

Two new species of solifuge genus *Gylippus* Simon, 1879 from western Turkey (Solifugae: Gylippidae)

Два новых вида сольпуг рода *Gylippus* Simon, 1879 из западной Турции (Solifugae: Gylippidae)

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КЛЮЧЕВЫЕ СЛОВА: *Gylippus* (*Paragylyppus*), сольпуги, паукообразные, Arachnida, Türkiye.

ABSTRACT. Two new solifuge species of the subgenus *Gylippus* (*Paragylyppus*) Roewer, 1933, *Gylippus* (*Paragylyppus*) *dunlopi* sp.n. and *Gylippus* (*Paragylyppus*) *kunti* sp.n. are described and illustrated based on both sexes from western Turkey. The detailed morphological description of the flagella, flagellar complex spiniform setae, dorsomedial spiniform setae, femoral spines on the pedipalps in males and genital bulges in females, and the other characteristics are described and discussed with related gylippids.

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РЕЗЮМЕ. Даны иллюстрированные описания самцов и самок двух новых для науки видов сольпуг из подрода *Gylippus* (*Paragylyppus*) Roewer, 1933, *Gylippus* (*Paragylyppus*) *dunlopi* sp.n. и *Gylippus* (*Paragylyppus*) *kunti* sp.n. из западной Турции. В сравнении с близкими представителями семейства Gylippidae описана и обсуждается морфология флагеллума, шиповидных щетинок флагеллярного комплекса, дорсомедиальных шиповидных щетинок, шипов на бедрах педипальп самцов и генитальных выступов самок, а также других признаков.

Introduction

Two distinct taxonomic groupings (Gylippinae Roewer, 1933 and Lipophaginae Wharton, 1981) with a dispersed distribution constitute the family Gylippidae as currently defined. The characteristics of the flagellar complex and the presence of distinctive spiniform setae in Gylippinae are two major features that significantly distinguish the subfamilies (Bird *et al.* 2015). Gylippinae Roewer, 1933, a subfamily of the small solifuge family Gylippidae Roewer, 1933, consists of 25 species in two

genera: *Acanthogylippus* Birula, 1913, and *Gylippus* Simon, 1879, distributed throughout the Middle East and Central Asia [Harvey, 2013; Bird *et al.*, 2015; Erdek, 2019, 2023, 2025].

The four subgenera of *Gylippus* — *G.* (*Anoplogylippus*) Birula, 1913, *G.* (*Gylippus*) Simon, 1879, *G.* (*Hemigylippus*) Birula, 1913, and *G.* (*Paragylyppus*) Roewer, 1933 — can be distinguished based on the structure of the flagellar complex, the presence and position of retrolateral manus spiniform setae, and the form of the dental papilla [Bird *et al.*, 2015; Erdek, 2019, 2023, 2025].

The subgenus *Gylippus* (*Paragylyppus*) Roewer, 1933, is currently represented by seven species: *G.* (*P.*) *afghanus* (Roewer, 1933) from Afghanistan; *Gylippus* (*Paragylyppus*) *arikani* Koç et Erdek, 2021 from Turkey; *G.* (*P.*) *caucasicus* Birula, 1907 (with subspecies *G.* (*P.*) *caucasicus caucasicus* Birula, 1907 and *G.* (*P.*) *caucasicus koenigi* (Birula, 1913) from Armenia, Azerbaijan, Georgia, and Turkey; *G.* (*P.*) *hakkaricus* Erdek, 2019 and *G.* (*P.*) *monoceros* Werner, 1905 from Turkey; *G.* (*P.*) *ozdinci* Erdek, 2025 from Turkey; and *G.* (*P.*) *quaestunculoides* Birula, 1907 and *G.* (*P.*) *spinimanus* Birula, 1905 from Iran [Harvey, 2013; Hosseinpour *et al.*, 2020; Koç, Erdek, 2021].

The present paper describes *Gylippus* (*Paragylyppus*) *dunlopi* sp.n. and *Gylippus* (*Paragylyppus*) *kunti* sp.n., and provides their diagnostic characters. With the addition of these two species, the number of known *Gylippus* (*Paragylyppus*) species increases to nine.

Material and Methods

The specimens examined for this study were collected by rock-rolling and moving among the grasses during the day on ground of the residential area in villages at night and pitfall trapping. The digital images were taken using digital camera attached to Leica DFC295 stereomicroscope. All measurements were made using Leica DFC295 stereomicroscope and given in millimeters (mm). Roewer [1933] and Birula [1913]

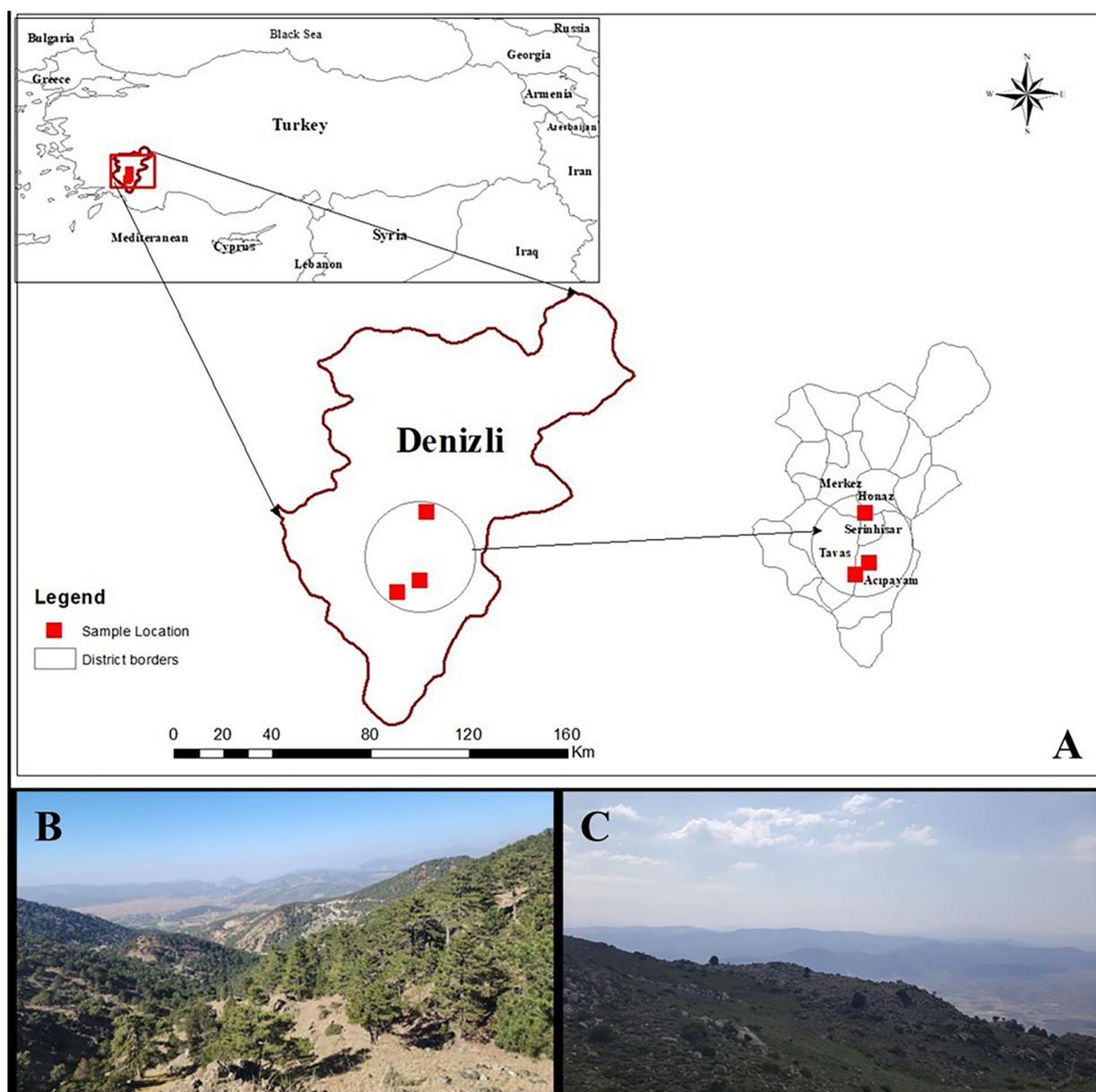


Fig. 1. Distribution and habitat of *Gylippus (Paragylippus) dunlopi* sp.n.: A — distribution map of sampling localities, B–C — habitats in type locality in Bozdağ Ski Center, Denizli Province, southeast Turkey.

Рис. 1. Распространение и местообитание *Gylippus (Paragylippus) dunlopi* sp.n.: A — карта распространения с местами сбора, B–C — биотопы в типовом местонахождении в горнолыжном курорте Боздаг, провинция Денизли, юго-восточная Турция.

were used for diagnosis and Bird *et al.* [2015] for terminology of cheliceral morphology. For Scanning Electron Microscopy (SEM), specimens were kept overnight in absolute ethanol. After dehydration, specimens were gold-coated in a Quorum SC7620 sputter coater. Morphological structures were studied and photographed at an accelerating voltage of 10kV in a ZEISS Sigma 300 scanning electron microscope at the Science Application and Research Center in Van Yüzüncü Yıl University. Specimens are deposited in the solifuge collection at the Hakkari University Zoological Museum (HAKZM) and Alaşehir Zoological Museum/ Manisa Celal Bayar University (AZM). The locations of the collected specimens were transferred to the numerical environment using GIS (Geographic Information

Systems) technique. The distribution map was produced using ArcMap 10.2 software (Figs 1A, 7A).

Abbreviation: flg — flagellum, fcs — flagellar complex spiniform seta, rlms — retrolateral manus spiniform seta, sp — stridulatory plate, FD — fixed finger, distal tooth, FM — fixed finger, medial tooth, FP — fixed finger, proximal tooth, FSM — fixed finger, submedial tooth, MM — movable finger, medial tooth, MP — movable finger, proximal tooth, MSM — movable finger, submedial tooth, PFM — profundal medial tooth, PFP — profundal proximal tooth, PFSP — profundal subproximal tooth, RF — retrofondal teeth, RFM — retrofondal medial tooth, RFP — retrofondal proximal tooth, RFSM — retrofondal submedial tooth.

