epidemic in the biotic environment to some degree. An excellent and readable account of human archaeology and the origin and spread of farming in the Near East can be found in Mithen (2003).

To some extent perhaps what we see is a migration and evolution of a human system through the Near East and Mediterranean. The development of farming and the spread of human civilisations expanding (and often retreating) through the landscapes of the Eastern Mediterranean and Near East since 22,000 BP following the end of the last Ice Age.

Hundreds of plant species provide food, medicine, fuel and domestic materials of all kinds.

pot herbs and salad plants

Often sustaining nomadic societies in the Middle East:-

Sedum nicaeense, Silene vulgaris, Silybum marianum, Sinapis alba, Sisymbrium, Thrincia tuberosa, Tolpis altissima, Urospermum picroides, Urtica, Veronica anagallis-aquatica and others.

Bulbs and Roots

Alhagi maurorum, Arum, Astoma seselifolium, Biarum, Bunium, Colchicum, Crocus, Cyclamen persicum, Emex spinosa, Erodium hirtum, Geranium tuberosum, Glycyrrhiza glabra, Hordeum bulbosum, Rheum, Scorzonera, Tamus communis, Zosima absinthiifolia and many others.

Wild fruits

Central Asian fruit species have been studied by Vavilov.
A representative list of some of the species of the Region is as follows;- Amelanchier, Amygdalus, Arbutus andrachne, Berberis, Blepharis, Capparis, castanea sativa, Ceratonia siliqua, Cordia gharaf, Cornus, Corylus, Cerasus, Crataegus, Elaeagnus angustifolia, Eriolobus trilobatus, Coccox pendulus, Ficus carica, Ficus pseudo-sycomorus, Glossonema boveanum, Hyphaene thebaica, Gundelia tournefortii, Juglans regia, Lycium, malus, Mespilus germanica, Moringa peregrina, Morus nigra, Nitraria retusa, Nymphaea caerulea, Ochradenus baccatus, Olea europaea oleaster, Pinus pinea, Pistacia, Prosopis farcta, Pyrus, Rubus, Salvadora persica, Vaccinium, Vitis orientalis, Zizypus.
Wild orchards can be found in large areas of the Middle East where fruit trees are left to grow in steppic landscapes. Sometimes wild tree species are used as stocks for grafting of domesticated cultivars. Large Genera of short-tongued bees such as Andrena will form part of the pollinator community for these fruits and the distribution and conservation requirements of many species are not yet researched through the regions.

In Turkey Ozbek (2008b) notes 123 species of bee recorded as pollinators of orchard fruit trees. It is fascinating to imagine the original recruitment and development of this type of bee community from originally dispersed forest tree habitats. Today at least forty species of Andrena attend these orchard trees with emergence times coinciding with spring blossoming. A further thirty species of Halictidae comprise another substantial part of this pollinator assemblage and twenty species of the Megachilidae with smaller numbers of species from among the other Families.

Peas and beans

Astragalus, Vicia, Lathyrus, Lupinus, Pisum and other genera provide Man and his animal herds with nourishment. Bees such as species of Anthophora and Eucera are members of the pollinator community of these crops. Legume forage and grazing intensity and distribution are interwoven with the abundance and distributions of many of these bee species.

Spices and Condiments

These resources were essential from early times in man’s history. Anethum graveolens, Coriandrum sativum, Rudolfia segetum, Cuminum cyminum, Artemisia, mentha, Myttus communis, Foeniculum vulgare, Nigella sativa, Origanum, Majorana syriaca, Salvia triloba, Salvia horminum, Salvia sclarea, Pituranthos tortuosus, Ziziphora, Teucrium polium, Thymus and many others.
Manna
Tamarix, Hammada salicornica, Quercus.

Medicinal Plants

Zohary gives the following list;-

Naghibi et al (2005) note that the Lamiaceae have genera such as Nepeta, Phlomis, Eremostachys, Salvia and Lagochilus which have a strong diversity in the Mediterranean and Southwestern Asia. The essential oils of these plants are partly responsible for their long history of use by man, including prehistoric periods where there is evidence that species now known only in the wild were formerly cultivated. Culinary, Medicinal and other uses are sometimes recorded from the same plant species by ethnomedical research.

Extracts of Oil, Gum or Resin

The following are among the plants used in industrial processes;-
Amygdalus, Artemisia judaica, Astragalus, Balanites aegyptiaca, Boswellia, Brassica, Cistus creticus, Commiphora, Cymbopogon schoenanthus, Eruca sativa, Ferula, Lallemantia iberica, Lavandula stoechas, Liquidambar orientalis, Mentha, Moringa peregrina, Origanum, Opapanx chironium, Pinus, Pistacia lentiscus, Ruta chalepensis, Styx officinalis and Thymus.

Dyes

Alkanna tinctoria, Ammi visnaga, Anchusa italic, Anthemis tinctoria, Arnebia hispidissima, Asperugo procumbens, Chrozophora plicata, Chrozophora tinctoria, Echium italicum, Euphorbia helioscopia,
Glycyrrhiza glabra, Indigofera, Lawsonia alba, Punica granatum, Resedea luteola, Tephrosia apollinea, Teucrium polium and Verbena supina.

Detergents and Tannins
Acacia, Anabasis, Hammada, Limonium, Nuphar luteum, Nymphaea alba, Glycyrrhiza echinata, Glycyrrhiza glabra, Quercus boissieri, Quercus macrolepis, Pistacia, Punica granatum, Salix, Salsola, Tamarix.

Wood products
A great variety of woods and timbers are and historically have been exploited for crafts and constructions.

Fuel and charcoal production
Many tree and scrub species have traditionally been cut for use as fuel for domestic fires, kilns and furnaces and local markets for these products are widespread including on the Mediterranean islands where wood fires and stoves are widely used especially during the winter months.

Piles of dead ends and cut logs and discarded branches are a very important nesting habitat for bees such as wood-nesting Megachilidae.

Hedging and boundary plantations.
Some hedges are survivals of cleared woodlands whereas many are planted to mark field boundaries and to act as shelter or as stockproof barriers. Often hedges provide foraging and nesting habitats for bees such as members of the Genus Hylaeus and Ceratina.

Farming and the Segetal Era
Incipient farming took place in Mesopotamia in steppe forest or parkland habitats. Scattered trees with herb rich grasslands and shrublands. Domestication of animals and hunting created a managed grazing regime. Foraging selected for cereals and pulses. The legumes are critically important for many bee species. Not only are species of Pisum, Vicia, Lens and Cicer, Lathyrus, Trifolium Onobrychis, Medicago, Melilotus, Lotus, Trigonella and Ornithopus sustaining domesticated animals in huge numbers but also the beans and peas are primary foodstuffs for man.

In the modern agricultural environment of Alfalfa Medicago sativa Ozbek(2008a) gives a detailed list of the bee species responsible for pollinating this legume in the region in which this plant is considered to have evolved:-

**Andrenidae**
Andrena ovata (Kr.)
A. labialis (Kr.)
A. flavipes Prz.
A...labiata regina Fr.
A. variabilis Sm.
A..panurgimorpha Mavr.
A.lepida Sch.
Panurgus calcaratus Scop.

**Halictidae**
P. sculpturatus Mor.
P. punctiventris Mor.
Melitturga clavicornis Latr.

Rophites canus Ev.
Lasioglossum limbellum Mor.
L. nitidiusculum (Kr.)
L. griseolum Mor.
L. angusticeps Perk.
L. convexiusculum (Sch.)
L. buccales Prz.
L. longirostris Mor.
L. viridiaeneus Bl.
L. morio (F.)
L. distinctus patulus Kohl
L. debilior Prz.
L. ordubadensis Fr.
L. nigripes Lep.
L. obscuratus Mor.
L. lativentr (Sch.)
L. fallax Mor.
L. sexnotatum (Kr.)
L. xanthopus (Kr.)
L. anellus Kohl
L. marginellum asiaticum D.T.
L. morbillosus Kriech.
L. leucozonium (Sch.)
L. sociorum Bl.
L. damascenus Prz.
L. malachurum (Kr.)
L. laticeps Sch.
L. lineare Sch.
L. mandibulare Mor.
L. morinellus War.
L. cephalicus Mor.
Halictus subauratus Rossi
H. concinns vestitus Lep.
H. pollinosus Sichel
H. maculatus Sm.
H. asperulus Prz.
H. tetraxonius pentheri Bl.
H. sajoi Bl.
H. bifidus War.
H. senilis Ev.
H. tetraxonianellus Strand
H. patellatus Mor.
H. alfenenellus Strand
H. frontalis turkmannus Prz.
H. sexcinctus albohispidus Bl.
H. quadrincinctus F.
Sphecodes monilicornis Kby.
Nomia diversipes Latr.
Systropha planidens Gir.
Melittidae
Melitta leporina Prz.
Megachilidae
Anthocopa avosetta (War.)
A.grumi Mor.
Hoplitis acuticornis (Duf. Et Par.)
H. carinata (Stanek)
H. fulva (Ev.)
H. laeviscutum (Alf.)
H. leucomelela (Kr.)
H. mollis Tk.
Osmia aurulelta (Panzer)
O. cerinthidis Mor.
O caerulescens L.
O. cyanoxantha Prz.
O. cypricola Mavr.
O. difficilis Mor.
O. dives Moc.
O. melanogaster Sp.
O. nigrohirta Fr.
O. signata Erichson
Anthidium cingularum Latr.
A. diadema Latr.
A. eximium Gir.
A. florentinum (F.)
A. manicatum L.
A. oblongatum (III.)
A. punctatum Latr.
A. undulantiforme Fr.
Anthidiellum insulare (Mor.)
Ant. strigatum lateum (Fr.)
Archianthidium pubescens (Mor.)
Icteranthidium cimbiciforme Sm.
I. laterale (Latr.)
I. limbiferum (Mor.)
Pseudoanthidium reticulatum (Moc.)
Creightonella albisecta (Klug)
Chalicodoma ericetorum (Lep.)
Ch. flavipes (Sp.)
Ch. hungarica Moc.
Ch. Monstrifica (Mor.)
Ch. parietina nestorea (Br.)
Megachile analis Nyl.
M. anatolica Reibman
M. apicalis Sp.
M. centuncularis (L.)
M. circumcincta ozbeki Tk.
M. iagopoda (L.)
M. picicornis Mor.
M. pilidens Alp.
M. rotundata F.
M. sexmaculata thracia Tk.
M. terminata Mor.
The diversity of bees at the Family and species levels indicates the importance these legume pasture and meadow habitats have for bee communities today as well as the significance for wild and semi-wild legume grassland habitats now and during prehistory.

The Segetal Flora

80% of the segetal plant species are Annuals, mainly of the winter and others are relics of ancient cultivation at a time when early farmers were unable to remove all of the native plants when clearing ground. These historical processes, changes in farming techniques, temporary or permanent abandonment and many other changes in management have assisted the emergence of this speciose set of communities. Zohary made a provisional classification of these farmland vegetations into four Classes. Some relate to irrigated crops and another to saline farmed lands but here we look at the Class of Secalinetea orientalia which was defined to include the arable wild floral communities of the rain-fed farmed lands.

The Secalinetea orientalia

This wild plant community orders comprises segetals in crops of Wheat, Barley, Maize, Rye, Sorgum, Legumes and others in subarid to humid rainfed farmed environments. Typical plant species make up communities which must support pollinator communities in very large areas of farmed lands. Common flower species number a hundred or more and there are many less common or widespread flowers in particular areas or particular arable habitats. Zohary gives examples of some Associations:-

Alluvial deep soils of lowlands in southern Turkey, Syria, Palestine which have been farmed for thousands of years. Plants found in the crops here in winter aspect are;-

Coelioxsis afra Lep.  
Apidae  
Amegilla quadrifaciata Vill  
Anthophora aestivalis Panzer  
Aatroalba Lep.  
Eucera caerulescens Fr.  
E. cinerea Lep.  
E. clypeata Erichs  
E. cineraria Ev.  
E. dalmatica Lep.  
E. interrupta Baer.  
E. nigrecens Perez  
E. nitidiventris Mocs.  
E. pollinosa Sm.  
E. vestita Mor.  
Tetralonia dentata Klug  
T. graja (Ev.)  
T. hungarica Fr.  

T. trinicta (Erichs)  
Nomada fucata Pz.  
N. cinnabarina F.  
Xylocopa valga Gerst.  
X. violacea L.  
Bombus cryptarum (F.)  
B. terestris (L.)  
B. argillaceus Scop.  
B. armeniacus Rad.  
B. ruderarius simulatilis Rad.  
B. sylvanum daghestanicus Rad.  
B. s. distinctus Vogt  
B. incertus Mor.  
B. cullumanus apollineus Scor.  
B. niveatus Kriech.  
Apis mellifera L
Prosopis farcta and Diplotaxis erucoides very commonly joined by dozens of flower species. In Central Anatolia sometimes Centaurea depressa and Isatis tinctoria are dominant. In Iran Achillea santolina, Hulthemia persica and others characterise further diverse communities of farmland segetal flowers.

These flower communities have evolved and spread from their original habitats and formed diverse communities within the farmed landscapes.

The Ruderal Flora.
Roadsides, derelict sites, refuse areas and suchlike harbour an important array of plants recruited from the floral provinces of the Region. The structure and appearance of these communities varies geographically and through the seasons but some typical species are;-


I have been struck by how rich the bee communities are in ruderal associations about historical, roadside, new construction and industrial abandoned areas in the Mediterranean where these plants form complex and surprisingly varied floral resources for insects often close by suitable nesting habitats for at least some of the groups of bees. Further, there are also parklands, vacant lots and abandoned gardens in a suburban or village context which provide a variety of other such ruderal communities, and where there has been gardening enrichment sometimes influences the presence of particular flower species.

Very many segetal species of plant are dependent now upon their farmed environments and cannot be found ‘in the wild.’ Many others are to be found in natural communities as well as in the fields. A further role for some of these segetal plants is to act as leading members of recovering post-agricultural areas.

Pastoralism
There are historical and geographic dimensions to present conditions of grazing and general livestock farming.

Non-palatable plants and even communities of such plants have been selected for over millenia by grazing either by settled pastoralism or forms of nomadic herding. Huge areas are intensively grazed and wooded areas deliberately burnt to produce a flush of palatable herbs and grasses. So much has grazing fragmented and reduced forest areas that the remaining flora, even the tree species, no longer consists of the full complement of species. Steppe and desert regions are degraded into sparse shrublands with pockets of annuals persisting. Hence pastoralism itself has been a factor in the desertification of large areas.

By the same token many habitats are maintained by grazing. There is a need for a balanced and managed grazing regime in large areas so that the needs of the farming community may be met in the context of a conserved flora and fauna. Where grazing is of a moderate frequency and intensity habitats essential for the flowering plant and insect faunas can be maintained.
Aspects of the regions

Below is a small number of coloured maps modified from a number of published sources in order to illustrate some of the geographical themes influencing the diversity of the bee species and their present distributions. The climate is changing and this will effect vegetation composition and the areas in which plant and bee communities will survive. Large areas of the region are presently unable to support many species due to extreme low rainfall. However, quite small changes in rainfall pattern may result in the restoration of extreme desert regions towards a wider range of life forms.

The picture above shows a pattern of annual rainfall across the geographic region we are looking at. The vast regions coloured yellow are devoid of settled agriculture except where there is substantial human managed irrigation or periodic river flooding, as for example the Nile Delta. Bee and plant communities contend with conditions of extreme aridity and also the pressures of nomadic pastoral subsistence. However the orange zone, with higher rainfall, allows a cultivation of wheat, barleys, olives, almonds and some other fruit and vegetables. This significant connected band of rainfall-maintained agriculture enables pollinating insects to exist on wild floral areas, farmed systems of crops supporting farmland flowers, and also citrus fruits and others which support and are supported by the pollination services of communities of wild bees both social and solitary.
In the illustration above we can see the position of the Floral Regions. The Sudanian savannah lies mostly to the south of our areas. However, the Sudanian has a historical and present day influence through processes such as the Nile Drainage. The greatest Floral Region upholding all the southern parts of our area is the Saharo-Arabian or Sindian Region comprised of vegetation communities adapted to stringent environmental conditions and yet enabling an adapted Desert fauna of bees including many little-studied species such as some of the members of the genus Anthophora.

The illustration also shows the Mediterranean Region which is met by the Irano-Turanian in the Levant and Anatolia. Here amid these two vast groupings are mountain Regions with their own distinctive Floral identities (marked in dark green) and also the Colchian and the Hyrcanian Floral Regions adjoining the Black and Caspian Seas.
The map above is a simple adaptation from Zohary (1970) and shows the plant community positions in more detail. Turkey in the north has the Euxinian deciduous and mixed forest domains in dark blue. Anatolia is dominated by Euxinian forest steppe and in the centre of this formation is the Central Anatolian Artemisia steppe, some of which is associated with saline hydrology. The light pink region of southern and western Turkey as well as Cyprus, Rhodes and the coastal Levant marks the Mediterranean communities. Note the presence of the Mediterranean communities continuing also in coastal Egypt but the disjunction created by the Nile drainage (shaded blue) and also the Saharo-Arabian communities marked in yellow. This feature is interesting as it is de facto the result of the present day level of the Mediterranean Sea. The Saharo-Arabian communities continue eastwards with a strong latitudinal border until they reach eastern Mesopotamia. To the north the large green area centrally placed shows the presence of the Mesopotamian Steppe floral communities.

The brown shading marks the original range of the Iranian Forest Steppe. To the east is the Iranian Artemisia steppe and sand communities marked in grey. Halophytic and Hydrophytic plant associations are shown in red and can be seen widely occurring. Communities of the Sudanian desert savannah and forest can be seen in purple. Between the Black Sea and the eastern Caspian is the high altitude Iranian Artemisia steppe and oak forest communities coloured lilac. Finally we can see the vast swathe of the Hyrcanian Forest systems running across the southern borders of the Caspian and marked in turquoise.
In the map above we can see that there are strong latitudinal features of mountain range and valleys which influence the distribution of bees and plants. As well as folding there are patterns of drainage interspersed amid very arid zones which are influenced by up and down warping of subsurface geological formations.

The Tertiary Foldings complement the geographic connections of Central Asia and the influence of the Central Asian bee communities.
Surface geology has a big influence of plant community and affects the nature of the bee communities. Ground-nesting bees need to be adapted to nest in the substrate which is locally available. The larval bees need to be adapted to feed on the pollen resources present in the nearby vegetation. Wood nesting and other non-fossorial bees require the presence of dead wood or other suitable material for the creation of their nests. The relative abundance of such groups as Megachile and Chalicodoma can be influenced by the presence of particular surface geologies. Acidity and calcareous soil chemistries can determine the presence of particular species of plant and bee.
References for Geography.


The Bee Species Catalogue

I have researched the literature and with enormous help and encouragement from Maximilian Schwarz, George Else, Stuart Roberts, Erwin Scheuchl, Stefan Risch, Andreas Müller, Andreas Ebmer, Seb Patiny, Michael Kuhlmann, Fritz and Josef Gusenleitner, Michael Engel, Jelle Devalez, Peter Hartmann, Hizmet Ozbek, Paul Williams Borek Tkalcu, Chris O’Toole. Also a warm thank you to the staff of the Plant Protection Department, Ministry of Agriculture, Cyprus and to many friends and fellow researchers at the University of the Aegean including of course Professor Theodora Petanidou to whom I am immensely grateful for the opportunity to study the bee species of Greece. Thanks and acknowledgements too to the staff at the Entomology Laboratory, Heraklion, Crete.

All flower visitation records and behavioural observations cited for Anthophora species from Israel and Israeli Occupied Territories were made available by Chris O’Toole and I thank him for making this data available from his unpublished doctoral thesis.

A special Thank you to my mother who has given me so much support during times away and after and to Maximilian for his tireless encouragement and support.

Note on identification and recording resources

This basic introduction to the fauna and region cannot hope to assist in identification or catalogue the synonymy. However, the references given under each bee Family are the main written sources for modern descriptions of the genera and species. Most important also is the creation of local collections of specimens and the accessibility of regional Museum, Ministeria, Private and University collections. In the eastern Mediterranean two very good collections are the Mavromoustakis Collection in Cyprus and the Lesbos Collection at the University of the Aegean in Mytiline. In Turkey the Tubitak programme is developing an excellent bee science resource and bee conservationists and naturalists in all other countries in the region should research for local and regional resources.

The Internet has revolutionised the possibilities of conservation and natural history research. Excellent on-line resources incude the Bee Atlas and on-line Papers in Belgium of the University of Mons-Hainault. Another superb resource is Andreas Mueller’s website on the Osmiine bees of the Western Palearctic at the University of Zurich, Switzerland. There is now a global taxonomy service online and the Internet needs to be used to search and contact resources, especially for those working in less resource areas. Individuals working locally should create their own specimen collections and library of papers, many of which can now be found on-line.

Finally, there is a need for more link-ups between botanical conservation and bee study and conservation.

I sincerely hope this initial summary will be extended and help and encourage survey and research of the bee fauna of the regions.

The order of Families and Genera given here is listed below.
Colletidae
Colletes
Hylaeus
Andrenidae
Andrena
Camptopoeum
Panurginus
Panurgus
Melitturga
Plesiopanurgus
Halictidae
Systropha
Rophitoides
Rophites
Dufourea
Nomia
Pseudapis
Lipotriches
Ceylalictus
Nomioides
Halictus
Lasioglossum
Sphecodes
Mellitidae
Dasypoda
Eremophanta
Promelitta
Macropis
Melitta
Megachilidae
Pararophites
Lithurgus
Chelostoma
Haetosmia
Heriades
Hofferia
Hoplitis
Hoplosmia
Ocherridaes
Osma
Protoosmia
Pseudoheriades
Stenoheriades
Stenosmia
Wainia
Trachusa
Anthidiellum
Eoanthidium
Afranthidium
Rhodanthidium
Anthidium
Pseudanthidium
Icteranthidium
Stelis
Aglaoapis
Alloidoxys
Dioxys
Ensliniana
Metadioxys
Paradioxys
Prodioxys
Eudioxys
Creightonella
Chalicodoma
Coelioxys
Radoszkowskiana
Megachile
Apidae
Proxylocopa
Xylocopa
Ceratina
Pithitis
Exoneuridia
Acanthonomada
Nomada
Epeorus
Ammobatoides
Schmiedeknechtia
Biastes
Aethammobates
Ammobates
Parammobotodes
Chiasmognathus
Pasites
Ancyla
Glazunovia
Tarsalia
Eucera
Cubitalia
Tetralonia
Tetraloniella
Amegilla
Anthophora
Habropoda
Melecta
Eupavlovskia
Paracrocisa
Thyreomelecta
Thyreus
Bombus
Apis
The Bee Species

Family Colletidae

Subfamily Colletinae

Genus Colletes

Central Asia has an estimated 2,000 bee species and shares with the Mediterranean Basin the status of a world centre for bee biodiversity. There are at least 35 endemic or subendemic species of Colletes in either the Turanian Basin or higher Mountains of Central Asia. (Kuhlmann 2005).

Colletes acutiformis Noskiewicz 1936
Israel. Libya.

Colletes albomaculatus (Lucas 1849)
On the wing during July in the Elburz at 2300 mtrs.

Colletes alfkeni Noskiewicz 1958
Turkey; Sirnak. Syria. Israel.

Colletes alfredjohni Kuhlmann 2002
Iran.

Colletes anceps Radoszkowski 1891
Eastern Turkey; Adiyaman, Van. Iran.
A summer bee on the wing from June to August in Iran.

Colletes anchusae Noskiewicz 1924
Turkey.
This bee is an oligolege of Cynoglottis barrelieri (Boraginaceae). Possibly also C. chetikiana. (Müller and Kuhlmann 2003).

Colletes ankaræ Warncke 1978
Turkey; Ankara eastwards.

Colletes armeniacus (Friese 1921)
Turkey; Hakkari.
A Central Asian species on the wing during June.

Colletes arztbergi Kuhlmann 2003
Syria.
Colletes askhabadensis Radoszkowski 1886
Syria

Colletes asiaticus Kuhlmann 1999
Eastern Turkey. Iran.

Colletes bidentulus Noskiewicz 1936
Turkey; Ankara, Konya, Nevsehir. Iran; Mazandaran.

Colletes brevigena Noskiewicz 1924

Colletes bytinskii Noskiewicz 1955
Israel.

Colletes carinatus Radoszkowski 1891
Continental Greece. Turkey.

Colletes cariniger Pérez 1903

Colletes caskanus (Strand 1919)
Recorded as a visitor to Almond and Cherry orchards in highland Jordan.
On the wing April to June. A spring Colletes including Iran.

Colletes chengtehensis Yasumatsu 1935
Continental Greece. Iran.

Colletes c.f. comatus Noskiewicz 1936
Turkey; Sivas.
This probably refers to an undescribed species.

Colletes coriandri Pérez 1895
Egypt. Libya.

Colletes cretaceus Morawitz 1876
Turkey; Malatya. Jordan. Iran.
A Central Asian species.

Colletes creticus Noskiewicz 1936
Greece on Crete.

Colletes cunicularius (Linnaeus 1761)

Colletes cyprius Noskiewicz 1936
Cyprus.
**Colletes daviesanus** Smith 1846
Turkey; Adiyaman, Afyon, Bingöl, Eskisehir, Van.

**Colletes dorsalis** Morawitz 1888
Central and eastern Turkey. Iran; Elburz.
A Central Asian species. In the Iranian Elburz found on the wing during July at 2300 mtrs.

**Colletes elegans** Noskiewicz 1936
Jordan. Israel. Egypt.

**Colletes eous** Morice 1904

**Colletes floralis** Eversmann 1852
Continental Greece. Turkey. Iran.
Both sexes on the wing during July and August at 2100 mtrs on Mount Olympos, Greece.

**Colletes fodiens** (Fourcroy 1785)
Eastern Turkey.
The subspecies **C. f. kirgisicus** Radoszkowski 1868 also in Turkey and in Iran.

**Colletes formosus** Pérez 1895
Israel. Jordan. Libya.

**Colletes foveolaris** Pérez 1903
Continental Greece. Turkey; Bilecik, Izmir. Libya.
A spring bee on the wing in May.

**Colletes fuscicornis** Noskiewicz 1936
Israel.

**Colletes glaber** Warncke 1978
Turkey.

**Colletes graeffei** Alfken 1900
Continental Greece.

**Colletes hakkari** Kuhlmann 2002
Eastern Turkey. Iran.

**Colletes hederae** Schmidt & Westrich 1993
North Aegean Greece on Lesbos.

**Colletes hethiticus** Warncke 1978
Continental Greece. Turkey. Iran; Elburz, Churasan.
This is the commonest Colletes in some parts of Turkey. Active during the summer in Iran.
**Colletes hiekeseni**ori Kuhlmann 2003
Turkey; Van.

**Colletes hylaeiformis** Eversmann 1852

**Colletes idoneus** Cockerell 1922
Eastern Turkey; Hakkari. Iran.

**Colletes intricans** Spinola 1838
Egypt. Libya.

**Colletes iranicus** Noskiewicz 1962
Eastern Turkey. Iran.

**Colletes jejunos** Noskiewicz 1936
Jordan. Egypt.

**Colletes judaicus** Noskiewicz 1955
Israel. Jordan.

**Colletes lacunatus** Dours 1872
Israel. Egypt. Libya.

**Colletes laevifrons** Morawitz 1894
Iran, Elburz.
An alpine summer-flying *Colletes* active up to 3500 mtrs.

**Colletes lebedewi** Noskiewicz 1936
Turkey; Agri, Siirt, Sivas, Van.

**Colletes maidli** Noskiewicz 1936
Recorded visiting *Eryngium creticum*. A bee of high summer and early autumn. Mavromoustakis noted this species on Cyprus on the wing in June and July and also gave flower visits for *Rubus ulmifolius anatolicus*, *Echinops spinosus*, *Myrtus communis* and *Nerium oleander*. Found on the wing during July and August in Iran.

**Colletes marginatus** Smith 1846
Continental Greece. Turkey; Ardahan, Hakkari, Nevsehir.

**Colletes maroccanus** Warncke 1978
Libya.

**Colletes meyeri** Noskiewicz 1936
Continental Greece. Turkey.
Colletes mixtus Radoszkowski 1891
Turkey; Igdir.
This bee is found here on the western fringe of its’ Asiatic range which extends to China.

Colletes mlokosewicz Radoszkowski 1891
Continental Greece. Widespread Turkey.

Colletes nanaeformis Noskiewicz 1959
Jordan. Egypt.

Colletes nanus Friese 1898

Colletes nasutus Smith 1853
Continental Greece. Turkey. Syria. Iran; Samnan, Elburz
Found up to 2300 mtrs in Iran during July.

Colletes nigricans Gistel 1857
Greece.

Colletes ottomanus Noskiewicz 1958
Central and eastern Turkey. Syria.

Colletes pallescens Noskiewicz 1936
Continental Greece. Iran.
A steppic bee.

Colletes perezi Morice 1904

Colletes persicus Warncke 1979
Iran; Chuzistan, Beluchistan.
On the wing during March and April.

Colletes pseudojejunus Noskiewicz 1959

Colletes pumilus Morice 1904

Colletes punctatus Mocsáry 1877

Colletes radoszkowskii Noskiewicz 1936
Turkey; Erzurum, Konya. Iran; Churastan.

Colletes roborovskyi Friese 1913
Eastern Turkey. Iran.
As with a number of Colletes species found in Iran this bee has an alpine or montane summer habitat.

**Colletes rozeni** Kuhlmann 2005
Israel.

**Colletes rubellus** Noskiewicz 1936
Israel.

**Colletes senilis** (Eversmann 1852)
Continental Greece. Turkey. Iran.
On the wing during July at 2300 mtrs in the Iranian Elburz.

**Colletes similis** Schenck 1861
Mavromoustakis recorded this species on the wing from May to September, visiting *Anthemis, Polygonum equisetiforme, Foeniculum piperitum, Pulicaria dysenterica, Statice virgata* and *Alyssum troodi*.
A summer bee of the Elburz Mountains of Iran where on the wing up to 2300 mtrs and active into October.

**Colletes squamosus** Morawitz 1878
Iran; Elburz, Schiraz.
A subendemic species of the Central Asia steppe deserts. Active during July.

**Colletes squamulosus** Noskiewicz 1936
Cyprus. Syria. Israel. Iran.

**Colletes standfussi** Kuhlmann 2003
Greece.

**Colletes subnitens** Noskiewicz 1936
Eastern Turkey. Iran.

**Colletes succinctus** (Linnaeus 1758)
A species of the Temperate zone.

**Colletes transitorius** Noskiewicz 1936
Turkey; Antalya, Adiyaman.

**Colletes tuberculatus** Morawitz 1894
Widespread Turkey. Iran.
The subspecies **C. t. anatolicus** Noskiewicz in Continental Greece, Turkey, Israel. Jordan. Iran.
A mountain bee of the summer months.
**Colletes wahrmanni** Noskiewicz 1959  
Turkey; Konya.  
A Central Asian bee.

**Colletes warnckei** Kuhlmann 2002  
Turkey; Hakkari, Kars. Iran.

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**Subfamily Hylaeinae**

**Hylaeus acer** Dathe 1980  
Turkey.

**Hylaeus adriaticus** (Warncke 1988)  
Continental Greece; northern Peloponnesos and Olympos.

**Hylaeus adspersus** (Alfken 1935)  
Turkey.

**Hylaeus alexandrinus** (Warncke 1992)  
Israel. Sinai. Egypt.

**Hylaeus alpina** Morawitz 1867  
Continental Greece; Olympos.

**Hylaeus alticolus** (Warncke 1981)  
Iran; Elburz.  
On the wing at 2400 mtrs during July.

**Hylaeus angustatus** (Schenck 1859)  
Crete. Turkey. Jordan.  
On the wing during June and July. The specimens on Crete have been referred to as **H. a. punctifrons** Pérez in Warncke (1992).

**Hylaeus annularis** (Kirby 1802)  
Subspecies **H. a. elbursus** (Warncke 1981) in southeast Turkey and northern Iran.  
on the wing from mid May to mid July in Iran.

**Hylaeus araxanus** (Warncke 1981)  
Eastern Turkey. Iran.  
noted visiting Ferula, *Daucus carota* and other umbelliferae.

**Hylaeus armeniacus** (Warncke 1981)  
Turkey. Israel. Iran; Elburz, Fars.  
On the wing mid May to mid June.
**Hylaeus biarmicus** (Warncke 1992)
Egypt.

**Hylaeus bifasciatus** (Jurine 1807)
Continental Greece; North Aegean Greece on Lesbos. Turkey. Israel.
A Pontic bee. Known from eastern Azerbaijan and may possibly occur in northermost Iran.

**Hylaeus bisinuatus** Foerster 1871
Crete. Turkey. Iran; Kordestan, Hamadan, Teheran.
Found during July and August. In Iran noted visiting *Medicago, Trifolium* and *Alhagi*.

**Hylaeus brevicornis** (Nylander 1852)
Iran.
Widespread Iran from May to August when flying to *Ferula, Peucedanum anisum, Daucus carota* and *Alhagi pseudoalhagi*.

**Hylaeus cervinus** (Warncke 1992)
Turkey. Iran.

**Hylaeus chukar** (Warncke 1992)
Turkey.

**Hylaeus clusium** (Warncke 1981)
Iran; Kopet Dag.
On the wing during July at 2000 mtrs.

**Hylaeus clypearis** (Schenck 1853)
Continental Greece. Crete.
Active during July.

**Hylaeus communis** Nylander 1852
Warncke (1982) reports this species from Iran; Isfahan, Mazandaran.
**H. c. creticus** (Warncke 1981) on Crete.
On the wing at 2100 mtrs during June.
**H. c. implicatus** Dathe 1980 Turkey. Iran.
Active during July.

**Hylaeus conformis niveofasciatus** (Foerster 1871)
Libya. Egypt.

**Hylaeus cornutus** Curtis 1831
Active in summer when visits *Daucus carota* in Iran.

**Hylaeus crassanus** (Warncke 1972)
Turkey.
**Hylaeus crispulus** Dathe 1980
Turkey. Iran; Elburz mountains.
Subspecies **H. c. koenigsmanni** Dathe 1981 Crete.
**H. c. hermonus** (Warncke 1981) Israel.
Subspecies **H. c. anatolicus** (Warncke 1981) Turkey.

**Hylaeus cypricolus** (Warncke 1972)
Cyprus. Turkey. Egypt.

**Hylaeus decaoctus** (Warncke 1992)
Turkey.

**Hylaeus deceptorius** (Benoist 1959)
North Aegean Greece on Lesbos.

**Hylaeus difformis** (Eversmann 1852)
Continental Greece. Turkey. Iran; Mazandaran.

**Hylaeus dolichocephalus** (Morawitz 1876)
Iran; Khorasan.
On the wing during August.

**Hylaeus duckei** (Alfken 1904)
Continental Greece; Olympos, northern Pindos. northeastern Turkey.
On the wing at 1400 mtrs during July.
Subspecies **H. d. stellatus** (Warncke 1992) recorded from southeast Turkey.

**Hylaeus elatus** (Warncke 1981)
Israel. Egypt.
Noted on the wing during April and May.

**Hylaeus euryscapus** (Foerster 1871)
North Aegean Greece on Lesbos. Turkey; Mediterranean and Black Sea coasts.

**Hylaeus excelsus** (Alfken 1931)
Turkey. Iran.

**Hylaeus friesei** Alfken 1904
Continental Greece, Peloponnesos.

**Hylaeus funereus** (Warncke 1992)
Turkey.

**Hylaeus gazagnairei** Vachal 1891
Libya; Cyrenaica.

**Hylaeus gibbus** Saunders 1850
On the wing during July. In Iran noted active from late May into August.

**Hylaeus glacialis** (Morawitz 1872)
Turkey.
The subspecies **H. g. giresunus** (Warncke 1992) also from Turkey.

**Hylaeus gracilicornis** (Morawitz 1867)
Continental Greece on Olympos. Corfu.

**Hylaeus heliacus** (Warncke 1992)
Turkey.

**Hylaeus hermonus** (Warncke 1981)
Israel; Mount Hermon.
Active on the wing during June at 2000 mtrs.

**Hylaeus hungaricus** (Alfken 1905)
Northeastern Iran.

**Hylaeus hyalinatus** (Smith 1842)
Subspecies **H. h. milossa** (Warncke 1981) Greece; Cyclades on Milos.
Subspecies **H. h. iranicus** Dathe 1980 Turkey. Northern Iran.

**Hylaeus hyperpunctatus** (Strand 1909)
Subspecies **H. h. helenae** (Pittoni 1950) on Continental Greece. Turkey.
Subspecies **H. h. tauricus** (Warncke 1981) Turkey.

**Hylaeus imparilis** Foerster 1871
Active during June and July.

**Hylaeus iranicus** Dathe 1980
Turkey. Iran.

**Hylaeus irritans** Dathe 1980
Turkey. Iran.

**Hylaeus kahri** Foerster 1871

**Hylaeus klugii** (Friese 1898)
Egypt. Israel. Iran; Khuzestan.
Subspecies **H.k. kermana** (Warncke 1981) in southeastern Iran.
Subspecies **H. k. mesopotamae** (Warncke 1992) Iraq and Iran.

**Hylaeus koenigsmanni** Dathe 1981
Crete.
Active during July.

**Hylaeus kotschisus** (Warncke 1981)
Turkey. Israel. Iran; Khorasan, Elburz.
On the wing at 2000 mtrs..

**Hylaeus kurdus** (Warncke 1981)
Turkey; Hakkari.
Active during August when found at 2600 to 3000 mtrs.
Subspecies **H. k. trochilus** (Warncke 1992) also in Turkey.

**Hylaeus laevithorax**
(Alfken 1924)
Israel. Iran.
On the wing from March to May.

**Hylaeus leptocephalus** (Morawitz 1870)
Turkey. Northern Iran.

**Hylaeus lineolatus** (Schenck 1861)
On the wing June to August in Cyprus and Crete, recorded visiting *Cistus villosus* and *Rubus ulmifolius anatolicus*. Recorded on the wing in Iran from mid May to mid July.

**Hylaeus longimaculus** (Alfken 1936)

**Hylaeus maculatus** (Alfken 1904)
Israel. Lebanon. Southern Iran.

**Hylaeus meridionalis** Foerster 1871
Found during July.

**Hylaeus monedulus** (Warncke 1992)
Turkey.

**Hylaeus moricei** (Friese 1896)
North Aegean Greece on Lesbos. Turkey. Northern Iran.
Eastern populations are referable to **H. m. luteifrons** (Strand 1909).
On the wing from June to August when recorded visiting *Medicago sativa*.

**Hylaeus nigritus** (Fabricius 1798)
Turkey.

**Hylaeus nivaliformis** Dathe 1977
Continental Greece, Olympos.
**Hylaeus nyroca** (Warncke 1992)
Iraq.

**Hylaeus orientalicus** (Warncke 1981)
Turkey. Israel.

**Hylaeus oriolus** (Warncke 1981)
Iran; Elburz.
Recorded on the wing during July at 1600 mtrs.

**Hylaeus pictipes** (Nylander 1852)
Turkey. Israel.

**Hylaeus pictus** (Smith 1853)
Warncke notes subspecies **H. p. damascenus** (Magretti 1890) in southeastern Turkey. Israel. Iraq. Iran.

**Hylaeus planulus** (Warncke 1981)
Turkey; Hakkari.
Inhabits mountain habitat at 2600 to 3000 mtrs where flies during August.

**Hylaeus punctatus** (Brullé 1832)
A summer bee on Cyprus reported from June to September, visiting *Cistus villosus, Rubus ulmifolius anatolicus* and *Mentha longifolia*.

**Hylaeus punctulatissimus** Smith 1842

**Hylaeus punctus** (Foerster 1871)
North Continental Greece, Corfu. Turkey.

**Hylaeus querquedulus** (Warncke 1981)
Turkey; Hakkari. Northern Iran.
On the wing during August at 2600 to 3000 mtrs.

**Hylaeus rubicolus** (Saunders 1850)

**Hylaeus rubosus** (Warncke 1981)
Turkey. Iran.

**Hylaeus rugicollis** (Morawitz 1873)
Turkey. Israel. Iran.

**Hylaeus scutellaris** (Morawitz 1873)
Turkey. Iran; Kerman, Teheran.
**Hylaeus scutellatus** (Spinola 1838)  
Continental Greece. Turkey. Israel. Northern Iran.

**Hylaeus sidensis** (Warncke 1981)  
Turkey. Lebanon. Israel.

**Hylaeus signatus** (Panzer 1798)  
Turkey.  
Subspecies **H. s. berlandii** (Benoist 1943) Turkey. Iran.

**Hylaeus sinuatus** (Schenck 1853)  
Continental Greece; Rhodopi. Northern Turkey.  
Subspecies **H. s. gribdoi** (Vachal 1895) Iran; Hamadan, Mazandaran, Elburz.  
Recorded on the wing in Iran from mid July to early August.

**Hylaeus soror** (Pérez 1903)  
Aegean Greece on Lesbos.

**Hylaeus styriacus** Foerster 1871  
Turkey.  
Subspecies **H. s. creccus** (Warncke 1992) also from Turkey.  
A Pontic bee.

**Hylaeus sulphuripes** (Gribodo 1894)  
Egypt. Libya.

**Hylaeus taeniolatus** Foerster 1871  
North Aegean Greece on Lesbos.

**Hylaeus tardus** (Warncke 1981)  
Iran; Elburz, Hamadan, Fars.  
Noted at 1850 up to 2060 mtrs during May into August. Flies to Umbelliferae.

**Hylaeus tephronotus** (Warncke 1992)  
Turkey.

**Hylaeus tetris** Dathe 2000  
Turkey.

**Hylaeus torquatus** (Warncke 1992)  
Turkey. Syria.

**Hylaeus trifidus** (Aflken 1936)  
North Aegean Greece on Lesbos. Turkey.

**Hylaeus trinotata** Pérez 1895  
Turkey.
Warncke gives a subspecies **H. t. graeca** (Warncke 1992) from central and southern Continental Greece, also a subspecies **H. t. mesopotamica** from Sumel, a location possibly in Iraq.

**Hylaeus tyroensis** (Foerster 1871)

**Hylaeus variegatus** (Fabricius 1798)
Turkey. Israel. Southern Iran.
Subspecies **H. v. coriaceus** (Pérez 1895) on Crete, appearing from May to July.

**Hylaeus vulgaris** (Morawitz 1876)
Iran; Fars, Khorasan.

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**Family Andrenidae**

**Subfamily Andreninae**

**Andrena (Ulandrena) abbreviata** Dours 1873
The subspecies **A. a. dominica** Warncke 1975
From Greece eastwards to Israel and on Crete and Cyprus. Turkey.
One of a good number of Andrena species originally described from Continental Greece or the Greek islands.

**Andrena (Taenandrena) aberrans** Eversmann 1852
Continental Greece.
A primarily Central European and Continental species but recorded from the Greek Chalkidiki Peninsula; Mount Athos at 600 mtrs.

**Andrena (Ulandrena) acerba** Warncke 1967
Found in the Greek Aegean, including Lesbos and Samos, there is a concentration of records in eastern Turkey and Adana.

**Andrena (Aciandrena) aciculata** Morawitz 1886
Continental Europe and Asia Minor with records from Crete and the Aegean including Lesbos and Rhodes and to Cyprus and Turkey.
Andrena (Orandrena) acrana Warncke 1967
Turkey.

Andrena (Chrysandrena) aegyptiaca Friese 1899
Found in Israel and Nilotic Egypt, this species has a now disjunct distribution with records also from northwest Africa.

Andrena (Suandrena) aegypticola Friese 1899
Found in Nilotic Egypt and Israel. On Cyprus the subspecies A. a. larnacensis Mavromoustakis 1954 is found and is quite possibly a full species.

Andrena (Aenandrena) aeneiventris Morawitz 1872
A successful Palaeartic distribution and from Greece to the fringe of the Sinai - the bee is found in Cyprus, Rhodes and Crete. Turkey east to Iran.
Mavromoustakis recorded this Andrena from March to June on Cyprus, with flower records for Ammi majus, Calendula persica, Ferula communis anatriches, Tordylium syriacum, Scandix pecten – veneris, Petroselinum sativum and Foeniculum piperitum. He also discovered this bee on Rhodes.

Andrena (Carandrena) aerinifrons Dours 1873
A montane species with records from southeast Turkey and Israel and Jordan but also from Al Jabal al akhdar, Libya.

Andrena (Melandrena) albifacies Alfken 1927
North of the Gulf of Aqaba and nilotic Egypt to Israel with a record from Libya. Iraq.

Andrena (Truncandrena) albopicta Radoszkowski 1874
Eastern Turkey. Iraq. Iran.

Andrena (Melandrena) albopunctata (Rossi 1792)
The race A. a. funebris Panzer 1798 occurs from Continental Greece towards the eastern Sinai, Israel and Turkey to Syria and on Crete and Cyprus. The species has a wide southern Palaeartic range.

Andrena (Micrandrena) alfkenella Perkins 1914
Greece and Turkey

Andrena (Micrandrena) alfkenelloides Warncke 1965
This bee has a strongly East Mediterranean distribution from Continental Greece through to West and Southwest Turkey, Israel and Jordan and including the large islands of Crete, Lesbos and Cyprus. Bees from Southeast Turkey are referable to subspecies A. a. cardalia Warncke 1975
Known as a pollinator of Almond and Cherry in the orchards of highland Jordan.

Andrena (Euandrena) allosa Warncke 1975
The subspecies A. a. canigica Warncke 1975 recorded from western Turkey. In southern Continental Greece the subspecies A. a. pileata Warncke 1975 occurs.

Andrena (Euandrena) alutacea Stoeckhert 1942
Turkey.

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**Andrena (Aciandrena) amicula** Warncke 1967
Records are confined to nilotic Egypt.

**Andrena (Nobandrena) anatolica** Alfken 1935
Continental Greece, Turkey, Syria and Lebanon.

**Andrena (Ptilandrena) angustior** (Kirby 1802)
A single record from Beghazi, Libya may refer to the race *A. a. impressa* Warncke 1967. The species is strongly western Continental.

**Andrena (Plastandrena) apiformis** Kriechbaumer 1873
A scarcely recorded species with a Southeasterly Continental distribution. Recorded in Greece and southern Turkey.

**Andrena (Leucandrena) argentata** Smith 1844
Continental Greece, Turkey.

**Andrena (Graecandrena) argyreofasciata** Schmiedeknecht 1900
An African bee present in Egypt.

**Andrena (Graecandrena) arsine** Schmiedeknecht 1900
Confined to nilotic Egypt.

**Andrena (Cryptandrena) aruana** Warncke 1967
Very locally recorded from Israel and Palestine.

**Andrena (Nobandrena) asiatica** Friese 1921
From the eastern Aegean including Lesbos and Samos to eastern Turkey through the Levant in coastal Syria and Lebanon. The distribution is centred on Asia Minor.

**Andrena (Melandrena) assimilis** Radoszkowski 1876
Continental Greece, also Lesbos and eastwards through Turkey.

**Andrena (Chlorandrena) astica** Warncke 1967
An Eastern Mediterranean species found on Crete and Cyprus, Lesbos, Southeastern coastal Turkey and Israel.

**Andrena (Nobandrena) athenensis** Warncke 1965
Continental Greece with a distribution running into central Turkey and Black Sea.

**Andrena (Melanapis) atrocoerulea** Giraud 1863
Turkey.

**Andrena (Melandrena) atrotegularis** Hedicke 1923
Continental Greece, Lesbos and to eastern Turkey and Syria.

**Andrena (Leucandrena) barbilabris** (Kirby 1802)
A European bee with records from Continental Greece. Turkey.

**Andrena (Truncandrena) bassana** Warncke 1969
A special longitudinal range, found in Israel and Lebanon. In central Turkey the subspecies *A. b. etesiaca* Warncke 1975 occurs.

**Andrena (Truncandrena) bengasinenis** Schulthess 1924
Coastal North Africa from Libya at Benghazi east to Cairo.

**Andrena (Micrandrena) biarmica** Warncke 1975
The eastern Aegean from Lesbos and Samos east through inland Turkey.

**Andrena (Parandrenella) bicarinata** Morawitz 1876
Turkey.

**Andrena (Euandrena) bicolor** Fabricius 1775
Widespread in Continental Greece and Turkey and recorded from Crete and Cyprus and Israel.

**Andrena (Hyperandrena) bicolorata** (Rossi 1790)
Continental Greece, Crete and coastal Turkey with records from Libya

**Andrena (Chlorandrena) bifida** Warncke 1967
Confined to coastal Libya.

**Andrena (Plastandrena) bimaculata** (Kirby 1802)
Subspecies *A. b. oligotrichia* Mavromoustakis 1952 is found on Cyprus whereas the nominate race is through Continental Greece and Turkey including the Aegean and Israel.
Flower records from Cyprus for the first brood of this bivoltine species, on the wing during March and April, are for *Prunus dulcis, Crataegus azarolus, Pyrus, Tamarix* (rarely) and *Sinapis alba*. A second generation is on the wing from June into early July and visits *Proteroa corymbosa, Tamarix* and *Eryngium creticum*.

**Andrena (Simandrena) biskrensis** Pérez 1895
A record for nilotic Egypt otherwise Western Palaearctic distribution is through Northwest Africa.

**Andrena (Aenandrena) bisulcata** Morawitz 1877
Continental Greece, the coasts of Turkey. Lebanon and Israel.

**Andrena (Aenandrena) bonasia** Warncke 1969
The nominate subspecies is recorded from central southern and eastern Turkey.
In Israel the subspecies *A. b. naevia* Warncke 1969 is found.

**Andrena (Pallandrena) braunsiana** Friese 1887
A small number of records from central and eastern Turkey of the subspecies *A. b. detorta* Warncke 1975.

**Andrena (Cryptandrena) brumanensis**
Friese 1899
A strongly southern and southeastern Palaearctic distribution. Continental Greece, with Crete and Aegean records. Turkey, Cyprus, Israel and Lebanon.

**Andrena (Andrena) bulgariensis** Warncke 1965
Tukey; Kars.

**Andrena (Graecandrena) butea** Warncke 1965
Inland central and eastern Turkey. Israel.
The subspecies **A. b. ketupa** Warncke 1975 also present in Turkey.

**Andrena (Poecilandrena) bytinskii** Warncke 1969
A restricted range in southeastern Turkey and Israel.

**Andrena (Micrandrena) calandra** Warncke 1975
A scarcely recorded bee of south and central eastern Turkey.

**Andrena (Ulandrena) callida** Warncke 1974
Coastal Egypt and Jordan.

**Andrena (Chlorandrena) callosa** Warncke 1967
Very local range in Libya; Benghazi and eastern Gulf of Sirte.

**Andrena (Truncandrena) caneae** Strand 1915
Range from Continental Greece to Lesbos and Crete. Widespread Cyprus. Turkey to Lebanon.
This species was originally described from Crete.

**Andrena (Avandrena) canohirta** (Friese 1922)
Continental Greece, the Aegean at Lesbos. Turkey.

**Andrena (Ulandrena) cantiaca** Warncke 1975
Central and eastern Turkey and on the Greek Aegean at Lesbos.
The subspecies **A. c. infuscata** Warncke 1975 also recorded in Turkey.

**Andrena (Euandrena) canuta** Warncke 1975
Eastern Turkey.

**Andrena (Lepidandrena) caprimulga** Warncke 1975
Eastern Turkey.

**Andrena (Hoplandrena) carantonica** Pérez 1902
A Continental temperate and northern species recorded from Aegean Greece at Lesbos.

**Andrena (Campylogaster) caroli** Pérez 1895
Nilotic Egypt and Israel.

**Andrena (Poliandrena) caspica** Morawitz 1886
Included here is **A. unicincta** Friese 1899. Continental Greece. Southeast Aegean islands. Turkey, Syria, Lebanon. Israel.
Andrena (Poliandrena) castanea Warncke 1975
Turkey; Central Anatolia.

Andrena (Avandrena) caudata Warncke 1965
Very locally known from south east Turkey.

Andrena (Micrandrena) cervina Warncke 1975
Found on Cyprus.

Andrena (Aenandrena) chaetogastra Pittioni 1950
Cyprus, Turkey and Israel.

Andrena (Aciandrena) chelma Warncke 1975
South Continental Greece, Peloponnesos.

Andrena (Leucandrena) christineae Dubitzky 2006
Turkey, Iran.

Andrena (Euandrena) chrysopus Pérez 1903
North eastern Turkey.

Andrena (Zonandrena) chrysopyga Schenck 1853
Northeastern Turkey.
A Continental species which may be present in European Turkey and north Continental Greece.

Andrena (Notandrena) chrysosceles (Kirby 1802)
Turkey.

Andrena (Poecilandrena) ciconia Warncke 1975
Central and eastern Turkey.

Andrena (Melandrena) cineraria (Linnaeus 1758)
Continental Greece.

Andrena (Chlorandrena) cinerea Brullé 1832
Continental Greece. Lesbos, Crete. Western Turkey.

Andrena (Chlorandrena) cinereophila Warncke 1965
Continental Greece through Turkey and Crete, the Aegean including Lesbos and Rhodes and to
Cyprus and Israel.

Andrena (Simandrena) cinnamonea Warncke 1975
Southeastern Turkey.

Andrena (Hoplandrena) clusia Warncke 1966
Central Turkey and northern Continental Greece.
**Andrena (Chlorandrena) clypella** Strand 1921
The subspecies *A. c. hasitata* Warncke 1973 found through Continental Greece to Crete and the Aegean and Turkey.
One of a number of Andrena species originally described by Strand from Crete.

**Andrena (Oreomelissa) coitana** (Kirby 1802)
The subspecies *A. c. xema* Warncke 1975 is found in northeastern Turkey.

**Andrena (Brachyandrena) colletiformis** Morawitz 1874
On Cyprus found from April into July, visiting *Ammi majus, Foeniculum piperitum, Eryngium creticum* and *Ferula communis anatriches*.
One of a number of species of Andrena recorded from Rhodes by Mavromoustakis.

**Andrena (Ulandrena) combaella** Warncke 1966
Northern Continental Greece and recorded from south-central Turkey.

**Andrena (Simandrena) combinata** (Christ 1791)
Continental Greece. Crete. Cyprus. Turkey and Lebanon and Israel.

**Andrena (Truncandrena) combusta** Morawitz 1876
Central Turkey.
The subspecies *A. c. rubicunda* Warncke 1975 also in Turkey.

