

A new pseudoscorpion species in *Amblyolpium* (Pseudoscorpiones: Garypinidae) from a house in Kermanshah Province, Iran

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Abstract. *Amblyolpium goldastehae* spec. nov., is described and illustrated on the basis of two males collected from western Iran. Its ability to live in a dry and xerotherme habitat is also discussed.

Keywords: Arachnida, Middle East, morphology, new species, taxonomy, trichobothriotaxy

Zusammenfassung. Eine neue Pseudoskorpionart der Gattung *Amblyolpium* (Pseudoscorpiones: Garypinidae) aus einem Haus in der Kermanshah Provinz, Iran. *Amblyolpium goldastehae* spec. nov. wird beschrieben. Die Zeichnungen basieren auf zwei im Westen Irans gesammelten Männchen. Die Präferenz für trockene und warme Habitate wird diskutiert.

The family Garypinidae Daday, 1888, which was considered a subfamily of Olpiidae Banks until it was raised to family level by Judson (2005), currently contains 21 genera and over 78 species (Harvey 2013), of which only two species belonging to two genera have since been reported from Iran: *Garypinus afghanicus afghanicus* Beier, 1959 and *Serianus validus* (Beier, 1971) (Harvey 2013). Also, two species representing a new species of *Garypinus* and *Amblyolpium bellum* J.C. Chamberlin, 1930 have recently been identified from central and southern Iran by Nassirkhani & Harvey (in prep.).

The genus *Amblyolpium* Simon, 1898 was erected on the basis of the type species, *A. dulfusi* Simon, 1898, collected from Collobrières, a commune in the Var department in the Provence-Alpes-Côte d'Azur region in south-eastern France (Harvey 2013). The genus includes 15 known species, of which 13 are found in the Palearctic, Oriental and Austroasiatic regions and two in the Neotropical region. It is only known from two species, *A. anatolicum* Beier, 1967 and *A. bellum* J.C. Chamberlin, 1930, in the Middle East, Central and South-Eastern Asia (Harvey 2013, Nassirkhani & Harvey in prep.). Recent collecting in western Iran revealed a new *Amblyolpium* species with an important difference in its trichobothriotaxy which is described and illustrated here.

Material and methods

The specimens used in this study are lodged in the collection of the Acarology Laboratory, Islamic Azad University of Arak (IAUA), Iran. The specimens were collected directly by hand, preserved in 70 % ethanol, cleared in 60 % lactic acid and prepared for study using black enameled pins (size 0 to 2). The holotype was permanently mounted on a dished glass microscope slide in Swan's fluid and the paratype was studied as a temporary slide prepared by immersion of the specimen in lactic acid. The prepared specimens were studied using an Olympus CH-2 compound microscope and illustrated with a drawing tube attachment. Measurements were taken by a calibrated ocular micrometer and the photograph was made using a digital camera (Canon PC1468). Chamberlin (1931), Legg (1974, 1975), Harvey (1992), Judson (2007) and Harvey et al. (2012) are the main references for morphological terminology and measurements.

The following trichobothrial abbreviations were employed:

<i>eb</i> = external basal,	<i>ist</i> = internal sub-terminal,
<i>esb</i> = external sub-basal,	<i>it</i> = internal terminal,
<i>est</i> = external sub-terminal,	<i>t</i> = terminal,
<i>et</i> = external terminal,	<i>st</i> = sub-terminal,
<i>ib</i> = internal basal,	<i>b</i> = basal,
<i>isb</i> = internal sub-basal,	<i>sb</i> = sub-basal.

In addition, the following abbreviations are used in the text: L = length, W = width, D = depth.

Systematics

Family Garypinidae Daday, 1888

Genus *Amblyolpium* Simon, 1898

Amblyolpium goldastehae spec. nov. (Figs 1-3)

Etymology. This species epithet is dedicated to Dr. Shila Goldasteh (Markazi, Iran) who has intensively worked on the ecology and biology of insects.

Material examined. IRAN, Kermanshah Province: holotype ♂, Kangavar [34°50'43"N, 47°26'53"E, altitude 1400 m], a wall crevice, into a house, 9 October 2015, leg. M. Rahmat Abadi (IAUA). Paratype ♂, on the external surface of the wall, collected with holotype (IAUA).

Diagnosis

Differs from the other species of the genus by the following combination of characters: trichobothrium *ist* proximad of *it*, *est* at the same level as *t*; the presence of a long and a slightly long seta on the pedipalpal femur; and the pedipalpal size, e.g. femur is 0.42-0.45/0.11-0.12 mm, patella 0.35-0.38/0.13-0.14 mm and chela (with pedicel) 0.68-0.72/0.17-0.19 mm.