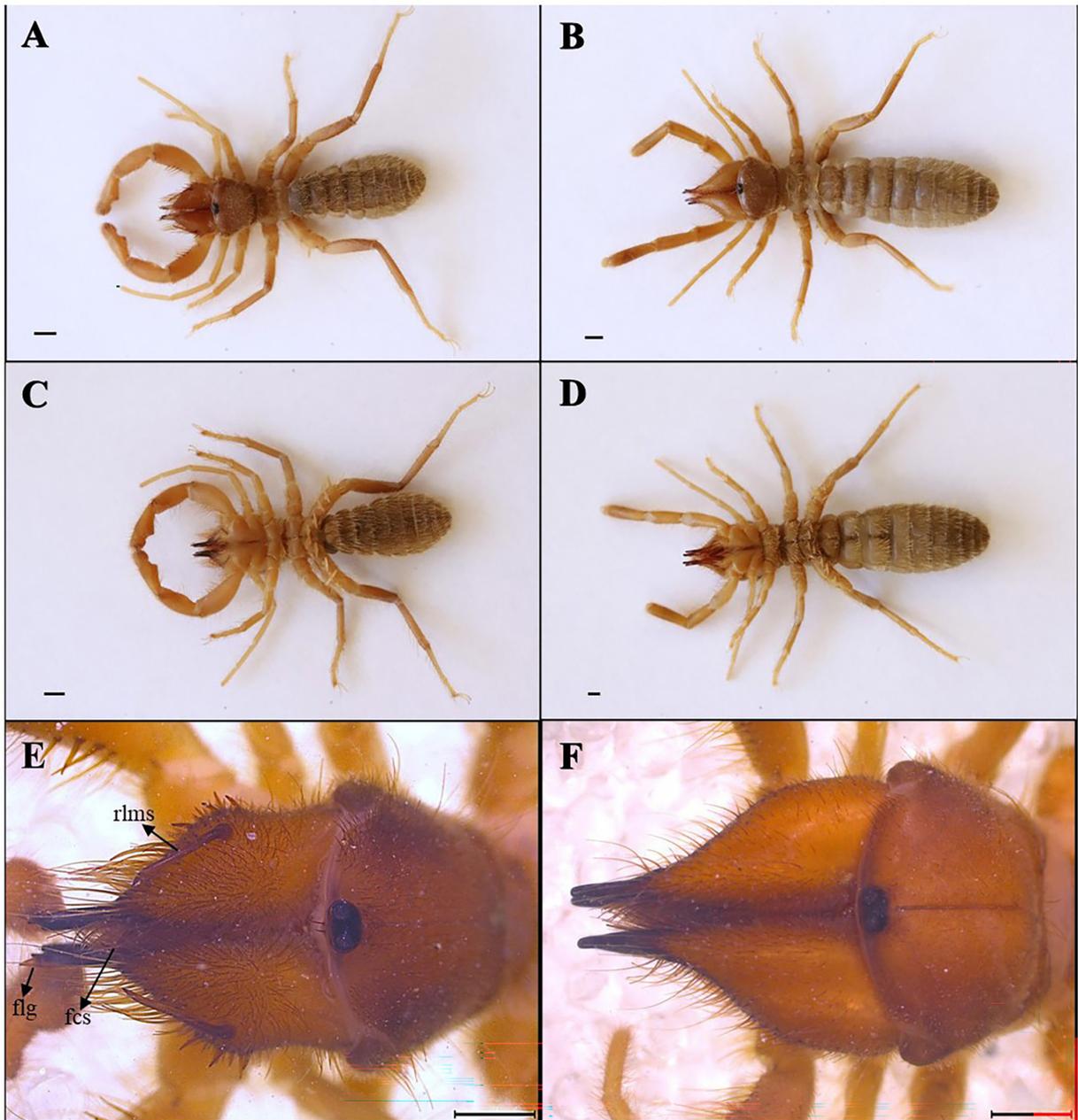


Fig. 2. *Gylippus (Paragylippus) dunlopi* sp.n.: A, C, E — male holotype, B, D, F — female paratype: A, B — habitus in dorsal view; C, D — habitus in ventral view; E, F — chelicerae and propeltidium in dorsal view. Scale bars: 2 mm.

Рис. 2. *Gylippus (Paragylippus) dunlopi* sp.n.: A, C, E — голотип самец, B, D, F — паратип самка: A, B — внешний вид, дорсально; C, D — то же, вентрально; E, F — хелицеры и пропельтидий, дорсально. Масштаб: 2 мм.

Results

Family Gylippidae Roewer, 1933
 Subfamily Gylippinae Roewer, 1933
 Genus *Gylippus* Simon, 1879
 Subgenus *Gylippus (Paragylippus)* Roewer, 1933
Gylippus (Paragylippus) dunlopi sp.n.
 Figs 1–6, Table 1.

TYPE MATERIAL. Holotype ♂ (HAKZM /Solfg-GyIp: 03-12); Turkey, Denizli Prov., Acıpayam District, Bozdağ Ski Center Road, 37°19'45"N 29°11'04"E, 2028 m, pitfall trap, 24.10.2022–28.10.2023,

leg. E.A. Yağmur & Ö. Sipahioğlu. Paratypes: 1 ♂, 1 ♀, 16 juv. (HAKZM/SIfg-GyIp: 02-13); same data of holotype. – 2 ♂♂, 2 ♀♀ 1 juv., (HAKZM/SIfg-GyIp: 02-14); same locality of holotype, pitfall trap, 30.10.2020–24.10.2021. – 2 ♀♀, 1 juv. (HAKZM/SIfg-GyIp: 02-15); same locality of holotype, pitfall trap, 22.11.2019–30.10.2020. – 1 juv. (HAKZM/SIfg-GyIp: 02-16) Turkey, Denizli Prov., Acıpayam District, Mevlütler Village, 37°23'44"N 29°15'09"E, 1252 m, pitfall trap, 30.10.2020–24.10.2021, leg. E.A. Yağmur & Ö. Sipahioğlu. – 2 ♀♀, 2 juv. (HAKZM/SIfg-GyIp: 02-17) same data of holotype, 2025 m, pitfall trap, 30.10.2020–24.10.2021, leg. E.A. Yağmur & Ö. Sipahioğlu. – 1 ♂, 1 ♀, 1 juv. (AZZM/Sol-2023: 01) same locality of holotype, 1252 m, pitfall trap, 30.10.2020–24.10.2021, leg. E.A. Yağmur & D. Köksal. – 2 ♂♂, 1 ♀, (HAKZM/SIfg-GyIp: 02-18); same locality of holotype, pitfall trap, 28.10.2023–18.06.2024.

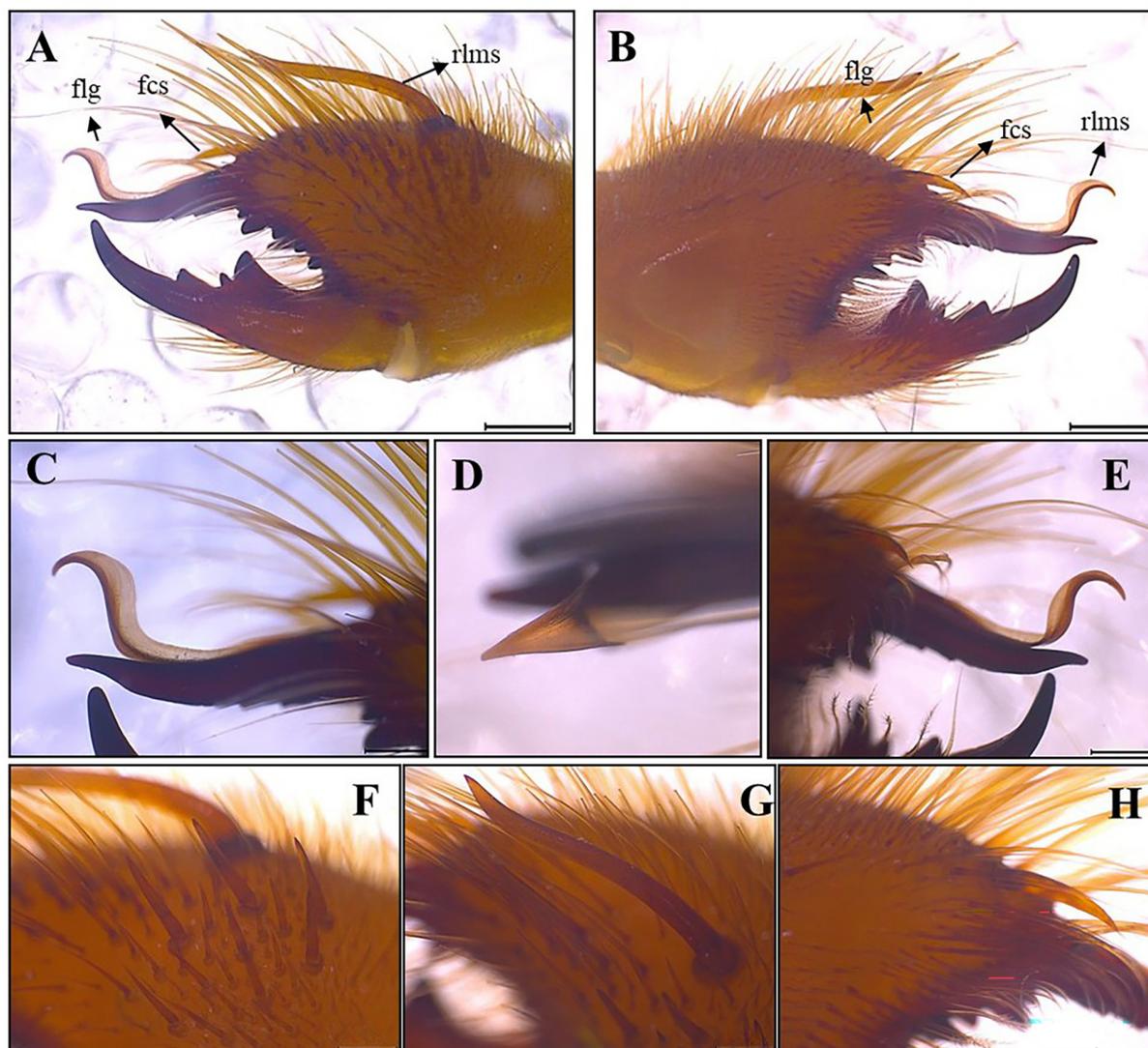


Fig. 3. *Gylippus (Paragylippus) dunlopi* sp.n., male holotype: A — sinistral chelicera in retrolateral view; B — sinistral chelicera in prolateral view; C — flagellum in retrolateral view; D — flagellum in dorsal view; E — flagellum in prolateral view; F — retrolateral manus setae; G — retrolateral manus spiniform setae; H — flagellar complex spiniform seta. Scale bars: 2 mm (A–B), 1 mm (E–H), 0.5 mm (C).

