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RESEARCH ARTICLE

A new species of *Dolomedes* Latreille, 1804 (Araneae: Dolomedidae) from the island of New Guinea

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Abstract

A new species, *Dolomedes afi* sp. n., is diagnosed and described from New Guinea Island (Papua New Guinea) based on both sexes. The new species is similar to the Australian species *D. alexandri* Raven & Hebron, 2018, *D. vicque* Raven & Hebron, 2018 and *D. wollemi* Raven & Hebron, 2018, but differs from them in the structure of the copulatory organs. The new species exhibits pronounced sexual dimorphism in body coloration. A detailed description and digital photographs are provided. The collecting localities of *Dolomedes* species in New Guinea are mapped.

Keywords

Aranei, Australasian Realm, biodiversity, body coloration, fishing spiders

Introduction

Dolomedidae Simon, 1876 is a relatively small family comprising 128 species in seven genera (World Spider Catalog 2026). The family has a worldwide distribution and is most diverse in the Australasian Realm. All known genera of the family are represented in this Realm (World Spider Catalog 2026). At the same time, all these genera, except *Dolomedes* Latreille, 1804, are endemic. Thus, Australia and its sur-

rounding island territories (New Guinea, New Caledonia, and New Zealand) can be considered a biodiversity hotspot for Dolomedidae. Unlike other genera of the family, *Dolomedes* has a worldwide distribution. Nevertheless, of the 105 known species in the world, 27 live in the Australasian Realm. A comparable level of species richness exists in the Afrotropical Realm and eastern Asia (Yu et al. 2024; World Spider Catalog 2026). *Dolomedes* species are large spiders that hunt on the surface of freshwater ponds or streams (Zhang et al. 2004). Their large size, in combination with active hunting tactics, allows members of the genus to feed on small fish and amphibians (Yu et al. 2024). *Dolomedes* species have easily recognizable body coloration with distinct white lateral bands, although deviations from this color scheme occur, sometimes even as intraspecific variation (Yu et al. 2024). Most of the Australasian representatives of *Dolomedes* were described in an extensive revision by Raven and Hebron (2018). Within Australia, species of the genus are known from the more humid northern and eastern parts of the continent (Raven & Hebron 2018). To date, only four species of *Dolomedes* are known from the vast territory of the island of New Guinea (Hogg 1915; Chrysanthus 1967; World Spider Catalog 2026). While studying unsorted material stored at the Institute of Systematics and Ecology of Animals, SB RAS (Novosibirsk, Russia), we found specimens of *Dolomedes* collected in Papua New Guinea. The study of these specimens has led to the identification of another new species in the genus. The aim of this paper is to describe this new species.

Materials and methods

Specimens were photographed using an Olympus DP74 camera attached to an Olympus SZX16 stereomicroscope, and with a Canon EOS 6D Mark II, at Altai State University (Barnaul, Russia). Photographs of the male palp and epigyne were taken in an alcohol-filled dish lined with white cotton at the bottom. Photographs of the general appearance and cephalic part were taken after the specimens had been slightly dried. The epigyne was cleared in a KOH-water solution until the soft tissues were dissolved. Digital images were stacked using Zerene Stacker and Helicon Focus software. The distribution map was created using the SimpleMappr (Shorthouse 2010). All measurements are in millimeters. The length of palp and leg segments was measured on their lateral side. Palp and leg measurements are presented as follows: femur, patella, tibia, metatarsus (absent in the palp), tarsus (total length). The description of spination is based on the examination of one side of the body from a single specimen. The spination pattern is given in the following format: the total number of spines is listed for the dorsal, prolateral, and retrolateral sides; ventral spines are listed in pairs, from proximal to distal. Apical spines on the metatarsi were not counted. The terminology and format of the description follow Raven and Hebron (2018). All examined material is deposited in the Institute of Systematics and Ecology of Animals, SB RAS, Novosibirsk, Russia (ISEA; curator: G.N. Azarkina).

