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## **Studies on Sphecidae of Aegean Region (Insecta: Hymenoptera)**

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### **Abstract**

In this study, 680 specimens of Sphecidae (Insecta: Hymenoptera), collected in the Aegean region (Western Turkey) in the years 1979 and 1980, are investigated. 23 species belonging to 13 genera from 7 subfamilies were determined. *Psen ater*, *Bembix sinuata*, *Bembix oculata*, *Cerceris conigera* and *Larra anathema* are new records to the Turkish fauna. Identification keys to subfamilies and genera are given.

### **Zusammenfassung**

In dieser Studie werden 680 Sphecidae (Insecta: Hymenoptera) bearbeitet, die in der ägäischen Region (Westtürkei) in den Jahren 1979 und 1980 gesammelt wurden. Es wurden 23 Arten und 13 Gattungen von 7 Unterfamilien festgestellt. *Psen ater*, *Bembix sinuata*, *Bembix oculata*, *Cerceris conigera* und *Larra anathema* sind neu für die türkische Fauna. Bestimmungsschlüssel zu den Unterfamilien und Gattungen wurden ausgearbeitet.

### **Introduction**

The family Sphecidae is a diverse group of solitary wasps which may be of different shape, size and colour. The female digs her nest in sand, soil or wood. She provisions each nest cell with paralysed prey and lays a single egg on it. The wasp larva feeds on the provisions. It winters in a cocoon and pupates the next spring. Adults feed on nectar, pollen and juices containing high amount of sugar while the larvae need adults or larvae of different insect orders such as Collembola, Ephemeroptera, Odonata, Orthoptera, Psocoptera, Hemiptera, Homoptera, Thysanoptera, Neuroptera, Trichoptera, Lepidoptera, Mecoptera, Diptera, Coleoptera, Hymenoptera as well as Araneida (BOHART & MENKE 1976). Because the wasps are usually predators of these groups, they are considered as useful insects.

Faunistic studies of this family concerning Turkey are not sufficient enough, although many species have been recorded from the Palearctic region. Turkey is known to have highly diverse geographical regions and very different habitats. Therefore it seems not unlikely that the Turkish fauna still contains undiscovered species (HENSEN & VAN OOIJEN, 1987). The Aegean region (west of Turkey) is under the effect of temperate mediterranean climate and has very rich flora and fauna. For these reasons it may be of some interest to determine specimens belonging to Sphecidae in the mentioned region. In preparation of subfamily and genera keys the publications of BOHART & MENKE (1976) and BERLAND (1958) were used.

### Key to Subfamilies

- 1 Abdomen petiolate. . . . . 2
- Abdomen non-petiolate. . . . . 3
- 2 Jugal lobe large. Forewing with three submarginal cells. . . . . Sphecinae
- Jugal lobe narrow. Forewing with two submarginal cells. . . . . Pemphredoninae
- 3 Midtibia with two apical spurs. Compound eyes touching at vertex. . . . . Astatinae
- Midtibia with only one spur. Compound eyes not touching at vertex. . . . . 4
- 4 Forewing with one submarginal cell separated from discoidal cell. . . . . Crabroninae
- Forewing with more than one submarginal cell. . . . . 5
- 5 Mandible stepped and notched exteroventrally. Hind ocelli deformed and scarlike. . . . . Larrinae
- Mandible not notched or stepped exteroventrally. Hind ocelli normal. . . . . 6
- 6 Second submarginal cell receiving both of the recurrent veins. . . . . Nyssoninae
- Each of the second and third submarginal cells receiving one recurrent vein . . . . . Philanthinae

### Key to genera of Sphecinae

- 1 Tarsi with plantulae and/or claws of some legs with one mesal tooth on inner margin. . . . . *Sceliphron*
- Tarsi without plantulae, claws simple or with one or more basal teeth on inner margin. . . . . 2
- 2 Claw with two teeth, second recurrent vein usually received by submarginal cell III. . . . . *Sphex*
- Claw simple, second recurrent vein usually received by submarginal cell II. . . . . 3
- 3 Apex of sternum I (petiol) meeting and often overlapping base of II. Spiracle of tergum I located before apex of sternum I (lateral profile), petiol often bent upward at level of tergum I base. . . . . *Podalonia*
- Apex of sternum I not reaching base of II, intervening space usually long and consisting of membrane and ligament. Spiracle of tergum I located at or beyond level of sternum I apex. Sternum I usually bent downward or straight at level of tergum I base. . . . . *Ammophila*