Рис. 3. *Gylippus (Paragylippus) dunlopi* sp.n., голотип самец: А — левая хелицера, ретролатерально; В — то же, пролатерально; С — флагеллум, ретролатерально; D — то же, дорсально; E — то же, пролатерально; F — ретролатеральные щетинки основного членика хелицера; G — ретролатеральные шиповидные щетинки основного членика хелицера; H — шиповидные щетинки флагеллярного комплекса. Масштаб: 2 мм (А–В), 1 мм (Е–Н), 0,5 мм (С).

ETYMOLOGY. The new species is named after Dr. Jason Dunlop (Curator of Arachnids, Myriapods and Stem-group Arthropods at Museum für Naturkunde – Leibniz Institute for Research on Evolution and Biodiversity) who has conducted important arachnological and paleontological research as well as for his friendship.

DIAGNOSIS. The present new species is included in *Gylippus (Paragylippus)* Roewer, 1933 genus by virtue of having relatively “S”-shaped flagellum, one dorsally-situated retrolateral manus spiniform seta, one flagellar complex spiniform seta, and 4–6 dorsomedial spiniform setae on the dorsal view of fixed finger as retrolateral manus setae in males and posteriorly oval/rounded a significantly bulges on the genital segment in females.

Despite bearing some similarities to species that are morphologically similar, *Gylippus (Paragylippus) dunlopi* sp.n. is distinguished by a number of notable characteristics. *G.*

(P.) dunlopi sp.n. differs from remaining species in subgenus *Gylippus (Paragylippus)* by general coloration, bends and folds in the S-shaped flagellum, indentations and protrusions in the sclerotized structure of the genital operculum in the female. This new species is similar in morphology to *G. (P.) arikani* Koç et Erdek, 2021 and *G. (P.) monoceros* Werner, 1905. Compared to both species, the part of the flagellum that curves upwards laterally is longer in the new species. In *G. (P.) dunlopi* sp.n., the base of the S-shaped flagellum is more elevated than the surface of the chelicerae compared to other species.

DISTRIBUTION. Bozdağ Mountain, Denizli Province, Turkey (Fig. 1B–C).

DESCRIPTION. Male (holotype)

Coloration (Figs 2A–F; 3–4). Propeltidium and chelicerae orange-like brown (Figs 2A, E; 3A–B). The anterior edges of propeltidium coalescing postero-dorsal of each chelicera with

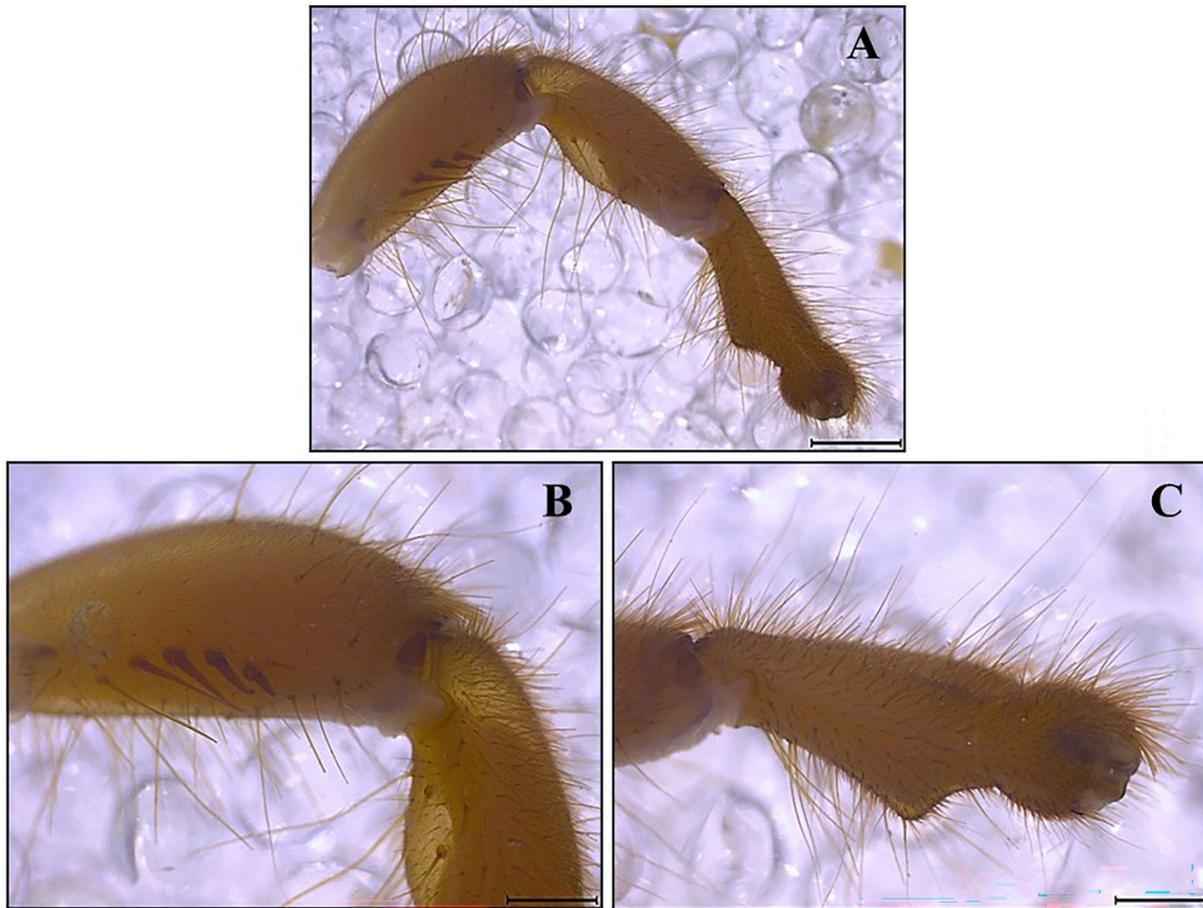


Fig. 4. *Gylippus (Paragylippus) dunlopi* sp.n., male holotype: A — sinistral pedipalp in dorsal view, B — pedipalpal femur and femoral setae in detail, C — pedipalpal tarsus and metatarsus in detail. Scale bars: 2 mm.

Рис. 4. *Gylippus (Paragylippus) dunlopi* sp.n., голотип самец: А — левая педипальпа, дорсально, В — бедро педипальпы и его щетинки, детально, С — лапка и предлапка педипальпы, детально. Масштаб: 2 мм.

significant white line. The ocular tubercle black and its anterior edges with short purplish lines. (Fig. 2A, E). Propeltidium and chelicerae cover with orange and thin setae, the propeltidial setae are substantially falciform (Fig. 3E). The cheliceral fingers rusty orange, the dental edges, tips, and teeth of each cheliceral fingers reddish brown. The prolateral surface of cheliceral fingers cover with pale orange-like brown filiform and plumose setae. Flagellum pale light brown (Figs 2E, 3A–E). Flagellar complex spiniform seta orange-like brown (Fig. 3A–B, H). Pedipalp pale yellow with reddish brown pigmentation at the connection points of the segments (Figs 2A, C, 4A–C). Legs pale yellow, and brownish on tibial and femoral parts (Fig. 2A, C). Opisthosoma rusty yellow dorsally with pale brown mesial stripe (Fig. 2A). Opisthosoma laterally rusty yellow and ventrally dark yellowish brown. The entire surface of opisthosoma covered with numerous pale light yellow and thin setae. Malleoli pale light yellow (Fig. 2C).

Propeltidium (Fig. 2A, F). The entire surface is background pale orange covered with brown pigmentation in different densities. The surface of the propeltidium is covered on the front side with increasingly sparse long setae, and there are also numerous short and fine setae. The anterior edge of the propeltidium is pale purplish in color. Ocular tubercle ovale, not indented posteriorly.

Chelicerae (Fig. 3A–H). **Dentition** (Fig. 3A–B). Fixed finger with 1 FD - 1 FM - 1 FSM - 1 FP - 1 RFM - 1 RFSM - 1 RFP - 5 RFSP (except for the two distal ones, the others are

extremely reduced)- 1 PFM - 1 PFP - 2 PFSP. Movable finger with 1 MM - 1 MSM - 1 MP. **Flagellum** (Fig. 3A–E). The membranous flagellum is S-shaped and is bent distally towards the cheliceral fixed fingertip in a wedge-like shape. The tip of the flagellum tapers to a point distally. The flagellum curves upwards on both sides. Prolaterally, this curvature begins before the flagellum leaves the cheliceral fixed finger. The distance between cheliceral fingertip and flagellum is 1,04 mm. The *rlms* (4,16 mm) located dorsolaterally on the fixed finger and slightly distal end curved upwards. The *fcs* (1.66mm) located adjacent to the cheliceral surface exhibits a progressive tapering from its dorsal region towards the distal end, ultimately acquiring a spicule-like slender and pointed morphology. **Setae**. Laterally on chelicera, 7 distinct retrolateral manus setae totally 13 visible with also some shorter and thinner setae around them. Numerous filiform and bifurcate setae cover the whole cheliceral surface. These setae are thicker and denser on the retrolateral and retrodorsal surfaces. Stridulatory plates with 4 stridulatory ridges not very prominent on anterior edges and located proximally on the inner side of the chelicera. The chelicera's prolateral surface has multiple lengthy plumose setae, five prodorsal distal setae dorsal to the stridulatory plate, and eight proventral subdistal setae (*pvstd*) behind the plumose setae.