**Andrena (Nobandrena) compta** Lepeletier 1841
A sole record from Benghazi, Libya.

**Andrena (Nobandrena) comptaeformis** Gusenleitner & Schwarz 2000
Far eastern Turkey; Van. Iran.
Females on the wing during May and June.

**Andrena (Simandrena) congruens** Schmiedeknecht 1884
Continental Greece and recorded in southeastern Turkey. Israel.

**Andrena (Cordandrena) cordialis**
Northern Continental Greece. Crete. Widespread Turkey.

**Andrena (Mellitoides) coromanda** Warncke 1975
A single record from south-central Turkey.

**Andrena (Poecilandrena) crassana** Warncke 1965
A Southeast mainly littoral Mediterranean range in southern Greece, the Aegean including Lesbos and through southern Mediterranean Turkey, Syria to northern Israel.
The subspecies *A. c. inka* Warncke 1969 also in Turkey.

**Andrena (Zonandrena) creberrima** Pérez 1895
Western Crete.
Andrena (Ulandrena) crecca Warncke 1965  
Turkey.

Andrena (Zonandrena) creticola Strand 1915  
Crete. Israel.

Andrena (Parandrenella) crispa Warncke 1975  
Southern Turkey.

Andrena (Cubiandrena) cubiceps Friese 1914  
Turkey except the north. North Greece and southern Aegean. Israel.

Andrena (Cubiandrena) cubicepsella Warncke 1975  
Central Turkey. Syria.

Andrena (Melittoides) curiosa (Morawitz 1877)  
Aegean Greece on Lesbos. Turkey.

Andrena (Notandrena) curvana Warncke 1965  
Continental Greece.

Andrena (Lepidandrena) curvungula Thomson 1870  
Continental Greece and through the Greek Aegean including Lesbos and Rhodes. Turkey.

Andrena (Melandrena) cussariensis Morawitz 1886  
Southeast and eastern Turkey.

Andrena (Suandrena) cyanomicans Pérez 1895  
Israel and nilotic Egypt.

Andrena (Cordandrena) cypria Pittioni 1950  
Central and eastern Turkey. Cyprus. Israel. Jordan.
Mavromoustakis located the male of this species on Cyprus, finding the species active on open montane slopes close to Pinus nigra forest during May and early June, flying to Alyssum. He reported an ecological separation between this bee and the closely related A. ventricosa Dours which is present but on coastal areas and lower hillsides.

Andrena (Plastandrena) cypricola Mavromoustakis 1952  
Cyprus.

Andrena (Melandrena) danuvia Stoeckhert 1950  
Turkey.

Andrena (Ulandrena) dauma Warncke 1969  
Southeast Turkey. Israel.

Andrena (Holandrena) decipiens Schenck 1859
Continental Greece and Lesbos. Turkey.

**Andrena (Truncandrena) delphiensis** Warncke 1965
Continental Greece and North Aegean on Lesbos. Turkey.

**Andrena (Parandrenella) dentiventris** Morawitz 1874
Central and south central Turkey.

**Andrena (Truncandrena) derbentina** Morawitz 1886
A Caucasian species recorded from the Greek Aegean at Lesbos. Turkey. Israel.

**Andrena (Chrysandrena) dilleri** Gusenleitner 1998
Far eastern Turkey.

**Andrena (Distandrena) distinguenda** Schenck 1871

**Andrena (Fumandrena) djelfensis** Pérez 1895
Continental Greece.

**Andrena (Lepidandrena) dorsalis** Brullè 1832
Continental Greece. Northern Turkey.

**Andrena (Simandrena) dorsata** (Kirby 1802)

**Andrena (Trunandrena) doursana** Dufour 1853
The subspecies *A. d. bengasia* Warncke 1980 found about coastal Egypt and Libya.

**Andrena (Melandrena) dubiosa** Kohl 1905
Continental Greece. Turkey. Syria.

**Andrena (Ulandrena) elegans** Giraud 1863
Northern Continental Greece through central Turkey.

**Andrena (Lepidandrena) elisaria** Gusenleitner 1998
Eastern Turkey.

**Andrena (Melandrena) elmoria** Gusenleitner 1998

**Andrena (Micrandrena) enslinella** Stoeckhert 1924
Recorded from Greek Peloponnesos and through Turkey.

**Andrena (Campylogaster) erberi** Morawitz 1871
Recorded from Attica by Schmiedeknecht. Originally described by Morawitz from the island of Syra, it may be widespread in the Cyclades. One of a good number of Andrena species on the island of
Crete first recorded there by Alfken. Recorded from Rhodes by Mavromoustakis. A summer bee out in July and visiting *Echinops* and *Mentha* in Attica.

**Andrena (Carandrena) eremobia** Guiglia 1933
Records from Egypt and Israel.

**Andrena (Notandrena) erythrocnemis** Morawitz 1870

**Andrena (Carandrena) euzona** Pérez 1895

**Andrena (Plastandrena) eversmanni** Radoszkowski 1867
Far eastern Turkey.

**Andrena (Chlorandrena) exquisita** Warncke 1975
Turkey; Bosphorus.

**Andrena (Truncandrena) fabalis** Warncke 1966
Southeastern Turkey.

**Andrena (Carandrena) falcinella** Warncke 1969
Southeastern Turkey. Israel. Lebanon.

**Andrena (Micrandrena) falsifica** Perkins 1915
North Continental Greece.

**Andrena (Hoplandrena) ferox** Smith 1847
Central southern and southeastern Turkey.

**Andrena (Truncandrena) ferrugineicrus** Dours 1872
Libya.

**Andrena (Parandrenella) figurata** Morawitz 1866
Cyprus. Turkey.

**Andrena (Holandrena) fimbriata** Brullè 1832
Continental Greece.

**Andrena (Holandrena) fimbriatoides** Scheuchl 2004
Israel. Jordan.
The male recorded at orchard blossoms of Apricot *Armeniaca vulgaris* during April.

**Andrena (Zonandrena) flavipes** Panzer 1799
Through Greece and the Aegean Islands. (But not recorded Crete). Turkey through the Levant to nilotic Egypt. Cyprus.
Recorded as a pollinator in the orchards of Jordan.
Andrena (Nobandrena) flavobila Warncke 1965
Continental Greece. Southern central Turkey.

Andrena (Poliandrena) florea Fabricius 1793
Aegean on Lesbos. Crete. Turkey.

Andrena (Micrandrena) floricola Eversmann 1852
Greece. Turkey.

Andrena (Lepidandrena) florivaga Eversmann 1852
Turkey.

Andrena (Holandrena) forsterella Osytshnjuk 1978
Continental Greece. Lesbos and some other Aegean islands though not recorded Crete. Turkey. Cyprus. Lebanon. Israel.

Andrena (Nobandrena) fratercula Warncke 1975
Eastern Turkey.

Andrena (Andrena) fucata Smith 1847
Extreme north Continental Greece and northeast Turkey.

Andrena (Truncandrena) fuligula Warncke 1965
Southeast Turkey to Israel and Jordan.

Andrena (Andrena) fulva Müller 1766
North Continental Greece and Lesbos.

Andrena (Chrysandrena) fulvago (Christ 1791)
North Continental Greece and northern Turkey.

Andrena (Ulandrena) fulvitarsis Brullé 1832

Andrena (Melandrena) fuscocalcarata Morawitz 1877
Lesbos. Central Turkey. Israel.

Andrena (Melanapis) fuscosa Spinola 1838
Andrena f. fuscosa Erichson 1835 from Continental Greece. Lesbos. Crete and some smaller Aegean islands through Turkey. A.f. rutila from the Levant through Egypt and Cyprus. The ranges in the Syrian Desert and Mediterranean not reported.

Andrena (Chlorandrena) galbula Warncke 1975
Eastern Turkey. Israel.

Andrena (Orandrena) gallinula Warncke 1975
Turkey.
**Andrena (Lepidandrena) gamskrucki** Warncke 1965
Continental Greece.
In western Turkey the subspecies *A. g. eburnea* Warncke 1975 occurs. In central and southeastern Turkey the subspecies *A. g. impasta* Warncke 1975 occurs.

**Andrena (Orandrena) garrula** Warncke 1965
North - eastern Greece and Turkey. Jordan.
The subspecies *A. g. lomvia* Warncke 1969 occurs in Israel.

**Andrena (Micrandrena) garzetta** Warncke 1975
Turkey.

**Andrena (Simandrena) gasparella** Patiny 1998
North - eastern Greece and Turkey. Jordan.
The subspecies *A. g. lomvia* Warncke 1969 occurs in Israel.

**Andrena (Zoandrena) gazella** Friese 1922
Extreme southeastern Turkey through the Levant to Nilotic Egypt.
The subspecies *A. g. flammea* Warncke 1975 is noted from Turkey.

**Andrena (Taeniandrena) gelriae** Van Der Vecht 1927
Eastern Turkey.

**Andrena (Euandrena) glabiventris** Alfken 1935
Central and eastern Turkey.

**Andrena (Chrysandrena) glandaria** Warncke 1975
South Aegean. South and eastern Turkey. Israel.

**Andrena (Ulandrena) glareola** Warncke 1969
Eastern Turkey. Israel.

**Andrena (Ptilandrena) glidia** Warncke 1965

**Andrena (Chlorandrena) gordia** Warncke 1975
Cyprus and in southeastern Turkey.

**Andrena (Distandrena) govinda** Warncke 1974
Nilotic Egypt.

**Andrena (Graecandrena) graecella** Warncke 1965
North Continental Greece. Israel.

**Andrena (Melandrena) grandilabris** Pérez 1903
South and eastern Turkey. Cyprus. Lebanon. Israel.

**Andrena (Euandrena) granulosa** Pérez 1902
Northwestern Continental Greece.

**Andrena (Zonandrena) gravida** Imhoff 1832
Continental Greece. Lesbos. Other Greek Islands. Central Turkey.
Dours reported that this bee was present in large numbers on some of the Greek islands.

**Andrena (Fumandrena) griseigena** Warncke 1975
Southeastern Turkey.

**Andrena (Ptilandrena) grossella** Grünwaldt 1976
South Continental Greece.
This bee is on the wing during late October to mid November.

**Andrena (Orandrena) gunaca** Warncke 1975
Central Turkey.

**Andrena (Poliandrena) guttata** Warncke 1969
Southern Israel towards Sinai.

**Andrena (Trachandrena) haemorrhhoa** (Fabricius 1781)
Continental Greece. Lesbos. Turkey.

**Andrena (Charitandrena) hattorfiana** (Fabricius 1775)
The subspecies **A. h. dimidiata** Brullé 1832 is found in Continental Greece, the south Aegean and in western to southeastern Turkey.

**Andrena (Cordandrena) hedikae** Jaeger 1934
The subspecies **A. h. inexpectata** Warncke 1975 in Eastern Turkey.

**Andrena (Ulandrena) heinrichi** Grünwaldt 2005
Greece; Aegean on Samos. Western Turkey; Kusadasi.
Both sexes on the wing during April and early May.

**Andrena (Graecandrena) helenica** Warncke 1965
Continental Greece and Lesbos.

**Andrena (Thysandrena) helouanensis** Friese 1899
Jordan and Eastern Egypt.

**Andrena (Andrena) helvola** (Linnaeus 1758)
Continental Greece and Turkey.

**Andrena (Chrysandrena) henotica** Warncke 1975
Southeastern Turkey. Israel and Jordan.

**Andrena (Chrysandrena) hesperia** Smith 1853
Andrena (Poliandrena) hibernica Warncke 1975
Turkey; Central Anatolia.
In Eastern Turkey the subspecies A. h. caucasica Warncke 1975 occurs.

Andrena (Carandrena) hieroglyphica Morawitz 1876
The subspecies A. h. kurdistanica Engel 2005 found in Turkey.

Andrena (Taeandiandrena) hova Warncke 1975
Central and eastern Turkey.

Andrena (Chlorandrena) humabilis Warncke 1965

Andrena (Chlorandrena) humilis Imhoff 1832
Specines in Turkey are referable to subspecies A. h. indigena Warncke 1975.
Noted as a member of the pollinator community among orchards of Almond and Cherry in Jordan.

Andrena (Zonandrena) hungarica Friese 1887
Subspecies A. h. macroura Warncke 1975 found in Central Turkey.

Andrena (Margandrena) hyacinthina Mavromoustakis 1958

Andrena (Poecilandrena) hybrida Warncke 1975
Central southern to eastern Turkey.
The subspecies A. h. tauriensis Warncke 1975 also in eastern Turkey.

Andrena (Graecandrena) hyemala Warncke 1973
The subspecies A. h. repressa Warncke 1975 also in Turkey.

Andrena ((Thysandrena) hypopolia Schmiedeknecht 1883
Continental Greece. Turkey. Libya.
The subspecies A. h. albiscopa Warncke 1967 is reported from Central Turkey eastwards.

Andrena (Aenandrena) hystrix Schmiedeknecht 1883
Central and eastern Turkey.
Subspecies A. h. rufilata Warncke 1975 reported from Turkey.

Andrena (Nobandrena) iliaca Warncke 1969
Southeast Turkey. Lebanon, Jordan and Israel.
Recorded as a pollinator of Almond and Cherry in Jordan.

Andrena (Micrandrena) illyrica Warncke 1975
Continental Greece.
Andrena (Fumandrena) immaculata Warncke 1975
Central and eastern Turkey. Israel.

Andrena (Graecandrena) impunctata Pérez 1895
Bees found in Israel into North Africa are referable to A. i. contusa Warncke 1967.

Andrena (Campylogaster) incisa Eversmann 1852
Continental Greece and throughout Turkey.

Andrena (Micrandrena) incognita Warncke 1975
South central and eastern Turkey.

Andrena (Andrena) inconstans Morawitz 1877
Far eastern Turkey.

Andrena (Melandrena) induta Morawitz 1895
Eastern Turkey.

Andrena (Mellitoides) innesi Gribodo 1894
Southeastern Turkey. Israel. Egypt. Libya.

Andrena (Taeniandrena) intermedia Thomson 1870
Continental Greece. Southeast and eastern Turkey.

Andrena (Campylogaster) iranella Popov 1940
Iran.

Andrena (Ulandrena) isabellina Warncke 1969
Southeast Turkey to southern Israel.

Andrena (Chlorandrena) isis Schmiedeknecht 1900
Jordan and Egypt.

Andrena (Leimelissa) ispida Warncke 1965
Throughout Turkey.

Andrena (Aciandrena) janthina Warncke 1975
Far southeastern Turkey. Israel.

Andrena (Poecilandrena) kilikiae Warncke 1969
Southeastern Turkey. Lebanon. Israel.

Andrena (Aciandrena) konyella Warncke 1975
Throughout Turkey.

Andrena (Pallandrena) korbella Grünwaldt 2005
Eastern Turkey.
Apparent up to 2600 mtrs during April and May.

**Andrena (Zonandrena) korleviciana** Friese 1887
Continental Greece.

**Andrena (Ptilandrena) kornosica** Mavromoustakis 1954
An island endemic bee of Cyprus.
An early bee, both sexes recorded on the wing in January and February, often in montane habitat to 2,500ft.

**Andrena (Margandrena) krausiella** Gusenleitner 1998
A visitor to Almond and Cherry orchards in Jordan.

**Andrena (Poliandrena) kriechbaumeri** Schmiedeknecht 1883
Continental Greece. Lesbos. Turkey.

**Andrena (Fumandrena) kurda** Warncke 1975
Southern Turkey.

**Andrena (Hoplandrena) labergeiella** Gusenleitner 1998
Far eastern Turkey.

**Andrena (Holandrena) labialis** (Kirby 1802)
In Iran and from Central Turkey the subspecies *A. l. megalia* Warncke 1975 is recorded.

**Andrena (Poecilandrena) labiata** Fabricius 1781
Continental Greece. Turkey.

**Andrena (Aciandrena) lamiana** Warncke 1965

**Andrena (Notandrena) langadensis** Warncke 1965
Subspecies *A. l. clanga* Warncke 1965 recorded in Turkey.

**Andrena (Larandrena) larisana** Warncke 1965
Two subspecies are also present;- *A. l. medioxima* Warncke 1975 (Central Anatolia and southern Turkey) and *A. l. sculpturata* Warncke 1975 (southeastern Turkey).

**Andrena (Campylogaster) lateralis** Morawitz 1876
Continental Greece. Turkey. Israel. Iran.

**Andrena (Taeniandrena) lathyri** Alfken 1899
Continental Greece. Northern Turkey.
Andrena (Poecilandrena) laticeps Morawitz 1877
Turkey.

Andrena (Simandrena) lepida Schenck 1861

Andrena (Notandrena) lepurana Warncke 1974
Libya.

Andrena (Suandrena) leucocyanea Pérez 1895
Libya and western Egypt.

Andrena (Taeniandrena) leucopsis Warncke 1967
Continental Greece. Turkey. Lebanon.
Specimens are referable to subspecies A. l. finschii Warncke 1975.

Andrena (Notandrena) leucura Warncke 1974
Southern Israel.

Andrena (Carandrena) levantina Hedicke 1938
Turkey.

Andrena (Poecilandrena) limassolica Mavromoustakis 1948
Cyprus
On the wing late January and February. Mavromoustakis reported this bee to be oligolectic on Gagea chlorantha.

Andrena (Melandrena) limata Smith 1853

Andrena (Poliandrena) limbata Eversmann 1852
The subspecies A. l. squamea Giraud 1863 is in Continental Greece to Thassos, Lesbos and western Turkey. In the Southeast Greek Aegean, Rhodes; and in the remainder of Turkey the race A. l. dusmeti Warncke 1967 is recorded.

Andrena (Micrandrena) lindbergella Pittioni 1950
Cyprus and Lebanon.

Andrena (Distandrena) longibarbis Pérez 1895
Israel and Egypt.

Andrena (Stenomelissa) lonicera Warncke 1973
Rarely recorded and although not found in our area it may be present in northern Continental Greece as it is present just north of the border. It is the only Western Palaearctic representative of the subgenus Stenomelissa of which three further species are within the Eastern Palaearctic.
Andrena (Zonandrena) lophura Warncke 1975  
Turkey.  
the subspecies A. l. anatolie Warncke 1975 also in Turkey.

Andrena (Thysandrena) lunata Warncke 1975  
Central Turkey.

Andrena (Micrandrena) luscinia Warncke 1975  
East and Southeastern Turkey.

Andrena (Carandrena) lutea Warncke 1967  
Libya.

Andrena (Melandrena) magna Warncke 1965  
South Continental Greece. Central Turkey.

Andrena (Micrandrena) magunta Warncke 1965  
Continental Greece. Lesbos. Turkey.

Andrena (Margandrena) marginata Fabricius 1776  
North Continental Greece and northern Turkey.

Andrena (Distantrena) mariana Warncke 1968  
South Israel. Egypt to Benghazi, Libya.

Andrena (Melandrena) marmora Nurse 1904  
Palestine and Israel.

Andrena (Truncandrena) medeninensis Pérez 1895  
Turkey. Cyprus. Egypt.  
Examples in Turkey referable to subspecies A. m. usura Warncke 1967.

Andrena (Simandrena) mehelyi Alfken 1936  
Turkey.

Andrena (Poliandrena) melaleuca Pérez 1895  
Nilotic Egypt.

Andrena (Poliandrena) melanota Warncke 1975  
South and eastern Turkey.

Andrena (Simandrena) melba Warncke 1966  
Eastern Turkey and Jordan.

Andrena (Melittoides) melittoides Friese 1899  
West and southern Turkey. Palestine. Israel. Jordan.  
A visitor to fruit tree orchards in Jordan.
**Andrena (Chrysandrena) merula** Warncke 1969

**Andrena (Chlorandrena) microcardia** Pérez 1895
South Israel. Libya.

**Andrena (Brachyandrena) miegiella** Dours 1873

**Andrena (Truncandrena) minapalumboi** Gribodo 1894
Egypt and Libya.

**Andrena (Aciandrena) minima** Warncke 1974
Nilotic Egypt.

**Andrena (Micrandrena) minutula** (Kirby) 1802
The race *A. m. dargia* Warncke 1965 from Continental Greece. Lesbos. Crete. Much of Turkey (except for northeast Turkey where the nominate race is distributed). Cyprus.

**Andrena (Micrandrena) minutuloides** Perkins 1914
Continental Greece. Central and eastern Turkey.

**Andrena (Suandrena) mirna** Warncke 1969
Turkey.

**Andrena (Leucandrena) mistrensis** Grünwaldt 2005

**Andrena (Andrena) mitis** Schmiedeknecht 1883
Rarely recorded Continental Greece. Turkey.

**Andrena (Truncandrena) mizorhina** Warncke 1975
Turkey. Israel.

**Andrena (Lepidandrena) Mocsáryi** Schmiedeknecht 1884
Continental Greece. Northern Turkey.

**Andrena (Poliandrena) mollissima** Warncke 1975
Eastern Turkey.

**Andrena (Cryptandrena) monacha** Warncke 1965
Greece; Lesbos. Cyprus. West and southern coastal Turkey. Syria and Lebanon.

**Andrena (Plastandrena) mongolica** Morawitz 1880
South central and eastern Turkey. Iran.

**Andrena (Orandrena) monilia** Warncke 1967
Southeastern Turkey. Southern Israel. Jordan.

**Andrena (Euandrena) montana** Warncke 1973
Continental Greece; Olympos.
On the wing in early August at 2500 mtrs.

**Andrena (Truncandrena) moricei** Friese 1899
Israel.

**Andrena (Taeniandrena) morinella** Warncke 1975
Southern Turkey; Sertavul.

**Andrena (Melandrena) morio** Brullé 1832
The nominate subspecies throughout Continental Greece, Lesbos and many smaller Aegean islands.
Rhodes. Crete. Cyprus. Throughout Turkey to northern Syria.
The race *A. m. lugubris* Erichson 1841 reported in Lebanon and Israel south to the Sinai and nilotic Egypt and western coastal Libya.

**Andrena (Didonia) mucida** Kriechbaumer 1873
Continental Greece. Eastern Turkey. Lebanon and Israel.

**Andrena (Truncandrena) mucronata** Morawitz 1871
Continental Greece. Corfu. Israel.
Out during April in the environs of Athens.

**Andrena (Philandrena) muscaria** Warncke 1965
A rarely recorded species Continental Greece.

**Andrena (Hoplandrena) najadana** Warncke 1975
Southern Turkey; Taurus Range.

**Andrena (Micrandrena) nana** (Kirby 1802)
Recently recorded from Lesbos.

**Andrena (Didonia) nasuta** Giraud 1863
North Continental Greece. Central and eastern Turkey.

**Andrena (Chlorandrena) negevana** Guseinleitner & Scheuchl 2000
Israel and Egypt in the Sinai.

**Andrena (Ulandrena) neocypriaca** Mavromoustakis 1956
Northeastern Continental Greece. Lesbos, Rhodes and some other East Aegean islands. Turkey along west and southern coast to southeast. Cyprus.
Found during April on Cyprus, visiting *Anthemis arvensis*.

**Andrena (Poecilandrena) neovirida** Grünwaldt 2005
Continental Greece.
A spring bee of March and April.
Andrena (Cnemidandrena) nigriceps (Kirby 1802)
North Continental Greece.
The subspecies A. n. comata Warncke 1975 found Turkey.

Andrena (Melandrena) nigroaenea (Kirby 1802)
Found throughout Continental Greece and Aegean islands including Rhodes, Crete, Cyprus. In Turkey, through Lebanon and Israel as the subspecies A. n. candiae Strand 1915.
North Egypt and Libya is populated by the subspecies A. n. aemula Alfken 1926.
Emerges January to March on Cyprus, where visits early floral resources including Prunus dulcis (Almond), P. domestica, Erodium, Gagea chlorantha, Salix alba, Sinapis alba and Calendula persica. Mavromoustakis reported this bee to be bivoltine in Mainland Greece.

Andrena (Chlorandrena) nigroolivacea Dours 1873
Continental Greece.
This species was discovered in Greece by Schmiedeknecht.

Andrena (Parandrenella) nisoria Warncke 1969
Southeast Turkey. Cyprus. Lebanon south through Israel.
This bee probably also occurs in Libya and possibly in Egypt (Erwin Scheuchl pers comm.).

Andrena (Melandrena) nitida (Müller 1776)
Turkey.
The subspecies A. n. batesiae Cockerell 1910 is distributed through Continental Greece. Aegean islands including Lesbos to the Cyclades. Crete. Parts of Turkey. Cyprus to Lebanon.

Andrena (Notandrena) nitidiuscula Schenck 1853
North Continental Greece. Turkey.
In Lebanon and Israel to Nilotic Egypt the subspecies A. n. nigellata Pérez 1895 is found.

Andrena (Micrandrena) niveata Friese 1887
The subspecies A. n. bubulca Warncke 1975 Far eastern Turkey.

Andrena (Truncandrena) noacki Alfken 1935
Turkey.

Andrena (Nobandrena) nobilis Morawitz 1874
Continental Greece. Lesbos and some other Aegean islands to Crete. Turkey.
On the wing in May in Attica, Greece, recorded visiting Hirschfeldtia.

Andrena (Carandrena) nubicai Warncke 1975
Central and southeastern Turkey. Israel.

Andrena (Simandrena) nucleola Warncke 1973
A rarely recorded species of Continental Greece and north to far eastern Turkey.

Andrena (Avandrena) ochropa Warncke 1974
Libya; Al Jabal al Akhdar.
**Andrena (Micrandrena) oedcinema** Warncke 1975
Continental Greece. Central to far eastern Turkey.

**Andrena (Micrandrena) oenas** Warncke 1975
Central and eastern Turkey.

**Andrena (Poecilandrena) olympica** Grünwaldt 2005
Continental Greece.
A vernal Andrena of March and April.

**Andrena (Notandrena) optata** Warncke 1975
Continental Greece, some Aegean islands. Crete. Cyprus. Turkey. Lebanon to southern Israel.

**Andrena (Orandrena) oralis** Morawitz 1876
Continental Greece. Turkey.

**Andrena (Chlorandrena) orientana** Warncke 1965

**Andrena (Poliandrena) ornata** Morawitz 1866
Far eastern Turkey.

**Andrena (Ulandrena) osychniuea** Osytshnjuk 1977

**Andrena (Truncandrena) oulskii** Radoszkowski 1867
Eastern Turkey.

**Andrena (Taeniandrena) ovatula** (Kirby 1802)
The nominate subspecies occurs in Continental Greece. Lesbos. South Aegean islands. Crete. Cyprus. Throughout Turkey. Israel. The subspecies **A. o. heliopolis** Friese 1914 is found in Egypt. The subspecies **A. o. poupllieri** Dours 1872 is present in Crete and Libya.

**Andrena (Micrandrena) paganettina** Warncke 1965

**Andrena (Cordandrena) pagophila** Warncke 1975
Far eastern Turkey.

**Andrena (Pallandrena) pallidicincta** Brullé 1832

**Andrena (Lepidandrena) pandellei** Pérez 1895
On the wing during May in Attica, Greece.
Andrena (Fumandrena) pandosa Warncke 1968
Southeastern Turkey to Lebanon. Israel. Egypt and Libya.

Andrena (Chlorandrena) panurgimorpha Mavromoustakis 1957
On the wing from late March to April on Cyprus.

Andrena (Poecilandrena) paradisaea Warncke 1975
Southeastern Turkey.

Andrena (Ulandrena) paradoxa Friese 1921
Turkey.

Andrena (Truncandrena) paramythensis Mavromoustakis 1957
Turkey.

Andrena (Truncandrena) pareklisiae Mavromoustakis 1957
Cyprus.
On the wing in February to April visiting Sinapis alba and Alyssum campestre hirsutum.

Andrena (Leucandrena) parviceps Kriechbaumer 1873
Continental Greece. Western and east Turkey.

Andrena (Lepidandrena) paucisquama Noskiewicz 1924

Andrena (Aciandrena) pellucida Warncke 1974
Egypt.

Andrena (Graecandrena) pelopa Warncke 1975
Continental Greece.

Andrena (Carandrena) pesleria Gusenleitner 1998
Coastal Egypt. Israel.

Andrena (Taeniandrena) phoenicura Warncke 1975
Central and eastern Turkey.

Andrena (Plastandrena) pilipes Fabricius 1781

Andrena (Chlorandrena) pinkeunia Warncke 1969
Israel. Jordan.

Andrena (Suandrena) planiventris Dours 1872
Egypt.
**Andrena (Orandrena) platalea** Warncke 1975
Southeast and eastern Turkey.

**Andrena (Ulandrena) polemediana** Mavromoustakis 1956
Cyprus. Turkey.

**Andrena (Poliandrena) polita** Smith 1847

**Andrena (Notandrena) pontica** Warncke 1972
Eastern Turkey.

**Andrena (Andrena) praecox** (Scopoli 1763)
Rarely recorded in southern Turkey.

**Andrena (Aciandrena) pratincola** Warncke 1974
Egypt.

**Andrena (Nobandrena) probata** Warncke 1973
Continental Greece. Eastern Turkey.

**Andrena (Taeniandrena) producta** Warncke 1973
Turkey.

**Andrena (Micrandrena) proxima** (Kirby 1802)
Continental Greece.

**Andrena (Campylogaster) pruinosa** Erichson 1835
Israel. Egypt.

**Andrena (Micrandrena) puffina** Warncke 1975
Turkey.

**Andrena (Aciandrena) pulicaria** Warncke 1975
Central Turkey.

**Andrena (Brachyandrena) punctatissima** (Morawitz 1866 *sensu* Warncke)
Throughout Turkey.

**Andrena (Carandrena) purpureomicans** Alfken 1935
Central, south and eastern Turkey.

**Andrena (Melandrena) pyropygia** Kriechbaumer 1873
On the wing Cyprus from May to July. Flower visits recorded for *Eryngium creticum*, *Cistus villosus creticus*, *Ferula communis anatriches*, *Allium* and *Marrubium vulgare apolum*. Mavromoustakis recorded this bee on the wing during April and May in Palestine and Israel, visiting *Teucrium*.

**Andrena (Poliandrena) pyrozonata** Friese 1921
South central and Southeastern Turkey. Cyprus.

**Andrena (Chlorandrena) pyrrhula** Pérez 1895
Nilotic Egypt.

**Andrena (Zonandrena) quadrimaculata** Friese 1921
Western continental Greece. Southern and eastern Turkey.

**Andrena (Fumandrena) querquedula** Warncke 1975
Southern Turkey

**Andrena (Melittoides) ramlehiana** Pérez 1903
Southeastern Turkey. Israel.

**Andrena (Thysandrena) ranunculorum** Morawitz 1877
Throughout central and eastern Turkey.

**Andrena (Notandrena) recurvirostra** Warncke 1975
Central and southeastern Turkey.

**Andrena (Poecilandrena) regina** Friese 1921
Eastern Turkey.

**Andrena (Euandrena) robusta** Warncke 1975
Rarely recorded Continental Greece. Greek Aegean on Lesbos, Samos and Rhodes.

aff. **Andrena (Euandrena) robusta** Warncke 1975
Aegean Greece at Lesbos.

**Andrena (Hoplandrena) rosae** Panzer 1801
Greece on Crete. Eastern Turkey.

**Andrena (Truncandrena) roseotincta** Warncke 1975
Turkey.

**Andrena (Truncandrena) rotundilabris** Morawitz 1878
Lesbos. South and eastern Turkey. Lebanon. Israel.

**Andrena (Distandrena) rubecula** Warncke 1974
Sinai and nilotic Egypt.

**Andrena (Euandrena) ruficrus** Nylander 1848
Continental Greece. Turkey.

**Andrena (Euandrena) rufitibialis** Friese 1899
The subspecies *A. r. limosa* Warncke 1969 recorded Southeast and eastern Turkey. Syria. Lebanon. Israel.

**Andrena (Truncandrena) rufomaculata** Friese 1921

**Andrena (Euandrena) rufula** Schmiedeknecht 1883
Continental Greece. South central Turkey.

**Andrena (Micrandrena) rugothorace** Warncke 1965

**Andrena (Micrandrena) rugulosa** Stoeckhert 1935
Continental Greece. Lesbos. Far eastern Turkey.

**Andrena (Poecilandrena) rusticola** Warncke 1975
Southeastern Turkey.

**Andrena (Melanapis) rutila** Spinola 1838
Turkey.

**Andrena (Troandrena) saettana** Warncke 1975
Aegean Greece on Samos and Rhodes. Cyprus. Southern Turkey.

**Andrena (Fumandrena) sandanskia** Warncke 1973
Continental Greece.

**Andrena (Poecilandrena) saturata** Warncke 1975
Central and south central Turkey.

**Andrena (Suandrena) savignyi** Spinola 1838
Egypt. Sinai. Israel.

**Andrena (Micrandrena) saxonica** Stoeckhert 1935
Continental Greece. Western Turkey.

**Andrena (Opandrena) schencki** Morawitz 1866

**Andrena (Carandrena) schlettereri** Friese 1896
Continental Greece. Lesbos. Turkey.

**Andrena (Truncandrena) schmiedeknechti** Magretti 1883
This bee is on the wing during April and May in Attica, recorded visiting *Erysimum pusillum* there by Mavromoustakis.

Bees in Turkey are referable to subspecies *A. s. flavopilis* Warncke 1965.

**Andrena (Hoplandrena) schonitzeri** Gusenleitner 1998
Far eastern Turkey.

**Andrena (Hoplandrena) schuberti** Gusenleitner 1998
Far Southeastern Turkey.

**Andrena (Ulandrena) schulzi** Strand 1921
The nominate subspecies on Continental Greece; Attica. Lesbos. Eastern Aegean islands including Rhodes.
On Crete and Turkey the subspecies *A. s. alba* Warncke 1967 is found. .

**Andrena (Graecandrena) schwarzi** Warncke 1975
South central Turkey.

**Andrena (Micrandrena) scirpacea** Warncke 1975

**Andrena (Scitandrena) scita** Eversmann 1852

**Andrena (Micrandrena) sedentaria** Warncke 1975
Central and eastern Turkey.

**Andrena (Truncandrena) seitzi** Alfken 1935
Central and eastern Turkey. Israel.

**Andrena (Notandrena) selcuki** Scheuchl & Hazir 2008
Turkey; Konya.
Recorded from a steppic region of Central Anatolia with areas of arable cultivation.

**Andrena (Simandrena) selena** Gusenleitner 1994
Sinai.

**Andrena (Poecilandrena) seminuda** Friese 1896
Continental Greece. Lesbos. Turkey.

**Andrena (Poecilandrena) semirubra** Morawitz 1876
Turkey. Israel.

**Andrena (Larandrena) sericata** Imhoff 1868
Scarcely recorded from Continental Greece. South central Turkey.

**Andrena (Truncandrena) serraticornis** Warncke 1965
Continental Greece. West and Southeast Turkey. Southern Israel.
Andrena (Taeniandrena) sexguttata Morawitz 1878
Central Turkey.

Andrena (Margandrena) sibthorpi Mavromoustakis 1952
Cyprus. Frequent on the wing in December. An oligolege of the winter – flowering Colchicum hiemale which begins to flower in November on Cyprus.

Andrena (Zonandrena) sigiella Gusenleitner 1998

Andrena (Micrandrena) silla Warncke 1975
Eastern Aegean islands. West and south central Turkey. The subspecies A. s. histrionica Warncke 1975 also occurs in Turkey.

Andrena (Taeniandrena) similis Smith 1849

Andrena (Cnemidandrena) simillima Smith 1851
Continental Greece; Mount Olympos. A summer bee found between 500 and 2000 mtrs.

Andrena (Micrandrena) simontornyella Noskiewicz 1939
Continental Greece. Lebanon. Turkey. Israel.

Andrena (Chlorandrena) sinuata Pérez 1895
Southern Israel. Libya.

Andrena (Campylogaster) skorikovi Popov 1940
Iran.

Andrena (Suandrena) sobrina Warncke 1975
Central southern Turkey.

Andrena (Taeniandrena) solitaria Warncke 1975
Eastern Turkey.

Andrena (Ulandrena) speciosa Friese 1899
Israel. Nilotic Egypt. Libya.

Andrena (Poecilandrena) sphecodimorpha Hedicke 1942

Andrena (Chlorandrena) spinaria Warncke 1974
Egypt.

Andrena (Aciandrena) spolata Warncke 1968
Israel. Nilotic Egypt.

**Andrena (Micrandrena) spreta** Pérez 1895
Libya. Egypt towards Sinai and Israel.
The subspecies *A. s. pseudasuniensis* Strand 1921 is in Continental Greece.

**Andrena (Lepidandrena) statusa** Gusenleitner 1998
Eastern Turkey. Israel.

**Andrena (Notandrena) stellaris** Warncke 1965

**Andrena (Micrandrena) stoeckertella** Pfitzoni 1948
Central Turkey.

**Andrena (Micrandrena) stolida** Warncke 1975
Turkey.

**Andrena (Micrandrena) strepera** Warncke 1975
Eastern Turkey.

**Andrena (Micrandrena) subopaca** Nylander 1848
Northern and central Continental Greece.

**Andrena (Simandrena) susteraii** Alfken 1914
Northern Continental Greece.

**Andrena (Euandrena) symphyti** Schmiedeknecht 1883
The nominate subspecies is found in Continental Greece.
In Turkey the subspecies *A. s. furcata* Friese 1921 is present.

**Andrena (Andrena) synadelpha** Perkins 1914
Rarely recorded from western Turkey.

**Andrena (Chlorandrena) tadauchii** Gusenleitner 1998
Turkey. Syria. Lebanon. Israel.

**Andrena (Micrandrena) taprobana** Warncke 1975
Southern Continental Greece. Eastern Turkey.

**Andrena (Chlorandrena) taraxaci** Giraud 1861
Found in Continental Greece; Attica and more widely. Recorded from the North Aegean on Lesbos where sometimes present alongside the closely related *A. orientana* Warncke.
In Egypt and Libya the subspecies *A. t. curtivalvis* Morice 1899 occurs.
Mavromoustakis reported this bee to be on the wing during May in Greece, recorded by his son Antonios Mavromoustakis whilst studying medicine in Athens.
Andrena (Tarsandrena) tarsata Nylander 1848
Northern Continental Greece. Turkey.

Andrena (Aciandrena) tenuiformis Pittioni 1950
Cyprus. Turkey.

Andrena (Aciandrena) tenuis Morawitz 1877
Central southern and eastern Turkey.

Andrena (Margandrena) testaceipes Saunders 1908
Northern Libya.

Andrena (Didonia) teunisseni Guseinleitner 1998
Far eastern Turkey.

Andrena (Simandrena) thomsoni Ducke 1898
Continental Greece. Crete. Throughout Turkey.

Andrena (Melandrena) thoracica (Fabricius 1775)
The subspecies A. t. kotschyi Mavromoustakis 1953 is referable in some cases.
On Cyprus a bivoltine bee with an early brood recorded at Asphodelus ramosus microcarpus, Oxalis corniculata, Calendula persica and Sinapis alba from January to March. Mavromoustakis reported a second brood on the wing during May, visiting Compositae. He reported the second brood active in Lebanon from June to July.

Andrena (Micrandrena) tiaretta Warncke 1974
Lebanon. Israel. Sparsely recorded from Egypt to Libya.

Andrena (Plastandrena) tibialis (Kirby 1802)
Turkey.
The subspecies A. t. porzana Warncke 1975 and A. t. concreta Warncke 1975 also occur in Turkey.
The subspecies A. t. vindobonensis Stoeckhert 1950 is recorded in northern Continental Greece.

Andrena (Lepidandrena) tinaria
Guseinleitner 1998
Eastern Turkey.

Andrena (Micrandrena) tkalcui Guseinleitner & Schwarz 2002
Southeastern Turkey. Israel.

Andrena (Poliandrena) toelgiana Friese 1921
Recorded from the Greek Aegean on Lesbos. Local in western and extreme Southeastern Turkey to Syria. Lebanon. Israel.

Andrena (Fumandrena) tomora Warncke 1975

**Andrena (Cordandrena) torda** Warncke 1965

**Andrena (Simandrena) transitoria** Morawitz 1871
Continental Greece; Attica. South Aegean islands. Cyprus. Turkey. Syria. Lebanon. Palestine. Israel. This species was originally described from the Greek Island of Syra. Mavromoustakis reported this bee to be bivoltine in Attica, on the wing in May and a second emergence in July.

**Andrena (Ulandrena) trikalensis** Warncke 1965
Scarcely recorded from central Continental Greece.

**Andrena (Hoplandrena) trimmerana** (Kirby 1802)

**Andrena (Micrandrena) tringa** Warncke 1973
Turkey. Although not recorded from Continental Greece it is present beyond the northern border and could be looked for.

**Andrena (Troandrena) troodica** Warncke 1975
Cyprus. Southeastern Turkey.

**Andrena (Truncandrena) truncatilabris** Morawitz 1877
Continental Greece. Lesbos. South Aegean islands. Crete. Cyprus. Throughout Turkey to Syria. Lebanon. Israel. A spring bee found on Cyprus during March and April and recorded at *Sinapis alba*, *Calendula persica* and *Eruca hispanica*. In Attica, Greece, Mavromoustakis noted this bee on the wing during May, visiting *Hirschfeldia*.

**Andrena (Truncandrena) tscheki** Morawitz 1872
Subspecies **A. t. tritica** Warncke 1965 occurs through Continental Greece and Turkey. Israel. Jordan.

**Andrena (Lepidandrena) tuberculifera** Pérez 1895
Coastal Libya.

**Andrena (Truncandrena) ulula** Warncke 1969
South central and Southeastern Turkey. Lebanon. Palestine. Israel.

**Andrena (Notandrena) ungeri** Mavromoustakis 1952

**Andrena (Notandrena) urdula** Warncke 1965

**Andrena (Zonandrena) vachali** Pérez 1895  

**Andrena (Melandrena) vaga** Panzer 1799  
Northern Continental Greece. Eastern Turkey.

**Andrena (Holandrena) variabilis** Smith 1853  
On Cyprus Mavromoustakis found this bee on the wing during June, visiting the flowers of *Eryngium creticum* and *Broteroa corymbosa*.

**Andrena (Andrena) varians** (Kirby 1802)  
Turkey.

**Andrena (Aciandrena) varicornis** Pérez 1895  
Nilotic Egypt.

**Andrena (Simandrena) venerabilis** Alfken 1935  
Southeastern Turkey. Lebanon. Israel. Palestine.

**Andrena (Larandrena) ventralis** Central Continental Greece. North Turkey.

**Andrena (Cryptandrena) ventricosa** Dours 1873  
Continental Greece. South and east Aegean. Crete. Throughout Turkey. Syria. Lebanon. Israel. One of the species of Andrena originally described from the Greek islands by Dours who noted the bee to be common on some of them. Recorded from Rhodes by Mavromoustakis.  
The subspecies *A. v. rubicunda* Warncke 1975 is on the wing during March in Cyprus, visiting *Umbelliferae*, *Scandix pecten - veneris* and *Calendula persica*.

**Andrena (Ptilandrena) vetula** Lepeletier 1841  
On the wing March and April in Cyprus where recorded visiting *Sinapis alba* and *Scandix pecten - veneris*. However, Mavromoustakis reported this bee in Lebanon to be active in May and June. Possibly this species is therefor bivoltine.

**Andrena (Micrandrena) virgata** Warncke 1975  
Recently recorded from North Aegean Greece at Lesbos. Scarcely recorded from central and far Eastern Turkey.

**Andrena (Poecilandrena) viridescens** Viereck 1916  
North Continental Greece. Northwestern Turkey.

**Andrena (Graecandrena) volka** Warncke 1969  
Southeastern Turkey. Israel. Palestine.
Andrena (Euandrena) vulpecula Kriechbaumer 1873
Continental Greece. Israel.

Andrena (Mierandrena) warnckei Gusenleitner & Schwarz 2000
Central and Eastern Turkey.

Andrena (Poliandrena) westensis Warncke 1965
North Aegean on Lesbos. Turkey.

Andrena (Holandrena) wilhelmi Schuberth 1995

Andrena (Taeniandrena) wilkella (Kirby 1802)
Continental Greece. Turkey. Cyprus.

Andrena (Parandrena) wolfi Gusenleitner & Scheuchl 2000
Israel.

Andrena (Aciandrena) yelkouan Warncke 1975
Southeast Turkey. Southern Israel. Jordan.

Andrena (Carandrena) zostera Warncke 1975
Southeast Turkey. Israel.

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Subfamily Panurginae

Tribe Panurgini

Camptopoeum friesei Mocsáry 1894
The subspecies C. f. densum (Warncke 1972) in Turkey.

Camptopoeum (Camptopoeum) frontale (Fabricius 1804)
North Aegean Greece on Lesbos. Turkey.
Specimens are referable to the subspecies C. f. sacrum Alfken 1935 and C. f. triticum (Warncke 1972).

Camptopoeum negevensis (Warncke 1972)
Israel. Egypt. present in the Sinai.

Camptopoeum (Epimethea) nigrotum (Warncke 1987)
Turkey. Israel.
Camptopoeum (Epimethea) pictipes (Morawitz 1876)
Turkey, Urfa, Nevsehir, Icel, Hakkari, Sirt.

Camptopoeum rubrum (Warncke 1987)
Turkey.

Camptopoeum (Epimethea) subflavum (Warncke 1987)
Turkey, Siirt, Elazig, Tunceli.

Camptopoeum (Epimethea) variegatum (Morawitz 1876)
Turkey.
The subspecies C. v. kilikiae (Warncke 1972) in Southeast Turkey.

Camptopoeum (Epimethea) warncki (Patiny 1999)
Southern Iran.

Panurginus anatolicus (Warncke 1972)
Turkey.

Panurginus brullei (Lepeletier 1841)
The subspecies P. b. clarus (Warncke 1972) as well as P. b. lactipennis Friese 1897 and P. b. turcomanus Popov 1936 are all to be found in Turkey.

Panurginus cavus (Warncke 1972)
Turkey.

Panurginus clavatus (Warncke 1972)
Turkey.

Panurginus corpanus (Warncke 1972)
Turkey.

Panurginus labiatus (Eversmann 1852)
Turkey.

Panurginus lactipennis Friese 1897
Cyprus. Turkey. Jordan.
In Cyprus found at montane habitat during May and June, visiting Alyssum troodi.

Panurginus minutulus (Warncke 1987)
Turkey.

Panurginus montanus Giraud 1861
Subspecies P. m. tyrozensis (Richards 1932)
Continental Greece; Pindos and Olympos.
Found from 1400 to 1700 mtrs montane slopes where both sexes on the wing July.
The subspecies P. m. ponticus (Warncke 1972) Turkey.
**Panurginus orientalicus** (Warncke 1972)  
Turkey.

**Panurginus punctiventris** Morawitz 1876  
Turkey.

**Panurginus sculpturatus** Morawitz 1872  
Subspecies **P. s. magnus** (Warncke 1972) in Turkey.

**Panurginus stylus** (Warncke 1987)  
Turkey.

**Clavipanurgus gusenleitneri** Patiny 2004  
Syria  
Both sexes on the wing in April.

**Gasparinahla megapalpae** Patiny 2001  
Southern Iran.  
Noted during May.

**Panurgus banksianus** (Kirby 1802)  
Continental Greece; Mount Olympos. Turkey.  
Both sexes on the wing during July and August at up to 2500 mtrs.

**Panurgus calcaratus** (Scopoli 1763)  
North Aegean Greece on Lesbos. Turkey.

**Panurgus (Panurgus) dentipes** Latreille 1811  

**Panurgus nigriscopus** Pérez 1895  
Palestine. Israel. Egypt, Sinai.  
Distributed only along the Jordan Valley within our region. This species is also found in Northwest Africa and eastern Arabia.

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Tribe Melitturgini

**Melitturga caucasica** Morawitz 1878  
Northern Iran.

**Melitturga clavicornis** (Latreille 1806)  
Turkey. Iran, Azerbaijan, Elburz, Mazandaran, Teheran.
**Melitturga krausi** Schwarz 2003
Israel.
Females recorded on the wing during the first half of April.

**Melitturga pictipes** Morawitz 1892
The subspecies **M. p. heinrichi** Tkalcu 1978 in Turkey.

**Melitturga praestans** Giraud 1861
Some examples are referable to **M. p. syriaca** Friese 1896.
On the wing March through to May on Cyprus, recorded visiting *Vicia cracca elegans, Trifolium stellatum* and species in the Family Lamiales.

**Melitturga spinosa** Morawitz 1892
Continental Greece. Turkey.

**Melitturga taurica** Friese 1922
Turkey.

**Plesiopanurgus cinerarius** Cameron 1907
Iran.
Flies to *Convolvulus leiocalycinus* and *Convolvulus spinosus*.

**Plesiopanurgus (Zizopanurgus) ibex** Baker 1972
Eastern Turkey.

**Plesiopanurgus richteri** (Schwammberger 1971)
South Iran.

**Plesiopanurgus (Zizopanurgus) zizus** (Warncke 1987)
Eastern Turkey.
Flower visiting records for *Convolvulus valentinus* and *Convolvulus trabutiensis* from the full range of this bee.

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**Family Halictidae**

Subfamily Rophitinae

**Systropha curvicornis** (Scopoli 1770)
This bee is apparent in summer, nesting in aggregations. It is oligolectic on *Convolvulaceae*.

**Systropha hirsuta** Spinola 1839
Israel. Egypt.
Males appear during mid April in Egypt and early May in Israel. Bees of this genus are markedly protandrous with the females emerging some weeks after the males first appear.
**Systropha iranica** Popov 1967
Iran; Kerman.
Found at 2000 mtrs on the wing from May.

**Systropha planidens** Giraud 1861
Males are active at least to 1700 mtrs in Turkey during June and July and both sexes are found together during mid July in Iran up to an altitude of 2150 mtrs. Males noted visiting *Convolvulus* in Iran.
Nests in aggregations are in level or sloping ground with a south-facing element.

**Systropha villosa** Ebmer 1978
Southern Iran.
Both sexes on the wing during March and April.

**Rophitoides anatolicus** (Schwammberger 1975)
Turkey.

**Rophitoides canus** (Eversmann 1852)
Northeastern Turkey. Iran.
A bee of the Eurasian steppes. Polylectic and visits *Tamarix* but with a strong preference for Fabaceae.

**Rophitoides epiroticus** Schwammberger 1975
Continental Greece.

**Rophites algirus** Pérez 1895
The subspecies *R. a. trispinosus* Pérez 1903 from southern Europe occurs as a transitional form with *R. a. graecus* in northern Greece.
The subspecies *R. a. graecus* Warncke 1980 is found in southern Continental Greece.
The subspecies *R. a. montanus* Ebmer 1978 is present in Turkey.
A univoltine summer bee oligolectic on Lamiaceae. A host of the cleptoparasite *Biastes emarginatus*.

**Rophites caucasicus** Morawitz 1875
Turkey.

**Rophites clypealis** Schwammberger 1976
Turkey.

**Rophites foveolatus** Friese 1900
Turkey.

**Rophites fuscescens** Friese 1902
Noted visiting *Papaver*.

**Rophites gusenleitneri** Schwammberger 1973
Turkey.

**Rophites hartmanni** Friese 1902  
A summer flying oligolege of the Lamiaceae.

**Rophites heinrichi** Schwammberger 1976  
Turkey.

**Rophites hellenicus** Ebmer 1984  
Continental Greece; Falakro south to the Katara Pass.  
A minute bee of the high mountains where visits Lamiaceae, especially *Acinos*.

**Rophites leclercqi** Schwammberger 1971  
Turkey.

**Rophites mandibularis** Morawitz 1891  
Iran.  
Males, and the previously unknown females of this bee discovered on the wing Iran; Karaj during May at 1200 mtrs.

**Rophites montanus** Ebmer 1978  
Iran.  
Active during June and July at elevations to 2800 mtrs and recorded flying to *Ballota*.

**Rophites morawitzia** Friese 1902  
Turkey.  
Noted visiting *Papaver*.

**Rophites nigripes** Friese 1902  
Turkey. Israel.

**Rophites quinquespinosus** Spinola 1808  
Continental Greece. Turkey.  
An oligolege of Lamiaceae although males visit flowers of other families. Both sexes are apparent in summer often about xerothermic swards such as meadows and forest clearings. This bee is a host of the cleptoparasitic bee *Biastes emarginatus*.

**Rophites transitorius** Ebmer 1993  
Turkey; Hakkari.

**Dufourea (Alpinodufourea) alpina** Morawitz 1865  
Continental Greece. Accidentally introduced to Crete.  
A mountain bee recorded at 2700 mtrs during November.

**Dufourea (Cyrirophites) armenia** Ebmer 1987  
Turkey.  
Noted flying to *Campanula* in the mountains at 1900 mtrs during July.
Dufourea (Afrodufourea) atrata (Warncke 1979)
Turkey.
Recorded at Veronica late May to mid June

Dufourea (Dentirophites) bytinski Ebmer 1999
Israel.

Dufourea (Dufourea) caelestis Ebmer 1987
Eastern Turkey.
Both sexes on the wing during July at 2600 mtrs. An oligolege of Campanula.

Dufourea (Dufourea) chagrina (Warncke 1979)
Israel.
Recorded early in April.

Dufourea (Dufourea) ciliata Ebmer 1993
Egypt.
Active on the wing during February and March.

Dufourea (Cyrirophites) coeruleocephala Morawitz 1872
Turkey; Agri.

Dufourea (Cyrirophites) cypria Mavromoustakis 1952

Dufourea (Dufourea) goeleti Ebmer 1999
Israel.

Dufourea (Halictoides) graeca Ebmer 1976
The subspecies D. g. dubiosa (Warncke 1979) in Central and northern Continental Greece and Peleponnessos. Eastern Turkey.
A summer bee of the mountains at 2300 to 2500 mtrs.

Dufourea (Halictoides) inermis (Nylander 1848)
Continental Greece.
A very local bee in the Greek mountains at 1800-1900 mtrs.

Dufourea (Cyrirophites) iris Ebmer 1987
Northwestern Continental Greece; Thrace.
A mountain bee found between 1500 to 1700 mtrs flying to Acinos alpinus during late July and August

Dufourea (Cyrirophites) longicornis (Warncke 1979)
Turkey. Israel. Iran.
Collects pollen from Salvia.

Dufourea (Trilia) muoti Vachal 1899
Reported from Israel although this is a northwest African bee and the record may need confirmation.

