

A faunistic study on ground-dwelling spiders (Araneae) in the Tirana district, Albania

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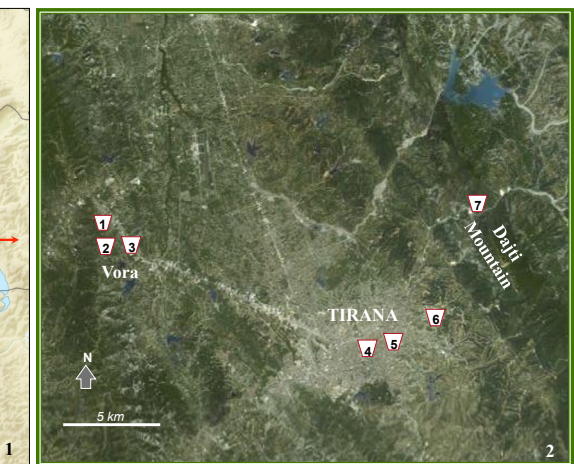
Abstract: Spiders from the Tirana district of Albania were investigated. Currently, 78 species from 24 families and a collection of 400 specimens from January to August 2010 were recorded for Tirana. A total of 32 new records for the Albanian fauna are included in the present paper. *Agracina lineata* (Simon, 1878) is the first record for the Balkan Peninsula. *Saitis graecus* Kulczyński, 1905 was known before only from Greece and Bulgaria. Presently, 373 spider species are known for Albania.

Keywords: Mediterranean, new records

Until now, 341 spider species were known for Albania based on various investigations (most recently DELTSHEV et al. 2011, VRENOZI 2012). The results presented in the current paper concerning ground dwelling spiders were assembled during a sampling programme at seven localities in the Tirana district. Spiders from these localities have not been studied before. A considerable number of new records for Albania resulted from this investigation, which is linked to the differences between the selected areas in the Tirana district. This present paper focuses on faunistic data for spiders in the Tirana district. Zoogeographical data on the distribution of the newly recorded spider species are also presented.

Methods

Spiders were collected using pitfall traps set from January to August 2010 at seven localities in the Tirana district. At each locality five pitfall traps were placed in a line, with seven meters distance between each other. The traps were filled up to 5 cm with



Figs. 1–2: 1. – Map of Albania showing Tirana district. 2. – Map of Tirana District with collecting localities (see text for description)

7% formaldehyde as a preserving solution, and were emptied once per month during the total sampling period (07.02.–08.08.2010). Some of the traps yielded no spider individuals at some localities in different months, although they did catch other invertebrates or vertebrates. The material was preserved in 70% ethanol for taxonomic examinations, which were carried out at the Senckenberg Research Institute in Frankfurt am Main. Voucher specimens are deposited at the Museum of Natural Sciences in Tirana.

The main literature used for identification was GRIMM (1985), HEIMER & NENTWIG (1991), METZNER (1999), MUSTER et al. (2007), NENTWIG et al. (2012), ROBERTS (1987, 1995) and TONGIORGI (1966).

Nomenclature and order of families in the species list follows PLATNICK (2011). Data concerning their general distribution are taken from PLATNICK (2011), HELSDINGEN (2011) and NENTWIG et al. (2012).

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Localities

Seven localities in the Tirana district were investigated (Figs. 1 & 2). A short description, including the main vegetation and soil composition, is given for each locality. The maps of Albania and the Tirana district are taken from <http://maps.google.com>, and the photos of each locality were taken with a Kodak EasyShare V1003. A Global Positioning System (Garmin GPSMap 60C) was used to measure altitudes and coordinates.

L1. Vora Hill, Guri i Bollës, top of the hill with degraded forest, with *Arbutus unedo* and *Erica arborea*, *Phyllirea media*, *Cistus incanus*, *Spartium junceum*, *Verbascum phlomoides*, *Rubus ulmifolius*, *Thymus praecox*, *Bromus arvensis*, *Hordeum murinum*, *Lolium perenne*, clay and stony soil, 195 m a.s.l., N 41°22.922', E 19°38.966', northwest of Tirana city (Fig. 3).

L2. Vora Hill, bottom of the hill with *Robinia pseudacacia*, *Arum italicum*, *Campanula* sp., Gramineae, moist ground during all the collecting period except June to August, 157 m a.s.l., N 41°22.710', E 19°39.298', northwest of Tirana city (Fig. 4).