Pedipalps (Figs 2A, C; 4A–C). Metatarsus prolaterally swollen. Metatarsus length/width = 2.54/2.09 mm. Pedipalps are covered with numerous different length setae. The mesal

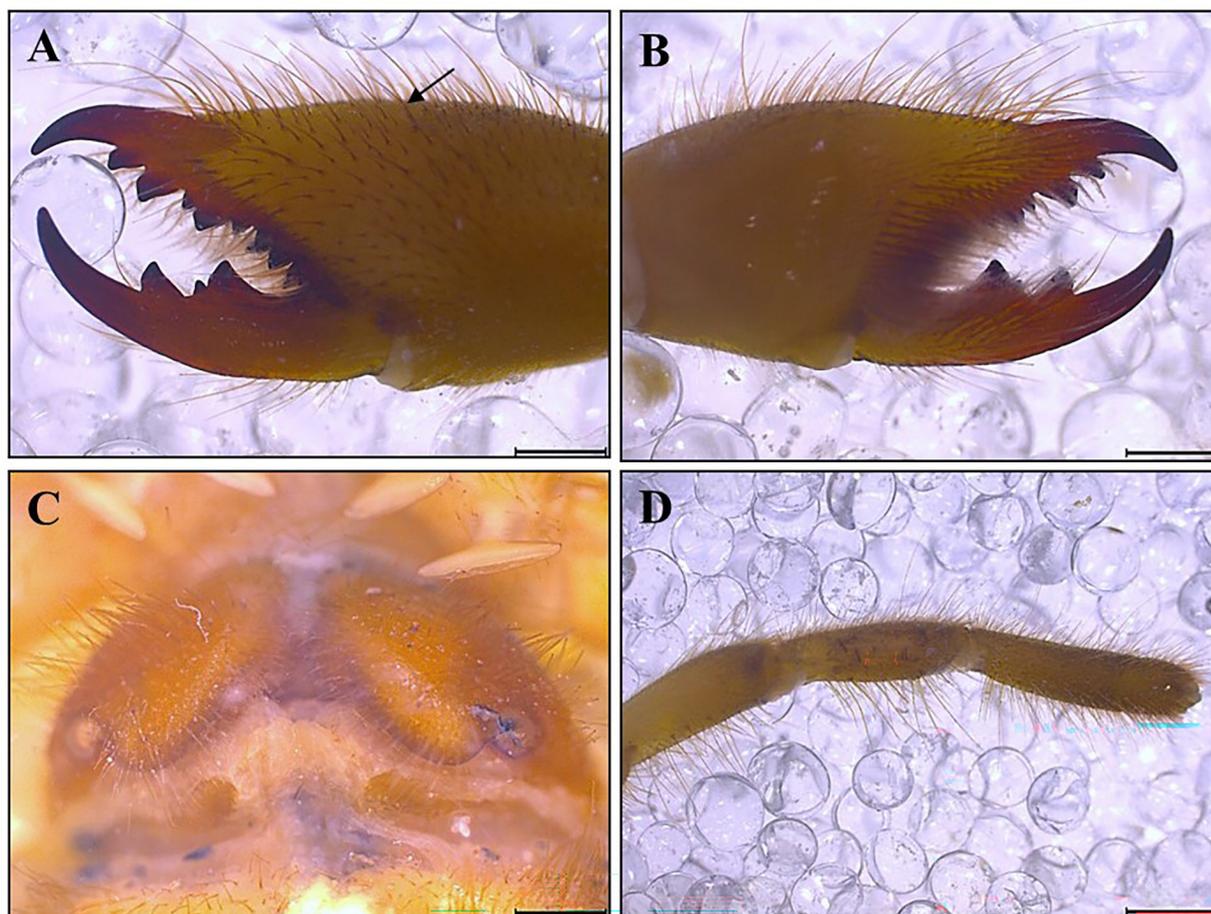


Fig. 5. *Gylippus (Paragylippus) dunlopi* sp.n., female paratype: A — sinistral chelicera in retrolateral view. Arrow indicates the setae in female homologous to retrolateral manus spiniform seta in male; B — sinistral chelicera in prolateral view; C — genital sternite, ventral view; D — sinistral pedipalp in dorsal view. Scale bars: 2 mm.

Рис. 5. *Gylippus (Paragylippus) dunlopi* sp.n., паратип самка: А — левая хелицера, ретролатерально. Стрелкой указаны щетинки самки, гомологичные шиповидных щетинкам основного членика хелицер самца; В — то же, пролатерально; С — генитальный стернит, вентрально; D — левая педипальпа, дорсально. Масштаб: 2 мм.

surface of femur with 4 brown robust thick spiniform setae shorter than the diameter of femur and one long, thin, distinctive setae proximally basal the spiniform setae, and one short, thin, distinctive seta distally basal the spiniform seta. The surface of the pedipalp femur covered with short, spindly and numerous setae, also with long, distinct, sparse setae.

Legs (Fig. 2A, C). Leg I without spiniform setae, with tarsal claws well-developed. Metatarsi II and III with two spiniform setae dorsally and five pairs of thin setae ventrally. Legs surface is covered with numerous, dense, thin setae some are sparse and long.

Some morphological details of males (flagellum, flagellar complex spiniform setae, flagellar complex plumose setae, retrolateral manus spiniform seta, pedipalp tarsus and metatarsus, femoral spines on pedipalp) pointed out on a paratype male in Fig. 6.

Opisthosoma (Fig. 2A, C). Opisthosomal sternites without ctenidia. Opisthosomal tergites and sternites covered with numerous bifurcated setae differing in length and thickness. Genital sternite with 2 pieces elliptical depression mid-posteriorly. Opisthosomal spiracles covered with short setae.

Female (paratype) (Figs 2B, D, F; 5A–D). General body coloration is similar to male but slightly lighter than male. The

general background pale orange. Propeltidium, mesopeltidium, metapeltidium pale brownish orange and opisthosomal tergites laterally and ventrally pale whitish brown, dorsomedially pale brown. Opisthosomal surface with dense yellowish setae. Propeltidium is rusty orange red with rusty reddish brown scattered spots occurring at different pigment densities, and short and sparse orange brown setae. Ocular tubercle reniform shape less distinctly than male, indented posteriorly. Legs generally pale yellow. Unlike males, pedipalps are not swollen and three slightly modified setae are present on femur with some sparse long and dense short thin hairs. Chelicerae with thin, short and less abundant setae. Dentition: Fixed finger with 1 FD - 1 FM - 1 FSM - 1 FP - 1 RFM - 1 RFSM - 1 RFP - 5 RFSP - 1 PFM - 1 PFP - 2 PFSP. Movable finger with 1 MM - 1 MSM - 1 MP. The tips of distal and medial teeth on the fixed finger flattened and the tips of other teeth rounded. Malleoli is entirely pale whitish yellow. Opisthosomal sternites sclerotized and darkened in middle of ventral side and without ctenidia. Genital sternites are sclerotized; covered with long and dense bifurcate setae and forming two distinct, protuberant lobes with abundant setae on both sides of genital opening (2.01 mm). The upper ends of these lobes obcordate. The inner parts of the surface of the genital lobes facing the genital opening with a slight depression. Pos-

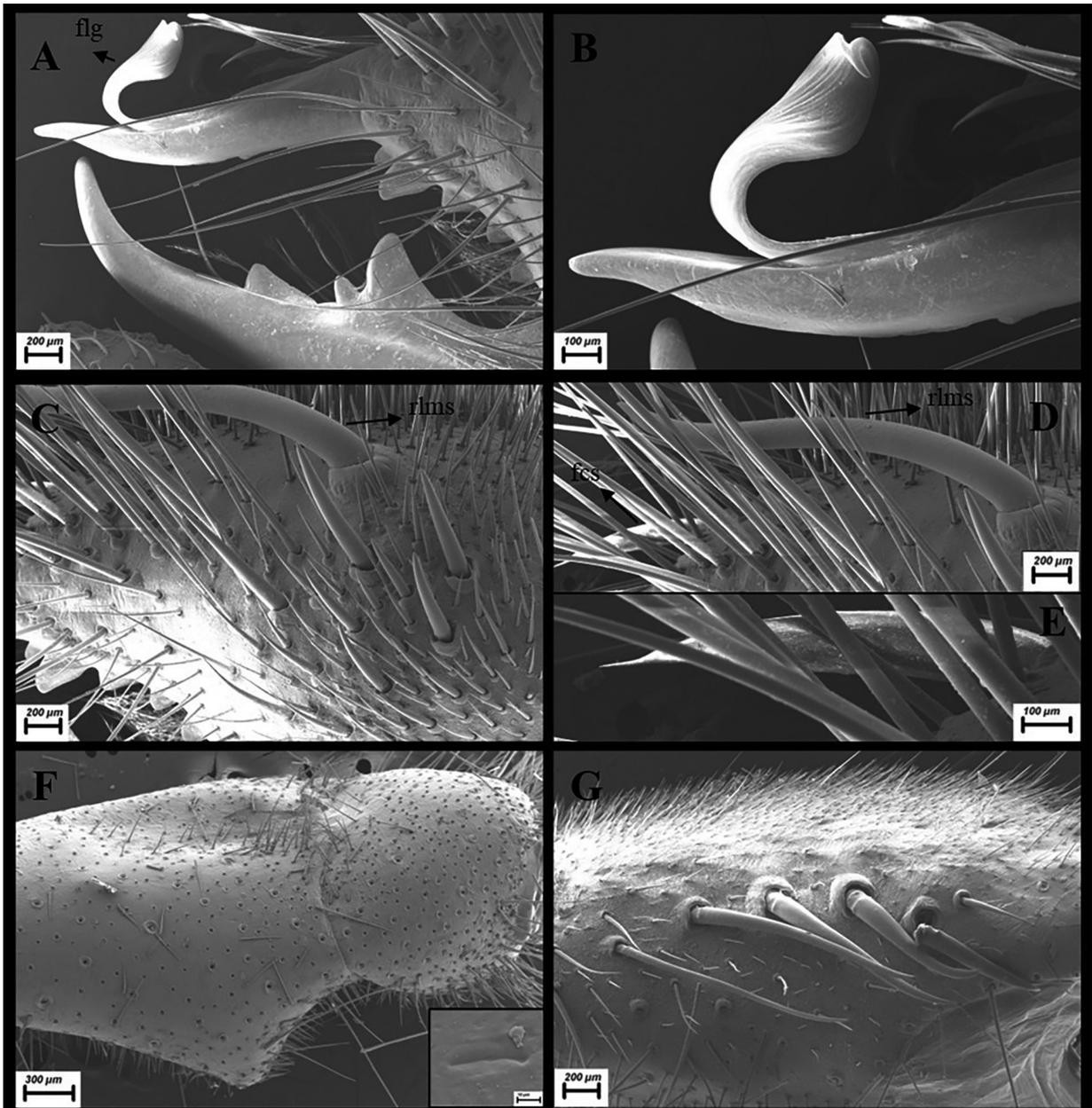


Fig. 6. *Gylippus (Paragylippus) dunlopi* sp.n., male paratype: A — sinistral chelicera in retrolateral view; B — sinistral flagellum in retrolateral view; C — retrolateral manus setae in detail; D — retrolateral manus spiniform seta in detail; E — flagellar complex spiniform seta in detail; F — dextral pedipalp, tarsus and metatarsus in retrorsal view, single slit sensillum in the lower right corner (10 µm); G — dextral pedipalp, modified setae on femur in prodorsal view.

