

New data on the East Mediterranean Nemesiidae (Aranei: Mygalomorphae)

Новые данные по восточномедиземноморским паукам семейства Nemesiidae (Aranei: Mygalomorphae)

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KEY WORDS. Taxonomy, new species, redescription, Araneae, spiders, Cyprus, Turkey.

КЛЮЧЕВЫЕ СЛОВА: таксономия, новые виды, переописание, Araneae, пауки, Кипр, Турция.

ABSTRACT: The paper contains new descriptions of *Brachythele zonsteini* sp.n. from Central Anatolia, Turkey, and *Nemesia cypriatica* sp.n. from Cyprus, as well as a redescription of *B. varrialei* (Dalmat, 1922), with the first description of the conspecific female from Turkey. All descriptions are based on both sexes of each species and accompanied by images or diagnoses based on comparisons to related species.

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РЕЗЮМЕ. Статья содержит первоописания *Brachythele zonsteini* sp.n. из Центральной Анатолии, Турция, и *Nemesia cypriatica* sp.n. из Кипра, а также переописание *B. varrialei* (Dalmat, 1922) вместе с первым описанием конспецифичной самки из Турции. Каждое из иллюстрированных описаний произведено по обоим полам данного вида и сопровождается диагнозом и сравнением с близкими видами.

Introduction

Nemesiidae Simon, 1889 is currently represented by 45 genera and 422 extant species in the world. Most of them are distributed in South America and Australia, and only three genera occur in the eastern Mediterranean, namely *Brachythele* Ausserer, 1871, *Nemesia* Audouin, 1826, and *Raveniola* Zonstein, 1987.

Currently, nine species of Nemesiidae belonging to all three genera of the eastern Mediterranean are known from Turkey [Danışman *et al.*, 2021]. The first record was by Rigler [1852] with *Nemesia caementaria* (Latreille, 1799) (as *Mygale caementaria*) from the vicinity of İstanbul, which was overlooked by arachnologists when compiling checklists in Turkey [Karol, 1967; Danışman *et al.*, 2021] and Europe [Nentwig *et al.*, 2021]. There have been few records in the following years, including *Raveniola micropa* (Ausserer, 1871) described based on a female collected from Bursa (Northwestern Anatolia), and *Brachythele varrialei* (Dalmat, 1920) described based on four males collected from Bodrum Castle, Muğla (Aegean coast of Turkey). Today, *Raveniola* is represented by seven species thanks to the efforts of Zonstein *et al.* [2018] and Kunt & Yağmur [2010], while *Nemesia* and *Brachythele* remain poorly studied, with no recent studies available following the old era of arachnology. Only two species are known from Cyprus: *Brachythele incerta* Ausserer, 1871, and one undescribed *Nemesia* sp. [Bosmans *et al.*, 2019].

Based on the material collected from Turkey and Cyprus, and could not be assigned to already known species, we tried to provide detailed descriptions and locality records for two new species and the previously unknown female of *Brachythele varrialei* (Dalmat, 1920).

Material and Methods

We obtained digital images of the copulatory organs using a Leica DFC295 digital camera, attached to a Leica

S8AP0 stereomicroscope. Several (5–15) photographs were taken in different focal planes and combined using “CombineZP” image stacking software. All measurements are given in mm. Terminology for measurements and copulatory organs adapted from Decae & Huber [2017], and Zonstein [2007].

Abbreviations: ALE — anterior lateral eye, AR — anterior eye row, BL — total body length, Bu — bulb length, Ca — caput length, CL — carapace length, CW — carapace width, Cy — cymbium length, EL — length eye group, Em — embolus length, Ext — external distance between receptacles, Fe — femur, Int — internal distance between receptacles, LL — labium length, LW — labium width, Me — metatarsus, ML — maxillae length, MW — maxillae width, Pa — patella, PLE — posterior eye, PR — posterior eye row, SL — sternum length, SW — sternum width; Ta — tarsus, Ti — tibia.

Depositories: AZM — Alaşehir Zoological Museum, Manisa, Turkey; CHNM — Cyprus Herbarium & Natural History Museum, Nicosia, Cyprus; CMG — Museo Civico di Storia Naturale di Genova; ETZM — Eskişehir Technical University Zoology Museum, Eskişehir, Turkey; NHMW — Museum of Natural History of Vienna, Austria; ZMMU — Zoological Museum of the Moscow State University, Moscow, Russia.

Taxonomy

Family Nemesiidae Simon, 1889

Genus *Brachythele* Ausserer, 1871

COMMENTS. *Brachythele* Ausserer, 1871 regarded as a senior synonym of *Nemesiothele* Dalmas, 1920 and transferred from the family Dipluridae to Nemesiidae by Raven [1985]. *Brachythele* is a genus of the nominative subfamily Nemesiinae that comprises eight species known predominantly from the North-Eastern Mediterranean region. Turkey and Cyprus are the easternmost points of the genus range [WSC, 2021].

Brachythele varrialei (Dalmas, 1920)

Figs 1A–B, 2A–D, 3A, 4A–D, 5A–B, 6A–C, 7A–C, 8A.

Nemesiothele v. Dalmas, 1920: 61 (♂).

B. v.: Raven, 1985: 96, f. 85–91 (♂).

TYPES: Holotype ♂, Turkey, Muğla Prov., Bodrum Dist., Bodrum Castle, In CMG, Not examined (see Dalmas, 1920; Raven, 1985).

MATERIAL EXAMINED: TURKEY, *İzmir* Prov.: 1♂ (ETZM), Nif Mountain (38°23′21.90″N 27°26′7.44″E), Kemalpaşa Dist., 294 m, under stone, 26.07.2005, S. Anlaş; 1♂ (ETZM), Buca Dist., Kaynaklar Vill. (38°21′39.50″N 27°17′17.90″E), 374 m, under stone, 4.04.2009, E.A. Yağmur & H. Durmuş; 1♂ (ETZM), Karaburun Dist., Parlak Vill. (38°35′59″N 26°23′17″E), 186 m, under stone, 19.07.2008, E.A. Yağmur & S. Anlaş; 1♀ (ETZM), Menemen Dist., Emiralem Vill. (38°37′02.5″N 27°10′04.8″E), 38 m, from burrow, 19.04.2009, E.A. Yağmur & F. Sürücü; 6♀♀, 1♂ (ETZM), Buca Dist., Kaynaklar Vill. (38°21′39.50″N 27°17′17.90″E), 374 m, 27.02.2010, E.A. Yağmur; 3♀♀, 1♂ (ETZM), Karaburun Dist., Parlak Vill. (38°35′59″N 26°23′17″E), 186 m, from burrow, 6.03.2010, E.A. Yağmur & E. Yağmur. *Manisa* Prov.: 1♀ (ETZM), Spil Mountain (38°32′8.20″N 27°27′31.20″E), 1121 m, 27.03.2010, E.A. Yağmur & E. Yağmur. *Muğla* Prov.: 1♂ (ETZM), Bodrum Dist., Aspat Bay (37°1′0.51″N 27°19′30.62″E), 74 m, pitfall trap, 29.11.2008, E.A. Yağmur; 1♂ (ETZM),

Milas Dist., Kırıkkışlacık Vill. (37°16′24.27″N 27°33′12.18″E), 24 m, under stone, 20.11.2010, M. Elverici.

DIAGNOSIS: Male of *Brachythele varrialei* appears to be most similar to those of *B. ictérica* (C.L. Koch, 1838) and *B. media* Kulczyński, 1897, the former differs by more pronounced bending of the embolus (Özkütük, pers. obs.); a flatten tip of embolus in *B. varrialei* is wider than in *B. media* (Figs 6A–C, 7A–C cf. Polenec, 1978, fig. 2). Endogyne in *B. varrialei* resembles those in other *Brachythele* spp. with differences in stem (receptacle) heights and distance between receptacles (Fig. 8A).

DESCRIPTION. MALE. Measurements: BL 16.0, CL 6.3, CW 4.9, Ca 3.7, AR 1.2, PR 1.2, EL 0.6, ALE 0.4, PLE 0.3, ALE–AME 0.05, ALE–PLE 0.1, PLE–PME 0.08, AME–AME 0.15, PME–PME 0.5, SL 3.1, SW 2.5, LL 0.8, LW 0.8, ML 2.6, MW 1.1. Palp 6.9 (2.7, 1.0, 2.3, 0.9). Legs: I 18.30 (5.4, 2.5, 4.0, 3.7, 2.7), II 17.30 (5.0, 2.5, 3.5, 3.5, 3.0), III 16.00 (4.6, 2.0, 3.0, 3.9, 2.5), IV 21.80 (5.5, 3.0, 5.0, 5.0, 3.3).

Cephalothorax: Carapace brown, broadly oval. Eye tubercle blackish. Cephalic portion with distinct blackish setae and dark ground color on a straight line between posterior eye row and fovea. Anterior half of carapace with tiny, whitish setae. Thoracic fovea deep crescent-shaped (Figs 1A, 2D). Chelicerae and cheliceral fangs dark brown. Chelicera without rastellum, with blackish setae close to fang base. Cheliceral furrow with 6 promarginal teeth and 5 mesobasal denticles. Cheliceral fang proximally serrated with 8–9 heterogeneous denticles (Fig. 4A).