Description

Carapace. Reddish brown, pale and weakly sclerotized at posterior margin, entirely smooth; without true transverse furrows, with only anterior distinct transverse stripe related to the musculature (Fig. 1a); 1.65 (1.74) times longer than broad; with two pairs of well-developed corneate eyes, anterior eyes less than one ocular diameter away from the anterior margin, distinctly larger than posterior ones; chaetotaxy 4:5(6):2:4:2:4:4; setae simple and acuminate; 6 pairs of lyrifissures (Fig. 1a).

Tergites. Pale brown, weakly sclerotized, entirely smooth (Fig. 1a); all setae acuminate and relatively long; chaetotaxy 4:4:5:6:6:6:7:7:7:8T:TT5TT:2(6:4:4:6:6:8:8:8:T6T:TT3TT:2).

Sternites. Weakly sclerotized, entirely smooth; male genital system with paired and enlarged dorsal anterior glands

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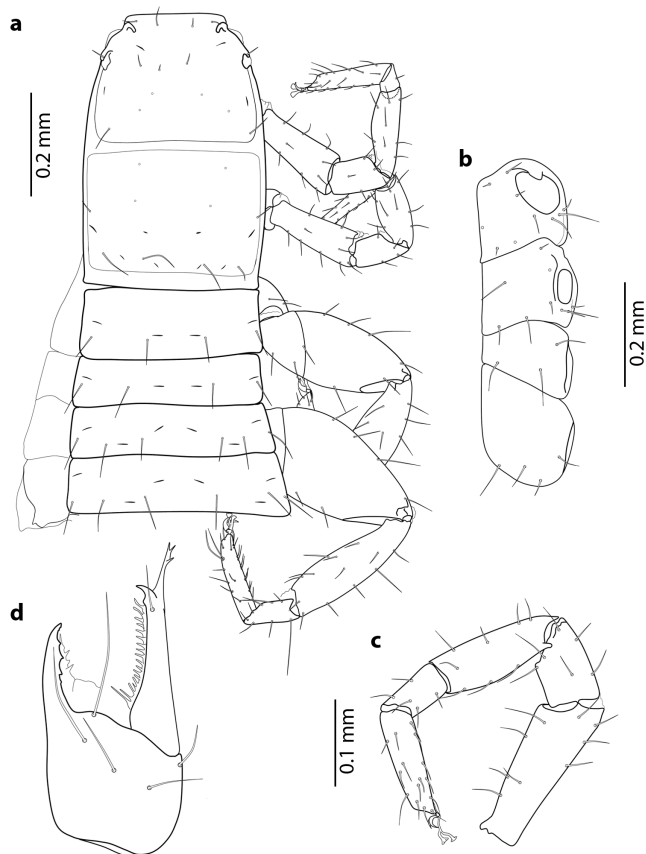


Fig. 1: *Amblyolpium goldastehae* **spec. nov.**, male holotype: **a.** carapace and tergites I-IV, dorsal view (showing chaetotaxy, eyes position, anterior strip and right legs); **b.** left coxae (showing chaetotaxy), ventral view; **c.** leg I (trochanter omitted); **d.** chelicera (showing chaetotaxy, galea, serrula exterior and serrula interior), ventral view

(Fig. 3), genital chamber with two glandular setae on each side; setae on anterior operculum distinctly shorter than those on posterior operculum; anterior operculum with 4 and posterior with 5 lyrifissures; without median suture line; X and XI respectively with 2 lateral long tactile setae; X with 2 medial slightly long setae; chaetotaxy 11:(0)8(0):(0)8(0):8:8:7:7:8:8:2.

Pleural membrane. Longitudinally striate.

Chelicera. Brown, hand with 5 acuminate setae (Fig. 1d); rallum with 4 blades, the distal one larger with short lateral denticulations; serrula exterior with 18-19 blades; lamina exterior absent; serrula interior present; fixed finger with 6 (5) teeth; movable finger with one sub-apical lobe and three small teeth; galea with 3 rami (2 short apical and 1 long sub-basal rami) (Fig. 1d).