### Key to genera of Crabroninae

- 1 Mesopleural carina absent, pygidial plate flat. . . . . *Crabro*
- Mesopleural carina present, pygidial plate grooved. . . . . *Ectemnius*

### Key to genera of Larrinae

- 1 Scars of hind ocelli very small, narrow, and elliptical; distance between midocellus and lower end of scar is greater than long axes of scar; frons with a swelling which is depressed and u- or m-shaped. . . . . *Larra*

- Scars of hind ocelli comma-shaped; distance between midocellus and lower end of scar is shorter than long axes of scar; frons without swellings. . . . . *Tachytes*

**Key to genera of Nyssoninae**

- 1 Labrum not exceeding mandibles. . . . . *Stizus*
- Labrum extended vertically, exceeding mandibles. . . . . *Bembix*

**Key to genera of Philanthinae**

- 1 Second cubital cell non-petiolate, abdominal segments not stricted. . . . . *Philanthus*
- Second cubital cell petiolate, abdominal segments stricted. . . . . *Cerceris*

**Subfamily Sphecinae**

***Sceliphron spirifex* (LINNAEUS, 1758)**

Material examined (131♀♀ 71♂♂): Aydın: Kuşadası (22m) 24.-26.8.1979 2♀♀ 2♂♂, 24.9.1979 6♀♀ 5♂♂, 27.-28.9.1979 3♀♀ 1♂; Didim (20m) 23.9.1979 2♀♀. Balıkesir: Altınoluk (150m) 10.8.1980 1♀; Altınova (25m) 17.8.1980 1♀ 2♂♂, 22.8.1980 3♀♀ 3♂♂; Havran (50m) 19.8.1980 1♂; Küçükkuşu (3m) 13.8.1980 2♀♀; Ören (10m) 14.8.1980 2♀♀. Denizli: Merkez (428m) 27.-28.9.1980 2♀♀ 2♂♂; Çal (850m) 20.9.1980 6♀♀; Goncalı (440m) 22.9.1980 14♀♀; Pamukkale (510m) 23.9.1980 17♀♀ 5♂♂. İzmir: Alsancak (5m) 22.6.1980 2♂♂, 27.6.1980 4♀♀ 2♂♂; Buca (20m) 21.6.1980 2♂♂; Bornova (20m) 22.6.1980 1♀ 5♂♂, Gaziemir (30m) 28.6.1980 1♀; Gümüşsu (30m) 1.7.1980 1♂; Güzelyalı (10m) 24.6.1980 1♀ 1♂; Hatay 23.6.1980 2♀♀, 8.7.1980 1♂; Ilıca (10m) 10.7.1980 14♀♀ 9♂♂; Karşıyaka (10m) 30.6.1980 2♀♀ 3♂♂. Manisa: Akhisar (93m) 5.-6.8.1980 8♂♂; Gürle (95m) 4.8.1980 1♀; Keçili (90m) 3.8.1980 3♀♀; Merkez (71m) 29.-30.7.1980 3♀♀ 1♂; Turgutlu (69m) 1.8.1980 1♀, 10.8.1980 1♀. Muğla: Güllük (3m) 1.8.1979 2♀♀, 6.-7.8.1979 2♀♀ 4♂♂; Marmaris (3m) 4.-8.8.1979 5♀♀ 5♂♂, 8.10.1979 2♀♀; Marmaris-Uzunyalı (3m) 4.6.1979 1♂, 2.-3.8.1979 5♀♀ 5♂♂.

Distribution see figure 1. Vertical distribution is recorded between 3 - 510m.

Phenology: June-September.