Рис. 6. *Gylippus (Paragylippus) dunlopi* sp.n., паратип самца: А — левая хелицера, ретролатерально; В — левый флагеллум, ретролатерально; С — ретролатеральные щетинки основного членика хелицер, детально; D — ретролатеральные шиповидные щетинки основного членика хелицер, детально; E — шиповидные щетинки флагеллярного комплекса, детально; F — правая педипальпа, лапка и предлапка, ретролатерально, единичная щелевидная сенсилла в нижнем правом углу (10 мкм); G — то же, видоизмененные щетинки на бедре, продорсально.

terior to the genital segment, there is a sclerotized orange-brown surface on both sides from which the genital lobes are separated. The average thickness of the middle part of the surfaces of the genital lobes is 2.54 mm, while the distance between the two lobes is 5.93 mm posteriorly. There is one depression, 0.86 mm deep, like a lobal notch in the posterior part of each lobe.

ECOLOGY. Denizli province is located in West part of Turkey. It is also situated in Mediterranean phytogeographic region and Aegean sub-region in Mediterranean Macronesian

zoogeographic region in Palearctic region. Specimens were collected in the alpine zone of Bozdağ Mountain, near the Bozdağ Ski Center. The collection site is located at approximately 2028 m a.s.l. and is characterized by a cold and humid climate. Pitfall traps were set in areas with hard or sandy soil, including sandy sites with dense accumulations of small broken stones and rock fragments. The vegetation consists of very short grasses and dense milkvetch (*Astragalus* sp.). The specimens of *Gylippus (Paragylippus) dunlopi* sp.n. are likely closely associated

Table 1. Measurements of *Gylippus (Paragylippus) dunlopi* sp.n. and *Gylippus (Paragylippus) kunti* sp.n. (male holotype and paratypes in both sexes, in mm).Таблица 1. Промеры *Gylippus (Paragylippus) dunlopi* sp.n. и *Gylippus (Paragylippus) kunti* sp.n. (голотипы самцов и паратипы обоих полов, мм).

	<i>Gylippus (Paragylippus) dunlopi</i> sp.n.	<i>Gylippus (Paragylippus) kunti</i> sp.n.
	Holotype (♂)/Paratype (♀/♀/♂)	Holotype (♂)/Paratype (♀/♂/♂)
Total length	24.54/(24.86/26.46/20.10)	31.84/(35.48/31.61/30.06)
Chelicerae		
Dorsal width	2.78/(1.76/1.98/2.55)	1.38/(1.52/1.42/2.25)
Lateral width	6.16/(3.18/3.46/2.85)	6.24/(5.48/6.17/5.68)
Lateral length	11.78/(13.14/13.96/7.16)	11.96/(12.02/11.94/10.06)
Propeltidium		
Anterior width	7.04/(7.56/8.40/5.85)	6.46/(7.06/6.42/5.26)
Posterior width	3.96/(4.68/5.03/2.81)	4.32/(4.52/4.27/3.38)
Length	4.12/(4.66/5.06/3.24)	5.20/(4.84/5.15/3.24)
Pedipalp		
Tarsus	1.18/(3.52/3.52/1.31)	1.90/(1.62/1.89/1.44)
Metatarsus	2.54/(2.86/2.89/3.06)	2.60/(4.62/2.58/3.83)
Tibia	3.62/(4.00/4.13/2.47)	4.08/(5.16/4.11/5.01)
Femur	3.80/(3.54/3.79/3.97)	4.16/(2.76/4.02/1.87)
Total	17.88/(15.28/15.66/14.5)	13.34/(17.84/15.06/15.61)
1 st leg		
Claw	0.22/(0.26/0.26/0.18)	0.21/(0.23/0.21/0.24)
Tarsus	1.88/(1.74/1.78/1.41)	2.00/(2.16/2.02/2.02)
Metatarsus	2.58/(2.54/2.66/2.16)	3.04/(3.16/3.03/2.70)
Tibia	3.72/(3.14/3.37/3.29)	4.18/(3.84/4.12/3.21)
Femur	2.76/(3.88/3.74/2.34)	2.78/3.38/2.71/1.42)
Total	14.94/(13.78/14.01/11.92)	16.34/(17.38/15.62/12.81)
2 nd leg		
Claw	0.64/(1.20/0.74)	1.12/(1.38/1.08/0.81)
Tarsus	1.08/(1.34/0.76)	1.20/(1.30/1.16/0.84)
Metatarsus	1.40/(1.40/1.46)	2.18/(2.08/2.13/1.42)
Tibia	2.10/(1.17/1.69)	3.30/(2.24/3.22/2.30)
Femur	2.32/(1.80/1.84)	2.86/(2.38/2.79/1.92)
Total	12.20/(12.70/10.25)	13.74/(15.22/12.93/11.07)
3 rd leg		
Claw	0.96/(1.14/1.12/0.77)	1.46/(1.54/1.42/1.03)
Tarsus	1.08/(1.66/1.49/1.41)	1.38/(1.62/1.40/1.33)
Metatarsus	2.44/(1.94/2.01/1.95)	3.38/(3.00/3.36/2.05)
Tibia	3.08/(3.46/3.45/2.75)	5.22/(4.30/5.19/3.56)
Femur	3.70/(3.54/3.42/2.84)	3.04/(3.38/3.06/2.71)
Total	15.52/(18.20/15.95/13.52)	19.12/(20.80/17.69/14.74)
4 th leg		
Claw	1.14/(2.06/2.07/1.59)	2.26/(2.08/2.22/1.43)
Tarsus	1.54/(1.86/1.91/1.46)	2.70/(1.56/2.64/2.23)
Metatarsus	3.12/(3.26/3.12/3.05)	4.52/(3.70/4.43/2.82)
Tibia	4.70/(4.54/4.28/4.60)	7.04/(6.08/6.96/4.23)
Femur	4.42/(4.20/4.07/3.70)	6.34/(5.38/6.18/3.94)
Total	20.20/(24.34/21.25/20.26)	27.08/(26.16/25.43/20.57)

with these bushes; they may climb onto the branches or hide beneath them.

The second locality is situated at approximately 1252 m a.s.l. and is characterized by the presence of red pine trees (*Pinus brutia*), a small water stream, and similarly cool and humid conditions.

Gylippus (Paragylippus) kunti sp.n.

Figs 7–12, Table 1.

TYPE MATERIAL. Holotype ♂ (HAKZM/Solfg-GyIp: 03-19), Turkey, Bahkesir Prov., Edremit District, Kaz Mountains, 39°42'5.44"N 26°51'52.60"E, 1745 m, pitfall trap, 11.05.2023–31.05.2023, leg.

K.B.Kunt. Paratypes. 2 ♂♂, 1 ♀, (HAKZM/SIfg-GyIp: 02-20), same data of holotype, – 1 ♂ (AZZM/Sol-2023: 02), same locality of holotype, 11.06.2023, leg. K.B. Kunt. – 1 ♂ (HAKZM/SIfg-GyIp: 02-21), same locality of holotype, 11.06.2023, leg. K.B. Kunt.

ETYMOLOGY. The new species is named after Kadir Boğaç KUNT (Kırıkkale University, Institute of Science), the first person to locate the species, and for his contributions to Turkish arachnological research as well as for his friendship.

DIAGNOSIS. The present new species is included in *Gylippus (Paragylippus)* Roewer, 1933 genus by virtue of having relatively “S”-shaped flagellum, one dorsally-situated retro-lateral manus spiniform seta, one flagellar complex spiniform seta, and 4–6 dorsomedial spiniform setae on the dorsal fixed

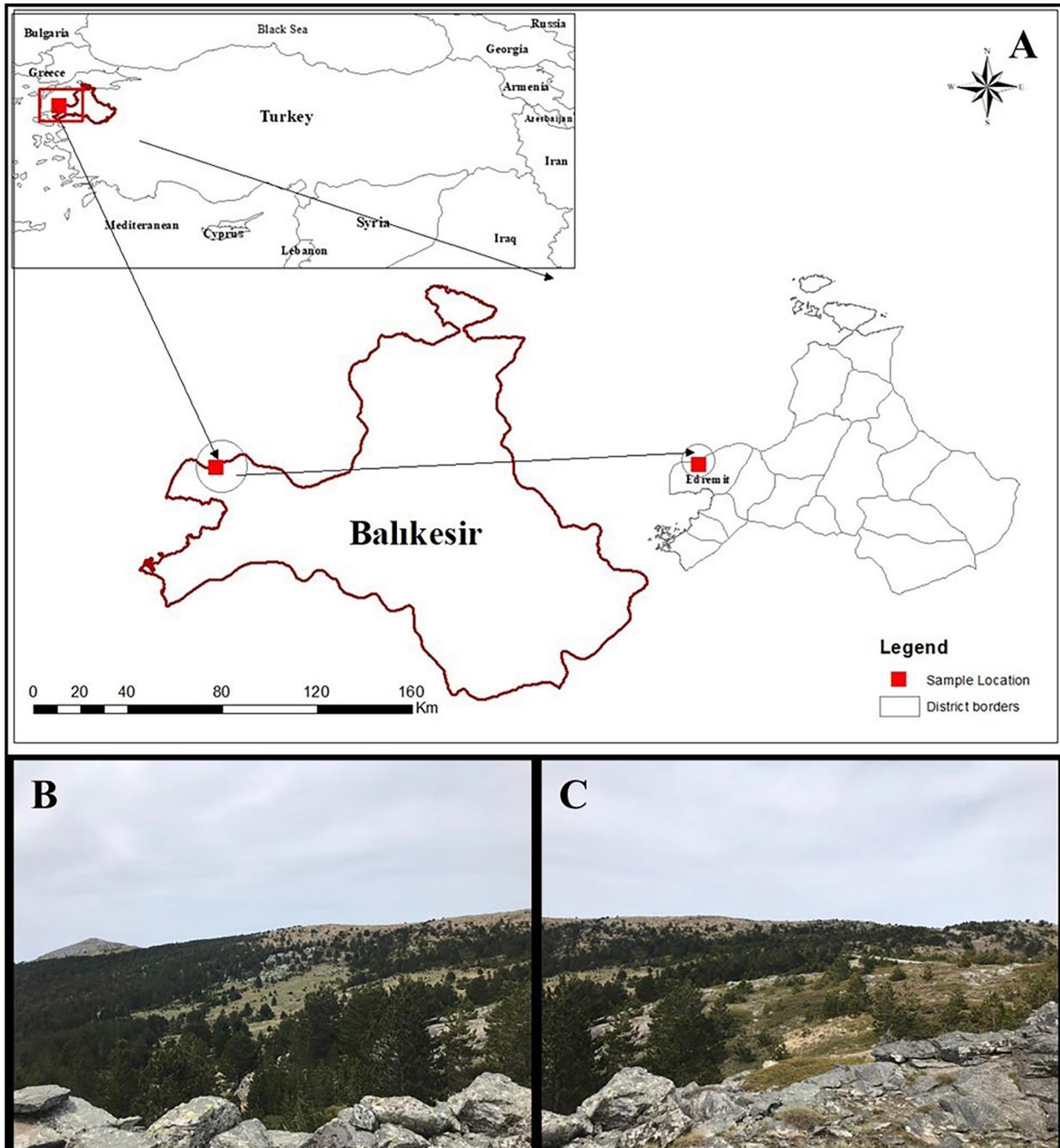


Fig. 7. Distribution and habitat of *Gylippus (Paragylippus) kunti* sp.n.: A — distribution map of sampling localities; B–C — habitats in type locality in Kaz Mountains, Balıkesir Province, southeast Turkey.