Pedipalp. Unicoloured (Fig. 2a), reddish brown; entirely smooth; femur with one long seta situated basally and one slightly long seta located sub-medially on retrolateral face (Fig. 2b), L/W 3.81 (3.75); patella with 5 basal lyrifissures (Fig. 2b), L/W 2.69 (2.71); chela (with pedicel) L/W 4.00 (3.79); chela (without pedicel) L/W 3.76 (3.52), hand (with pedicel) L/W 2.00 (2.05); movable finger as long as hand (with pedicel); fixed finger with 8, movable with 4 trichobothria (Fig. 2c, d); fixed finger with trichobothrium *est* situated nearer *it* than *et*, *it* distad of *ist*, *isb* slightly proximad of *ist*, and *ib* slightly proximad of *eb*; movable finger trichobothrium *st* situated at level of *t*, *sb* nearer *b* than *st*; trichobothrium *est* located at level of *t*, *esb* slightly proximad or at same level as *b*;

fixed finger with 9 (10) spine-like short chemosensory setae situated close to trichobothrium *et* on retrolateral face; fixed finger with 35 (37) distinct cusped teeth, 5 (7) basal teeth blunt; movable finger with 25 teeth, apical teeth acute, sub-apical teeth broadened and becoming indistinct towards base of finger; venom ducts unclear (not seen), nodus ramosus situated very close to *est* in fixed finger and slightly distad of *t* in movable finger (Fig. 2d).

Legs. Light brown; entirely smooth; coxal setae arranged (Fig. 1b): 10:9:3:4 (10:10:4:4); sub-terminal setae simple; claws symmetrical, stout and short; arolia divided and distinctly longer than claws (Fig. 1a, c). Leg I: femur L/D 2.33 (2.62); patella L/D 1.57 (2.00); joint between patella and femur mobile (Fig. 1a-c), femur L/patella L 1.91 (1.75); tibia L/D 2.83 (3.60); metatarsus L/D 1.75 (2.66); tarsus L/D 3.50 (2.50). Leg IV: femur L/D 1.20 (1.18); patella L/D 2.20 (2.21); femur + patella L/D 2.71 (2.67); tibia with a slightly long seta situated sub-medially (Fig. 1a), L/D 3.62 (3.33); metatarsus with one tactile seta situated basally (Fig. 1a), L/D 2.20 (2.40); tarsus L/D 4.25 (4.50).

Dimensions (in mm) (paratype in brackets): Body length: 1.92 (2.12). Carapace: 0.53/0.32. Pedipalp: trochanter 0.22/0.11 (0.25/0.12); femur 0.42/0.11 (0.45/0.12); patella 0.35/0.13 (0.38/0.14); chela (with pedicel) 0.68/0.17 (0.72/0.19); chela (without pedicel) L. 0.64 (0.67); hand (with pedicel) L. 0.35 (0.38); movable finger L. 0.35 (0.38). Leg I: femur 0.21/0.08 (0.21/0.09); patella 0.11/0.07 (0.12/0.06); tibia 0.17/0.06 (0.18/0.05); metatarsus 0.07/0.04 (0.08-0.03); tarsus 0.14/0.04 (0.11/0.04). Leg IV: femur

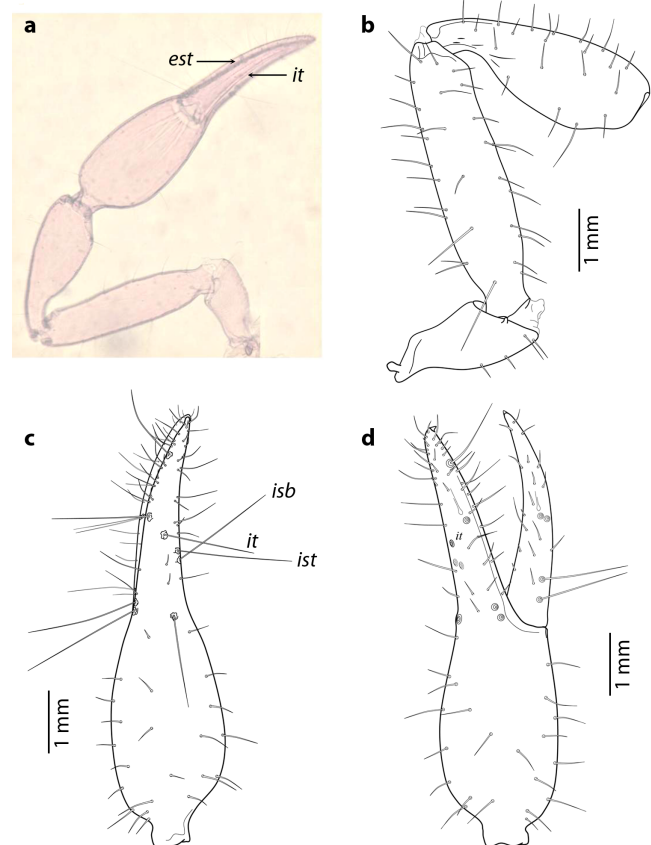


Fig. 2: *Amblyolpium goldastehae* **spec. nov.**, male holotype: **a.** left pedipalp (the positions of trichobothria *it* and *est* shown by arrows), dorsal view; **b.** basal segments of pedipalp, dorsal view; **c.** left chela, dorsal view; **d.** right chela (showing trichobothriotaxy), ventral view