Labium, sternum, and ventral parts of coxae light brown, maxillae darker, all with black setae. Labium without cusps. Maxillae with 15–18 probasal cusps. Sternal sigilla small, oval and submarginal. Chevron-like labiosternal sigillum entirely covers anterior part of sternum (Fig. 3A).

Leg structures: Legs brown, covered with black setae, denser at distal parts of femur and retro-lateral sides of patella III and IV. Distal segments (tibia to tarsus) of leg I as shown in Fig. 5A–B. Like other male congeners, tibia I subapically armed with two parallel proventral megaspines set on low joint process. Cymbium with 10 dorsal spines.

Spination: Palp: fe p1, d1-1; pa 0; ti p1-1-1-1, d1-1; ta d10. Leg I: fe p1-1, r1-1-1, d4; pa p1-1, r1-1-1; ti p1-1, pv2, v2-2-1; mt p1-1-1, r1-1-1, d2-2, v1. Leg II: fe p1-1-1; pap1; ti p1-1-1, v2-2-2; mt p1-1-1, pd1, v2-2-2. Leg III: fe p1-1-1, pd1, d1-1-1; pa p1-1, r1, rd1, rv1; ti p1-1-1, r1-1, v2-2-2; mt pd1-1, pv1-1, r1-1-1, v2-2-3; ta p1, r1. Leg IV: fe p3, rd1-1; pa p2; ti p1-1-1, pd1-1; mt p1-1-1, r1-1-1; ta p1, r1-1-1.

Abdomen: greyish brown, covered with black setae. Dorsum with a dark pattern resembling multiple arrowheads, consecutively arranged, anteriorly directed (Figs 1A, 2D). Venter with numerous slit sensilla between epigastric furrow and pedicel, unnoticeable unless SEM screening (Fig. 4D).

Spinnerets: uniformly greyish brown. PMS rod-shaped. PLS greyish brown; maximal diameter 0.6; length of basal, medial, and apical segments 1.3, 0.7, and 0.7 mm, respectively.

Copulatory organs: length ratio of palpal segments (fe, pa, ti, ta): 12, 6, 3, 2. Bulb pyriform. Bulb smooth dorsally. Embolus thin and long. Tip of embolus flattened and leaf-shaped, gently curved and ahead-directed (Figs 6A–C, 7A–C). Bu 1.4, Em 0.70.

FEMALE. Measurements: BL 19.2, CL 6.1, CW 4.7, Ca 3.7, AR 1.3, PR 1.3, EL 0.60, ALE 0.3, PLE 0.28, ALE–AME 0.12, ALE–PLE 0.12, PLE–PME 0.06, AME–AME 0.12, PME–PME 0.5, SL 6.0, SW 5.0, LL 0.80, LW 1.0, ML

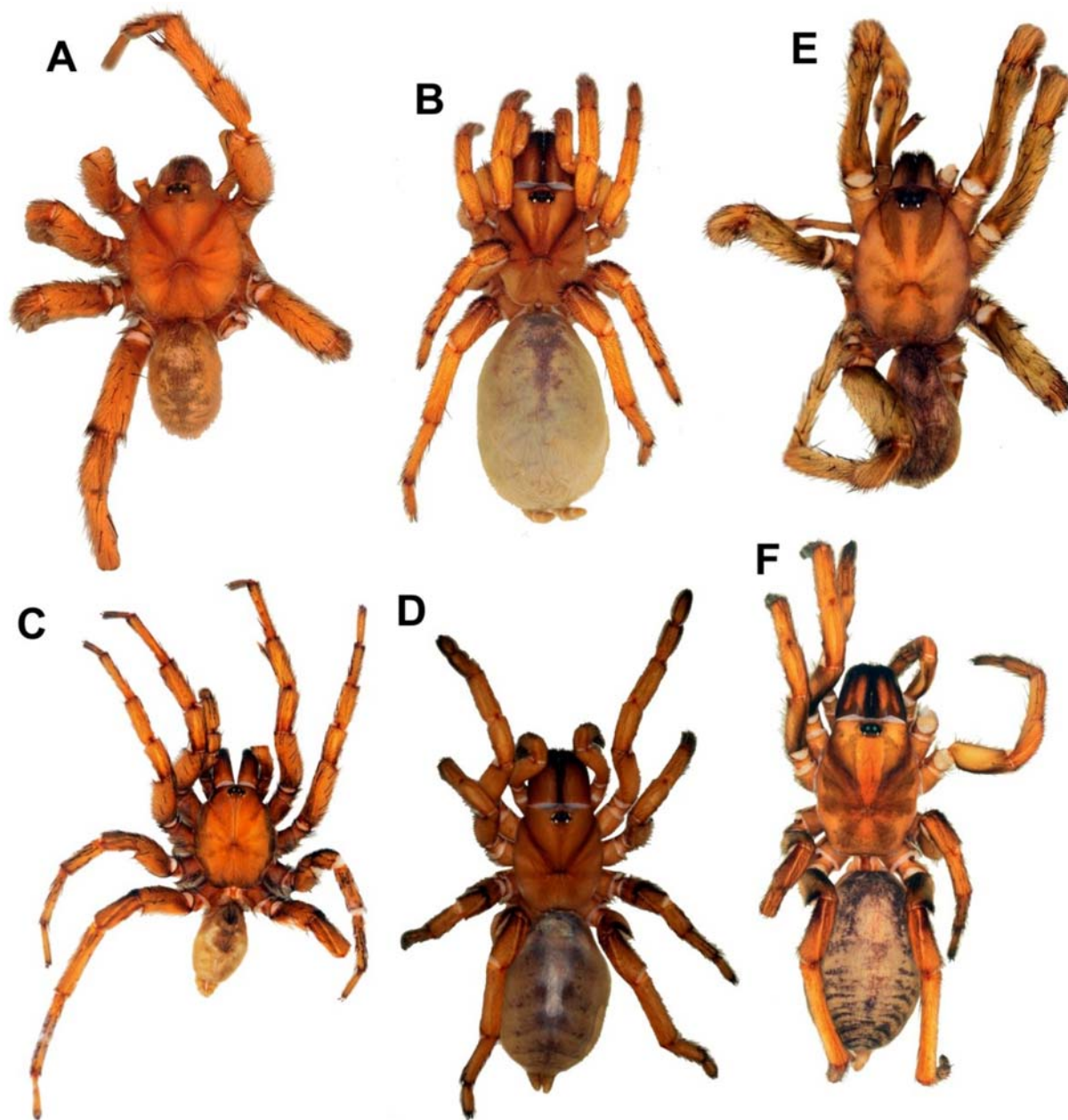


Fig. 1. Eastern Mediterranean nemesiid spiders, male (A, C, E) and female (B, D, F) habitus: A–B — *Brachythele varrialei*; C–D — *B. zonsteini* sp.n.; E–F — *Nemesia cypriatica*. Not to scale.

Рис. 1. Восточносредиземноморские пауки сем. Nemesiidae, внешний вид самцов (A, C, E) и самок (B, D, F), сверху: A–B — *Brachythele varrialei*; C–D — *B. zonsteini* sp.n.; E–F — *Nemesia cypriatica*. Масштаб не указан.

2.0, MW 2.5. Palp 6.9 (2.7, 1.0, 2.3, 0.9). Legs: I 13.9 (4.4, 2.4, 2.9, 2.4, 1.8), II 12.5 (3.5, 2.5, 2.5, 2.2, 1.8), III 11.9 (3.2, 2.2, 2.0, 2.5, 2.0), IV 17.8 (4.8, 3.1, 3.7, 4.0, 2.2).

Cephalothorax: Carapace hexagonal, brown, with darker colored linear pattern between posterior eye row and fovea. Thoracic fovea distinct, though not so concave and deep as in male, covered with blackish setae, sparser compared to male (Figs 1B, 2A–C). Chelicerae and fangs dark brown. Chelicera anteriorly with dense, strong setae. Cheliceral furrow with 7–8 promarginal teeth and 5–6 mesobasal denticles. Cheliceral fang as in male.

Maxillae, labium, sternum as in male, except 28–30 cuspsules on maxillae. Sternal and labiosternal sigilla as in male.

Leg structures: Legs I–IV brown. Legs III and IV with dense setae at distal parts of femur and patella. Trichobothria on legs I–IV segments (Fig. 4B–C): tibia 8–10 in each of two rows, metatarsi 14–15, tarsi 4–16, metatarsal trichobothria longest. Palp with 10 and 13–14 trichobothria on palpal tibia and tarsus, respectively.

