

New species of coelotine spiders (Araneae, Amaurobiidae) from northern Thailand III

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New species of coelotine spiders (Araneae, Amaurobiidae) from northern Thailand III. - Two new species of coelotine spiders are described from northern Thailand: *Draconarius globulatus* sp. n. and *D. papai* sp. n., both from Phu Soi Dao National Park, Uttaradit Province. The unique patellar apophysis can easily distinguish *Draconarius globulatus* sp. n. from all other *Draconarius* species. *Draconarius papai* sp. n. is similar to the *venustus*-group species.

Keywords: Thailand - *Draconarius* - *venustus*-group - zoogeography.

INTRODUCTION

The northern part of Thailand is essentially a series of mountain ridges lying in roughly north-south direction with broad plains and valleys in between. Although this region makes up only approximately twenty percent of the country's land area, it processes evergreen hill forests where many species of high-altitude flora and fauna are abundant and cannot be found elsewhere. Over the past decades forest cover on most mountain slopes above 1,000 m was greatly reduced, mainly for cultivation. Fortunately several national parks have recently been established to protect forested areas all over the kingdom, particularly the evergreen forests of the north. Northern Thailand is undoubtedly home to many interesting species that still await discovery.

Recent publications have revealed and emphasized the richness of the spider fauna of northern Thailand and particularly of evergreen hill forests, where much of the natural habitats have remained relatively undisturbed by human activity (Dankittipakul & Wang, 2003, 2004; Dankittipakul *et al.*, 2005, 2006). Coelotine spiders were described from the Inthanon (15 species), the Khuntan (2 species) and the Phi Pan Nam ranges (5 species). In this study two new species of the subfamily Coelotinae are described from the Dan Lao range: *D. globulatus* sp. n. and *D. papai* sp. n. Both species were collected from Phu Soi Dao (650-1600 m asl), Phu Soi Dao National Park, Uttaradit Province.

MATERIAL AND METHOD

All illustrations were made with a Nikon SMZ 800 and an Olympus SZX 9 stereomicroscope equipped with a drawing tube. Body measurements are in mm. Measurements of leg segments were taken from the dorsal side. Epigynes were drawn in natural and cleared state (after immersing them in lactic acid for 10-20 minutes). Male palps were drawn in lateral and ventral view.

The specimens examined are deposited in the collections of the Muséum d'histoire naturelle, Genève (MHNG) and in the collection of the first author (TC, Department of Biology, Chiang Mai University), which will be deposited in MHNG later.

Abbreviations used in the text and in the figures are as follow: A, atrium of epigyne; AER, anterior eyes row; ALE, anterior lateral eyes; AME, anterior median eyes; C, conductor; CD, copulatory duct; CL, conductor lamella; DC, dorsal apophysis of conductor (= conductor dorsal apophysis, according to Wang, 2002); E, embolus; ET, epigynal tooth; FD, fertilization duct; H, epigynal hood; LE, lateral eyes; MA, median apophysis; ME, median eyes; MOQ, median ocular quadrangle; PA, patellar apophysis; PD, posterior duct system; PER, posterior eyes row; PLE, posterior lateral eyes; PME, posterior median eyes; RDTA, retrolateral dorsal tibial apophysis (= lateral tibial apophysis according to Wang, 2002); RTA, retrolateral tibial apophysis; SC, subtegular sclerite; SH, spermathecal head; SP, spermatheca; SS, spermathecal stalk.

TAXONOMY

AMAUROBIIDAE Thorell, 1870

Draconarius Ovtchinnikov, 1999

Draconarius globulatus sp. n.