Рис. 7. Распространение и местообитание *Gylippus (Paragylippus) kunti* sp.n.: A — карта распространения с местами сбора; B–C — биотопы в типовом местонахождении в горах Каз, провинция Балыкесир, юго-восточная Турция.

finger as retrolateral manus setae in males and posteriorly oval/rounded a significantly bulges on the genital segment in females.

Despite bearing some similarities to species that are morphologically similar, *Gylippus (Paragylippus) kunti* sp.n. is distinguished by a number of notable characteristics. *G. (P.) kunti* sp.n. differs from remaining species in *Gylippus (Paragylippus)* by general coloration, bends and folds in the S-shaped flagellum, indentations and protrusions in the sclerotized structure of the genital operculum in the female. This new species is similar in morphology to *G. (P.) ozdinci* Erdek, 2025, and *G. (P.)*

monoceros Werner, 1905. Comparing the species, curvature of the distal part of the flagellum toward the tip of the chelicerae, location and positioning of *rlms* on retrolateral chelicerae, location of the *fcs*, general shape/incline to the chelicerae surface, shape of the distal end are distinctly different from new species.

DISTRIBUTION. Kaz Mountains, Balıkesir Province, Turkey (Fig. 7A–C).

DESCRIPTION. Male (holotype).

Coloration (Figs 8A, C, E; 9–10). Propeltidium and chelicerae pale yellowish-brown (Figs 8A, E; 9). The ocular tubercle

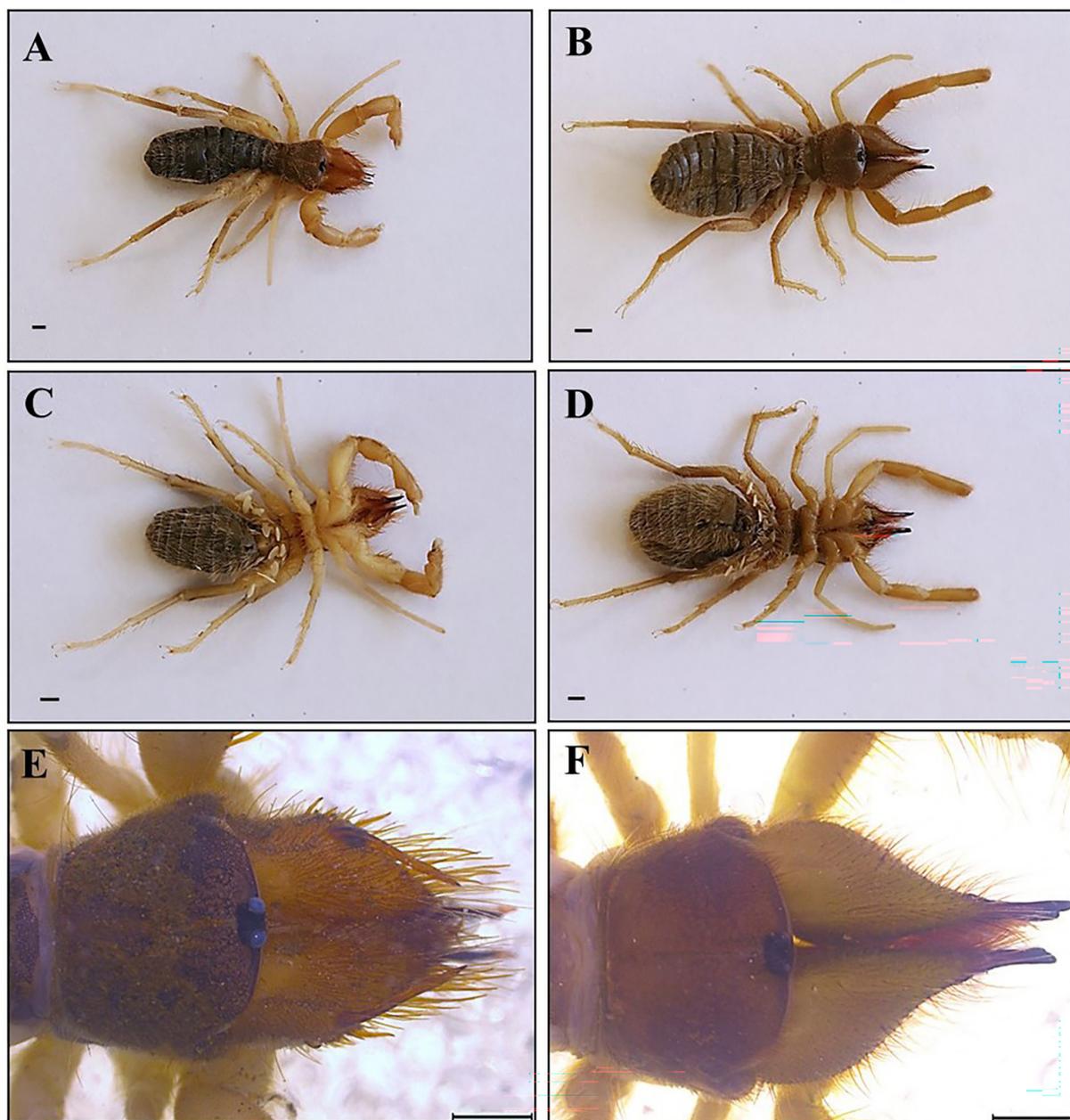


Fig. 8. *Gylippus (Paragylippus) kunti* sp.n., A, C, E — male holotype, B, D, F — female paratype: A, B — habitus in dorsal view; C, D — habitus in ventral view; E, F — chelicerae and propeltidium in dorsal view. Scale bars: 2 mm.

Рис. 8. *Gylippus (Paragylippus) kunti* sp.n., A, C, E — голотип самец, B, D, F — паратип самка: A, B — внешний вид, дорсально; C, D — то же, вентрально; E, F — хелицеры и пропельтидий, дорсально. Масштаб: 2 мм.

black and its anterior edges with short dark brownish lines (Fig. 8A, E). Propeltidium and chelicerae cover with rusty brown and thin setae, the propeltidial setae are substantially falciform (Fig. 8E). The cheliceral fingers purplish brown, the dental edges, tips, and teeth of each cheliceral fingers dark reddish brown. The prolateral surface of cheliceral fingers cover with reddish brown filiform and plumose setae. Flagellum pale reddish brown (Figs 8E, 9A–E). Retrolateral manus seta reddish brown (Figs 8E, 9A–B, F). Flagellar complex spiniform seta orange brown (Figs 8E, 9A–B, G). Pedipalp pale yellow with pale brown pigmentation at the connection points of the femur and tibia (Figs 8A, C, 4A–C). Legs pale

yellow, and purplish brown on tibial and femoral parts (Fig. 8A, C). Opisthosoma blackish brown dorsally with paler mesial stripe (Fig. 8A, C). The entire surface of opisthosoma covered with numerous rusty yellow and thin setae. Malleoli pale matte light yellow (Fig. 8C).

Propeltidium (Fig. 2A, F). The entire surface is background pale light brown covered with blackish brown pigmentation in different densities. The surface of the propeltidium is covered on the lateral and anterolateral side with increasingly sparse long setae, and there are also numerous short and fine setae. The anterior edge of the propeltidium is pale purplish in color. Ocular tubercle ovale, slightly indented posteriorly.