**Dufourea (Dufourea) nodicornis** (Warncke 1979)
A spring bee active during March and April.

**Dufourea (Cephalictoides) paradoxa** (Morawitz 1867)
The subspecies **D. p. zolotasi** (Warncke 1988) only on Continental Greece at Olympos.
This species is a midsummer and univoltine bee. Likely to be oligolectic, it exists in cool temperate regions inhabiting only montane areas in the south of the range. In Russia this bee flies to *Veronica incana*. There are a number of other subspecies in the Old World.
The subspecies **zolotasi** is a summer bee found at 2500 mtrs in the Greek Olympos Massif.

**Dufourea (Halictoides) pontica** (Warncke 1979)
Northeastern Turkey.
On the wing during July in mountains at 2500 to 2800 mtrs when flying to *Campanula*.

**Dufourea (Dufourea) quadridentata** (Warncke 1979)
Turkey; Erzurum.

**Dufourea (Dufourea) rufiventris** Friese 1898
Israel. Egypt; Sinai.

**Dufourea (Cyprirrophites) salviae** Ebmer 2008
Ebmer recorded this bee collecting pollen from *Salvia* amid tragacanthic ground flora within a grove of *Populus*.

**Dufourea (Halictoides) schmiedeknechtii** (Kohl 1905)
Eastern Turkey.
Found flying to *Campanula* and *Asyneuma* at 2100 mtrs during July.

**Dufourea (Cyprirrophites) styx** Ebmer 1976
Widespread Continental Greece.
Frequents the Mountains of Peloponnesos, Pindos and Olympos north to Macedonia.

**Dufourea (Dufourea) trigonellae** Ebmer 1999
Israel.

**Dufourea (Dufourea) wolfi** Ebmer 1989
Aegean Greece on Lesbos, Chios, Samos and Rhodes. Turkey.
On the wing during April and May.

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Subfamily Nomiinae
Nomia (Hoplonomia) callichlora (Cockerell 1911)
Iran; Bandar Abbas.

Nomia (Austronomia) clavicorns Warncke 1980
Iran.

Nomia (Curvinomia) lutea Warncke 1976
Egypt.

Nomia (Hoplonomia) zonaria (Walker 1871)
Egypt.

Pseudapis (Pseudapis) anatolica (Warncke 1976)
Turkey.

Pseudapis (Nomiaapis) bispinosa Brullé 1832
Turkey. Iraq. Egypt.
Greece; North Aegean on Lesbos. Iran. Egypt.
On the wing during July and August On Lesbos one of the bee species visiting the invasive Solanum eleagnifolium during the hot dry summer. It also flies to Glaucom flavum and Malva sylvestris.
Strongly associated with saline coastal environments. Often on the wing from June to August, sometimes earlier, and polylectic.

Pseudapis (Pseudapis) bytinski (Warncke 1976)
Turkey. Israel. Egypt. Iran.
Recorded on the wing to 700mtrs during June and July in Turkey. A summer bee in Iran.

Pseudapis (Nomiaapis) diversipes (Latreille 1806)
Both sexes on the wing by July in Ankara Province, Turkey.
Both sexes on the wing in Cyprus, Lesbos and in Iran from late May to September. Visits a good variety of flowers on Cyprus, including Medicago, Eryngium creticum, Allium, Statice, Echinops spinosus, Crozophora verbascifolia, Polygonum equisetiforme, Heliotropium villosum, Mentha longifolia, Inula viscosa and Urginea maritima.
Widely recorded Iran from spring through summer. Generally a univoltine summer steppic bee and rather polylectic but with some preference for Legumes. The anthophorine bee Pasites maculatus is a cleptoparasite of this species. Epeolus variegatus has also been reported as a cleptoparasite.
For references to detailed biological studies see Pesenko et al 2000.

Pseudapis (Pseudapis) dixica (Warncke 1976)
Egypt; Central Sinai.

Pseudapis (Pseudapis) edentata (Morawitz 1876)
Turkey. Iraq. Iran. Egypt.
On the wing from May to October widely in Iran.

**Pseudapis (Pseudapis) elegantissima** (Popov 1949)
Iran; Chuzistan
Noted the wing late June and early July.

**Pseudapis (Nomiapis) equestris** Gerstaecker 1872
A summer-flying bee on Lesbos with both sexes noted at *Thymus capitatus, Teucrium divaricatum, Origanum vulgare* and *Coridothymus capitatus*.

**Pseudapis (Pseudapis) fayumensis** Baker 2002
Egypt.

**Pseudapis (Nomiapis) femoralis** (Pallas 1773)
Continental Greece. Aegean Greece on Rhodes. Turkey.

**Pseudapis (Pseudapis) flavolobata** (Cockerell 1911)
Iran.
On the wing during May.

**Pseudapis (Nomiapis) fugax** (Morawitz 1878)
Iran. Egypt, Cairo District.

**Pseudapis (Pseudapis) geddensis** (Warncke 1976)
Israel, En Gedi.

**Pseudapis (Pseudapis) inermis** (Morawitz 1894)
Egypt.

**Pseudapis (Pseudapis) innesi** (Gribodo 1894)
Iraq. Egypt; Cairo District. Aswan.

**Pseudapis (Pseudapis) lobata** (Olivier 1811)
Eastern Turkey. Iran; Schiraz, Teheran
On the wing later in June to August in Iran, up to 1300 mtrs..

**Pseudapis (Nomiapis) monstrosa** (Costa 1861)
Mavromoustakis noted this bee on the wing in May and June, visiting *Teucrium polium micropodioides* and *Marrubium vulgare apolum*.
The flight season extends from late May to early August in Greece with a few earlier appearances. Strongly polylectic on summer flowers on Lesbos including *Origanum onites, Origanum vulgare, Teucrium divaricatum, Coridothymus capitatus, Ballota acetabulosa, Echinops spinosissimus, Cistus creticus* and *Thymus capitatus*.

**Pseudapis (Crocisaspidia) muscatensis** Cockerell 1910
Iran; Kirman.
**Pseudapis (Pseudapis) negevensis** (Warncke 1976)
Israel.

**Pseudapis (Pseudapis) nilotica** (Smith 1875)
Egypt.
Subspecies *P. n. latipes* (Morawitz 1880) in Jordan. Israel. Iran.
This bee is on the wing from April through to November.

**Pseudapis (Pseudapis) nubica** (Warncke 1976)
Egypt, Heliopolis.

**Pseudapis (Pseudapis) platula** (Warncke 1976)
Turkey; Gaziantep. Iran; Kirman, Baluchistan, Churasan.
Recorded on the wing from May to August in Iran. Both sexes on the wing during July in Turkey.

**Pseudapis (Pseudapis) rufescens** (Morawitz 1876)
Turkey.
Recorded to 1700 mtrs in Van during mid July.

**Pseudapis (Nomiapis) squamata** (Morawitz 1894)
Iran.

**Pseudapis (Nomiapis) unidentata** (Olivier 1811)
Greece; North Aegean on Lesbos. Iran. Egypt.
On the wing during July and August On Lesbos one of the bee species visiting the invasive *Solanum eleagnifolium* during the hot dry summer. It also flies to *Glaucium flavum* and *Malva sylvestris*.

**Pseudapis (Nomiapis) urfana** (Warncke 1980)
Eastern Turkey.

**Pseudapis (Nomiapis) valga** (Gerstaecker 1872)

**Lipotriches parca** (Kohl 1906)
Egypt, Luxor.

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**Subfamily Nomioidinae**

*The bees of this subfamily are found in desert and semi-desert regions of Africa and Asia where they are ground-nesting and solitary, although sometimes in aggregations, often in stony and sandy surfaces during dry summer months. The bees are bivoltine or even polyvoltine and both sexes occur together on the wing.*
**Ceylalictus (Meganomioides) desertorum** (Blüthgen 1925)
Jordan. Egypt.

**Ceylalictus (Ceylalictus) punjabensis** (Cameron 1907)
This bee is recorded on the wing in many months of the year.

**Ceylalictus (Ceylalictus) variegatus** (Olivier 1789)
Mavromoustakis recorded this bee on the wing from April to November, at a wide range of flowers. These include *Sinapis alba, Anthemis, Centaurea hyalolepis, Teucrium polium micropodioides, Teucrium diviricatum, Thymus capitatus, Thymelaea hirsuta, Vitex agnus – castus, Salsola kali, Noaea mucronata, Foeniculum piperitum, Polygonum equisetiforme, Mentha longifolia, Satureia incana, Scilla autumnalis, Zygophyllum album, Echiium sericeum, Eryngium maritimum, Eryngium creticum, Urginea maritime, Inula crithmoides* and *Crozophora verbascifolia.*
Recorded on the wing from Lesbos during May and June including many males *about Anthemis tomentosa.*
The biology of this bee was well studied in India by Batra (see Pesenko *et al* 2000).

**Nomioides (Nomioides) bluthgeni** Pesenko 1979

**Nomioides (Nomioides) chalybeatus** (Blüthgen 1934)
Greece; North Aegean on Lesbos. Turkey. Iran.
Recorded on Lesbos during June with females visiting *Chrysanthemum segetum.*

**Nomioides (Nomioides) deceptor** Saunders 1908
Jordan. Egypt. Libya.

**Nomioides (Nomioides) elbanus** Blüthgen 1934
Egypt.

**Nomioides (Nomioides) facilis** (Smith 1853)
In the African part of the range this bee is noted as a visitor to *Ammi visnaga, Reseda lutea, Reseda luteola* and *Ziziphus lotus.*

**Nomioides (Nomioides) gussakovskiji** Blüthgen 1933
Turkey. Jordan.
A bee of the Asian deserts.

**Nomioides (Nomioides) ino** (Nurse 1904)

**Nomioides (Nomioides) klausi** Pesenko 1983
Southwestern Iran.
**Nomioides (Nomoiodes) longiceps** Blüthgen 1933
Libya.
On the wing during May.

**Nomioides (Nomoiodes) minutissimus** (Rossi 1790)
Continental Greece. Aegean Greece on Lesbos, Karpathos, Rhodes. Crete, Cyprus, Turkey, Iran.
Bees of Turkey and other parts of the Near East are referable to the subspecies **N. m. modestus** Pesenko 1977.
On Cyprus on the wing from May to August, recorded there visiting *Zygophyllum album, Teucrium polium micropodioides, Thymus capitatus, Echium sericeum, Sinapis, Eryngium creticum, Polygonium equisetiforme, Tamarix* and *Mentha longifolia*. In the Eurasian steppic range this bee has a preference for *Thymus* but appears to have a much more diverse range of flower hosts in the Mediterranean.
Both sexes on the wing in Anatolia during July and early August where found to 1500 mtrs.
This is a largely univoltine steppic bee of the summer but occupying some Mediterranean habitats where it is bivoltine or even polyvoltine with a long season.
Males rarely recorded on Lesbos during June.

**Nomioides (Nomoiodes) modestus** Pesenko 1977
Eastern Turkey.

**Nomioides (Nomoiodes) mucoreus** Blüthgen 1933
Libya.

**Nomioides (Nomoiodes) nigriceps** Blüthgen 1933
Iran.

**Nomioides (Nomoiodes) ornatus** Pesenko 1983
Egypt. Israel.

**Nomioides (Nomoiodes) parviceps** Morawitz 1876
Eastern Turkey. Egypt.

**Nomioides (Nomoiodes) rotundiceps** Handlirsch 1888

**Nomioides (Nomoiodes) schwarzi** Pesenko 1989
Turkey; Karakurt.

**Nomioides (Nomoiodes) similis** Pesenko 1983
Turkey. Iran.

**Nomioides (Nomoioides) squamiger** Saunders 1908
Turkey; Mut. Israel. Egypt.

**Nomioides (Paranomioides) steinbergi** Pesenko 1983
Eastern Iran.
Nomioides (Nomioides) turanicus Morawitz 1876
Turkey. Iraq. Iran. Egypt.

Subfamily Halictinae

Tribe Halictini

The genus Halictus is most species diverse within the territory of the Ancient Mediterranean basin, encompassing West and Central Asia as well as the present Mediterranean. It is much more poorly represented in the Eastern Palaeartic in comparison to the genus Lasioglossum.

Halictus (Halictus) aegypticola Strand 1909

Halictus (Vestitohalictus) aestuans Ebmer 1978
Northeast Iran.

Halictus (Halictus) alfkenellus Strand 1909

Halictus (Halictus) asperulus Pérez 1895
Reported in May to August and September from Cyprus, visiting Mentha longifolia, Teucrium cyprium, Nepeta troodi, Cistus villosus creticus, Pulicaria dysenterica, Rubus ulmifolius anatolicus and Phlomis in montane habitat. Females rarely recorded on Lesbos during May.

Halictus (Halictus) bagirensis Blüthgen 1936
Northern Iran.
Another example of a rare montane Central Asian Halictid bee. In Iran found in the Kopet Dag during July up to 1600 mtrs.

Halictus (Halictus) berlandi Blüthgen 1936
Turkey. Israel.

Halictus (Halictus) beytueschebapensis Warncke 1984
Turkey; Hakkari, Taurus.

Halictus (Halictus) brunnescens (Eversmann 1852)
A southern Western Palaearctic species of the warm zones, often at lower montane elevations, recorded to 1000 mtrs in Iran during May to July. Females on the wing from late April to early July and males during June. On Lesbos flies to *Ballota acetabulosa*, *Notobasis syriaca*, *Cardopatium corymbosum*, *Carduus* species and some other flowers but probably is especially attracted to large-flowered summer Asteraceae. Recorded on the wing from April to July on Crete. Recorded at 2200 mtrs in the Iranian mountains from May to July.

**Halictus (Halictus) centaureae** Ebmer 1982
Continental Greece. Kefalonia.

**Halictus (Seladonia) cephalicus** (Morawitz 1873)
On the wing from April through to October in Cyprus, can be found to the end of the year. Records of flowers visited includes *Achillea santolina*, *Carlina lanata*, *Notobasis syriaca*, *Centaurea* species, *Inula viscosa*, *Colchicum hiemale*, *Asphodelus autumnalis* and *Statice virgata*.

**Halictus (Seladonia) clangulus** Warncke 1984
Eastern Turkey

**Halictus (Halictus) cochlearitarsis** (Dours 1872)
Females recorded active during July in Anatolia.

**Halictus (Seladonia) confusus** Smith 1853
The subspecies **H. c. perkinsi** Blüthgen 1926 recorded Turkey, Erzincan.

**Halictus (Vestitohalictus) cupidus** Vachal 1902
Israel. Egypt. Possibly present in Iran.

**Halictus (Vestitohalictus) cypricus** Blüthgen 1937
Cyprus. Israel. Jordan. Iran.
Both sexes on the wing during May in Israel and recorded in Iran during July.

**Halictus (Halictus) cyrenaicus** Blüthgen 1930
Libya, Cyrenaica.

**Halictus (Seladonia) desertorum** Morawitz 1876
Turkey, Kars.

**Halictus (Halictus) dschulfensis** Blüthgen 1936
Southeastern Turkey. Iran.

**Halictus (Halictus) duplocinctus** Vachal 1902
A desert species found in Iran eastwards.

**Halictus (Halictus) eurygnathus** Blüthgen 1930
Continental Greece and much of Turkey. This bee occurs on semiarid steppelands and nests in sandy soils in warm dry and open places. Polylectic with a preference for composites.

**Halictus (Halictus) falcinellus** Warncke 1982  
Iran.

**Halictus (Halictus) fatsensis** Blüthgen 1936  

**Halictus (Halictus) funerarius** Morawitz 1876  
A rare montane bee of Central Asia which may be present in Iran.

**Halictus (Seladonia) gavarnicus** Pérez 1903  
Continental Greece, Parnassos, Timfi, Lakmos, Timfristos, Chelmos and Killiki.

**Halictus (Seladonia) gemmeus** Dours 1872  

**Halictus (Halictus) gordius** Warncke 1975  
Turkey.

**Halictus (Halictus) graecus** Blüthgen 1923  

**Halictus (Halictus) grossellus** Ebmer 1978  
Continental Greece; Thessaly. Aegean Greece on Lesbos, Samos.

**Halictus (Halictus) hermon** Ebmer 1975  
Israel, Mount Hermon.

**Halictus (Halictus) holomelaenus** Blüthgen 1936  
Greece on Mykonos, Karpathos, Santorini, Sifnos, Paros, Kithyra and Crete. Females active on the wing from late April on Crete with males appearing in the summer.

**Halictus (Halictus) humkalensis** Blüthgen 1936  
Iran. A Central Asian montane halicid with both sexes recorded near Shandiz at 1600 mtrs during July.

**Halictus (Halictus) icarus** Ebmer 1978  
Iran, Elburz Mountains. Recorded on the wing during the summer between 2700 and 2800 mtrs.

**Halictus (Vestitohalictus) indefinitus** Blüthgen 1923  
Halictus (Vestitohalictus) inpilosus Ebmer 1975
Continental Greece, locally Peloponnesos at Sparta. Crete.
Females on the wing from late April on Crete, joined by males during July and recorded up to 1900 mtrs.

Halictus (Seladonia) kessleri Bramson 1879
Rare in Greece but found as far south as the Taygetos.
A bee of the Western Palaearctic steppes. A polylege attracted to composites with females on the wing from the spring and males emerging in high summer.

Halictus (Seladonia) kusdasi Ebmer 1975
Turkey.

Halictus (Seladonia) laticephalus Warncke 1984
Eastern Turkey.

Halictus (Seladonia) leucaheneus Ebmer 1972
The subspecies H. l. occipitalis Ebmer 1972 is found in Northeastern Turkey.

Halictus (Halictus) lobatus Ebmer 1978
Southeast Turkey. Iran.
On the wing in the Elburz Mountains of Iran during July.

Halictus (Seladonia) lucidipennis Smith 1853
Israel. Iraq. Egypt. Libya.

Halictus (Halictus) luganicus Blüthgen 1936
Turkey.
The male recorded from Central Anatolia, Ankara, during June.

Halictus (Halictus) lunatus Warncke 1975
Recorded to 1600 mtrs during July.

Halictus (Halictus) lussinicus Blüthgen 1936
Greece, Keramoti.

Halictus (Halictus) maculatus Smith 1848
The nominate race is found up to 2000 mtrs in the Mountains of Northern Iran. There is a subspecies H. m. priesneri Ebmer 1975 also recorded from Iran and in much of Turkey. Both subspecies are active by May. Records from Ankara province are for both sexes on the wing during July and August at 1300 mtrs.
Rather rarely recorded on Lesbos during late May and early June.
It is a primitively eusocial steppic bee with two generations in the female and males emerging with the second brood of females.
This bee is a host of the cleptoparasitic bees *Sphecodes subovalis* and *Sphecodes divisus*.

**Halictus (Halictus) minor** Morawitz 1876  
Northeastern Iran.  
A Central Asian bee.

**Halictus (Vestitohalictus) morawitzi** Vachal 1902  
Turkey, Agri. Israel. Iran.  
On the wing in the mountains of Iran up to 2000 mtrs during May to July.

**Halictus (Vestitohalictus) nasica** Morawitz 1876  
Iran.  
both sexes found on the wing during July in Iran, visiting *Artemisia*.

**Halictus (Halictus) nicosiae** Blüthgen 1923  
Southern Aegean Greece on Crete. Cyprus.  
Males active during July on Crete, a typical summer season for males of this genus.

**Halictus (Vestitohalictus) nigricutis** Warncke 1975  
Turkey. Jordan. Iran.

**Halictus (Halictus) patellatus** Morawitz 1874  
Both sexes active during July in Ankara Province to 900 mtrs.  
Widespread on Lesbos where females on the wing March to early June, visiting especially *Cistus creticus*, *Coridothymus capitatus*, *Origanum onites* among a variety of flowers.  
In North Iran there is a zone of introgression with the eastern nominate subspecies *H. p. patellatus* Morawitz 1874.

**Halictus (Halictus) pentheri** Blüthgen 1923  

**Halictus (Vestitohalictus) pici**  
Blüthgen 1895  
Israel. Jordan.  
The subspecies *H. p. falix* Ebmer 2008 in Israel. Egypt

**Halictus (Vestitohalictus) pollinosus** Sichel 1860  
Recorded at *Eryngium* in September by Mavromoustakis. On the wing from June and also visits *Medicago*, *Rubus ulmifolius anatolicus*, *Polygonum equisetiforme*, *Teucrium cyprium* and *Mentha longifolia*.  
Active during June and July in Ankara where found to 1100 mtrs.  
Recorded as a member of the pollinator community of Almond and Cherry orchards in Jordan.  
In flight by May in Palestine, visiting *Ballota*.  

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Recorded from May to July in Iran.

**Halictus (Halictus) ponticus** Blüthgen 1933
A rare steppic species of Eastern Europe. Several records of males in Lesbos from late May and early June when recorded at *Anthyllis hermanniae* and *Cistus creticus*.

**Halictus (Vestitohalictus) pseudomucoreus** Ebmer 1975
Eastern Turkey. Northeastern Iran.
Recorded during May to July from Iran up to 1500 mtrs.

**Halictus (Vestitohalictus) pulvereus** Morawitz 1874
Recorded from April to July in northwestern Iran.
This bee is possibly an eastern subspecies of *H. tectus*.

**Halictus (Halictus) quadricinctoides** Blüthgen 1936
Turkey, Taurus.

**Halictus (Halictus) quadricinctus** (Fabricius 1776)
Found up to 2000 mtrs in Turkey and Iran during the summer.
A thermophilous transpalaearctic steppic bee nesting in exposed dry and warm ground and flying during the summer to large-flowered compositae such as *Onopordon, Carduus, Knautia, Centaurea* and *Cirsium*. This species is also a visitor to orchard fruit crops in highland Jordan.
A large and spectacular bee of the hottest months in open countryside. As this bee is a member of the steppic Central Asian fauna there is an excellent bibliography available for this species - given in Pesenko *et al* (2000).
The Halictid cleptoparasite *Sphecodes gibbus* attacks this bee.

**Halictus (Vestitohalictus) radoszkovskii** Vachal 1902
Iran.
Females of this bee recorded on the wing in Iran up to 2100 mtrs during June

**Halictus (Halictus) resurgens** Nurse 1903
An eastern Mediterranean and Central Asian bee. Active on Crete at least from May to July. Common on Continental Greece. On Lesbos quite succesful and females active during late April into July recorded visiting especially *Notobasis syriaca* and *Centaurea solstitialis* but quite polylectic. Males are found often in July at *Carduus macrocephalus, Coridothymus capitatus* and *Origanum onites*.
This bee is rare in Egypt where it is on the southern border of its’ geographic range.

**Halictus (Halictus) rubicundus** (Christ 1791)
Continental Greece; Olympos and south to Timfristos. Turkey; Istanbul, Bursa and Black Sea coast.
A very successful Holarctic species. Most common in the forest zones in temperate and Continental parts.
Halictus (Halictus) sajoi Blüthgen 1923
The subspecies H. s. bifidus Warncke 1975
Turkey. Northern Iran.
A steppic species of Eastern Europe and western Asia. In Iran found to 1800 mtrs during the summer and is recorded from Ankara at 900 mtrs during June.

Halictus (Halictus) scabiosae (Rossi 1790)
A large Mediterranean Halictid bee of the summer months, on the wing from June to early September in Anatolia where found up to 2000 mtrs. rare on Continental Greece.

Halictus (Halictus) scardicus Blüthgen 1936
Continental Greece. Northern Turkey.

Halictus (Halictus) sefidicus Blüthgen 1936
Southwestern Iran.
A further research is needed to determine the taxonomy of this bee which is not well recorded.

Halictus (Seladonia) seladonius (Fabricius 1794)
Continental Greece. Central and Eastern Turkey. Iran.
Found as high as 2800 mtrs in western Iran during July. A eusocial species primarily steppic to the north of our area. recently recorded from Ankara Province, Central Anatolia.

Halictus (Vestitohalictus) semiticus Blüthgen 1955
A scarcely recorded bee appearing in the Iranian mountains to 1600 mtrs during July.

Halictus (Halictus) senilis (Eversmann 1852)
Recorded in the female during May at 1000 mtrs, Mashad, Iran. This bee is an inhabitant of the deserts and semi-deserts of the Palaearctic.

Halictus (Hexataenites) sexcinctus (Fabricius 1775)
The nominate subspecies on Continental Greece and kefalonia. This form grades here into the eastern subspecies H. s. albohispidus Blüthgen 1923 which occurs on Lesbos. Chios, Samos, Mykonos. Crete. Turkey. Iran. Israel. Jordan.
On the wing from late March to July on Lesbos, the males appearing in July.
Noted as a visitor to Almond and Cherry orchards in highland Jordan.
Recorded to 2800 mtrs in montane habitat at Chalus, Iran.
Sphecodes gibbus is a parasite in the European range.

Halictus (Halictus) simplex Blüthgen 1923
Continental Greece. Turkey.
In Ankara, Turkey, both sexes on the wing from June to August up to 1300 mtrs.

Halictus (Seladonia) smaragdulus Vachal 1895
A successful and sometimes numerous species.
On the wing April to October on Cyprus, visiting *Anthemis, Carlina lanata, Urginea maritima, Pulicaria dysenterica, Polygonum, Teucrium cyprium, Teucrium polium micropodioides, Heliotropium europeum, Gagea chlorantha, Linarea elatine, Inula viscosa* and *Marrubium vulgare apolum*.
The flight season is the same on Lesbos where the bee is found to be polylectic.
Recorded widely in northwest Iran during the summer months. Males appear later in the summer. This is another steppic species confined to the Western Palaearctic.

**Halictus (Vestitohalictus) solitudinis** Ebmer 1975
Turkey.

**Halictus (Vestitohalictus) solitudinis** Ebmer 1975
Turkey; Konya, Gürün.
On the wing during June.

**Halictus (Halictus) squamosus** Lebedev 1910
Turkey; Iran; Kopet Dagh, Damavand, The Elburz.
Recorded during July. A very rare bee in Turkey.

**Halictus (Seladonia) subauratus** (Rossius 1792)
Continental Greece, kefalonia, Aegean Greece on Lesbos, Samos. Turkey. Israel. Iran.
Widespread on the wing in northwestern Iran during May to July. A bee of steppe and deciduous forest. Primitively eusocial, sometimes nesting in large aggregations in the Eurasian range. Nests excavated on sloping sandy ground. Females on the wing from April to October and males emerging in the latter half of summer. Polylectic.

**Halictus (Halictus) submodernus** Blüthgen 1936
Eastern Turkey. Iran.
Found from May to July in western Iran.

**Halictus (Vestitohalictus) surabadensis** Ebmer 1975
Iran.
Found up to 2000 mtrs in montane regions of western Iran.

**Halictus (Vestitohalictus) tectus** Radoszkowski 1875
Recorded infrequently late April to early August on Lesbos where females noted visiting *Coridothymus capitatus* and *Lythrum salicaria*.
This bee is very closely related to *Halictus pulvereus*. Morawitz (above) which is found to the east of the range of this species.

**Halictus (Halictus) tetrazonianellus** (Strand 1909)
In Cyprus recorded from March to September with flower visits to *Medicago, Statice, Calendula persica, Centaurea cilicica, Carlina lanata, Broteroa corymbosa, Onopordum insigne, Sinapis alba* and *Ammi*. 
A long season also recorded from Lesbos where this bee is strongly polylectic. Females recorded during June in Anatolia. Widespread though infrequently recorded, Iran.

**Halictus (Halictus) tetrazonius** (Klug 1817)

**Halictus (Vestitohalictus) theseus** Ebmer 1975
Crete. An island endemic bee.

**Halictus (Halictus) tibialis** (Walker 1871)
Jordan. Israel. Egypt.

**Halictus (Vestitohalictus) tuberculatus** Blüthgen 1925

**Halictus (Seladonia) tumulorum** (Linnaeus 1758)
Northeastern Turkey.
The subspecies **H. t. oros** Ebmer 1988 in Continental Greece.

**Halictus (Seladonia) verticalis** Blüthgen 1931
Central and parts of Eastern Turkey. An endemic species.

**Thrincohalictus prognathus** (Pérez 1912)
North Aegean Greece on Lesbos. Chios. Turkey. Lebanon. Israel. Iran. Rarely recorded in Iran during May and found to 2100 mtrs.

**Lasioglossum (Evylaeus) ablenum** (Blüthgen 1934)
Egypt.

**Lasioglossum (Lasioglossum) acephaloides** (Blüthgen 1931)

**Lasioglossum (Evylaeus) adaliae** (Blüthgen 1923)
Turkey. Israel. Jordan.

**Lasioglossum (Lasioglossum) aegyptiellum** (Strand 1909)
Continental Greece; Aegean on Lesbos. Samos. Crete. Turkey. Jordan. Israel. Iran. Possibly Egypt. Recorded up to 2100 mtrs in the mountains of Iran. Flies from March to June to *Centaurea, Scabiosa, succisa, Achillea, Daucus, Hieracleum, Angelica* and *Aster amellus* among a number of other flowers. This bee is one of the members of the subgenus *Lasioglossum* that is thought to be eusocial to some degree rather than strictly solitary.
**Lasioglossum (Evylaeus) aeratum** (Kirby 1802)
Specimens from Crete are referable to subspecies *L. a. caudatum* (Warncke 1982).
Widespread from April to July in Iran.

**Lasioglossum (Evylaeus) aglyphum** (Pérez 1895)
Israel. Iran. Egypt.
A little-known species recorded Iran from April to August.

**Lasioglossum (Evylaeus) aaroundicum** (Blüthgen 1937)
Cyprus.
An endemic bee of the Cyprus mountains.

**Lasioglossum (Evylaeus) albipes** (Fabricius 1781)
Continental Greece. Aegean Greece on Lesbos, Rhodes. Turkey; Rize. Iran.
Active during June and July in Iran, recorded up to 1900 mtrs.

**Lasioglossum (Lasioglossum) albocinctum** (Lucas 1879)
Northern Continental Greece; Thessaly.
An isolated population here of this Western Mediterranean bee.

**Lasioglossum (Evylaeus) alectore** (Warncke 1984)
Turkey; Hakkari. Iran; Elburz.

**Lasioglossum (Evylaeus) algirum** (Blüthgen 1923)
Continental Greece. Turkey. Iran.
Confined to some high mountains such as the Greek Chelmos. Widely recorded in the mountains of Iran during July up to 2800 mtrs.

**Lasioglossum (Evylaeus) alpigenum** (Dalla Torre 1877)
Continental Greece.
Present in some mountain areas of Greece including Timfristos and Timfi.

**Lasioglossum (Evylaeus) andromeda** Ebmer 1978
Iran.
Both sexes recorded active during July in the Elburz Mountains of Iran up to 2800 mtrs.

**Lasioglossum (Evylaeus) anellum** (Vachal 1905)
A summer flying bee recorded at *Statice*. On the wing in Crete from May into August. Noted on the wing in Iran during May at 2100 mtrs and probably also has a summer-long flight season there.

**Lasioglossum (Evylaeus) angusticeps** (Perkins 1895)
An Anatolian species but with a distribution extending to Crete where found on the wing during July.
Lasioglossum (Evylaeus) angustipes Ebmer 1972
Greek Aegean on Samos, Crete. Turkey.

Lasioglossum (Evylaeus) annulipes (Morawitz 1876)
Turkey. Iran.
Recorded up to 2700 mtrs in Iran from May to July.

Lasioglossum (Evylaeus) apostoli Ebmer 1970
Turkey.
The subspecies L. a. pistis Ebmer 1985 occurs in Continental Greece in the mountains from Vermion to the Taygetos.

Lasioglossum (Evylaeus) apricarium (Warnecke 1982)
Turkey; Kalikeri, Artvin, Alanya.

Lasioglossum (Evylaeus) araxanum (Blüthgen 1923)
Turkey; Kars.

Lasioglossum (Lasioglossum) arcaeum (Blüthgen 1931)
Central Turkey.
Subspecies L. a. ragusanum (Blüthgen 1931) Continental Greece; Pangaion to the Taygetos.

Lasioglossum (Evylaeus) ariadne Ebmer 1981
Crete; Lefka Ori.
An endemic bee probably confined to just this one mountain area. It is a member of a complex of Southern Mountain halictid species.
The halictid bee Sphecodes miniatus Hagens appears to be a cleptoparasite of this bee.

Lasioglossum (Evylaeus) articularare (Pérez 1895)

Lasioglossum (Evylaeus) asteria Ebmer 1978
Iran.
Both sexes found in Iran at elevations up to 2400 mtrs during July.

Lasioglossum (Evylaeus) atrovirens (Pérez 1903)
Continental Greece. Crete. Turkey. Iran.
Found up to 2000 mtrs in Iran during July.

Lasioglossum (Evylaeus) bavaricum (Blüthgen 1930)
The subspecies L. b. olympicum (Warnecke 1982) is found in Continental Greece; mountains from Falakro to the Taygetos.

Lasioglossum (Evylaeus) betomarium (Blüthgen 1925)
Iran.
Recorded from May to July in Iran.
Lasioglossum (Lasioglossum) bicallosum (Morawitz 1873)
Noted during May in Iran at elevations of up to 2100 mtrs.

Lasioglossum (Lasioglossum) bischoffi (Blüthgen 1931)
Continental Greece, North Aegean on Lesbos. Turkey.
A very rare bee.

Lasioglossum (Evylaeus) bluethgeni (Ebmer 1971)

Lasioglossum (Evylaeus) brevicorne (Schenck 1868)
Males on the wing during July on Crete.

Lasioglossum (Lasioglossum) breviventre (Schenck 1853)
Montane areas of Continental Greece; Falakro, Olympos.
A rare and little-known European bee.

Lasioglossum buccale (Pérez 1903)
Recorded during late July on Olympos at 2500 mtrs. On Samothrace during late June to 1000 mtrs.

Lasioglossum (Evylaeus) calceatum (Scopoli 1763)

Lasioglossum (Evylaeus) cannabinum (Warncke 1989)
Egypt; Sinai.

Lasioglossum (Lasioglossum) caspicum (Morawitz 1873)
Turkey. Syria. Israel. Iran.
Active from May to July in Iran where recorded up to 2000 mtrs.

Lasioglossum (Ctenonomia) cavernifrons (Blüthgen 1926)
Southeastern Iran.

Lasioglossum (Lasioglossum) chloropus (Morawitz 1893)
The subspecies L. c. tungusicum Ebmer 1978 Turkey; Artvin. Iran.
On the wing in the Elburz Mountains during July up to 2800 mtrs.

Lasioglossum (Lasioglossum) cilicium Ebmer 1972
Turkey. Iran.
Recorded up to 2800 mtrs in the mountains of Iran during July.

Lasioglossum (Evylaeus) cinclum (Warncke 1984)
Turkey.

Lasioglossum (Evylaeus) ciscapum (Blüthgen 1931)
Turkey.
A very rare bee.

**Lasioglossum (Evylaeus) clypeare** (Schenck 1853)
Continental Greece. Kefalonia. Turkey. Iran.
Females rarely noted from Iran at 1500 mtrs during July. A steppic bee and an oligolege of the Lamiaceae.

**Lasioglossum (Evylaeus) clypeiferellum** (Strand 1909)
A spring bee recorded March and April on Cyprus, visiting Asteraceae. females on the wing by May on Crete.
Females rarely recorded Iran during May.

**Lasioglossum (Evylaeus) convexiusculum** (Schenck 1853)
Recorded from May to July on Crete and in the same months from Iran, where found up to 2200 mtrs.
An oligolege of the Lamiaceae.

**Lasioglossum (Evylaeus) corvinum** (Morawitz 1876)
Continental Greece. Kefalonia. Turkey.

**Lasioglossum (Lasioglossum) costulatum** (Kriechbaumer 1873)
Females appear from May on Crete and the males are recorded from early August. This bee is recorded during May and June in Iran.
An oligolege of the Campanulaceae.

**Lasioglossum (Evylaeus) crassepunctatum** (Blüthgen 1923)
Recorded on the wing from April to July in Iran.

**Lasioglossum (Lasioglossum) cristulam** (Pérez 1895)
In Iran active from late April into summer and recorded up to 2100 mtrs.

**Lasioglossum (Evylaeus) croceipes** (Morawitz 1876)
The form **semicroceipes** Ebmer 1972 Turkey; Gürün. Iran; Kopet Dag.

**Lasioglossum (Evylaeus) cucullatum** (Warncke 1984)
Turkey.

**Lasioglossum (Evylaeus) cupromicans** (Pérez 1903)
A mountain bee present in Highland Continental Greece as the subspecies **L. c. pangaeum** (Warncke 1982) and found also in the Sat Mountains of Turkey as the subspecies **L. c. gevriense** (Warncke 1984)
**Lasioglossum (Evylaeus) daglariense** (Warncke 1984)
Northeastern Turkey.
A mountain bee.

**Lasioglossum (Evylaeus) damascenum** (Pérez 1910)
On the wing in Cyprus March to June. Recorded at *Erodium gruinum*.

**Lasioglossum (Evylaeus) danubium** (Blüthgen 1944)
Continental Greece.
Recorded from Rhodopi.

**Lasioglossum (Evylaeus) daphne** Ebmer 1978
Iran.
Active during July up to 2200 mtrs in Iran where recorded flying to *Salvia*.

**Lasioglossum (Evylaeus) decolor** (Pérez 1895)
Egypt.

**Lasioglossum (Evylaeus) denislucum** (Strand 1909)
A very rare bee.

**Lasioglossum (Lasioglossum) discum** (Smith 1853)
Recorded from May to July in Iran at altitudes up to 2000 mtrs. Noted visiting *Carduus, Cirsium* and *Centaurea*.

**Lasioglossum (Evylaeus) dolichocephalum** (Blüthgen 1923)
On Cyprus Mavromoustakis recorded the form *hierosolymae* Blüthgen visiting *Ballota integrifolia* in June. This form also occurs in Israel.
The subspecies *L. d. minos* Ebmer 1972 is an endemic island form of Crete where found in the female in the vicinity of Hieraklion during late May.

**Lasioglossum (Evylaeus) duckei** (Alfken 1909)
The subspecies *L. d. hakkariense* (Warncke 1984) present in Turkey; Hakkari.
The subspecies *L. d. psiloritum* Ebmer 1981 is found rather locally in the Highlands of Crete.

**Lasioglossum (Evylaeus) edessae** Ebmer 1974
Turkey. Syria. Iran.

**Lasioglossum (Evylaeus) elegans** (Lepeletier 1841)
Mavromoustakis recorded this bee on the wing in May and June, visiting *Ballota integrifolia* and *Vitex agnus-castus*.
A scarcely recorded species from Iran where noted during July up to 1600 mtrs.

**Lasioglossum (Evylaeus) enslini** Ebmer 1972
Lebanon. Israel.
An endemic species.

**Lasioglossum (Evylaeus) epipygiale** (Blüthgen 1924)
Turkey. Syria. Israel. Iran.
Scarcely recorded in Iran at Karaj.
A subspecies, *L. e. bentoni* (Cockerell 1919), is recorded from southern Iran.

**Lasioglossum (Lasioglossum) equinum** Ebmer 1978
Eastern Turkey. Israel; Mount Hermon. Iran.
Recorded on the wing during May from Khorramabad, Iran.

**Lasioglossum (Evylaeus) erraticum** (Blüthgen 1931)
On Crete females found on the wing during July.

**Lasioglossum (Evylaeus) euboeense** (Strand 1909)
Very scarcely and locally recorded in Iran; Hamadan at 2100 mtrs, during May.
The subspecies *L. e. anatolicum* (Blüthgen 1931) found in Central Turkey.

**Lasioglossum (Evylaeus) eurydikae** Ebmer 1974
Eastern Turkey. Iran.
Recorded up to 2400 mtrs in Iran where females on the wing from May and males appearing during July.

**Lasioglossum (Lasioglossum) euxanthopus** Pesenko 1986
North Aegean Greece on Lesbos. Iran.

**Lasioglossum (Lasioglossum) euxinicum** Ebmer 1972
Turkey. Taurus. Iran.
Recorded on the wing in Iran from May to July.

**Lasioglossum (Lasioglossum) fahringeri** (Friese 1921)
Turkey. Iran.

**Lasioglossum (Lasioglossum) fallax** (Morawitz 1873)
Turkey. Iran.
Recorded during May to July in Iran where found up to 2000 mtrs. rare and local in Turkey from Ankara to kalikeri.

**Lasioglossum (Ctenomia) fasciger** (Strand 1909)
Israel. Egypt.
Lasioglossum (Evylaeus) faustum Ebmer 1978
Iran.
Both sexes recorded in the Elburz Mountains to 2800 mtrs during July.

Lasioglossum (Evylaeus) filipes Ebmer 1972
Southeastern Turkey. Israel. Jordan. Egypt; Sinai.

Lasioglossum (Evylaeus) fratellum (Pérez 1903)
Northern Continental Greece. Turkey.

Lasioglossum (Evylaeus) fulvicorne (Kirby 1802)
Northern Continental Greece and Turkey; central Black Sea coast.
The subspecies L. f. antelicum (Warncke 1975) recorded Northeastern Turkey, also Iran up to 1400 mtrs during May and June.
A transpalaearctic solitary Evylaeus of open grasslands. This solitary mode of nesting ecology may be a reversion from a former state of eusociality when taking regard of mode of nest establishment and architecture (see Pesenko et al 2000 and references therein). The flight phenology however appears classical for Evylaeus, with a very long season for females and a latter emergence of males into late summer.

Lasioglossum (Ctenonomia) gibber (Vachal 1892)
Israel. Egypt.

Lasioglossum (Evylaeus) gilanum (Blüthgen 1931)
Iran.

Lasioglossum (Evylaeus) glabriusculum (Morawitz 1872)
Very scarcely recorded Iran during May. An uncommon steppic bee.

Lasioglossum (Lasioglossum) glaciegenitum Ebmer 1972
Found on the wing in Iran in montane areas up to 2400 mtrs during July.

Lasioglossum (Evylaeus) griseolum (Morawitz 1872)
On Crete females have been recorded active during May.
Noted from April to July in Iran up to 2200 mtrs.

Lasioglossum (Lasioglossum) haesitans (Blüthgen 1931)

Lasioglossum (Evylaeus) harputicum Ebmer 1972
Turkey. Iran.
Rarely recorded from Iran, Shiraz; where the female recorded during May.

Lasioglossum (Evylaeus) hecate Ebmer 1986
Turkey.
Recorded on the wing during July in Turkey

**Lasioglossum (Evylaeus) hethiticum** Ebmer 1970
Greece; Aegean on Samos. Turkey.

**Lasioglossum (Evylaeus) hilare** Ebmer 1972
In the Pindos Range of Central Greece recorded at 1400 mtrs.
Females of this bee have been recorded on Crete during late April. The species is found on the wing from May to July in Iran at up to 2000 mtrs.

**Lasioglossum (Evylaeus) hyalinipenne** (Morawitz 1876)
Iran.
Noted during July in the mountains of Iran up to 2400 mtrs.

**Lasioglossum (Evylaeus) hyrkanium** Ebmer 1978
Iran.
Both sexes recorde in Iran during the summer up to 2800 mtrs in montane habitat.

**Lasioglossum (Evylaeus) imbecillum** (Ebmer 1974)
Continental Greece; Livadiion.
The subspecies **L. i. scirpaceum** (Warncke 1975) Eastern Turkey. Northern Iran; Elburz..

**Lasioglossum (Evylaeus) interruptum** (Panzer 1798)
Continental Greece. Corfu. Kefalonia. Aegean on Lesbos. Turkey. Iran. Most perhaps all are referable to the subspecies **L. i. trispinosum** (Alfken 1907).
Found in Iran during May to July at elevations up to 1600 mtrs. A bee of the temperate steppelands. A sometimes very common polylectic bee, the females with a long flight season. Primitively eusocial reproductive ecology.

**Lasioglossum (Lasioglossum) iranicum** Ebmer 1975
Iran.

**Lasioglossum (Evylaeus) israeleuse** Ebmer 1974
Israel.

**Lasioglossum (Evylaeus) ituraeum** Ebmer 1972
local in Iran where found up to 1700 mtrs during July.

**Lasioglossum (Lasioglossum) josefi** Ebmer 2009
Iran.

**Lasioglossum (Evylaeus) kappadokium** Ebmer 1974
Central Turkey.
A very rare endemic bee.

**Lasioglossum (Lasioglossum) korbi** (Blüthgen 1929)
Turkey. Iran.

**Lasioglossum (Lasioglossum) kotschyi** Ebmer 1981
Cyprus. An island endemic bee of the Mountains.

**Lasioglossum (Lasioglossum) kussariense** (Blüthgen 1925)

**Lasioglossum (Evylaeus) laeve** (Kirby 1802)
Continental Greece south to Taygetos. Aegean on Lesbos, Samos. Israel; northern Mountains. Iran.
Recorded up to 2700 mtrs in Iran during May to July. Uncommon and attached to upland forests.

**Lasioglossum (Evylaeus) laevidorsum** (Blüthgen 1923)
Aegean Greece on Samos, Rhodes. Turkey.
The subspecies **L. l. troodicum** (Blüthgen 1937) on Cyprus.

**Lasioglossum (Lasioglossum) laevigatum** (Kirby 1802)
Found up to 2400 mtrs in the mountains of Iran from April to July. Noted at 1900 mtrs in the Greek mountains.
A polylectic species with a long flight season. The main distribution is in the temperate Western Palaearctic.

**Lasioglossum (Lasioglossum) laterale** (Brullé 1832)
Noted flying to *Verbascum phoenicum, Campanula* and *Sisymbrium*.

**Lasioglossum (Evylaeus) laticeps** Schenck 1870
Continental Greece.
The subspecies **L. l. hellenicum** (Blüthgen 1937) found Continental Greece (where there is a transition zone between the two subspecies). Aegean on Lesbos, Chios. Samos. Crete. Cyprus. Turkey. Israel. Jordan. Iran.
This successful steppic bee is primitively eusocial with a long flight season for females and males appearing in late May in Greece. Polylectic.
It is a host of the cleptoparasite *Sphecodes ferruginatus*.

**Lasioglossum (Lasioglossum) lativentre** (Schenk 1853)
Females recorded on the wing during late May from Crete. Females on the wing through the season in Greece.
Found up to 1400 mtrs in Iran where on the wing from late April. Ebmer notes *Trifolium*, *Tussilago* and *Solidago* as floral hosts.

In Greece females visit a variety of flowers especially Asteraceae although is polylectic and visits other families including legumes such as *Trifolium angustifolium*, *Trifolium nigrescens* and *Trifolium scabrum*.

**Lasioglossum (Evylaeus) leptocephalum** (Blüthgen 1923)

**Lasioglossum (Evylaeus) leptomorhynchum** (Blüthgen 1931)
Israel. Egypt including Sinai.

**Lasioglossum (Lasioglossum) lecomontanum** Ebmer 1981 Crete. An island endemic, confined to the mountains of Lefka Ori, Ida and Dikti.

**Lasioglossum (Evylaeus) leucopus** (Kirby 1802)
Continental Greece, Peloponnesos. Turkey. A boreo-Alpine bee mainly found to the north of our region.

**Lasioglossum (Lasioglossum) leucozonium** (Schrank 1781)
The nominate subspecies found in Continental Greece. Kefalonia. Lesbos, Chios, Samos, Karpathos, Santorini. Western Turkey. In Western Turkey this nominate subspecies intergrades with the subspecies *L. l. clusium* listed below.
The subspecies *L. l. xylopedis* Ebmer 1978 Iran; Elburz where on the wing during June and July. The subspecies *L. l. cedri* Ebmer 1976 present on Lesbos, Crete and Cyprus. Females recorded as active from April to June on Crete.
On the wing February to June in Cyprus, recorded at *Calendula persica* and *Prunus dulcis*. Can be found in winter, at *Colchicum hiemale*.

Ebmer gives *Centaurea*, *Achillea*, *Calluna*, *Carduus*, *Origanum*, *Taraxacum*, *Salix*, *Angelica*, *Scabiosa*, *Senecio* and *Solidago* all as floral hosts. On Greece a variety of floral associations are recorded and among the asteraceae *Leontodon tuberosus*, *Crepis sancta*, *Crepis commutata*, *Crepis setosa*, *Taraxacum sp.* and *Hedypnois cretica* are favoured.
A further subspecies, *L. l. clusium* (Warncke 1975), occurs in Eastern Turkey. Iran. This bee nests on sparsely vegetated open sandy soil in aggregations where the nest sites seem sometimes to be positioned to collect the rays of the early morning sun at certain days in spring. An often steppic bee but also found in other grasslands. The young females mate in the summer then hibernate before making nests at new sites the following spring. Although widely polylectic there is an affinity with the asteraceae but also flies to legumes and the bee is reported as an important pollinator of Lucerne.

**Lasioglossum (Evylaeus) limbelloides** (Blüthgen 1931)

**Lasioglossum (Evylaeus) limbellum** (Morawitz 1876)
females recorded from Crete during May and on the wing in Iran in the same month. The subspecies **L. l. troodicum** (Blüthgen 1937) an endemic of Cyprus.

**Lasioglossum (Evylaeus) lineare** (Schenck 1869)
On the wing February to June in Cyprus where visiting flowers of *Teucrium polium micropodioides*, *ballota integrifolia*, *Gagea chlorantha*, *Mandragora officinarum* and *Tamarix*.
Females appear from late April on Crete, mainly during May, into July when males emerge.
Noted between May and July in Iran at elevations up to 2000 mtrs.
A succesful polylectic bee. Primitively eusocial.

**Lasioglossum (Evylaeus) lissonatum** (Noskiewicz 1925)
Continental Greece; Mountains of Rhodopi and the Taygetos.

**Lasioglossum (Evylaeus) littorale** (Blüthgen 1923)
This species is recorded from Continental Greece and Mykonos.
The subspecies **L. l. colchicum** (Ebmer 1972) recorded from Aegean Greece on Lesbos, Samos, Kos. Turkey.
The endemic island subspecies **L. l. midas** Ebmer 1972 is found on Crete. Both sexes noted active during May.
On the Island of Karpathos an intermediate form occurs between the two subspecies.
Seemingly weakly polylectic in Greece.

**Lasioglossum (Evylaeus) longirostre** (Morawitz 1876)
Greece; Aegean on Lesbos, Chios, Samos. Turkey. Israel; Mount Hermon. Iran.
A mountain bee of Iran where active to 2800 mtrs during July, visiting *Salvia*.

**Lasioglossum (Evylaeus) lucidulum** (Schenck 1861)
Females recorded during May on Crete.
Rarely recorded from Iran where females active during May.

**Lasioglossum (Ctenonomia) luridipes** (Vachal 1897)
Egypt.

**Lasioglossum (Evylaeus) maculipes** (Morawitz 1876)
Turkey. Southern Iran.
Females noted on the wing during May.

**Lasioglossum (Evylaeus) malachurum** (Kirby 1802)
Mavromoustakis recorded this bee on the wing from February and March to October, visiting *Oxalis corniculata*, *Gagea chlorantha*, *Erodium*, *Sinapis alba*, *Inula viscosa* and *Calendula persica*. A polylectic species. In Greece flower visits are also to many different plant species.
Reported from Palestine visiting *Mandragora* in February.
Females have been recorded emerging in huge numbers on Crete during late May and in June. They remain on the wing into August. Males begin to appear during July. A small number of records from Iran between June and July.

This bee is common or even numerous at times in some steppe and desert and is strongly eusocial with a defined worker caste which in this species originally led to the recognition of sociality in the halictidae. Females have a long flight season and males appear later, often with the second generation of the worker caste. The bee is an important member of the pollinator community of Legumes in the steppe areas.

*Sphecodes monilicornis* is recorded as a cleptoparasite.

**Lasioglossum (Evylaeus) mandibulare** (Morawitz 1866)
Bees found in Cyprus, Israel and Egypt may be referable to subspecies *L. m. carneivendre* (Dours 1872)
Females recorded on Crete during May.
Found from May to October on Cyprus, with flower visit records for *Statice virgata*, *Inula crithmoides*, *Inula viscosa* and *Nerium oleander*.
Recorded at *Polygonum* in Palestine in October.

**Lasioglossum (Evylaeus) marginatum** (Brullé 1832)
On Cyprus recorded at *Erodium*, *Papaver rhoeas*, *Sinapis alba*, *Chrysanthemum segetum*, *Calendula persica*, *Cistus villosus*, *Cistus salviifolius*, *Sinapis alba*. *Quercus inferoria*, *Quercus alnifolia*, *Quercus coccifera*, *Pistacia lentiscus* and *Crocus*. The bee is found active there during March to May. There are also some records in winter, at *Colchicum hiemale*.
On the wing by May on Continental Greece.

An abundant bee on Crete and throughout Continental Greece from the first emergence in spring.

Hugely abundant on Lesbos in comparison to the entire Haictid fauna. Many flowers are visited by females and especially *Anthemis arvensis*, *Smyrnium perfoliatum*, *Crepis sancta*, *Crepis commutata*, *Crepis setosa*, *Brassica nigra* and *Leontodon tuberosum*.

This bee has a perennial life-cycle of colonies and is primitively eusocial. (Pesenko et al 2000).

**Lasioglossum (Evylaeus) masculum** (Pérez 1895)
Syria. Israel. Iran. Egypt.

**Lasioglossum (Evylaeus) mesosclerum** (Pérez 1903)
Recorded during April and May in Iran where on the wing up to 1800 mts. Rarely recorded on Lesbos during May.
The form *L. m. balneorum* Ebmer 1974 occurs Israel, in the Negev desert.

**Lasioglossum (Evylaeus) minutissimum** (Kirby 1802)
The female of this bee found on the wing in Crete during May. A solitary univoltine bee of sandy soils. Reported as rare in Egypt.
**Lasioglossum (Evylaeus) minutulum** (Schenck 1853)
Continental Greece. Turkey; Bolu.
A rare bee in Greece.

**Lasioglossum (Evylaeus) montifringillum** (Warncke 1984)
Turkey.
An endemic bee.

**Lasioglossum (Evylaeus) montivolans** Ebmer 1975
Continental Greece; Timfristos, Parnassos and mountains south to the Taygetos. Turkey. Iran, Elburz.
On the wing up to 2800 mtrs in the mountains of Iran during July.

**Lasioglossum (Evylaeus) morio** (Fabricius 1793)
A eurybiontic eusocial polylege with a very wide distribution in the Western Palaearctic. One of the commonest Evylaeus, perhaps especially in warm steppic Continental areas where females have a long flight season. Less common on Lesbos though found at a variety of plants there.