Figs 1-5

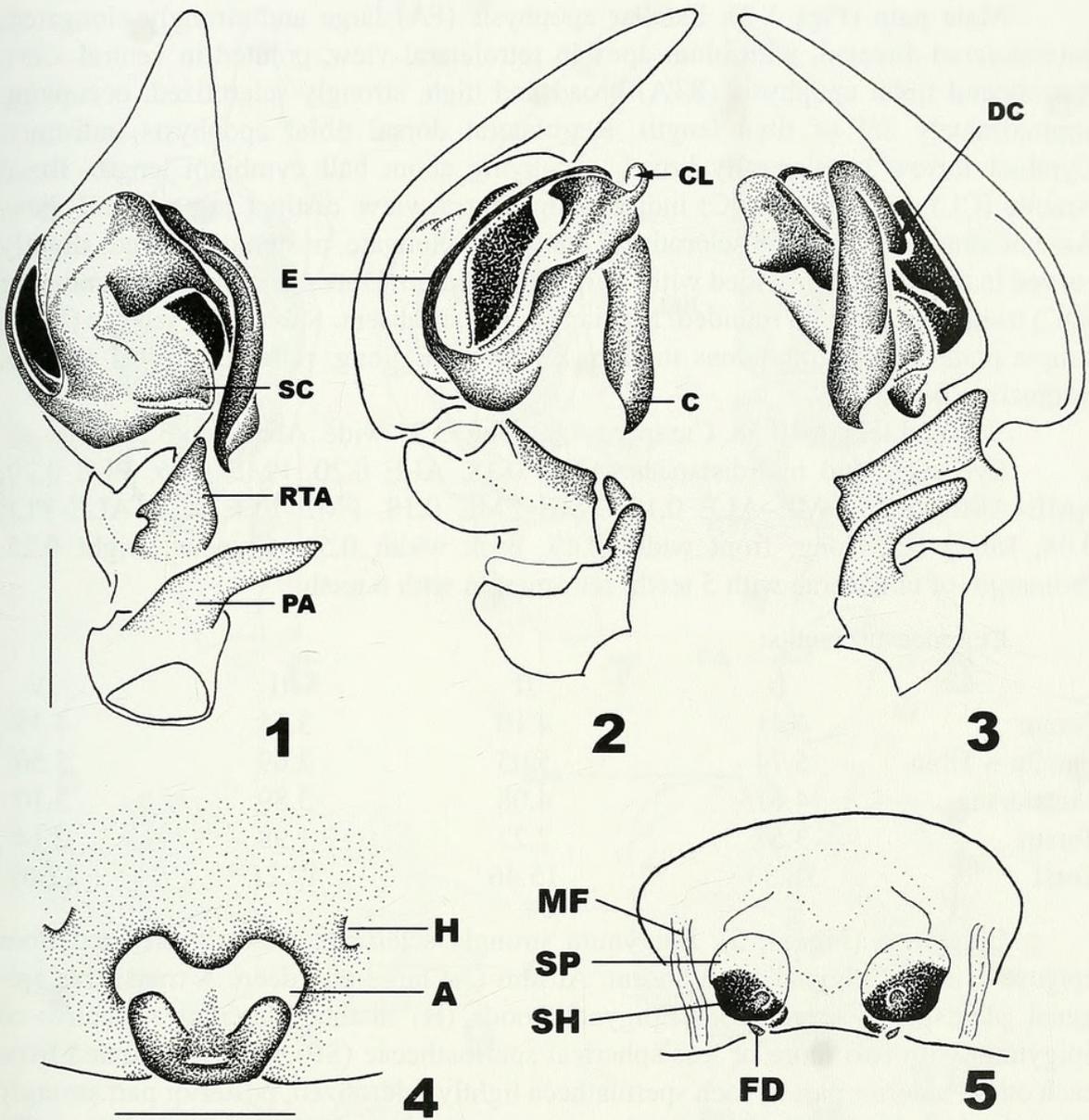
TYPE MATERIAL: Holotype: ♂, Thailand, Uttaradit Province, Phu Soi Dao National Park, Phu Soi Dao, mixed evergreen-deciduous forest, 1200 m, 22.XII.2005; leg. P.J. Schwendinger (MHNG TC x023). Paratype: 5♂, 8♀, lower montane forest, 650-830 m, 21.-23.XII.2005; leg. T Chami-Kranon & P Dankittipakul (MHNG TC x010-022).

ETYMOLOGY: The specific epithet refers to the strongly compacted spermathecae of females. Latin adjective of *globulus* = globule, a minute spherical or rounded structure.