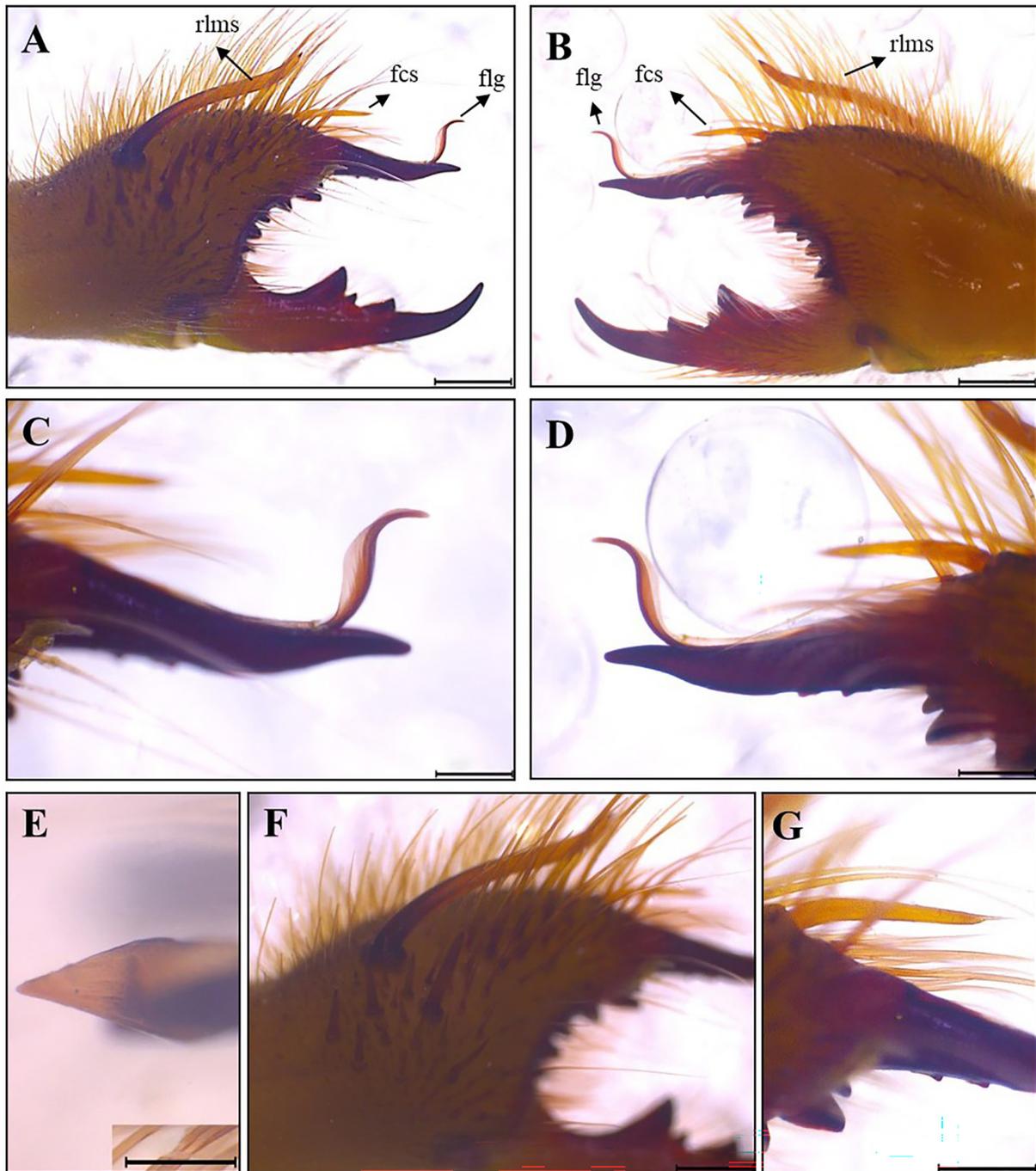


Fig. 9. *Gylippus (Paragylippus) kunti* sp.n., male holotype: A — sinistral chelicera in retrolateral view; B — sinistral chelicera in prolateral view; C — flagellum in retrolateral view; D — flagellum in prolateral view; E — flagellum in dorsal view; F — retrolateral manus setae and retrolateral manus spiniform setae; G — flagellar complex spiniform setae. Scale bars: 2 mm (A, B, G), 1.5 mm (F), 0.5 mm (C–D), 0.25 mm (E).

Рис. 9. *Gylippus (Paragylippus) kunti* sp.n., голотип самец: А — левая хелицера, ретролатерально; В — то же, пролатерально; С — флагеллум, ретролатерально; D — то же, пролатерально; E — то же, дорсально; F — ретролатеральные щетинки и ретролатеральные шиповидные щетинки основного членика хелицер; G — шиповидные щетинки флагеллярного комплекса. Масштаб: 2 мм (А, В, G), 1,5 мм (F), 0,5 мм (С–D), 0,25 мм (E).

Chelicerae (Fig. 9A–G). **Dentition** (Fig. 9A–B). Fixed finger with 1 FD - 1 FM - 1 FSM - 1 FP - 1 RFM - 1 RFSM - 1 RFP - 6 RFSP (except the first one in distal, the others are extremely reduced) - 1 PFM - 1 PFP - 1 PFSP. Movable finger typically with 1 MM - 1 MSM - 1 MP. **Flagellum** (Fig. 9A–E). The flagellum separates from the chelicerae surface, makes a

slight inclination, and rises straighter than the typical “S” shape from the body part and is positioned anteriorly without curving ventrally in the distal part. The tip of the flagellum tapers to a point distally (Fig. 9E). The flagellum curves upwards on both sides. Prolaterally, this curvature begins before the flagellum leaves the cheliceral fixed finger (Fig. 9D) and thicker in the

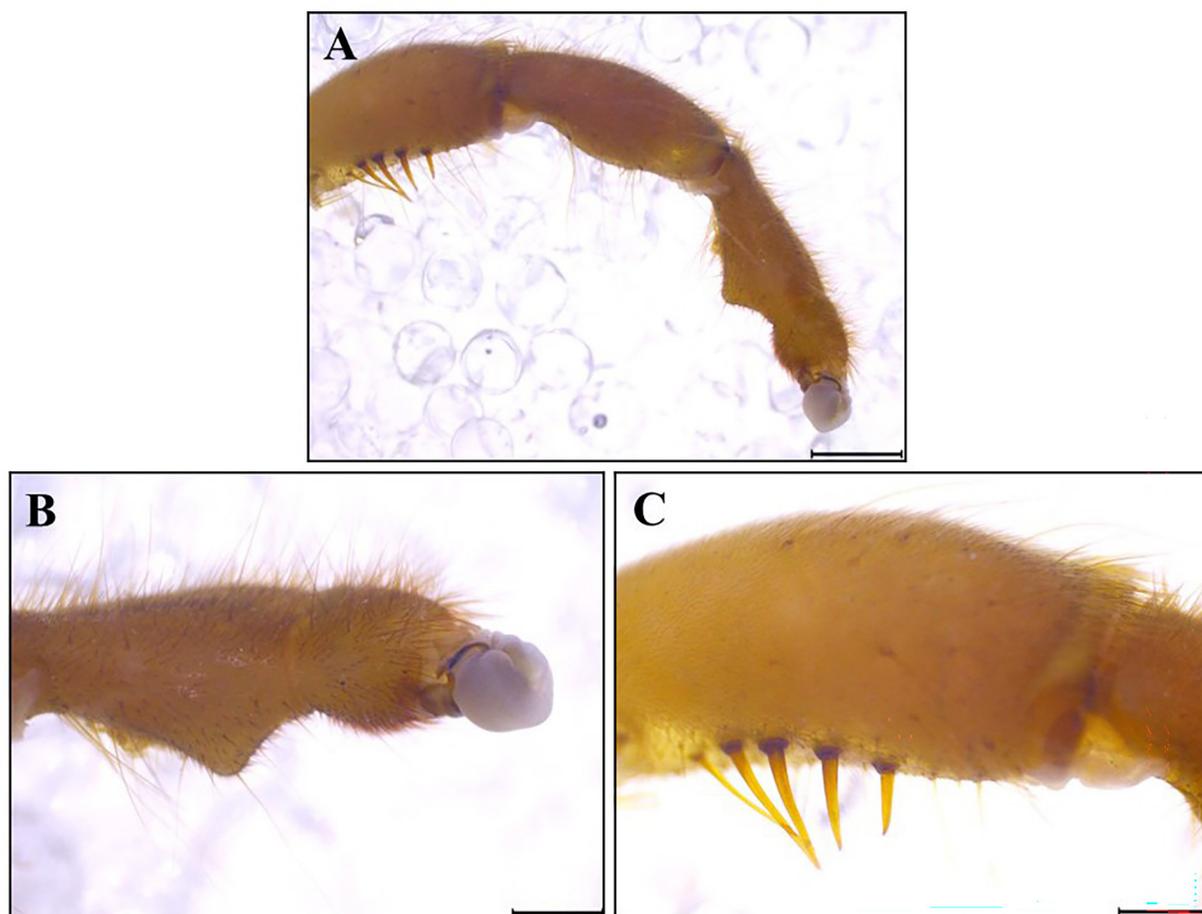


Fig. 10. *Gylippus* (*Paragylippus*) *kunti* sp.n., male holotype: A — sinistral pedipalp in dorsal view; B — pedipalpal tarsus and metatarsus in detail; C — pedipalpal femur and femoral setae in detail. Scale bars: 2 mm.

Рис. 10. *Gylippus* (*Paragylippus*) *kunti* sp.n., голотип самец: А — левая педипальпа, дорсально; В — лапка и предлапка педипальпы, детально; С — бедро педипальпы и его щетинки, детально. Масштаб: 2 мм.

middle part of the flagellum in the retrolateral aspect (Fig. 9C). The distance between cheliceral fingertip and flagellum is 0.68 mm. The *rlms* (4.64 mm) located dorsolaterally on the fixed finger and slightly distal end curved upwards. The *fcs* (2.02 mm), which is positioned closer to the chelicerae surface, becomes thinner and more pointed from its dorsal part towards the distal and thin like a spicule. *Setae*. Laterally on chelicera, 6 distinct retrolateral manus setae totally 12 visible with also some shorter and thinner setae around them. Numerous filiform and bifurcate setae cover the whole cheliceral surface. These setae are thicker and denser on the retrolateral and retrodorsal surfaces. Stridulatory plates with 5 stridulatory ridges not very prominent on anterior edges and located proximally on the inner side of the chelicera. The chelicera's prolateral surface has multiple lengthy plumose setae, five prodorsal distal setae dorsal to the stridulatory plate, and ten proventral subdistal setae (pvsd) behind the plumose setae.

Pedipalps (Figs 8A, C; 10A–C). Metatarsus prolaterally swollen. Metatarsus length/width = 3.07/1.66 mm. Pedipalps are covered with numerous different length setae. The mesal surface of femur with 4 yellowish brown robust thick spiniform setae shorter than the diameter of femur and one long, thin, distinctive setae proximally basal the spiniform seta. The surface of the pedipalp femur covered with short, spindly and numerous setae, also with distally long, distinct, sparse setae.

Legs (Fig. 8A, C). Leg I without spiniform setae, with tarsal claws well-developed. Metatarsi II and III with two spiniform setae dorsally and five pairs of thin setae ventrally. Legs surface is covered with numerous, dense, thin setae some are sparse and long.

Some morphological details of males (flagellum, flagellar complex spiniform setae, flagellar complex plumose setae, retrolateral manus spiniform seta, pedipalp tarsus and metatarsus, femoral spines on pedipalp) pointed out on a paratype male in Fig. 12.

Opisthosoma (Fig. 8A, C). Opisthosomal sternites without ctenidia. Opisthosomal tergites and sternites covered with numerous, in different lengths and thicknesses bifurcated setae. Genital sternite with 2 pieces with elliptical depression mid-posteriorly. Opisthosomal spiracles covered with short setae.