***Sphex rufocinctus* BRULLÉ, 1833**

Material examined (46♀♀ 11♂♂): Aydın: Kuşadası (22m) 25.9.1979 1♀. Balıkesir: Altınoluk (150m) 10.8.1980 2♀♀; Burhaniye (10m) 11.8.1980 1♀; Kızılköprü (25m) 21.8.1980 1♀; Küçükkuşu (3m) 13.8.1980 2♀♀, Ören (10m) 14.8.1980 1♀; Tahtakuşlar (25m) 20.8.1980 1♀. Denizli: Çal (850m) 20.9.1980 1♂. İzmir: Alsancak (5m) 25.6.1980 2♀♀ 1♂; Gaziemir (30m) 29.6.1980 1♂; Gümüşsu (30m) 2.-3.7.1980 2♀♀ 3♂♂; Ilıca (10m) 8.-10.7.1980 8♀♀ 1♂; Seferihisar (30m) 6.-7.7.1980 5♀♀ 2♂♂; Tire (100m) 5.7.1980 2♀♀ 2♂♂; Urla (50m) 11.7.1980 2♀♀. Manisa: Akhisar (93m) 5.8.1980 2♀♀; Derinköy (100m) 2.8.1980 5♀♀; Karaoğlanlı (90m) 26.7.1980 1♀; Keçili (90m) 3.8.1980 2♀♀; Milli Park (71m) 30.7.1980 1♀. Muğla: Güllük (3m) 6.8.1979 2♀♀; Marmaris (3m) 4.-6.8.1979 3♀♀.

Distribution see figure 1. Vertical distribution is recorded between 3 - 850m.

Phenology: June-September.

***Podalonia hirsuta* (SCOPOLI, 1763)**

Material examined (10♀♀ 4♂♂): Aydın: Kuşadası (22m) 27.9.1979 1♂. İzmir: Alsancak (5m) 27.6.1980 1♀; Ilıca (10m) 9.-10.7.1980 5♀♀ 1♂; Tire (100m) 5.7.1980 3♀♀ 2♂♂. Manisa: Millipark (71m) 30.7.1980 1♀.

Distribution see figure 1. Vertical distribution is recorded between 5 - 100m.

Phenology: June-September.

***Ammophila sabulosa* (LINNAEUS, 1758)**

Material examined (25♀♀ 18♂♂): Aydın: Kuşadası (22m) 25.9.1979 1♀, 28.-29.9.1979 4♀♀ 1♂, 5.8.1980 4♀♀ 7♂♂. Balıkesir: Altınoluk (150m) 10.8.1980 1♂; Kızılkeçili (25m) 21.8.1980 1♀; Küçükkuyu (3m) 13.8.1980 5♀♀ 2♂♂. İzmir: Ilıca (10m) 8.-10.7.1980 7♀♀ 7♂♂. Manisa: Millipark (71m) 29.-30.7.1980 2♀♀; Keçili (90m) 3.8.1980 1♀.

Distribution see figure 1. Vertical distribution is recorded between 3 - 150m.

Phenology: July-September.

**Subfamily Pemphredoninae**

***Psen ater* (OLIVIER, 1792)**

Material examined (114♀♀ 42♂♂): Aydın: Kuşadası (22m) 5.8.1980 1♀. Balıkesir: Altınoluk (150m) 10.8.1980 6♀♀ 1♂; Burhaniye (10m) 11.8.1980 6♀♀ 3♂♂; Kızılkeçili (25m) 21.8.1980 1♀; Küçükkuyu (3m) 13.8.1980 2♂♂; Ören (10m) 12.8.1980 1♀ 3♂♂. İzmir: Alsancak (5m) 25.6.1980 3♀♀; Bornova (20m) 22.6.1980 3♀♀ 1♂; Buca (15m) 21.6.1980 4♀♀ 2♂♂; Dikili (3m) 12.7.1980 1♀; Gaziemir (30m) 29.6.1980 4♀♀ 6♂♂; Gümüşsu (30m) 1.-3.7.1980 9♀♀ 3♂♂; Güzelyalı (10m) 24.6.1980 5♀♀ 1♂; Hatay (20m) 23.6.1980 1♀ 2♂♂; Ilıca (10m) 8.-9.7.1980 5♀♀; Seferihisar (30m) 6.-7.7.1980 29♀♀ 3♂♂; Tire (100m) 4.-5.7.1980 10♀♀ 4♂♂; Urla (50m) 11.7.1980 6♀♀ 2♂♂. Manisa: Dereköy (100m) 2.8.1980 4♀♀ 1♂; Gürle (95m) 4.8.1980 2♀♀, 9.8.1980 1♂; Keçili (90m) 3.8.1980 1♀; Merkez (71m) 28.7.1980 1♀; Milli Park (71m) 30.-31.7.1980 3♀♀ 5♂♂; Turgutlu (69m) 1.8.1980 1♀. Muğla: Güllük (3m) 6.8.1979 1♀ 1♂; Marmaris (3m) 4.-9.8.1979 6♀♀ 1♂.

Distribution see figure 1. Vertical distribution is recorded between 3 - 150m.

Phenology: June-August.