Abbreviations: ALE – anterior lateral eye, AME – anterior median eye, BAC – basal apophysis of cymbium, C – conductor, CD – copulatory duct, CO – copulatory opening, d – dorsal, dRTA – dorsal lobe of RTA, DTP – distal tegular process, E – embolus, EL – lip of epigyne, EP – epigynal plate, F – fovea, FD – fertilization duct, Fe – femur, LP – lateral projection, MA – median apophysis, MOQ – median ocular quadrangle, Mt – metatarsus, p – prolateral, Pa – patella, PLE – posterior lateral eye, PME – posterior median eye, r – retrolateral, RTA – retrolateral tibial apophysis, RTAmax – view of RTA at its maximal width, S – septum, T – tegulum, Ta – tarsus, Ti – tibia, TO – triangular outgrowth of MA, v – ventral, vRTA – ventral lobe of RTA, VTA – ventral tibial apophysis.

Results

***Dolomedes afi* sp. n.**
http://zoobank.org/ECDE0927-2C30-4118-ADA3-2BC5AA56FF3A
Figs 1–26

Type material. Holotype ♂ (ISEA, 001.9328), PAPUA NEW GUINEA: Central Province, Astrolabe Mountain Range [09°30'S, 147°24'E], river in the tropical rainforest, 700 m, 18–31.08.1992. Yashnikov B.M. **Paratypes:** 1♀ (ISEA, 001.9329), 1♀ (ISEA, 001.9330), together with the holotype.

Etymology. The specific name is derived from "afi", the Kairuku people's name for the New Guinea death adder [*Acanthophis laevis* (Macleay)], a venomous elapid snake endemic to New Guinea, reflecting that the new species also inhabits the damp jungles of New Guinea.

Diagnosis. The male of *D. afi* sp. n. is most similar to those of Australian *D. alexandri* Raven & Hebron, 2018, *D. vicque* Raven & Hebron, 2018 and *D. wollemi* Raven & Hebron, 2018. All four species possess an elongated median apophysis (MA) that tapers distally and lacks a chelate apophysis, in combination with a conductor (C) that arises from the median part of the embolus (E). The male of the new species can be distinguished from those of similar species by its two-lobed retrolateral tibial apophysis (RTA), in which the dorsal lobe (dRTA) is twice as long as the ventral lobe (vRTA) in retrolateral view. In contrast, the males of *D. alexandri* and *D. wollemi* have a single-lobed RTA (cf. Figs 11, 15–16 and figs 26c, 30b, 31b–c in Raven & Hebron 2018). Finally, the male of *D. vicque* has a three-lobed RTA with a digitate median lobe (cf. Figs 11, 15–16 and figs 15d, 16b–c in Raven & Hebron 2018). The female of *D. afi* sp. n. is also most similar to those of *D. vicque* and *D. wollemi* (the female of *D. alexandri* remains unknown). All three species possess relatively long and thin copulatory ducts (CD) (ca. 10 times longer than wide) that form a single loop. The female of the new species can be distinguished from those of both similar species by its smooth septum (S) (vs. S with two cones) and by the

