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Scorpions from West Papua, Indonesia and description of a new species of *Lychas* C. L. Koch, 1845 (Scorpiones: Buthidae)

WILSON R. LOURENÇO

(with 13 figures)

Abstract

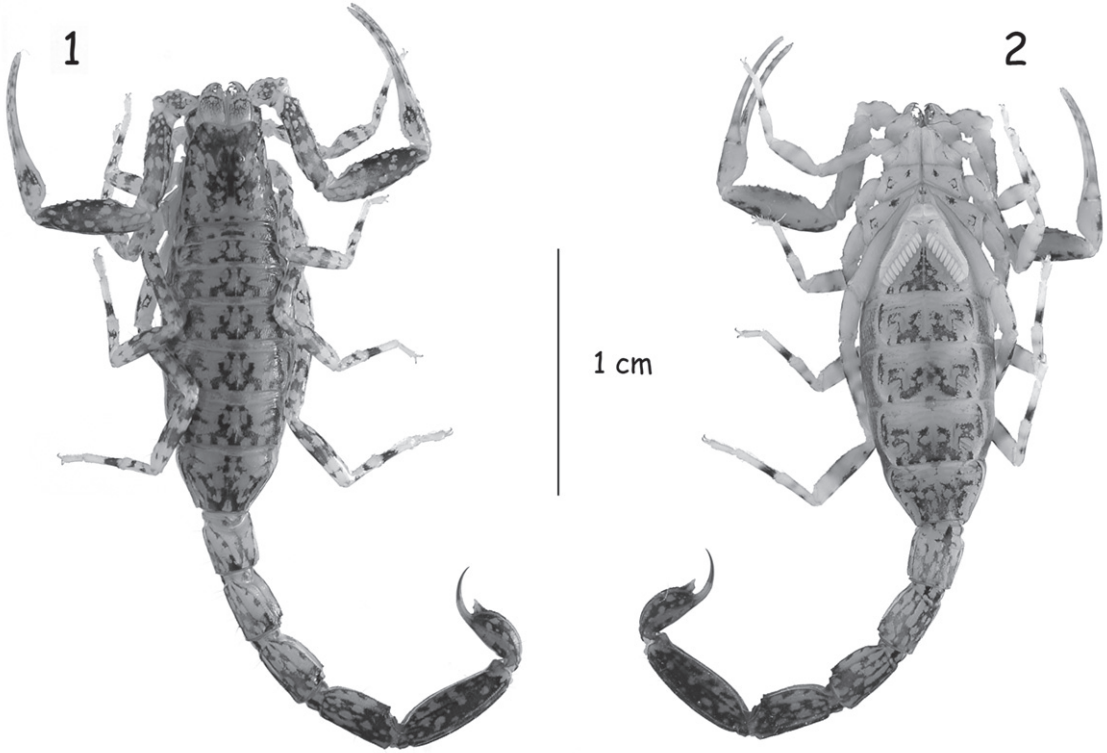
Scorpions collected during the field expedition organized by Dr. Dimitry Telnov in West Papua, Indonesia are studied in the present note. Very few reports are available on the scorpions of the occidental side of the island. Three species were collected during this field expedition: *Liocheles australasiae* (Fabricius, 1775) and *Liocheles karschii* (Keyserling, 1885) family Liochelidae Fet & Bechly, 2001 and, *Lychas kaimana* sp. n., family Buthidae C. L. Koch, 1837, described here.

K e y w o r d s: Scorpiones, Buthidae, *Lychas*, new species, Indonesia, West Papua.

Introduction

Scorpions collected in the Indonesian islands in general, but noticeably on West Papua, the Indonesian portion of the Island of New Guinea, remain rare in collections. Also, very few reports have been precisely documented in the literature. Among classical references can be cited those of Keyserling (1885) with the description of *Hormurus karschii* (= *Liocheles karschii*), Kraepelin (1914) with the description of *Hormurus papuanus* (= *Liocheles papuanus*) and Thorell (1888) with the description of *Isometrus variatus papuanus* (= *Lychas variatus papuanus*). All these results concern exclusively the eastern portion of the island, what is today Papua-New Guinea. In the very exhaustive contribution by Koch (1977) on the Australo-Papuan scorpions, once again only the eastern portion of the island was treated. Similarly, Monod (2000) in his unpublished dissertation on the genus *Liocheles*, refers only to specimens collected in Papua-New Guinea. More recently, Lourenço & Qi (2007) described a new subspecies *Lychas variatus canopensis* from the Madang Province in Papua-New Guinea. These known results attest to the lack of information on scorpions from West Papua.