Spination: Palp: fe0; pa0; ti p1-1-1, pv1, v2; ta p1, rv1. Leg I: fe pd1, d1-1-1-1; pa 0; tiv1-1-3; mt v1-2-2. Leg II: fe



Fig. 2. Eastern Mediterranean nemesiid spiders, alive females (A–C, E–H) and male (D): (A–D — *Brachytele varrialei*; E, F — *B. zonsteini* sp.n.; G, H — *Nemesia cypriatica* sp.n.

Рис. 2. Восточносредиземноморские пауки сем. Nemesiidae, живые самки (A–C, E–H) и самец (D): (A–D — *Brachytele varrialei*; E, F — *B. zonsteini* sp.n.; G, H — *Nemesia cypriatica* sp.n.

pd1; pa0; ti pd1, v1-1-3; mtv2-2-2. Leg III: fe 0; pa rd1-1-1; ti pd1-1, r1-1, d1, v2-2-2; mt pd1-1-1, rd1-1-1, rv1-1-1, d2, v2-2-3; tar1. Leg IV: fe 0; pa0; ti p1-1,v7; mt p1-1-1, r1, rv1, v2-2-3; ta r1.

Abdomen: greyish brown, covered by black setae. Dorsum with indistinct dark pattern (arrowhead-shaped, anteriorly directed, covering $\frac{3}{4}$ of abdomen), not as pronounced as in male (Figs. 1B, 2A–C).

Spinnerets: iniformly coloured. PMS greyish, rod-shaped. PLS greyish brown; maximal diameter 0.7 mm; length of basal, medial, and apical segments 1.4, 0.8, and 0.7 mm, respectively.

Copulatory organs: Pair of claviform receptacles. Receptacular head round-shaped. Distance between receptacles

approximately equal to their height. Receptacular head 4 times wider than distal part of stalk (Fig. 8A). Int 0.5, Ext 0.8.

Brachytele zonsteini sp.n.

Figs 1C–D, 2E–F, 3B, 4E, 5D–F, 6D–G, 7D–G, 8B.

TYPES: Holotype ♂ (ETZM), TURKEY, *Eskişehir* Prov., Tepebaşı Dist., Tandır Vill. (39°56'7.20"N 30°29'33.49"E), 1145 m, 14.08.2012, F. Altunsoy. Paratypes: 1♂ (ETZM), same data as in holotype; 2♂♂ (ETZM), Odunpazarı Dist., Yukarı Kalabak Vill. (39°30'33.48"N 30°24'46.91"D), 17.02.–2.05.2013, R.S. Özkütük; 1♀, 2 subadult ♀♀ (ETZM), Tepebaşı Dist., Tandır Vill. (39°56'7.20"N 30°29'33.49"E), 1145 m, 3.12.2015, G. Karakaş, E.A. Yağmur & Ç. Altın.

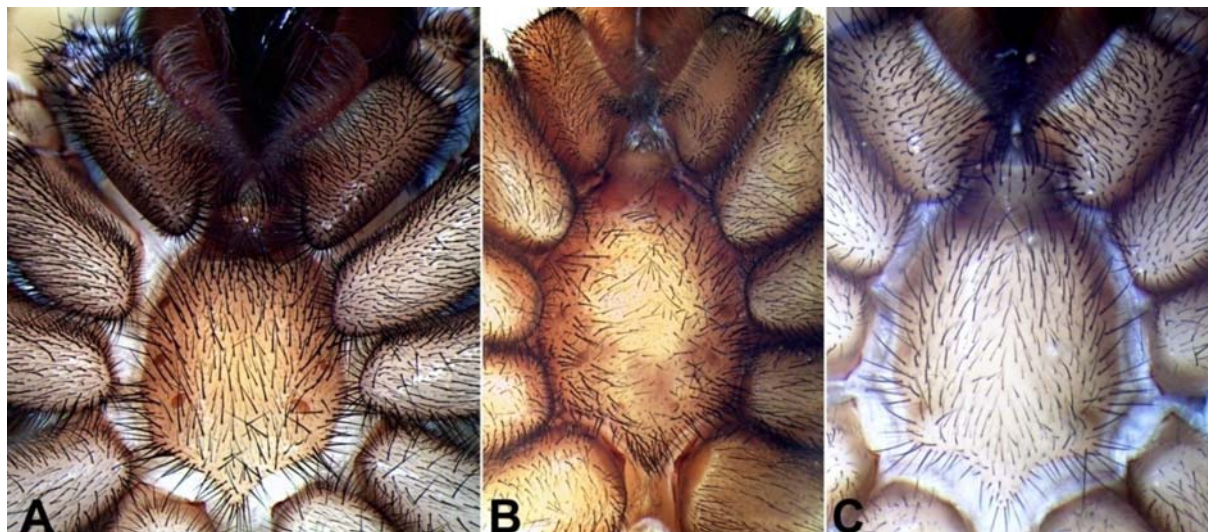


Fig. 3. Eastern Mediterranean nemesiid spiders, male (A, B) and female (C) sternum, labium and maxillae, ventral: A — *Brachythele varrialei*; B — *B. zonsteini* sp.n.; C — *Nemesia cypriatica* sp.n. Not to scale.

Рис. 3. Восточносредиземноморские пауки сем. Nemesiidae; стернум, лабиум и максиллы самца (A, B) и самки (C) снизу: A — *Brachythele varrialei*; B — *B. zonsteini* sp.n.; C — *Nemesia cypriatica* sp.n. Масштаб не указан.

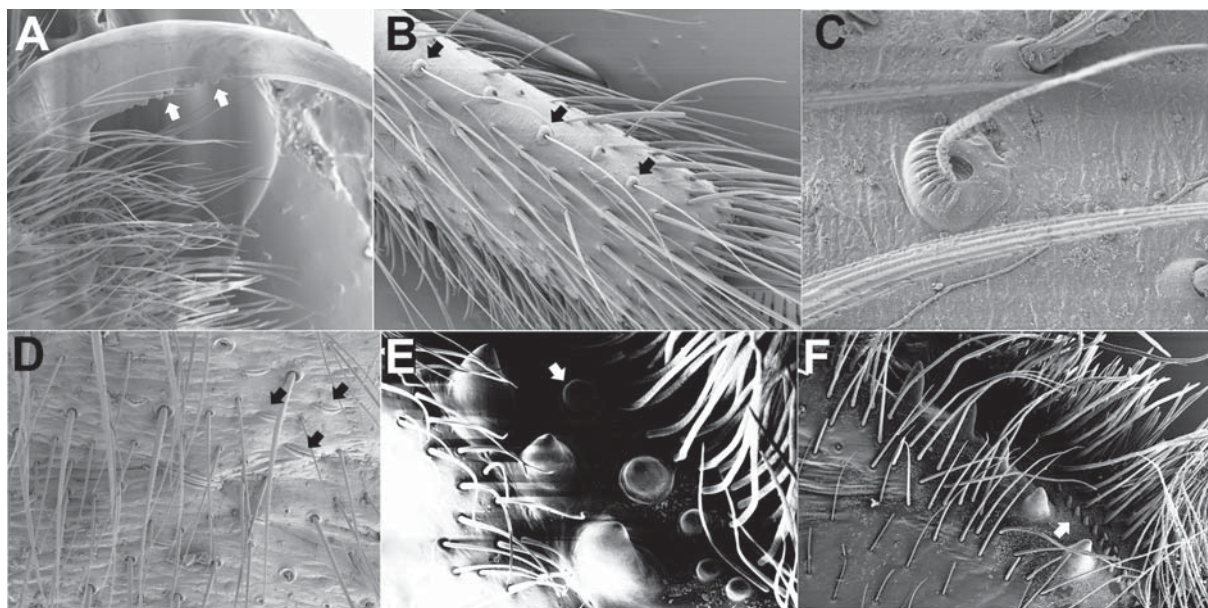


Fig. 4. Eastern Mediterranean nemesiid spiders; SEM micrographs, showing cheliceral fang (A; arrows indicate denticles), tarsus I (B; arrows show the trichobothria alignment); trichobothrial base on metatarsus I (C), slit sensillae on ventro-anterior abdomen (D; arrows indicate their alignment), cheliceral furrow (E, F; arrow indicates the alignment of denticles); proventral (A, E, F), dorsal (B, C) and ventral (D): A–D — *Brachythele varrialei*; E — *Brachythele zonsteini* sp.n., F — *Nemesia cypriatica* sp.n. Not to scale.

Рис. 4. Восточносредиземноморские пауки сем. Nemesiidae; СЭМ-фотографии, показаны коготок хелицеры (A; зубчики отмечены стрелками), лапка I (B; базы трихоботрий отмечены стрелками), предлапка I, основание трихоботрии (C), щелевидные органы в проксимальной части брюшка (D; их расположение отмечено стрелками), желобок хелицеры (E, F; расположение зубчиков указано стрелкой); провентрально (A, E, F), сверху (B, C) и снизу (D): A–D — *Brachythele varrialei*; E — *Brachythele zonsteini* sp.n., F — *Nemesia cypriatica* sp.n. Масштаб не указан.

ETYMOLOGY. The new species is dedicated to the prominent arachnologist, Dr. Sergei Zonstein, friend of the authors.