**Lasioglossum (Evylaeus) mose** Ebmer 1974
Israel.

**Lasioglossum (Evylaeus) muganicum** Ebmer 1972
Eastern Turkey. Iran.
male recorded on the wing during July rather locally in Iran.

**Lasioglossum (Evylaeus) nabardicum** (Blüthgen 1931)
Southern Israel; En Gedi to Eilat. Egypt, Sinai.

**Lasioglossum (Lasioglossum) nigrilabre** (Morawitz 1876)
Iran.
Found up to 2000 mtrs during the summer in the Iranian mountains.

**Lasioglossum (Evylaeus) nigripes** (Lepeletier 1841)
The subspecies *L. n. pharaone* (Strand 1909) found Israel, Jordan, Egypt.
Females recorded active during May to July on Crete. The same flight phenology recorded in Iran where found up to 1600 mtrs in montane regions.
In Greece often recorded during July although some appear from late April.
A eusocial bee with a caste system. For references see (Pesenko *et al* 2000) an invaluable resource for information and references on the nesting biology of this and some of the other related species occurring in our regions.
This bee is a host of the cleptoparasite *Sphecodes alternatus*.

**Lasioglossum (Evylaeus) nitidiusculum** (Kirby 1802)
Females recorded on Crete between May and July. The same phenology is noted for Iran where the bee is recorded up to 2400 mtrs. This bee is not primarily a mediterranean taxon and is found above 1000 mtrs locally in mountain Crete and the Peloponnesos and in the Kopet Dag of Iran.

**Lasioglossum (Evylaeus) nitidulum** (Fabricius 1804)
Continental Greece; Samolikas, Pindos, Panatoliko.
Often flying to small-flowered lamiales, especially *Mentha*.
Recorded on the wing on Crete from May into July. There is also a further subspecies recorded on Crete; **L. n. cretense** (Warncke 1975). A similar phenology is recorded on Lesbos although the bee has not been frequently found there it may well be common but overlooked.

**Lasioglossum (Evylaeus) obscuratum** (Morawitz 1875)
On the wing February to August on Cyprus, visiting a wide range of flowers including *Thymelaea hirsuta*, *Mentha longifolia*, *Nepeta troodi*, *Lithospermum hispidulum*, *Berberis cretica*, *Gagea chlorantha* and *Calendula persica*.
A successful bee on Lesbos with a large early emergence of females during March visiting *Cistus*, *Anthemis* and others.
Records from May to July in Iran where found up to 1600 mtrs. A Eurasian mainly steppic and desert bee with females on the wing through the summer and males appearing later in the season.
A polylege with a preference for Asteraceae.

**Lasioglossum (Evylaeus) opaconitens** (Blüthgen 1931)
Iran.
A rarely recorded bee found in Iran at up to 2800 mtrs during July.

**Lasioglossum (Evylaeus) ordubadense** (Friese 1916)
Turkey, Israel. Iran.
On the wing during May in Iran up to 1500 mtrs.

**Lasioglossum (Evylaeus) orpheopse** (Blüthgen 1931)
Iran.

**Lasioglossum (Evylaeus) osiris** Ebmer 1986
Southeastern Iran.; Khash.
The female noted on the wing during late April.

**Lasioglossum (Evylaeus) paleae** Ebmer 1972
Southwestern coastal Turkey.

**Lasioglossum (Lasioglossum) pallens** (Brullé 1832)
A visitor to Almond and Cherry orchards in highland Jordan. Ebmer notes floral hosts as *Salix, Potentilla* and *Prunus spinosa*.
Rather scarcely recorded on Lesbos during late April and May with flower visits by females to *Asphodelus ramosus, Smyrnium perfoliatum* and *Geranium lucidum*.
The subspecies **L. p. kantarae** Warncke 1982 is in Cyprus.
A Pontic-Mediterranean bee. It is a host of the cleptoparasitic halictid **Sphecodes majalis**.

**Lasioglossum (Evylaeus) panagaeum** Ebmer 1978
Iran.
Found on the wing during July in mountains up to 2800 mtrs.

**Lasioglossum (Evylaeus) parvulum** (Schenck 1853)
Continental Greece. Turkey. Northern Iran.
In Greece found in Montane areas. Local in Iran where recorded between April and July.

**Lasioglossum (Evylaeus) pauperatum** (Brullé 1832)
Continental Greece; Peloponnesos to Alexandroupolis. Crete. Greek Aegean also on Lesbos, Chios, Andros, Paros, Samos, Patmos. Mediterranean Turkey.
Active on Crete during April and May. On Lesbos not often recorded during May when noted visiting *Echium plantagineum* and *Centaurium tenuiflorum*.

**Lasioglossum (Evylaeus) pauxillum** (Schenck 1853)
Females recorded during May on Crete.
In Iran recorded from May to July up to 1500 mtrs.
A eusocial bee of steppelands, the females have a long flight season and are polylectic with a preference for compositae. males tend to emerge in summer. Both **Sphecodes crassus** and **Sphecodes ferruginatus** are recorded as cleptoparasites.

**Lasioglossum (Lasioglossum) perclavipes** (Blüthgen 1934)
Rare in Continental Greece.
Females recorded from late April, mainly during May, on Crete. A similar phenology on Lesbos with records from late March but mostly during May. Females seem to be polylectic noted visiting *Genista acanthoclada, Medicago sativa, Asphodelus ramosus* and *Calendula arvensis*.

**Lasioglossum (Evylaeus) peregrinum** (Blüthgen 1923)
Continental Greece. Samos. Turkey. Iran.
Males rarely recorded from the mountains of Iran at 2200 mtrs during July.

**Lasioglossum (Evylaeus) persicum** (Cockerell 1919)
Iran.
Recorded in Iran during May to July at up to 2200 mtrs.

**Lasioglossum (Lasioglossum) picipes** (Morawitz 1876)
Israel. Iraq. Iran.
A very rare bee. Recorded from Khorramabad, Iran, where females on the wing during May.
Lasioglossum (Evylaeus) pistorium (Vachal 1902)
Turkey; Kars. Iran.

Lasioglossum (Evylaeus) podolicum (Noskiewicz 1924)
Continental Greece; from Rhodopi to the Taygetos. Turkey.
Subspecies L. p. canum Warncke 1982 Iran.
Active during July up to 2800 mtrs Iran.

Lasioglossum (Evylaeus) politum Schenck 1853
On the wing during July up to 2400 mtrs in Iran.
Eusocial with monogynous nest establishment but a strongly differentiated worker caste. Bivoltine, workers probably responsible for the rearing of the male auxilliary sexual caste in the summer generation as well as young queens.

Lasioglossum (Lasioglossum) prasinum (Smith 1848)
Continental Greece; Peloponnesos. Zakinthos.
A scarce European univoltine summer bee of sandy habitats.

Lasioglossum (Evylaeus) pressithorax Ebmer 1974
Continental Greece. Aegean on Samos. Turkey. Israel.
A very rare bee on Continental Greece.

Lasioglossum (Lasioglossum) prunellum Warncke 1975
Continental Greece, from Falakro to the Taygetos. Turkey.

Lasioglossum (Lasioglossum) pseudocaspicum (Blüthgen 1923)
On the wing from March but mainly May on Lesbos where found to be polylectic.

Lasioglossum (Evylaeus) pseudoleptorhynchum (Blüthgen 1931)
Turkey. Iran.
Emerges during May in this range and found at least to July in montane areas of Iran to 2100 mtrs. A seemingly very local and sporadic species.

Lasioglossum (Evylaeus) pseudolittorale (Blüthgen 1923)
Israel.

Lasioglossum (Evylaeus) pseudonigripes (Blüthgen 1934)
The subspecies L. p. bassanum (Warncke 1982) found Turkey. Iran.
A very rare bee.

Lasioglossum (Evylaeus) pseudosphecodimorphum (Blüthgen 1923)

Lasioglossum (Evylaeus) punctatissimum (Schenck 1853)
Recorded on Crete from late April to July.
Active from April to July in Iran at altitudes up to 2100 mtrs.
An oligolege of the Lamiaceae.

**Lasioglossum (Evylaeus) pulicarium** (Warncke 1975)
Central Turkey.
An endemic bee.

**Lasioglossum (Evylaeus) puncticolle** (Morawitz 1872)
Females recorded during May from Crete. Infrequently noted from Iran during June and July. A bivoltine polylege attracted to Asteraceae.
Rarely recorded on Lesbos in spring in the female sex but also a rare record of a male visiting *Eryngium campestre* in July

**Lasioglossum (Evylaeus) pygmaeum** Schenck 1853
In Iran females found on the wing during May at altitudes to 1500 mtrs.
Both sexes are recorded on Lesbos from March to July.

**Lasioglossum (Lasioglossum) quadrinotatum** (Kirby 1802)
Continental Greece south to Parnassas. Turkey; Arfin.

**Lasioglossum (Evylaeus) quadrisignatus** (Schenck 1853)
Continental Greece. Turkey. Iran.
A very rare western palaeartic steppic bee.

**Lasioglossum (Evylaeus) reinigi** Ebmer 1978
Iran.
On the wing locally between May and July.

**Lasioglossum (Evylaeus) rhynchites** (Morawitz 1876)
Turkey.

**Lasioglossum (Evylaeus) rufitarse** (Zetterstedt 1838)
Northwestern Iran.
Scarcely recorded in Iran where noted on the wing during May at elevations up to 1300 mtrs. Very widely distributed in Holarctic upland forest biotopes to the north of our region.

**Lasioglossum (Evylaeus) rupestre** (Warncke 1984)
Turkey.

**Lasioglossum (Evylaeus) rusticolum** (Warncke 1982)
Turkey. Iran.
**Lasioglossum (Evylaeus) samaricum** (Blüthgen 1935)
Turkey.
A very rare bee.

**Lasioglossum (Evylaeus) salinum** (Morawitz 1875)
Aegean Greece on Samos. Turkey. Iran.
A very rare bee.

**Lasioglossum (Evylaeus) saxatile** (Warncke 1984)
Eastern Turkey; Hakkari.
Found on the wing in late June in eastern Turkey up to 1700 mtrs.

**Lasioglossum (Evylaeus) schachti** (Warncke 1984)
Turkey; Hakkari.

**Lasioglossum (Evylaeus) scheherezade** Ebmer 2000
Iraq.

**Lasioglossum (Evylaeus) schwarzi** Ebmer 1985
Turkey; Hakkari.

**Lasioglossum (Evylaeus) semilucens** (Alfken 1914)
Continental Greece; Vermion, Rhodopi. Turkey.

**Lasioglossum (Evylaeus) setulellum** (Strand 1909)
Active during July in Iran where recorded up to 2200 mtrs. A rather rare bee of the steppe.

**Lasioglossum (Lasioglossum) sexnotatum** (Kirby 1802)
Females recorded on the wing from Iran during May up to 600 mtrs.

**Lasioglossum (Evylaeus) siistense** (Warncke 1984)
Turkey. Syria. Iran.
A very rare bee.

**Lasioglossum (Lasioglossum) sinistrum** (Blüthgen 1934)
Iran.
Females noted often at lower levels, below 800 mtrs, in Iran during May to July where observed flying to *Dipsacus*.

**Lasioglossum (Evylaeus) sobrinum** (Warncke 1982)
Turkey; Hakkari. Iran.

**Lasioglossum (Evylaeus) sociorum** (Blüthgen 1924)
Turkey. Iran.
Females recorded rarely during July in Iran at altitude up to 1600 mtrs during July.
**Lasioglossum (Lasioglossum) solitarium** (Warncke 1975)
Turkey; Western Taurus Range.

**Lasioglossum (Evylaeus) soror** (Saunders 1901)
Continental Greece. Kefalonia.
Subspecies **L. s. livium** (Warncke 1982) Crete.
Subspecies **L. s. elatum** (Warncke 1975) Aegean Greece on Chios, Samos. Turkey.

**Lasioglossum (Evylaeus) stelidum** (Warncke 1982)
Turkey. Jordan.

**Lasioglossum (Evylaeus) subaenescens** (Pérez 1896)
In Iran this bee occurs to 2200 mtrs from May to July.

**Lasioglossum (Lasioglossum) subbuteo** (Warncke 1982)
Turkey.
A local endemic bee found in the Province of Hakkari.

**Lasioglossum (Lasioglossum) subequestre** (Blüthgen 1931)
Iran.
Females recorded in northeastern Iran at Surabad.

**Lasioglossum (Lasioglossum) subfasciatum** (Imhoff 1832)
Widespread Continental Greece. Turkey. Iran.
Recorded on the wing from May to July up to 2000 mtrs in Iran. At 2350 mtrs on Chelmos, Greece. Ebmer lists *Tussilago, Salix* and *Gentiana cruciata* as floral hosts.

**Lasioglossum (Evylaeus) subfulvicorne austriacum** Ebmer 1974
Continental Greece.
Found locally.

**Lasioglossum (Lasioglossum) tadschicum** (Blüthgen 1929)
Eastern Turkey; Erçis. Iran.
Found up to 2000 mtrs in Iran during May to July.

**Lasioglossum (Evylaeus) talyschense** (Blüthgen 1925)
Iran.
Both sexes recorded during July flying up to 2400 mtrs.

**Lasioglossum (Evylaeus) taninense** (Warncke 1984)
Turkey; Hakkari.

**Lasioglossum (Evylaeus) tarsatum** (Schenck 1868)
Greece; Aegean on Samos. Turkey.
Lasioglossum (Evylaeus) tauricum Ebmer 1972  
Turkey.  
A rare bee.

Lasioglossum (Lasioglossum) tenuiceps (Vachal 1905)  
Central Turkey.  
An endemic bee.

Lasioglossum (Evylaeus) transitorium (Schenck 1870)  
The nominate race on Continental Greece. Ionian Islands. Libya.  
Both sexes found on Crete during May to July.

Lasioglossum (Evylaeus) trichopygum (Blüthgen 1923)  
Continental Greece. Turkey.

Lasioglossum (Evylaeus) tricinctum (Schenck 1874)  
Subspecies L. t. muganicum Ebmer 1972 on Turkey. Iran.  
An undescribed subspecies occurs on Cyprus.  
A rare mainly steppic bee. Females on the wing from Late March into June on Lesbos.

Lasioglossum (Lasioglossum) tripolitanum (Blüthgen 1924)  
Cyrenaica.

Lasioglossum (Evylaeus) truncaticolle (Morawitz 1877)  
Females on the wing by May on Crete. On the wing from May to July in Iran at elevations up to 1600 mtrs.

Lasioglossum (Evylaeus) tschibuklinum (Blüthgen 1931)  
Continental Greece. Turkey. Iran.  
Scarcely recorded in Iran where females are on the wing from April to June at altitudes up to 1400 mtrs.

Lasoglossum (Ctenonomia) vagans (Smith 1858)  

Lasioglossum (Evylaeus) villosulum (Kirby 1802)  
Mavromoustakis recorded this bee on the wing in February, visiting Asteraceae and also in October, at Satureia incana. A preference for Asteraceae is also recorded from Lesbos.  
On Crete females are found active from May into August.  
Infrequently recorded Iran from May to July, often at height; up to 2800 mtrs.
The Halictid bee *Sphecodes villosulus* Schwarz 2010, described from UAE, is considered very probably to be a cleptoparasite of *L. villosulum*.

**Lasioglossum (Lasioglossum) xanthopum** (Kirby 1802)
The subspecies **L. x. lativalve** (Warncke 1984) in Iran.
Recorded active on the wing in western Iran from May to July. Noted on the wing in June at Ankara. Most records of females from Lesbos are for April and there is a series of males recorded during the spring there.
Ebmer notes that this bee has been recorded making visits to *Salvia pratensis, Lamium, Potentilla, Hieraceum, Taraxacum* and *Raphanus*.
A widespread bee to the north of our region. It is recorded as a host of the cleptoparasite *Sphecodes spinulosus*.

**Lasioglossum (Lasioglossum) zonulum** (Smith 1848)
Continental Greece. North Aegean Greece on Lesbos. Rare on mainland Greece. Scarce or rare on Lesbos with females recorded visiting *Cistus creticus* and *Cephalaria transylvanica*. Generally known in Europe as a polylege with a long flight season.

**Lasioglossum (Evylaeus) zostaceum** (Warncke 1982)
Turkey; Hakkari.

**Sphecodes albilabris** (Fabricius 1793)

**Sphecodes alternatus** Smith 1853
Mavromoustakis reports this bee on the wing from April to September, with flower records on Cyprus for *Mentha longifolia, Eryngium, Tamarix* and *Broteroa corymbosa*.

**Sphecodes anatolicus** Warncke 1992
Turkey.

**Sphecodes armeniacus** Warncke 1992
Turkey.

**Sphecodes crassanus** Warncke 1992
Continental Greece.

**Sphecodes crassus** Thomson 1870
Continental Greece. Turkey.

**Sphecodes cristatus** Hagens 1882

**Sphecodes croaticus** Meyer 1922
Continental Greece. Turkey.
Subspecies **S. c. cypricus** Blüthgen 1938 occurs on Cyprus, on the wing March to May and noted visiting *Ballota*.

**Sphecodes dusmeti** Blüthgen 1924  
females on the wing during June.

**Sphecodes ephippius** Linnaeus 1767  
Continental Greece. Lesbos. Turkey.  
The female recorded about *Smyrnium perfoliatum* during June on Lesbos.

**Sphecodes ferruginatus** Hagens 1882  
The female noted on the wing during July and August on Mount Olympos, Greece.

**Sphecodes geoffrellus** (Kirby 1802)  
Turkey.  
Subspecies **S. g. hakkariensis** Warncke 1992 also present in Turkey.

**Sphecodes gibbus** (Linnaeus 1758)  
Subspecies **S. g. rufispinosus** Meyer 1920 on Cyprus where Mavromoustakis reports it on the wing from April to September, visiting the flowers of *Mentha longifolia, Ballota, Tamarix* and *Eryngium*.  
On Lesbos females are on the wing from April to early June and have been noted attending *Crepis sancta* and *Origanum onites*.

**Sphecodes intermedius** Blüthgen 1923  
Turkey.

**Sphecodes longulus** Hagens 1882  
Continental Greece. Turkey.

**Sphecodes majalis** Pérez 1903  
Subspecies. **S. m. barbatus** Blüthgen 1923 on Continental Greece. Lesbos. Turkey.

**Sphecodes marginatus** Hagens 1882  
Subspecies **S. m. biskrensis** Pérez 1903 found in Turkey.

**Sphecodes miniatus** Hagens 1882  
Continental Greece. Lesbos.

**Sphecodes monilicornis** (Kirby 1802)  
Appears active from late May through June on Lesbos.  
On Cyprus the subspecies **S. m. cephalotes** Meyer 1920 is reported where on the wing from April to July often at montane levels, visiting *Alyssum troodi, Anthemis arvensis* and other flowers.
Sphecodes olivieri Lepeletier 1825

Sphecodes pellucidus Smith 1845
Cyprus. Turkey.
Recorded by Mavromoustakis on the wing in Cyprus from March to June. visiting Prunus domestica in March and also recorded at Ballota.

Sphecodes pinguiculus Pérez 1903
Bees in Turkey are referable to subspecies S. p. sareptensis Meyer 1922.

Sphecodes puncticeps Thomson 1870
On the wing March to August in Cyprus, recorded visiting Ammi and Mentha longifolia.

Sphecodes reticulatus Thomson 1870
Continental Greece. Lesbos. Turkey.

Sphecodes rubicundus Hagens 1875
Greece; North Aegean on Lesbos. Turkey.

Sphecodes ruficrus Erichson 1835
North Aegean Greece on Lesbos.
A single record of a male at Anthyllis hermanniae in early May.

Sphecodes rufiventris (Panzer 1798)
Cyprus.
Subspecies S. r. hethiticus Warncke 1992 Greek Aegean on Lesbos. Turkey.
On Cyprus flying in May and June, visiting Ballota.

Sphecodes scabricollis Wesmael 1835
Continental Greece.

Sphecodes schencki Hagens 1882
Females recorded during late March and April on Lesbos with an interesting record of a male at Ammi majus in late June.

Sphecodes spinulosus Hagens 1875
Continental Greece.

Sphecodes zangherii Noskiewicz 1931
Turkey.
Family Melittidae

Subfamily Dasypodainae

**Dasypoda albipila** Spinola 1838
Israel. Egypt.
The range is mainly within the Arabian Peninsula.

**Dasypoda argentata** Panzer 1809
Northern Continental Greece. Turkey. Iran.
An oligolege of the *Dipsacaceae*; visiting primarily *Scabiosa columbaria* and *S. Atropurpurea*. This bee also visits *Carduus* spp. *Centaurea jacea*, *Knaatia arvensis*, *Echium vulgare*, *Cephalaria leucantha* and *Armeria maritima. On the wing from the end of May to late August.

**Dasypoda braccata** Eversmann 1852
Northern Continental Greece. Turkey.
Bees in Turkey may be referable to subspecies *D. b. anatolica* Warncke 1973.
An oligolege of the *Dipsacaceae*, especially *Scabiosa rotata*. Also in Europe visits *Scabiosa ochroleuca*. On the wing from late June into August.

**Dasypoda cingulata**
Continental Greece; Peloponnesos.
Primarily a Western Mediterranean bee.

**Dasypoda frieseana** Schletterer 1890
Continental Greece; Peloponnesos. Central Aegean islands. Turkey.
A scarcely recorded bee.

**Dasypoda gusenleitneri** Michez 2004
Jordan.

**Dasypoda hirtipes** (Fabricius 1793)
Widespread Continental Greece. Turkey. Iran. Egypt. Libya.
Subspecies *D. h. graeca* Lepeletier 1841 is present in parts of this range.
Broadly oligolectic on the *Asteraceae*.

**Dasypoda (Megadasypoda) intermedia** Michez 2005
Northwestern Iran.
The male noted on the wing in montane habitat during late July at 2000 to 2500 mtrs.

**Dasypoda litigator** Baker 2002
Northern Iran.
An endemic species, found in the Central Alborz Mountains up to 2200 mtrs during July and August.

**Dasypoda longigena** Schletterer 1890
Eastern Turkey; Erzurum.

**Dasypoda patinyi** Michez 2002
Eastern Turkey; Urfa. Syria.

**Dasypoda pyriformis** Radoszkowski 1887
Widespread Continental Greece. Widely recorded on Aegean Greece including Lesbos. Southwestern Turkey.
On the wing late May to late July.
On Lesbos this is a local psammophilous bee attracted to the flowers of *Onopordum*. 
**Dasypoda pyrotrichia** Foerster 1855  
On the wing mid May to late August.

**Dasypoda sinuata** Pérez 1895  
Nilotic Egypt. Western Libya.  
Active from mid February into April.

**Dasypoda spinigera** Kohl 1905  
Local on Continental Greece. Widespread Turkey.  
An oligolege of the *Dipsacaceae*. A typical high-summer flight season for such a bee, from mid June to late August.

**Dasypoda suripes** (Christ 1791)  
An oligolege of the *Dipsacaceae*. In Europe very attracted to *Knautia arvensis*.  
On the wing from May to July.

**Dasypoda syriensis** Michez 2004  
Syria.

**Dasypoda toroki** Michez 2004  
Israel. Syria.  
Recorded at *Centaurea hispanica* and *C. iberica*.

**Dasypoda tubera** Warncke 1973  
Turkey. Coastal Syria.

**Dasypoda visnaga** Rossi 1790  
Records of flowers visited are *Eryngium maritimum*, *Centaurea seridis maritima*, *Scolymus hispanicus* and *Tolpis altissima*.

**Dasypoda warnckeii** Michez 2004  
Central and eastern Turkey.

**Eremophanta (Eremophanta) iranica** Schwammberger 1971  
Iran.  
Found in the extreme south of Iran.  
The eight Species of this Genus are largely found in the Central Asian deserts.

Tribe Promelittini

**Promelitta alboclypeata** (Friese 1900)  
Recorded from northern Sudan close to the border with Egypt.  
This rare species is the only member of the Tribe Promelittini. Species such as this, inhabiting the Palaearctic deserts, may sometimes represent archaic forms.
Subfamily Melittinae

**Macropis europaea** Warncke 1973
Continental Greece. Turkey.

**Macropis frivaldszkyi** Mocsáry 1878
Continental Greece. Turkey. Syria.
Oligolectic on *Lysimachia*.

**Macropis fulvipes** (Fabricius 1804)
Turkey.
The preferred pollen source of this oligolectic bee is *Lysimachia nummularia* but it is also hosted by *L. punctata* and *L. vulgaris*.
The bee is the host of the cleptoparasitic bee **Epeoloides coecutiens**.

**Melitta aegyptiaca** (Radoszkowski 1891)
Israel. Egypt.
On the wing from early February to the beginning of May.

**Melitta bicollaris** Warncke 1973
Eastern Turkey. An endemic species. Flower visits are mainly to the *Fabaceaeː* *Astragalus xerophyllus, Medicago sativa, Onobrychis cf stenostachya, O. transcaucasia, Trifolium ambiguum* and *Vicia cracca ssp. stenophylla*.
On the wing June and July.

**Melitta budensis** (Mocsáry 1878)
Turkey; Black Sea Regions.
Oligolectic on the Campanulaceae. A summer bee on the wing July and August.

**Melitta dimidiata** Morawitz 1875
Turkey.
This bee is associated with xeric calcareous steppelands. It is an oligolectic of *Onobrychis vicifolia, O. supina* and *O. arenaria*. Males on the wing from June to mid August and the females appearing some time later than the first males.

**Melitta haemorrhoidalis** (Fabricius 1775)
Continental Greece. Turkey.
An oligolectic of the Campanulaceae. Flower species recorded are *Campanula latifolia, C. persicifolia, C. rapunculoides, C. rotundifolia* and *C. trachelium*. However this bee also has an affinity for *Malva moschata*, and other flower visits may be for nectar resources. Both sexes of this bee are on the wing from early July to the beginning of September. The Nomad bees **Nomada emarginata** and **N. Flavopicta** are cleptoparasites.
Melitta leporina (Panzer 1799)
Turkey. Iran.
Oligolectic on the Fabaceae. This bee is a major pollinator of Medicago sativa but frequently visits related species.
On the wing early June to late August.
The bee Nomada flavopicta is a cleptoparasite.

Melitta maura (Pérez 1895)
Israel. Libya.
A scarcely recorded bee. It flies very early, from January to April.

Melitta nigricans Alfken 1905
Turkey.
A species of meadows, pastures and steppe where there is a good floral community within the grassland, and Lythrum salicaria is present.

Melitta rasmonti Michez 2007
Eastern Turkey; Hakkari, Erzurum.
An endemic species. Found on the wing during August

Melitta schmiedeknechti Friese 1896
On the wing early February to April.

Melitta wankowiczi Radoszkowski 1891
An affinity with the Campanulaceae. This bee appears from early June into late August.
Family Megachilidae

Subfamily Fideliiinae

Tribe Pararhophitini

*Pararhophites quadratus* Friese 1898
Egypt. Sinai.
An oligolege of *Zygophyllum album*. Noted active during March.

*Pararhophites orobinus* (Morawitz 1876)
Iran, Isfahan. Fars, Samnan.
An oligolege of the Zygophyllaceae upon the Iranian steppes at 1500 mtrs.

Subfamily Megachiliniae

Tribe Lithurgini

*Lithurgus chrysurus* Fonscolombe 1834
On the wing during June and July in Continental Greece and Corfu, recorded visiting *Centaurea solstitialis*. This bee is widespread through Continental Greece, from Thessaly south through to the Peloponnesos. It occurs up to 1400 mtrs in Boetia.
Flower visit records in Turkey, where this species is widespread and especially prevalent during July, are for flowers in the genera *Onopordum, Carduus, Cirsium, Centaurea* and *Trifolium*.
Mavromoustakis recorded this bee in June and July on Cyprus, visiting *Centaurea hyalolepis*, *Carthamus creticus* and *Centaurea cilicica*.
Out during July in Syria, up to 1200 mtrs and in Iran to the end of August, flying to *Medicago sativa*.
Flies in June and July in Lebanon where attracted to *Centaurea iberica meryonis*.
Both sexes are reported active during May from Israel, (Van der Zanden 1986), suggesting a much earlier appearance in the south of the range.
This bee is the host of the cleptoparasitic Anthidiine bee *Stelis simillima*.
**Lithurgus cornutus** (Fabricius 1787)
Continental Greece. Western Turkey.
This bee is on the wing in July in Greece, noted visiting in southern Europe. *Onopordon acanthium* and *Carduus crispus*
Subspecies **Lithurgus cornutus maximus** Radoszkowski 1872 found Turkey; common in eastern Anatolia. Iran.
A summer bee apparent during June and to late August. Noted visiting *Medicago sativa* in Iran.

**Lithurgus tibialis** Morawitz 1875
On the wing June to early September. On Cyprus Mavromoustakis recorded this bee nesting in beetle borings in the dried trunk of *Opontia* in a village garden, and flying to *Crozophora verbascifolia*.
In Turkey both sexes recorded from Dyarbakir during August.
A visitor to the Almond and Cherry orchards of highland Jordan. Noted flying to *Alhagi* in Iran.

All the species of **Lithurgus** reported from eastern Turkey are recorded at *Centaurea*, *Carduus*, *Cirsium*, *Onopordum* and *Arctium*. (Ozbek and Zanden 1994) note that *L. chrysurus* and *L. cornutus maximus* also visit *Onobrychis*. Michener (2000) notes that floral associations vary between species in the subgenus Lithurgus and that those species with shorter proboscids and sometimes three instead of four labial palpi are associated with the collection of fine pollen from members of the Asteraceae. These comments apply to *L. fuscipennis* and *L. chrysurus* among others.

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Tribe Osmiini

Most species in the genus *Chelostoma* are oligolectic and where species do have a broad flower-host range there is an evolutionary inference that floral host choice is neurologically or otherwise physiologically constrained.. See Sedivy et al (2008) and the works cited therein. These constraints can be overcome either through preadaptation or expansion to new pollen hosts exhibiting similar features to the original host plant. This is followed by an increasing tendency towards specialisation on the new plant resulting in the evolution of a further phase of oligolecty.

Floral associations and much more biological information can be found on the website of Andreas Müller at the University of Zurich http://blogs.ethz.ch/osmiini/ This site contains the most up to date information on all the species of Osmiines recorded in the Western Palaearctic and an excellent resource for this region.

**Chelostoma appendiculatum** (Morawitz 1872)
Ozbek
Turkey. On the wing in June.

**Chelostoma brevifurca** (Benoist 1935)
Ozbek.
Turkey, Taurus Mountains. On the wing late May.

**Chelostoma (Foveosmia) bytinskii** (Mavromoustakis 1948)
Discovered on the wing in Jerusalem in late April by Dr Bytinski-Salz.
An oligolege of *Campanula*.

**Chelostoma (Foveosmia) campanularum** (Kirby 1802)
Continental Greece. Turkey.
An oligolege of *Campanula*.

**Chelostoma (Chelostoma) diodon** Schletterer 1889
Both sexes recorded on the wing from Samos during April.
Recorded as a visitor to Almond and Cherry orchards in Jordan.
On Cyprus the subspecies **C. d. cypriacum** Mavromoustakis occurs. On Cyprus this bee was recorded nesting in old wood on village houses and visiting the flowers of *Anthemis libanotica* and *Bellis perennis*.

**Chelostoma (Foveosmia) distinctum** (Stoeckert 1929)
Continental Greece. Turkey.
An oligolege of *Campanula*.

**Chelostoma (Chelostoma) dolosum** (Benoist 1935)
Turkey; Bursa.

**Chelostoma (Chelostoma) emarginatum** (Nylander 1856)
Continental Greece. Lesbos. Turkey. Iran.
An oligolege of *Ranunculus*.

**Chelostoma (Chelostoma) florisomne** (Linnaeus 1758)
Continental Greece. Turkey; Central Anatolia and Erzurum.
Recorded on the wing during July from Ankara.
This bee is an oligolege of *Ranunculus*.

**Chelostoma (Foveosmia) forcipatum** (Benoist 1928)

**Chelostoma (Foveosmia) foveolatum** (Morawitz 1868)
An oligolege of *Campanula*.

**Chelostoma (Foveosmia) galeridum** (Warncke 1991)
Turkey; Icel, Antalya.
Chelostoma (Foveosmia) garrulum (Warncke 1991)
Turkey; Kars, Bitlis, Rize, Erzurum, Hakkari.

Chelostoma (Chelostoma) grande (Nylander 1852)
Continental Greece; Pindos Range close to Ioannina. Turkey, reported Amanus Mountains by Friese 1921 per Ozbek.
An oligolege of the Dipsacaceae.

Chelostoma (Chelostoma) grande (Nylander 1852)
Continental Greece; Pindos Range close to Ioannina. Turkey, reported Amanus Mountains by Friese 1921 per Ozbek.

Chelostoma (Chelostoma) grande (Nylander 1852)
Continental Greece; Pindos Range close to Ioannina. Turkey, reported Amanus Mountains by Friese 1921 per Ozbek.

Chelostoma (Chelostoma) handlirschi Schletterer 1889
Continental Greece. Turkey.

Chelostoma (Chelostoma) hebraeum (Benoist 1935)
Turkey. Israel. Palestine.

Chelostoma (Chelostoma) hellenicum (Benoist 1938)
Continental Greece.
Mavromoustakis noted that this bee was on the wing at Mount Parnes, Attica, in late May and early June. The species was originally described from Greece but without a locality given, a not unusual form of treatment for a new species in earlier periods.
An oligolege of Campanula.

Chelostoma (Chelostoma) isabellinum (Warncke 1991)
Turkey; Hatay, Mardin, Maras.

Chelostoma (Chelostoma) josefi Schwarz & Gusenleitner 2000
Turkey; Hakkari.

Chelostoma (Chelostoma) laticaudum (Benoist 1938)
South and central Continental Greece.
An oligolege of Campanula.

Chelostoma (Chelostoma) lucens (Benoist 1928)
In Turkey; Icel, females recorded on the wing in late May and early June. However, Mavromoustakis discovered the male of this species and reported it to be on the wing during March on Cyprus. Nests were in the wooden fence posts of village gardens and the bees flew to Calendula persica and Anthemis libanotica. Bytinski – Salz noted the occurrence of this bee in Palestine.
On the wing in May in Lebanon, recorded visiting Ranunculus.

Chelostoma (Chelostoma) maidli (Benoist 1935)
Turkey, Bursa, Kars, Hakkari, Van.

Chelostoma (Chelostoma) Mocsaryi Schletterer 1889
Continental Greece. Lesbos. Turkey; Artvin, Amasya.
On the wing during June in Attica.
This bee is oligolectic on Ornithogalum.

Chelostoma (Chelostoma) nasutum Pérez 1895
Continental Greece.
An oligolege of *Campanula*.

**Chelostoma (Gyrodromella) orientale** Schletterer 1890
Eastern Turkey.

**Chelostoma (Foveosmia) palaestinum** (Benoist 1935)
Turkey; Hatay, Lebanon, Israel, Palestine.
The female described from Lebanon by Mavromoustakis where recorded on the wing during May.

**Chelostoma (Gyrodromella) proximum** Schletterer 1889
Turkey; Erzurum, Bursa, Iran.

**Chelostoma (Gyrodromella) rapunculi** (Lepeletier 1841)
Continental Greece, Turkey.
Recorded during July from Central Anatolia.
This bee is oligolectic on *Campanula*.

**Chelostoma (Foveosmia) schlettereri** (Friese 1899)
Greece, Aegean on Samos, Turkey; Mugla, Sivas, Aydin, Antalya, Icel, Maras, Palestine, Israel, Syria.

**Chelostoma (Foveosmia) seidenstueckeri** Mavromoustakis 1954
Syria; Homs.
On the wing in May.

**Chelostoma (Foveosmia) styriacum** Schwarz & Gusenleitner 1999
Continental Greece; Mount Ossa and The Taygetos, Turkey.
An oligolege of *Campanula*.

**Chelostoma (Foveosmia) subnitidum** (Benoist 1935)
Turkey; Taurus.

**Chelostoma (Foveosmia) torquillum** (Warncke 1991)
Turkey; Kayseri, Kars, Bitlis, Hakkari, Van.

**Chelostoma (Chelostoma) transversum** (Friese 1897)
Continental Greece, Turkey; Taurus Mountains.
This bee is an oligolege of the *Dipsacaceae*.

**Chelostoma (Foveosmia) ventrale** Schletterer 1889
Turkey; Bursa.

**Haetosmia circumventa** (Peters 1974)
Egypt, Libya.
The female recorded on the wing during May in Libya.

**Haetosmia vechti** (Peters 1974)
Continental Greece. Turkey; Izmir, Kayseri, Icel. Israel. Palestine. Iran.

**Heriades (Rhopaloheriades) clavicornis** Morawitz 1875
Both sexes on the wing in the environs of Jerusalem during May, attracted to *Tolpis.*
Recorded on the wing in May and June in Lebanon. Males reported on the wing during July from Turkey, at 1300 mtrs. Males recorded during August at 1600 mtrs in Continental Greece. The flight season is affected strongly by the latitude within the distribution range.

**Heriades (Heriades) crenulatus** Nylander 1856
Both sexes recorded flying to *Centaurea solstitialis* in Greece during July. This is also the favoured month for records from Central Anatolia.

**Heriades (Michenerella) dalmaticus** Maidl 1922
On Cyprus the subspecies **H. d. troodicus** Mavromoustakis occurs.
From Attica, Greece, Mavromoustakis was able to describe the male of this species and noted both sexes flying to *Allium hymettium* in June.
Mavromoustakis found this bee at high elevations on Cyprus, on the wing during July and August and visiting the flowers of *Teucrium cyprium.*
In Lebanon both sexes recorded at *Teucrium polium* during July.

**Heriades (Heriades) hierosolomitus** Benoist 1935
Israel. Palestine.

**Heriades (Michenerella) hissaricus** Popov 1955
Turkey; Urfa.
Females on the wing in early August

**Heriades (Michenerella) punctuliferus** Schletterer 1889
One of the bee species noted as a visitor to Almond and Cherry orchards in Jordan.

**Heriades (Heriades) rubicolus** Pérez 1890
Recorded on the wing from June to September on Cyprus, by Mavromoustakis. The bee recorded visiting *Inula viscosa,* *Inula crithmoides,* *Linaria elatine.* *Pulicaria dysenterica,* *Carthamus boissieri,* *Statice* and *Eryngium creticum.*

**Heriades (Heriades) truncorum** (Linnaeus 1758)
In Turkey recorded on the wing from July through September with flower visit records for *Salvia,* *Centaurea solstitialis,* *Arctium lappa* and *Onopordum.* On Cyprus this species has been recorded from April into September, visiting *Pulicaria dysenterica,* *Inula viscosa* and *Inula crithmoides.*
This bee is a host of the cleptoparasitic bee *Stelis minuta*.

**Hofferia schmiedeknechti** (Schletterer 1889)

**Hoplitis (Alcidamea) abnormis** Van der Zanden 1992
Found in montane areas to 2000 mtrs in Greece and Israel with males on the wing during May and June. the flight season begins slightly earlier in the levant than in Greece.

**Hoplitis (Alcidamea) acanthophora** (Morawitz 1875)
Turkey; Malatya, Hakkari.

**Hoplitis (Alcidamea) acuticornis** (Dufour and Perris 1840)
In Turkey recorded at *Onobrychis viciifolia* and *Lathyrus sp*.
On the wing in March and April on Cyprus, recorded at *Faba*. Mavromoustakis reported nests constructed within the dried stems of *Scilla*.

**Hoplitis (Hoplitis) adunca** (Panzer 1798)
Reported as rare in Turkey.

**Hoplitis (Platosmia) africana** (Warncke 1990)
Palestine. Israel.

**Hoplitis (Anthocopa) agis** (Benoist 1929)
Continental Greece. Eastern Turkey. Iran.

**Hoplitis (Platosmia) alchata** (Warncke 1990)
Turkey, Urfa.

**Hoplitis (Alcidamea) alexandrina** Warncke 1991

**Hoplitis (Anthocopa) anipuncta** (Alfken 1935)
Recorded visiting *Onopordum, Centaurea iberica* and *C. solstitialis* in Turkey.
On the wing during April in Palestine and Israel. However, records for Crete and from Turkey and Syria are for May to August.

**Hoplitis (Annosmia) annulata** (Morawitz 1871)
Recorded in April and May from Cyprus, visiting *Echium sericeum*, and on the wing during May in Palestine. Noted as a visitor to orchards in highland Jordan.

**Hoplitis (Micreriades) antalyae** Tkalcü 2000  
North Aegean Greece on Lesbos. Turkey; Antalya.

**Hoplitis (Alcidamea) antennata** (Morawitz 1876)  
Turkey; Kars. A Caucasian bee.

**Hoplitis (Annosmia) aqabaensis** (Warncke 1991)  
Jordan.

**Hoplitis (Alcidamea) arenivaga** Van der Zanden 1996  
Jordan. Israel.  
The male recorded active during April. An inhabitant of desertic areas.

**Hoplitis asiae** Tkalcu 1979  
Continental Greece, Thrace.

**Hoplitis (Anthocopa) batyameae** (Van der Zanden 1986)  
Palestine. Israel.

**Hoplitis (Alcidamea) bicallosa** (Morawitz 1876)  
Continental Greece. Turkey; Antalya, Kars, Konya.  
Males recorded during May in the Peloponnesos at 900 mtrs.

**Hoplitis (Anthocopa) bidentata** (Morawitz 1876)  
Widespread Turkey. Egypt.

**Hoplitis (Anthocopa) bifoveolata** (Alfken 1935)  

**Hoplitis (Anthocopa) bipartita** (Friese 1899)  
Turkey; Erzurum, Hakkari.

**Hoplitis (Alcidamea) bispinosa** Van der Zanden 1992  
Continental Greece. Turkey.  
Males active on the wing at 1700 mtrs during July and August in the Taygetos Range of Greece.  
Males noted during June in Turkey at 2250 mtrs.

**Hoplitis (Anthocopa) bisulca** (Gerstaecker1869)  
Mavromoustakis reported this bee to be active during May in Israel and Palestine. In flight during July and August on Continental Greece. Females recorded Turkey; Urfa, during July.

**Hoplitis (Annosmia) bohdenheimeri** (Mavromoustakis 1949)  
Palestine. Israel.
Hoplitis (Hoplitis) bombiformis Van der Zanden 1991
Turkey; Hakkari, Van.
The females of this large Hoplitis discovered on the wing at up to 2200 mtrs during July in Turkey

Hoplitis (Prionohoplitis) brachypogon (Pérez 1879)
Both sexes noted active in late May in Greece.

Hoplitis (Anthocopa) brevispina (Tkalcu 2000)
Turkey; Erzurum.

Hoplitis (Anthocopa) bytinskii (Mavromoustakis 1948)
Palestine. Israel.
On the wing during May.

Hoplitis (Prionohoplitis) campanularis (Morawitz 1877)
Continental Greece, Peloponnesos. Turkey, Mardin, Kars, Hakkari, Sivas.

Hoplitis (Hoplitis) carinata (Stanek 1969)
Very common in eastern Turkey. Flower visits recorded for Onobrychis viciifolia, Medicago sativa, Melilotus officinalis, Lotus corniculatus, Also flower species in the genera Vicia, Astragalus and Convolvulus.
females recorded on the wing during June in Syria.

Hoplitis (Alcidamea) carsophila (Ducke 1900)

Hoplitis (Alcidamea) caucasica (Friese 1920)
Turkey; Erzurum, Gümüşhane.
Females reported at O. viciifolia and M. officinalis. Found on the wing during July.

Hoplitis (Alcidamea) caularis (Morawitz 1875)
Turkey; Van, Erzurum.
Females reported on the wing during June.

Hoplitis (Annosmia) cercomela Warncke 1991
Jordan; Aqaba.

Hoplitis (Bytinskia) christae (Warncke 1991)
Israel. Palestine.

Hoplitis (Annosmia) chukar (Warncke 1991)
Turkey, Hakkari, Konya. Israel. Palestine.

Hoplitis (Alcidamea) ciliaris (Pérez 1902)
Southern Continental Greece; Peleponnessos. Turkey; Erzincan, Konya, Hakkari. Israel, Hula.
Hoplitis (Alcidamea) claviventris (Thomson 1872)
Northern Continental Greece. Northwestern Turkey; Bolu.

Hoplitis (Alcidamea) contracta (Walker 1871)
Egypt. A southwest Asian and Afrotropical species.

Hoplitis (Anthocopa) cretaea (Tkalcu 1992)
Continental Greece. Crete.

Hoplitis (Alcidamea) curtula (Pérez 1895)
Widespread Turkey.

Hoplitis (Prionohoplitis) curvipes (Morawitz 1871)
Males reported on the wing during late June.

Hoplitis (Anthocopa) cypriaca (Mavromoustakis 1938)
On the wing in April and May on Cyprus, visiting Centaurea hyalolepis.
Mavromoustakis recorded this bee on the wing in June in Palestine, visiting Centaurea.

Hoplitis (Anthocopa) dalmatica (Morawitz 1871)
Continental Greece. Turkey.
Recorded at Cirsium in eastern Turkey.

Hoplitis (Anthocopa) daniana (Mavromoustakis 1949)
Palestine. Israel.

Hoplitis (Alcidamea) decaocta (Warncke 1991)
Turkey; Kirsehir, Van.

Hoplitis (Anthocopa) duckeana (Kohl 1905)
Turkey; Kayseri, Urfa. Syria.
Males active in June and July.

Hoplitis (Prionohoplitis) eburnea (Warncke 1991)

Hoplitis (Annosmia) elaziga Warncke 1991
Turkey, Ankara.

Hoplitis (Pentadentosmia) enslini (Alfken 1936)
Israel, Jericho. A scarcely recorded bee.

Hoplitis (Prionohoplitis) epeoliformis (Ducke 1899)
Jordan.
**Hoplitis (Annosmia) eremophila** (Warncke 1991)  
Southern Aegean on Crete. Turkey; Erzurum, Hakkari, Bitlis. Syria.

**Hoplitis (Bytinskia) erythrogastra** (Mavromoustakis 1954)  
Mavromoustakis found this species on the wing in May and June, numerous in mid-June. Cleptoparasitic on the ground nesting **Hoplitis sordida**.

**Hoplitis (Hoplitis) erzurumensis** Tkalcu 2000  
Turkey; Erzurum.  
On the wing from the second decade of June into early July. Flowers visit records are for *O. sativa, M. sativa* and *T. pratense*.

**Hoplitis (Hoplitis) fabrei** Van der Zanden 1987  
Continental Greece, Corfu.  
Both sexes on the wing in May and early June in Greece where widespread.

**Hoplitis (Hoplitis) fertoni** (Pérez 1890)  
Israel. Palestine. Egypt.

**Hoplitis (Hoplitis) flabellifera**  
(Morice 1901)  

**Hoplitis (Alcidamea) fossulata**  
(Mocsáry 1883)  
Iran. A rarely recorded bee. The only specimen, male, originally placed in *Stelis*.

**Hoplitis (Annosmia) fulica** (Warncke 1991)  
Turkey; Van.

**Hoplitis (Megalosmia) fulva** (Eversmann 1852)  
Central and eastern Turkey. Syria. Jordan.  
Active in June and July in Central Anatolia.

**Hoplitis (Anthocopa) furcula** (Morawitz 1875)  
Continental Greece. Crete. Turkey; Amasya.

**Hoplitis (Alcidamea) galbula** (Warncke 1991)  
Continental Greece; Peloponnesos. Turkey, Hakkari.

**Hoplitis (Pentadentosmia) gallinula** (Warncke 1991)  
Central and eastern Turkey. Jordan.  
On the wing late July and August above 2000 mtrs.

**Hoplitis (Alcidamea) garzetta** (Warncke 1991)  
Continental Greece. Turkey; Adiyaman, Hakkari, Konya, Bitlis.
Hoplitis (Annosmia) gentilis (Warncke 1991)  
Turkey, Konya.

Hoplitis (Platosmia) gerofta (Warncke 1990)  
Israel. Palestine.

Hoplitis (Anthocopa) graeca (Tkalcu 2000)  
Central Continental Greece; Attica. 
Subspecies H. g. ionica on Turkey.

Hoplitis (Prionohoplitis) grossepunctata (Kohl 1905)  
Both sexes are on the wing in July at elevations of up to 2200 mtrs in eastern Turkey.

Hoplitis (Anthocopa) grumi (Morawitz 1894)  
Turkey; Erzurum, Gürün, Urgüp. 
A visitor to Onobrychis vicifolia which is a well – studied important forage legume. Females on the wing in June.

Hoplitis (Micreriades) haemi Tkalcu 2000

Hoplitis (Chlidoplitis) heinrichi Van der Zanden 1980  
Turkey; Urfa, Birecik. 
A rarely recorded species. In eastern Turkey both sexes are on the wing during June.

Hoplitis (Pentadentosmia) helouanensis (Friese 1899)  
Jordan. Palestine. Israel. Egypt; Sinai.

Hoplitis (Anthocopa) hemisphaerica (Alfken 1935)  
In flight during April and May in Syria.

Hoplitis (Annosmia) hierichonica (Mavromoustakis 1949)  
An endemic bee found from the Lower Jordan Valley to the Red Sea.

Hoplitis (Hoplitis) holmboei (Mavromoustakis 1948)  
Continental Greece. Cyprus. 
On the wing during April on Cyprus, recorded visiting Onosma fruticosum.

Hoplitis (Hoplitis) homalocera Van der Zanden 1991  

Hoplitis (Annosmia) idaensis (Warncke 1991)  
Southern Aegean Greece on Crete. Turkey; Adiyaman.

Hoplitis (Anthocopa) idalia (Mavromoustakis 1948)  
Recorded at *Centaurea iberica* in Turkey. Females on the wing during July in Izmir.
On Cyprus recorded at *Centaurea hyalolepis* and *Scolymus hispanicus.*

**Hoplitis (Chlidoplistis) illustris** Van der Zanden 1980
Turkey.
Both sexes recorded up to 1900 mtrs during June and July.

**Hoplitis (Micreriades) illyrica** (Noskiewicz 1926)
Continental Greece. Lesbos.

**Hoplitis (Hoplitis) improceros** Van der Zanden 1998
Palestine. Israel.
Males noted in the Red Sea Region and Arava during March.

**Hoplitis (Alcidamea) iranica** (Warncke 1991)
Iran, Fars.

**Hoplitis (Annosmia) israelica** (Warncke 1991)

**Hoplitis (Anthocopa) jakovlevi** (Radoszkowski 1874)
Eastern Turkey; Erzurum. Iran.
Flower record visits for *Carduus* and *Cirsium spp.*
On the wing during July and August.

**Hoplitis (Pentadentosmia) jejuna** Popov 1952
Subspecies *H. j. argentea* Van der Zanden in Iran; Khuzestan.
Females recorded on the wing in late July.

**Hoplitis (Anthocopa) jerichoensis** (Van der Zanden 1996)
Palestine. Israel.
Males active in the Jordan Valley during March and mid April.

**Hoplitis (Hoplitis) jheringi** (Ducke 1898)
Egypt.

**Hoplitis (Pentadentosmia) karakalensis** (Popov 1936)
Iran.

**Hoplitis (Pentadentosmia) laevifrons** (Morawitz 1872)
Turkey; Erzurum, Kars. A Continental European species.
On the wing from June to July. Recorded visiting flowers in the genera *Salix, Cirsium, Anchusa* and *Carduus.*

**Hoplitis (Pentadentosmia) laeviscutum** (Alfken 1935)
Mavromoustakis reported this species active during May in the Levant.
**Hoplitis (Hoplitis) lapidaria** (Morawitz 1877)
Turkey; Icel, Nevsehir.

**Hoplitis (Micreriades) lebanotica** (Mavromoustakis 1955)
Eastern Turkey. Lebanon.
On the wing in May and June.

**Hoplitis (Annosmia) leiocephala** (Mavromoustakis 1954)
Israel. Palestine.
On the wing March and April.

**Hoplitis (Alcidamea) leucomelana** (Kirby 1802)
Central and eastern Turkey.
On the wing from late May to early July. Flower visits reported include *Lotus corniculatus*, *Melilotus officinalis*, *Latyrs sp* and *Convolvulus sp*.

**Hoplitis (Hoplitis) libanensis** (Morice 1901)

**Hoplitis (Anthocopa) ligurica** (Morawitz 1876)
On the wing in April and May on Cyprus, where Mavromoustakis gives flower records for *Anthemis arvensis*, *Calendula persica* and *Achillea santolina*.
Nests within the dried stems of *Rubus*.

**Hoplitis (Alcidamea) limassolica** (Mavromoustakis 1937)
This bee is abroad from March to May on Cyprus, recorded visiting *Onosma fruticosum*, *Echium*, *Anchusa hybrida* and *Hyacinth trifoliatus*. Makes a nest of four cells, separated by double partitions, in a dried stem of *Asphodelus*, recorded by Mavromoustakis, and considered by him to be a rare species.
On the wing during April in Palestine and Israel.

**Hoplitis (Hoplitis) linguaria** (Morawitz 1876)
Turkey; Nevsehir.
Both sexes found upon the wing during July to 1050mtrs.

**Hoplitis (Chlidoplitis) lysolmi** Friese 1899
In the Levant found on the wing during April.

**Hoplitis (Hoplitis) manicata** (Morice 1901)
On the wing during June and July in Ankara and other parts of Turkey.
Hoplitis (Micreriades) mazzucoi (Schwarz & Gusenleitner 2005)
Turkey.

Hoplitis (Pentadentosia) meyeri (Benoist 1934)
Palestine. Israel.

Hoplitis (Pentadentosmia) minor (Morawitz 1877)

Hoplitis (Alcidamea) mitis (Nylander 1852)
Continental Greece.

Hoplitis (Anthocopa) Mocsaryi (Friese 1895)
Continental Greece. Turkey. Recorded from Turkey by Friese and Kohl during the early 20th Century, but appears to be little recorded generally.

Hoplitis (Alcidamea) mollis Tkalcu 2000
Turkey; Erzurum. Jordan.
Flight period early May into July. Flower visits recorded for Turkey are O. viciifolia and M. sativa. The species is common at Erzurum and an important pollinator of these two plant species (Ozbek 1979).

Hoplitis (Hoplitis) monstrabilis Tkalcu 2000
Turkey; Erzurum.

Hoplitis (Pentadentosmia) moricei (Friese 1899)

Hoplitis (Hoplitis) mucida (Dours 1873)
Israel. Palestine.