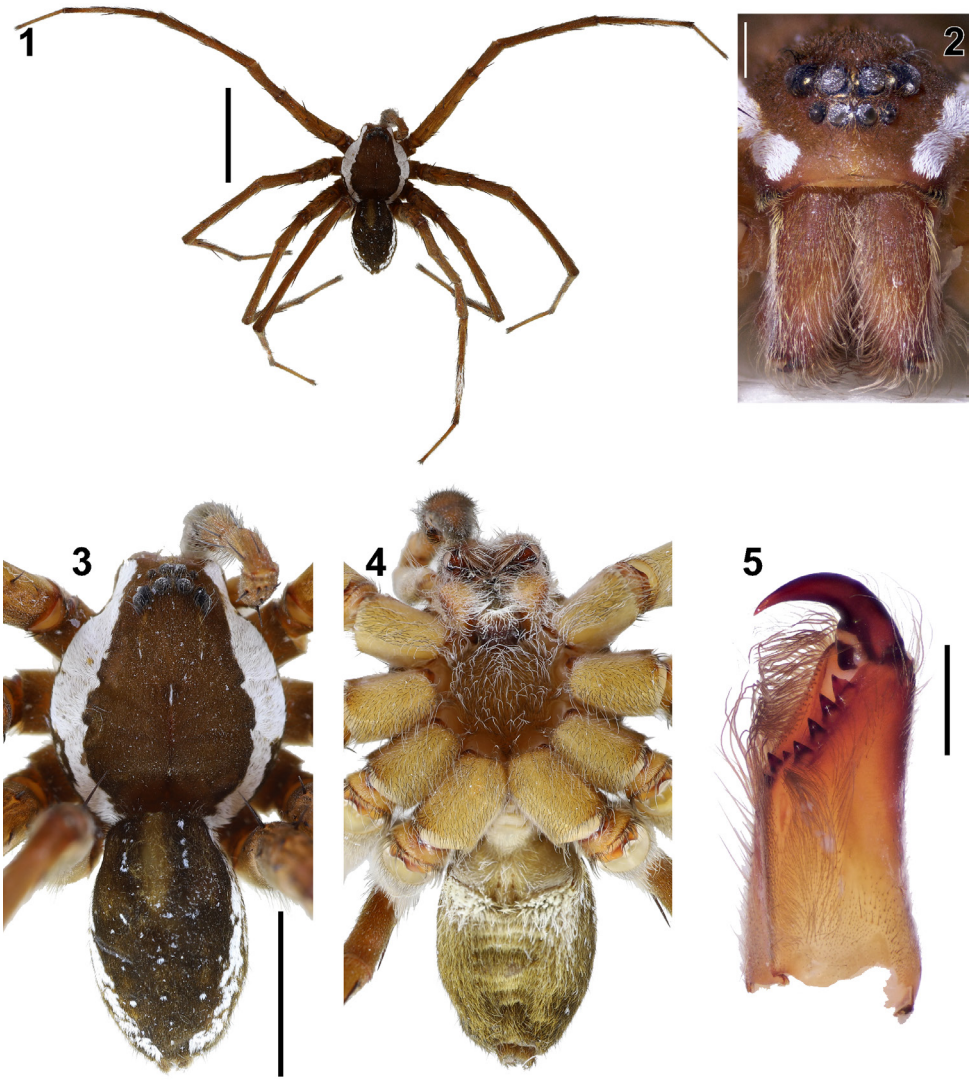
presence of distinct lateral projections (LP) (vs. absence; cf. Figs 23–24 and figs 16g, 26e in Raven & Hebron 2018).

Description. Male. Total length 15.5. Carapace: 8.2 long, 7.2 wide. Abdomen: 8.0 long, 4.8 wide. Eye sizes and interdistances: AME 0.40, ALE 0.26, PME 0.56, PLE 0.49. MOQ length 0.75. MOQ front width 0.85. MOQ back width 1.10. Chelicerae with 3 pro- and 4 retromarginal teeth (Fig. 5). Coloration (slightly dried specimen) (Figs 1–4). Carapace dark brown, with wide, white lateral stripes. Clypeus, chelicerae and sternum brown. Labium dark brown. Sternum and mouthparts bear long white setae. Coxae light brown. Palps light brown, cymbium brown. Legs brown, Mt with white rings. Abdomen dark brown, with white lateral stripes, small white spots medially and yellow cardiac mark. The venter of the abdomen light brown, with vague white spots behind the epigastral groove. Spinnerets light brown. Legs and palp measurements: Palp: 4.9, 2.2, 2.5, -, 3.1 (12.7); Leg I: 11.0, 4.8, 10.5, 9.5, 5.4 (41.2); Leg II: 11.6, 4.6, 10.4, 9.6, 5.2 (41.4); Leg III: 10.4, 4.0, 9.3, 8.6, 4.5 (36.8); Leg IV: 12.1, 4.5, 9.3, 11.9, 6.2 (44.0). Legs and palp spination: Palp: Fe d5 p1 r1; Pa d2 p1; Ti d1 p2; cymbium spineless. Leg I: Fe d3 p5 r5; Pa d1 p1 r1; Ti d2 p2 r2 v2-2-2-2; Mt p2 r2 v2-2. Leg II: Fe d2 p5 r5; Pa d1 p1 r1; Ti d2 p2 r2 v2-2-2-2; Mt p1 r1 v2-2. Leg III: Fe d3 p5 r5; Pa d1 p1 r1; Ti d2 p2 r2 v2-2-2; Mt p1 r2 v2-1. Leg IV: Fe d3 p5 r4; Pa d1 p1 r1; Ti d2 p2 r2 v2-2-2; Mt p2 r2 v3-2.