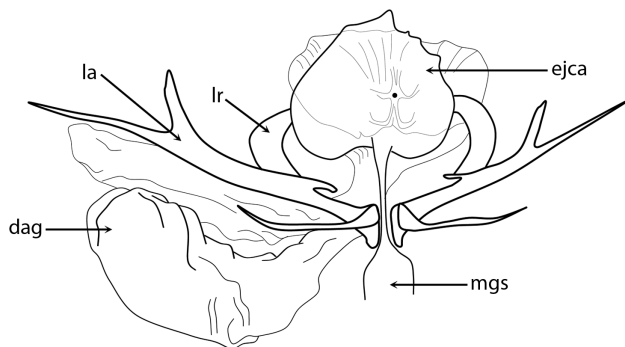


Fig. 3: *Amblyolpium goldastehae* **spec. nov.**, male holotype: genitalia, ventral view (dag = dorsal anterior gland; ejca = ejaculatory canal atrium; la = lateral apodeme; lr = lateral rod; mgs = median genital sac)

0.12/0.11 (0.13/0.09); patella 0.31/0.14 (0.33/0.15); tibia 0.29/0.08 (0.31/0.09); metatarsus 0.11/0.05 (0.12/0.05); tarsus 0.17/0.04 (0.18/0.04).

Remarks

The new species can be distinguished from *Amblyolpium franzi* Beier, 1970, *A. simoni* Heurtault, 1970, *A. japonicum* Morikawa, 1960, *A. bellum* J.C. Chamberlin, 1930, *A. graecum* Mahnert, 1976 and *A. ruficeps* Beier, 1966 by the position of trichobothrium *ist* which is located distinctly proximad of *it* (judging from Beier 1970a: fig. 3, Beier 1966: fig. 5, Harvey 1988: figs 60–61, Heurtault 1970: figs 16–17, Mahnert 1976: figs 7–8, Morikawa 1960: pl.2:9, pl. 7:12, pl. 9:15), and also differentiated from *A. dollfusi* Simon, 1898, *A. ortonadae* (Ellingsen, 1902), *A. novaeguineae* Beier, 1971, *A. biaroliatum* (Tömösváry, 1884) and *A. birmanicum* (With, 1906) on the basis of the position of trichobothrium *est* which is situated at same level as *t* (judging from Beier 1932: figs 233–235, Beier 1971: fig. 1, Lazzeroni 1970: fig. 3).

Amblyolpium salomonense Beier, 1970 and *A. anaticum* Beier, 1967 can be separated from *A. goldastehae* **spec. nov.** by the position of trichobothrium *it* being located between *ist* and *isb* (judging from Beier 1967: fig. 2, Beier 1970b: fig. 1). The trichobothrial pattern of *A. martinense* Tooren, 2002 is more or less similar to that of *A. goldastehae*, nonetheless in *A. martinense*, trichobothria *est*, *it*, *ist* and *isb* are clustered in the midpoint of the fixed chelal finger, the long seta/e on the pedipalpal femur is lost and the pedipalp is also distinctly larger than that of *A. goldastehae*, e.g. the pedipalpal femur size is 0.72/0.15 mm in *A. martinense* while it is 0.42–0.45/0.11–0.12 mm in *A. goldastehae* (Tooren 2002). Note: Tooren (2002) described the species as *martinensis*, but *Amblyolpium* being neuter, Harvey (2013) corrected it to *martinense*.

Amblyolpium species mostly occur in litter and under the bark of trees (Morikawa 1960, Mahnert 1976, Harvey 1988), or rarely on bat guano (Tooren 2002). The newly collected specimens from western Iran occurred in a crevice on the outside face of a brick wall coated with plaster. In fact, finding only two specimens in a house is not sufficient to characterize the species as synanthropic, and only shows that the species is capable of living and reproducing in dry and warm habitats.