L3. Vora Hill, bottom of the hill with *Olea europaea*, Gramineae, rural area, 5 - 15 cm leaf litter, 144 m a.s.l., N 41°22.934', E 19°39.284', northwest of Tirana city (Fig. 5).

L4. Museum of Natural Sciences, urban area, *Nerium oleander*, *Ligustrum lucidum*, *Thuja orientalis*, *Laurus nobilis*, *Jasminum nudiflorum*, *Hypericum perforatum*, *Hordeum murinum*, *Aegilops neglecta*, moist ground during all the collecting period except June to August, 106 m a.s.l., N 41°19.611', E 19°48.338', centre of Tirana city (Fig. 6).

L5. Hospital "Nënë Tereza" - urban area, *Ligustrum sinensis*, *Hordeum murinum*, *Lolium perenne*, leaf litter, 134 m a.s.l., N 41°20.483', E 19°49.972', centre of Tirana city (Fig. 7).

L6. Institute of Veterinary Research, suburban area with *Rubus ulmifolius*, Gramineae, moist ground during all the collecting period except June to August, 167 m a.s.l., N 41°20.814', E 19°51.179', northeast of Tirana city (Fig. 8).

L7. Dajti Mountain, National park mainly with *Fagus sylvatica* and other vegetation such as *Juniperus communis*, *Acer pseudoplatanus*, Gramineae, beside a stream, 15 - 30 cm leaf litter, 1584 m a.s.l., N 41°23.421', E 19°55.334', northeast of Tirana city (Fig. 9).

Results

In total, 400 specimens of spiders including 310 males and 90 females, representing 78 species from 49 genera and 24 families were collected. Seven spe-



Figs. 3–9: Localities (3: L1, 4: L2, 5: L3, 6: L4, 7: L5, 8: L6, 9: L7) where were placed pit fall traps, listed from West to East of Tirana

cies account for 53.6% of all the individuals collected: *Trochosa hispanica* (14.0%), *Pardosa proxima* (11.5%), *Alopecosa pulverulenta* (8.2%), *Inermocoelotes falciger* (7.5%), *Drassyllus villicus* (4.2%), *Tallusia vindobonensis* (4.2%) and *Trachyzelotes pedestris* (4.2%). Three families were well-represented in terms of specimens: Lycosidae (173 specimens or 43.1%), Gnaphosidae (74 specimens or 18.5%) and Agelenidae (40 specimens or 10.0%). Gnaphosidae, Lycosidae, Salticidae and Theridiidae have respectively 18, 12, 10 and 8 species each, representing the richest families which together comprise 61.5% of all the species collected by pitfall trapping.

A total of 32 records are new to the Albanian araneofauna; together they belong to 27 genera.

Atypus affinis Eichwald, 1830 is well-represented in Central Europe. The only female for Albania was collected at L7 in June and four males at L5 in July. This species was identified according to KRAUS & BAUR (1974) and confirmed by C. Deltshv. Based on KRAUS & BAUR (1974) this would represent the most south-eastern record of the species.

Nemesia pannonica pannonica Herman, 1879 has an Eastern European distribution. This species new for Albania was collected only at L3 in March and April and was identified according to FUHN & POLENEC (1967).

Enoplognatha afrodite Hippa & Oksala, 1983 has a Southern European distribution. The only male for Albania was collected at L6 in May.

Enoplognatha mandibularis (Lucas, 1846) has a Palaearctic distribution. Two males were collected at L4 in January and February. These records extend its distribution in the Balkan Peninsula, whereby it is now also known for Albania.

Episinus maculipes Cavanna, 1876 is a Western Palaearctic species. The only female was collected at L6 in July. This record extends its distribution in the Balkan Peninsula, whereby it is now also known for Albania.

Episinus truncatus Latreille, 1809 is well-represented in the Palaearctic region. In Albania, two females were collected at L3 in June and at L6 in July.

Neottiura herbigrada (Simon, 1873) has a Central European to Asian distribution. The only male for Albania was collected at L3 in May.

Tallusia vindobonensis (Kulczyński, 1898) is known in Central and Eastern Europe. In Albania, six females were collected at L4, L5 and L6 in January,

L4 in February; while 11 males were collected only at L6 in January.

Pachygnatha degeeri Sundevall, 1830 is well-represented in the Palaearctic region. One female and one male were recorded at L6, respectively in March and April.