**Subfamily Astatinae**

***Astata boops* (SCHRANK, 1781)**

Material examined (2♂♂): İzmir: Ilıca (10m) 10.-12.7.1980 2♂♂.

Distribution see figure 1. Vertical distribution is recorded for 10m.

Phenology: July.

**Subfamily Crabroninae**

***Crabro peltarius* (SCHREBER, 1784)**

Material examined (1♀): İzmir: Tire (100m) 7.7.1980 1♀.

Distribution see figure 1. Vertical distribution is recorded for 100m.

Phenology: July.

***Ectemnius crassicornis* (SPINOLA, 1808)**

Material examined (1♀): İzmir: Tire (100m) 6.7.1980 1♀.

Distribution see figure 1. Vertical distribution is recorded for 100m.

Phenology: July.

**Subfamily Larrinae**

***Larra anathema* (ROSSI, 1790)**

Material examined (4♂♂): İzmir: Gaziemir (30m) 28.6.1980 1♂; Güzelyalı (10m) 24.6.1980 2♂♂. Manisa: Akhisar (93m) 5.8.1980 2♂♂.

Distribution see figure 2. Vertical distribution is recorded between 10 - 93m.

Phenology: June-August.

***Tachytes europaeus* KOHL, 1884**

Material examined (4♀♀ 4♂♂): Balıkesir: Havran (50m) 19.8.1980 1♀; Kızılkeçili

(25m) 21.8.1980 1♂. Manisa: Keçili (90m) 3.8.1980 2♀♀ 3♂♂; Akhisar (93m) 5.8.1980 1♀.

Distribution see figure 2. Vertical distribution is recorded between 25 - 93m.

Phenology: August.

### Subfamily Nyssoninae

#### *Stizus fasciatus* (FABRICIUS, 1781)

Material examined (2♀♀ 15♂♂): Balıkesir: Burhaniye (10m) 11.8.1980 3♂♂; Ören (10m) 12.8.1980 1♂. İzmir: Urla (50m) 11.7.1980 1♂; Dikili (3m) 13.7.1980 2♀♀ 2♂♂. Muğla: Marmaris-Uzunyali (3m) 3.-6.8.1979 7♂♂; Güllük (3m) 6.8.1979 1♂.

Distribution see figure 2. Vertical distribution is recorded between 3 - 50m.

Phenology: July-August.

#### *Bembix sinuata* PANZER, 1804

Material examined (23♂♂): Balıkesir: Burhaniye (10m) 11.8.1980 1♂, 16.8.1980 1♂; Küçükkuuyu (3m) 13.8.1980 7♂♂. İzmir: Bornova (20m) 22.6.1980 1♂; Gümtüşsu (30m) 2.7.1980 2♂♂; Ilica (10m) 8.-9.7.1980 5♂♂; Urla (50m) 11.7.1980 4♂♂. Manisa: Dereköy (100m) 2.8.1980 1♂. Muğla: Marmaris-Uzunyali (3m) 6.8.1979 1♂.

Distribution see figure 2. Vertical distribution is recorded between 3 - 100m.

Phenology: June-August.

#### *Bembix oculata* PANZER, 1801

Material examined (17♀♀): Aydın: Didim (20m) 22.-23.9.1979 4♀♀; Kuşadası (22m) 5.8.1980 2♀♀. Balıkesir: Küçükkuuyu (3m) 13.8.1980 1♀. İzmir: Dikili (3m) 13.7.1980 1♀; Ilica (10m) 10.7.1980 1♀; Gaziemir (30m) 29.6.1980 1♀; Gümtüşsu (30m) 3.7.1980 1♀; Tire (100m) 5.7.1980 2♀♀; Seferihisar (30m) 6.-7.7.1980 2♀♀. Muğla: Marmaris-Turunçadası (5m) 5.8.1979 2♀♀.

Distribution see figure 2. Vertical distribution is recorded between 3 - 100m.

Phenology: June-September.

#### *Bembix bidentata* VAN DER LINDEN, 1829

Material examined (13♀♀ 16♂♂): Balıkesir: Kızılkeçili (25m) 21.8.1980 1♀. İzmir: Bornova (20m) 22.6.1980 2♂♂; Ilica (10m) 8.-10.7.1980 11♀♀ 8♂♂. Muğla: Marmaris-Uzunyali (3m) 4.-8.8.1979 1♀ 5♂♂; Güllük (3m) 7.8.1979 1♂.

Distribution see figure 2. Vertical distribution is recorded between 3 - 25m.