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References

- Beier M 1932 Pseudoscorpionidea I. Subord. Chthoniinea et Neobisiinea. – *Das Tierreich* 57: 1–258
- Beier M 1966 Ergebnisse der österreichischen Neukaledonien-Expedition 1965. Pseudoscorpionidea. – *Annalen des Naturhistorischen Museums in Wien* 69: 363–371
- Beier M 1967 Ergebnisse zoologischer Sammelreisen in der Türkei. – *Annalen des Naturhistorischen Museums in Wien* 70: 301–323
- Beier M 1970a Ergänzungen zur Pseudoscorpionidenfauna der Kanaren. – *Annalen des Naturhistorischen Museums in Wien* 74: 45–49
- Beier M 1970b Die Pseudoscorpione der Royal Society Expedition 1965 zu den Salomon-Inseln. – *Journal of Natural History* 4: 315–328 – doi: [10.1080/00222937000770301](https://doi.org/10.1080/00222937000770301)
- Beier M 1971 Pseudoscorpione unter Araucarien-Rinde in Neu-Guinea. – *Annalen des Naturhistorischen Museums in Wien* 75: 367–373
- Chamberlin JC 1931 The arachnid order Chelonethida. – *Stanford University Publications, Biological Sciences* 7(1): 1–284
- Harvey MS 1988 Pseudoscorpions from the Krakatau Islands and adjacent regions, Indonesia (Chelicerata: Pseudoscorpionida). – *Memoirs of the Museum of Victoria* 49: 309–353
- Harvey MS 1992 The phylogeny and classification of the Pseudoscorpionida (Chelicerata: Arachnida). – *Invertebrate Taxonomy* 6: 1373–1435 – doi: [10.1071/IT9921373](https://doi.org/10.1071/IT9921373)
- Harvey MS 2013 Pseudoscorpions of the world, version 3.0. Western Australian Museum. – Internet: <http://museum.wa.gov.au/catalogues-beta/pseudoscorpions> [accessed 6 December 2015]
- Harvey MS, Ratnaweera PB, Randeniya PV & Wijesinghe MR 2012 A new species of the pseudoscorpion genus *Megachernes* (Pseudoscorpiones: Chernetidae) associated with a threatened Sri Lankan rainforest rodent, with a review of host associations of *Megachernes*. – *Journal of Natural History* 46: 2519–2535 – doi: [10.1080/00222933.2012.707251](https://doi.org/10.1080/00222933.2012.707251)
- Heurtault J 1970 Pseudoscorpions du Tibesti (Tchad). I. Olpiidae. – *Bulletin du Muséum National d'Histoire Naturelle (Paris)* (2) 41: 1164–1174
- Judson MLI 2005 Baltic amber fossil of *Garypinus electri* Beier provides first evidence of phoresy in the pseudoscorpion family Garypinidae (Arachnida: Chelonethi). In: Logunov DV & Penney D (eds) *European Arachnology 2003. Proceedings of the 21st European Colloquium of Arachnology, St. Petersburg 2003*. – *Arthropoda Selecta, Special Issue* 1: 127–131
- Judson MLI 2007 A new and endangered species of the pseudoscorpion genus *Lagynochthonius* from a cave in Vietnam, with notes on chelal morphology and the composition of the Tyrannochthoniini (Arachnida, Chelonethi, Chthoniidae). – *Zootaxa* 1627: 53–68
- Lazzeroni G 1970 Ricerche sugli Pseudoscorpioni V. – *L'isola di Giannutri*. – *Atti della Società Toscana di Scienze Naturali, Memorie* B 76: 101–112
- Legg G 1974 A generalised account of the female genitalia and associated glands of pseudoscorpions (Arachnida). – *Bulletin of the British arachnological Society* 3: 42–48
- Legg G 1975 A generalised account of the male genitalia and associated glands of pseudoscorpions (Arachnida). – *Bulletin of the British arachnological Society* 3: 66–74
- Mahnert V 1976 Zwei neue Pseudoskorpion-Arten (Arachnida) aus griechischen Höhlen (Über griechische Pseudoskorpione VII). – *Berichte des naturwissenschaftlich-medizinischen Vereins in Innsbruck* 63: 177–183
- Morikawa K 1960 Systematic studies of Japanese pseudoscorpions. – *Memoirs of Ehime University* (2B) 4: 85–172
- Tooren D van den 2002 Pseudoscorpions of the genera *Pachyolpium*, *Novohorus* and *Amblyolpium* (Pseudoscorpiones: Olpiidae) from St. Eustatius (Statia), St. Martin (Sint Maarten) and Anguilla (Lesser Antilles, Leeward group). – *Zoologische Mededelingen* 76: 451–472