DIAGNOSIS: *Brachythele zonsteini* sp.n. is similar to *B. bentzieni* Zonstein, 2007, *B. denieri* (Simon, 1916) and *B. langourovi* Lazarov, 2005 by the shape of the bulb. The new

species differs most evidently by the unique shape of the embolus apex with three distinct protrusions (Fig. 6F). Other notable differences are as follows: the embolus distally shows an angular orientation (Fig. 6D, E, G), differing from *B. bentzieni* and *B. denieri*; a serrulate margin of the bulb is strongly pronounced but not as protruding as that in *B.*

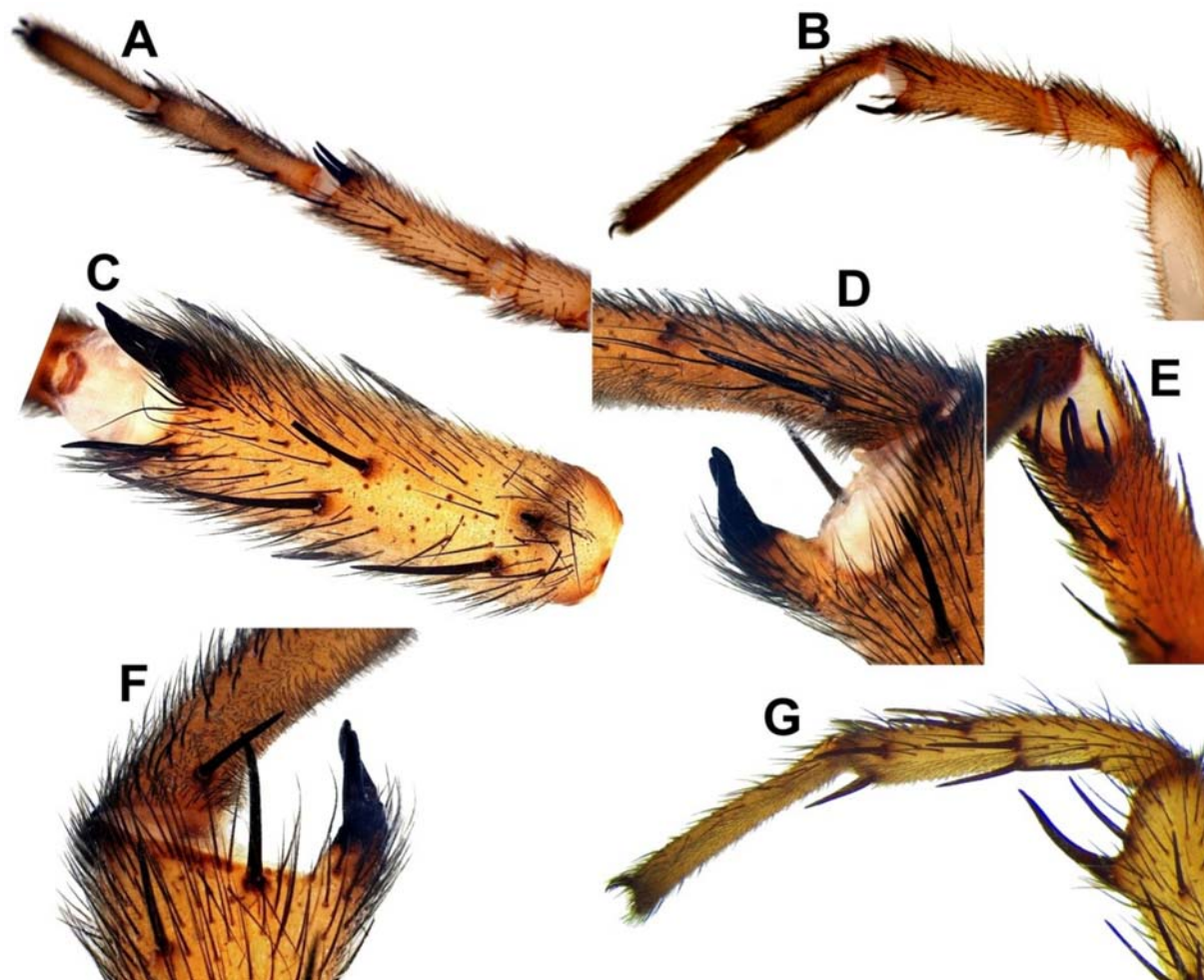


Fig. 5. Eastern Mediterranean nemesiid spiders; proventral apophysis on male tibia I, ventral (A, C) prolateral (B, D, G), proventral (E) and retrolateral (F): A, B — *Brachythele varrialei*; C–F — *Brachythele zonsteini* sp.n., G — *Nemesia cypriatica* sp.n. Not to scale.

Рис. 5. Восточносредиземноморские пауки сем. Nemesiidae; провентральный вырост голени I самца, снизу (A, C), пролатерально (B, D, G), провентрально (E) и ретролатерально (F): A, B — *Brachythele varrialei*; C–F — *Brachythele zonsteini* sp.n., G — *Nemesia cypriatica* sp.n. Масштаб не указан.

langourovi (Fig. 6G). The structure of the endogyne in *Brachythele zonsteini* sp.n. resembles that in *B. langourovi*, *B. media*, and *B. varrialei* by shape, yet differ evidently in proportions: length of the stalks proportionally exceeds the receptacle head width as 2:1 (Fig. 8B), while in *B. langourovi* and *B. media*, the same ratio is 1:1 (cf. Lazarov, 2005, fig. 5; Naumova *et al.*, 2016, figs 2, 3); distance between receptacles exceeds receptacle length by 2:1, and the basal stalk width is equal to the stalk length (Fig. 8B), whereas in *B. varrialei* these proportions are 1.5:1 and 1:2 respectively (Fig. 8A).

DESCRIPTION. MALE. Measurements: BL 16.2, CL 7.0, CW 5.4, Ca 4.2, AR 1.3, PR 1.3, EL 0.7, ALE 0.5, PLE 0.3, ALE–AME 0, ALE–PLE 0, ALE–PME 0, AME–AME 0.14, PME–PME 0.5, SL 3.8, SW 3.0, LL 0.5, LW 1.0, ML 2.5, MW 1.0. Palp 8.2 (3.0, 1.5, 2.5, 1.2). Legs: I 19.9 (5.5, 3.4, 4.0, 4.2, 2.8), II 17.6 (5.1, 3.0, 3.5, 3.5, 2.5), III 18.7 (5.0, 2.5, 3.5, 4.7, 3.0), IV 23.5 (6.0, 3.5, 5.4, 6.0, 2.6). PLS: maximal diameter 0.7 mm; length of basal, medial and apical segments 1.4, 0.8 and 0.7 mm, respectively.

Cephalothorax: Carapace oval, brown, cephalic portion and lateral margins darker brown. Eyes encircled with black rings. Fovea distinct, concavely crescent-shaped (Fig. 1C). Posterior part of carapace with long setae; setae barely visible or absent on rest of carapace. Chelicera blackish, without rastellum, densely covered with strong, black setae around anterior edge. Cheliceral furrow with 8 promarginal teeth and 6 mesobasal denticles (Fig. 4E). Fang proximally serrated with 11 heterogeneous denticles. Maxillae, labium, sternum, and ventral parts of coxae light brown with blackish setae. Labium without cuspules. Maxillae with 41–32 probasal cuspules. Sternal sigilla small, oval, submarginal and approximately subequal in their size. Labiosternal sigillum bilobed, convexly extended through sternum; recession between lobes distinct (Fig. 3B).

Leg structures: Legs I–IV brown. Distal parts of femora and patellae II–IV with dense setae. Trichobothria range in numbers between segments: tibia 10–12 in each of two rows, metatarsi 14–15, tarsi 15–16. Leg I tibia distally dilated, with 2 proventral megaspines. Megaspines set on joint