DIAGNOSIS: *Draconarius globulatus* sp. n. has four unique characters that separate it from all other known *Draconarius* species: the extraordinary large and elongate patellar apophysis; the long, broad, posteriorly extending conductor; the absence of a median apophysis (Figs 1, 3); and the large epigynal atrium (Fig. 4).

DESCRIPTION: ♂ (holotype). Total length 9.94. Carapace 4.58 long, 3.15 wide. Abdomen 5.47 long.

Eye sizes and interdistances: AME 0.18, ALE 0.22, PME 0.18, PLE 0.21; AME-AME 0.10, AME-ALE 0.75, PME-PME 0.20, PME-PLE 0.25, ALE-PLE 0.10; MOQ 0.53 long, front width 0.50, back width 0.54. Clypeus height 0.22. Promargin and retromargin of chelicerae with 5 teeth.



FIGS 1-5

Draconarius globulatus sp. n., ♂ holotype (1-3) and ♀ paratype (4, 5). Left palp: ventral (1), prolateral (2) and retrolateral (3) view. Epigyne, ventral view (4); its internal structures, dorsal view (5). Scale lines 0.5 mm (1-3); 0.25 mm (4, 5). Abbreviations: A, atrium of epigyne; C, conductor; CL, conductor lamella; DC, dorsal apophysis of conductor; E, embolus; H, epigynal hood; MF, muscle filaments; PA, patellar apophysis; RTA, retrolateral tibial apophysis; SC, subtegular sclerite; SH, spermathecal head; SP, spermatheca.

Leg measurements:

	I	II	III	IV
Femur	3.51	3.38	3.05	4.08
Patella + Tibia	4.53	4.08	3.57	4.76
Metatarsus	3.47	2.87	2.73	3.69
Tarsus	1.72	1.56	1.49	1.56
Total	13.23	11.89	10.84	14.09

Male palp (Figs 1-3). Patellar apophysis (PA) large and strongly elongated, anterolaterad-directed, with blunt apex in retrolateral view, pointed in ventral view. Retrolateral tibial apophysis (RTA) broad and high, strongly sclerotized, occupying approximately 3/4 of tibia length. Retrolateral dorsal tibial apophysis indistinct. Cymbial furrow basolaterally broad, occupying about half cymbium length. Basal lamella (CL) of conductor (C) indistinct in ventral view, distinct in prolateral view. Base of conductor strongly sclerotized; conductor elongate, posterad-directed, slightly curved in the middle, provided with sharply pointed tip. Dorsal apophysis of conductor (DC) triangular, its apex rounded. Median apophysis absent. Subtegular sclerite (SC) a simple plate with membranous margin. Embolus (E) long, relatively broad at base, originating posteriorly.

♀. Total length 10.58. Carapace 4.89 long, 3.21 wide. Abdomen 5.20 long.

Eye sizes and interdistances: AME 0.18, ALE 0.20, PME 0.16, PLE 0.20; AME-AME 0.14, AME-ALE 0.10, PME-PME 0.18, PME-PLE 0.24, ALE-PLE 0.08; MOQ 0.55 long, front width 0.49, back width 0.51. Clypeus height 0.25. Promargin of chelicerae with 5 teeth, retromargin with 6 teeth.

Leg measurements:

	I	II	III	IV
Femur	4.41	4.10	3.65	4.35
Patella + Tibia	5.74	5.05	2.69	5.50
Metatarsus	4.61	4.08	3.89	5.10
Tarsus	3.57	2.23	1.98	2.14
Total	18.33	15.46	12.21	17.09

Epigynum (Figs 4, 5). Epigynum strongly sclerotized, clearly elevated from epigastric area. Epigynal teeth absent. Atrium (A) large and deep. A transverse epigynal plate partly sclerotized. Epigynal hoods (H) distinct. Internal structures of epigynum with two more or less spherical spermathecae (SP) widely separated from each other; anterior part of each spermatheca lightly sclerotized, posterior part strongly sclerotized; posteromesally located spermathecal heads (SH) small, slightly rising from the spermathecae. Fertilization ducts (FD) simple, originating posteriorly.