Hoplitis (Annosmia) mutica Warncke 1991
Central and eastern Turkey.

Hoplitis (Bytinskia) negevensis (Warncke 1991)
Israel.

Hoplitis (Anthocopa) nigrocolor (Van der Zanden 1991)
Egypt. Libya.

Hoplitis (Pentadentosmia) nitidula (Morawitz 1877)
Iran.

Hoplitis (Anthocopa) obtusa (Friese 1899)
Recorded visiting Knautia integrifolia in Greece.
Hoplitis (Chlidoplitis) onychophora (Mavromoustakis 1939)
Turkey. Palestine. Israel.
Recorded on the wing during May in Palestine.

Hoplitis (Alcidamea) ozbeki Tkalcu 2000
Turkey; Erzurum.

Hoplitis (Hoplitis) pallicornis (Friese 1895)
Active during May and June.

Hoplitis (Anthocopa) papaveris (Latreille 1799)
Continental Greece, North Aegean on Lesbos. Turkey; Erzurum.
On the wing in May in Greece.

Hoplitis (Microhoplitis) paralias (Mavromoustakis 1954)
Palestine. Israel.
Appears from mid April into May.

Hoplitis (Annosmia) parana (Warncke 1991)
Palestine. Israel.

Hoplitis (Bytinska) parasitica (Warncke 1991)
Eastern Turkey. Iran.

Hoplitis (Micreriades) parnesica (Mavromoustakis 1958)
Continental Greece.
Mavromoustakis reported that both sexes of this bee flew in June at Mount Parnes Greece, visiting a low-growing Lamiale with violet flowers.

Hoplitis (Annosmia) peralba Van der Zanden 1992
Egypt.

Hoplitis (Anthocopa) Perezi (Ferton 1895)
Continental Greece. Lesbos. Turkey; Sivas, Kars, Nevsehir.
On the wing from June into August. Visits recorded to O. sativa, M. sativa, M. officinalis and Lythrum.

Hoplitis (Coloplitis) persica (Warncke 1991)
Iran; Tehran.

Hoplitis (Hoplitis) pici (Friese 1899)
On the wing during April and May.
The females of this bee have hooked bristles on the galea of the proboscis which enable them to extract pollen from their floral host Muscari, a genus which has anthers hidden within a narrow-mouthed corolla. On Rhodes the host flower is specifically Muscari comosum. (Müller 2006).
Hoplitis (Anthocopa) picicornis (Morawitz 1895)
Turkey; Erzincan. Iran.
Males on the wing during mid June in eastern Turkey.

Hoplitis (Micreriades) pisidiae Tkalcu 2000
Turkey.

Hoplitis (Pentadentosmia) pomarina (Warncke 1991)
Continental Greece; Stavros. Eastern Turkey.

Hoplitis (Alcidamea) praestans (Morawitz 1894)
Males recorded during June in Turkey.

Hoplitis (Anthocopa) pulchella (Pérez 1895)
Jordan. Egypt. Libya.
Both sexes active during March and April.

Hoplitis (Anthocopa) quadrispina (Tkalcu 1992)
Libya.

Hoplitis (Pentadentosmia) quinquespinosa (Friese 1899)
Israel, En Gedi, Bersheva, Jericho.

Hoplitis (Platosmia) recticauda (Stanek 1969)
Turkey, Antalya, Icel, Erzurum, Hakkari.
On the wing in early and mid June..

Hoplitis rhodoensis ferina Warncke 1988
Continental Greece, Thrace.

Hoplitis (Pentadentosmia) ridibunda (Warncke 1991)
Turkey; Antalya, Elazig, Mus..

Hoplitis (Anthocopa) scutellaris (Morawitz 1868)
On the wing April and May in Cyprus, visiting Marrubium vulgare apolum and Anthemis. Active in April in Palestine and Israel, recorded visiting Pallenis.

Hoplitis (Annosmia) segura (Warncke 1991)
Palestine. Israel.

Hoplitis (Hoplistis) semilinguaria Tkalcu 1992
Southwestern Iran.

Hoplitis (Anthocopa) semirubra (Friese 1899)
Endemic to this part of the Middle East and reported by Mavromoustakis as widespread in the Lower Jordan Valley to Jerusalem. On the wing during May and recorded visiting *Centaurea*.

**Hoplitis (Anthocopa) serrilabris** (Morawitz 1875)
Turkey; Erzurum. Iran; Isfahan.
Zanden reported males on the wing in Iran during September.

**Hoplitis (Anthocopa) singularis** (Morawitz 1875)
Turkey; Konya. Israel. Palestine.

**Hoplitis (Annosmia) sordida** (Benoist 1929)
Israel. Palestine. Egypt.
Mavromoustakis found females of this bee to be widespread and common in parts of Israel, nesting in hard sandy soil close to stands of *Echium*. This bee is an oligolege, possibly of *Echium sericeum*.

**Hoplitis (Alcidamea) stellaris** Warncke 1991
Continental Greece, Corinth. Western and eastern Turkey; Denizli, Van.

**Hoplitis (Alcidamea) subbutea** (Warncke 1991)

**Hoplitis (Alcidamea) tenuispina** (Alfken 1937)
Continental Greece. Turkey; Konya.
Males recorded during June from both Greece and Turkey, up to 950 mtrs in Attica.

**Hoplitis (Anthocopa) tergestensis** (Ducke 1897)
Continental Greece, Thrace. Egypt.
Subspecies **H. t. remota** Tkalcu in Eastern Turkey.

**Hoplitis (Hoplitis) testaceozonata** (Alfken 1935)
Palestine. Israel.

**Hoplitis (Megahoplitis) tigrina** (Morawitz 1871)
Continental Greece. Lesbos. Turkey.

**Hoplitis (Alcidamea) tricolor** (Saunders 1908)
Jordan.

**Hoplitis (Alcidamea) tridentata** (Dufour & Perris 1840)
Continental Greece. Central and eastern Turkey. Iran. Egypt.
Males on the wing from June in Sparta, Greece. Recorded late June to Late July in Turkey, visiting flowers of *Onobrychis viciifolia, Medicago sativa, Anchusa, Echium italicum, Carduus, Carthamus lanatus* and *Cirsium*.

**Hoplitis (Pentadentosmia) tringa** (Warncke 1991)
Central and eastern Turkey.

**Hoplitis (Annosmia) uncaticornis** (Stanek 1969)
Greece. Eastern Turkey. Syria.
Warncke describes subspecies **H. u. cursoria** from Turkey; Sanliurfa. Syria.
Males abroad during June in Turkey.

**Hoplitis (Anthocopa) unispina** (Alfken 1935)
Mavromoustakis reported this bee active in April from Palestine and Israel. On the wing during April and May in Greece.

**Hoplitis (Anthocopa) urfensis** (Van der Zanden 1984)
Turkey; Urfa. Syria.
A scarcely recorded bee. Both sexes active during June in Turkey.

**Hoplitis (Annosmia) verhoeffi** (Mavromoustakis 1954)
Both sexes found on the wing from mid April to mid May.

**Hoplitis (Alcidamea) verruciventris** (Morawitz 1886)
Turkey, Kırşehir.

**Hoplitis (Anthocopa) villosa** (Schenck 1853)
Continental Greece; Attica. Turkey; Erzurum. Lebanon.
On the wing during May in Greece.

**Hoplitis (Anthocopa) wadicola** (Alfken 1935)
Turkey. Palestine. Israel.

**Hoplitis (Anthocopa) wahrmani** (Mavromoustakis 1948)
Palestine. Israel.
From April to June common, an oligolege of *Centaurea*. Mavromoustakis records this fossorial bee making shallow gallery nests in hard red sandstone soils. The cells lined with fragments of *Oenothera* petals. The species is figured in Mavromoustakis (1948) p218.

**Hoplitis (Alcidamea) xanthoprymna** (Warncke 1991)
Turkey, Konya.

**Hoplitis (Anthocopa) yermasoyiae** (Mavromoustakis 1938)
Subspecies **H. y. corcyracaea** Tkalcu on Continental Greece; Attica and Peloponnesos. Corfu, North Aegean on Thassos, Lesbos. The nominate subspecies **H. y. yermasoyiae** Mavromoustakis 1938 is on Cyprus. Lebanon and also Turkey; Konya, Sivas..
Subspecies **H. y. asiae** Tkalcu reported in Turkey; Antalya, Erzurum.
Subspecies **asiae** on the wing in June and July in eastern Turkey where recorded visiting *O. sativa* and *M. officinalis*.
Recorded visiting *Scabiosa brachiata* during late June on Continental Greece.
Mavromoustakis recorded this bee on Cyprus from March to May, nesting on the ground with their mines lined with fragments of Cistus petals. Flower visits recorded there for *Cistus villosus creticus, Anthemis, Convolvulus* and *Vicia cracca elegans*.
Hoplosmia (Odontanthocopa) bidentata (Morawitz 1876)
The nominate H. b. bidentata in Greece, Northern Aegean on Lesbos.
In Eastern Turkey pallens on the wing during August in Provinces Erzurum, Antalya, Aydin, Agri, Erzurum, Van and Kars where flower genus records are Carduus, Onopordum and Centaurea iberica, C. glastifolia, C. solstitialis, Eryngium billardieri, Echium vulgare and Arctium lappa.
Found to be widespread on the wing in Central Anatolia during July and August.

Hoplosmia (Hoplosmia) croatica (Friese 1893)
Females recorded during late August in eastern Turkey and both sexes on the wing in Istanbul during July. This species is also a summer bee in Greece.

Hoplosmia (Odontanthocopa) distinguenda (Tkalcu 1974)
Recorded visiting Onopordum in eastern Turkey.

Hoplosmia (Hoplosmia) elegans Tkalcu 1992
Aegean Greece on Lesbos. Turkey.

Hoplosmia (Odontanthocopa) hermonensis Tkalcu 1992
Palestine. Israel.

Hoplosmia (Odontanthocopa) ligurica (Morawitz 1868)

Hoplosmia (Odontanthocopa) olgae (Tkalcu 1978)
Turkey; Nevsehir. Syria.

Hoplosmia (Odontanthocopa) padri (Tkalcu 1974)
Continental Greece. Lesbos. Turkey.

Hoplosmia (Paranthocopa) pinguis (Pérez 1895)

Hoplosmia (Odontanthocopa) scutellaris (Morawitz 1868)

Hoplosmia (Hoplosmia) spinigera (Latreille 1811)
On the wing during April in the Levant.

Hoplosmia (Hoplosmia) spinulosa (Kirby 1802)
Turkey: Agri, Aydin, Erzurum.
A summer bee on the wing into mid September. Recorded at Carduus and Onopordum in Turkey.
**Hoplosmia (Odontanthocopa) warncke**i Tkalcu 1992
Eastern Turkey. Iran.

**Ochriades fasciatus** (Friese 1899)
Described in the male sex from Jericho. The male reported active during May in Syria. Mavromoustakis discovered the female on the wing in Damascus in July. Present in Jerusalem. A rare genus of two species with a further species in Namibia.

**Osmia (Helicosmia) aeruginosa** Warncke 1988
Continental Greece. Turkey; Konya, Hakkari.

**Osmia (Helicosmia) alfkenii** DUCKE 1899
Israel; En Gedi. Jordan; Petra. Egypt; Wadi Um Assad.
A desertic bee apparent from the early season flight period, both sexes apparent from late January into March.

**Osmia (Pyrosmia) amathusica** Mavromoustakis 1937
On the wing in June and reported at *Salix* in Turkey.
The flight time appears to be earlier south of Turkey into the Eastern Mediterranean islands and the Levant. In Cyprus females emerge during March and Mavromoustakis reported this bee nesting in April, cells constructed from tiny fragments of stone mixed with masticated leaf fragments and a secreted material were placed in crevices in a stone. Females are active on Rhodes also during April and early May and in Syria during April.

**Osmia (Hemiosmia) anceps** Pérez 1895
Libya.

**Osmia (Erythrosmia) andrenoides** Spinola 1808
On the wing with early individuals in March and then to July on Cyprus, recorded at *Teucrium polium micropodioides*, *Echium*, *Medicago*, *Calendula persica* and *Linaria elatine*.
In Palestine and Israel recorded on the wing in March and in June, flying to *Ballota saxatalis*.

**Osmia (Monosmia) apicata** Smith 1853
In eastern Turkey recorded from early June, visiting *Centaurea*.

**Osmia (Annosmia) aqabaensis** Warncke 1991
Jordan.

**Osmia (Helicosmia) aquila** Warncke 1988

**Osmia (Osmia) ariadne** Peters 1978
Continental Greece. Crete.
**Osmia (Helicosmia) aurulentata** (Panzer 1799)
Continental Greece. Widespread Turkey. Lebanon. Iran.
On the wing during May and June in Central and eastern Turkey, reported at *Salix* and *Sinapis arvensis*.
In Lebanon both sexes on the wing in June, flying to *Vicia tenuifolia*.

**Osmia (Pyrosmia) avertedata** Warncke 1992
Jordan. Israel.

**Osmia (Ozbekosmia) avosetta** Warncke 1988
A frequent visitor to *Onobrychis viciifolia* in Turkey.

**Osmia (Osmia) bicornis** (Linnaeus 1758)
Subspecies **O. b. globosa** (Scopoli 1763) on Continental Greece; Thrace. Lesbos. Turkey. Syria. Iran.
The nominate subspecies also found in Iran.

**Osmia (Allosmia) bischoffi** Atanassov 1938
Continental Greece. Turkey.
A little known species.

**Osmia (Annosmia) bohdenheimeri** Mavromoustakis 1949.
Israel.

**Osmia (Helicosmia) breviata** Warncke 1988
Turkey, Konya, Sivas, Kars, Icel, Hakkari.

**Osmia (Metallinella) brevicornis** (Fabricius 1798)

**Osmia (Helicosmia) brevipes** Van der Zanden 1994
Turkey; Sivas.

**Osmia (Helicosmia) bulgarica** Friese 1922
Continental Greece.

**Osmia (Helicosmia) caerulescens** (Linnaeus 1758)
In Egypt the subspecies **O. c. cyanea** (Fabricius) occurs.
In Turkey reported visiting *Sisymbrium sophia, Sinapis arvensis* and flowers in the genera *Prunus, Carduus, Ajuga* and *Salvia*.
On the wing April and May to August on Cyprus, visiting *Calendula persica, Onosma fruticosum, Vicia cracca elegans, Onobrychis venosa, Calycotome villosa, Salvia grandiflora willeana, Nepeta troodi* and *Ballota nigra*. Mavromoustakis reports this bee nesting in the dry stems of Carob trees.
Recorded from June to August in Turkey and widely polylectic.

**Osmia (Pyrosmia) cephalotes** Latreille 1811
Libya.
In flight from March to June on Cyprus, where recorded visiting Calendula persica, Bellis perennis, Echium sericeum, Salvia, Trifolium physodes and Hyacinthus trifoliatu.

Osmia (Annosmia) cercomela Warncke 1991
Jordan.

Osmia (Osmia) cerinthidis Morawitz 1876
Continental Greece. Widespread Turkey. Iran.
Recorded visiting Onobrychis viciifolia, Sinapis arvensis, Salix, Prunus and Malus.

Osmia (Helicosmia) chrysaetos Warncke 1988
Turkey, Icel, Kars, Hakkari.

Osmia (Hemiosmia) chrysolepta Haeseler 2005

Osmia (Annosmia) chukar Warncke 1991
Turkey at Hakkari.

Osmia (Helicosmia) cinctella Dours 1873
Continental Greece. Crete.

Osmia (Helicosmia) cinerea Warncke 1988
Turkey, Adiyaman, Nevsehir, Hakkari.

Osmia (Neosmia) cinnabarina Pérez 1895
Palestine. Israel.

Osmia (Helicosmia) clypearis Morawitz 1871
Continental Greece and Corfu.
On the wing during April and May in Greece.

Osmia (Osmia) cornuta (Latreille 1805)
The nominate subspecies on Continental Greece.
In the North Aegean on Lesbos and on Cyprus the subspecies O. c. neoregaena Mavromoustakis occurs.
Mavromoustakis reports this bee on the wing in March, visiting Prunus dulcis blossom and nesting in holes in old walls.
Subspecies O. c. divergens Friese in Iran.
In Turkey, Iran and possibly Crete the further subspecies, O. c. quasirufa Peters 1978 is found, widespread through Turkey.

Osmia (Helicosmia) cyanescens Morawitz 1875
Continental Greece.
**Osmia (Pyrosmia) cyanoxantha** Pérez 1879
Both sexes on the wing in the Peloponnesos from Late April into May at 1900 mtrs or higher. A similar appearance on the Aegean islands, from April into June.
Females appear during April in Jordan and Israel, May in Syria and in eastern Turkey both sexes are apparent in June.
Visits *Onobrychis viciifolia* in Turkey.
Mavromoustakis noted this species having a strong affinity with leguminosae.
The bee makes a nest on top of stones, a group of two or three cells created from a glandular adhesive secretion mixed with stone fragments and masticated petal pieces. The cells are then covered with an additional seal made of the same material.

**Osmia (Pyrosmia) cypricola** Mavromoustakis 1937
Flower visit records for *Salix*, *Carduus* and *Onobrychis viciifolia* in Turkey.
In Cyprus Mavromoustakis reported this bee nesting during April, the nests being placed in cavities formed between a rock and the underlying soil surface. In Cyprus the nesting habitat is stony hillsides with abundant stands of the host plant *Onobrychis venosa*.
Also recorded visiting *Astragalus cyprius*, *Salvia* and *Hyacinthus trifoliatius*.
Males are reported on the wing in Turkey during June. This disjunction in the flight phenology of Megachilidae between Cyprus and Turkey is apparent from accounts of a number of bee species and may be caused by the montane wider distribution and more northern latitudes of the main Continental populations. In much of this range the habitat occupied is above 1000 mtrs.

**Osmia (Osmia) cyrenaica** Peters 1978
Libya.

**Osmia (Helicosmia) damascena** Pérez 1911
Syria, Damascus.

**Osmia (Pyrosmia) derasa** Pérez 1895
Libya.
The female of this bee noted from Cyrenaica during April.

**Osmia (Hemiosmia) difficilis** Morawitz 1875
Central and eastern Turkey. Israel. Palestine. Northern Iran.
Reported visiting *Centaurea solstitialis*, *Onobrychis viciifolia* and *Medicago sativa* in Turkey.

**Osmia (Pyrosmia) dilaticornis** Morawitz 1875
Females recorded during May from Greece.

**Osmia (Helicosmia) dimidiata** Morawitz 1870
Subspecies *O. d. assomatosana* Le Goff occurs on Crete. A further subspecies, *O. d. rossica* Friese 1899 is reported from Eastern Turkey; Van.
This bee is found on the wing from March, mainly from April to June on Cyprus, visiting *Cirsium syriacum, Calendula persica, Centaurea hyalolepis, Statice sinuata, Echium sericeum, Scolymus hispanicus* and *Marrubium vulgare apolum.*

Recorded in April from Palestine and Israel.

In Turkey recorded on the wing in June and July where found in Ankara and many Provinces eastwards.

**Osmia (Helicosmia) diomedia** Warncke 1988

Turkey, Hakkari.

**Osmia (Helicosmia) dives** Mocsáry 1877


A fossorial species, on the wing March and April throughout much of this range although into May on Crete and reported females on the wing from June in Turkey, presumably at altitude. This more extensive phenology in such a bee for a widespread distribution in our region can be related to a tolerance of wide altitudinal conditions across the latitudinal gradient.

Visits noted to *Chrysanthemum coronaria* in Upper Galilee and flies up to 1600 mtrs at the Carmel Massif beyond Haifa. Flower visits on Cyprus recorded for *Cirsium syriacum, Centaurea hyalolepis, Scolymus hispanicus* and *Marrubium vulgare apolum.*

**Osmia (Pyrosmia) dlabolae** Tkalcu 1978


Females recorded on the wing from April into June. Noted visiting *Salvia fruticosa* in Israel during late April.

**Osmia (Annosmia) elaziga** Warncke 1991

Turkey, Ankara.

**Osmia (Erythrosmia) erythrogastra** Ferton 1905

Continental Greece; Sterea Hellas and Thessaly. Cyprus. Turkey.

Males appear on the wing from mid March.

**Osmia (Helicosmia) fasciata** Latreille 1811

Syria. Israel; Sinai. Jordan.

Males on the wing during June in Turkey.

**Osmia (Pyrosmia) ferruginea** Latreille 1811


First males appear in February but mainly flies in March to May on Cyprus, visiting *Onobrychis venosa, Vicia, Medicago marina, Hymenocarpus* and *Teucrium polium micropodioides.* Found nesting in the empty snail shells of *Helicella protea larnacensis, Helix cincta chassyana* and *Eobania vermiculata.*

This bee is out by February in Palestine.

**Osmia (Pyrosmia) forticornis** Van der Zanden 1989


On the wing in Turkey from April to June.
**Osmia (Helicosmia) frieseana** Ducke 1899
Turkey. Libya.
This species is reported from one site in Turkey.

**Osmia (Annosmia) fulica** Warncke 1991
Turkey.

**Osmia (Pyrosmia) gallarum** Spinola 1808
Continental Greece. Cyprus. Turkey.
Recorded at *Salix* in early May in Turkey.
In Greece recorded from montane habitat above 1800 mtrs during May to July.

**Osmia (Pyrosmia) gemmea** Pérez 1895
On the wing in March.
Active on the wing during March to mid April. This bee has been recorded nesting in the empty shell of the snail *Trochoidea cretica syrtica* in Cyrenaica.

**Osmia (Annosmia) gentilis** Warncke 1991
Turkey, Konya.

**Osmia (Tergosmia) glareola** Warncke 1988
Eastern Turkey; Van.

**Osmia (Neosmia) gracilicornis** Pérez 1895
Palestine. Israel.
On the wing in March.

**Osmia (Helicosmia) gutturalis** Warncke 1988
Eastern Turkey; Hakkari. Israel. Palestine. Iran.

**Osmia (Pyrosmia) hebraea** Benoist 1934

**Osmia (Helicosmia) heliaca** Warncke 1988
Turkey, Hakkari.

**Osmia (Pyrosmia) hellados** Van der Zanden 1984
Appears during March in southern parts of the range such as Israel and the Peloponnesos and active into June.

**Osmia (Pyrosmia) hermona** Warncke 1992
Turkey; Hakkari. Syria; Homs. Israel. Palestine.

**Osmia (Annosmia) hierichonica** Mavromoustakis 1949
Israel.
Osmia (Hemiosmia) iberica Van der Zanden 1987
Continental Greece.

Osmia (Annosmia) idaensis Warncke 1991
Greece on Crete. Turkey.

Osmia (Helicosmia) indigotea Morawitz 1875
Iraq.

Osmia (Helicosmia) latreillei Spinola 1806
The nominate subspecies in Continental Greece and Rhodes. The species is present on Lesbos and may there belong to the subspecies given below.

Mavromoustakis recorded this bee on the wing from February to May on Cyprus, visiting Malva, Chrysanthemum segetum, Achillea, Anthemis and Calendula persica. Males are abroad from late February in Jordan and the female flight season in Libya and the Mediterranean extends from March into May.

Osmia (Helicosmia) lazulina Benoist 1928
Palestine. Israel. Libya.
Mavromoustakis recorded this bee on the wing in May.

Osmia (Helicosmia) leaiana (Kirby 1802)
Continental Greece. Turkey; Erzurum, Tunceli, Kars.
In Turkey on the wing from early August to the second half of September, visiting Cirsium, Onopordum, Eryngium and Salvia.

Osmia (Annosmia) leiocephala Mavromoustakis 1954
Israel.

**Osmia (Allosmia) lhotelleriei** Pérez 1887

**Osmia (Helicosmia) livida** Tkalcu 1978
Widespread Turkey.
Reported on the wing from early June to mid July. Flower records are for *Onobrychis viciifolia* and *Centaurea solstitialis*.

**Osmia (Pyrosmia) lobata** Friese 1899
Palestine. Israel.
females recorded active during May.

**Osmia longiceps** Morawitz 1876
Continental Greece, Thrace.

**Osmia (Orientosmia) maxillaris** Morawitz 1875
Subspecies *O. m. scheherazade* Peters 1978 on Turkey,
In Iran the subspecies *O. m. dinazade* Peters occurs.
Both sexes recorded at *Medicago sativa* in Turkey and males active in June.

**Osmia (Helicosmia) mediana** Engel 2006
Iran.
Found at 1200 mtrs in the Alborz Mountains.

**Osmia (Helicosmia) melanogaster** Spinola 1808
Subspecies *O. m. subaenea* Pérez occurs Egypt. Libya.
Subspecies *O. m. carniolica* Morawitz 1872 recorded from Cyprus and Northern and Eastern Turkey; Zonguldak, Beysehir, Icel.
Flower visits to *Cirsium arvense* and *Centaurea glastifolia* recorded from Turkey where a summer bee active in June and July. In Jordan recorded visiting Almond and Cherry orchards.

**Osmia (Allosmia) melanura** Morawitz 1872
Continental Greece; Thrace. Turkey; Antalya.

**Osmia (Helicosmia) milenae** Tkalcu 1992
Turkey; Mus.

**Osmia (Helicosmia) mirhiji** Mavromoustakis 1957

**Osmia (Pyrosmia) moreensis** Van der Zanden 1984
Males first appear during February in Israel but in general both sexes are active during April and May in much of this range.
Osmia (Osmia) mustelina Gerstäcker 1869
Subspecies O. m. griseohirta in Turkey (Icel, Kars, Gumushane, Mut) and Iran.
Reported visiting Anchusa sp. in June when females are on the wing to 2300 mtrs.
Males noted during late March from Israel, Mount Meron.

Osmia (Osmia) mutensis Peters 1978
Eastern Turkey; Icel.

Osmia (Annosmia) mutica Warncke 1991
Turkey.

Osmia (Pyrosmia) nana Morawitz 1874
Mostly recorded during April and May. On the wing in May on Cyprus, visiting Compositae.

Osmia (Pyrosmia) nicosiana Mavromoustakis 1939
Cyprus.
On the wing from February to May on Cyprus, recorded visiting Onobrychis venosa, Hymenocarpus circinnatus and other flowers in the Leguminosae.
A snail shell nesting bee using the empty shells of Eobania vermiculata, Helicella protea mavromoustakisi and Helicella cyparissias.

Osmia (Pyrosmia) nigricollis Warncke 1992
Turkey, Hakkari.

Osmia (Osmia) nigrohirta Friese 1899
Continental Greece. Widespread Turkey. Lebanon. Iran.
On the wing in early July at least.
Recorded at Centaurea spp. in Turkey.

Osmia (Helicosmia) niveata (Fabricius 1804)
Recorded on the wing during April and May on Cyprus.
Reported July and August from Turkey.

Osmia (Helicosmia) niveocincta Pérez 1879
Continental Greece.

Osmia (Helicosmia) notata (Fabricius 1804)
Israel. Palestine. Egypt. Libya.

Osmia (Allosmia) nuda Friese 1899
Turkey; Bursa.
Osmia (Helicosmia) ocularis Warncke 1988
Turkey, Hakkari.

Osmia (Helicosmia) onocrotala Warncke 1988
Turkey; Hatay, Kars, Hakkari.

Osmia (Tergosmia) ononidis Ferton 1897
Turkey, Ankara, Konya, Erzurum. Egypt.

Osmia (Pyrosmia) oramara Warncke 1992
Turkey; Hakkari. Iran; Fars.

Osmia (Helicosmia) palmyrae Van der Zanden 1998
Syria; Palmyra
Recorded at 400 mtrs during April.

Osmia (Annosmia) parana Warncke 1991
Israel.

Osmia (Melanosmia) parietina Curtis 1828
Continental Greece. Turkey; Erzurum.

Osmia (Helicosmia) pennata Warncke 1988
Turkey, Icel, Hakkari.

Osmia (Helicosmia) peregrina Warncke 1988
Turkey, Urfa.

Osmia (Pyrosmia) polkruga Warncke 1992
Jordan.

Osmia (Tergosmia) pratincola Warncke 1988
Turkey; Agri, Ankara, Sivas, Elazig.

Osmia (Pyrosmia) punica Pérez 1895
Egypt. Libya.

Osmia (Pyrosmia) ramona Warncke 1992
Israel. Palestine.

Osmia (Tergosmia) rhodoensis (Van der Zanden 1983)
Found to 1600 mtrs in Greece and Turkey from April into August.
Warncke describes subspecies O. r. ferina from Continental Greece, Delphi. The subspecies O. r. arquata Warncke is widespread Turkey as well as the nominate subspecies.
Present in Jordan.

Osmia (Osmia) rufa (Linnaeus 1758)
Continental Greece. Cyprus.

**O. rufa cornigera** (Rossi 1790) is reported from Turkey; Bursa, Erzurum, Adana, Antalya. Mavromoustakikis recorded this bee during March to June on Cyprus, found up to 2,500 ft, visiting *Viccia, Fabia, Prunus domestica, Prunus dulcis, Pyrus communis, Sinapis alba, Calendula persica, Quercus infectoria, Hyacinthus trifoliatus, Anagyris foetida* and *Asphodelus* in various habitats, including montane open hillsides. A member of the Almond and Cherry pollinator community in Jordan.

**Osmia (Allosmia) rufohirta** Latrielle 1811

**Osmia (Allosmia) rufotibialis** Friese 1920
Israel. Palestine. Jordan. On the wing during March and April, noted visiting *Centaurea* and *Lepidium*.

**Osmia (Helicosmia) saxatilis** Warncke 1988
Central and Eastern Turkey.

**Osmia (Pyrosmia) saxicola** Ducke 1899

**Osmia (Annosmia) segura** Warncke 1991
Israel.

**Osmia (Helicosmia) sieversi** Morawitz 1886
Turkey. Syria. Iran. Females recorded from Syria during May and Turkey in early July.

**Osmia (Helicosmia) signata** Erichson 1835

**Osmia (Helicosmia) sogdiana** Morawitz 1875

**Osmia (Annosmia) sordida** Benoist 1929
Israel.

**Osmia (Helicosmia) subaenea** Pérez 1895
Egypt. Turkey.

**Osmia (Helicosmia) subcornuta** Morawitz 1875

**Osmia (Pyrosmia) submicans** Morawitz 1870
Mostly on the wing in the Greek Aegean islands during April and May.
Mavromoustakis noted this bee on the wing primarily during April and May on Cyprus, recorded at *Vicia cracca elegans*, *Hymenocarpus* and *Lithospermum hispidulum*. However, Van der Zanden (1991) recorded males appearing there in late February. On the wing in April in Palestine and generally this subspecies has a very scattered temporal distribution, recorded from late January into June.

**Osmia (Allosmia) sybarita** Smith 1853
Subspecies **O. s. fossoria** Pérez in Egypt.
On the wing during February to April on Cyprus, visiting *Hymenocarpus, Vicia* and other flowers in the Leguminosae.
Females on the wing during June in Turkey.
The Chrysid wasp **Chrysis dichroa** Dahlbohm is recorded as a parasite of this bee.

**Osmia (Pyrosmia) tawildara** Warncke 1992
Turkey; Hakkari.

**Osmia (Tergosmia) tergestensis** Ducke 1897
Continental Greece.
Subspecies **O. t. ononidis** Ferton in Turkey. Egypt. A further subspecies **O.t. remota** Tkalcu 1979 is recorded for Turkey; Erzurum.
Flower visits recorded for *Onobrychis viciifolia, Centaurea solstitialis* and *Astragalus*.

**Osmia (Pyrosmia) teunisseni** Van der Zanden 1981
The male active during late April on Samos, when discovered there by Teunissen. From March in Israel and generally active during April widely in the range, into May in Turkey. Noted at 1200 mtrs in Syria.

**Osmia (Melanosmia) thoracica** Radoszkowski 1874
Turkey; Erzurum.
Both sexes on the wing at from 1700 to 2400 mtrs during June.

**Osmia (Pyrosmia) tichodroma** Tkalcu & 1992
Continental Greece.

**Osmia (Neosmia) tingitana** Benoist 1969
Egypt and Libya. The subspecies **O. t. secunda** Peters also occurs in Libya.

**Osmia (Helicosmia) torquata** Warncke 1988
Turkey; Hakkari.

**Osmia (Osmia) tricornis** Latreille 1811
Libya.

**Osmia (Helicosmia) tunensis** (Fabricius 1787)
Egypt. Libya.

**Osmia (Annosmia) uncaticornis** Stanek 1969
Turkey; Icel, Nevsehir, Konya, Sivas.

**Osmia (Helicosmia) ventralis** (Panzer 1798)
Turkey, Rize, Erzincan, Kars, Erzurum.

**Osmia (Annosmia) verhoeffi** Mavromoustakis 1954
Israel.

**Osmia (Pyrosmia) versicolor** Latreille 1811
Subspecies **O. v. viricephalica** Warncke from Turkey eastwards to Syria. Lebanon. Palestine. Israel.
In Libya the subspecies **O. v. corrusca** occurs.
Emergence begins in February and into April in the Middle East. On the wing by March in Israel whereas mainly during May and June in Greece and Turkey.
In Greece recorded at up to 2000 mtrs from Chelmos during June.

**Osmia (Pyrosmia) viridana** Morawitz 1874
A subspecies, **O. v. mulleolus** Van der Zanden 1984 is reported from eastern Turkey; Nevsehir, Erzurum. This subspecies is also in Central Continental Greece, females in the Pindos Range at 1850 mtrs during August.
On Cyprus the endemic subspecies **O. v. nicosiana** Mavromoustakis 1939 occurs, adults out during March to May. Mavromoustakis recorded this bee as a snail shell nester, inhabiting the empty shells of *Helicella cretica sitiensis* Maltzan. The chrysid wasp *Chrysis dichroa* is a parasite of this bee.
Flight times are from March and early April in Israel and Jordan and tending to be active into June in Greece where probably the emergence times are later.

**Osmia (Melanosmia) xanthomelana** (Kirby 1802)
Continental Greece; Mount Olympos and montane northern Peloponnesos.

**Protosmia (Protosmia) exenterata** (Pérez 1895)
Ozbek
Protosmia (Protosmia) glutinosa (Giraud 1871)  
Mavromoustakis noted this as a summer bee of the open montane phrygana on Cyprus, visiting *Nepeta troodi* and *Salvia grandiflora willeana*.

Protosmia (Protosmia) humeralis (Pérez 1895)  

Protosmia judaica (Mavromoustakis 1948)  
Palestine. Israel.  
Recorded on the wing in late April.

Protosmia (Nanosmia) limbata (Benoist 1935)  
Turkey; Hakkari. Syria. Lebanon.  
An eastern Mediterranean bee on the wing from May to July at elevations up to 2300 mtrs.

Protosmia (Chelostomopsis) longiceps (Friese 1899)  
Mavromoustakis (1955) described and figured the male from Lebanon where it was recorded visiting *Carduus* in May.  
In Turkey females recorded on the wing from late May to early July.

Protosmia (Protosmia) magnicapitis (Stanek 1969)  
Turkey; Birecik, Urfa.

Protosmia (Protosmia) mirabilis (Friese 1899)  
Ozbek  
Turkey; Isparta, Aydin.

Protosmia (Protosmia) monstrosa (Pérez 1895)  
On Cyprus both sexes active during March and April. Flowers visited are in the Family Leguminosae and nests are constructed in small fissures in large stones.

Protosmia (Protosmia) paradoxa (Friese 1899)  
On the wing during March to May in Cyprus, visiting *Sideritis curvidens*, *Hymenocarpus*, and *Echium sericeum*. Nests are constructed in the empty snail shells of *Helicella protea mavromoustakisi* Haas and *Eobania vermiculata* Müller.. Van der Zanden reported the female of this species on the wing during June and July in Turkey; Konya.

Protosmia (Nanosmia) pulex (Benoist 1935)  
Palestine. Israel.

Protosmia (Protosmia) sideritis Tkalcu 1978  
Continental Greece. Turkey; Sivas.
The male noted on the wing in Greece during late April. The female noted in Turkey during July when recorded at 1650 mtrs.

**Protosmia (Protosmia) stigmatica** (Pérez 1895)
Continental Greece. Corfu. Turkey.
The female noted during May in Corfu.

**Protosmia (Protosmia) tauricola** Popov 1961
Turkey; Hakkari.

**Protosmia (Protosmia) tiflensis** (Morawitz 1876)
Mavromoustakis reported this bee on the wing in Greece during June and considered it to be a rather rare species.

**Pseudoheriades grandiceps** Peters 1988
Iran.

**Pseudoheriades moricei** (Friese 1897)

**Stenoheriades asiaticus** (Friese 1921)
On the wing April to early June in Turkey and Greece.

**Stenoheriades eingeddicus** Griswold 1994
Israel. Jordan.

**Stenoheriades hofferi** (Tkalcu 1983)
Turkey; Icel.
Both sexes on the wing in mid May. Present in the Taurus Range.

**Stenomia aravensis** Van der Zanden 1992
Syria. Israel. Palestine.
On the wing in the Levant from mid February to mid April when both sexes have been noted flying to *Tamarix*.

**Stenomia denticulata** Van der Zanden 1992
Palestine. Israel.
Apparent during April and May.

**Stenomia flavicornis** (Morawitz 1877)
Jordan; Fidan. A Caucasian bee.

**Stenomia hartliebi** (Friese 1899)
Palestine. Israel. Egypt; Fayum, Helouan. Libya; Benghazi.
**Stenosmia jordanica** (Warncke 1991)
Jordan. Egypt.

**Stenosmia kotschisa** (Warncke 1991)
Turkey; Ankara.

**Wainia (Caposmia) eremopiana** (Mavromoustakis 1949)
Recorded active during March and April.

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Tribe Anthidiini

Nests are placed in the ground or in natural cavities such as hollow plant stems, fissures in rocks and sometimes nests are attached freely to the surfaces of plants or rocks. Snail-shell nesting is recorded for some species. Nest structures are comprised of plant resins, leaf fragments and fibres, plant hairs from stems and leaves and sometimes soil particles. Species can be either oligolectic to family or genus level or polylectic. The pattern of pollen and host plant preference and its relationship with the evolution of the Anthidini is given in Müller, A. (1996).

**Trachusa (Archianthidium) butea** (Warncke 1980)
Turkey; Siirt.

**Trachusa (Trachusa) byssina** (Panzer 1798)
Central and northern Continental Greece. Turkey. From Istanbul and Ankara to northeastern Provinces. A montane species of high summer, on the wing up to 2000 mtrs during July at Mount Olympos.
An oligolege of Legumes; Papilionoideae.

**Trachusa (Paraanthidium) dumerlei** (Warncke 1980)
Northern Continental Greece. Aegean on Lesbos. Turkey.
Recorded visiting *Onopordum, Centaurea* and *Cephalaria*.

**Trachusa (Archianthidium) forcipata** (Morawitz 1875)
Turkey; Hatay, Erzurum.

**Trachusa (Paraanthidium) interrupta** (Fabricius 1781)
Central Continental Greece. Turkey. Syria.
In Attica, Greece, recorded on the wing in July, both sexes in numbers visiting *Scabiosa maritima*.
This bee is an oligolege of Dipsacaceae.
Recorded from many Turkish Provinces and flower records given for *Vitex, Cirsium, Onopordum, Centaurea solstitialis, Melilotus officinalis* and *Cephalaria alpina*. Many flower visiting records will refer to nectar feeding.

**Trachusa (Archianthidium) laticeps** (Morawitz 1873)
Continental Greece; Epirus, Attica. North Aegean Greece on Lesbos, some smaller Greek islands including Andros and Methoni. Widespread Turkey.

Mavromoustakis recorded the subspecies *T. l. anatolicum* from Syria.

A summer bee especially attracted to Legumes but also recorded visiting *Vitex, Centaurea solstitialis* and *Cephalaria alpina*.

In Greece Mavromoustakis reports this bee on the wing in June and July with all flower records there for *Acanthus spinosus*.

This bee is the host of the large Stelidine cleptoparasite *Stelis gigantea*.

**Trachusa (Archianthidium) maxima** (Friese 1931)

Turkey; Taurus Mountains.

**Trachusa (Archianthidium) pubescens** Morawitz 1872

Northern and Central Continental Greece. Widespread Turkey, Jordan, Iran.

Subspecies *T. p. verhoeffi* Mavromoustakis occurs in Syria and Lebanon.

On the wing during July in Turkey and in Iran where active up to 2800 mtrs in the Elburz Range.

This bee is an oligolege of Labiatae and therefore flower visit records to the Asteraceae, including *Carduus* and *Centaurea* will refer to nectar gathering by either sex.

**Trachusa (Archianthidium) superbum** (Radoszkowski 1876)

Turkey. Recorded from Ankara eastwards.

It can be discovered on the wing from early May into July. An oligolege of Legumes in the Papilionoideae.

**Anthidiellum crenulatum** (Warncke 1981)

Iran.

The female noted on the wing during March.

**Anthidiellum judaeense** (Mavromoustakis 1945)

The nominate subspecies in Lebanon and Israel.

The subspecies *A. j. anale* Pasteels 1969 occurs on Lesbos. Widespread Turkey.

Females recorded from eastern Turkey in Mut, Pannukale and Kusadası during the first half of June where discovered by Professor Josef Gusenleitner.

**Anthidiellum strigatum** (Panzer 1805)


In Libya a further form, *A. s. rubellum* (Friese 1917) occurs.

Generally a species of high summer into September. Flower association records gleaned from the entire range are *Hypericum prolificum*, *Onobrychis*, *Lotus corniculatus*, *Centaurea solstitialis* and *Melilotus officinalis*.

The range of flowers visited is much greater than for the other members of Anthidiellum in our region although the Legume family is preferred.

This bee is a host of the cleptoparasitic bee *Stelis signata*.

**Anthidiellum troodicum** Mavromoustakis 1949
A summer bee recorded in June to August.
On the wing in June in Attica, visiting *Satureia thymbra*.
On Cyprus up to 5,000 ft in the Troodos Mountains. Recorded visiting *Calycotome villosa, Salvia, Nepeta troodi* and *Teucrium cyprium* amid open phryganic montane slopes between stands of *Pinus nigra* forest.
Found during May in Lebanon with flower visits recorded to *Lavandula stoechas*.
This bee is oligolectic on Labiatae.

**Eoanthidium (Eoanthidium) clypeare** (Morawitz 1874)
Subspecies **E. c. hoplostomum** Mavromoustakis 1945 occurs Syria, Palestine and Israel.
On the wing from May in Syria, Palestine and Israel.
Mavromoustakis reported this bee common locally in Attica during June, strongly associated with *Allium hymettium*. Elsewhere in Mediterranean Europe Müller recorded this bee flying about hot xeric slopes amongst stands of *Allium sphaerocephalon*.

**Eoanthidium (Eoanthidium) insulare** (Morawitz 1873)
Southern and Central Continental Greece. Syra, Aegean islands of Lesbos and Rhodes. Turkey.
Subspecies **E. i. persicolum** Mavromoustakis (1937) is found on Cyprus, south – western Iran, Palestine and Israel.
A summer bee abroad mainly during June to August. On the Magnesia Peninsula of Continental Greece this species is active from May to October when the last females of the season may be recorded. There is a bivoltine phenology.
In Palestine recorded visiting *Ballota undulata, Lavandula, Carthamus, Centaurea, Cephalaria* and *Carlina involucrata*.
On the wing during June in Attica, Greece, where associated with *Satureia thymbra*.

**Eoanthidium (Clisanthidium) nasicum** (Friese 1917)
Subspecies **E. n. nasiculum** Pasteels 1969 widespread Turkey. Collected from Mut during June by Doctor Maximilian Schwarz.
Noted in Iran from mid May to late July quite widely.
Mavromoustakis discovered the male of this species in Palestine. On the wing there in June and July and recorded visiting *Ballota undulata*.

**Afranthidium (Mesanthidium) alaemon** (Warncke 1981)
Iran.

**Afranthidium (Mesanthidium) alternans** Klug 1832
Israel at En Gedi and one or two other sites. Egypt.
Oligolectic on the *Asteroideae* within the Composites.

**Afranthidium (Mesanthidium) carduele** Morawitz 1876
**Afranthidium (Mesanthidium) lebanense** Mavromoustakis 1955
Cyprus. Recorded Israel by Pasteels. Turkey; reported from Tokat by Warncke. Lebanon.
Mavromoustakis (1955) figures the male of this species which is abroad in May.

**Afranthidium (Mesanthidium) malacopygum** (Gribodo 1894)
Greece on the north Aegean at Lesbos. Turkey; Bursa, Erzurum.

**Afranthidium (Mesanthidium) pusillum** (Morawitz 1895)
Recorded on the wing Egypt late June. early to mid July in Iran.
Mavromoustakis recorded this bee on the wing in Cyprus from late April through May.
Oligolectic on the Asteroideae within the Composites.

**Rhodanthidium (Asianthidium) aculeatum** (Klug 1832)
Eastern Turkey; Erzurum, Artvin, also recorded from Western Turkey in Bursa. Syria. Lebanon. Iran.
On the wing June to August.
This bee was originaly described from Syria. Mavromoustakis reported many of both sexes flying about *Salvia microstegia*. As with some other Anthidiines this may involve resource defence polygyny and with mating at the floral territories. The bee is classified as an oligolectic of Labiatae. *Nepeta* is another one of the flower genera visited.
Plant resin is used for nest construction, Resin from *Cedrus libanoticus* has ben recorded.
Found during the summer at 2000 mtrs in the Elburz Mountains, Iran.

**Rhodanthidium (Rhodanthidium) acuminatum** (Mocsáry 1884)
Central Continental Greece. Western Turkey; Bursa, Konya. Recorded from Greece by Friese, but generally a scarcely recorded bee.

**Rhodanthidium (Asianthidium) caturigense** (Giraud 1863)
Subspecies *R. c. ducale* (Morawitz 1876) in south Continental Greece. Turkey.
In the Peloponnesos of Greece females are on the wing during May.
Subspecies *R. c. jerusalemicum* Mavromoustakis is present in Lebanon, Palestine and Israel.
On the wing from May to July, thought to be strongly oligolectic on Leguminosae. Males recorded at *Ononis natrix*.

**Rhodanthidium (Rhodanthidium) exsectum** (Pasteels 1969)
Eastern Turkey; Erzincam. Lebanon. Iran.
On the wing in montane habitat during high summer in eastern Turkey and the Elburz of Iran.
Considered to be oligolectic on the Leguminosae.

**Rhodanthidium (Rhodanthidium) septendentatum** (Latreille 1809)
The endemic subspecies *R. s. rufocinctum* Alfken is on Crete.
In Eastern Turkey, the Greek island of Rhodes. Cyprus, Lebanon and Israel a subspecies or perhaps a form *R. s. faciale* (Friese 1917) occurs.
In Attica appears from May, flying to *Marrubium* and *Stachys italicca*.
On Cyprus noted flying to *Vitex, Calycotome villosa, Teucrium divaricatum, Ballota integrifolia, Echium sericeum, Onosma fruticosum* and *Centaurea solstitialis*.
Mavromoustakis records this bee on the wing in Palestine from late March, primarily in May to July. Recorded flying to *Ballota undulata*.

Recorded during June and July from Central Anatolia and flower records for Turkey are *Centaurea solstitialis* and *Vitex*.

Recorded on the wing May and early June in Lebanon where recorded at *Cirsium syriacum*, *Calycotome* and *Lavandula stoechas*.

Mavromoustakis noted that females collect resin from the trunks of the evergreen forest tree *Pinus halepensis*. They nest close to these stands of the forest, making their brood cells in empty shells of the land snails *Eobania vermiculata*, *Levantina bellardi* and *Levantina cypria*, often at montane habitats such as found on Mount Pentadactylos.

**Anthidium (Proanthidium) amabile** Alfken 1932
Turkey. Iran. Egypt.
A little recorded spring bee.

**Anthidium (Proanthidium) anguliventre** Morawitz 1888
On the wing from June to August in Syria, Lebanon, Palestine and Israel. A Turkestanic species. Oligolectic on thistles within the *Cardueae*.

Flower visit records in the levant for *Ballota undulata*, *Chamaepeuce diacantha* and *Teucrium divaricatum*. Noted at *Centaurea* in Iran.

**Anthidium (Anthidium) auritum** Klug 1832
Israel. Egypt.
A polylectic bee.

**Anthidium (Turkanthidium) brevithorace** (Warncke 1981)
Iran; Khuzestan.
On the wing in late June and early July.

**Anthidium (Anthidium) caspicum** Morawitz 1880
Turkey at Ankara and Hakkari. Iran; Elburz.
On the wing during summer when it is considered to collect pollen from species in the *Campanulaceae*.

**Anthidium (Anthidium) christianseni** Mavromoustakis 1956
North and Central Lebanon. Iran.
The male figured by Mavromoustakis (1962) who recorded this species on the wing in June and July in Lebanon visiting *Teucrium divaricatum graecum*.

**Anthidium (Anthidium) cingulatum** Latreille 1809
On the wing during May and June in Attica, flying to *Stachys italica* and *Satureia thybbra*. During a long-term study in the Magnesia Peninsula males were noted during June and in September with females recorded in October and it has been suggested that this species is bivoltine.

Common in Turkey from late May to the middle of October and visiting *Onobrychis vicifolia*, *O. cornuta*, *Medicago sativa*, *Trifolium pratense*, *Melilotus alba*, *M. officinalis*, *Lotus corniculatus*, *Convolvulus arvensis* and plants in the genera *Salvia*, *Carduus*, *Onopordon*, *Cirsium*, *Centaurea,*
Stachys and Linaria. This bee is an important pollinator of O. viciifolia in eastern Anatolia. The species is found from sea level to an altitude of 2500 mtrs.
Recorded on the wing in Cyprus from April, but primarily from late May onwards and visiting Teucrium divaricatum, Teucrium polium micropodioides, Statice sinuata, Carlina lanata, Calycotome villosa, Ballota integrifolia, Salvia, Marrubium vulgare apolum, Vicia cracca elegans and cultivated Sesamum.

**Anthidium (Anthidium) dalmaticum** Mocsáry 1884
Subspecies **A. d. syriacum** Dusmet 1915 is found in Southeastern Turkey through Lebanon to Palestine and Israel.
On the wing in June in Attica, flying to *Satureia thymbra*.
Both sexes recorded at *Salvia* in mid August.
Mavromoustakis noted this bee on the wing in May in Lebanon where there was a strong preference for *Ballota*. Both sexes on the wing by June in Palestine.
Generally this bee is a polylege on Legumes, Labiataes and some plants within the Scrophulariaceae.

**Anthidium (Anthidium) diadema** Latreille 1809
Males on the wing throughout July and August in Turkey.
Oligolectic on thistles within the *Cardueae*.
Recorded at *Carduus*, *Onopordum*, *Medicago* and other flower genera presumably for nectar.

**Anthidium (Proanthidium) echinatum** Klug 1832
Israel, Egypt and Libya. A desertic bee with a preference for the pollen of *Zygophyllum* and flowers of the Cruciferae in desert habitats where floral choices are sometimes restricted.

**Anthidium (Proanthidium) eremicum** Alfken 1938
Syria and Israel.

**Anthidium (Anthidium) florentinum** (Fabricius 1775)
Subspecies **A. f. subspinosum** Klug on Cyprus and in Syria and Lebanon.
Mavromoustakis reported this bee very common at flowering shrubs in Athens as well as visiting *Rubus* and *Satureia thymbra*. Presumably this species will have suffered from the extensive urban expansion there since the 1950s. The bee is active throughout June to August in Central Greece with females on the wing into October.
Active from June on Cyprus, attracted to the flowers of *Rubus ulmifolius anatolicus* and *Vitex* in summer.
In Central Anatolia found from mid June to August. A polylectic bee recorded there visiting the flowers of *Lotus corniculatus*, *Melissa officinalis*, *Salvia*, *Stachys*, *Centaurea solstitialis*, *Onopordum*, *Cirsium*, *Linaria* and *Vitex*.
Recorded at 1200 mtrs from Antilebanon, Syria. Widely recorded in Iran where noted at *Medicago sativa*.

**Anthidium (Anthidium) gussakovskiji** Mavromoustakis 1939
Eastern Turkey and Iran.
An early spring bee in Iran. Late March to mid April. An oligolege of thistles within the Cardueae.

**Anthidium (Anthidium) loti** Perris 1852
On the wing during late June to August, with flower visiting reported for *Onopordum*, *Vitex*, *Onobrychis*, *Medicago sativa*, *Lotus corniculatus*, *Anchusa officinalis*, and *Echinospermum deflexum*.

**Anthidium (Anthidium) manicatum** Linnaeus 1758
Subspecies **A. m. cyrenaica** is reported from Libya (in Zanden 1992).
On the wing June to late September. Flower visits recorded for the genera *Stachys*, *Ballota*, *Salvia*, *Onopordum*, *Caronilla* and *Linaria*. This bee is polylectic on pollen resources from flowers in the *Fabaceae*, *Lamiaceae* and *Scrophulariaceae*.
Mavromoustakis reports this bee absent from Cyprus and it is very scarce on Lesbos. This pattern of scarcity is commented upon for the bee population of the *Oleo-Ceratonion* phytosociological community studied in Thessaly (Standfuss, Standfuss and Schwarz 2003). The species may be better adapted to the more northern parts of its’ range within Europe or perhaps be in a transitional phase of being out-competed by more adapted congeners in the mediterranean ecosystems.
Recorded widely in Turkey including Central Anatolia, where active in June and July.

**Anthidium (Anthidium) melanopygum** Friese 1917
North Aegean Greece at Lesbos. Widespread on Crete. Turkey. Iran.
On the wing from mid May to mid July in Iran.

**Anthidium nanum** Mocsáry (lituratum Panzer nec Gmelin)
Lesbos.

**Anthidium (Anthidium) neosyriacum** Mavromoustakis 1956
Eastern Turkey; Urfa. Syria. Israeli. Iran.
Described from the Antilebanon, Syria, at 1200 mtrs during June by Mavromoustakis. Pasteels recorded this species from En Gedi, Israel.