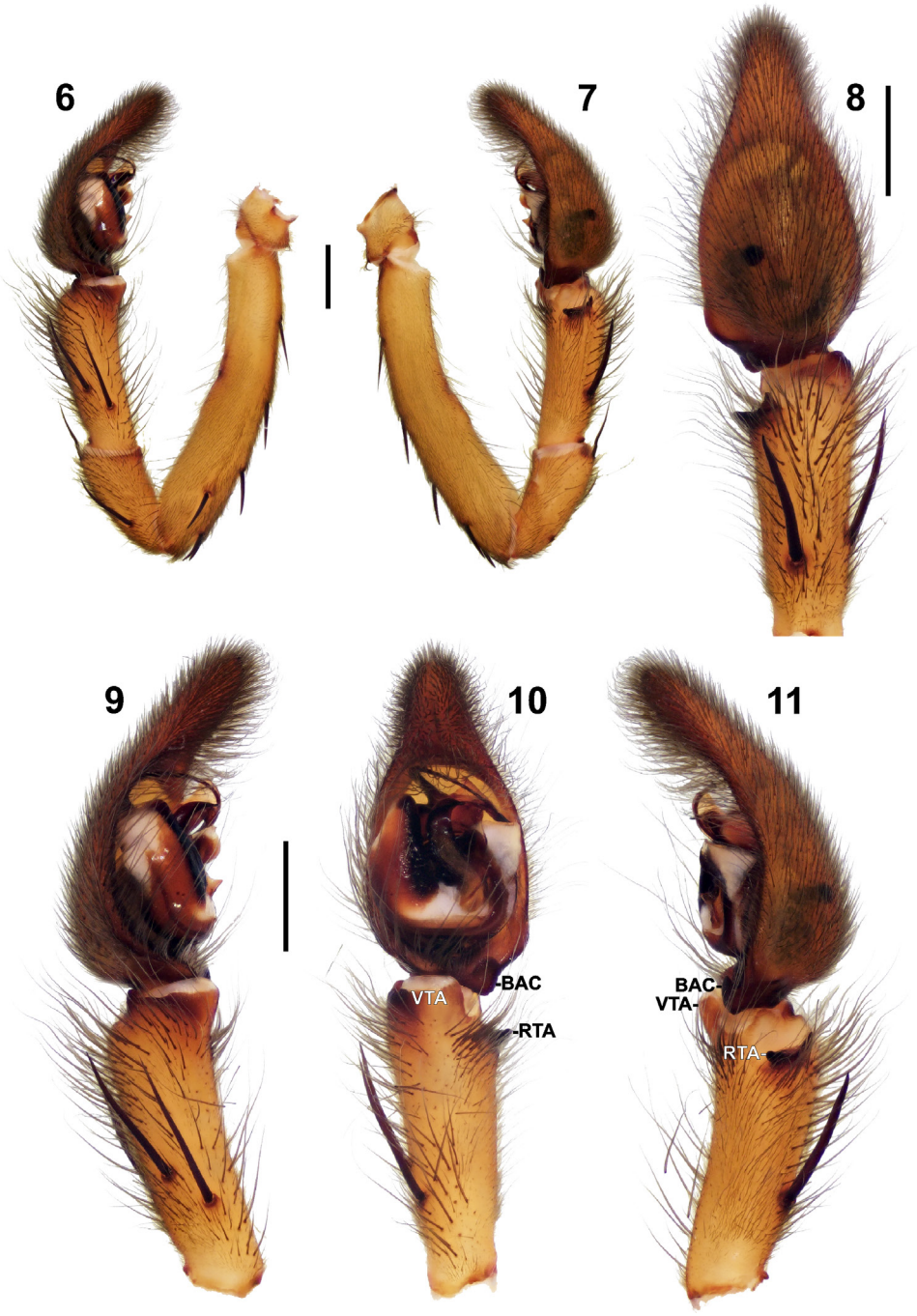
Male palp as shown in Figs 6–17. Femur 1.9 times longer than tibia. Patella 1.3 times shorter than tibia. Tibia 1.2 times shorter than cymbium. Retrolateral tibial apophysis (RTA) two-lobed. Dorsal lobe of RTA (dRTA) sharply pointed, two times longer than ventral one (vRTA) in retrolateral view. vRTA blunt and robust. Interspace between dRTA and vRTA with tiny, almost invisible spike. Ventral tibial apophysis (VTA) smoothed, poorly developed. Cymbium 2.2 times longer than wide. Basal apophysis of cymbium (BAC) hook-shaped in retrolateral view. Tegulum (T) with straight posterior edge. Distal tegular process (DTP) as long as median apophysis (MA). MA falciform, 3.9 times longer than wide. Base of MA with triangular outgrowth (TO) in prolateral view. Conductor (C) starting from the median part of embolus (E). E starting from 11 o'clock.