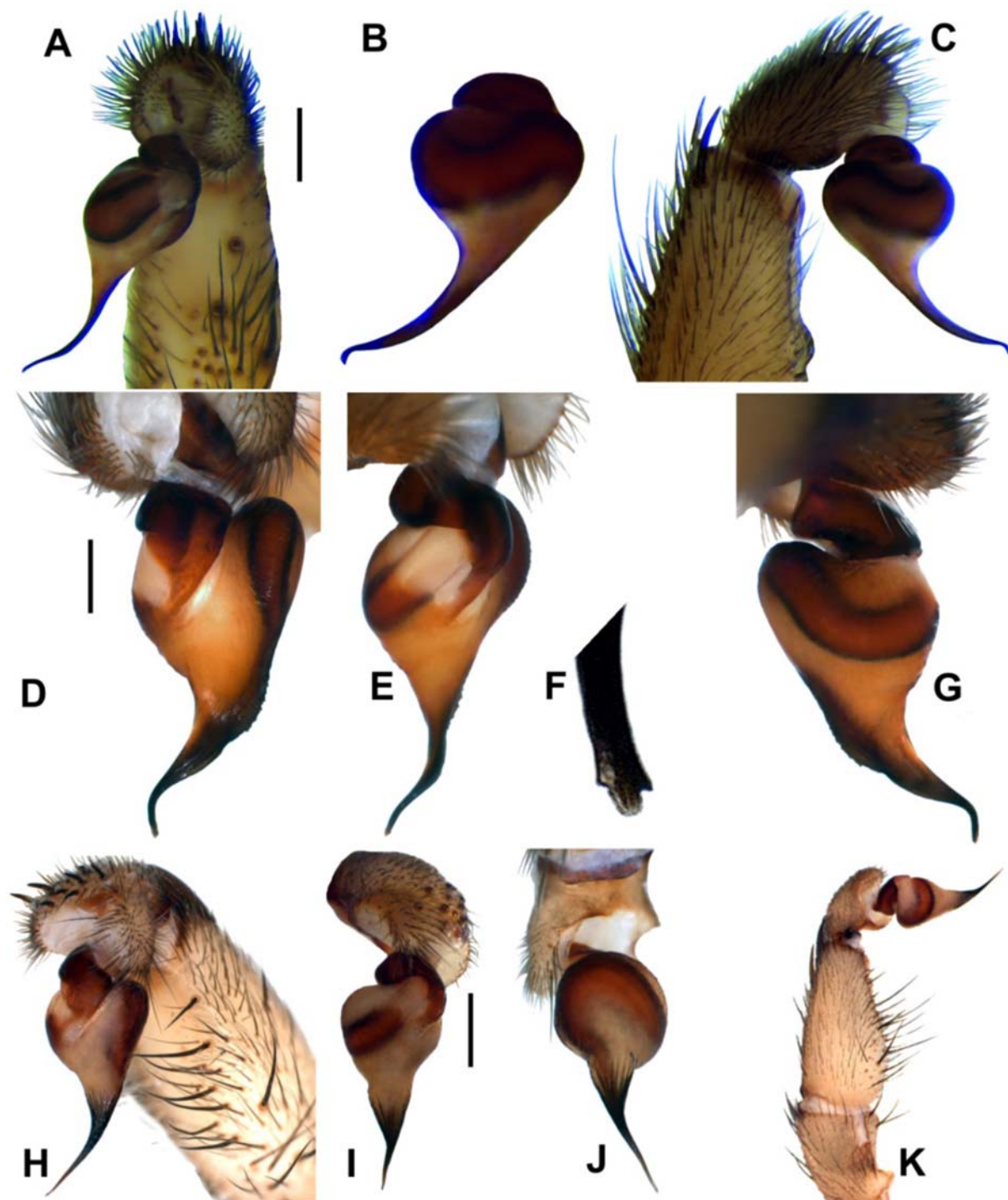


Fig. 6. Eastern Mediterranean nemesiid spiders, distal segments of male palp showing copulatory bulb; retroventral (A, F showing the tip of embolus, K), retrolateral (B, G), prolateral (C, D), ventral (E, I), proventral (H, J): A–C — *Brachythele varrialei*; D–F — *Brachythele zonsteini* sp.n., H–J — *Nemesia cypriatica* sp.n. Scale bars: A, C — 1 mm; D, E, G — 0.25 mm; H–J — 0.5 mm.

Рис. 6. Восточносредиземноморские пауки сем. Nemesiidae; дистальные сегменты и бульбус пальпы самца; ретровентрально (A, F: кончик эмболуса, K), ретролатерально (B, G), пролатерально (C, D), снизу (E, I), провентрально (H, J): A–C — *Brachythele varrialei*; D–F — *Brachythele zonsteini* sp.n., H–J — *Nemesia cypriatica* sp.n. Масштаб: A, C — 1 мм; D, E, G — 0,25 мм; H–J — 0,5 мм.

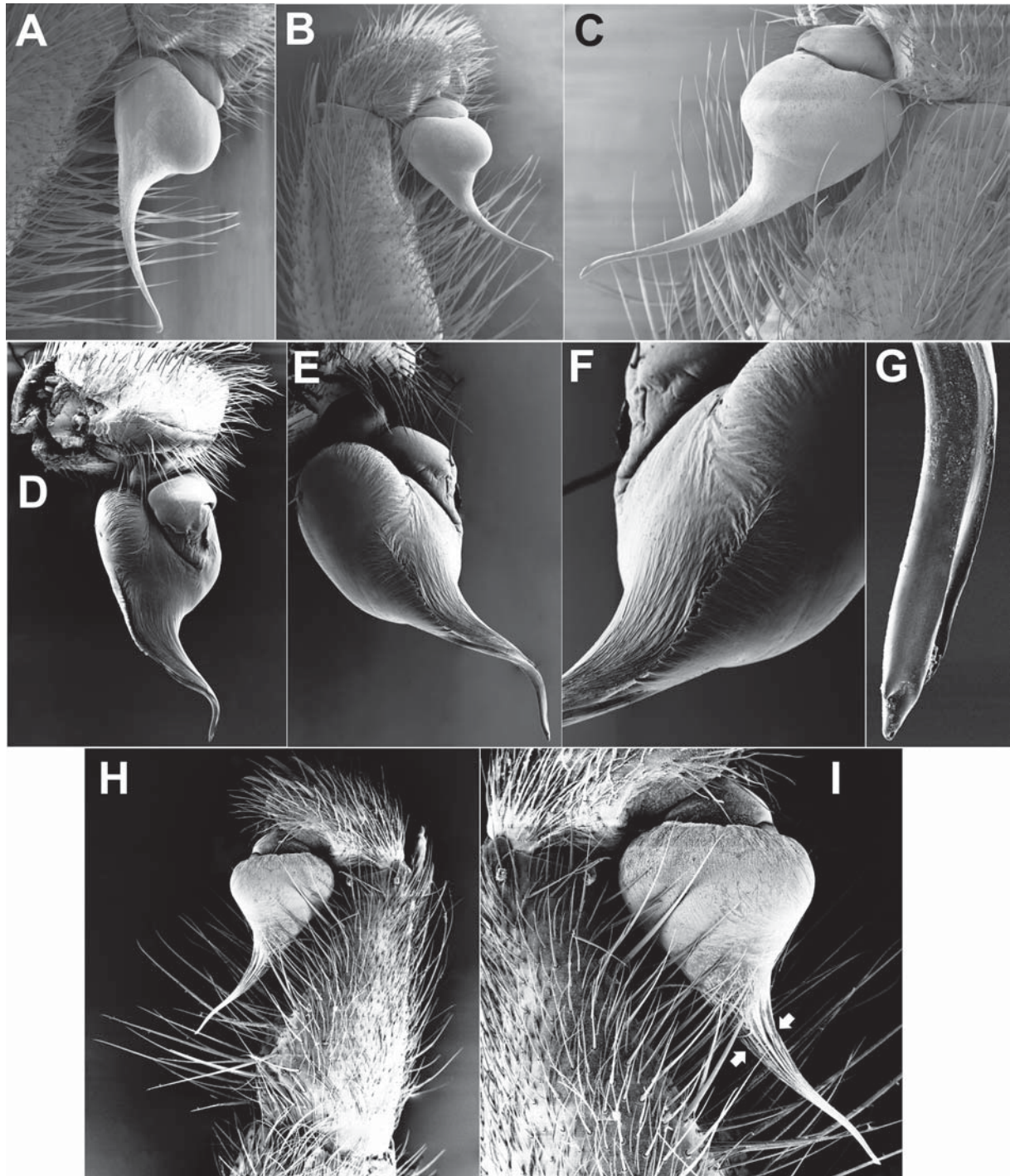


Fig. 7. Eastern Mediterranean nemesiid spiders, SEM micrographs showing structure and details of male copulatory bulb, prolateral (A, B, H), proventral (C, E–G, I), and ventral (D): A–C — *Brachythele varrialei*; D–G — *Brachythele zonsteini* sp.n., H, I — *Nemesia cypriatica* sp.n. Embolic ribs indicated with arrows. Not to scale.

Рис. 7. Восточносредиземноморские пауки сем. Nemesiidae; СЭМ-фотографии, показывающие детали структуры копулятивного бульбуса самца, пролатерально (А, В, Н), провентрально (С, Е–Г, I) и снизу (D): А–С — *Brachythele varrialei*; D–Г — *Brachythele zonsteini* sp.n., Н, I — *Nemesia cypriatica* sp.n. Ребристость эмболюса отмечена стрелками. Масштаб не указан.

process, as wide as length of spines. Outer megaspine nearly straight, while interior megaspine slightly curled towards the outer one at its tip (Fig. 5C–F).