In a field expedition organized by Dr. Dimitry Telnov in September 2010 in West Papua, several scorpion specimens have been collected. These have been studied and correspond to three distinct species: *Liocheles australasiae*



Figs 1-2. *Lychas eliseanneae* Lourenço, holotype ♀. Habitus, dorsal and ventral aspects.

(Fabricius, 1775) and *Liocheles karschii* (Keyserling, 1885) (the family Liochelidae Fet & Bechly, 2001) and, *Lychas kaimana* sp. n. (the family Buthidae C. L. Koch, 1837), described below.

Material and methods

Illustrations and measurements were produce using a Wild M5 stereo-microscope with a drawing tube (camera lucida) and an ocular micrometer. Measurements follow Stahnke (1970) and are given in mm. Trichobothrial notations follow Vachon (1974) and morphological terminology mostly follows Hjelle (1990).

Material is deposited in the Zoologisches Museum Hamburg (ZMH).

Taxonomic account

Liochelidae Fet & Bechly, 2001
Liocheles Sundevall, 1833

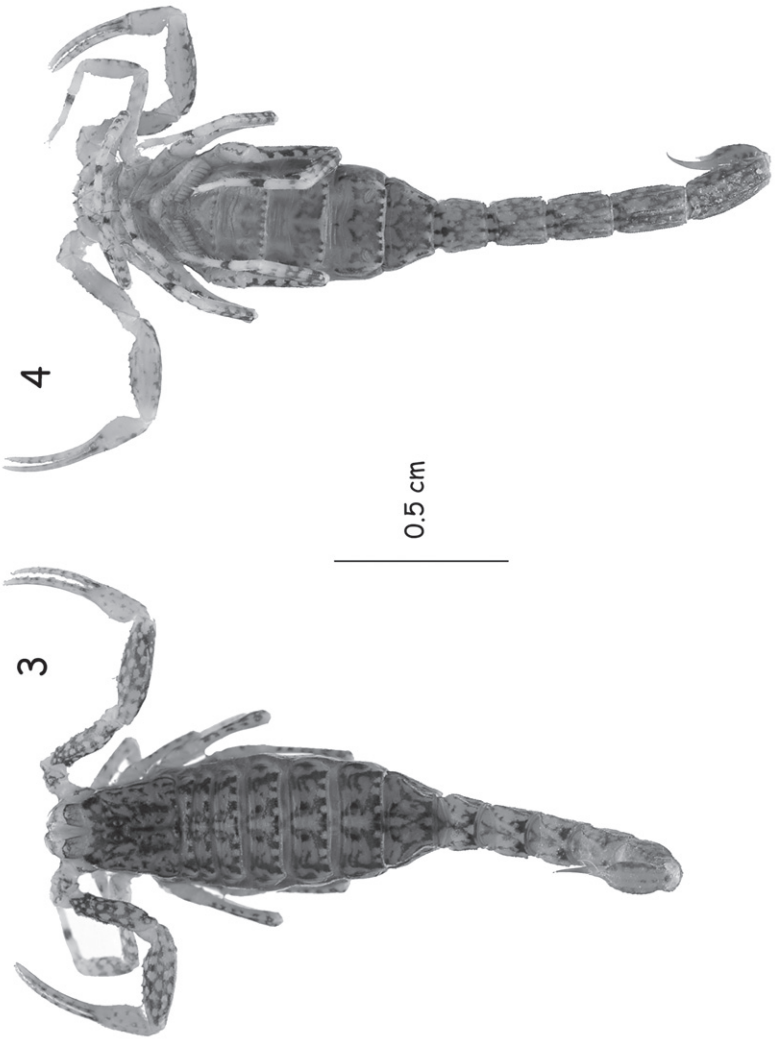
Liocheles australasiae (Fabricius, 1775)