Female. Total length 16.9. Carapace: 8.5 long, 8.0 wide. Abdomen: 8.7 long, 5.1 wide. Eye sizes and interdistances: AME 0.41, ALE 0.26, PME 0.44, PLE 0.40. MOQ length 0.90. MOQ front width 0.95. MOQ back width 1.20. Chelicerae with 3 pro- and 5 retromarginal teeth (Fig. 22). Coloration (slightly dried material) (Figs 18–21). Carapace dark brown, with pale light lateral stripes. Clypeus, chelicerae and labium dark brown. Endites and sternum brown. Sternum and mouthparts bear long white setae. Palps and legs dark brown with yellow dots. Abdomen dark brown, with indistinct yellow lateral stripes, small white spots medially and yellow-gray cardiac mark. The venter of the abdomen and spinnerets yellow. Legs and palp measurements: Palp: 4.3, 2.0, 2.6, -, 3.7 (12.6); Leg I: 10.2, 4.7, 9.6, 8.1, 4.2 (36.8); Leg II: 11.0, 4.7, 9.8, 8.5, 4.3 (38.3); Leg III: 10.4, 4.3, 8.9, 8.0, 3.9 (35.5); Leg IV: 11.7, 4.5, 10.7, 10.7, 5.1 (42.7). Legs and palp spination: Palp: Fe d5 p1 r1; Pa d2 p1; Ti d2 p2; Ta p3 r2. Leg I: Fe d3 p5 r5; Pa d1 p1 r1; Ti d2 p2 r2 v2-2-2-2; Mt p2 r2 v2-2. Leg II:

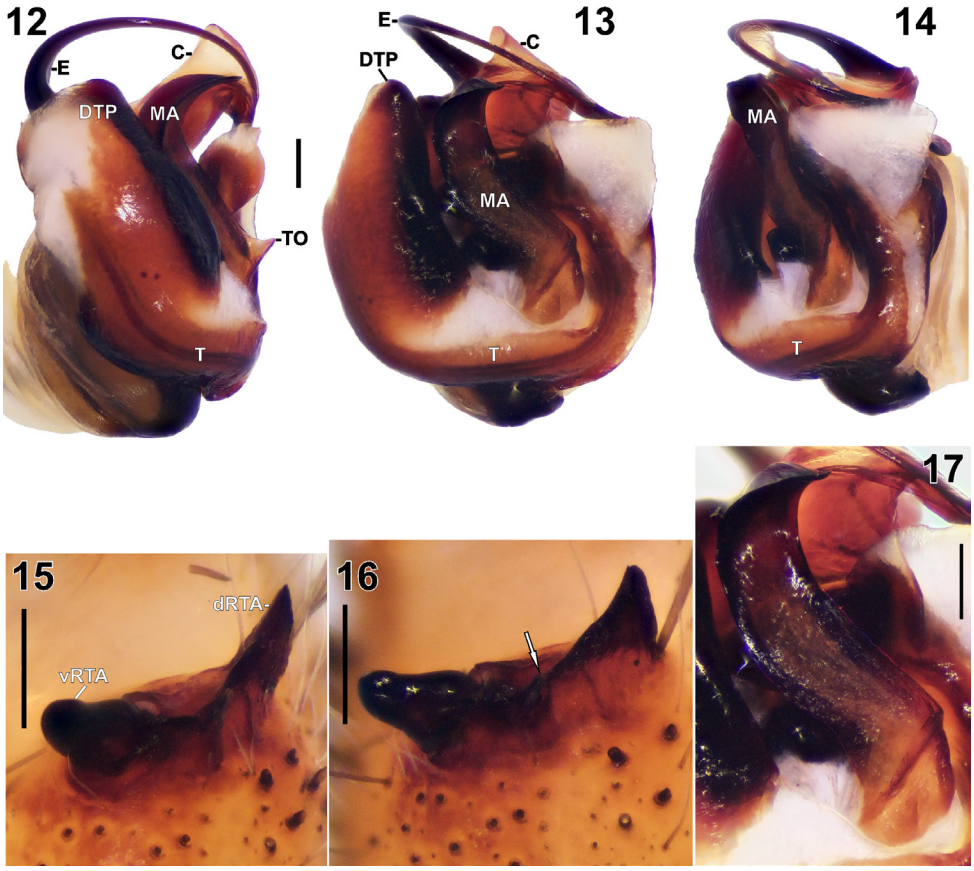
Fe d3 p5 r5; Pa d1 p1 r1; Ti d2 p2 r2 v2-2-2-2; Mt p2 r2 v2-2. Leg III: Fe d3 p5 r5; Pa d1 p1 r1; Ti d2 p2 r2 v2-2-2; Mt p2 r2 v2-2. Leg IV: Fe d3 p5 r4; Pa d1 p1 r1; Ti d2 p2 r2 v2-2-2; Mt p2 r2 v2-2.