Glyptogona sextuberculata (Keyserling, 1863) has a Mediterranean distribution. These records extend its distribution into the Balkan Peninsula. In Albania, only two males were collected at L1 in May.

Alopecosa cursor (Hahn, 1831) is well represented in the Palaearctic region. The only male recorded for Albania was collected at L1 in April.

Aulonia albimana (Walckenaer, 1805) has a Central Asian to Mediterranean distribution. In Albania, two males were collected at L6 in May and June.

Pardosa vittata (Keyserling, 1863) is a European species. The only female for Albania was collected at L6 in July.

Inermocoelotes falciger (Kulczyński, 1897) has an Eastern European distribution. The only female for Albania was collected at L5 in January; while 29 males were collected at L2 in January and February, at L5 in January and at L6 in May and July.

Malthonica dalmatica (Kulczyński, 1906) has a Central-European Asian distribution. The only female for Albania was collected at L4 in March.

Agraecina lineata (Simon, 1878) is distributed in the North Mediterranean. In Albania, four males were collected at L6 in June and July. This find represents the first record for the Balkan Peninsula.

Aphantaulax cincta (L. Koch, 1866) is a Western Palaearctic species. The only female for Albania was collected at L3 in July.

Aphantaulax trifasciata (O. P.-Cambridge, 1872) has a Palaearctic distribution. The only male for Albania was collected at L6 in July.

Drassyllus villicus (Thorell, 1875) is distributed in Europe. Two females and 14 males were collected at L2 in April and May; while one male was found at L3 in June.

Echemus angustifrons (Westring, 1861) has a European to Central Asian distribution. The only male for Albania was collected at L7 in July.

Micaria coarctata (Lucas, 1846) has a Central Asian to Mediterranean distribution. The only male was collected at L6 in July.

Nomisia recepta (Pavesi, 1880) is distributed in the Mediterranean region. Until now, this species was only known in Europe from Corsica and Sicily. In

Albania, two males and two females were collected at L4 in May and June. This species was identified according to LEVY (1995) and CHATZAKI (2010). *Zelotes atrocaeruleus* (Simon, 1878) has a Palearctic distribution. In Albania, one male and two females were collected at L1 in June and at L3 in July. *Zelotes hermani* (Chyzer, 1897) is distributed in Europe. The only female for Albania was collected at L6 in May. *Philodromus bistigma* Simon, 1870 has a Mediterranean distribution. One male and one female were collected at L5 in June and July. *Philodromus ruficapillus* Simon, 1885 has a Mediterranean distribution. In Albania, two females were collected at L4 in July and at L6 in June. These females extend the species' distribution in the Balkan Peninsula, as it was previously known only in Greece. *Thanatus atratus* Simon, 1875 has a Palearctic distribution. In Albania, two males and one female were collected at L3 in June and July. *Xysticus kempeleni* Thorell, 1872 is well-distributed in Central Europe through to Central Asia. The only male for Albania was collected at L2 in April. *Ballus chalybeius* (Walckenaer, 1802) is well-distributed from Europe to Central Asia. The only female for Albania was collected at L7 in July. *Habrocestum papilionaceum* (L. Koch, 1867) was previously known from Greece and Turkey. The only female for Albania was collected at L1 in June. *Neaetha membra* (Simon, 1868) has a Mediterranean distribution, with records also in the southwest of Germany. The only male for Albania was collected at L1 in February. *Saitis graecus* Kulczyński, 1905 was known previously from Greece and Bulgaria. In Albania, the only male and three females were collected at L2 in April and May, and at L3 in June. This record emphasizes the nature of this species as a Balkan endemic.

A total of 32 new species records for Albania based on 121 specimens is included in this study. The largest number of species were found at L2 (39) and L6 (37), the lowest number at L7 (3). Species with the largest number of specimens were *Inermocoelotes falciger* (30), *Tallusia vindobonensis* (17) and *Drassyllus villicus* (17), which amount to 52.9% of all specimens.

Regarding the zoogeographic distribution of these species (Tab. 2), the Holarctic complex is well represented (43.8%) followed by the Mediterranean complex (23.1%) and the European species (16.7%).

Balkan endemics (*Saitis graecus*) comprise 7.7% of the species.

Including data from this study, the spider fauna of Albania now comprises a total of 373 recorded species.