Female (paratype) (Figs 2B, D, F; 5A–D). The general background pale brown. Propeltidium, mesopeltidium, metapeltidium pale rusty brown and opisthosomal tergites laterally and ventrally pale brown, dorsomedially pale dark brown. Opisthosomal surface with dense rusty yellow setae. Propeltidium is rusty dark yellow with rusty reddish brown scattered spots occurring at different pigment densities, and short and sparse orange-brown setae. Ocular tubercle reniform shape less distinctly than male, indented posteriorly. Legs generally pale yellow. Unlike males, pedipalps are not swollen and three

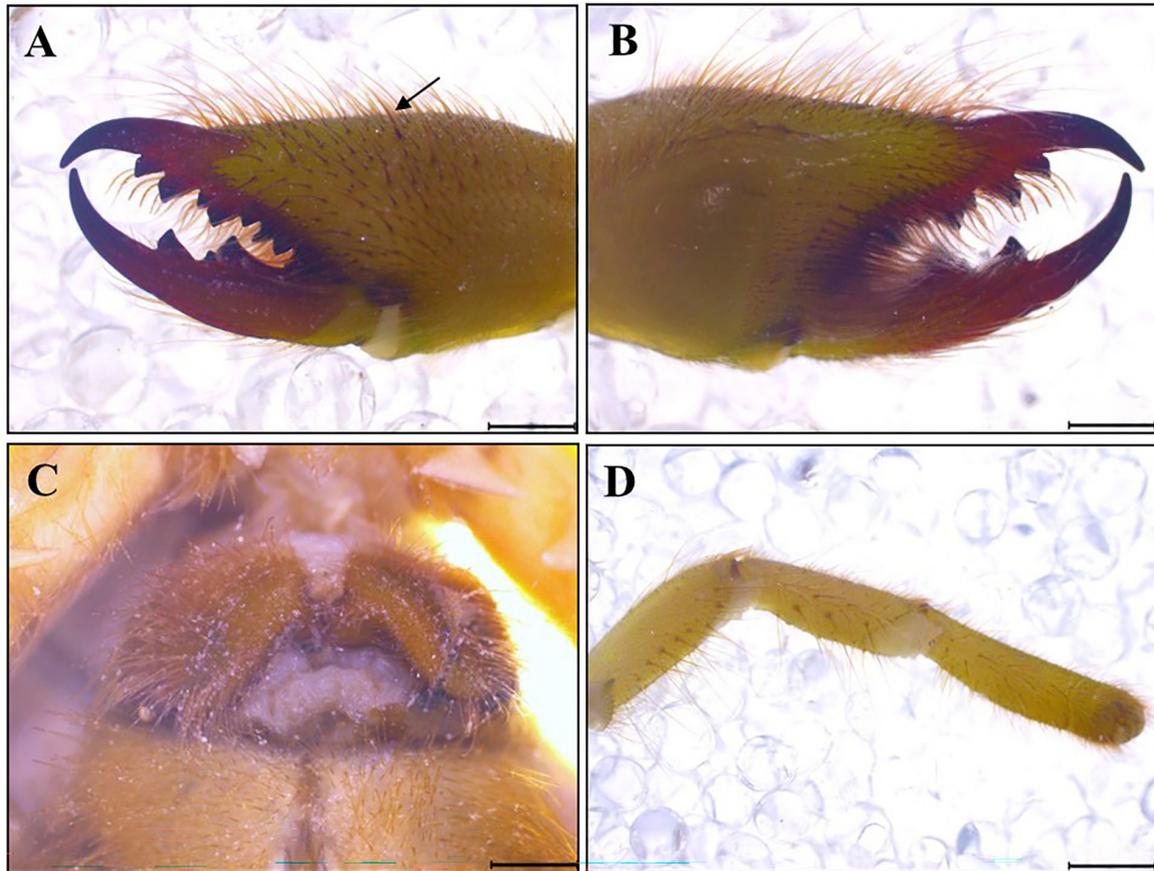


Fig. 11. *Gylippus (Paragylippus) kunti* sp.n., female paratype: A — sinistral chelicera in retrolateral view. Arrow indicates the setae in female homologous to retrolateral manus spiniform seta in male; B — sinistral chelicera in prolateral view; C — genital sternite, ventral view; D — sinistral pedipalp in dorsal view. Scale bars: 2 mm.

Рис. 11. *Gylippus (Paragylippus) kunti* sp.n., паратип самка: А — левая хелицера, ретролатерально. Стрелка указывает щетинки самки, гомологичные ретролатеральным шиповидным щетинкам основного членика хелицер самца; В — левая хелицера, пролатерально; С — генитальный стернит, вентрально; D — левая педипальпа, дорсально. Масштаб: 2 мм.

slightly modified setae are present on femur with some sparse long and dense short thin hairs. Chelicerae with thin, short and less abundant setae. Dentition: Fixed finger with 1 FD - 1 FM - 1 FSM - 1 FP - 1 RFM - 1 RFSM - 1 RFP - 5 RFSP (except distal one, all very reduced) - 1 PFM - 1 PFP - 3 PFSP (all very reduced). Movable finger with 1 MM - 1 MSM - 1 MP. The tips of distal and medial teeth on the fixed finger flattened and the tips of other teeth rounded. Malleoli entirely pale yellow. Opisthosomal sternites sclerotized and darkened in middle of ventral side and without ctenidia. Genital sternites are sclerotized; covered with long and dense bifurcate setae and forming two distinct, protuberant lobes with abundant setae on both sides of genital opening (2.6 mm). The upper ends of these lobes reniform. The dorsal inner part of the genital lobes has a prominent knob-like protrusion. The inner parts of the surface of the genital lobes facing the genital opening with a prominent depression. Posterior to the genital segment, there is a sclerotized orange-brown surface on both sides from which the genital lobes are separated. The average thickness of the middle part of the surfaces of the genital lobes is 2.48 mm, while the distance between the two lobes is 5.1 mm posteriorly. There is one depression, 0.38 mm deep, like a lobal notch in the posterior part of each lobe.

ECOLOGY. Balıkesir province is located in Northwestern part of Turkey. It is also situated in Mediterranean phyto-geographic region and Marmara sub-region in Mediterranean Macronesian zoogeographic region in Palearctic region. The

specimens were found in eastern part of alpine zone in the high parts (Sarıköz Hill) of the Kaz Mountains (1745m a.s.l.). The habitat vegetation in type locality is dominated by low herbaceous plants and coniferous trees (Figs. 7B–C). *Juniperus* sp., *Astragalus* sp., *Minuartia* sp., *Narduss* sp., *Nepeta* sp. and *Saxifraga* sp. Adults most likely occur in mid-May to mid-June.

Compliance with ethical standards

CONFLICT OF INTEREST: The authors declare that they have no conflict of interest.

Ethical approval: No ethical issues were raised during our research.

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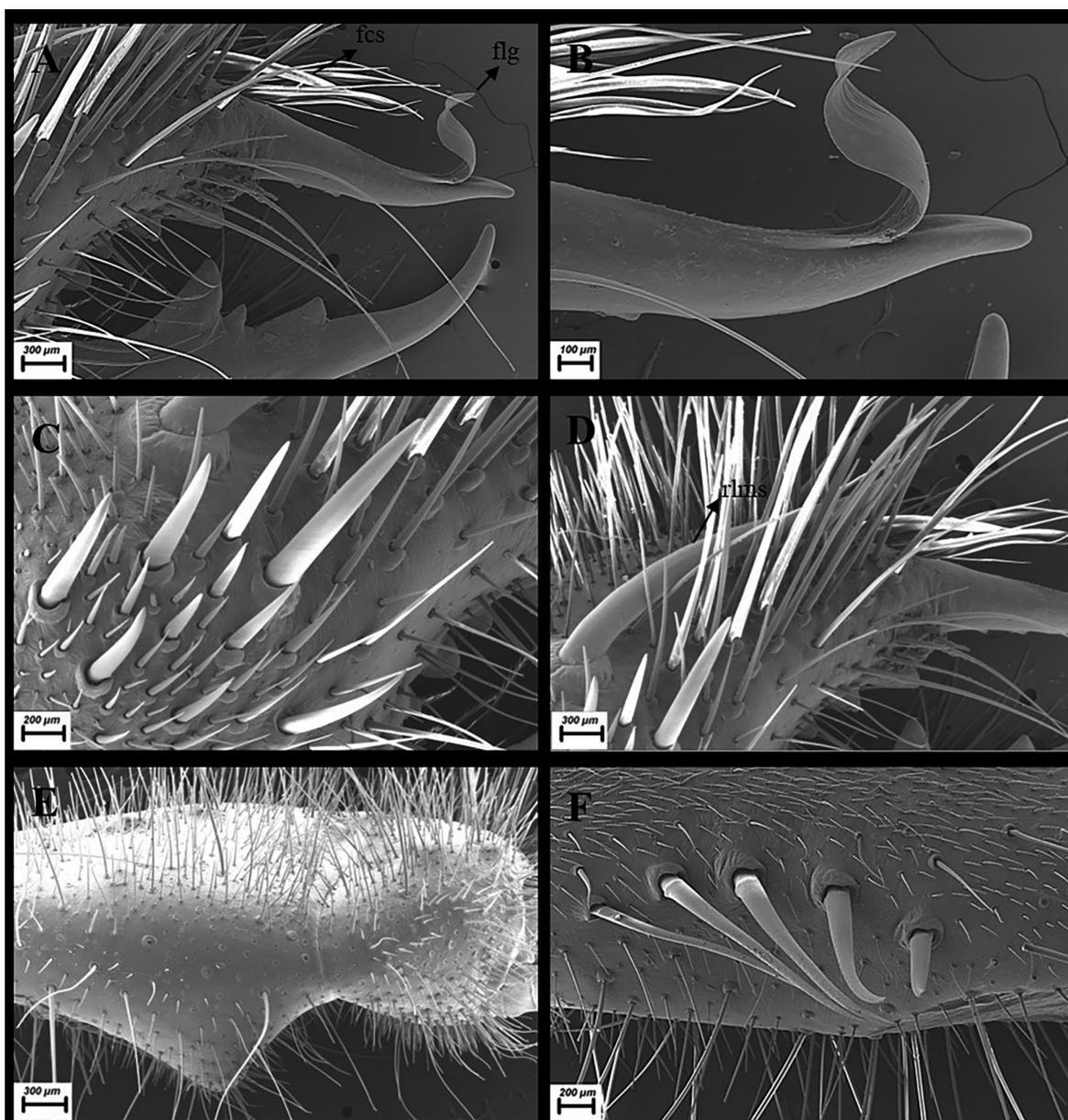


Fig. 12. *Gylippus (Paragylippus) kunti* sp.n., male paratype: A — dextral chelicera in retrolateral view; B — dextral flagellum in retrolateral view; C — retrolateral manus setae in detail; D — retrolateral manus spiniform seta in detail; E — dextral pedipalp, tarsus and metatarsus in retrodorsal view; F — dextral pedipalp, modified setae on femur in prodorsal view.

Рис. 12. *Gylippus (Paragylippus) kunti* sp.n., паратип самец: А — правая хелицера, ретролатерально; В — правый флагеллум, ретролатерально; С — ретролатеральные щетинки основного членика хелицер, детально; D — ретролатеральные шиповидные щетинки основного членика хелицер, детально; E — правая педипальпа, лапка и предлапка, ретролатерально; F — правая педипальпа, видоизмененные щетинки на бедре, продорсально.

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