Figures 1–5. Male of *Dolomedes afi* sp. n.: **1** – general appearance, dorsal; **2** – cephalic part; **3** – prosoma and abdomen, dorsal; **4** – ditto, ventral; **5** – left chelicera, retrolateral. Scale bars: 10 mm (**1**); 1 mm (**2**, **5**); 5 mm (**3**–**4**).



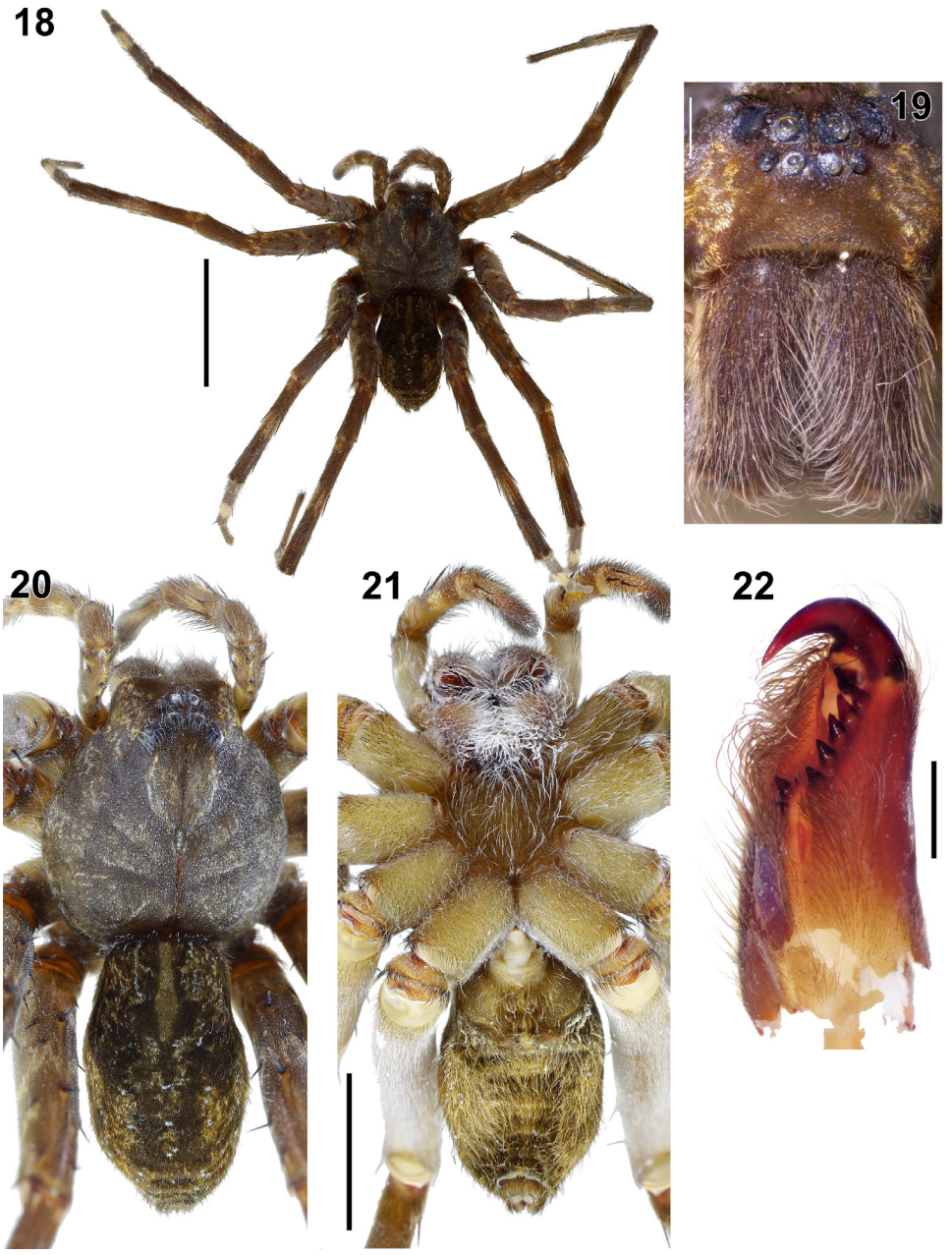
Figures 6–11. Palp of male of *Dolomedes afi* sp. n.: **6** – whole palp, prolateral; **7** – ditto, retrolateral; **8** – terminal part of palp, dorsal; **9** – ditto, prolateral; **10** – ditto, ventral; **11** – ditto, retrolateral. Scale bars: 1 mm. Abbreviations: BAC – basal apophysis of cymbium, RTA – retrolateral tibial apophysis, VTA – ventral tibial apophysis.