Discussion

Spiders have not been studied previously at these localities. Comparing all localities in the Tirana district, the total number – and especially the numerous newly recorded species collected from only in seven localities – implies an area with high species richness. Most of the spiders sampled (71.6%) from the seven localities in the Tirana district belong to three families: Lycosidae, Agelenidae and Gnaphosidae. The most new records for Albania belong to the families Linyphiidae, Agelenidae and Gnaphosidae. These families are very common on the ground surface, and they were expected to be highly represented in pitfall traps due to their predatory activity on or near the ground. The Vora hills, especially the artificial forest with *Robinia pseudacacia*, and the suburban area with *Rubus ulmifolius* have the highest composition of new records and thus may be 'hotspots' for the Tirana district. Balkan endemics, such as *Saitis graecus*, occur in natural habitats and emphasize the local character of this fauna. Based on these results, further studies need to be undertaken and a preliminary checklist should be compiled for the Tirana district.

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Tab. 1: Species list with indication of collecting dates and localities

(L1–L7 see text. Numbers of ♂/♀. * new records for Albania. BAL – Balkan, CAM – Central-Asian Mediterranean, CE – Central European, CEA – Central-European Asian, CEE – Central & Eastern European, ECA – European-Central Asian, EE – Eastern European, EEA – European-Eastern Asian, EM – East Mediterranean, EUR – European, HOL – Holarctic, MED – Mediterranean, NM – Nord Mediterranean, PAL – Palaearctic, SE – Southern European, WPA – West-Palaearctic

| Family/Species | L1 | L2 | L3 | L4 | L5 | L6 | L7 | Zoogeographical distribution |
|---|------|------|-----|-----|------|-------|-----|------------------------------|
| Atypidae | | | | | | | | |
| * <i>Atypus affinis</i> Eichwald, 1830 | | | | | 4/- | | -/1 | CE |
| Nemesiidae | | | | | | | | |
| * <i>Nemesia pannonica pannonica</i> Herman, 1879 | | | 4/- | | | | | EE |
| Scytodidae | | | | | | | | |
| <i>Scytodes thoracica</i> (Latreille, 1802) | | | 1/1 | | -/2 | | | HOL |
| Theridiidae | | | | | | | | |
| <i>Asagena phalerata</i> (Panzer, 1801) | | | | 1/- | | 1/- | | PAL |
| * <i>Enoplognatha afrodite</i> Hippa & Oksala, 1983 | | | | | | 1/- | | SE |
| * <i>Enoplognatha mandibularis</i> (Lucas, 1846) | | | | 2/- | | | | PAL |
| <i>Enoplognatha thoracica</i> (Hahn, 1833) | | | | 1/- | | | | HOL |
| * <i>Episinus maculipes</i> Cavanna, 1876 | | | | | | | -/1 | WPA |
| * <i>Episinus truncatus</i> Latreille, 1809 | | | -/1 | | | | -/1 | PAL |
| <i>Euryopis episinoides</i> (Walckenaer, 1847) | | | | | 1/- | 5/- | | MED |
| * <i>Neottiura herbigrada</i> (Simon, 1873) | | | 1/- | | | | | CEA |
| Linyphiidae | | | | | | | | |
| * <i>Tallusia vindobonensis</i> (Kulczyński, 1898) | | | | -/2 | 2 | 11/2 | | CEE |
| <i>Tenuiphantes tenuis</i> (Blackwall, 1852) | | | | -/1 | | | | EEA |
| Tetragnathidae | | | | | | | | |
| * <i>Pachygnatha degeeri</i> Sundevall, 1830 | | | | | | 1/1 | | PAL |
| Araneidae | | | | | | | | |
| * <i>Glyptogona sextuberculata</i> (Keyserling, 1863) | 2/- | | | | | | | MED |
| Lycosidae | | | | | | | | |
| <i>Alopecosa aculeata</i> (Clerck, 1757) | -/2 | | | | | | -/1 | HOL |
| <i>Alopecosa albofasciata</i> (Brulle, 1832) | | | 3/3 | | | | | CAM |
| * <i>Alopecosa cursor</i> (Hahn, 1831) | 1/- | | | | | | | PAL |
| <i>Alopecosa pulverulenta</i> (Clerck, 1757) | 17/- | 5/- | 8/3 | | | | | PAL |
| * <i>Aulonia albimana</i> (Walckenaer, 1805) | | | | | | 2/- | | PAL |
| <i>Pardosa alacris</i> (C.L. Koch, 1833) | | | | | | | 2/1 | EUR |
| <i>Pardosa hortensis</i> (Thorell, 1872) | | | | | | 8/3 | | PAL |
| <i>Pardosa proxima</i> (C.L. Koch, 1847) | | | | | | 40/6 | | PAL |
| * <i>Pardosa vittata</i> (Keyserling, 1863) | | | | | | | -/1 | EUR |
| <i>Pirata latitans</i> (Blackwall, 1841) | | | | | | 1/- | | EUR |
| <i>Trochosa hispanica</i> Simon, 1870 | 1/- | 7/- | 1/- | 4/2 | 12/1 | 18/10 | | CAM |
| <i>Trochosa ruricola</i> (De Geer, 1778) | | 7/3 | | | | | | HOL |
| Oxyopidae | | | | | | | | |
| <i>Oxyopes lineatus</i> Latreille, 1806 | | | | | | 1/2 | | PAL |
| Zoridae | | | | | | | | |
| <i>Zora spinimana</i> (Sundevall, 1833) | | | | | | 1/- | | PAL |
| Agelenidae | | | | | | | | |
| * <i>Inermocoelotes falciger</i> (Kulczyński, 1897) | | 18/- | | | 3/1 | 8/- | | EE |
| <i>Inermocoelotes microlepidus</i> (de Blauwe, 1973) | | | | | | | 7/- | BAL |
| <i>Maimuna vestita</i> (C.L. Koch, 1841) | | | | 1/- | | | | EM |
| * <i>Malthonica dalmatica</i> (Kulczyński, 1906) | | | | -/1 | | | | CEA |