MATERIAL EXAMINED: Indonesia, West Papua, S. Bird's Neck, Kaimana 47 km E, Triton Bay, Kamaka (former Warika) (3°46'42"S, 134°10'24"E), 50-130 m a.s.l., secondary lowland rainforest on limestone, 10 Sept 2010 (D. Telnov), 2 ♀. Idem, (3°46'43"S, 134°10'18"E), 50 m a.s.l., edge of primeval rainforest, white light 9 Sept 2010 (M. Kalnins), ♀. Idem (3°46'24"S, 134°10'28"E), 100 m a.s.l., gardens & second rainforest on limestone, 7 Sept 2010 (M. Kalnins), 2 ♀. Idem, Lake Kamakannalar (3°45'33"S, 134°12'5"E), 90 m a.s.l., primeval rainforest on limestone, 8 Sept 2010 (M. Kalnins), ♀. Idem (3°46'22"S, 134°12'02"E), 60-130 m a.s.l., primeval lowland rainforest on limestone, 8 Sept 2010 (D. Telnov & K Greke), 12 ♀. Idem, 9 Sept 2010, 2 ♀. Idem (3°46'21"S, 134°12'11"E), 30 m a.s.l., rainforest near lake on limestone, 8 Sept 2010 (M. Kalnins), ♀.

Kaimana 40 km E, Triton Bay, Lobo Vill., env. (3°45'33"S, 134°06'11"E), 100 m a.s.l., primeval rainforest on limestone temporary creek valley, 12 Sept 2010 (M. Kalnins), 7 ♀. Idem, 2 juveniles. Idem, 100-400 m a.s.l., primeval lower montane rainforest on limestone, under bark, 11-12 Sept 2010 (D. Telnov), 8 ♀. Idem (3°44'8"S, 134°5'40"E), gardens & secondary costal forest, 16 Sept 2010 (M. Kalnins), ♀. Idem, Kaimana 24 km road from Kaimana to Bitsyann-bay (3°39'26"S, 133°46'21"E), 150 m a.s.l., primeval lowland rainforest on limenstone, 12 Sept 2010 (M. Kalnins), ♀.

Fak-Fak peninsula, Fak-Fak 40-42 km NE, between Kokas-Goras (2°43'19"S, 132°37'57"E), 0-10 m a.s.l., primeval rainforest on limestone under dry bark, 27 Sept 2010 (D. Telnov), 5 ♀ [All ZMH Acc. No. A25/11].

N O T E: Considering that the majority of the specimens of *Liocheles australasiae* collected were females, most certainly this population is also parthenogenetic. This phenomenon has already been observed for other populations of this species, in different islands of the Pacific zone. For details see Lourenço (2008, 2009). Note that both species, *L. australasiae* and *L. karschii* have a common zone of distribution in this part of the island.



Figs 3-4. *Lychas kaimana* sp. n., holotype ♀. Habitus, dorsal and ventral aspects.

Liocheles karschii (Keyserling, 1885)

MATERIAL EXAMINED: Indonesia, West Papua, S. Bird's Neck, Kaimana 47 km E, Triton Bay, Kamaka (former Warika), Lake Kamakannalar (3°46'22"S, 134°12'2"E), 60-310 m a.s.l., primeval lowland rainforest on limestone, 8 Sept 2010 (D. Telnov, K. Greke), ♂, ♀. Idem, 9 Sept 2010, 3 juveniles.

Fak-Fak peninsula, Fak-Fak 5-7 km N (2°53'26"S, 132°18'22"E), 300-400 m, primeval lowland rainforest on limestone, 23 Sept 2010 (D. Telnov), ♀.

Buthidae C. L. Koch, 1837
Lychas C. L. Koch, 1845

Lychas kaimana sp. n.
(Figs 3-12)

TYPE MATERIAL: Holotype ♀. Indonesia, West Papua, S Bird's Neck, Kaimana, 40 km E Triton Bay, Lobo Vill. env. 3°44' 08" S, 134°05' 40" E, 200-300 m a.s.l., 15-17 Sept 2010, primeval rainforest on limestone & clearing, coll. D. Telnov. Deposited in ZMH, Acc. No. A24/11.