Figures 12–17. Details of the palp of male of *Dolomedes afi* sp. n.: **12** – bulb, prolateral; **13** – ditto, ventral; **14** – ditto, retrolateral; **15** – retrolateral tibial apophysis, retrolateral; **16** – RTAmax; **17** – median apophysis, ventral. Scale bars: 0.2 mm. Arrow indicates a tiny spike between dRTA and vRTA. Abbreviations: C – conductor, dRTA – dorsal lobe of RTA, DTP – distal tegular process, E – embolus, MA – median apophysis, T – tegulum, TO – triangular outgrowth of MA, vRTA – ventral lobe of RTA.

Epigyne as shown in Figs 23–25. Epigynal plate (EP) 1.3 times wider than long. Lateral projections (LP) triangular, with rounded apex. Fovea (F) rectangular, 1.5 times longer than wide. Lips of epigyne (EL) with almost straight internal edges. Septum (S) almost square, with rounded anterior corners. Copulatory openings (CO) situated between anterior corners of S and internal edges of EL. Copulatory ducts (CD) 10 times longer than wide, laid in one loose loop. Fertilization ducts (FD) located medially.

Distribution. Type locality only (Fig 26).



Figures 18–22. Female of *Dolomedes afi* sp. n.: **18** – general appearance, dorsal; **19** – cephalic part, anterior; **20** – prosoma and abdomen, dorsal; **21** – ditto, ventral; **22** – left chelicera, retrolateral. Scale bars: 10 mm (**18**); 1 mm (**19**, **22**); 5 mm (**20**–**21**).

Comments. The new species exhibits pronounced sexual dimorphism in body coloration. The male has bright white lateral stripes on the carapace and abdomen, while the female lacks them. Similar dimorphism in body coloration is already known in *Dolomedes* species from other regions. Examples are known from both the Palearctic and Australasian realms. Males of *D. sulfureus* L. Koch, 1878 from the Russian Far East and eastern Asia consistently lack light lateral stripes on the carapace and abdomen, while females exhibit two known color forms: with and without lateral stripes (Namkung 2003: fig. 21.1; Vertyankin et al. 2023: fig. 1). In Australia, the males of *D. wollemi*, a species similar to *D. afi* sp. n. in the structure of its copulatory organs, possess very bright lateral stripes on the carapace and abdomen. In contrast, lateral stripes in females of this species are present only on the carapace and, even then, are very faint (Raven & Hebron 2018: figs 25a–b).

Figures 23–25. Epigyne of *Dolomedes afi* sp. n.: **23** – intact, ventral; **24** – macerated, ventral; **25** – ditto, dorsal. Scale bar: 0.2 mm. Abbreviations: CD – copulatory duct, CO – copulatory opening, EL – lip of epigyne, EP – epigynal plate, F – fovea, FD – fertilization duct, LP – lateral projection, S – septum.