Phenology: June-August.

#### *Bembix rostrata* (LINNAEUS, 1758)

Material examined (6♀♀): Balıkesir: Burhaniye (10m) 16.8.1980 1♀. İzmir: Gümtüşsu (30m) 2.7.1980 1♀; Ilica (10m) 8.-10.7.1980 3♀♀. Muğla: Marmaris-Uzunyali (3m) 6.8.1979 1♀.

Distribution see figure 2. Vertical distribution is recorded between 3 - 30m.

Phenology: July-August.

### Subfamily Philanthinae

#### *Philanthus triangulum* (FABRICIUS, 1774)

Material examined (8♀♀ 4♂♂): Aydın: Kuşadası (22m) 27.9.1979 1♀. İzmir: Gümtüşsu (30m) 2.-3.7.1980 3♀♀; Ilica (10m) 8.7.1980 4♂♂; Seferihisar (30m) 6.-7.7.1980 2♀♀; Tire (100m) 5.7.1980 2♀♀.

Distribution see figure 3. Vertical distribution is recorded between 10 - 100m.

Phenology: July-September.

***Cerceris arenaria* (LINNAEUS, 1758)**

Material examined (4♀ 24♂♂): Aydın: Didim (20m) 22.-23.9.1979 3♂♂; Kuşadası (22m) 25.9.1979 1♂. Balıkesir: Altınoluk (150m) 10.8.1980 1♂; Burhaniye (10m) 11.8.1980 1♂; Havran (50m) 19.8.1980 2♂♂. Denizli: Kale (1000m) 19.9.1980 2♀♀ 2♂♂. İzmir: Dikili (3m) 12.7.1980 1♀, 22.07.1980 2♂♂; Ilica (10m) 8.-10.7.1980 8♂♂; Seferihisar (30m) 6.7.1980 1♀, 8.8.1980 1♂. Manisa: Keçili-Millipark (90m) 29.7.1980 1♂, 31.7.1980 3♂♂, 3.8.1980 1♂.

Distribution see figure 3. Vertical distribution is recorded between 3 - 1000m.  
Phenology: July-September.

***Cerceris bupresticida* DUFOR, 1841**

Material examined (1♀): İzmir: Gümüşsu (30m) 4.7.1980 1♀.

Distribution see figure 3. Vertical distribution is recorded for 50m.  
Phenology: July.

***Cerceris sabulosa* (PANZER, 1799)**

Material examined (19♀ 20♂♂): Aydın: Didim (20m) 22.9.1979 1♂. Balıkesir: Havran (50m) 13.8.1980 1♀ 1♂; Kızılköçü (25m) 21.8.1980 2♀♀. Denizli: Kale (1000m) 18.-19.9.1980 3♀♀. İzmir: Alsancak (5m) 25.6.1980 1♂; Bornova (20m) 22.6.1980 1♂; Buca (20m) 21.6.1980 3♀♀ 1♂; Ilica (10m) 8.-9.7.1980 4♀♀ 3♂♂; Seferihisar (30m) 6.7.1980 3♀♀ 2♂♂; Urla (50m) 11.7.1980 1♂. Manisa: Akhisar (93m) 5.-6.8.1980 1♀ 1♂; Dereköy (100m) 2.8.1980 1♂; Gürle (95m) 4.8.1980 1♀; Keçili (90m) 3.8.1980 2♂♂; Millipark (71m) 31.7.1980 5♂♂; Turgutlu (69m) 1.8.1980 1♀.

Distribution see figure 3. Vertical distribution is recorded between 5-1000m.  
Phenology: June-September.

***Cerceris rybyensis* (LINNAEUS, 1771)**

Material examined (1♀): Manisa: Dereköy (100m) 4.8.1980 1♀.

Distribution see figure 3. Vertical distribution is recorded for 100m.  
Phenology: August.

***Cerceris quadrifasciata* (PANZER, 1799)**

Material examined (6♂♂): Balıkesir: Kızılköçü (25m) 21.8.1980 1♂. İzmir: Ilica (10m) 8.7.1980 4♂♂. Manisa: Millipark (71m) 31.7.1980 1♂.

Distribution see figure 3. Vertical distribution is recorded between 10 - 71m.  
Phenology: July-August.

***Cerceris interrupta* (PANZER, 1799)**

Material examined (9♀♀ 1♂): İzmir: Ilica (10m) 8.-9.7.1980 7♀♀ 1♂; Dikili (3m) 12.7.1980 2♀♀.