NATURAL HISTORY: The male holotype was collected on a fairly dry ridge in a mixed evergreen-deciduous forest. The paratypes were from a gallery evergreen forest (interspersed with bamboo stands along a stream). The lower sites are clearly more humid than the upper site. *Draconarius globulatus* sp. n. has a moderately wide altitudinal distribution, ranging from 650 to 1200 m. The holotype was collected as it was running across the trail, probably in search of a mate. The paratypes were collected from rotten logs along the stream. A few specimens were found from the same log.

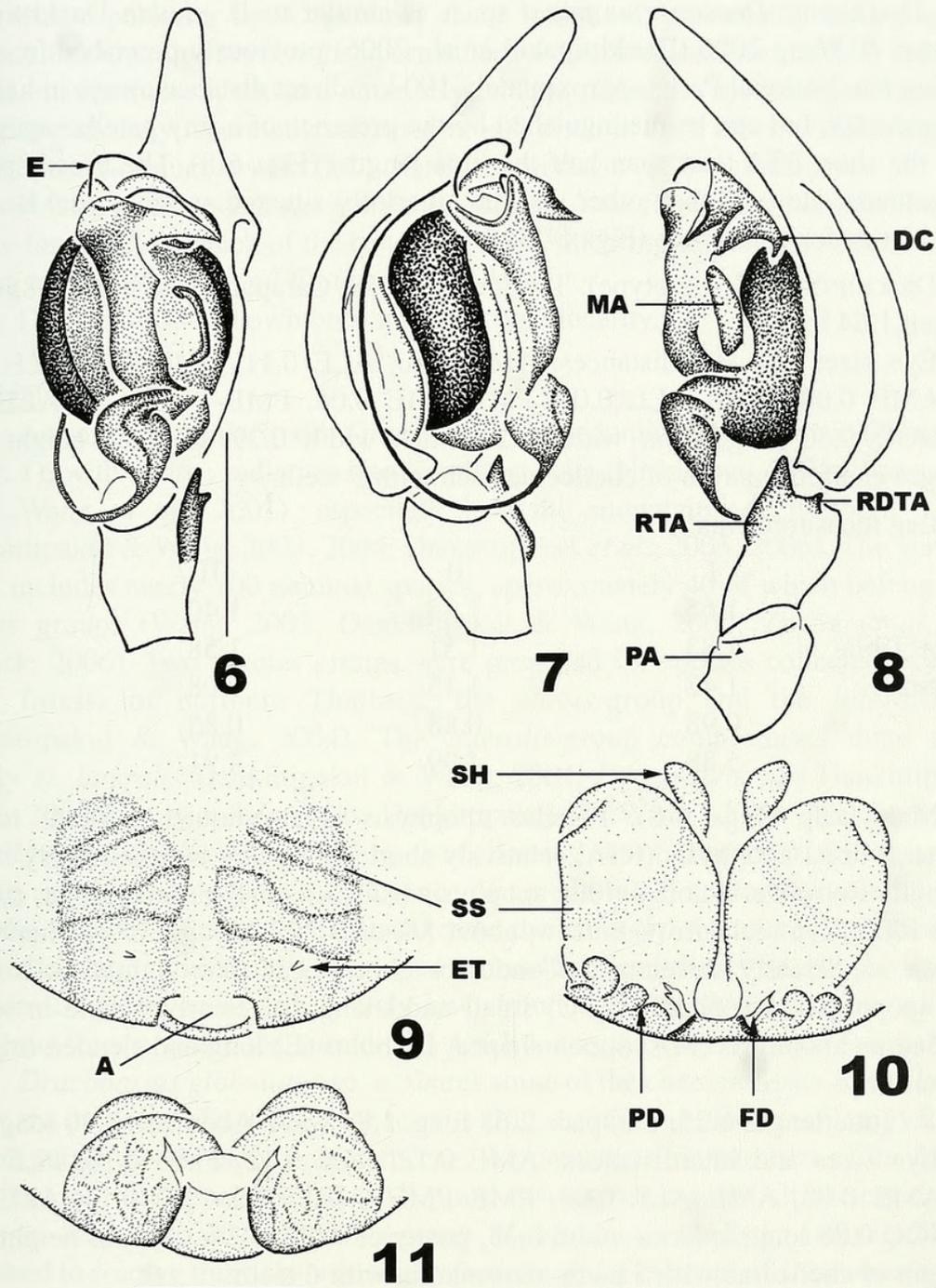
DISTRIBUTION: Known only from the type locality.