Spination: Palp: fe p1, d1-1-2; pap1; ti p1-1-1, d9; pv2,

ta0. Leg I: fe p1-1-1, rd1-1-1, d10; pa p1-1, v1; ti p1-1-1, pv2, r1-1, rv1, v3-3; mt d1-1, v1. Leg II: fe p1-1-1-1, rd4, d5; pa p2; ti p1-1-1, v2-2-3; mt p1-1, v2-1-1. Leg III: fep1-1, pd2, d1-1-1; pa p1-1; tipl-1-1, pd3, pv1-1, v1-2-2; mt

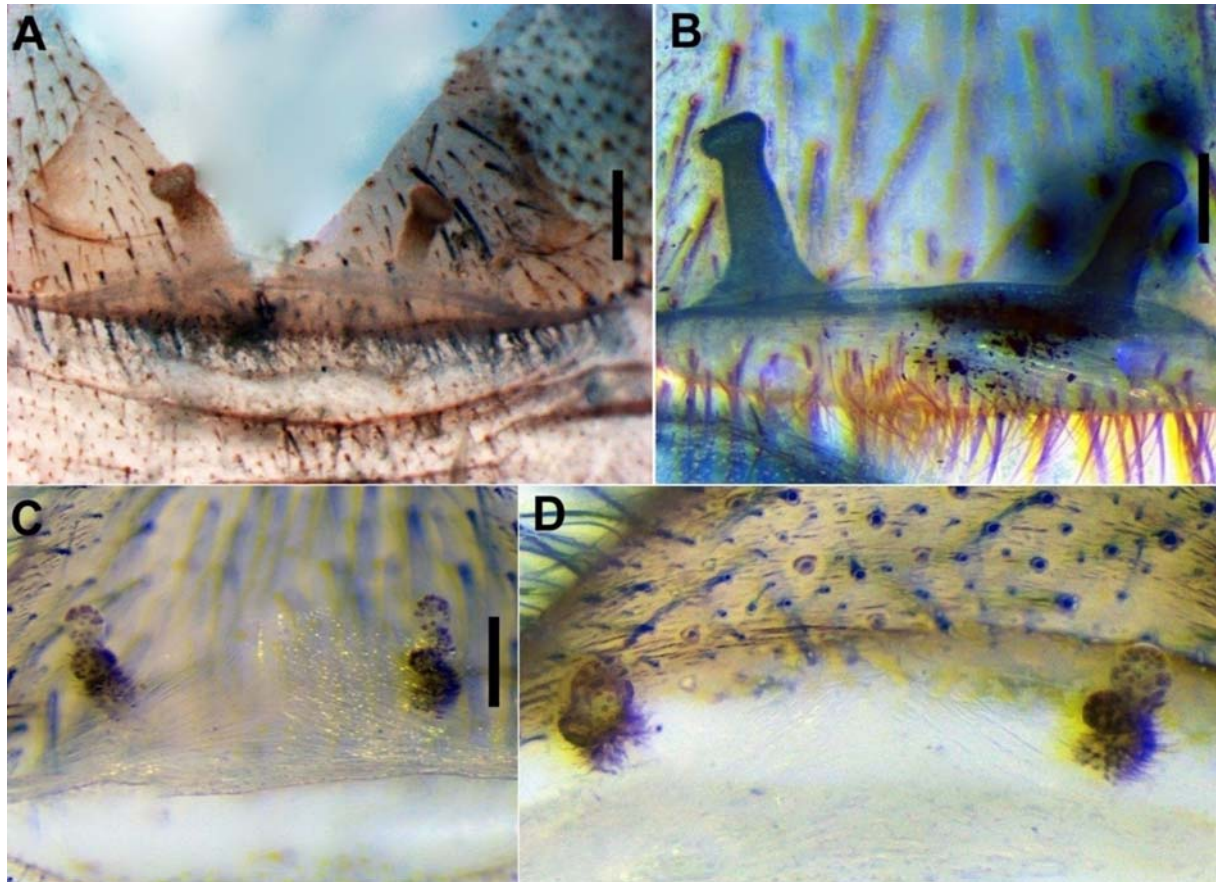


Fig. 8. Eastern Mediterranean nemesiid spiders, endogyne, dorsal (A–C) and antero-dorsal (D): A — *Brachythele varrialei*; B — *Brachythele zonsteini* sp.n.; C, D — *Nemesia cypriatica* sp.n. Scale bars: 0.5 mm.

Рис. 8. Восточносредиземноморские пауки сем. Nemesiidae, эндогина, сверху (A–C) и спереди-сверху (D): A — *Brachythele varrialei*; B — *Brachythele zonsteini* sp.n.; C, D — *Nemesia cypriatica* sp.n. Масштаб: 0,5 мм.

pd1-1-1-1, d1-1, v1-1-1-2. Leg IV: fe p3, rd1-1, d4; pa p2, r1; tip1-1, pd3, r3, rv1, d1, v3-2; mt pd1-1-1, pv2, d4, v8.

Abdomen: brown, without distinct dorsal pattern, covered by blackish setae (Fig. 1C).

Spinnerets: uniformly brown, slightly darker than abdomen. PMS rod-shaped, approximately $\frac{1}{2}$ long of the length of PLS basal segment.

Copulatory organs: Palpal femur slightly longer than tibia. Tibia approximately two times as long as cymbium and provided with numerous dorsal spines. Bulb pyriform. Proximal side of embolus unevenly serrated with heterogeneous denticles. Embolus distally bends in two directions: (from base to tip) posteriorly at the middle section, dorsally through the tip (Figs 6D–G, 7D–G). Tip of embolus tridentate (Fig. 6F). Bu 1.5, Em 0.8.

FEMALE. Measurements: BL 26.0, CL 9.0, CW 6.0, Ca 4.5, AR 1.4, PR 1.4, EL 0.7, ALE 0.48, PLE 0.3, ALE–AME –, ALE–PLE –, ALE–PME –, AME–AME 0.68, PME–PME 0.6, SL 4.8, SW 3.3, LL 0.7, LW 1.1, ML 3.4, MW 0.8. Palp 8.2 (3.0, 1.5, 2.5, 1.2), I 18.9 (5.6, 4.0, 4.0, 3.0, 2.3), II 17.3 (5.2, 3.5, 3.3, 3.0, 2.3), III 15.5 (4.6, 3.0, 2.7, 3.0, 2.2), IV 23.0 (6.5, 4.0, 5.0, 5.0, 2.5). PLS diameter 0.8 mm; length of basal, medial and apical segments 1.5, 0.9 and 0.7 mm, respectively.

Cephalothorax: Carapace hexagonal, brown: covered with tiny, whitish setae (Figs 1D, 2E–F). Caput darker at

submarginal parts. A dark brown line apparent between AME and fovea. Anterior side of AME with a clump of setae. Fovea straight. Chelicera brown, distally with setae. Rastellar region of chelicera without rastellum or strong setae. Cheliceral furrow with 7 basal denticles and 10 promarginal teeth. Fangs with 8–9 proximal denticles of variable sizes. Maxillae, labium, sternum, and ventral parts of coxae light brown with blackish setae. Labium without cusps. Maxillae with 51–52 probasal cusps.

Spination: Palp: fe 0; pa 0; ti p1-1, pv1,v2-2-2; ta p1, r1, v1. Leg I: fer d1; pa 0; tir1, v1-1-1; mt v1-2-2. Leg II: fer d1; pa 0; tiv1-1-2; mt v2-2-2. Leg III: fe 0; papd1-1-1; ti p1-1, r1-1, v2-2-2; mt pd1-1-1, r1-1-1, d3, v2-2-2. Leg IV: fe 0; pa 0; ti p1-1, v2-1-2-2; mt p1-1-1, pd1, rd2, v1-1-2.

Abdomen: brown, covered with black setae. Mid-part of abdomen, dorsally with brown, polygonal, saddle-shaped pattern; 3–4 saddles aligned linearly, with grey shadows in between. Markedness and size of saddles diminish from anterior to posterior (Figs 1D, 2E–F). Spinnerets slightly darker than abdomen.

Spinnerets: PMS and PLS uniformly brownish coloured. PLS as in male except basal segment slightly shorter than length of PMS.