**Anthidium (Proanthidium) oblongatum** (Illiger 1806)
Turkey. Iran.
Warncke noted a lack of records from Greece for this Continental species.
The species is widespread and sometimes common on the wing in eastern Turkey from early June to Late September, where flowers visited include *Onobrychis vicifolia*, *Medicago sativa*, *Astragalus christianus*, *Trifolium pratense*, *Melilotus officinalis*, M. *alba*, *Lotus corniculatus* and flowers in the genera *Centaurea*, (including *C. carduiformis*, *C. iberica*, *C. solstitialis* and *C. glastifolia*). *Salvia*, *Carduus*, *Cirsium*, *Cichorium*, *Coronilla* and *Lythrum*.
The flight season is closely similar in Iran where flower visits are also reported for *Onobrychis*. This bee is generally classified as a polylectic species.
Often a montane species, this bee is a host of the cleptoparasite *Stelis punctulatissima*.

**Anthidium (Proanthidium) pulchellum** Klug 1832
Palestine. Israel. Egypt.
This bee appears to be located on the Sinai and is on the wing in May. A polylectic bee.
**Anthidium (Anthidium) punctatum** Latreille 1809
Continental Greece. Lesbos. Turkey. Iran.
The subspecies *A. p. bequaerti* Alken 1915 found Syria and Mavromoustakis recorded the male of this form (as *A p. amanusense* Dusmet 1915) on the wing in Israel and Palestine during April.
Common in Turkey from June until the end of September. Flowers visited in our region include *Onobrychis viciifolia*, *Medicago sativa*, *Trifolium pratense*, *T. repens*, *M. officinalis*, *L. corniculatus* and plants in the genera *Caronilla*, *Stachys*, *Salvia* and *Onopordon*. This species is strongly polylectic.

**Anthidium (Proanthidium) rotundum** Warncke 1980
Often found in montane regions when active in July. Oligolectic on thistles of the *Cardueae*.

**Anthidium (Anthidium) septemspinosum** Lepeletier 1841
Eastern Turkey: Kayseri, Erzurum.
A polylectic bee.

**Anthidium (Anthidium) soikai** Mavromoustakis 1968
Iran.
On the wing from late May into July.

**Anthidium (Anthidium) spiniventre** Friese 1899
Found by Dr A. Mochi on the wing during May in Syria. On the wing during April in Palestine.
Recorded in May in Iran up to 1800 mtrs.
Oligolectic on thistles within the *Cardueae*.

**Anthidium (Anthidium) sublustre** Warncke 1981
Iran.
Active during May at up to 1800 mtrs.

**Anthidium (Anthidium) syriacum** Pérez 1911
Turkey. Palestine. Israel. Iran.
On the wing in June in Palestine, visiting *Ballota undulata*.

**Anthidium (Anthidium) taeniatum** Latrielle 1809
On the wing June, July and August. In Turkey recorded on *Carduus*.
In flight during June and July in Attica, Greece, frequently visiting *Ononis*. Flower visits in Iran include *Lotus* and *Onobrychis*.
Generally this bee is a polylectic on Legumes, Labiataes and some plants within the Scrophulariaceae.
Mavromoustakis notes that this bee, though common in the Mediterranean, is absent from Cyprus.

**Anthidium (Anthidium) taschenbergii** Morawitz 1894
Subspecies *A. t. shirazense* Mavromoustakis 1968 occurs in Iran.
Anthidium (Anthidium) tesselatum Klug 1832
Oligolectic on the Asteroideae within the Composites.

Anthidium (Anthidium) trispinosum Friese 1917
Turkey.
Thought to be an oligolege of the Papilionoideae within the legumes. (Müller 1996).

Anthidium (Proanthidium) undulatiforme Friese 1917
Mavromoustakis described the female of this species. He illustrated the male of this and closely related species (1939) p89.
Noted flying during May to Phlomis viscosa in Palestine. Generally this bee is polylectic collecting pollen from a number of flower Family hosts.

Anthidium (Proanthidium) undulatum Dours 1873
Subspecies A. u. holozonicum (Mavromoustakis 1939) widely recorded eastern Turkey and also Greek Eastern Aegean at Rhodes. Found on Cyprus. Western Syria. Lebanon. Palestine. Israel. Jordan. Iran. Females of this race are active in Dyarbakir, Turkey and also the Iranian Elburz during July.
The additional subspecies A. u. wahrmanni (Mavromoustakis 1948) is in Israel and Palestine. Iran. A summer bee found May to September but mainly during June and July.
Mavromoustakis discovered the female of this species from Attica, Greece, on the wing during June flying to Satureia thymbra. His son was able to record bees there while studying medicine in Athens and it seems that only one male and one female of this species were recorded there.
On Cyprus found visiting Calycotome villosa, Carlina lanata, Linaria elatine, Satureia incana, Teucrium polium micropodioides, Teucrium cyprium, Marrubium vulgare apolum, Heliotropium villosum and Alhagi maurorum. These flowers typically include members of the montane summer phrygianic community.
In Jordan this bee is recorded as a visitor to the Almond and Cherry orchards.
Mavromoustakis notes A. u. wahrmanni on the wing July and August with some remaining active to October. Flower visit records there for Ballota undulata, Carlina, Sideritis perfoliata, Ononis antiquorum and Ballota saxatalis.

Anthidium (Proanthidium) venustum Morawitz 1878
Egypt.

Anthidium (Anthidium) waltlii Spinosa 1838
Oligolectic on the Asteroideae within the Composites.

Anthidium (Anthidium) wüstneii Mocsáry 1887
Ionian Greece, Corfu. Eastern Aegean Greece at Rhodes. Turkey; recorded as far west as Mugla.
Lebanon. Syria. Iran.
A summer bee noted up to 2300 mtrs in the Elburz of Iran. An oligolege of Asteroideae.
**Pseudoanthidium alpinum** (Morawitz 1874)
Turkey at Nevsehir and Konya. An oligolege of the Cardueae.

**Pseudoanthidium arenosum** (Warncke 1981)
Iran.

**Pseudoanthidium bytinskii** (Mavromoustakis 1948)
Southern Israel.
On the wing in April and May.

**Pseudoanthidium cribratum** (Morawitz 1875)
Mavromoustakis (1938) described a subspecies, *P. c. palestinicum* which appears on the wing from May to July.
Females have been recorded at *Centaurea iberica* in Turkey.
Recorded flying to *Centaurea* in Palestine.

**Pseudoanthidium (Exanthidium) enslini** (Alfken 1928)
Egypt, including Luxor and Fayoum.

**Pseudoanthidium (Exanthidium) eximium** (Giraud 1863)
Turkey. Iran.
Oligolectic on the *Asteroidae* within the Composites.
Both sexes recorded from July and on the wing to mid September visiting *Onopordon* and *Lythrum*. A species of the high summer.

**Pseudoanthidium (Pseudoanthidium) lituratum** (Panzer 1801)
Continental Greece. Widespread Turkey.
A summer bee on the wing well into September, at elevations up to 2200 mtrs.
Oligolectic on Compositae with a strong preference for the *Cardueae*.
A subspecies *P. l. tropicum* (Warncke) 1981 is described from Iran.

**Pseudoanthidium (Royanthidium) melanurum** (Klug 1832)
Oligolectic on thistles within the *Cardueae*.

**Pseudoanthidium (Pseudoanthidium) ochrognathum** (Alfken 1932)
Southern Israel. Palestine. Egypt.
On the wing during August. This bee is strongly polylectic especially visiting flowers in the Cruciferae as well as Boraginaceae, Legumes and members of some other plant Families.

**Pseudoanthidium puncticolle** (Morawitz 1888)
Iran.
Both sexes of this Central asian bee recorded at Fars up to 1800 mtrs during May.

**Pseudoanthidium (Royanthidium) reticulatum** (Mocsáry 1884)
Continental Greece. Turkey. Lebanon. Iran.
Oligolectic on thistles within the *Cardueae*.

**Pseudoanthidium (Pseudoanthidium) rhombiferum** (Friese 1917)
Turkey near Urfa. Israel. Palestine.
Noted on the wing during April in Palestine. Strongly oligolectic on thistles of the Cardueae.

**Pseudoanthidium (Exanthidium) wahrmannicum** (Mavromoustakis 1933)
Southern Israel. Palestine.
Oligolectic on the *Asteroideae* within the Composites and noted on the wing in April.

**Icteranthidium abbasii** (Warncke 1981)
Iran.
On the wing in May at lower levels, the female noted flying to *Centaurea*.

**Icteranthidium aequabile** (Morawitz 1896)
Turkey at Urfa.

**Icteranthidium angulosum** (Warncke 1981)
Iran.
On the wing from the end of June to mid July.

**Icteranthidium bilobatum** Pasteels 1969
Egypt; Wadi Turrel Rachid.
The female recorded during April.

**Icteranthidium capitum** (Warncke 1981)
Iran.
Appears during May. As with a number of Iranian Anthidiines there are flower visits to *Alhagi*, a genus of spiny racemose shrubby legumes of the eastern Mediterranean eastwards.

**Icteranthidium cimbiciforme** (Smith 1854)
Greece from the Cyclades of the southern Aegean on Milos and Naxos. Widespread Turkey; Aydin, Central Anatolia and eastwards. Syria. Lebanon. Iran.
On the wing from mid June to early September.
The bee is an oligolege of the Cardueae within Compositae.
Flower visit records from Turkey for *Centaurea solstitialis* and *Vitex*.

**Icteranthidium decoloratum** Alfken 1932
Iran. Egypt.

**Icteranthidium fedtschenkoi** Morawitz 1875
Syria. Lebanon. Iran.
On the wing in June and July. This bee, a member of the Turkestanic fauna, is an oligolege of thistles in the *Cardueae*.

**Icteranthidium ferrugineum** (Fabricius 1787)
Subspecies *I. f. discoidale* (Latreille 1809) is recorded in Eastern Turkey; Icel, Kayseri. Cyprus. Iran.
Subspecies **I. f. subhyalinum** (Mavromoustakis 1947) is reported from eastern Turkey; Urfa. Palestine. Israel. Egypt. Mavromoustakis found this bee rather common in coastal sand habitat during high summer in parts of Cyprus. Flower visits recorded there for *Echium sericeum*, *Thymus capitatus* and *Statice*. Females make vertical burrows 15 cms deep in sand 10 to 15 mtrs above the tideline. Nest chambers are created among the roots of *Zygophyllum album* and *Thymus capitatus* and up to ten cells constructed from a mixture of resin and sand grains. The bee is reported to be bivoltine, presumably with overlapping generations.

**Icteranthidium grohmanni** (Spinola 1838)
Subspecies **I. g. rubiginosum** (Lepeletier 1841) is reported by Zanden on the wing in Turkey in July. Males have been noted visiting *Ononis viciifolia* in late August. However, the bee is a noted polylege and has a prediliction for *Eryngium*.

**Icteranthidium laterale** (Latreille 1809)
Turkey. Iran.
Females recorded at *Carduus* in summer. *Cirsium, Onopordum* and other related flowers are also reported, so that this bee has a broad oligolectic affinity with the *Cardueae*.

**Icteranthidium limbiferum** (Morawitz 1875)
Turkey. Iran.
In Turkey females recorded visiting *Onopordon*.
Mainly on the wing from late June to late July in Iran.

**Icteranthidium obsoletum** (Warncke 1981)
Iran.

**Icteranthidium ovasi** (Warncke 1980)
Turkey.

**Icteranthidium subangulosum** (Warncke 1981)
Iran.

**Icteranthidium urfanum** (Warncke 1980)
Turkey at Urfa. Recorded Iran at Fars by Mavromoustakis and Soika.

**Stelis aculeata** Morawitz 1880
Eastern Turkey; Ankara, Van.
Found on the wing during late June.

**Stelis aegyptiaca** (Radoszkowsky 1876)
Egypt.
This bee may be present in Libya but does not appear to have been recorded there.

**Stelis annulata** (Lepeletier 1841)
The host species is *Anthidium pubescens* (Friese 1921).

**Stelis bicornuta** Pasteels 1969  
Southern Israel.  
The male of this bee recorded during early June.

**Stelis breviuscula** (Nylander 1848)  
Continental Greece. Turkey; Erzurum, Sivas. Egypt.  
Hosts of this cleptoparasite are reported as *Heriades truncorum* and *Hoplitis adunca*.

**Stelis denticulata** Friese 1899  
Eastern Turkey. Palestine. Israel.  
On the wing in Jerusalem during May.  
In Turkey widespread in eastern provinces where on the wing from late June to early August.

**Stelis genalis** Pasteels 1969  
Lebanon.

**Stelis gigantea** Friese 1921  
Continental Greece. Turkey. Iran, Elburz Mountains  
On the wing from early and especially mid June to the first half of July. A cleptoparasite of *Anthidium pubescens*.  
Recorded at 1350 mtrs from Turkey in Malatya where the male noted visiting *Echium italicum* during mid July.

**Stelis inamoena** Popov 1932  
Turkey; Ankara, Konya. Iran.

**Stelis iugae** Noskiewicz 1962  
Western Turkey; Kirklareli.  
The flight period is from mid July to mid August.

**Stelis minuta** Lepeletier & Serville 1828  
Continental Greece; Olympos. Corfu. Widespread Turkey, Black Sea and northeastern Provinces. Lebanon; Hezine.  
Active at 1900 mtrs during late July on Mount Olympos, Greece.  
A range of hosts reported among the smaller Megachilidae including *Osmia leucomelana, Osmia gallarum, Hoplitis claviventris, Heriades truncorum, Chelostoma campanularum* and *Chelostoma florisomne*.

**Stelis nasuta** (Latreille 1809)  
On the wing June to August. Found as high as 2000 mtrs.  
The host bee is *Chalicodoma parietina*.

**Stelis odontopyla** Noskiewicz 1925  
Continental Greece; Thessaloniki. Turkey; Istanbul, Erzurum.  
A summer bee, on the wing June to August. A cleptoparasite of *Hoplosmia spinulosa*.  

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**Stelis orientalis** Warncke 1992
Ionian Greece on Corfu. Iran.
On the wing during August.

**Stelis ornatula** (Klug 1807)
Continental Greece. Central and eastern Turkey.
On the wing by late June. Local in montane areas of northern Greece.

**Stelis pentelica** Mavromoustakis 1963
Continental Greece; Attica. Turkey. Israel.

**Stelis phaeoptera** (Kirby 1802)
Crete. Turkey; Aydin, Erzurum. Israel. Egypt. Libya.
On Cyprus the subspecies **S. p. meridionalis** Popov 1932 occurs.
The populations elsewhere in our area are referred to the subspecies **S. p. murina** Pérez 1884.
On Cyprus found on the wing during May, visiting *Marrubium vulgare apulum*.
Both sexes on the wing by late July in Turkey.
Hosts are some species of those Osmiine bees in the subgenera Helicosmia and Osmia.

**Stelis punctulatissima** (Kirby 1802)
The subspecies **S. p. hellenica** Mavromoustakis 1959 is reported from Continental Greece, Crete. Lesbos. Rhodes. Turkey. Syria. This subspecies is originally described from the eastern Greek Aegean on Rhodes.
**S. punctulatissima** is a successful cleptoparasitic species with a wide spectrum of reported host species among the Megachilidae;-* Hoplitis adunca*, *Osmia aurulenta*, *O. brevicornis*, *O. fulviventris*, *O. leaiana*, *O. niveata*, *Anthidium manicatum*, *A. oblongatum*, *A. scapulare* and *Chalicodoma parietina*.

**Stelis rhodia** Mavromoustakis 1959
Greece; Aegean islands on Lesbos and Rhodes. Turkey; Mut, Içel.
Found on the wing in early to mid June.

**Stelis ruficornis** Morawitz 1872
North Aegean Greece on Lesbos. Eastern Aegean on Rhodes. Central Turkey; Amasya. Lebanon; Djezzine. The Lebanese example may be referable to a subspecies **S. r. lebanensis** Mavromoustakis 1963.
Active from the end of June to mid July.

**Stelis scutellaris** Morawitz 1894
This appears to be primarily a Central Asiatic bee but it is recorded from Turkey.

**Stelis signata** (Latreille 1809)
Continental Greece including Attica and The North; Euboeia, Lesbos, Rhodes, Samothrace. Turkey. In much of Greece and Turkey the subspecies **S. s. flavescens** Friese 1925 is reported. There is also a subspecies **S. s. cremica** Alfken 1938 in Cyprus. Israel. Lebanon. Iraq. However, **Stelis signata** is a variable bee and it is possible that these subspecies represent examples of a clinal variation within the nominate species.
It is active on the wing May to August and Mavromoustakis recorded this Stelis during the summer on Cyprus, visiting Mentha longifolia, Teucrium polium micropodioides and Marrubium vulgare apulum, all flowers which are summer nectar resources in this part of the eastern Mediterranean.

A cleptoparasite of Anthidiellum strigatum.

This species is distinctly different in the male armature from other species of Stelis.

**Stelis simillima** Morawitz 1876
Continental Greece; Peloponnesos. Turkey; Kars, Bitlis. Iran.
On the wing July to August. Recorded as a cleptoparasite of Lithurgus chrysurus and L. cornutus fuscipennis

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Tribe Dioxyini

**Aglaoapis tridentata** (Nylander 1848)
Ozbek
Cyprus. Eastern Turkey.
On the wing July and August in Turkey, recorded visiting Onopordum.
In Cyprus Mavromoustakis recorded a race, A. t. limassolica (Mavromoustakis 1948) out in May, visiting Teucrium polium micropodioides. This race was discovered to be a cleptoparasite of the mason bee Chalicodoma roeweri akrotirika.

**Allodioxys schulthessi** (Popov 1936)
Eastern Turkey; Urfa.

**Dioxys ammobius** Mavromoustakis 1954
Israel. Palestine.
On the wing in June. A cleptoparasite of Hoplitis wahrmani.

**Dioxys cincta** (Jurine 1807)
Reported on the wing in March and April on Cyprus, with a flower visiting record for Onobrychis venosa.

**Dioxys moesta** (Costa 1883)

**Dioxys montana** Heinrich 1977
Turkey; Ankara, Konya, Icel,

**Dioxys pumila** Gerstaeker 1869
On the wing April and May on Cyprus, recorded visiting Echium sericeum.
In Iran noted from May to July between 1800 and 2300 mtrs.

**Ensliniana bidentata** (Friese 1899)
Syria. Israel. Palestine.
Subspecies **E. b. anatolica** Heinrich 1977
Turkey; Konya, Erzurum, Agri.
On the wing in May.

**Metadioxys formosa** (Morawitz 1875)
Israel. Iran.

**Metadioxys graeca** Mavromoustakis 1963
Turkey; Konya.

**Paradioxys pannonica** Mocsáry 1877
Turkey; Adana, Urfa.

**Prodioxys richardi** Mavromoustakis 1954
Palestine. Israel.
On the wing in late March.

**Eudioxys quadrispinosa** (Friese 1899)
Egypt.
In flight from the second part of March and through April.
Mavromoustakis discovered the female of this species. Schmiedeknecht originally discovered the male of the species, visiting *Zygophyllum coccineum*.

**Eudioxys schwarzi** Mavromoustakis 1968
Iran; Chuzistan.
Both sexes on the wing during summer.

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Tribe Megachilini

**Creightonella (Metamegachile) albisecta** (Klug 1817)
In Eastern Turkey the subspecies **C. a. caucasica** (Lepeletier 1841) is also reported.
In Cyprus the subspecies **C. a. cyprica** is reported and this race is also reported from Eastern Turkey at Konya. Mavromoustakis reports the species on Cyprus from May to September, visiting *Scolymus hispanicus, Carlina lanata, Onopordum insigne, Centaurea cilicica, Centaurea hyalolepis, Echinops spinosus, Broteroa corymbosa, Marrubium vulgare apolum, Heliotropium europium, and Statice virgata*.
Mavromoustakis (1958) reported that **caucasica** was the race present on Corfu. This bee is also reported from many of the Central Anatolian Provinces of Turkey.
A high summer bee on the wing from July and August in Greece and Turkey and active well into September. Flower visit records in Turkey include *Centaurea solstitialis*, *C. iberica*, *Eryngium billardieri* and *Salvia* spp.
This bee is known from North Africa and so although no records published for Egypt or Libya it could be present.
Mavromoustakis also recorded this species from Palestine and Israel where on the wing in June and July.

**Creightonella (Metamegachile) arabica** (Friese 1901)
Egypt.
This bee may also be present in Libya.

**Creightonella aurantiaca** Rebmann 1972
Iran.

**Creightonella (Metamegachile) doriae** (Magretti 1890)
Turkey, Ankara, Syria, Lebanon.

**Creightonella ghigii** (Gribodo 1924)
Libya, Cyrenaica.

**Creightonella (Metamegachile) heinrichi** Tkalcu 1979
Southeastern Turkey.

**Creightonella (Metamegachile) rhodosiaca** (Rebmann 1972)
Greece; Rhodes. Turkey; Antalya, Icel, Erzincan.
On the wing from mid June to mid August.

**Creightonella (Metamegachile) sudanica** (Magretti 1899)
Jordan.
The female of this bee reported active during June.
This species is a member of the Sudanic or Ethiopian fauna.

**Chalicodoma (Pseudomegachile) albocincta** (Radoszkowski 1874)
Southern Egypt.

**Chalicodoma (Allochalicodoma) albocristata** (Smith 1853)
Continental Greece; Thrace.
On the wing in August.

**Chalicodoma (Chalicodoma) albonotata** (Radoszkowski 1886)

**Chalicodoma (Chalicodoma) alborufa** (Friese 1911 nec 1918)
Turkey; Mut.
On the wing during June.

**Chalicodoma (Euchalicodoma) asiatica** (Morawitz 1875)
Continental Greece. Turkey; Isparta. Palestine. The range of this species in Greece needs to be clarified as it is a primarily Central Asian bee. Palestinian examples are referable to *C. a. levantina* (Hedicke 1938). Closely related to *Chalicodoma montenegrensis*.

**Chalicodoma (Chalicodoma) atrocastaneum** Alfken 1932  
Egypt.

**Chalicodoma (Pseudomegachile) branicki** (Radoszkowski 1876)  
Egypt.

**Chalicodoma (Pseudomegachile) cinnamomea** (Alfken 1926)  
Egypt.  
This bee may be present in Libya.

**Chalicodoma (Chalicodoma) cressa** Tkalcu 1988  
Greece on Crete. An island endemic taxon. On the wing during April although scarcely recorded.

**Chalicodoma (Chalicodoma) cypricola** (Mavromoustakis 1938)  
Cyprus.  
Found on the wing from March to May, flying to *Echium sericeum, Onobrychis venosa* and *Astragalus cyprius*.  
Mavromoustakis reported the nest, constructed from mud and stone, is sometimes attached to the woody parts of a plant of the shrub *Sanguisorba spinosa*. Nests are otherwise attached to large stones.

**Chalicodoma (Pseudomegachile) derasa** (Gerstaecker 1869)  
Continental Greece. Aegean Greece on Lesbos. Discovered on Naxos, Central Aegean, by Krüper. This species has an affinity for *Vitex Agnus-castus*, but only in some habitats, possibly connected with a degree of soil surface salinity or the presence of certain salts. A summer bee.

**Chalicodoma (Chalicodoma) desertorum** Morawitz 1875  
Subspecies *C. d. atrorufa* Friese 1898 occurs Egypt.

**Chalicodoma (Pseudomegachile) ericetorum** (Lepeletier 1841)  
Continental Greece, Thrace. North Aegean on Lesbos. Crete. The subspecies *C. e. tyrneri* Tkalcu 1994 is reported from western Turkey; Balikesir. The species is reported common across Turkey and a pollinator of *Onobrychis vicifolia* and *Medicago sativa* in Eastern Turkey. On the wing from June to September. Recorded from Central Anatolian Turkey and further flower records additional to legume forage research are for *Coronilla varia, Vicia, Trifolium, Genista, Cytisus nigricans, Stachys turcomanica, Digitalis laevigata, Nepeta formosa, Acanthus longifolius, Lathyrus latifolius* and in the European range also *Betonica*. Friese noted *Lotus corniculatus, Cytisus laburnum and Salvia argentea* as host flowers. On the wing June and July.

**Chalicodoma (Maximegachile) esseniensis** Pasteels 1979  
Israel.

**Chalicodoma (Pseudomegachile) farinosa** (Smith 1853)
Iraq.

**Chalicodoma (Pseudomegachile) flavipes** (Spinola 1838)
A summer bee with both sexes on the wing during July in Syria
Widespread through Central and Eastern Turkey.
Recorded in June and July on Cyprus, with some records into October, visiting *Alhagi maurorum*, *Thymus capitatus*, *Vitex*, *Linaria elatine*, *Eryngium*, *Statice virgata*, *Trifolium* and cultivated *Medicago*.
This bee nested in old clothes hanging up in Mavromoustakis’ house in Limassol. The nest comprised two elongate cells constructed of mud.

**Chalicodoma (Pseudomegachile) foersteri** (Gerstaecker 1869)
Subspecies *C. f. albescens* (Friese 1898) central and Eastern Turkey. Both sexes are on the wing during July from low elevations up to 2150 mtrs. This subspecies has a centre of population gravity in the Taurus Range. The bee is reported visiting *Vitex agnus-castus* and *Caphalaria alpina*.
On the wing in June up to 1200 mtrs in the Antilebanon range, Syria.

**Chalicodoma (Allochalicodoma) hungarica** Mocsáry 1877
Recorded as a pollinating visitor to the Almond and Cherry orchards of highland Jordan.

**Chalicodoma (Pseudomegachile) incana** (Friese 1898)
Egypt.
A spring bee, on the wing during May. This bee probably ranges into Libya as it is known from Algeria.

**Chalicodoma judaea** Tkalcu 1999
Israel.
On the wing during May.

**Chalicodoma (Allochalicodoma) lefebvrei** (Lepeletier 1874)
Greece; possibly present.

**Chalicodoma (Katamegachile) manicata** (Giraud 1861)
Lebanese examples are referable to *C. m. hammanensis* (Mavromoustakis 1956)
On the wing March to May. A spring bee visiting *Rosmarinus* and *Cytisus*.

**Chalicodoma (Chalicodoma) monstrifica** (Morawitz 1877)
Eastern Turkey. Lebanon.
Lebanese examples are referable to *C. m. lebanotica* (Mavromoustakis 1956).
Noted during July at 2200 mtrs in tragacanthic montane steppe.

**Chalicodoma (Euchalicodoma) montenegrensis** (Dours 1873)

**Chalicodoma (Chalicodoma) nasidens** (Friese 1898)
Jordan. Egypt. Libya.
A desertic species on the wing during May.

**Chalicodoma (Pseudomegachile) nigripes** (Spinola 1838)
Egypt.
Not recorded in Libya yet could be present there.
On the wing April and May, visiting *Echium*.

**Chalicodoma (Chalicodoma) nigrita** (Radoszkowski 1876)
Israel. Egypt. Libya.

**Chalicodoma (Chalicodoma) palaestina** Tkalcu 1988
Palestine. Israel.

**Chalicodoma (Chalicodoma) parietina** (Geoffroy 1785)
The nominate subspecies in North Africa, possibly present in Libya and Egypt.
Present in Continental Greece, Thrace and the North Aegean on Lesbos as the subspecies *C. p. nestorea* (Brullé 1832) which is the subspecies found in Turkey where it is common. Recorded in Jordan as a visitor to orchards. This subspecies is also found in Israel.
In Turkey recorded visiting *Onobrychis viciifolia, O. cornuta, Lotus corniculata, Vicia cracca, Melilotus alba, M. officinalis, Centaurea, Potentilla* and *Caronilla*.

**Chalicodoma (Parachalicodoma) pasteelsi** (Van der Zanden 1998)
Turkey; Urfa, Birecik. Egypt.

**Chalicodoma (Chalicodoma) pyrenaica** (Lepeletier 1874)
Continental Greece; Thrace. North Aegean on Lesbos. Reported from western Turkey; Bursa. The subspecies *C. p. asiae* Tkalcu 1988 on central and eastern Turkey; Elazig, Isparta. The zone of integration between the two subspecies is not clear.
The nominate subspecies is also reported in North Africa but no details from Libya or Egypt are known.

**Chalicodoma (Allochalicodoma) roeweri** Alfken 1927
Continental Greece; Peloponnesos. Crete. Turkey; Tunceli.
Males recorded from May to August in Greece and Turkey with a flower visit record by the male to *Acanthus* from Greece. Both sexes recorded by Alfken visiting *Salvia pomifera*.
On Crete and Cyprus the subspecies *C. r. akrotirica* (Mavromoustakis 1939) is found.
In Cyprus this subspecies mainly flies in May and June, some on the wing into early July, visiting *Marrubium vulgare apolum, Centaurea hyalolepis, Ballota, Teucrium polium micropodioides, Teucrium divaricatum, Anchusa* and *Echium sericeum*. The female creates a nest in a cavity in stones,
hard ground or cliff, using a mixture of glandular secretion, pebbles and fragments of Pistacia leaf for cell lining and seals.

**Chalicodoma (Pseudomegachile) rubripes** (Morawitz 1875)
Turkey.
This Central Asian bee has been reported from Aydin and Icel.

**Chalicodoma (Pseudomegachile) sanguinipes** (Morawitz 1875)
Turkey; Konya. Palestine. Israel.
Flying during May and June in Palestine, recorded at *Ballota undulata*.

**Chalicodoma (Pseudomegachile) saussurei** (Radoszkowski 1874)
Eastern Turkey.
Reported at *Centaurea* and *Carduus, Eryngium billardieri, Onobrychis viciifolia* and *Astragalus lineatus*. May July to late September.

**Chalicodoma (Chalicodoma) sicula** (Rossi 1792)

**Coelioxys (Allocoelioxys) acanthopyga** Alfken 1940
Cyprus. Israel.
Very locally recorded.

**Coelioxys (Allocoelioxys) acanthura** (Illiger 1806)
Continental Greece. Lesbos. Cyprus. Turkey; Cankiri, Sanliurfa. Israel.
A cleptoparasite of *Chalicodoma*, on the wing May to August.
On Cyprus recorded at *Broteroa corymbosa, Centaurea ciliarica, Centaurea hyalolepis* and *Statice virgata*.

**Coelioxys (Allocoelioxys) afra** Lepeletier 1841
Subspecies **C. a. erzurumensis** Tkalcu recorded from *Carduus* in September, Eastern Turkey.
In parts of North Africa bees are referable to the subspecies **C. a. tunensis** Gribodo.
Pasteels considered this species to be a most successful member of the genus with a very large global range.
Cleptoparasitic on some of the smaller leafcutter bees in the subgenus Eutricharaea; **Megachile apicalis, M. leachella, M. argentata** and **M. pilidens**.
A typical high summer flight season of late May or early June to September with females on the wing to the beginning of October. This species will visit *Rubus ulmifolius anatolicus, Broteroa corymbosa, Thymus, Teucrium polium micropodioides, Teucrium cyprium, Linaria elatine, Statice* and *Onobrychis viciifolia*.

**Coelioxys (Coelioxys) alata** Foerster 1853
Turkey; Rize.
A summer bee as is typical for the genus. Reported to parasitise **Megachile lignesica** and **Anthophora furcata**. The species has a northerly distribution in the central and eastern palearctic. It is known from Bulgaria but not recorded in our area.
Coelioxys (Mesocoelioxys) argentea Lepeletier 1841
A Turano-Mediterranean and Central Asian range.
A cleptoparasite of the large chalicodominforne Creightonella albisecta.
Both sexes have been recorded at Vitex Agnus-castus.
On Cyprus flying from late May until September, visiting Crozophora verbascifolia, Broteroa corymbosa, Carlina lanata, Centaurea ciliicica, Marrubium vulgare apolum, Heliotropium europeum, Eryngium ceticum, Mentha longifolia, Statice virgata and Vitex.

Coelioxys (Allococelioxys) artemis Schwarz 2001

Coelioxys (Coelioxys) aurolimbata Foerster 1853
No details from Egypt or Libya but could be searched for there.
The subspecies C. a. orientalica Warncke recorded from Aydin and Konya which are western Provinces of Turkey.
On the wing from the end of May to August. A cleptoparase of Chalicodoma ericetorum.
Floral visits are recorded to Betonica, Origanum, Cirsium and Onobrychis viciifolia.

Coelioxys (Allococelioxys) brevis Eversmann 1852
Continental Greece. Lesbos. Cyprus. Turkey, Israel.
The range of this bee in North Africa is not clearly reported.
On the wing in late June to mid September and recorded at Carduus, Eryngium ceticum and O. viciifolia. Hosts recorded are Megachile apicalis, M pilidens and M. leachella.
A successful species probably widespread through Turkey.

Coelioxys (Allococelioxys) caudata Spinola 1838
Continental Greece; Epirus, Thrace. Widespread Turkey. Israel.
Flight period June to August in montane habitats.

Coelioxys (Coelioxys) conoidea (Illiger 1806)
Continental Greece; mainly highlands of Chalkidiki and the Pindos. Crete. Turkey. Cyprus.
On the wing late June to mid September. In Kars found at elevations of 1700 mtrs but often as a montane species active up to 2300 mtrs in the range..
On the wing in Cyprus from May to September, visiting Rubus ulmifolius anatolicus, Statice and Vicia cracca elegans.
Hosts reported are from among the larger Megachilinae; Chalicodoma ericetorum, Megachile lagopoda and Megachile maritima.

Coelioxys (Liothyrapis) decipiens Spinola 1838
No records for Libya although this bee should be searched for there.
On the wing by late June when males have been recorded at Vitex in Eastern Turkey. Recorded at Alhagi maurorum, Trifolium, cultivated Medicago and Linaria elatine on Cyprus. Mavromoustakis noted this bee often present alongside the small leafcutter Megachile flavipes, which he reported to be the probable host.
Coelioxys (Allocoelioxys) echinata Foerster 1853
On the wing June to August. A specialist cleptoparasite on the small leafcutter bees Megachile rotundata and M. apicalis.

Coelioxys (Allocoelioxys) elegantula Alfken 1934
On the wing from May to August on Cyprus. Recorded at Statice, Broteroa corymbosa and Teucrium polium micropodioides.
Pasteels reported this species as present in Turkey in Cankiri and in southwestern coastal Mediterranean areas.

Coelioxys (Coelioxys) elongata Lepeletier 1841
Eastern Turkey. Iran.
A cleptoparasite of Megachile circumcincta, M. centuncularis, M. leachella, M. lignesica and M. willughbiella. On the wing June to September. Reported visiting Cirsium spp. in Turkey.

Coelioxys (Allocoelioxys) elongatula Alfken 1938

Coelioxys (Allocoelioxys) elsei Schwarz

Coelioxys (Allocoelioxys) elytrura Spinola 1838
Turkey. Egypt.
A very locally reported bee.

Coelioxys (Allocoelioxys) emarginata Foerster 1853
Turkey; Erzurum.
In Turkey recorded mid September at an elevation of 1850 mtrs. A bee of high summer. Stoeckhert recorded the leafcutter bee Megachile leucomalla as a host.

Coelioxys (Allocoelioxys) emarginatella Pasteels 1982
Israel. Palestine
Reported by Pasteels on the wing from June to October, primarily during August. It appears to be local and perhaps of conservation concern.

Coelioxys erythrura Spinola 1838
Turkey; Icel.

Coelioxys foersteri Morawitz 1871
Continental Greece at Epirus.

Coelioxys (Allocoelioxys) haemorrhoa Foerster 1853
Though not yet reported from Libya this species could be searched for there.
The bees of Israel and Egypt may be referable to *C. rhodocantha* Cockerell 1931 which Warncke (1992) treats as a subspecies of *haemorrhhoa*. On the wing June through August. Reported visiting summer nectar resources such as *Vitex, Statice* and *Thymus* and found on the wing to montane elevations, sharing with many Megachilidae of Asia Minor a propensity for high altitudes.

Mavromoustakis recorded this bee on Cyprus during May and June and also in September. Flowers visited were *Heliotropium europeum, Anthemis* and *Eryngium creticum*. Pasteels reported the host to be the widespread smaller leafcutter *Megachile rotundata*.

**Coelioxys (Coelioxys) inermis** (Kirby 1802)
Turkey; Eskisehir, Canakkale, Hakkari.

This bee has a wide paleoarctic range and hosts recorded are *Hoplitis papaveris, Megachile centuncularis, M. alpicola* and *Megachile versicolor*. Warncke (1992) lists also *Megachile argentata* and *Megachile Bombycina* but without details.

**Coelioxys (Allocoelioxys) iranica** Warncke 1992
Iran.

On the wing from late May to early July, often found at lower elevations.

**Coelioxys (Coelioxys) mandibularis** Nylander 1848
Continental Greece. Turkey.

Local in the northern Greek mountains at 2000 to 2200 mtrs during mid August.

A European and Central Asian species. In Turkey on the wing June until early September. Host species are in the Megachilidae; *Osmia villosa, Hoplitis papaveris, Megachile leachella* and also reported *M. centuncularis, M. versicolor, M. (brevicornis), M. circumcincta* and *M. pyrenaea* within the full range, with the majority of these or all associations given here from outside our region. Found up to 2400 mtrs in Eastern Turkey. This is a Continental Eurasian bee.

**Coelioxys (Allocoelioxys) obtusa** Pérez 1884
Turkey; Bitlis.

on the wing from June to August when females seek out the nests of their host, the leafcutter *Megachile giraudi bicoloriventris*.

**Coelioxys (Allocoelioxys) polycentris** Foerster 1853

Fahringer noted that this species is a cleptoparasite on the summer Eucerine *Tetralonia nana* and is on the wing June and July. *Megachile deceptoria* has also been reported as a host (Jozan 1971).

**Coelioxys pulchella** Morawitz 1874
Continental Greece; Attica. Turkey; Nevsehir, Bitlis, Urfa.

**Coelioxys (Coelioxys) quadridentata** (Linnaeus 1758)
Continental Greece; Olympos. Turkey; Erzurum.

A Continental Eurasian species recorded visiting *Onobrychis* and *Vicia* in Turkey. On the wing May through August. Females on the wing into September. This is one of the strongly protandrous Coelioxys with males appearing ten day or so before females and accompanying them until mid summer after which only the females remain on the wing. Host bee species reported from the full range are: *Megachilidae; Megachile circumcincta, M. willughbiella, M. leachella, Trachusa*
byssina and the following Anthophora species; A. furcata, A. plagiata and A. parietina. All of these host bee associations are likely to have been recorded from the north of our area.

Coelioxys (Coelioxys) rufescens Lepeletier & Serville 1825
Continental Greece; Peloponnesos. Delphi. Turkey. Iran.
A transpalaearctic and north Asian species.
On the wing from June through August.
Host species among the Megachilidae not reported.
Host species reported in the Anthophorini include Anthophora bimaculata, A. borealis, A. fulvitarsis, A. furcata and Anthophora quadrimaculata.
A range of flower records include composites such as Onopordum, Centaurea and Carduus.

The subspecies C. r. oltuensis Tkalcu is in Eastern Turkey as well as the nominate subspecies.
The subspecies C. r. anatolica Warncke has been recorded from Hakkari, Turkey, with both sexes on the wing during June and July.

Coelioxys (Allocoelioxys) ruficauda Lepeletier 1841
Probably present in Libya but confirmation needed.

Coelioxys warnckeii Schwarz & Gusenleitner 2003
Iran.

Coelioxys (Allocoelioxys) sogdiana Morawitz 1875
Israel; Jerusalem.
The female noted on the wing during July. This is a Central Asian species.

Radoszkowskiana barrei (Radoszkowski 1893)
Eastern Turkey. Iran.

Radoszkowskiana gusevi Schwarz 2001
Syria. Suwayda.

Radoszkowskiana rufiventris (Spinola 1838)
Egypt. Iran.
Considered by Popov (1955) to be a cleptoparasite of Megachile schnabli Radoszkowski in the Asian range.

Radoszkowskiana tkalcui Schwarz 2001
Eastern Turkey, Van.

Megachile (Eutricharaea) albipila Pérez 1895
On the wing in July and August in Greece.

Megachile (Megachile) alpicola Alfken 1924
Continental Greece; Olympos. Turkey; Erzurum.
A Eurasian bee and local in our region. Found between 1900 and 2200 mtrs in late July and August in the Olympos Massif, Greece.

**Megachile (Xanthosarus) analis** Nylander 1852
Continental Greece. Turkey.
Locally present in mountains of northern Greece from lower altitudes to 2700 mtrs when on the wing during July and August.
Widespread in Eastern Anatolia from low elevations to 3000 mtrs. A summer bee with females noted during August and September.
An important pollinator of *Onobrychis vicifolia* but visiting a range of other forage flower species. Subspecies **M. a. albida** Friese 1898 is recorded in Turkey.

**Megachile (Eutricharaea) anatolica** Rebmann 1968
North Aegean Greece on Lesbos. Eastern Turkey; widely recorded.
On the wing July to early September in eastern Turkey.

**Megachile (Eutricharaea) apicalis** Spinola 1808
present in North Africa although not reported for Egypt or Libya.
A summer-flying member of the small leafcutters in the subgenus Eutricharaea, appearing on the wing during July and August in Continental Greece and Turkey.
Common during July in eastern Turkey where females collect pollen from the flowers of *O. vicifolia*. This successful and polylectic bee also visits *Medicago sativa, M. lapilina, Melilotus alba, M. officinalis, Vicia cracca, Thymus fallax, Centaurea solstitialis, Helianthus annuus, Carduus, Lotus and Onopordum.*
On the wing from May to October on Cyprus, mainly June into September, recorded visiting *Echium sericeum, Centaurea hyalolepis, Carlina lanata, Carthamus boisseri, Cirsium chamaepeuce camptolepis, Inula viscosa* and *Rubus ulmifolius anatolicus*. This bee is also on Cyprus frequent at summer flowering Lamiales such as *Thymus*.
Appears by May in Palestine and recorded there visiting *Satureia*.

**Megachile (Eutricharaea) argentata** (Fabricius 1798)
A summer bee recorded at flowers in the genera *Lotus, Reseda and Sedum*.

**Megachile (Megachile) armenia** Tkalcu 1992
Turkey; Erzurum.

**Megachile (Eutricharaea) atratula** Rebmann 1967
Turkey; Diyarbakir, Bingöl.

**Megachile (Eutricharaea) auripubens** Rebmann 1970
Iran; Iranshah.

**Megachile (Eutricharaea) babylonica** Rebmann 1970
Iraq.

**Megachile (Eutricharaea) basilaris** Morawitz 1875
Subspecies **M. b. posti** Mavromoustakis 1952
Cyprus. Eastern Turkey.
Both sexes flying to *Noaea mucronata* during July in Cyprus.

**Megachile (Xanthosarus) boops** Friese 1921
Turkey; Amanus Mountains.

**Megachile (Eutricharaea) carinata** Radoszkowski 1893
The range in our area not documented.

**Megachile (Megachile) centuncularis** Linnaeus 1758
Widespread Turkey.
Subspecies **M. c. parvula** Lepeletier 1841 reported from central eastern Turkey.
Subspecies **M. c. nesiotica** Mavromoustakis 1953 on Cyprus, recorded during July until September and sometimes October, visiting *Inula crithmoides, Inula viscosa, Heliotropium europaeum, Alhagi maurorum, Pulicaria dysenterica* and cultivated *Medicago*. Mavromoustakis also reported this extensively red-marked subspecies from Israel.

**Megachile (Xanthosarus) circumcincta** (Kirby 1802)
Continental Greece; Olympos. Turkey.
Noted at 2000 mtrs in Olympos during July.
Subspecies **M. c. ozbeki** Tkalcu 1977 is reported as common in eastern Turkey in Provinces such as Erzurum where it is a pollinator of *O. viciifolia* among other plants.

**Megachile (Eutricharaea) deceptoria** Pérez 1890
Greece; north Aegean on Lesbos. Turkey; Balikesir and now found to be widespread through to Central Anatolia. However, this bee seems generally less numerous than some more abundant members of the subgenus Eutricharaea.
Polylectic.

**Megachile (Xanthosarus) diabolica** Friese 1898
Continental Greece.
A rare leafcutter found in the Lykaion Range of the Peloponnesos at 1200 to 1400 mtrs. The bee has a disjunct range including the Caucasus.
Females line the nesting chambers in the ground with leaf fragments of *Prunus mahaleb* and the cells are provisioned with pollen of *Asyneuma limonifolium* (Campanulaceae) (described by Hartmann & Arens 1998). Megachile diabolica is one of a number of species sharing this calcareous montane habitat forming a cohort utilising the floral resources of *Asyneuma* which includes *Xylocopa iris, X. violacea, Megachile willughbiella, Osmia campanularis, Anthidium caspicum, Lasioglossum argueum ragusanum, Colletes meyeri* and *Coelioxys conoidea*.

**Megachile (Eutricharaea) dorsalis** Pérez 1879
North Aegean Greece on Lesbos.
Visits *Centaurea* during the summer months.

**Megachile (Eutricharaea) fertonii** Pérez 1895
Turkey; Antalya, Aydin.
Megachile (Eutricharaea) flabellipes Pérez 1895
Greece; North Aegean on Lesbos. Turkey.

Megachile (Eutricharaea) fulvocrinita Alfken 1934
Egypt.

Megachile (Megachile) genalis Morawitz 1880
Subspecies M. g. tortumensis Tkalcu 1980 recorded Turkey; Erzurum.

Megachile (Xanthosaurus) giraudi Gerstäcker 1869
Continental Greece. North Aegean Greece on Lesbos. Samos. Widespread Turkey, including Central Anatolia as well as eastern Provinces. 
Subspecies M. g. erzurumensis Tkalcu 1980 reported from eastern Turkey where on the wing during June. 
An oligolege of the Fabaceae, on the wing from May through July and nest building within cavities in stone by the creation of clusters of pot-like cells. This bee carries a substantial cleptoparasitic load, reported to be Coelioxys afra, C. obtusa, C. mandibularis and parasitized by flies in the genus Melittobia.

Megachile (Eutricharaea) impressipuncta Alfken 1934
Egypt.

Megachile (Eutricharaea) inexpectata Rebmann 1968
Turkey; Icel, Sanhurfa.

Megachile (Eutricharaea) inornata Walker 1871
Egypt; Sinai.

Megachile (Eutricharaea) insignis Van der Zanden 1996
Israel.
Males on the wing during May.

Megachile (Eutricharaea) iranica Rebmann 1970
Iran.

Megachile (Xanthosaurus) lagopoda (Linnaeus 1761)
Reported very common in Turkey and found throughout the country, on the wing from early June through to the end of September. Flowers visited in the genera Carduus, Centaurea, Onopordum, Salvia and Trifolium.
A typical leafcutter enthusiastic polylege of a selection of the classical triumvirate of Legumes, Composites and Lamiales.
The species is found from low elevations to mountains at 3000 mtrs.
Mavromoustakis reported a subspecies M. l. fulvohirta Alfken 1935 from Palestine and Israel.

Megachile (Megachile) lapponica Thomson 1872
Continental Greece; Olympos.
A Eurasian bee.

**Megachile (Eutricharaea) leucomalla** Gerstaecker 1869
On the wing in high summer.

**Megachile (Eutricharaea) levistriga** Alfken 1934
Egypt.

**Megachile (Megachile) ligniseca** (Kirby 1802)
Turkey; Artvin.
This species has a northerly transpalaeartic range. A robust member of the genus, on the wing in midsummer, often nesting in beetle borings in felled tree trunks. Records reported for Turkey are for July to September.

**Megachile (Eutricharaea) marginata** (Smith 1853)
Continental Greece. Turkey. Egypt.

**Megachile (Xanthosarus) maritima** (Kirby 1802)
Turkey; early records reported Erzurum, Kars, Artvin, Ankara, Proving to be widespread in the centre and east.
A Polylectic species recorded visiting flowers in the genera *Vicia, Genista, Onopordum, Centaurea* and *Betonica*. In Turkey visiting *Onopordum* in September. It is a summer bee mainly recorded during June to August.

**Megachile (Neoeutricharaea) mavromoustakisi** Van der Zanden 1992
Cyprus.
Present in the Troodos Range with both sexes active during July up to 1900 mtrs.

**Megachile (Eutricharaea) melanogaster** Eversmann 1852
Turkey; Agri, Erzurum.

**Megachile (Megachile) melanopyga** Costa 1863
A summer bee recorded visiting *Centaurea paniculata* and *Carduus*.
Rhodes specimens are referable to *M. m. rhodia* Tkalcu 2005. Cyprus specimens are referable to *M. m. zakakica* Mavromoustakis 1957 while in Palestine the subspecies *M. m. vulpecolor* Hedicke 1938 is noted.

**Megachile (Xanthosarus) metatarsalis** Morawitz 1895
Turkey; Erzincan.
A scarcely recorded species.

**Megachile (Eutricharaea) minutissima** Radoszkowski 1876
Turkey; Erzincan. Israel. Egypt.
The life history is described by Krombein (1969).
Megachile (Eutricharaea) minutuloides Alfken 1936
Egypt.

Megachile (Megachile) octosignata Nylander 1852
Continental Greece. Turkey; Erzurum, Kars.

Megachile (Eutricharaea) patellimana Spinola 1838
Cyprus. Israel. Egypt.
Mavromoustakis recorded this bee on Cyprus during May to July, flying to Vitex agnus – castus, Alhagi maurorum and Echium sericeum.

Megachile (Eutricharaea) picicornis Morawitz 1878
Continental Greece. Cyprus. Eastern Turkey.
Reported from North Africa without detail.
Flower visit records for Centaurea glastifolia, C. solstitialis, C. iberica, Cephalaria alpina, vitex.

Megachile (Megachile) pilicrus Morawitz 1877
On the wing during July and August. Flower visit records for Centaurea paniculata and Salvia.

Megachile (Eutricharaea) pilidens Alfken 1924
Reported on the wing mid July to mid September visiting Carduus, Centaurea solstitialis, Onopordum, Cirsium, Knautia, Onobrychis viciifolia, Arctium lappa, Medicago sativa and Mentha.

Megachile (Eutricharaea) privigna Rebmann 1968
Egypt.

Megachile (Megachile) pyrenaea Pérez 1890
Continental Greece.
Both sexes recorded from Mount Olympos and northern Greek mountains where active on the wing later in July into early September between 1600 and 2200 mtrs.
The subspecies M. p. ardahanensis Tkalcu 1980 recorded Turkey; Ardahan. This species has been recorded also from Central Anatolian provinces;– Ankara and Eskisehir. On the wing from June through to late August.
(see Banaszak).

Megachile (Eutricharaea) rotundata (Fabricius 1787)
An important pollinator of Onobrychis viciifolia. The commonest and most successfully distributed Eutricharaea in Turkey, found from sea level to 3000 mtrs. On the wing July and August. Recorded flower species visited include members of the genera Onobrychis, Coronilla orientalis, Lotus corniculatus, Trifolium repens, Vicia cracca, Melilotus alba, M. officinalis, Medicago sativa, M. lupulina, M. papillosa, M. varia, Astragalus aureus, A. christianus, A. lineatus, A. pinoterum, Hedysarum elegans, H. hedysaroides, Thymus fallax, Vitex, Salvia sclarea, Eryngium, Sedum, Rubus caesius and Centaurea iberica.
Friese noted both sexes as visitors to Reseda odorata.
Mavromoustakis recorded this bee on the wing from June to October on Cyprus, visiting *Pulicaria dysenterica*, *Ononis*, *Statice* and *Inula viscosa*. This leafcutter is a host of the cleptoparasitic bee *Coelioxys rufocaudata*.

**Megachile (Eutricharaea) rubrimana** Morawitz 1894
Turkey; Edirne, Samsun, Denizli,

**Megachile (Eutricharaea) sedilloti** Pérez 1896
Libya; Cyrenaica.

**Megachile (Eutricharaea) semicircularis** Van der Zanden 1996

**Megachile (Eutricharaea) sexmaculata** Alfken 1942
The subspecies **M. s. thracia** Tkalcu 1979 in Turkey. On the wing mid July and August. Flower visit records for *Onobrychis viciifolia*, *C. glastifolia*, *S. scarea*, *Medicago sativa*. Also *Centaurea diffusa* in forest steppe.

**Megachile (Eutricharaea) squamosa** Rebmann 1970
Iraq.

**Megachile (Eutricharaea) striatella** Rebmann 1968

**Megachile (Eutricharaea) submucida** Alfken 1926
Egypt.

**Megachile (Eutricharaea) terminata** Morawitz 1875
Eastern Turkey. A scarcely recorded bee.

**Megachile (Eutricharaea) tkalcui** Van der Zanden 1996
Israel. Females found on the wing during May.

**Megachile (Eutricharaea) troodica** Mavromoustakis 1953
Cyprus. A summer leafcutter found in July flying on open phryganic hillsides where visiting *Salvia grandiflora willeana* and *Teucrium cyprium*.

**Megachile (Megachile) versicolor** Smith 1844
Continental Greece. Turkey; Erzurum, Kars, Eskisehir. Very locally recorded in Greece; from Mount Olympos in late July. In Turkey reported visiting *Trifolium repense*.

**Megachile (Eutricharaea) villipes** Morawitz 1875
Turkey; Antalya, Van, Mus, Baysehir.
Recorded at *Cirsium* and *C. solstitialis*.
On the wing from June to August.

**Megachile (Eutricharaea) walkeri** Dalla Torre 1896

**Megachile (Xanthosarus) willughbiella** (Kirby 1802)
Continental Greece. Turkey.
Found locally in Greece; Mount Olympos at 2000 mtrs where active during July.
Widespread in eastern Turkey during summer when the leaves of *Rosa* spp. are used in nest construction. This handsome greater leafcutter has a temperate Eurasian distribution.
Family Apidae

Subfamily Xylocopinae

Tribe Xylocopinae

Proxylocopa nitidiventris Morawitz 1895
Subspecies P. n. parviceps Morawitz 1895 in eastern Turkey and Iran at up to 2350 mtrs.

Proxylocopa olivieri (Lepeletier 1841)
From May to September in flight, often crepuscular but not at all wholly so. A ground nesting species often, with a distinctive habitus. Mavromoustakis noted the very late and early appearance of this bee at forage plants and well after sunset this behaviour is seen on Lesbos. Capparis spinosa sicula, Centaurea hyalolepis, Echinops spinosus, Eryngium, Cistus villosus and Calycotome villosa, and in September Vitex, are recorded as visited on Cyprus. Mavromoustakis reported males of this bee on the wing during April in Palestine, visiting Anchusa. This bee lays a very large egg for its’ size, as do the Xylocopas. Egg size is an adaptation perhaps for moisture retention in a dry nest. (Rozen and Ozbek 2003). A wide range in Iran during June and July.

Proxylocopa rufa Friese 1901
Israel. Iran.
A widespread bee in Iran.