Draconarius papai sp. n.

Figs 6-11

TYPE MATERIAL: Holotype: ♂, Thailand, Uttaradit Province, Phu Soi Dao National Park, Phu Soi Dao, evergreen gallery forest, 650-830 m, 21.-23.XII.2005; leg. T. Chami-Kranon & P. Dankittipakul (MHNG TC x001).

Paratype: 2♂, 4♀, data as for the holotype (MHNG TC x002-009); leg. S. Sonthichai.



FIGS 6-11

Draconarius papai sp. n., ♂ holotype (6-8) and ♀ paratype (9-11). Left palp: ventral (6), prolateral (7) and retrolateral (8) view. Epigyne, ventral view (9); its internal structures, dorsal (10) and caudal (11) view. Scale lines 0.5 mm (6-8); 0.25 mm (9-11). Abbreviations: A, atrium of epigyne; DC, dorsal apophysis of conductor; E, embolus; ET, epigynal tooth; FD, fertilization duct; MA, median apophysis; PA, patellar apophysis; PD, posterior duct system; RDTA, retrolateral dorsal tibial apophysis; RTA, retrolateral tibial apophysis; SH, spermathecal head; SS, spermathecal stalk.

ETYMOLOGY: The specific epithet refers to the habitat where this new species was collected, a forest with sparse canopy which allows bamboo to grow and become relatively abundant. Thai: *Pa Pai* = bamboo forest; noun in apposition, thus invariable.

DIAGNOSIS: *Draconarius papai* sp. n. is similar to *D. phuhin* Dankittipakul, Sonthichai & Wang 2006 (Dankittipakul *et al.*, 2006) previously described from Phu Hin Rong Kla National Park (approximately 100 km direct distance away) in having a short conductor, but can be distinguished by the presence of a tiny patellar apophysis and by the short RTA (less than half the tibia length) (Figs 6-8). The broad spermathecae situated close to each other and the anteriorly situated spermathecal head are characteristics for the female (Figs 6-11).

DESCRIPTION: ♂ (holotype). Total length 3.58. Carapace 1.70 long, 0.85 wide. Abdomen 1.64 long.

Eye sizes and interdistances: AME 0.10, ALE 0.11, PME 0.08, PLE 0.12; AME-AME 0.08, AME-ALE 0.06, PME-PME 0.06, PME-PLE 0.12, ALE-PLE 0.04; MOQ 0.30 long, front width 0.28, back width 0.29. Clypeus height 0.15. Promargin and retromargin of chelicerae each with 5 teeth.

Leg measurements:

	I	II	III	IV
Femur	1.65	1.45	1.40	1.82
Patella + Tibia	1.83	1.51	1.58	1.88
Metatarsus	1.42	1.15	1.08	1.64
Tarsus	0.98	0.88	0.85	1.12
Total	5.88	4.99	4.91	6.46

Male palp (Figs 6-8). Patellar apophysis (PA) minute, difficult to see. Retrolateral tibial apophysis (RTA) relatively short, occupying approximately half of tibia length. Retrolateral dorsal tibial apophysis (RDTA) small and triangular, situated close to RTA. Cymbial furrow narrow, about 3/4 of cymbial length. Basal lamella of conductor moderately developed. Conductor short, beak-like, lightly sclerotized. Dorsal apophysis of conductor (DC) small and triangular, clearly visible in ventral view. Median apophysis (MA) spoon-shaped. Embolus (E) long and slender, originating posteriorly.

♀. Total length 6.25. Carapace 2.68 long, 1.84 wide. Abdomen 3.10 long.