Copulatory organs: Paired receptacles claviform. Receptacular head smoothly convex, almost plain distally. Dis-

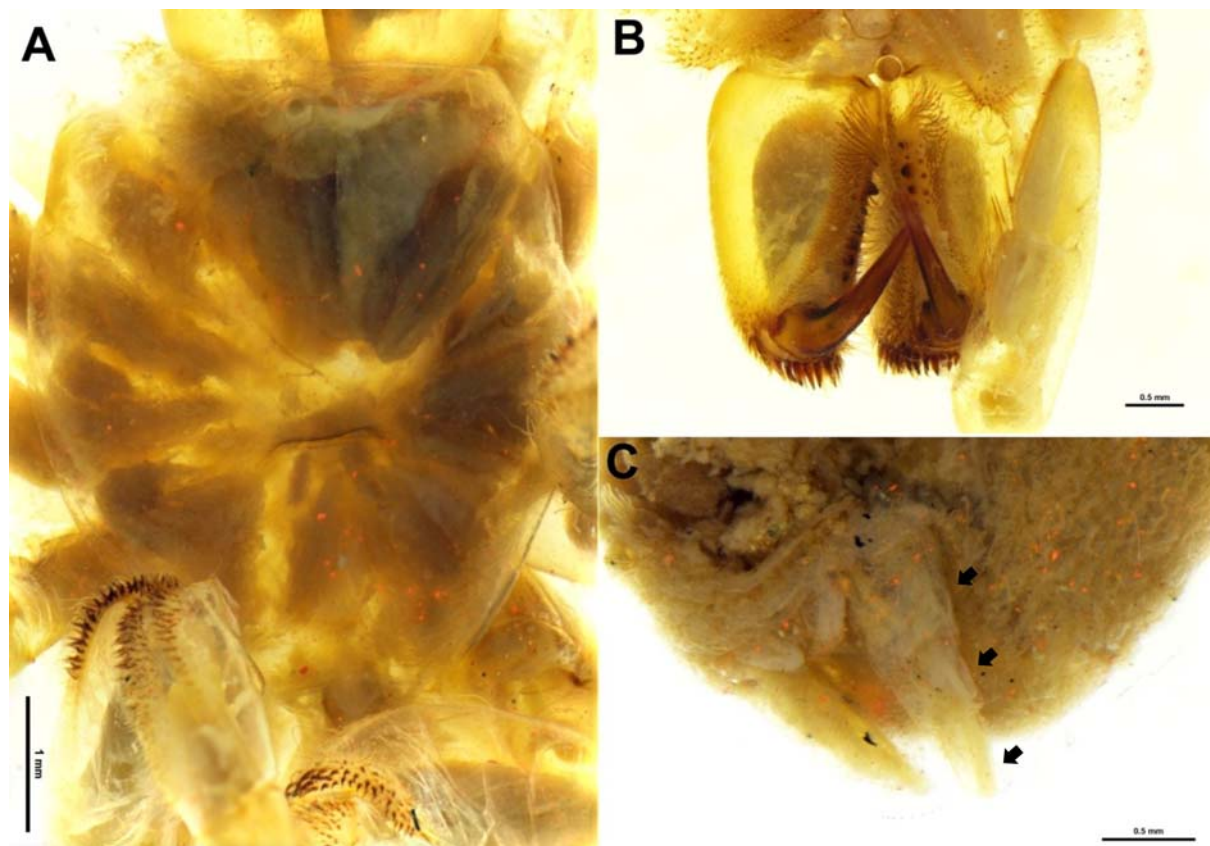


Fig. 9. *Brachythele incerta*, holotype non-adult female (NHMW): A — carapace, dorsal; B — chelicerae, ventral; C — spinnerets, ventro-lateral (segments of PLS are indicated by arrows). Not to scale.

Fig. 9. *Brachythele incerta*, holotype non-adult female (NHMW): A — карапакс, сверху; B — хелицеры, снизу; C — паутинные бородавки, снизу-сбоку (сегменты PLS отмечены стрелками). Масштаб не указан.

tance between receptacles about 1.5 times exceeds stalk height. Receptacular head less than 2 times wider than stalk; base of stalk two times wider than head (Fig. 8B). Int 0.5–0.6, Ext 0.8–1.0.

Genus *Nemesia* Audouin, 1826

COMMENTS. *Nemesia* is one of the five Nemesiinae genera after *Brachythele*, Nearctic *Calisoga* Chamberlin, 1937, Mexican *Mexentypesa* Raven, 1987, and West Mediterranean *Iberesia* Decae et Cardoso, 2006. At the same time, it is the most species-rich nemesine genus, represented by 56 species predominantly distributed throughout the Mediterranean basin [WSC, 2021]. Currently, Cyprus becomes the easternmost fixed point of the genus range (if not a very doubtful record from China).

Nemesia cypriatica sp.n.

Figs 1E–F, 2G–H, 3C, 4F, 5G, 6H–K, 7H–I, 8C–D.

TYPES: Holotype ♂ (CHNM), Cyprus, Beşparmak Mts., Btw. Alevkayası-Girnekayası (35°17'13"N 33°31'01"E), 633 m, 21.02.–21.03.2018, K.B. Kunt & S. Gücel. Paratypes: 3♂♂ (CHNM), same data as holotype; 2♂♂ (AZM), Lefkoşa Dist., Kalavaç Vill., Alevkayası (35°17'06"N 33°31'41"E), 630 m, 21.02.2018.–21.03.2018, K.B. Kunt & S. Gücel; 1♀, 3 subadult ♀ (CHNM), Girne Dist., Lapta, Servili Tepe (35°19'36.90"N 33°8'55.40"E), 753 m, 25.03.2018, E.A. Yağmur & S. Gücel; 3♂♂ (CHNM), Girne Dis-

trict, Lapta (35°18'33.32"N 33°12'9.24"E), 537 m, 1.11.2018, K.B. Kunt & S. Gücel; 3♂♂, 1♀ (ZMMU), Lefkoşa Dist., Kalavaç Vill., Alevkayası (35°17'06"N 33°31'41"E), 630 m, 2.11.2018, K.B. Kunt & S. Gücel; 8♂♂ (CHNM), İskele Dist., Balalan Vill., Yastık Lavlar Area (35°29'02"N 34°06'32"E), 144 m, 7.11.2018, K.B. Kunt & S. Gücel; 1♂ (CHNM), Beşparmak Mts., road to the Kantara Castle (35°22'58.00"N 33°52'30.00"E), 450 m, 6.11.2018, K.B. Kunt & S. Gücel.

ETYMOLOGY. The specific name refers to the area of distribution.

DIAGNOSIS: *Nemesia cypriatica* sp.n. appears to be most similar to *N. coheni* Fuhn et Polenec, 1967 and differs by small details in the male palp. The ratios between heights of bulb and embolus differ: in *N. cypriatica* sp.n. embolus 1.5 times longer than the bulb, whereas the same measure is more than two times in *N. coheni*. Additionally, the angle of embolar bending (at the section where longitudinal ribs disappear; distal half of embolus) differs between the two species (see Fuhn & Polenec, 1967), and the angle between the base of tibial megaspine and tibia (distally) wider in *N. cypriatica* sp.n. compared to *N. coheni*. Endogyne in *N. cypriatica* sp.n. is similar to those in *N. bristowei* Decae, 2005 and *N. macrocephala* Ausserer, 1871, it can be distinguished by the receptacles twisted at their central part (Fig. 8C–D).

DESCRIPTION. MALE (holotype). *Measurements*: BL 9.0, CL 3.6, CW 3.1, Ca 2.3, AR 0.8, PR 0.8, EL 0.21, AL E0.2, PLE 0.2, ALE–AME 0.08, ALE–PLE 0.05, ALE–

PME 0, AME–AME 0.43, PME–PME 0.35, SL 2.5, SW 0.9, LL 0.5, LW 0.6, ML 2.0, MW 0.7. Palp 5.1 (2.0, 1.0, 1.4, 0.7). Legs: I 13.1 (4.0, 2.0, 2.6, 2.6, 1.9), II 11.8 (3.3, 1.6, 2.5, 2.5, 1.9), III 11.6 (3.0, 1.5, 2.2, 3.0, 1.9), IV 17.5 (5.0, 2.0, 4.5, 4.0, 2.0). PLS diameter 0.36; length of basal, medial and apical segments 0.4, 0.2 and 0.16 mm, respectively.

Cephalothorax: Carapace oval, yellowish brown. Posterior part of carapace with long, dark-colored and anteriorly directed setae. Rest of carapace covered with tiny whitish setae. Cephalic part darkened laterally, with creamy light brown band starting at posterior eye row and reaching fovea. Carapace margins dark-colored, almost black laterally and posteriorly. Thoracic fovea deep and distinct (Fig. 1E). Eye tubercle black. Chelicera light brown dorsally (anterior view), with longitudinal rows of long, strong and black setae. Anterior side with rastellum composed of 4–5 short thick spines. Cheliceral fang black. Cheliceral furrow with 6 prolateral teeth and 15–16 mesobasal denticles (Fig. 4F). Maxillae, labium, sternum, and ventral parts of coxae light brown with blackish setae. Maxillae darker than those counted. Maxillae and labium without cuspules. Sternal sigilla indiscernible (Fig. 3C).

Leg structures: Legs I–IV greyish. Femora and patellae III and IV with dense setae at distal parts. Trichobothria: tibia 11–12 in each of two rows, metatarsi 14–15, tarsi 12–13. Most part (3/4) of metatarsi I and II scopulate, while metatarsi III and IV without scopula. All tarsi with narrowly divided scopula. Tibia I with proventral megaspine as shown in Fig. 5G. Leg tarsi aspinose. Cymbium with 8–9 dorsal spines.

Spination: Palp: fe d1-1-1-1, pd1; pa 0; ti d1-1-1; ta d8. Legs: I: fe d1-1-1-1-1-1; pa p2; ti p2, r3, MS1, v1-2-1; mt p2, pd1, r1, rd1-1, v2-1-2; II: fe p1-1, r1-1-1-1, d1-1-1-1-1-1; pa p1-1; ti p1-1, r1, 2-2-2; mt pd1, pv1, r1-1, d1, v2-1-2; III: fep1-1-1-1, r1-1-1, d1-1-1-1; pa p1, r1-1-1; ti p1-1-1, r1-1-1, d1-1-1, v2-2-2; mt pd3, r1-1-1, d1-1, v2-2-2; IV: fe p1-1-1-1, r1-1, d4; pa p1; ti p1-1-1, r1, d1, v2-2-2; mt pv1, r1-1, d1-1-1, v2-2-2.