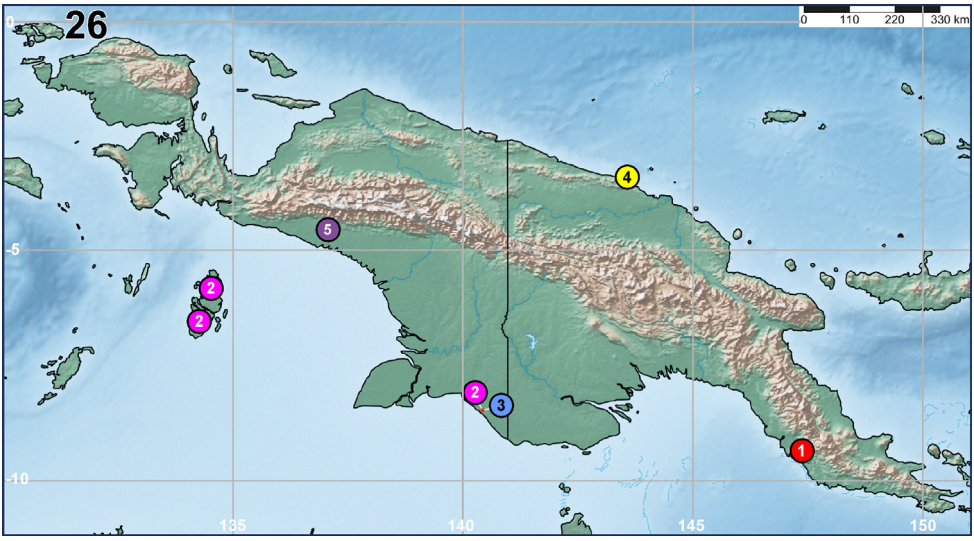


Figure 26. Distribution records of *Dolomedes* spp. from New Guinea: *D. afi* (**1**), *D. chroesus* (**2**), *D. facetus* (**3**), *D. instabilis* (**4**), *D. wollastoni* (**5**).

Discussion

At present, with the inclusion of the new species from New Guinea and adjacent small islands, five species of the genus *Dolomedes* are known from this region: *D. afi* sp. n., *D. chroesus* Strand, 1911, *D. facetus* L. Koch, 1876, *D. instabilis* L. Koch, 1876 and *D. wollastoni* Hogg, 1915. The description of a new species inevitably raises the question of its potential conspecificity with species previously recorded from this area. *Dolomedes chroesus* was originally described from a female (Strand 1911) and later redescribed by Chrysanthus (1967) based on specimens of both sexes. However, it was subsequently shown that the sexes had been incorrectly matched: the male attributed to *D. chroesus* actually belongs to *D. facetus* (Raven and Hebron 2018). Thus, at present *D. chroesus* is considered to be known only from the female (World Spider Catalog 2026). In the original description, Strand (1911) illustrated only the epigyne, whereas Chrysanthus (1967) additionally provided a drawing of the vulva. These illustrations are sufficiently detailed to allow reliable comparison and clearly indicate that the new species is not conspecific with *D. chroesus*. *Dolomedes facetus* and *D. instabilis* were recently redescribed based on both sexes (Raven and Hebron 2018). These redescriptions are accompanied by high-quality illustrations and photographs of diagnostic structures, allowing us to confidently exclude their conspecificity with the new species. A somewhat more complicated situation exists with *D. wollastoni*, which is known only from the original description (Hogg 1915) accompanied by three black-and-white figures (general appearance, eye region and epigyne). These illustrations are rather schematic and poorly detailed. Nevertheless, it is possible to conclude that *D. afi* sp. n. is not conspecific with *D. wollastoni*. First, the carapace of the latter, as in most known species of *Dolomedes*, bears distinct lateral stripes as well as a bright median stripe, whereas these stripes are completely absent in the female of the new species. Second, the number of retromarginal teeth on the cheliceral furrow in *D. wollastoni* is four, whereas in the new species there are five. An examination of the geographic distribution of *Dolomedes* species known from New Guinea (Fig. 26) shows that all records originate from areas located relatively close to the sea coast. The diversity of *Dolomedes* in the interior regions of this large island remains virtually unknown. This suggests that additional species of the genus may be discovered and described from New Guinea in the future.

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