Eye sizes and interdistances: AME 0.12, ALE 0.12, PME 0.10, PLE 0.13; AME-AME 0.08, AME-ALE 0.06, PME-PME 0.10, PME-PLE 0.13, ALE-PLE 0.06; MOQ 0.38 long, anterior width 0.35, posterior width 0.36. Clypeus height 0.11. Promargin of chelicerae with 5 teeth, retromargin with 6 teeth.

Leg measurements:

	I	II	III	IV
Femur	2.29	1.98	1.85	2.53
Patella + Tibia	2.70	2.21	1.93	2.75
Metatarsus	1.73	1.43	1.51	2.04
Tarsus	1.02	0.95	0.78	1.05
Total	7.74	6.57	6.07	8.37

Epigynum (Figs 9-11). Epigynal area relatively large, occupying 1/3 of the ventral side of the abdomen. Epigynal teeth (ET) small, lightly sclerotized, located in the middle of the epigynum. Atrium (A) small, situated close to epigastric furrow, pro-

vided with a posterior lip. Copulatory ducts indistinct, presumably arising near the membranous area in between the spermathecae. Spermathecal heads (SH) drumstick-shaped, medium-sized, situated anteriorly on spermathecae; spermathecal stalks (SS) originating mesally; spermathecal bases broad, close to each other, with strongly convoluted posterior duct system (PD). Fertilization ducts (FD) leaf-shaped.

NATURAL HISTORY: *Draconarius papai* sp. n. was found in a disturbed evergreen gallery forest where much of the canopy is open, allowing saplings (of bamboo in particular) to grow rapidly and fill the canopy space.

DISTRIBUTION: Known only from the type locality.

AFFINITIES

As currently understood, *Draconarius* is predominantly Palearctic (Wang 2002: 4, Fig. 1), with a large radiation into Southeast Asia (Nishikawa, 1995; Wang & Ono, 1998; Wang *et al.*, 2001), especially into the mountains of northern Thailand (Dankittipakul & Wang, 2003, 2004; Dankittipakul *et al.*, 2005, 2006). The genus currently includes nearly 100 nominal species, approximately 40 of which belong to nine species groups (Wang, 2003; Dankittipakul & Wang, 2004; Zhang *et al.*, 2005; Platnick, 2006). Two species groups were proposed for species collected from evergreen forests of northern Thailand: the *elatus*-group and the *lateralis*-group (Dankittipakul & Wang, 2004). The *lateralis*-group comprises three species, namely *D. lateralis* Dankittipakul & Wang, 2004, *D. paralateralis* Dankittipakul & Wang, 2004, *D. pseudolateralis* Dankittipakul & Wang, 2004. Members of the *lateralis*-group can be recognized by the following set of characters: the absence of a median apophysis in males; the presence of an additional subtegular sclerite (Fig. 1, SC); the absence of female epigynal teeth; the strongly sclerotized and compacted spermathecae; and the poorly developed or indistinct copulatory ducts. The species of the *lateralis*-group occur at relatively low altitudes (510-1200 m) and are adapted to deciduous forests where the humidity is much lower than in evergreen forests.

Draconarius globulatus sp. n. shares some of the characteristics of the *lateralis*-group: the presence of a subtegular sclerite (Fig. 1, SC); the absence of epigynal teeth; and the partly membranous spermathecae. We presume that members of the *lateralis*-group belong to a separate clade. All three species possess the characters described above as diagnostic of the species-group. However, no cladistic analysis has been published to resolve this debate and therefore the wider concept of *Draconarius* (*sensu* Ovtchinnikov, 1999 and Wang, 2002, 2003) is used in the present article. Additional material is required to confirm the above synapomorphic characters as evidence for the monophyly of the *lateralis*-group.

Draconarius papai sp. n. belongs to the *venustus*-group that comprises more than 20 nominal species. The known distribution of this species group ranges from Central Asia, the Himalayas (Nepal, Bhutan, Tibet), East Asia (China, Korea) to Southeast Asia (Thailand). The new species described here provides additional taxonomical information on the *venustus*-group and expands its known zoogeographical distribution.

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