| Family/Species | L1 | L2 | L3 | L4 | L5 | L6 | L7 | Zoogeographical distribution |
|--|-----|------|-----|-----|-----|-----|-----|------------------------------|
| <i>Malthonica nemorosa</i> (Simon, 1916) | | | 1/- | | | | | BAL |
| Amaurobiidae | | | | | | | | |
| <i>Amaurobius erberi</i> (Keyserling, 1863) | | | | 3/- | 3/- | | | EUR |
| <i>Amaurobius phaeacus</i> Thaler & Knoflach, 1998 | | | | | | | 5/1 | BAL |
| Titanoecidae | | | | | | | | |
| <i>Nurscia albomaculata</i> (Lucas, 1846) | | | | 2/- | | 1/- | | ECA |
| Liocranidae | | | | | | | | |
| * <i>Agraecina lineata</i> (Simon, 1878) | | | | | | 4/- | | NM |
| Zodariidae | | | | | | | | |
| <i>Zodarion elegans</i> (Simon, 1873) | -/1 | | | | | | | MED |
| <i>Zodarion frenatum</i> Simon, 1884 | | | | | | | -/1 | BAL |
| <i>Zodarion obridense</i> Wunderlich, 1973 | | | | | | | 3/- | BAL |
| Gnaphosidae | | | | | | | | |
| * <i>Aphantaulax cincta</i> (L. Koch, 1866) | | | -/1 | | | | | WPA |
| * <i>Aphantaulax trifasciata</i> (O. P.-Cambridge, 1872) | | | | | | 1/- | | PAL |
| <i>Drassodes cupreus</i> (Blackwall, 1834) | 1/- | | 2/- | | | | | PAL |
| <i>Drassodes lapidosus</i> (Walckenaer, 1802) | | | 1/1 | | | 2/- | | PAL |
| <i>Drassyllus praeficus</i> (L. Koch, 1866) | -/1 | 1/- | | | | | | ECA |
| * <i>Drassyllus villicus</i> (Thorell, 1875) | | 14/2 | 1/- | | | | | EUR |
| * <i>Echelus angustifrons</i> (Westring, 1861) | | | | | | | 1/- | ECA |
| <i>Haplodrassus signifer</i> (C.L. Koch, 1839) | 4/- | | 5/- | | 1/- | 4/- | | HOL |
| <i>Micaria albobittata</i> (Lucas, 1846) | | | | | | 1/- | | PAL |
| * <i>Micaria coarctata</i> (Lucas, 1846) | | | | | | 1/- | | CAM |
| * <i>Nomisia recepta</i> (Pavesi, 1880) | | | | 2/2 | | | | MED |
| <i>Trachyzelotes barbatus</i> (L. Koch, 1866) | | | 1/- | | | | | CAM |
| <i>Trachyzelotes pedestris</i> (C.L. Koch, 1837) | | 13/2 | | 1/- | | | | EUR |
| <i>Zelotes apricorum</i> (L. Koch, 1876) | | | | | | | 1/- | EUR |
| <i>Zelotes argoliensis</i> (C.L. Koch, 1839) | | 1/- | | | | | | MED |
| * <i>Zelotes atrocaeruleus</i> (Simon, 1878) | 1/1 | | -/1 | | | | | PAL |
| * <i>Zelotes hermani</i> (Chyzer, 1897) | | | | | | -/1 | | EUR |
| <i>Zelotes tenuis</i> (L. Koch, 1866) | | | | -/2 | | | | MED |
| Philodromidae | | | | | | | | |
| * <i>Philodromus bistigma</i> Simon, 1870 | | | | | 1/1 | | | MED |
| * <i>Philodromus ruficapillus</i> Simon, 1885 | | | | -/1 | | -/1 | | MED |
| * <i>Thanatus atratus</i> Simon, 1875 | | | 2/1 | | | | | PAL |
| Thomisidae | | | | | | | | |
| <i>Cozyptila blackwalli</i> (Simon, 1875) | | 1/- | | | | | | PAL |
| <i>Ozyptila sanctuaria</i> (O. P.-Cambridge, 1871) | -/1 | | | | | | | EUR |
| <i>Xysticus acerbus</i> Thorell, 1872 | 1/- | | 2/- | | | | | ECA |
| <i>Xysticus cristatus</i> (Clerck, 1757) | | | | | -/1 | | | PAL |
| * <i>Xysticus kempeleni</i> Thorell, 1872 | | 1/- | | | | | | ECA |
| <i>Xysticus kochi</i> Thorell, 1872 | | | 1/- | | | | | ECA |
| Salticidae | | | | | | | | |
| <i>Aelurillus v-insignitus</i> (Clerck, 1757) | 1/- | | | | | | | PAL |
| * <i>Ballus chalybeius</i> (Walckenaer, 1802) | | | | | | | -/1 | ECA |
| <i>Euophrys frontalis</i> (Walckenaer, 1802) | | | | -/1 | | | | PAL |
| <i>Euophrys rufibarbis</i> (Simon, 1868) | | -/1 | | | | | | PAL |
| <i>Evarcha jucunda</i> (Lucas, 1846) | | | -/1 | 2/2 | -/1 | 1/- | | MED |