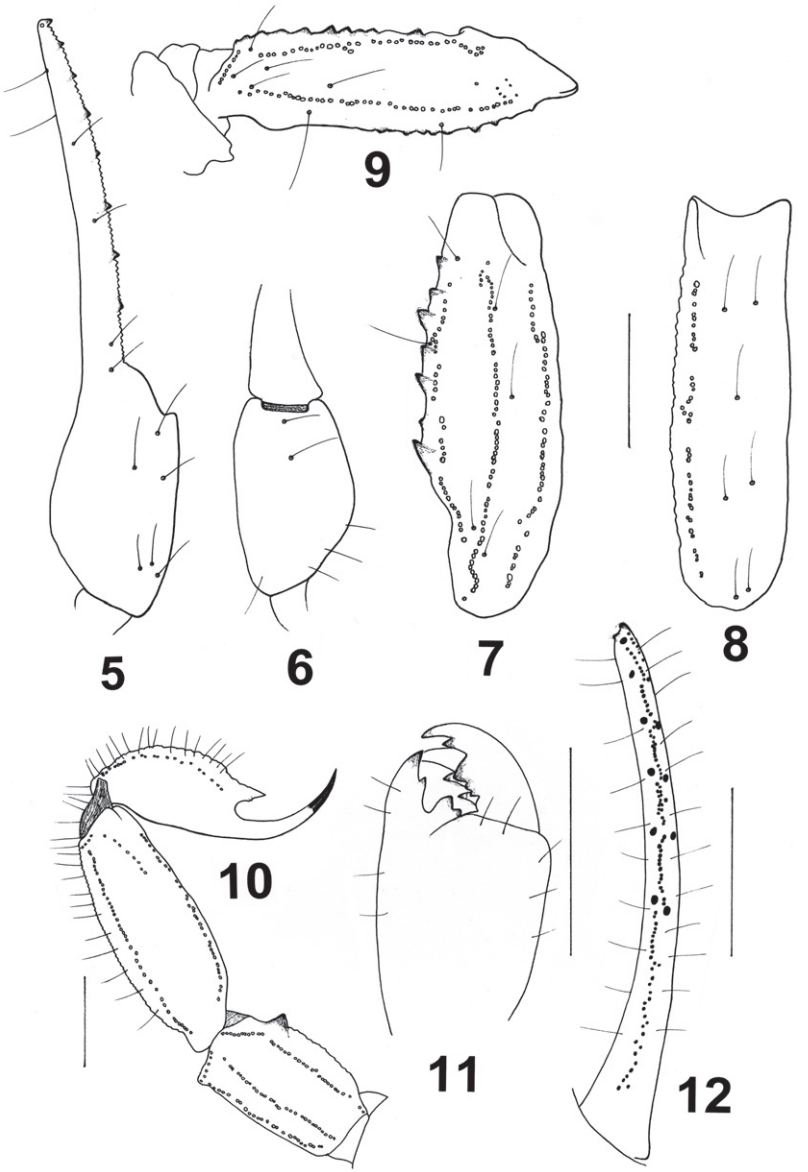
COMPARATIVE MATERIAL EXAMINED: *Lychas eliseanneae* Lourenço, 2011, holotype ♀, MNHN, Paris.

ETYMOLOGY: The specific name is placed in apposition to the generic name and refers to Kaimana, the location in which the new species was collected.

DIAGNOSIS. Scorpions of small size, with respect to the genus, measuring 21 mm for female. General coloration yellowish with intense brownish variegated pigmentation over the body and appendages. Carinae and granulations moderate to strong. Pectines small; pectinal tooth count 10-10 for female holotype; fulcra absent or inconspicuous. Dentate margins of fixed and movable fingers of pedipalp chela with 6-7 almost linear rows of granules; internal and external accessory granules; external less conspicuous. Subacular tubercle moderate, spinoid in shape; two ventral conspicuous granules.

DESCRIPTION based on female holotype. (Morphometric measurements in Table 1).