Abdomen: brown, without distinct dorsal pattern, covered with blackish setae (Fig. 1E).

Spinnerets: PMS short; PMS and PLS coloured as abdomen.

Copulatory organs: Palp as in Figs 6H–K, 7H–I; femur about 2 times longer than tibia; patella slightly longer than half of tibia. Tibia with dorsodistal spines. Bulb pyriform. Proximal part of embolus with distinct longitudinal ribs. Distal half of embolus retrolaterally bended at angle 45° (Figs 6H–K, 7H–I). Bu 0.4, Em 0.6.

FEMALE (paratype). Measurements: BL 15.6, CL 6.6, CW 3.4, Ca 2.9, AR 0.9, PR 0.9, EL 0.42, ALE 0.12, PLE 0.15, ALE–AME 0.08, ALE–PLE 0.08, ALE–PME 0, AME–AME 0.12, PME–PME 0.34, SL 2.5, SW 2.0, LL 0.5, LW 1.0, ML 1.6, MW 1.0. Palp 5.1 (2.0, 1.0, 1.4, 0.7). Legs: I 10.7 (3.3, 2.0, 2.3, 1.7, 1.4), II 9.4 (3.0, 1.8, 2.0, 1.5, 1.1), III 9.0 (3.0, 1.2, 1.7, 1.9, 1.2), IV 14.9 (4.1, 2.3, 4.2, 2.7, 1.6). PLS 0.53 wide; length of basal, medial and apical segments 0.68, 0.28 and 0.13, respectively.

Cephalothorax: Carapace hexagonal, covered with tiny, black setae. Anterior half primarily dark brown; posterior half mostly yellowish (Figs 1F, 2G–H). Chelicera dark brown, with yellow longitudinal stripes dorsally; anterior side with rastellum composed of 5–6 short, thick spines promarginally, structurally stronger than males. Cheliceral fangs black. Cheliceral furrow with 6 promarginal teeth and 25 mesobasal denticles. Maxillae, labium, sternum, and ventral parts of

coxae yellowish with blackish setae. Maxillae with 5–7 cuspules. Sternum with three pairs of indistinct sternal sigilla.

Leg structures: Legs I–IV dark brown. Femora darker than other segments. Femur and patella III and IV with dense setae at distal parts. Trichobothria range throughout the paratypes as follow: tibia 8–10 in each of two rows, metatarsi 5–10, tarsi 8–10. Palpal tarsus spinose. Tarsus I with two spines ventrally.

Spination: Palp: fe0; pa pv2; ti pd2, pv3, rv2, v2; ta pv1, rv1-1, v13. Legs: I fe pd1, d1-1-1-1-1; pa p1; ti p1, v1-1-2; mt v2-1-3; ta v1-1; II: fe pd1; pa p1-1; ti pd1-1, v1-1-1; mt pd1, pv1, v2-2-3; III: fe p1-1; pa 0; ti p1-1, r1-1, v1-2; mt p1-1-1, r1-1-1, d1, v2-2-3; IV: fe 0; pa 0; tip1-1, v1-2-2; mt p1-1-1, pv1, r1-1, rv1, v1-2-2.

Abdomen: brown, covered with blackish setae, with a dark blotch at anterior dorsal side (Figs 1F, 2G–H).

Spinnerets: Medial and apical parts of posterior spinnerets darker than abdomen and patternless. PMS very small, in similar size with apical segments of PLS.

Copulatory organs: Endogyne membranous, receptacles tubular, coiled at the mid-section (stalks), forming a spiral-like appearance. Receptacular heads globular. Glandular cilia are visible. Distance between receptacles about 3 times as wide as stalk length. Receptacular head about equal with stalk in width (Fig. 8C–D). Int 0.5, Ext 0.6.

Results and Discussion

Brachythele incerta Ausserer, 1871 was originally described based on the holotype juvenile female. With the first *Nemesia cypriatica* sp.n. specimen we have collected from the island (having thought that it was *B. incerta*), we questioned the generic identity of *B. incerta*, with thoughts whether it might belong to *Nemesia* or not. These speculations came to an end as we examined the type specimen of *B. incerta*. The triangular shape of PLS apical segment approves its relatedness with *Brachythele*, yet the almost straight state of the thoracic fovea remains suspicious, pointing out the necessity of a redescription.

The occurrence of *Nemesia* sp. in Cyprus has been pronounced more than once in the literature. Decae [2012] has predicted its presence by considering the distribution of the genus in the east Mediterranean. Bosmans *et al.* [2019] confirmed its existence based on the collected material and emphasized that it is a new species, yet did not provide a description. This problem is addressed with the current paper.

Nemesia cypriatica sp.n. belongs to the “type-A” group by the male palp, according to Decae [2012] by having longitudinal ribs on proximal part of embolus; whereas endogyne belongs to the “type-D” due to coiled mid-section.

Brachythele varrialei (Dalmás, 1920) was originally described based on the male from Muğla to be never found again. With the accumulation of material since 2005, we managed to study specimens from the close vicinity of the type locality as well as new northern locations, describing the female for the first time and indicating the species’ wider distribution range at the Aegean coast of Anatolia. Furthermore, we believe that the discovery of *Brachythele zonsteini* sp. n. from cen-

tral Anatolia indicates the existence of many more new species to be found throughout the little-studied Anatolia.

Compliance with ethical standards

CONFLICTS OF INTEREST: The authors declare that they have no conflicts of interest.

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References

- Ausserer A. 1871. Beiträge zur Kenntniss der Arachniden-Familie der Territelariae Thorell (Mygalidae Autor) // Verhandlungen der Zoologisch-Botanischen Gesellschaft in Wien. Bd.21. S.117–224.
- Bayram A. 2002. Distributions of Turkish Spiders // Demirsoy A. (ed). Zoogeography of Turkey. Ankara: Meteksan publications.
- Bosmans R., Keer J.V., Russell A., Hadjiconstantis M., Komnenov M., Bosselaers J., Huber S., Mccowan D., Snazell R., Decae A., Zoumides C., Kielhorn K.-H., Oger P. 2019. Spiders of Cyprus (Araneae): A catalogue of all currently known species from Cyprus // Newsletter Belgian Arachnological Society. Vol.34. P.1–173.
- Dalmas R., de. 1920. Liste d'araignées de Boudron en Asie Mineure suivie d'une étude des espèces méditerranéennes du genre *Habrocestum* // Annali del Museo civico di storia naturale di Genova. Vol.50. P.57–69.
- Danişman T., Kunt K.B., Özkütük R.S. 2021. The Checklist of the Spiders of Turkey. Version 2021. Internet: <http://www.spidersofturkey.info>
- Decae A., Huber S. 2017. Description of a new *Nemesia* species from Sardinia that constructs a remarkable star-shaped trapdoor (Araneae: Mygalomorphae: Nemesiidae) // Arachnology. Vol.17. Pt.4. P.188–194.
- Decae A.E. 2012. Geography related sub-generic diversity within the Mediterranean trapdoor spider genus *Nemesia* (Araneae, Mygalomorphae, Nemesiidae) // Arachnologische Mitteilungen. Vol.43. P.24–28.
- Demir H., Seyyar O. 2017. Annotated checklist of the spiders of Turkey // Munis Entomology & Zoology. Vol.12. No.2. P.433–469.
- Karol S. 1967. Türkiye Örümcekleri. I. Ön Liste // Ankara Üniversitesi Basımevi. P.1–37 [in Turkish]
- Raven R.J. 1985. The spider infraorder Mygalomorphae (Araneae): cladistics and systematics // Bulletin of the American Museum of Natural History. Vol.182. No.1. P.1–180.
- Rigler K.L. 1852. Die Türkei und deren Bewohner in ihren naturhistorischen, phisiologischen und pathologischen Verhältnissen vom Standpunkte Konstantinopel's. Wien: Verlag von Carl Gerold.
- Topçu A., Demir H., Seyyar O. 2005. A Checklist of the spiders of Turkey // Serket. Vol.9. No.4. P.109–140.
- WSC. 2021. World Spider Catalog. Version 22.5. Natural History Museum Bern, online at <http://wsc.nmbe.ch>, accessed 26.08.2021.
- Zonstein S., Kunt K.B., Yağmur E.A. 2018. A revision of the spider genus *Raveniola* (Araneae, Nemesiidae). I. Species from Western Asia // European Journal of Taxonomy. Vol.399. P.1–93.
- Zonstein S.L. 1987. [A new genus of mygalomorph spiders of the subfamily Nemesiinae (Aranei, Nemesiidae) in the Palearctic fauna] // Zoologicheskii zhurnal. Vol.66. No.7. P.1013–1019 [in Russian, with English summary].

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