| Family/Species | L1 | L2 | L3 | L4 | L5 | L6 | L7 | Zoogeographical distribution |
|--|-----------|-----------|-----------|-----------|-----------|------------|-----------|------------------------------|
| <i>Habrocestum papilionaceum</i> (L. Koch, 1867) | -/1 | | | | | | | BAL |
| <i>Heliophanus auratus</i> C.L. Koch, 1835 | | | | | | | -/1 | PAL |
| <i>Neaetha membroza</i> (Simon, 1868) | 1/- | | | | | | | MED |
| <i>Pseudeuophrys obsoleta</i> (Simon, 1868) | | 1/- | | | | | | PAL |
| <i>Saitis graecus</i> Kulczyński, 1905 | | 1/2 | -/1 | | | | | EM |
| Total numbers of adults | 36 | 81 | 48 | 33 | 34 | 144 | 24 | |
| Total numbers of species | 15 | 13 | 20 | 16 | 11 | 28 | 9 | |

Tab. 2: Species number according to complexes and chorotypes; Abbreviations as in Tab. 1

| Complexes | Chorotypes | species no. | % |
|---------------|--------------|-------------|-------------|
| Holarctic | HOL | 5 | 12.2 |
| | PAL | 24 | 58.5 |
| | WPA | 2 | 4.9 |
| | ECA | 7 | 17.1 |
| | EEA | 1 | 2.4 |
| | CEA | 2 | 4.9 |
| | Total | 41 | 52.6 |
| European | EUR | 9 | 69.2 |
| | EE | 2 | 15.4 |
| | CE | 1 | 7.7 |
| | CEE | 1 | 7.7 |
| | Total | 13 | 16.7 |
| Mediterranean | MED | 10 | 55.6 |
| | NM | 1 | 5.6 |
| | EM | 2 | 11.1 |
| | SE | 1 | 5.6 |
| | CAM | 4 | 22.2 |
| | Total | 18 | 23.1 |
| Endemics | BAL | 6 | 100.0 |
| | Total | 6 | 7.7 |

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