Xylocopa (Ctenoxylocopa) basalis Smith 1854
Southeastern Iran.
On the wing at lower altitudes in Iran. On the wing in April and May.

Xylocopa (Koptortosoma) caffra (Linnaeus 1767)
Greece; Zakinthos.
A single record.

Xylocopa (Ctenoxylocopa) fenestrata (Fabricius 1798)
Israel. Iraq. Southern Iran.
A spring bee often active during March.

Xylocopa (Ctenoxylocopa) hottentotta Smith 1854
Israel. Egypt.

Xylocopa (Copoxyla) iris Christ 1791
Widespread in numbers on Cyprus, where Mavromoustakis recorded nesting in the dried stems of Asphodelus ramosus micropodioides. In July and August fond of Vitex and Rubus ulmifolius anatolicus.

Xylocopa (Afroxylocopa) nigrita (Fabricius 1775)
Greece; Zakinthos.
A single record.

**Xylocopa (Ancylocopa) pavlovskyi** Popov 1935
Central Turkey. Iran, Teheran.

**Xylocopa (Koptortosoma) aeuans pubescens** Spinola 1838
This bee is on the wing during March in Cyprus and Iran. In Libya there is a race or more possibly a related species – **X. a. bengasinensis** Warncke 1976.

**Xylocopa (Nodula) punctilabris** Morawitz 1894
Eastern Iran.

**Xylocopa (Copoxyla) turanica** Morawitz 1875
Iran.
This is a Caucasian and Central Asian bee which is found on the wing above 2200 mtrs in the Elburz Mountains eastwards from June.
However, a subspecies **X. t. armeniaca** Warncke 1982 is recorded from the mountains of eastern Turkey above 2600 mtrs from late May into July.

**Xylocopa (Xylocopa) valga** Gerstaecker 1872
Continental Greece. Turkey. Iran.

**Xylocopa (Xylocopa) varentzowi** Morawitz 1895
Turkey. Iran.
On the wing from May to July up to 2060 mtrs.

**Xylocopa (Xylocopa) violacea** (Linnaeus 1758)
Common throughout Cyprus from January and February onwards, visiting Asphodelus early in the season. Other flower records are for *Prunus dulcis, Myrtus communis, Astragalus lusitanicus,* and *Thymelaea hirsuta.*
A pollinator of Almond and Cherry in highland Jordan.
Found up to 4000 mtrs in the Taurus and other montane regions

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Tribe Ceratinini

These are the Small Carpenter Bees. Ceratina is a genus of polylectic bees, attractively coloured. Their distributions are influenced by their reliance on the habit of nesting in the stems of *Rubus* and sometimes *Verbascum.* (Terzo and Rasmont 2004). In North Africa *Rubus ulmifolius* is frequently used for nesting. This plant is widespread as the leaves are used for making tea, fruits are edible and
the plant is also used in hedging. In Central Asia the following additional species are inhabited:—
*Rubus saxatilis, R. idaeus, R. anatolicus, R. caesius and R. turkestanicus.*

**Ceratina (Euceratina) acuta** Friese 1896
Common in Continental Greece. Crete. Widespread Turkey. Israel. Iran, Caspian Region.

**Ceratina (Euceratina) bifida** Friese 1900
Mediterranean coastal Turkey. Syria. Lebanon. Israel.
Not found on Cyprus.

**Ceratina (Neoceratina) bispinosa** Handlirsch 1889
On the wing May to September. On Cyprus visiting the flowers of *Lotus, Teucrium polium micropodioides* and *Satureia incana.* Mavromoustakis recorded this bee hibernating and nesting in the dried stems of *Asphodelus, Anchusa* and *Echium.*

**Ceratina (Euceratina) chalcites** Germar 1839
Active on the wing during June and July.

**Ceratina (Euceratina) chalybea** Chevrier 1872

**Ceratina (Euceratina) christellae** Terzo 1998
Eastern Turkey; Antalya, Hakkari. North Iran; Elburz Mountains.
Recorded from late May to early August.

**Ceratina (Euceratina) chrysomalla** Gerstaecker 1869
On the wing mainly during April through to October in Cyprus, visiting *Sinapis alba, Cistus salvifolius, Malva sylvestris, Anchusa, Salvia, Calendula persica, Carlina lanata, Centaurea hyalolepis* and *Inula viscosa.* Mavromoustakis noted that this bee nests and hibernates in the dead stems of *Rubus ulmifolius anatolicus,* another plant whose flowers are visited.

**Ceratina (Ceratina) cucurbitina** Rossi 1792
This bee is absent from Cyprus, Egypt and Libya.
This is the commonest and most widespread of the Ceratina of the Mediterranean.

**Ceratina (Euceratina) cyanea** (Kirby 1802)

**Ceratina (Euceratina) cypriaca** Mavromoustakis 1954
Endemic to Cyprus.
Ceratina (Euceratina) dallatorreana Friese 1896
Not found in Egypt or Libya.

Ceratina (Euceratina) dalyi Terzo 1998
Iran; Kopet Dag.
On the wing during July.

Ceratina (Euceratina) denesi Terzo 1998
Turkey; Adana.
Recorded during May.

Ceratina (Euceratina) dentiventris Gerstaecker 1869
Continental Greece. Crete. Turkey.

Ceratina (Euceratina) laevifrons Morawitz 1875
Iran.

Ceratina (Euceratina) loewi Gerstaecker 1869

Ceratina (Euceratina) mandibularis Friese 1896

Ceratina (Euceratina) moricei Friese 1899

Ceratina (Euceratina) neocallosa Daly 1983
Egypt; Lower Nile.
This bee is on the wing from May to early August. The range extends southwards into eastern Africa.

Ceratina (Neoceratina) nigra Handlirsch 1889
Iran, southern Elburz.
A Turkestanic bee.

Ceratina (Euceratina) nigroaenea Gerstaecker 1869

Ceratina (Euceratina) nigrolabiata Friese 1896
(Cyprus. – check Terzo)
On the wing May to July, (recorded up to 4,000 ft on Cyprus where noted at Centaurea ciliicica, Salvia and Vitex.)

Ceratina (Ceratina) parvula Smith 1854
Continental Greece. North Aegean Greece on Lesbos. Cyprus. Turkey. Syria and through the Levant to Egypt and Libya. Widespread although sometimes local throughout the Mediterranean, with a flight season from June through the summer to October. Visits the flowers of *Rubus ulmifolius anatolicus* and *Linaria elatine* on Cyprus, hibernating and nesting in the dried stems of *Asphodelus, Anchusa* and *Echium*.

**Ceratina (Euceratina) rasmonti** Terzo 1998
Eastern Turkey; Agri. Van.
On the wing from late June into August.

**Ceratina (Euceratina) sakagamii** Terzo 1998
Crete. Central and Eastern Turkey.
Active from June to August.

**Ceratina (Neoceratina) schwarzi** Kocourek 1998

**Ceratina (Euceratina) schwarziana** Terzo 1998
Eastern Turkey; Hakkari.
Active during August.

**Ceratina (Euceratina) tibialis** Morawitz 1895

**Ceratina (Euceratina) warnkei**
Terzo 1998
Eastern Turkey; Hakkari, Kahraman, Maras, Siirt.
Active through June to August.

**Ceratina (Euceratina) zandeni** Terzo 1998
Continental Greece. Turkey. Israel.

**Ceratina (Euceratina) zwakhalsi** Terzo & Rasmont 1997
Eastern Turkey. Northeastern Iran.

**Pithitis citriphila** (Cockerell 1935)
Egypt.
Widespread in Egypt with a wide spectrum of flight phenology.

**Pithitis tarsata** (Morawitz 1872)
Egypt.
Widespread in Egypt and appearances scattered throughout the year.

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Tribe Allodapini

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Exoneuridia libanensis (Friese 1899)
Lebanon. Israel. Palestine.
Females on the wing in mid-June in Upper Galilee.

Exoneuridia marginata (Smith 1854)
Iran; Bandar Abbas.

Exoneuridia oriola (Warncke 1979)
Southwest Iran; Chuzistan, Shiraz.
On the wing during July.

Subfamily Nomadinae

Tribe Nomadini

Acanthonomada odontophora (Kohl 1905)
Turkey. Syria.

Nomada agrestis Fabricius 1787
On the wing during April in Greece.

Nomada anatolica Pittioni 1952
Turkey.

Nomada argentea (Schwarz 1966)
Turkey.

Nomada armata Herrich–Schaeffer 1839
Continental Greece.

Nomada atroscutellaris Strand 1921
Continental Greece. Turkey.

Nomada babiyi Schwarz & Standfuss 2007

Nomada basalis Herrich-Schaeffer 1839

Nomada beaumonti Schwarz 1967
Continental Greece. Lesbos.

Nomada bifasciata Olivier 1811
Continental Greece. Lesbos. Turkey.

Nomada bispinosa Mocsáry 1883
Continental Greece. Lesbos. Turkey.
**Nomada blepharipes** Schmiedeknecht 1882
Continental Greece. Turkey.

**Nomada bouceki** Kokourek 1985
Continental Greece. Turkey. Israel.

**Nomada braunsiana** Schmiedeknecht 1882

**Nomada calimorpha** Schmiedeknecht 1882
Continental Greece. Turkey.

**Nomada caspia** Morawitz 1895

**Nomada cherkesiana** Mavromoustakis 1955
On Cyprus flying in late March and early April, often visiting *Hymenocarpus circinnatus*.

**Nomada chrysopyga** Morawitz 1872
Greece; Crete.

**Nomada cleopatra** Schwarz 1989
Iran. Egypt including Luxor and Fayum.
The distribution extends into Arabia.

**Nomada collarae** Schwarz 1964
Turkey. Iraq.

**Nomada confinis** Schmiedeknecht 1882

**Nomada connectens** Pérez 1884

**Nomada corcyraea** Schmiedeknecht 1882

**Nomada coxalis** Morawitz 1877
Turkey. Israel. Iran.

**Nomada corcyraea** Schmiedeknecht 1882
Turkey.

**Nomada cretensis** (Schulz 1906)
Crete.
Nomada cruenta Schmiedeknecht 1882  

Nomada curvispinosa Schwarz 1981  
Turkey. Israel. 

Nomada cypria Mavromoustakis 1952  

Nomada diacantha Schwarz 1981  

Nomada difficilis Friese 1920  
Turkey. 

Nomada distinguenda Morawitz 1874  

Nomada ebmeri Schwarz MS  
Continental Greece. Aegean Greek islands; Lesbos, Chios, Rhodes. Turkey. Syria. 

Nomada eos Schmiedeknecht 1882  
Continental Greece; Peloponnesos. Lesbos. Turkey. Syria. 

Nomada erythrocephala Morawitz 1871  
Found in April on Cyprus, recorded at Anthemis arvensis. 

Nomada fabriciana (Linnaeus 1767)  

Nomada facilis Schwarz 1967  
Continental Greece, Thrace. Ionian Greece on Corfu. Turkey. 

Nomada femoralis  
Morawitz 1869  
On the wing during may in Greece. 

Nomada fenestrata Lepeletier 1841  

Nomada ferghanica Morawitz 1875  
Continental Greece. Turkey. Israel. 

Nomada filicornis Schwarz MS  
Nomada flava Panzer 1798
Continental Greece.

Nomada flavigenis Schwarz & Standfuss 2007
Continental Greece.

Nomada flavinervis Brullé 1832

Nomada flavoguttata (Kirby 1802)
This bee has a transpalaearctic distribution.
Found during March and April, visiting Asteraceae for nectar.

Nomada fucata Panzer 1798
A Nomad bee with a very wide palaearctic distribution.
On the wing from March to May visiting Anthemis, Vicia cracca elegans, Cistus villosus and Asteraceae.

Nomada fulvicornis Fabricius 1793
Continental Greece; Peloponnesos. Lesbos. Turkey.
This species has a transpalaearctic distribution and exhibits colour variability across the range, but which is not indicative of subspecies. (Maximilian Schwarz pers comm.).

Nomada furva Panzer 1798

Nomada furvoides Stoeckhert 1944

Nomada fuscicornis Nylander 1848

Nomada glaberrima Schmiedeknecht 1882

Nomada glaucopis Pérez 1890

Nomada goodeniana Kirby 1802

Nomada gracilicornis Morawitz 1895
Turkey. Israel.

Nomada gribodi Schmiedeknecht 1882

**Nomada guichardi** Schwarz 1981  
Turkey. Israel.

**Nomada gusenleitneri** Schwarz 1981  
Turkey.

**Nomada guttulata** Schenck 1861  
Continental Greece. Lesbos.

**Nomada hera** Schwarz 1965  

**Nomada hungarica** Dalla Torre & Friese 1894  
Continental Greece. Turkey.

**Nomada immaculata** Morawitz 1874  
Emerges in April.

**Nomada imperialis** Schmiedeknecht 1882  

**Nomada incisa** Schmiedeknecht 1882  
Continental Greece. Cyprus.

**Nomada insignipes** Schmiedeknecht 1882  

**Nomada integra** Brullé 1832  

**Nomada italica** Dalla Torre & Friese 1894  

**Nomada kervilliana** Pérez 1913  

**Nomada kohli** Schmiedeknecht 1882  
Continental Greece. Eastern Aegean on Rhodes.

**Nomada kornosica** Mavromoustakis 1958  

**Nomada kusdasi** Schwarz 1981  
Turkey. Israel.
Nomada lapillula Schwarz (MS)

Nomada lateritia Mocsáry 1883

Nomada laticrus Mocsáry 1883
Turkey.

Nomada limassolica Mavromoustakis 1955
On the wing from mid February to mid April in Cyprus, mostly recorded at Malva by Mavromoustakis.

Nomada lucidula Schwarz 1967

Nomada marshamella (Kirby 1802)
Continental Greece.

Nomada mauritanica manni Lepeletier 1841
Subspecies N. m. chrysopyga Morawitz 1871 in Syria.
On Cyprus found from March to May visiting Teucrium polium micropodioides, Centaurea hyalolepis, Sinapis alba.

Nomada mavromoustakisi Schwarz & Standfuss 2007
Continental Greece; Peloponnesos. Turkey.

Nomada melanopyga Schmiedeknecht 1882
North Aegean Greece on Lesbos. Turkey.

Nomada melathoracica Imhoff 1834
Turkey.

Nomada Mocsaryi Schmiedeknecht 1882

Nomada morawitzi Radoszkowski 1876

Nomada mutabilis
Morawitz 1870

Nomada mutica Morawitz 1872
North Aegean Greece on Lesbos. Turkey.
**Nomada nausicaa**  
Schmiedeknecht 1882  

**Nomada nigrifrons** Schwarz (MS)  

**Nomada nigrilabris** Schwarz (MS)  

**Nomada nobilis** Herrich-Schaeffer 1839  

**Nomada oculata** Friese 1921  

**Nomada odontophora** Kohl 1905  
Turkey.

**Nomada oralis** Schwarz 1981  
Turkey.

**Nomada ottomanensis** Schwarz (MS)  

**Nomada ovaliceps** Schwarz 1981  
Turkey. Israel.

**Nomada pallispinosa** Schwarz 1967  

**Nomada pastoralis** Eversmann 1852  
Turkey.

**Nomada piccioliana** Magretti 1883  
Continental Greece. Turkey.

**Nomada piliventris** Morawitz 1877  
Turkey.

**Nomada platythorax** Schwarz 1981  
Turkey.

**Nomada pleurosticta** Herrich – Schaeffer 1839  
Turkey. Iran.
**Nomada propinqua** Schmiedeknecht 1882  
Recorded in March on Cyprus, visiting *Sinapis alba*.

**Nomada pygidialis** Schwarz 1981  

**Nomada quadrifasciata** Schwarz 1981  
Turkey, at Bursa, Mus.

**Nomada quinquefasciata** Schwarz 1981  
Turkey, at Ankara and Konya.

**Nomada radoszkowii** Lozinski 1922  
North Aegean Greece on Lesbos. Turkey.

**Nomada robertjeotiana** Panzer 1799  
Turkey.

**Nomada rubiginosa** Pérez 1884  
Turkey. Israel.

**Nomada rubricollis** Schwarz 1967  

**Nomada rubriventris** Schwarz 1981  
Widespread Turkey.

**Nomada ruficornis** (Linnaeus 1758)  
Turkey.

**Nomada rufipes** Fabricius 1793  
Turkey.

**Nomada scheuchli** Schwarz & Standfuss 2007  
Continental Greece, Peloponnesos, Volos. Turkey, Cankiri. Iran, Gilan-e-Gharb.

**Nomada sexfasciata** Panzer 1799  
The hosts of this bee include *Eucera nigrescens* Pérez 1879.

**Nomada signata** Jurine 1807  
Turkey.

**Nomada smyrnaensis** Friese 1920  
Turkey.

**Nomada standfussi** Schwarz 2007
Continental Greece.

**Nomada stigma** Fabricius 1804
Continental Greece. Cyprus. Turkey.

**Nomada striata** Fabricius 1793
Continental Greece. Lesbos. Turkey.

**Nomada succincta** Panzer 1798

**Nomada tarsalis** Schwarz MS

**Nomada thersites** Schmiedeknecht 1882

**Nomada transitoria** Schmiedeknecht 1882
Aegean Greece on Rhodes.

**Nomada tridentirostris** Dours 1873

**Nomada trispinosa** Schmiedeknecht 1882

**Nomada umbrosa** Schmiedeknecht 1882
Continental Greece. Turkey.

**Nomada unispinosa** Schwarz 1981
Continental Greece. Turkey.

**Nomada warncke**i Schwarz MS
North Aegean Greece on Lesbos. Turkey.

**Nomada yarrowi** Schwarz 1981
Turkey.

**Nomada zonata** Panzer 1793

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Tribe Epeolini

**Epeolus bischoffi** (Mavromoustakis 1954)
Israel.
**Epeolus cruciger** (Panzer 1799)
Continental Greece.

**Epeolus fasciatus** Friese 1895
Turkey.

**Epeolus julliani** Pérez 1884

**Epeolus productulus** Bischoff 1930

**Epeolus schummeli** Schilling 1849
Turkey.

**Epeolus variegatus** (Linnaeus 1758)
Turkey.

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Tribe Ammobatoidini

**Ammobatoides abdominalis**
(Eversmann 1852)
Cyprus. Turkey. Lebanon.

**Ammobatoides luctuosus** (Friese 1911)
Turkey.

**Ammobates melectoides** (Radoszkowski 1872)
Turkey.

**Ammobatoides rubescens** (Bischoff 1923)
Turkey, at Izmir, Urfa and The Taurus.

**Schmiedeknechtia (Schmiedeknechtia) brevicornis** Schwarz 1993
Turkey. Widespread including Hakkari, Urfa, Siirt, Antalya and Mardin.

**Schmiedeknechtia (Schmiedeknechtia) piliventris** Schwarz 1993
Turkey, at Hakkari.

**Schmiedeknechtia (Cyrtopasites) verhoeffi** Mavromoustakis 1959.
Israel, at En Gedi. Egypt, at Cairo.

**Schmiedeknechtia (Schmiedeknechtia) walteri** Schwarz 1993
Turkey. Recorded at Siirt.
Tribe Biastini

**Biastes brevicornis** (Panzer 1798)
Continental Greece. Turkey.
Bees in Turkey can be referred to subspecies **B. b. denesi** Tkalcu 1994.

**Biastes emarginatus** (Schenck 1853)
North Aegean Greece on Lesbos. Turkey.

**Biastes schmidti** Heinrich 1977
Central Turkey at Konya.

**Biastes truncatus** (Nylander 1848)
Turkey.
This bee is a cleptoparasite of **Dufourea dentiventris** and **Dufourea inermis** (Nylander 1848).

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Tribe Ammobatini

**Aethammobates prionogaster** Baker 1994
Egypt; Gebel Asfar.
This rare bee is only known from the male sex, on the wing in Late May. The district where it was recorded has been built upon and there is a need to survey to find out if this bee still survives. It is considered to possibly be a cleptoparasite of **Meliturgula**.

**Ammobates (Ammobates) ancylae** (Warncke 1983)
Turkey.

**Ammobates (Ammobates) armeniacus** Morawitz 1876
Turkey. Israel.

**Ammobates (Euphileremus) atrorufus** (Warncke 1983)
Eastern Turkey. Israel.

**Ammobates (Ammobates) atticus** Mavromoustakis 1968
Central Continental Greece.

**Ammobates (Ammobates) baueri** (Warncke 1983)
Eastern Turkey.

**Ammobates (Ammobates) biastoides** Friese 1895
The subspecies *A. b. globosus* Mavromoustakis 1954 on Cyprus. Turkey. Israel.
On Cyprus the bee was recorded in May and June by Mavromoustakis, sometimes visiting *Eryngium creticum*. This flower is a very important resource for many Mediterranean aculeates, primarily blooming in the high summer after May.

**Ammobates (Ammobates) depressus** Friese 1911
Turkey.

**Ammobates (Ammobates) dubius** Benoist 1961
Egypt.

**Ammobates (Ammobates) hellenicus** Mavromoustakis 1960
Central Continental Greece.
Mavromoustakis recorded both species on the wing in Attica during June.

**Ammobates (Ammobates) iranicus** (Warncke 1983)
Turkey, at Urfa. Iran.

**Ammobates (Euphileremus) latitarsis** (Friese 1899)
Both sexes on the wing from late March into June.

**Ammobates (Ammobates) mavromoustakisi** Popov 1944
Cyprus. Turkey. Israel.
Mavromoustakis noted that this bee although a cleptoparasite is an oligotrophic bivoltine species. The first brood appears on the wing in June and the second is still found in September. The bee visits *Centaurea hyalolepis and C. cilicica*. The second brood remains active into September, also visiting *Carlina lanata*. The host species is the Anthophorine bee *Tarsalia ancyformis mediterranea* Pittioni which visits the same species of flower. The autecology of this bivoltine system is not fully described.

**Ammobates (Phileremus) melectoides** (Smith 1854)

**Ammobates (Euphileremus) muticus** (Spinola 1843)
Libya at Tripoli.

**Ammobates (Ammobates) niveatus** (Spinola 1838)
Israel. Egypt, including Sinai.
Females on the wing early June in Israel.

**Ammobates (Euphileremus) oraniensis** (Lepeletier 1841)
Subspecies *A. o. anatolicus* (Warncke 1983) Turkey.

**Ammobates (Ammobates) persicus** Mavromoustakis 1968
Iran.
Ammobates (Ammobates) robustus Friese 1896
Central Turkey. Israel.
Reported visiting *Cephalaria* in mid June, Israel, by Mavromoustakis.

Ammobates (Ammobates) rostratus Friese 1899
Turkey. Israel.

Ammobates (Ammobates) sanguinea Friese 1911
Turkey.

Ammobates (Ammobates) semitorquatus (Warncke 1983)
Egypt.

Ammobates (Ammobates) similis Mocsáry 1894
Continental Greece at Thessaloniki. Eastern Turkey.

Ammobates (Ammobates) syriacus Friese 1899
Israel. Jordan.
Mavromoustakis noted females of this bee on the wing from early May in to June.

Ammobates (Ammobates) tassus (Warncke 1983)
Eastern Turkey. Israel.

Ammobates (Ammobates) tehranicus Mavromoustakis 1968
Iran.

Ammobates (Ammobates) vinctus Gerstaecker 1869
Continental Greece at Nea Keffisia and in Thrace.
In the Eastern Aegean on Rhodes and in Turkey the subspecies *A. v. setosus* (Morawitz 1871) occurs.

Parammobatodes minutus (Mocsáry 1878)

Parammobatodes rozeni Schwarz 2003
Israel.

Chiasmognathus aegyptiacus (Warncke 1983)
Israel. Egypt.
In Israel females recorded active in the Negev during mid May. A cleptoparasite of *Nomioideae*
species as are the other members of this Genus of minute bees.

Chiasmognathus orientanus (Warncke 1983)
A cleptoparasite of *Nomia minutissimus* (Rossi).

Chiasmognathus rhaeae Engel 2008
Iran; Tehran.
On the wing in early August.

**Pasites maculatus** Jurine 1807
On Cyprus recorded May to September and very active during June and July. Visits *Centaurea cilicica*, *Heliotropium europaeum*, *Teucrium polium micropodioides*, *Statice* and *Vitex*.
This bee, a member of a primarily sub-Saharan African genus, is a cleptoparasite of *Pseudapis* (Nominae) and the fascinating biology is researched in Rozen (1986).

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**Subfamily Apinae**

Tribe Ancylini

**Ancyla asiatica** Friese 1922
Turkey, Adana, Mut, Tunceli. Lebanon.
A summer bee found from June to August.

**Ancyla cretensis** Friese 1902
Aegean Greece on Crete. Turkey.

**Ancyla holtzi** Friese 1902
Recorded in June and July on Cyprus, visiting *Eryngium creticum*. In Iran recorded during May in steppelands at 1550 mtrs. In Turkey and Greece often on the wing during August.

**Ancyla nitida** Friese 1902
Turkey, Kars, Hakkari.
The subspecies *A. n. nigricornis* Friese 1902 reported from Continental Greece.

**Ancyla orientalica** Warncke 1979
On the wing June to August.

**Ancyla stolli** Friese 1922
Turkey. Syria. Lebanon. Iran, Fars.
On the wing in May at 1550 mtrs in Iran. This bee is generally on the wing from May into June.

**Glazunovia nigriceps** (Morawitz 1895)
Turkey. Iran.
On the wing during June and July. Popov reported this bee visiting *Centaurea calcitrapa* from the Central Asian part of the range.

**Tarsalia ancylliformis** Popov 1935
The subspecies **T. a. mediterranea** Pittioni 1950 is found on Cyprus. On Cyprus Mavromoustakis reported this bee as bivoltine, the first generation on the wing from June to July and the second in August and September. *Centaurea hyalolepis* and *Eryngium creticum* were visited in June and *Carlina lanata* from Late July and August. Both sexes were found to be common at *C. hyalolepis* in June and males and females also of the cleptoparasitic bee **Ammobates mavromoustakisi** Popov were amongst them. Mavromoustakis considered this was a cleptoparasite of the Tarsalia. Popov had determined this bee to be strongly oligotrophic during his researches in Tadjikistan.

**Tarsalia hirtipes** Morawitz 1895  
Iran, Churasan, Shiraz.  
On Cyprus the subspecies **T. h. cypriaca** Mavromoustakis 1952 is found on the wing during June and July and the nominate form is also active in Iran during these months. Flower visiting on Cyprus recorded for *Scolymus hispanicus*.

**Tarsalia mimetes** (Cockerell 1933)  
Egypt, Qina.  
This bee appears to have a Sudanic distribution.

**Tarsalia persica** (Warncke 1979)  
Iran, Bandar Abbas, Schiraz, Chuzistan.  
A steppic bee of the late spring and early summer when flying to *Centaurea*.

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Tribe Eucerini

**Eucera albopunctulata** Dours 1873  
Western Turkey.

**Eucera (Atopeucera) alfkeni** Risch 2003  
Syria. Lebanon. Israel.  
Appears on the wing during late March and active to early June.

**Eucera (Eucera) alopex** Risch 1999  
A Tunisian bee considered by Risch to probably be found in the border areas with Libya. Records in North Africa are for mid February and March but a single record also for early May.

**Eucera ampla** Walker 1871  
Egypt, Cairo.

**Eucera bibalteata** Dours 1873  
Greece, Islands.

**Eucera bidentata** Pérez 1887  
On the wing during March on Cyprus, visiting *Calendula persica, Achillea santolina, Cichorium pumilum, Fumaria, Erodium* and *Sinapis.* This bee has not been assigned to a subgenus.

**Eucera (Pteneucera) brevitarsis** Risch 1997
Southeastern Turkey; Hakkari.
On the wing from late May to mid June.

**Eucera caerulescens** Friese 1899
Cyprus. Central and southeastern Turkey. Israel.
On the wing March to May on Cyprus, flying to Lamiales and *Calendula persica.*

**Eucera (Pareucera) caspica** Morawitz 1873
North Continental Greece. Turkey.

**Eucera chrysopyga** Pérez 1879
North Aegean Greece on Lesbos.

**Eucera cineraria** Eversmann 1852
This bee has not been assigned to a subgenus.

**Eucera cinerascens** Walker 1871
Egypt, Sinai.

**Eucera (Stilbeucera) clypeata** Erichson 1835
Friese noted that in Europe the males of this bee fly to *Anchusa* and *Nonnea* during May and June but he recorded the females at *Trifolium.*
Found widely in Turkey on the wing from March to June.

**Eucera curvitarsis**
Mocsáry 1879
North Aegean Greece on Lesbos.

**Eucera (Eucera) cypria**
Alfken 1933
Rhodes. Cyprus. Iraq.
An early bee, Mavromoustakis recorded this on the wing from January to March on Cyprus, flying to *Mandragora officinarum, Asphodelus ramosus micropodioides, Oxalis corniculata, Lamium amplexicaule, Faba* and *Vicia.*

**Eucera dalmatica**
Lepeletier 1841
Mavromoustakis recorded this species on the wing from April to June on Cyprus, with flower visit records for *Echium sericeum* and *Statice sinuata*. Friese recorded this bee as a summer flier in Europe, visiting *Echium altissimum*.

**Eucera (Atopeucera) decipiens**
Alfken 1935
Quite widely recorded in eastern Turkey and from a number of localities in Syria.

**Eucera (Atopeucera) digitata**
Friese 1895
Greece; Aegean islands of Lesbos, Chios, Samos, Kos. Turkey; widespread from Ankara eastwards. Syria; Latakia, Dibbin, Homs, Cr. des Chevaliers, Jisr ash Shugur. Jordan. Iran; Tehran.

**Eucera (Eucera) dimidiata**
Brullé 1832
Cyprus. Turkey. Iran.
Reported on Cyprus from February to April, visiting *Oxalis corniculata*, *Eruca sativa*, *Rhaphanus*, *Sinapis alba*, *Asphodelus ramosus micropodioides*, *Vicia*, *Anthemis arvensis* and *Achillea santolina*.

**Eucera discoidalis**
Morawitz 1877
Turkey.

**Eucera (Rhyteucera) ebmeri**
Risch 1999
North Aegean Greece on Lesbos. Turkey; Balikesir, Bursa. Israel; Tabor.
Found during February in Israel and during April in Turkey.

**Eucera (Pteneucera) eucnemidea**
Dours 1873
North Africa.
Although not reported for Libya or Egypt it should be searched for in these countries.

**Eucera euroa**
Tkalcu (MS)
North Aegean Greece on Lesbos.

**Eucera (Atopeucera) excisa**
Mocsáry 1879
Turkey; Isparta, Konya, Erzurum, Agri and Hakkari.

**Eucera (Pileteucera) fasciata**
Risch 1999
On the wing during late May in Jordan. Active during mid July Ankara and in Iran. The peak of the flight season is in June.
**Eucera (Atopeucera) flavicornis**
Risch 2003
Turkey; Ankara eastwards.
Found on the wing from April through to July.

**Eucera (Atopeucera) friesei**
Risch 2003
Northern Israel.
A local montane bee active during May.

**Eucera fulvescens**
Walker 1871
Egypt, Cairo.

**Eucera furfurea**
Vachal 1907
On the wing March to April on Cyprus, recorded at *Echium sericeum*.

**Eucera (Atopeucera) gaullei**
Vachal 1907
On the wing from February to June. Flowers visited include early spring nectar and pollen resources among other plants, including *Asphodelus, calendula persica, Fumaria, Lamium amplexicaule, Achillea santolina, Echium sericeum, Calycotome villosa, Cistus villosus, Vicia cracca elegans* and *Onosma fruticosum*.
This bee can be found well above 2000 mtrs as well as at lower elevations.

**Eucera (Eucera) graeca**
Radoszkowski 1876
In Cyprus appears on the wing in March, visiting *Fumaria* and *Anchusa hybrida*.
Schmiedkenecht recorded this bee on Corfu.
Friese noted that in Europe males visit *Borago* and *Nonnea* and females fly to *Anchusa* during the month of May. The emergence of this bee in the Balkans may perhaps be timed to the flowering of the Boraginaceae as spring progresses from south to north through the range.

**Eucera grisea**
Fabricius 1793
Libya.

**Eucera (Pareucera) griseohirta**
Risch 2001
A steppic bee especially active during April.

**Eucera helvola**
Klug 1845
Both sexes on the wing during May and June in Lebanon, strongly attracted to *Cirsium syriacum*
there.

**Eucera (Atopeucera) hermoni**
Risch 2003
Active from April to May when recorded from sea level to 1600 mtrs.

**Eucera hirsuta**
Morawitz 1875
Turkey.

**Eucera (Eucera) interrupta**
Baer 1850
Greece, Greek islands. Turkey.

**Eucera kervillei**
Pérez 1911
Turkey.

**Eucera kilikiae**
Risch 1999
Turkey; Antalya.
Found on the wing during late March and early April.
This bee has not been placed to a subgenus yet.

**Eucera (Eucera) kullenbergi**
Tkalcü 1978
This handsome eucerine emerges during March and April, and on the wing into May. In Turkey recorded from Ankara eastwards.

**Eucera (Pteneucera) lanata**
Söndikov 1988
Eastern Turkey; Kars, Hakkari.
A bee of the mountains found on the wing up to 2300 mtrs during mid May to early July, the spring
and early summer of the highlands.

**Eucera (Pteneucera) laticeps**
Risch 1997
Eastern Turkey; Erzurum, Agri.
Emerges from later May and active to mid July.

**Eucera laxiscopa**
Alfken 1935
North Aegean Greece on Lesbos.
**Eucera major**
Risch (MS)
North Aegean Greece on Lesbos.

**Eucera maxima**
Tkalcü 1987
North Aegean Greece on Lesbos, Turkey, Syria.
Active on the wing from mid May to early July.

**Eucera meridionalis**
Dalla Torre & Friese 1895
Egypt.

**Eucera (Atopeucera) microsoma**
Cockerell 1922
North Aegean Greece on Lesbos. Widespread Turkey, Syria, Israel.
Found on the wing from April to June including a number of localities in Syria.

**Eucera (Atopeucera) minulla**
Risch 2003
Syria; Aleppo, Jordan; Amman.
Active during March and April. Recorded at Cruciferae.

**Eucera (Atopeucera) monticola**
Risch 2003
Turkey; Hakkari, Adiyaman.
A bee of the mountain springtime when on the wing from May, mainly during June, found up to 2600 mtrs.

**Eucera multesima**
Tkalcü (MS)
North Aegean Greece on Lesbos.

**Eucera (Eucera) nigrescens**
Pérez 1879
Continental Greece. North Aegean Greece on Lesbos, Crete, Turkey, Jordan, Iran. The bees of this species recorded in our area are of the subspecies *E. n. contraria* Tkalcu 1984.
Recorded as a pollinator of Almond and Cherry in the highlands of Jordan.
The nomad bee *Nomada sexfasciata* Panzer 1799 is cleptoparasitic on the nests of this bee.

**Eucera (Pteneucera) nigrifacies**
Lepeletier 1841
Found from March to July.

**Eucera (Eucera) nigrilabris**
Lepeletier 1841
Widespread Continental Greece, including Peloponnesos, Aegina, Delphi. Corinth. North Aegean Greece on Lesbos. Turkey; Adana, Konya. In Palestine and Israel the subspecies *E. n. orientis* Tkalcu 1984 is found. Within the rest of our area is the subspecies *E. n. rufitarsis* Tkalcu 1984. This eucerine appears on the wing during March and April and is noted visiting *Vicia dasycarpa* amid wooded terraced slopes.

**Eucera (Pareucera) nigrita**
Friese 1896

**Eucera notata**
Lepeletier 1841
Turkey. Egypt. Active during March and April.

**Eucera obsoleta**
Pérez 1911
North Aegean Greece on Lesbos.

**Eucera (Atopeucera) oreophila**
Risch 2003
Turkey; Adiyaman, Hakkari. A montane eucerine on the wing during June and found up to 2500 mtrs.

**Eucera (Hemieucera) paraclypeata**
Sitdikov 1988

**Eucera parnassia**
Pérez 1902
North Aegean Greece on Lesbos.

**Eucera parvicornis**
Mocsáry 1878
Greece, Corfu. Aegean Greece on Lesbos. Tinos, Rhodes. In Europe Friese noted that this bee visits *Nonnea* during May and June.

**Eucera parvula**
Friese 1895
Turkey.
**Eucera pedata**
Dours 1873
Greece, Islands.

**Eucera (Pteneucera) penicillata**
Risch 1997
North Aegean Greece on Lesbos. Widespread on Cyprus. Turkey. Widespread Syria. Jordan. Israel. On the wing from February in Cyprus, late March at least in Jordan and recorded as active to mid May in Syria.

**Eucera pilosa**
Walker 1871
Egypt, Cairo.

**Eucera (Pteneucera) pseudeucnemidea**
Risch 1997
Continental Greece. North Aegean Greece on Lesbos. Turkey. Syria. Israel. Iran. The flight season begins in March in the Aegean and Israel but rather later in Highland Turkey. The bee may be found into mid June.

**Eucera (Atopeucera) puncticolle**
Morawitz 1876
Continental Greece; Peloponnessos. Turkey; Antalya, Nevsehir, Marsin. Erzurum, Agri, Sivas, Develi, Kars. Active from May to early July.

**Eucera punctulata**
Alfken 1942
North Aegean Greece on Lesbos.

**Eucera (Atopeucera) pythagoras**
Risch 2003
Greece; Aegean islands of Lesbos, Samos. Turkey; very locally present including Aydin. Active during April and May, discovered on Samos frequenting steppic hillsides with pine trees and *Phlomis*.

**Eucera rhodia**
Tkalcü (MS)
North Aegean Greece on Lesbos.

**Eucera (Atopeucera) seminuda**
Brullé 1832
Widespread Continental Greece, Ionian islands on Corfu, North Aegean on Lesbos. Widespread throughout Turkey including Istanbul. In the European range Friese recorded males flying to *Anchusa officinalis* during April and females visiting *Trifolium pratense* during May.

**Eucera serraticornis**
Risch 1999
Eastern Turkey; Hakkari.
Males of this bee are found on the wing during June, in montane habitat to 1500 mtrs.
This bee has not been placed in a subgenus yet.

**Eucera sogdiana**
Morawitz 1875
Eastern Aegean Greece on Rhodes.
Subspecies *E. s. phrygiae* Tkalcu 1978 Turkey.

**Eucera (Atopeucera) spatulata**
Gribodo 1893
This North African species species may possibly be present in Libya.

**Eucera spectabilis**
Mocsáry 1881
Turkey.

**Eucera speculifer**
Pérez 1911
Turkey.

**Eucera (Atopeucera) spinipes**
Risch 2003
Turkey; Urfa, Gaziantep, Hakkari, Elazig, Malatya. Syria at a number of localities. Israel. Iran; Kasan, Persepolis.
On the wing from April to July.

**Eucera squamosa**
Lepeletier 1841
Central Continental Greece, including Athens and Patras, North Aegean on Lesbos. Turkey.

**Eucera subtilis**
Tkalcü (MS)
North Aegean Greece on Lesbos.

**Eucera syriaca**
Dalla Torre
Syria.

**Eucera taurica**
Morawitz 1870
North Aegean Greece on Lesbos.

**Eucera thoracica**
Spinola 1838
Egypt.
Eucera (Pteneucera) tibialis
(Morawitz 1837)
Turkey. Southeastern Iraq; Baiji.
This bee is predominantly a Central Asian species.

Eucera tomentosa
Morawitz 1875
Iran.

Eucera trivittata
Brullé 1832
Continental Greece.

Eucera (Atopeucera) troglodytes
Risch 2003
Turkey; Mardin, Siirt. Syria. Israel. Jordan; north Shuna.
On the wing from late April into June.

Eucera velutina
Smith 1879
Turkey.

Eucera (Eucera) vidua
Lepeletier 1841
This western Mediterranean bee is included as it may occur in Libya.

Eucera vulpes
Brullé 1832

Cubitalia (Cubitalia) baal
Engel 2006
North Israel, Hermon.
Both sexes on the wing at 1500 mtrs on Mount Hermon during the second half of April where noted flying to Symphytum brachycalyx.

Cubitalia (Cubitalia) boyadjiani
(Vachal 1907)
Southeastern Turkey; Adana, Hatay.
Active during June.

Cubitalia (Cubitalia) breviceps
(Friese 1911)
Southeastern Turkey.
A local montane bee active during May.

Cubitalia (Cubitalia) monstruosa
(Risch 1999)
Turkey; Hakkari, Kayseri, Kars.
A Highland species of the east of Turkey active upon the wing during late May and early June.

**Cubitalia (Cubitalia) morio**
(Friese 1922)
Northern Continental Greece. Widespread through Turkey. A summer bee emerging late in May and active into August.

**Cubitalia (Pseudeucera) parvicornis**
(Mocsáry 1878)
Continental Greece.
An oligolege of the Boraginaceae.

**Cubitalia (Cubitalia) tristis**
(Morawitz 1876)
Eastern Turkey; Mus, Kars.
On the wing later in May and the first half of June.

**Tetralonia (Synhalonia) alternans**
(Brullé 1832)

**Tetralonia amoena**
Walker 1871
Egypt.
Reported from the Red Sea region.

**Tetralonia atrata**
(Klug 1845)
Egypt.

**Tetralonia (Synhalonia) berlandi**
Dusmet 1926
Turkey. Iran.

**Tetralonia blanda**
Walker 1871
Egypt.
reported from the Red Sea region.

**Tetralonia (Synhalonia) cressa**
Tkalcu 1984
Greece; Crete.
An endemic island bee of Crete active during April and May.

**Tetralonia cunicularia**
(Klug 1845)
Egypt.
Reported on the wing during March in Egypt.

**Tetralonia decora**
Walker 1871
(research distribution).

**Tetralonia hungarica**
(Friese 1895)
Greece, Corfu.
Flower records given from Europe by Friese are of males visiting *Anchusa* and *Nonnea* during May and females visiting *Centaurea cyanea* during June. *Medicago sativa* is also a host.

**Tetralonia invaria**
Walker 1871
Egypt.
Recorded from the Cairo District.

**Tetralonia (Synhalonia) lucasi**
Gribodo 1893

**Tetralonia malvae**
(Rossi 1790)
The subspecies *T. m. crinita* Klug is found in the Greek Aegean on Rhodes. Turkey. Syria. Egypt. A summer bee appearing in July when visiting *Malva*.

**Tetralonia (Synhalonia) mavromoustakisi**
Cyprus.
An island endemic species of Cyprus found on the wing from April to June.

**Tetralonia (Synhalonia) mediterranea**
(Friese 1895)

**Tetralonia (Synhalonia) nadigi**
(Friese in Schulthess 1924)
North Africa.
This species could be present in Libya or Egypt and is included here for reference.

**Tetralonia olivieri**
(lepeletier 1841)
Iraq.

**Tetralonia persica**
(Friese 1895)
Egypt. Iran.

**Tetralonia ruficollis**

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(Brullé 1832)
Continental Greece, Athens. Syria. Iran.

**Tetralonia spoliata**
Walker 1871
Palestine and Israel.

**Tetralonia tricincta**
(Erichson 1835)
On the wing in May in Palestine, recorded there visiting *Ballota*.
Recorded at *Salvia silvestris* in Europe.

**Tetralonia turcestanica**
(Dalla Torre 1895)
Iran.
A desertic bee of Central Asia.

**Tetralonia vetusta**
Walker 1871
Egypt.
Red Sea region.

**Tetralonia (Synhalonia) zeta**
(Dalla Torre 1896)
On the wing February and March on Cyprus where Mavromoustakis recorded it as an oligotrophe of *Prunus dulcis* (Almond) and *Crataegus azarolus*.

**Tetraloniella alticincta**
(Lepeletier 1841)
North Aegean Greece on Lesbos.
Females of this bee have an area of specialised pollen-collecting hairs on gastral sternites 3 to 5 which are adapted for gathering pollen efficiently from the flowers of *Inula* and *Pulicaria*. (Müller 2008). This bee is oligolectic on *Inula ensifolia*, *Inula germanica* and *Pulicaria dysenterica*.

**Tetraloniella basizona**
(Spinola 1838)
Egypt.

**Tetraloniella fulvescens**
(Giraud 1863)
Continental Greece, Loutraki.
An oligolege of *Inula candida*, *Inula ensifolia*, *Inula germanica*, *Inula hirta*, *Inula montana* and *Inula salicina* found on the wing during June. Females possess an especially adapted pollen-gathering structure on sternites 3 to 5 enabling effective foraging from these host plants.
Tetraloniella glauca
(Fabricius 1775)
On the wing from June to August, especially active during July.

Tetraloniella graja
Eversmann 1852
In Syria the subspecies T. g. syriaca Friese is described
A summer Tetraloniella and in Europe recorded visiting Centaurea arenaria during July.

Tetraloniella inulae
(Tkalcu 1979)
Cyprus. Iran.
Typically active in high summer, recorded during July and August. This bee inhabits open calcareous rocky hill slopes with phryganic vegetation where Inula grows. Original observations by Tkalcu in Albania, Continental Europe, discovered that Inula ensifolia, Inula germanica and Inula oculus-christi were all host flowers. (Müller 2008) describes the especially adapted pollen-gathering structure possessed by females of this bee and some congeners and adds Inula spiraeifolia to the list of known hosts of this bee.

Tetraloniella julliani
Pérez 1879
North Aegean Greece on Lesbos.
The subspecies T. j. biroi Mocsáry 1879 is found in Turkey; Mersin. A further subspecies, T. j. ebmeri Tkalcu 1979 is found in Iranian mountains up to 2000 mtrs.
Active in July.

Tetraloniella nana
Morawitz 1873
Friese notes that this bee is rather rare and only locally makes an appearance. It is on the wing during July.

Tetraloniella pollinosa
(Lepeletier 1841)
A steppic summer bee and the range not known or certain in our Region.
In Europe recorded visiting Scabiosa and Mentha.

Tetraloniella ruficornis
(Fabricius 1804)
The possible range and status in our Region not known but a summer species visiting Centaurea during July. There is also a variant or subspecies T. r. biroi Mocsáry
Tribe Anthophorini

**Amegilla albigena**
Lepeltier 1841
In Egypt a subspecies *A. a. afra* (Priesner 1957) occurs.
In flight through the summer, June to September, on Cyprus. Flower visiting records from Cyprus for *Rubus ulmifolius anatolicus, Echium sericeum, Anchusa, Statice, Nepeta troodi, Thymus capitatus, Teucrium cyprium, Salvia grandiflora willeana, Ballota nigra* and *Ballota integrifolia.*
In Turkey the male of this species recorded from *Onopordum* during summer.
A visitor to orchards of Almond and Cherry in Jordan.
Present in desert valleys of Egypt and the northern and Red sea coasts to Sinai where active from April right through to January.

**Amegilla andresi**
(Friese 1914)
Egypt. Libya.
Widespread and locally common in Egypt where active from April until November. Recorded during July from Libya.

**Amegilla argophenax**
Engel 2007
Egypt; Birket Qarun.
Recorded in October.

**Amegilla byssina**
(Klug 1845)
Egypt.
Common and widespread and active all year in Egypt.

**Amegilla cana**
(Walker 1871)
Possibly present in Egypt. reported from the vicinity of the Red Sea.

**Amegilla candidella**
(Priesner 1957)
Egypt.
Described in the female recorded on the wing in Egypt during June.

**Amegilla carnea**
(Gribodo 1894)
Egypt.
Found in Egypt during April to June. Uncommon but widespread.

**Amegilla crocea**
(Klug 1845)
Egypt.
A southern species, presumably Sudanic. Recorded by Priesner in Egypt from Kom Ombo, Assouan, Mersa halaib and Gebel Alba

**Amegilla deceptrix**  
(Priesner 1957)  
Northeast Egypt and Sinai.  
On the wing in Egypt from April to October. The full range in Egypt may be more extensive.

**Amegilla garrula**  
(Rossi 1790)  
Turkey.

**Amegilla harmalae**  
Morawitz  
Cyprus, Lebanon.  
On the wing June and July.

**Amegilla harttigi**  
(Alfken 1926)  
Iraq, Basra.

**Amegilla klugi**  
(Priesner 1957)  
Egypt.  
Rather common and widespread in Egypt from April through to December.

**Amegilla latizona**  
(Spinola 1838)  
Egypt.  
Priesner found this bee widespread in Egypt from May through to September.

**Amegilla litorana**  
(Priesner 1957)  
Egypt.  
recorded twice from Egypt, in May and in August from Mersa Matrouh and Sinai.

**Amegilla lutulenta**  
(Klug 1845)  
Israel. Egypt.  
Primarily a bee of the Negev desert in Israel where found on the wing during March and April with floral visits recorded most often to *Centaurea pallescens* and also *Carduus argentatus*.

**Amegilla magnilabris**  
Fedtschenko 1875  
Rather scarce on Lesbos in comparison with some other members of the genus. Priesner recorded this bee during March in Egypt where it was rarely recorded. Reported on the wing during July by Friese, visiting *Anchusa*.
Amegilla montivaga  
(Fedtschenko 1875)  
Egypt.  
Reported from Cairo by Friese, this is a mainly Central Asian bee.

Amegilla mucorea  
(Klug 1845)  
Egypt.  
Widespread in Upper Egypt and uncommon but present in the canal zone and Cairo. Found from January to November.  
Friese noted that this bee flies to Mentha longifolia and is also attached to Acacia in some parts of the range.

Amegilla nivosella  
(Priesner 1957)  
Egypt.  
Priesner described this bee as local in Egypt, where active on the wing during May and June.

Amegilla ochroleuca  
Pérez 1879

Amegilla omissa  
(Priesner 1957)  
Egypt.  
Females only recorded by Priesner in Egypt. On the wing during April and local in distribution.

Amegilla pipiens  
(Mocsáry 1879)  
Egypt.  
Not common but possibly widespread in Egypt, including Sinai, where Priesner reports the species active from March to May.

Amegilla pulverea  
Walker 1871  
Possibly present in Egypt.  
Reported from the region of the Red Sea.

Amegilla punctifrons  
(Walker 1871)  
Egypt.  
Common in Egypt in Central and Upper parts of the Country, the Red Sea Region and the Canal zone. Active from April to October.

Amegilla quadrifasciata  
(Villiers 1789)  
A summer bee. On the wing from June in Lebanon and recorded June to August in Cyprus. There are also records from September to December. The flight season recorded from Turkey is the same, from July to September and with floral records to Salvia. Flower visits in Cyprus recorded to Ononis, Broteroa corymbosa, Inula viscosa, Carlina lanata, Carduus, Cirsium hamaepeuce camptolepis, Carthamus boissieri, Cistus villosus creticus, Silene, Heliotropium europium, Echium sericeum, Statice virgata, Scutellaria hirta, Rubus ulmifolius anatolicus, Salvia grandiflora willeana and Thymus capitatus.
Priesner found this bee in Central Egypt and along parts of the northern coast, where on the wing from March through to December.

**Amegilla salviae**  
(Morawitz 1876)  
From Turkey a record of female flower visiting to Myosotis during July.  
A summer bee on the wing July and August in Cyprus, recorded visiting Echium sericeum.  
Friese reported an association with Anchusa during August in the European range.

**Anthophora saussurei**  
Fedtschenko 1875  
Iran.  
This is a Central Asian species.

**Amegilla savignyi**  
(Lepeletier 1841)  
Egypt.  
Common throughout Egypt including Sinai and found throughout the year.

**Amegilla torensis**  
(Priesner 1957)  
Egypt.  
Described from a single female discovered in southern Sinai.

**Anthophora aegyptiaca**  
Dalla Torre & Friese 1895  
Israel. Egypt.  
A common hibernal bee in Egypt from August through to April, mainly during the winter and found throughout Central and Upper Egypt.

**Anthophora aestivalis**  
Panzer 1801  
Reported to be the commonest Anthophora species in parts of Eastern Turkey, where found upon the wing from late April to the end of August. In these areas of Turkey the bee visits Legumes such as Onobrychis sativa, Medicago sativa and Trifolium pratense and has a role in pollinating some of these flower species.  
In Jordan also known as a pollinator of fruit trees.  
Fairly widespread in Israel where found from April to late May. Floral records there are for Cerasus microcarpus and Echium angustifolium.
**Anthophora affinis**  
Brullé 1832  
Continental Greece.

**Anthophora aflabellata**  
Gribodo 1926  
Libya.

**Anthophora agama**  
Radoszkowski 1869  
Recorded from Continental Greece during May.  
Reported on the wing in Turkey during June and July where visiting *Arctium lappa, Cirsium* and *Salvia*.  
Appears in Israel from the latter half of March and especially active in May, present into the first half of June  
This anthophorine is not a true desertic species but is found in the steppe-desert transition zone in, for instance, the Northern Negev desert.  
As with a number of species in the genus there is a strong attachment to flowers in the Boraginaceae.  
The species of the Palestinian flora recorded as hosts are:- *Anchusa italica, Anchusa undulata, Anchusa strigosa, Echium angustifolium, Salvia palaestina* and *Centaurea iberica*.

**Anthophora albomaculata**  
Radoszkowski 1874  
Iran.

**Anthophora albosignata**  
(Friese 1886)  
Fairly common in parts of the north coast of Egypt.

**Anthophora alfieri**  
Alfken 1942  
Egypt.  
Desert areas. (Priesner notes synonymy needs to be checked with *A. cyrenaica* GRIBODO).

**Anthophora alfkenella**  
Priesner 1957  
Egypt.  
Described from two localities in Egypt where discovered on the wing during April.

**Anthophora alternans**  
(Klug 1845)  
Egypt.  
Priesner reported this bee as uncommon in Egypt during April and May.
Anthophora ambitiosa
Alfken 1935
Israel.
Recorded by Bytinski-Salz from the coastal plain of Israel during April and May.

Anthophora annulifera
Walker 1871
Possibly present in Egypt.

Anthophora arabica
Priesner 1957
Israel. Egypt.
On the wing late March and early April in Egypt, males visiting Stachys aegyptiaca. Priesner considered this bee as possibly very rare in Egypt, yet it has been found to be at least widespread in Israel from mid February and March. Flower visits to the Palestinian flora are reported for especially Astragalus spinosus, also Moricandia nitens.

Anthophora armata
Friese 1905
The subspecies A. a. tetra Friese 1922 in Egypt.
On the wing during February.
The nominate A. a. armata is an Ethiopian species.

Anthophora atriceps
Pérez 1879
Egypt.
Fairly common around the northern coastal areas of Egypt from February to April.