Distribution see figure 3. Vertical distribution is recorded between 3 - 10m.  
Phenology: July.

***Cerceris conigera* (GMELIN, 1790)**

Material examined (13♂♂): Denizli: Kale (1000m) 18.9.1980 1♂. İzmir: Bornova (20m) 22.6.1980 4♂♂; Hatay 23.6.1980 2♂♂; Gaziemir (30m) 29.6.1980 2♂♂; Gümüşsu (30m) 2.7.1980 1♂; Seferihisar (30m) 6.7.1980 2♂♂. Manisa: Gürle 4.9.1980 1♂.

Distribution see figure 3. Vertical distribution is recorded between 20 - 1000m.  
Phenology: June-September.

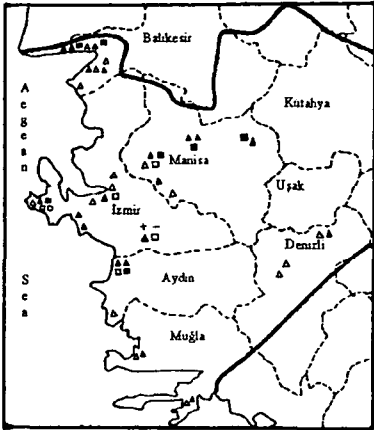


Fig. 1:  
 Δ = *Sceliphron spirifex*  
 ▲ = *Spheg rufocinctus*  
 □ = *Podalonia hirsuta*  
 ■ = *Ammophila sabulosa*  
 ○ = *Astarta boops*  
 + = *Crabro peltarius*  
 - = *Ectemnius crassicornis*

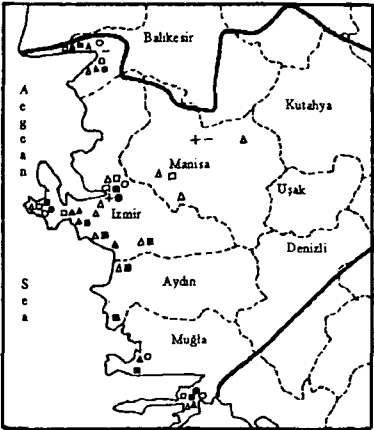


Fig. 2:  
 Δ = *Psen ater*  
 ▲ = *Stizus fasciatus*  
 □ = *Bembix sinuata*  
 ■ = *Bembix oculata*  
 ○ = *Bembix bidentata*  
 ● = *Bembix rostrata*  
 + = *Larra anathema*  
 - = *Tachytes europaeus*

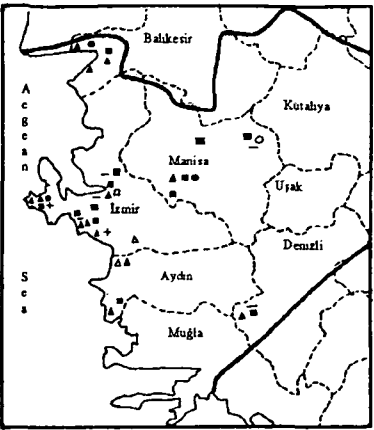


Fig. 3:  
 Δ = *Philanthus triangulum*  
 ▲ = *Cerceris arenaria*  
 □ = *Cerceris bupresticia*  
 ■ = *Cerceris sabulosa*  
 ○ = *Cerceris rybyensis*  
 ● = *Cerceris quadrifasciatus*  
 + = *Cerceris interrupta*  
 - = *Cerceris conigera*

## Results

At the end of the study *Psen ater*, *Bembix sinuata*, *Bembix oculata*, *Cerceris conigera* and *Larra anathema* are recorded as new to the Turkish fauna and *Sceliphron spirifex*, *Cerceris bupresticida*, *Cerceris rhybensis*, *Cerceris quadrifasciata*, *Cerceris interrupta*, *Bembix rostrata* and *Tachytes europaeus* are new to the Aegean region. According to literature, *Ammophila sabulosa* and *Stizus fasciatus* were known only from Kütahya province. But now *Ammophila sabulosa* is additionally recorded from the provinces Aydın, Balıkesir, İzmir and Manisa, and *Stizus fasciatus* from Balıkesir, İzmir and Muğla. The area of distribution is now significantly enlarged for both species. Another important faunistic record is the discovery of *Larra anathema* from the region, which had been known only from S-Europe, N-Africa and Iraq.

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