Anthophora atricilla
Eversmann 1846
Turkey.
The subspecies A. a. aegyptorum Priesner 1957 is common along parts of the north coast of Egypt.

Anthophora atroalba
Lepeletier 1841
Greece, North Aegean on Lesbos. Turkey.
Common in forage legume fields in Eastern Turkey and an important pollinator of Onobrychis and Medicago. Found on the wing in these habitats with the more common Anthophora aestivalis. Also visits Taraxacum officinale and Anchusa.

Anthophora biciliata
Lepeletier 1841
In Turkey reported active during June from the eastern Provinces of Erzurum and Erzincan where noted visiting Onobrychis sativa and Cirsium.
In Israel recorded from the coastal plain, though the majority of records are from montane regions including the Carmel massif and the Mountains of Judea. Active primarily in later March and the first half of April.
Flower hosts recorded from among the Palestinian flora are: *Asphodelus aestivus, Anchusa strigosa, Anchusa undulata, Echium judaeeum, Echium angustifolium, Salvia fruticosa, Trifolium clypeatum, Trifolium purpureum, Arbutus andrachne and Cistus incanus*. 

Visits are especially noted to *Anchusa strigosa* for this bee.

**Anthophora bicincta**  
(Fabricius 1793)  
Egypt.

**Anthophora bimaculifera**  
Walker 1871  
Possibly found in Egypt.  
Friese noted that this bee was reported from the region of the Red Sea.

**Anthophora blanda**  
Pérez 1895  
Israel. Egypt.  
Uncommon in Egypt and local on the wing in March and April. Found in Cairo among other localities.  
Found to be widespread in Israel away from the Negev desert. On the wing from March to June and especially recorded from the Mountains of Judea. Flower visits to the Palestinian flora are especially frequent for *Echium angustifolium*, an important member of the Boraginaceae in the Region and not one of the earliest species to blossom. Other flower visits are to *Echium judaeeum, Anchusa aegyptiaca and Salvia fruticosa*. 

**Anthophora borealis**  
Morawitz 1864  
Eastern Turkey; Erzurum.  
Reported to be quite common at *Centaurea* in eastern Turkey during July and August.

**Anthophora caelebs**  
Gribodo 1924  
Israel.  
A desert species in Israel, recorded especially throughout the Negev, in the Dead Sea region and in Sinai. This bee is mainly active from February to early April. 
Flower visiting to the Palestinian flora includes a strong desertic element, with especially frequent visits recorded to *Astragalus spinosus*, also noted at *Onosma orientalis, Echium judaeeum, Papaver sp. and Hyoscyamus desertorum*. 

**Anthophora canescens**  
Dours 1865  
An early bee, on Cyprus emerging in late January and February, polylectic and successful, visiting *Prunus dulcis, Faba, Mandragora officinarum, Muscari, Lamium amplexicaule, Oxalis corniculata, Crataegus azarolus, Scilla maritima* and *Asphodelus*. In February visiting *Lycium europaeum* among sand dunes.  
In Israel found from late February to early April, with the peak of activity occurring in March. Flower visiting records for the Palestinian flora are for *Calycotome villosa, Lamium moschatum, Vicia*
villosa, Asphodelus aestivus, Amygdalus communis, Echium judaeum, Anchusa strigosa, Trifolium clypeatum, Bellevalia flexuosa, Lavandula and Rosmarinus officinale

**Anthophora carnea**
Gribodo 1894
Egypt.
Known from a single specimen from Cairo.

**Anthophora caroli**
Pérez 1895
Israel.
In Israel Recorded in January and March to April. Widespread there second half of March to mid-April. It is especially frequent at the steppe-desert transition zone where the plant *Echium judaeum* occurs, and also visits *Echium angustifolium* and *Moricandia nitens*.

**Anthophora caucasica**
Radoszkowski 1874
Syria.

**Anthophora cinerascens**
Lepeletier 1841
In Israel a pattern of infrequent records with an extended flight phenology in diverse landscape; from February to early July from montane, lowland and some desert areas. Flower visits recorded for *Anchusa strigosa*.

**Anthophora combusta** Dours 1869
Egypt.

**Anthophora concinna** (Klug 1845)
Egypt.
Not rare in Egypt. On the wing from March to June and widespread including Giza and Cairo.

**Anthophora concolor** Alfken 1926
Syria. Egypt.
Described from Egypt from a single female specimen.

**Anthophora crassipes** Lepeletier 1841
Turkey; Erzurum, Bitlis. Israel.
Recorded in July in Turkey flying to *Cirsium*.
Scarcely recorded in Israel during January and early February where it is a desert anthophorine with a flower visiting record for *Ononis natrix*.

**Anthophora crinipes** Smith 1854
North Aegean Greece on Lesbos. Turkey; Mus, Erzurum. Israel.
Reported active in June from eastern Turkey and flower visiting records there are for *Lepidium, Lonicera and Ajuga*. 

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On the wing during March and April in Israel and a nest site in the Carmel Massif was located in a cave within a north facing cliff where freshwater seepage was available within the cave. This bee was also recorded visiting nest holes in the deep shade of a Roman ruin and visiting vertical eroding lithosol cliff faces.

A record from Israel of predation of this bee by the Arachnid *Synaema globosum*.

A male noted patrolling and defending a patch of *Moricandia nitens* which was growing around a bush of *Retama raetum* suggests resource defence territoriality and mating occurring at floral resources.

Flower visit records from the Palestinian flora are *Podosoma orientalis, Anchusa strigosa, Salvia fruticosa, Styrax officinalis, Echium angustifolium, Alkanna strigosa, Anchusa aegyptiaca, Ononis natrix and Onosma*.

**Anthophora dalmatica** Pérez 1902
North Aegean on Greece.

**Anthophora deserticola** Morawitz 1873
Israel.
Records for April and July from Israel, where found in the Negev desert but scarcely recorded.

**Anthophora desertorum** Priesner 1957
Egypt.
On the wing in March and April about the valleys of the Eastern Desert, Egypt.

**Anthophora dispar** Lepeletier 1841
Syria. Israel. Egypt.
In Egypt the subspecies or variant *A. d. niveohirta* Friese 1922 is reported.
Common about the Nile Delta from December to March.
In Israel appears towards late January and found frequently by February through March. The distribution there extends from the Central Negev Desert northwards to Hermon. This bee visits a wide selection of flowers of the Palestinian flora and especially seems attached to *Asphodelus aestivus* and *Prasinum majus*. Other members of that flora recorded as hosts are *Echium angustifolium, Echium judaenum, Anchusa strigosa, Anchusa undulata, Bellevalia flexuosa, Calycotome villosa, Lycium shawii, Retama raetam, Ononis natrix, Rosmarinus officinale, Salvia horminum, Salvia fruticosa, Anagyrus foetida, Trifolium clypeatum, Astragalus lanatus, Arbutus andrachne, Narcissus tazetta, Amygdalus communis and Helianthemum vesicarium*,
A bilateral gynandromorph has been recorded from *Anchusa strigosa* during April.

**Anthophora disparilis** Friese 1922
Found on the wing from January to April in northern regions of Israel and the Mountains of Judea.
Flower visiting records to the Palestinian flora are for *Amygdalus communis, Asphodelus aestivus, Rosmarinus officinale* and *Anagyrus foetida*.

**Anthophora dufourii** Lepeletier 1841
Recorded widely in Israel where active during March and April.
Flower visits to the Palestinian flora show a classical vernal anthophorine profile of Boraginaceae, Lamiales and some visits to Compositae. The bee is especially noted at *Salvia fruticosa* and also visits
Echium judaeum, Echium angustifolium, Anchusa strigosa, Onosma orientalis, Salvia hierosolymytana, Salvia dominica and Crepis sancta,

**Anthophora dusmeti** Guiglia 1933  
Libya.  
Cyrenaica.

**Anthophora elbana** Priesner 1957  
Egypt.  
The male of this species found on the wing during February and March.

**Anthophora erschowi** Fedtschenko 1875  
Turkey. Israel. Libya.  
On the wing in Israel from early February well into April, with one or two records into May. Widespread there including the Negev Desert and northern montane districts. This bee seems to occupy a dispersed polylectic vernal niche and there are flower visit records for a good range of the Palestinian flora:-- Echium judaeum, Matthiola aspera, Erucaria rostrata, Alkanna sp., Anchusa aegyptiaca, Lavandula coronopifolia, Anchusa strigosa, Reboudia pinnata, Moricandia nitens, Bellevalia desertorum, Senecio vernalis, Helianthemum vesicarium, Diplotaxis harra, Eruca sativa and Brassica sp..

**Anthophora erubescens** Morawitz 1880  
Israel.  
Rarely recorded in Israel during April.

**Anthophora extricata** Priesner 1957  
Israel. Egypt.  
Found in desert areas of Egypt from February to April.  
A early vernal desert phenology in Israel where recorded January and February with floral records for Moricandia nitens and Diplotaxis acris.

**Anthophora facialis** Priesner 1957  
Egypt.  
Priesner noted males from March and females from April in the Eastern Desert, Egypt.

**Anthophora fallaciosa** Priesner 1957  
Egypt.  
The male of this species described from Egypt at Amriah where found flying during April.

**Anthophora fastuosa** Gribodo  
Libya.

**Anthophora fayoumensis** Priesner 1957  
Egypt.  
Active in March to May throughout Central and Upper Egypt including southern regions of the Eastern Desert.

**Anthophora festae** Gribodo
Libya

**Anthophora finitima** Morawitz 1894
Turkey.

**Anthophora flabellata** Priesner 1957
Israel. Egypt.
Found on the wing in March and May in the deserts of Egypt.
Very local in Israel; recorded in early April there and with a flower visiting record for *Echium rauwolfii*.

**Anthophora fratercula** Gribodo
Libya

**Anthophora freimuthi** Fedtschenko 1875
Israel.
In Israel often found in lowlands and deserts from the Lower Jordan Valley to Central and southern Negev, Judean Desert, the Dead Sea region and to Sinai. The bee is found up to 1000 mtrs in mountain desert. Noted from late February to April with a peak of activity in March, recorded inspecting possible nesting sites in the vertical clay bank of a Wadi.
Flower hosts recorded among the Palestinian flora show a desertic profile: *Astragalus spinosus, Moricandia nitens, Onosma orientalis, Anchusa strigosa* and *Papaver sp.*

**Anthophora fulvipes** Eversmann 1846
Turkey; Van, Tatvan, Erzurum.
Found during June and July in eastern Turkey visiting *Centaurea, Onopordum* and *Salvia*.

**Anthophora fulvitarsis** Brullé 1832
Turkey; Mus, Erzurum. Israel.
Reported on the wing during June from eastern Turkey where noted flying to *Malvea, Lepidium, Salvia* and *Cirsium*.
Widespread in Israel and found quite strongly active from early February through March.
Flowers visiting records from amongst the Palestinian flora are *Echium judaem, Erucaria rostrata, Anchusa strigosa, Alkanna and Lycium shawii*.
In the Negev Desert during March males are found patrolling the edges of vertical clay and fluviatile loess cliffs where females construct their nest mines in the vertical faces.

**Anthophora fulvodimidiata** Dours 1869
Egypt.
Locally common in Egypt during July to September.

**Anthophora fumipennis** Alfken 1926
Egypt.
On the wing in May. Known from a single female specimen.

**Anthophora furcata** (Panzer 1798)
Turkey; Erzurum.
Reported from eastern Turkey during August where flower visiting noted to *Cirsium* and *Arctium lappa*.

**Anthophora galalensis** Priesner 1957  
Egypt.  
Recorded during March, Priesner considered this to be a probably rare and local bee.

**Anthophora ghigii** Gribodo 1924  
Libya.

**Anthophora guigliae** Dusmet  
Libya.

**Anthophora heliopolitensis** Pérez 1910  
Lebanon. Israel.  
In Lebanon on the wing during May and June and flying to *Stachys*.  
Local in Israel. A late spring and early summer species of May and June recorded visiting *Anchusa italic* and *Echium angustifolium*.

**Anthophora helouanensis** Priesner 1957  
Egypt.  
The male of this bee described. On the wing in April.

**Anthophora hermanni** Schwarz & Gusenleitner 2003  
Egypt.

**Anthophora hispanica** (Fabricius 1787)  
Active in northern areas of Egypt during February to April.  
In Israel a desert bee, found during March and April throughout the Negev and northwards to the coastal plain.  
Flower visits are often to desertic elements within the Palestinian flora;– *Echium angustifolium, Moricandia nitens, Stachys aegyptiaca* and *Astragalus spinosus*.

**Anthophora humilis** (Spinola 1838)  
Egypt.  
A rare bee on the Egyptian north coast.

**Anthophora ilepida** Walker 1871  
 Possibly present in Egypt.  
An Arabian species from the vicinity of the Red Sea. One of a number of anthophorines described by Walker whose range appears to be Arabian.

**Anthophora inclyta** Walker 1871  
Egypt.  
Active from March to May, this bee is a southern species of the Red Sea coast, Wadi Ambaga, Gebel Elba and Sinai.
**Anthophora intermixta** Gribodo
Libya.

**Anthophora intricata** Gribodo 1924
Libya.

**Anthophora kapnoptera** Alfken 1936
Egypt.

**Anthophora lanata** (Klug 1845)
Found on the wing in north coastal Egypt during February and March, a typical flight period for one of the larger endothermic vernal Anthophorine bees.

**Anthophora lepida** Eversmann 1848
Iran.

**Anthophora libyphaenica** Gribodo 1893
Israel. Libya.
Widespread in Israel, appearing from late january and then frequent by February into March.
A range of floral resources visited in the Palestinian flora:- *Eruca sativa, Lycium shawii, Erucaria boveana, Retama raetam, Reboudia pinnata, Moricandia nitens, Astragalus lanatus* and *Bellevalia stepporum*.

**Anthophora lutescens** Walker 1871
Possibly present in Egypt. An Arabian species.

**Anthophora lutulenta** (Klug 1845)
Egypt.
Found from February to May. Apparently local but not rare.

**Anthophora lydia** Tkalcu 1994
Turkey, southwest Anatolia.
Recorded during mid May.

**Anthophora maculigera** Priesner 1957
Egypt.
In flight during May along the north coast of Egypt and described from a series of males collected by Ferrante. Priesner states that this may be the male of one of the other species which are only known in the (entirely black) female sex.

**Anthophora melaleuca** Walker 1871
Egypt.

**Anthophora mellina** Priesner 1957
Egypt.
Found from several localities in Egypt.
Anthophora moderna Morawitz 1878
Continental Greece. Turkey.

Anthophora moricei Friese 1899
Egypt.
An hivernal anthophorine in Egypt from October to April when common in desert valleys and found also in Upper Egypt and the Elba Mountains.

Anthophora mucida Gribodo 1873
North Aegean Greece on Lesbos. Turkey; Erzurum. Egypt.
Reported as active locally in Turkey from May to July visiting Anchusa and Onobrychis sativa.
Priesner reported a single male of this species collected by Frauenfeld as the only record for Egypt, perhaps alluding to Friese who reported this bee from Alexandria.

Anthophora muscaria Fedtschenko 1875
Israel.
On the wing in Israel during March in the Central Negev and Sinai, though infrequently recorded.

Anthophora nigriceps Morawitz 1886
Lebanon. Israel. Syria.
Recorded during mid March from Syria.
Reported by Mavromoustakis active during May in Lebanon where visiting Asphodelus.
In Israel this bee has a rather northern and montane distribution and found from February to May.
There is a good range of records for species in the Palestinian flora; Eremurus libanoticus, Onobrychis comuta, Pyrus syriaca, Asphodelus aestivus, Amygdalus communis, Anchusa undulata, Anchusa strigosa, Salvia horminum, Rosmarinus officinale, Gagea chlorantha, salvia fruticosa, Echium angustifolium, Trifolium clypeatum and Alkanna strigosa.

Anthophora nigrilabris Alfken 1926
Israel. Egypt.
Local in Egypt with Priesner reporting four localities for the Country.

Anthophora niveiventris Friese 1919
Egypt.
Priesner reported this to be a local species in Egypt, on the wing there in February and March.

Anthophora nubica Lepeletier 1841
Egypt.
Found in Egypt during February. A little-known desert bee of the Sudanic fauna.

Anthophora oraniensis Lepeletier 1841
Egypt.
A rare anthophorine in Egypt. On the wing during February.

Anthophora orientalis Morawitz 1878
A variety or subspecies A. o. flaviventris Friese reported from Syria.
In eastern Turkey reported on the wing from late April through to June. Here this bee appears to be attracted to fruit trees and noted flying to *Prunus cerasus, Prunus domestica, Prunus armeniaca* and also visiting *Salix*.

Recorded in Israel from the Lower Jordan valley northwards, mainly active from later March and in April with some records into May.

There are a number of flower species in the Palestinian flora recorded as hosts, and as with a number of other anthophorine bees there is the possibility of a rational pattern where individual bees are foraging from more than one species of flower. Species recorded are *Eremurus libanoticus, Anchusa undulata, Anchusa strigosa, Echium angustifolium, Alkanna strigosa, Amygdalus communis, Rosmarinus officinale* and *Trifolium purpureum*.

**Anthophora pauperata** Walker 1871
Egypt. Israel.
Both sexes rarely recorded in the Sinai Desert during late March.

**Anthophora pedata** Eversmann 1852
Eastern Turkey; Erzurum.
Recorded rarely in eastern Turkey in February and from May to July, with most records falling in June.

**Anthophora perlustrata** Priesner 1957
Egypt.
The male discovered on the wing in April at Taloun, Egypt.

**Anthophora persica** Radoszkowski 1876
Iran.

**Anthophora plagiata** (Illiger 1806)
Turkey; Erzurum, Kars.
Common on the wing in some areas of Turkey from early June until late July. This bee is polylectic to some extent and one of the anthophorine species attracted to clover meadows. It appears to share a foraging strategy shared with some others of the numerically succesful anthophorines where visits are frequent to Legumes but resources are also Boraginaeae, Lamiales and some plants in other Families. Flower record visits are for *Onobrychis sativa, Trifolium pratense, Trifolium repens, Anchusa, Echium vulgare, Lamium album, Salvia* and *Sinapis arvensis*.

**Anthophora plumipes** Pallas 1772
In eastern Turkey on the Erzurum Plain this bee is a visitor and pollinator of *Prunus armeniaca, Prunus domestica* and *Malus domestica*. It also visits *Salix*. Flies during April and May.
In Jordan a pollinator of Almond and Cherry.
Found on the wing in Israel from February to May.
During April about the Carmel Massif nesting was observed within caves on north facing slopes where water is available from seepages.
This succesful anthophorine visits a wide selection of plants in the Palestinian flora with records for *Asphodelus aestivalis, Nepeta ciliaris, Salvia hierosolymitana, Eremurus libanoticus, Rosmarinus officinale, Trifolium clypeatum, Salvia fruticosa, Bellevia flexuosa, Prasium majus, Begonia sp., Symphytum palaestinum, Lamium moschatum, Pyrus syriaca, Amygdalus communis, Echium
judaeum, Lavandula sp., Trifolium purpureum, Pyrus var., Anchusa strigosa, Asphodeline lutea, Serapias levantina, Lupinus palaestinus, Salvia horminum, Anagyris foetida, Sinapis alba, Jasminum fruticans, Ononis natrix and Onosma orientalis.

**Anthophora podagra** Lepeletier 1841
North Aegean Greece on Lesbos. Turkey.

**Anthophora ponomarevae** Brooks 1988
Israel.
Recorded in mountain regions of Israel during late April and in July and August. Flower visits recorded there are for *Anchusa strigosa*.

**Anthophora pretiosa** Friese 1919
Egypt.
Priesner recorded a solitary male of this large Anthophorine in Egypt during February but he did not detect the female.

**Anthophora priesneri** Alfken 1932
Israel. Egypt.
Recorded in Egypt during October and January to April, probably hivernal. Present in valleys of the Eastern Desert of Egypt and very attached to *Stachys aegyptiaca*.
In Israel also recorded in December and from January to April; a desert species of the Judean Desert and western and Central Negev.
Flower visiting records to the Palestinian flora show a desertic profile, with the following species:- *Anchusa aegyptiaca*, *Moltkiopsis ciliata*, *Lycium shawii*, *Matthiola longipetala*, *Diplotaxis harra*, *Rosmarinus officinalis* and *Reboudia pinnata*.

**Anthophora prshewalskyi** (Morawitz 1880)
Eastern Turkey; Erzinan, Kars.
Noted at *Centaurea* during July.

**Anthophora pubescens** Fabricius 1871
Israel.
A single record in Israel, from En Gedi during February. Visiting *Trichodesma africana*.

**Anthophora quadrimaculata** (Panzer 1798)
Reported from Turkey.

**Anthophora retusa** (Linnaeus 1758)
Continental Greece. Turkey; Erzurum, Erzincan, Kars.
Common in some eastern Turkish Provinces and reported active from early May to late August. Noted as a good pollinator of legume forage crops: *Medicago sativa*, *Onobrychis sativa*, *Trifolium pratense* and *Trifolium repens*. Also recorded at *Anchusa*, *Salvia*, *Centaurea*, *Cirsium* and *Taraxacum*.

**Anthophora richaensis** Alfken 1938
Israel.

**Anthophora rivolleti** Pérez 1895
Israel.
Within Israel a small number of records during March and April from the Central Negev and Sinai deserts.

**Anthophora robusta** (Klug 1845)
Found into montane habitat on Cyprus during June and July where visiting phryganic summer flowers including *Nepeta troodi, Saponaria vaccaria, Salvia grandiflora willeana* and *Anchusa*.
A common species in parts of eastern Turkey although the population is not high. In some eastern Provinces noted from late June to late August and recorded at *Onobrychis sativa, Anchusa* and *Papaver*.
Recorded from Smyrna, Syria, during May and in Israel often from Mount Hermon at 2100 mtrs during May and Mount Meron, Upper Galilee, during July.
This is an early to mid summer montane anthophorine with visits to the Palestinian flora recorded for *Astragalus cruentiflorus* and *Salvia multistegia*.

**Anthophora rogenhoferi** Morawitz 1872
On the wing February until May in Cyprus, Mavromoustakis recorded this bee visiting *Echium sericeum* and *Anchusa hybrida* among a variety of other plants. The sexes mate around these two species of flower. Flower records also include *Hyacinthus trifoliatus, Lamium amplexicaule, Lithospermum hispidulum, Salvia viridis* and *Salvia verbenacea*.
In Turkey recorded from the eastern Province of Mus with females on the wing in early June flying to *Malvea*.
In Palestine recorded at *Anchusa* during April.
Recorded during May in Lebanon.
In Israel this bee is apparent from March to June and especially active from the second half of March to late April, a spring phenology which probably applies throughout the range. The bee is found in the Lower Jordan Valley but appears to be absent from the Negev. Males are found patrolling and fighting in the vicinity of gullies where nest sites are probably placed. There is a good record of flower visits to members of the Palestinian flora as follows;* Anchusa italica, Anchusa undulata, Anchusa strigosa, Salvia multicaulis, Echium angustifolium, Echium judeaenum, Ononis natrix, Papaver subpiriforme* (a pollen-collecting record), *Asphodelus aestivus, Lamium moschatum, Salvia fruticosa, Salvia indica, Salvia hierosolimitana, Cistus incanus, Trifolium resupinatum, Trifolium purpureum* and *Silene sp.*.

**Anthophora romandii** Lepeletier 1841
Israel.
Within Israel found from the Central Negev desert northwards to the Coastal Plain and Judean Desert. Most active on the wing from mid March to mid April and nests sometimes in aggregations in vertical hard sand pan surfaces. Males patrol these hard desert pan surfaces but also gullies. The nest aggregations on vertical terrain attract aerially ovipositing Bombylidae during March.
Flower visiting to the Palestinian flora is recorded for *Alkanna, Anchusa strigosa, Echium angustifolium, Cistanche tubulosa* and *Moricandia nitens*.

**Anthophora rubricrus** Dours 1869
On the wing in Cyprus from January to April. Recorded visiting Anchusa hybrida, Mandragora officinarum, Gagea chlorantha, Lithospermum hispidulum, Calendula persica, Fumaria, Sinapis alba, Salvia viridis, Salvia verbenacea, Lamium amplexicaule, Hyacinthus trifolius, Muscari, Romulea columnae, Genista sphaelatella, Onosma fruticosum, Crataegus azarolus, Prunus dulcis, Asphodelus ramosus microcarpus and Raphanus. This species is a successful generalist to some extent but Mavromoustakis also recorded it in sand dune habitat in March, visiting Anchusa aggregata.

Also out in January to March in Palestine where flower visits reported for Calendula and Bellevalia. In Israel this bee is recorded from January to April – a widespread early vernal bee distributed in regions north of the Negev desert. This anthophora is a successful polylectic species and a good variety of species in the Palestinian flora is recorded as host flowers; Asphodelus communis, A. aestivus, Lavandula sp., Amygdalis communis, Crepis sancta, Echium judaem, Bellevalia flexuosa, Bellevalia desertorum, Bellevalia mosheovii, Salvia horminum, Anchusa strigosa, Anchusa undulata, Rosemarinus officinalis, Trifolium stellatum, Alkanna strigosa, Erucastra rostrata and Lycium shawii.

**Anthophora rugosa** Radoskowski 1884
Iran.

**Anthophora rutilans** Dours 1869
Recorded infrequently during February to May, primarily March, on Cyprus, where visiting Vicia. Asphodelus ramosus microcarpus, Quercus infectoria, Prasium majus, Calendula persica, Sinapis alba, Lithospermum hispidulum, Prunus dulcis, Hyacinthus trifolius, Lamium amplexicaule, Salvia viridis, Papaver roheas, Genista sphaelatella, Anchusa hybrida, Echium sericeum, Onosma fruticosum, Allium, Trifolium stellatum, Medicago marina and Astragalus lusitanicus.
In Palestine found during April, flying to Anchusa.
Recorded from February in Israel, although most active there from mid March to late April. Distribution within Israel is from the northern Negev desert north to Hermon. An interesting array of flower hosts within the Palestinian flora includes Papaver subpiriforme as a pollen source. Other plants visited are Anchusa strigosa, Anchusa undulata, Echium judaem, Echium angustifolium, Trifolium clypeatum, Vicia villosa, Asphodelus aestivus, Eremostachys laciniata, Salvia fruticosa and Tulipa sharonensis.

**Anthophora sagamehli** Morawitz 1883
Iran.

**Anthophora saropodoides** Dalla Torre 1896
Egypt.

**Anthophora scopipes** Spinola 1838
Israel. Egypt.
On the wing during March and April in desertic regions of Egypt.
Recorded in the same months from Israel, including Negev and Sinai deserts where the species is less frequent than some congeners.
Noted visiting Echium judaem in Israel desert habitat.

**Anthophora selecta** Priesner 1957
Egypt.
The female of this bee described from Borgash, Egypt. Recorded during April.

**Anthophora semirufa** (Friese 1898)
Israel. Egypt.
Found in desert areas of Egypt from April to July.
Recorded infrequently from desertic areas of Israel from late March to early July. Flower visit records are for *Blepharis edulis* and *Erucaria boveana*.

**Anthophora semperi** Fedtschenko 1875
Iran.

**Anthophora senescens** Lepeletier 1841
Continental Greece. Israel. Egypt.
Common in the Nile Delta and along north coastal Egypt.
In Israel widely found on the wing from February to late April. This species is present then within the Central Negev. In the Lower Jordan Valley found nesting in vertical eroding lithosol cliff faces.
Flower visit records for the palestinian flora suggest a partly desertic profile and are listed as *Lycium shawii*, *Moricandia nitens*, *Reboudia pinnata*, *Retama raetum*, *Astragalus lanatus* and *Onosma orientalis*.
Males (along with males of Tetralonia) have been noted to patrol, hover and fight around clumps of *Moricandia nitens* during April.

**Anthophora shagrensis** Priesner 1957
Egypt.
Priesner reported that only the female was known. Collected by Moh. Kassim and M. Tewfik during the months of April and of August from desert areas of Egypt, including Sinai.

**Anthophora socia** (Klug 1845)
Syria.

**Anthophora speciosa** Friese 1919
Egypt. Libya.
Found along north coastal Egypt from February to April.

**Anthophora spinacoxa** Brooks 1988
Israel.
In Israel found in the Lower Jordan Valley, Negev Desert and environs of the Dead Sea. Noted from February to April but much less frequently than *A. dufourii* to which it is closely related.

**Anthophora spinolana** Priesner 1957
Israel. Egypt.
On the wing in Egypt from December to March in Central regions and the northern coast.
Rarely recorded in Israel, February to April.
A flower visiting record from Israel for *Daemia tomentosum*.

**Anthophora subterranea** Germar 1826
Israel.
Widespread in Israel.
**Anthophora superans** Walker 1871  
Possibly present in Egypt. Reported from Mount Sinai.

**Anthophora tarsalis** Priesner 1957  
Israel. Egypt.  
Described from the Eastern Desert of Egypt.  
Apparently local in Israel with records during February and March from En Gedi.

**Anthophora taurica** Friese 1922  
Presumably eastern Turkey and Iran.

**Anthophora tenella** (Klug 1845)  
Egypt.  
Widespread in Egypt from March to May.

**Anthophora tenuicilata** Alfken 1926  
Priesner reported this bee as possibly present in Egypt.

**Anthophora aff. tibialis** Morawitz  
North Aegean Greece on Lesbos.

**Anthophora tridentella** Priesner 1957  
Egypt.  
In Egypt reported on the wing in April and considered by Priesner to be a possibly widespread but local bee.

**Anthophora trochanterica** Morawitz 1888  
Eastern Iran.  
Found in montane areas up to 2000 mtrs during May.

**Anthophora valga** Klug 1845  
Friese noted the range as The Arabian Desert and it perhaps should be looked for from Sinai and the Eastern Desert of Egypt.

**Anthophora vernalis** Morawitz 1878  
Israel.  
On the wing in Israel from late January to the first half of March, mainly recorded from the Negev Desert. Known flower hosts among the Palestinian flora are *Astragalus lanatus*, *Astragalus spinosus*, *Leontice leontopelatum* and *Bellevalia stepporum*.

**Anthophora vetula** (Klug 1845)  
Friese noted that this bee is reported from the Arabian Desert. The distribution in our Region is not clarified.

**Anthophora viduata** (Klug 1845)  
Egypt.  
Widespread in Egypt.
Anthophora wegelini Friese 1914
Israel. Egypt.
Priesner notes this bee as common all over Egypt including oases. One of the first of the spring
anthophorines to appear, with the emergence precipitated by the first rains of mid December the bee
remains on the wing into March. Strongly associated with Zilla spinosa.
In Israel found in the Arava Valley during February, with a flower visiting record for Astragalus
spinosus.

Anthophora zanoni Gribodo 1925
Egypt. Libya
Found in February and March on the northern coast of Egypt. Priesner noted that the Egyptian bees
were a form, borgensis.

Habropoda annae Schwarz & Gusenleitner 2001
Turkey, found in the provinces of Elazig, Antalya, Hakkari and Siirt.
On the wing from late May and especially June.

Habropoda ezonata Smith 1854
Widespread Continental Greece. Some Greek Islands.

Habropoda hakkariensis Schwarz & Gusenleitner 2001
Turkey, Hakkari.
Found on the wing from late May and June at elevations up to 1700 mtrs.

Habropoda schafelneri Schwarz & Gusenleitner 2001
Turkey, Kars.
Found at 1600 mtrs during May.

Habropoda tarsata Spinola 1838
Reported from eastern Turkey during June.
In Israel on the wing during March and April with the majority of records from the Carmel Massif and
Mountains of Judea.
Flower hosts from among the Palestinian flora are recorded as Asphodelus aestivus, Echium judaenum,
Anchusa undulata, Anchusa strigosa, Cercis siliquastrum and Vicia hybrida.

Habropoda zonatula Smith 1854
Greece, North Aegean on Lesbos and other Greek Islands. Turkey. Syria.
Friese noted that females of this species fly to Salvia and Vicia.
Found on the wing through June and July in Erzurum, eastern Turkey.

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Tribe Melectini

Melecta albifrons (Foerster 1771)
From late March to June on the wing in Cyprus. Mavromoustakis found this bee in the nest of *Anthophora acervorum*.

**Melecta ashabadensis** Radoszkowski 1893
Turkey.

**Melecta crassicornis** Friese 1921
Turkey.

**Melecta duodecimmaculata** Rossi 1790

**Melecta festiva** Lieftinck 1980
Continental Greece. Lesbos.

**Melecta fulgida** Lieftinck 1980
Continental Greece. Lesbos.

**Melecta guichardi** Lieftinck 1980
North Aegean Greece on Lesbos.

**Melecta italică** Radoszkowski 1876
Continental Greece. Lesbos.

**Melecta leucorhyncha** Gribodo 1893
Continental Greece. Lesbos.

**Melecta luctuosa** (Scopoli 1770)
North Aegean Greece on Lesbos.
This cleptoparasitic anthophorine is hosted by *Anthophora aestivalis* (Panzer 1801) and *Anthophora retusa* (Linnaeus 1758) in the European range.

**Melecta tuberculata** Lieftinck 1980
Continental Greece.

**Eupavlovskia funeraria** (Smith 1854)
North Aegean Greece on Lesbos. Turkey.

**Eupavlovskia obscura simulatrix** (Lieftinck 1969)
Continental Greece. Lesbos.

**Paracrocisa guilochi** Dusmet 1915
North Aegean Greece on Lesbos.

**Thyreomelecta bidentata** (Kirby 1889)
A Central Asian bee likely to be present in Eastern Iran. It is present along the Harirund River on the Afghanistan side of the border with Iran.
Thyreomelecta dimidiatipuncta (Spinola 1838)
Libya; Tripolitania and eastwards. Egypt. Iraq, near Baghdad.

Thyreus affinis (Morawitz 1874)
Recorded by Mavromoustakis visiting Statice, Centaurea ciliarica, Thymus capitatus and Echium sericeum on Cyprus from May to July.

Thyreus elegans (Morawitz 1877)
Turkey.

Thyreus hellenicus Lieftinck 1968
North Aegean Greece on Lesbos. Turkey.

Thyreus hirtus (Beaumont 1940)
Turkey.

Thyreus histrionicus (Illiger 1806)
Continental Greece. Cyprus. Turkey.
On the wing April to October on Cyprus, recorded visiting Echium sericeum, Statice, Inula viscosa, Marrubium vulgare apolum, Statice virgata, Heliotropium europeum, Nepeta troodi, Cirsium syriacum, Centaurea ciliarica, Centaurea hyalolepis and Eryngium creticum. Recorded up to montane slopes on Cyprus.

Thyreus orbatus (Lepeletier 1841)
Turkey.

Thyreus picaron Lieftinck 1968
Continental Greece. Lesbos.

Thyreus praevalens (Kohl 1905)
Turkey.

Thyreus ramosus (Lepeletier 1841)
Recorded mainly from May to September on Cyprus but with some later autumn records, visiting Marrubium vulgare apolum, Inula viscosa, Carlina lanata, Teucrium polium micropodioides, Heliotropium europeum, Echium sericeum and Statice virgata.

Thyreus scutellaris (Fabricius 1781)
Turkey.

Thyreus truncatus (Pérez 1883)
North Aegean Greece on Lesbos. Turkey.
Tribe Bombini

**Bombus (Cullumanobombus) apollineus** Skorikov 1910
Turkey.
Widespread eastern Turkey, especially Erzurum, and also central Anatolia. A bumblebee of the mountain meadows, pastures and fallows. Open areas at higher altitudes where visits made to *Onobrychis viciifolia*, *Medicago sativa*, *Trifolium pratense* and some other forage legumes. Also noted flying to *Helianthus annuus* and *Brassica napus*. This may be conspecific with *B. cullumanus* (Williams 1998; molecular study awaited).

**Bombus (Megabombus) argillaceus** (Scopoli 1763)
Up to 1800 mtrs on montane slopes in northern Greece where visiting *Crocus*.
An abundant and widespread Bombus of Turkey where found from sea level to 3500 mtrs. This bee is strongly polylectic and from Central Anatolia known to frequent *Cousinea caesarea*, *Anchusa leptophylla*, *Consolida repalis*, *Consolida orientalis*, *Ballota nigra*, *Echium italicum*, *Helianthus annuus*, *Centaurea solstitialis*, *Salvia virgata*, *Salvia cyanescens*, *Salvia bracteata* and *Ononis spinosa*.
Widespread in the Central Elburz Range of Iran where found up to 2900 mtrs between May to August. Generally discovered to be widespread in western and central Iran where active from May into August and flower visiting recorded to *Borago officinalis*, *Securigera varia*, *Lathyrus roseus*, *Medicago sativa*, *Onobrychis altissima* and Lamiales in the genera *Phlomis*, *Marrobium*, *Salvia* and *Stachys*.

**Bombus (Thoracobombus) armeniacus** Radoszkowski 1877
Turkey. Iran.
Widespread and abundant through Turkey. Often a lowland species yet occurs up to 3500 mtrs and inhabits meadows, pastures, clover fields and orchards. A substantial decline in numbers has occurred in the populations of this bee visiting forage legume fields of the Erzurum Plain since the 1970s. An interesting selection of floral hosts recorded for this bee from Central Anatolia includes *Marrubium anisodan*, *Ononis spinosa*, *Cousinia*, *Salvia virgata* and *Consolida repalis*.
Noted to 2600 mtrs in Iran from May to July foraging at Legumes and *Salvia*.

**Bombus (Psithyrus) barbutellus** (Kirby 1802)
Turkey.

**Bombus (Psithyrus) bohemicus** Seidl 1837
Continental Greece. Turkey. Iran.
Rarely recorded in north Greece during May flying to *Crocus* in montane habitat to 1800 mtrs.

**Bombus (Pyrobombus) brodmanni** Vogt 1909
Turkey.
In Turkey recorded from northeast Anatolia where inhabits mountain meadows rarely from over 2000 mtrs to 3500 mtrs. A subspecies *B. b. denesi* Tkalcu 1994 is referable to this population.

**Bombus (Psithyrus) campestris** (Panzer 1801)
Continental Greece. Turkey. Iran.
Rarely noted in north Greece during early May when males recorded visiting *Origanum* in montane habitat.

**Bombus (Bombus) cryptarum** (Fabricius 1775)
Northern Continental Greece.

**Bombus (Thoracobombus) deuteronymus** Schulz 1906
Continental Greece.
Rarely recorded in northern Greece during June when females noted visiting *Vicia* at 650 mtrs.

**Bombus eversmanni** Friese 1911
Turkey.

**Bombus (Subterraneobombus) fragrans** (Pallas 1771)
Turkey. Iran
In Turkey now found sporadically and generally rare, having declined greatly and with a fragmented distribution in the meadowlands of central and eastern Anatolia. Queens recorded locally in Iran at 2500 mtrs during late July, flying to *Lamium album* and *Salvia*.

**Bombus (Pyrobombus) haematurus** Kriechbaumer 1870
Noted at *Prunus dulcis* in Greece.
Not common in north Anatolian Turkey where found in open forest habitats from 600 mtrs to 2600 mtrs.
In the Central Elburz of Iran and perhaps more widely this bee is more locally present than some congeners and is found during May and June, often to 1200 mtrs or lower but can be recorded to 2500 mtrs. Flower visiting records in Iran are for *Berberis vulgaris, Borago officinalis, Medicago sativa, Lamium album, Salvia, Stachys, Securigera varia* and *Citrus*.

**Bombus (Mendacibombus) handlirschianus** Vogt 1909
Turkey. Iran.

**Bombus (Megabombus) hortorum** (Linnaeus 1761)
Noted from May to August in Greece at *Crocus* up to 1800 mtrs montane slopes. Also recorded visiting *Carduus* and *Vicia*.
Mainly found in Turkey in the north and especially abundant in the Black Sea region. This bee is present in Central Anatolia. It has been extinguished from the Black Sea coastal belt due to human development pressures on the natural landscapes. Found in forested areas up to 2500 mtrs.
In the Central Elburz range of Iran this bee is scarcely recorded during May at up to 2000 mtrs. The bee seems to be very scarce in Iran and occasionally recorded; from 2000 to 2500 mtrs and flying to *Lamium album* and *Stachys*.

**Bombus (Thoracobombus) humilis** Illiger 1806
Central and north Continental Greece. Turkey. Iran.
On the wing from June to August in northern Greece where noted at *Vicia cracca, Echium* and *Carduus*.
Flower visit records for Ankara province Turkey include *Anchusa leptophylla*, *Helianthus annuus*, *Echium italicum*, *Centaurea solstitialis*, *Cousinia* and *Ononis spinosa*.

In Iran this bee has a broad altitudinal range about the Central Elburz Mountains and is active at lower levels but especially from 1500 mtrs and up to 3200 mtrs from May into September.

**Bombus hypnorum** (Linnaeus 1758)
Turkey.

**Bombus (Melanobombus) incertus** (Morawitz 1881)
Turkey. Iran.
Widespread and fairly abundant in Turkey and known to pollinate legume and fruit crop plants. Found about clover fields, pastures, meadows and fallow plots. Found in the Central Elburz and other Regions of Iran from 2000 mtrs up to 3200 mtrs between May and July. This bee appears to have a wide range of floral hosts, not only visiting Lamiales, Fabaceae and Boraginaceae but also noted at Plumbaginaceae and others. It is likely to be a pollinator of *Citrus* in Iran.

**Bombus jonellus** (Kirby 1802)
Turkey.

**Bombus (Melanobombus) keriensis** Morawitz 1886
Turkey. Iran.
Confined in Turkey to northeastern Anatolia where an inhabitant of colder plateau meadow and pasture at high altitude.

**Bombus (Thoracobombus) laesus** Morawitz 1875
Continental Greece. Turkey. Iran.
Recorded to 600 mtrs in Greece during June and July where noted visiting *Vicia, Echium* and *Centaurea*.
In Turkey widespread from west-central to eastern provinces although rather sporadically encountered. Frequentes meadows, pastures and fallow plots in open areas to 2400 mtrs. This bee is a pollinator of *Pisum arvense* although most frequently recorded visiting *Centaurea glastifolia*.
Found to 2500 mtrs during late June and July in Iran where noted flying to *Salvia*.

**Bombus (Melanobombus) lapidarius** (Linnaeus 1758)
Central and northern Continental Greece. Northern Turkey.
Recorded from June to October in Greece with flower records for *Alkanna, Carduus* and *Epilobium*.
Not common in northern Turkey where found in open forest, meadow and orchard. In northeast Anatolia northeastwards of an imaginary line between Zigana and Kizildağ the subspecies **B. l. caucasicus** (Radoskowski 1859) is found and can be locally abundant at colder and higher elevations in forest clearings and orchards above 1500 mtrs.

**Bombus (Bombus) lucorum** (Linnaeus 1761)
Central and northern Continental Greece. Turkey. Iran.
Found up to 1800 mtrs in Greece where recorded from May to August with flower visit records for *Prunus dulcis, Origanum, Crocus, Epilobium* and *Rubus*.
Flower visit records for central Turkey are to *Stachys* and *Astragalus*.  

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Widespread from May to September in the Central Elburz Range of Iran where recorded to 2550 mtrs. and more widely up to 2730 mtrs with forage plant records for *Echinops*, *Berberis vulgaris*, *Borago officinalis* and a variety of species in the Fabaceae including *Medicago sativa*, *Trifolium repens*, *Onobrychis alissima*, *Securigera varia* and *Lathyrus roseus*. From Iran there are also records for visits to a variety of fruit trees such as *Prunus*, *Malus*, *Citrus* and *Pyrus* species.

**Bombus (Psithyrus) maxillosus** Klug 1817
Continental Greece. Turkey. Iran.
Recorded up to 1350 mtrs in northern Continental Greece during June to August when flying to *Origanum*, *Vicia* and *Carduus*.
Discovered in Iran at Ardebil where females are active on the wing during late May.

**Bombus (Subterraneobombus) melanurus** (Lepeletier 1835)
Turkey. Iran.
Within Turkey rather occasionally recorded from central Provinces but widespread in east and northeast Anatolia where abundant at colder high altitude pastureland and meadow in Ağrı and Erzurum. Also considered an important pollinator of legume crops. Active on the wing Iran from May into July when found foraging between 2200 and 2730 mtrs at *Astragalus*, *Medicago sativa*, *Vicia*, *Lamium album*, *Salvia* and *Acantholimon*.

**Bombus (Thoracobombus) mesomelas** (Gerstaecker 1869)
Continental Greece; Olympos and the north. Turkey. Iran.
In northern Greece noted visiting *Crocus* up to 1800 mtrs and from lower elevations recorded at *Echium* and *Centaurea*. This bee is rarely recorded in Iran during July at 2050 mtrs.
In Turkey some records from central Provinces. Flower hosts noted in Ankara Province are *Anchusa leptophylla*, *Consolida orientalis* and *Marrubium anisodan*. It is an abundant bee in east and northeastern Anatolia. The subspecies **B. m. alboluteus** Vogt 1909 is referable to this Turkish population which inhabits mountain pasture and meadow from 1600 mtrs to 3500 mtrs.
In Iran found active from May to August up to 2565 mtrs, visiting *Astragalus*, *Medicago sativa*, *Vicia*, *Trifolium*, *Lamium album*, *Salvia* and *Acantholimon*.

**Bombus (Psithyrus) mlokosewitzi** (Radoszkowski 1889)
Turkey.

**Bombus (Thoracobombus) mlokosievitzii** Radoszkowski 1877
Turkey; Central Anatolia.

**Bombus (Pyrobombus) monticola** Smith 1849
Continental Greece; Mount Olympos.

**Bombus (Thoracobombus) muscorum** (Linnaeus 1758)
On the wing July to September to 600 mtrs in Continental Greece where males recorded at *Carduus* and females at *Echium*.
Iranian records are from July into November and often at 2500 mtrs.
**Bombus (Sibiricobombus) niveatus** Kriechbaumer 1870
Widespread Continental Greece. Crete. Turkey. Iran.
Found up to 1600 mtrs in northern Greece. Noted from June to August with flower visit records for *Epilobium, Vicia* and *Echium*.
Widespread through Turkey where present from sea level to 3000 mtrs. Reported to be a common species here and nests in cavities in fences and walls about human habitations. Known as a pollinator of forage legumes and fruit crops.
An interesting aspect of the breeding biology is recorded by Rasmont et al (2008) where in Turkey, southwest Anatolia, this bee occupied and usurped 40% of nests (in nestboxes) of the Common Redstart *Phoenicurus phoenicurus* leading to desertion by the birds even when eggs or young were established. It was also noted that other bird species utilising nestboxes were not intruded upon at all by the bees.
flower hosts recorded in central Anatolia include *Cousinea caesarea, Ononis spinosa, Anchusa leptophylla, Consolida orientalis, Helianthus annuus* and *Astragalus gymnolobus*.
In the Central Elburz Mountains of Iran recorded on the wing from May to August and quite widespread there up to 2550 mtrs. Recently found to be more widespread in Western and Central Iran to 3000 mtrs and to have a wide spectrum of floral hosts.

**Bombus (Thoracobombus) pascuorum** (Scopoli 1763)
Central and northern Continental Greece. Thássos. Turkey. Iran.
Active during June to August up to 1600 mtrs in Greece where noted visiting *Vicia cracca, Origanum* and *Epilobium*.
Recorded visiting *Anchusa leptophylla* in central Anatolia, Ankara.
Found between 1500 and 2700 mtrs within Iran emerging from February and active into July. Noted flying to *Borago officinalis, Salvia* and *Althaea*.

**Bombus (Thoracobombus) persicus**
Radoszkowski 1881
Turkey. Iran.
Found widely on the wing in the Central Elburz of Iran and more widely from May to October up to 2850 mtrs.
The populations of this bee in Turkey are referred to as **B. p. eversmanniellus** (Skorikov 1922). This subspecies is widespread in open montane habitats from 1500mtrs to 3000 mtrs and most abundant in eastern and northeastern Anatolia where it exhibits a marked preference for *Cephalaria procera*.
Flowers visited in Iran are often Legumes including *Securigera varia, Medicago sativa* and *Vicia* and also mints in the genera *Lamium, Stachys, Salvia* and *Marrobium*.

**Bombus (Thoracobombus) pomorum** (Panzer 1805)
North Continental Greece.
Recorded in Greece by Reinig.
In Turkey the subspecies **B. p. canus** Schmiedeknecht 1883 is found on mountain plateaux of northeastern Anatolia where there is meadow and pasture above 1700 mtrs. generally not common except for Erzurum province where the bee is locally abundant.

**Bombus (Megabombus) portchinsky** Radoszkowski 1883
Turkey. Iran.
Found in northeast Anatolia only in cooler open montane zones of pasture and meadow from over 2000 mtrs to 3500 mtrs. Reported from Central Anatolia.
Very rarely noted in Iran at 2500 mtrs during May flying to *Lamium album*.

**Bombus (Pyrobombus) pratorum** (Linnaeus 1761)
Central and northern Continental Greece. Iran.
Active from April into August at altitudes up to 1600 mtrs and noted flying to *Verbascum, Epilobium* and *Prunus dulcis* in Greece.

**Bombus (Pyrobombus) pyreaeus** (Pérez 1880)
Continental Greece.

**Bombus (Psithyrus) quadricolor** (Lepeletier 1832)
Turkey. Iran.

**Bombus (Thoracobombus) ruderarius** (Müller 1776).
Continental Greece. Turkey. Iran.
Found between May and August in the Iranian western and central mountains at up to 3200 mtrs.

**Bombus ruderatus** (Fabricius 1775)
Turkey.

**Bombus (Psithyrus) rupestris** (Fabricius 1793)
Turkey.

**Bombus (Cullumanobombus) serrisquama** Morawitz 1888
Turkey.
Confined to northeast Anatolia where found at low densities about the higher montane meadows and pastures.

**Bombus (Melanobombus) sicheli** (Radoszkowski 1859)
Eastern Turkey; Agri, Ardahan, Bayburt, Erzurum.
This bee recorded in very low population sizes about mountain meadows and pastures of northeastern Anatolia above 2000 to 3000 mtrs ot higher.

**Bombus (Kallobombus) soroeensis** (Fabricius 1777)
Central and north Continental Greece. Turkey. Iran.
Recorded flying to *Origanum, Carduus* and *Epilobium* in northern Greece where noted to 1600 mtrs.
An abundant bumblebee throughout most of Turkey and fond of montane valley orchards.
Recorded in Iran during May and June from 1950 to 2230 mtrs and visiting *Lamium album* and *Salvia*.

**Bombus (Subterraneobombus) subterraneus** (Linnaeus 1758)
Central Continental Greece. Turkey. Iran.
In Iran infrequently noted in the Central Elburz where active at up to 3200 mtrs between May and August. Otherwise more widely recorded in western and central areas often at 2500 mtrs during May and June. Flower visits recorded in Iran for *Borago officinalis, Medicago sativa, Onobrychis altissima, Securigera varia, Lathyrus roseus, Phlomis, Marrobiun, Salvia* and *Stachys*. 

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In Turkey the subspecies *B. s. latreillellus* Kirby 1802 occurs and is widespread throughout. It is especially abundant in east and northeast Anatolia about woodland, orchard, montane pasture and meadow where it shows an affinity for *Salvia*.

**Bombus (Sibiricobombus) sulfureus** Friese 1905
Turkey; Erzurum, Niğde, Osmaniye, Ağrı and Kayseri.
An extremely rare and local bee of eastern Turkey. Iran.
Recorded locally in small numbers in Iran during June and July where noted flying to *Salvia* and *Medicago sativa*.

**Bombus (Thoracobombus) sylvarum** (Linnaeus 1761)
Continental Greece. Turkey. Iran.
Recorded active in northern Greece between 550 and 750 mtrs between June and September when visiting *Tagetes, Carduus, Vicia, Alkanna* and *Echium*.
This bee has a narrow high summer flight phenology in the Central Elburz Range of Iran where noted from July but mainly during August when found up to 2050 mtrs. generally in Iranian Highlands of the west and centre reported between 1940 and 2730 mtrs. A good range of floral hosts is visited.

**Bombus (Psithyrus) sylvestris** (Lepeletier 1832)
Iran.
Recorded infrequently in Iran from May to August at up to 2250 mtrs.

**Bombus (Bombus) terrestris** (Linnaeus 1758)
Widespread Turkey.
Widespread in the Central Elburz of Iran to 2550 mtrs and active there from May to September.

**Bombus (Psithyrus) vestalis** (Geoffroy 1785)
North Continental Greece. Iran.
Recorded visiting *Vicia* and *Origanum* in Greece.
Infrequently recorded from the Central Elburz of Iran from May to July at up to 2550 mtrs.

**Bombus (Alpigenobombus) wurflenii** Radoszkowski 1859
North Continental Greece. Turkey.
Rarely recorded in northern Greece at 1500 mtrs during August.

**Bombus (Thoracobombus) zonatus** Smith 1854
Continental Greece. Corfu. Turkey. Iran.
Found to 600 mtrs in northern Continental Greece during the summer when noted at *Echium, Carduus* and *Centaurea*.
Flower visit records for Central Anatolian Turkey include *Anchusa leptophylla, Echium italicum, Cousinia caesarea, Ononis spinosa, Centaurea iberica, Centaurea solstitialis, Helianthus annuus, Consolida orientalis* and *Cirsium alatum*.
On the wing from May, primarily during August, in the Iranian Elburz at up to 3348 mtrs where visits a good range of flower species.
Tribe Apini

**Apis (Apis) mellifera** Linnaeus 1758
The Western Honey Bee occurs throughout the region after having arisen in the Near East or Pontocaspian Regions during the early Pliocene (Engel 1999). The subspecies *A. m. adami* Ruttner is endemic to Crete. *A. m. anatoliaca* Maa is through much of Turkey. *A. m. cecropia* Kiesenwetter ranges through most of Continental Greece and the Aegean islands. In Northernmost Continental Greece *A. m. macedonica* Ruttner is found. *A. m. cypria* Pollmann is found on Cyprus. The race *A. m. meda* Skorikov is found in Iran and Iraq into northern Syria and southeastern Turkey. The race *A. m. syriaca* occurs in the levant from Syria south to the Negev Desert. *A m. lamarckii* Cockerell is present along the Nile Valley, Egypt.

**Apis (Micrapis) florea**
Fabricius 1787
Southern Iran and Iraq.

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REFERENCES

Colletidae


Andrenidae


Halictidae


Melittidae


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