Coloration. Generally yellowish with intense brownish variegated pigmentation. Prosoma: yellowish, globally covered with brownish pigmented zones; eyes surrounded by black pigment. Mesosoma: tergites yellowish with brownish spots forming approximately three longitudinal strips. Venter yellowish, with pale brown variegated spots covering coxapophysis, sternum, genital operculum and sternites. Metasoma: segments yellowish intensely marked with brownish variegated spots. Ventral aspect of segment V dark. Vesicle yellowish with brownish spots; aculeus



Figs 5-12. *Lychas kaimana* sp. n., holotype ♀. 5-9. Trichobothrial pattern. **5-6**. chela, dorso-external and ventral aspects. **7-8**. patella, dorsal and external aspects. **9**. femur, dorsal aspect. **10**. metasomal segments IV-V and telson, lateral aspect. **11**. chelicera, dorsal aspect. **12**. dentate margin of movable finger, showing rows of granules (scale bar = 1 mm).

Table 1. Morphometric values (in mm) of the holotypes of *Lychas eliseanneae* Lourenço and *Lychas kaimana* sp. n.

	L. eliseanneae	***L. kaimana sp. n.***
	♀	♀
Total length*	32.0	21.2
Carapace:		
- length	3.9	2.8
- anterior width	2.8	2.1
- posterior width	4.2	3.0
Mesosoma length	10.8	7.6
Metasomal segment I:		
- length	2.3	1.4
- width	2.3	1.6
Metasomal segment V:		
- length	5.4	3.2
- width	1.8	1.2
- depth	1.7	1.2
Telson		
- length	4.4	3.3
- width	1.3	0.9
- depth	1.4	1.1
Pedipalp:		
- femur length	4.3	2.7
- femur width	1.1	0.8
- patella length	4.8	3.2
- patella width	1.4	1.0
- chela length	6.6	4.5
- chela width	1.1	0.9
- chela depth	1.0	0.8
movable finger:		
- length	4.7	3.2

(* telson not included)

yellow at the base and reddish-yellow at its extremity. Chelicerae yellowish, intensely marked with blackish-brown variegated spots which cover the posterior 2/3; teeth reddish. Pedipalps: yellowish; femur and patella intensely marked with variegated brownish spots; chela yellowish with pale and diffused spots, much less marked than those of femur and patella; rows of granules on dentate margins of the fingers dark yellow. Legs yellowish marked with brownish variegated spots.

MORPHOLOGY. Prosoma: Anterior margin of carapace moderately emarginate. Carapace carinae moderate to weak; anterior median and posterior median carinae moderately developed; other carinae weak to obsolete. Intercarinal spaces moderately granular. Median ocular tubercle anterior to the centre of the carapace; median eyes separated by one ocular diameter.

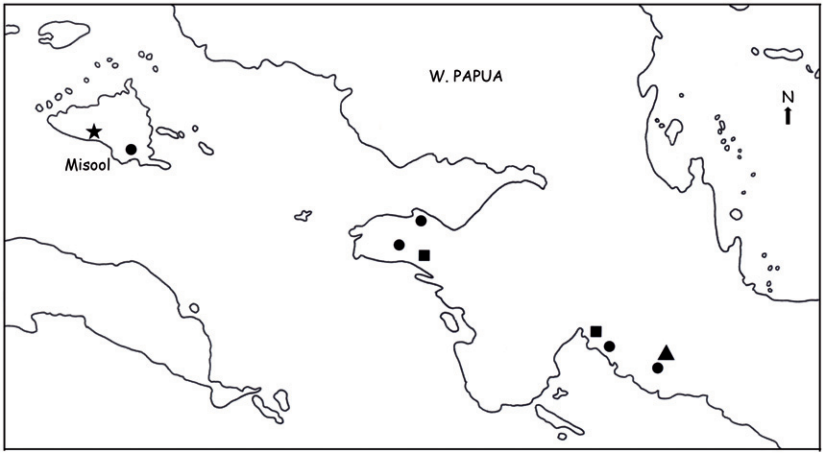


Fig 13. The western portion of West Papua and the Island of Misool, with the collecting sites of *Liocheles australasiae* (F.) (black circle), *Liocheles karschii* Keyserling (black square), the type locality of *Lychas eliseanneae* Lourenço (black star) and *Lychas kaimana* sp. n. (black triangle).

Three pairs of lateral eyes. Mesosoma: tergites I-VI with a median carina; weak to obsolete on I, moderate on II-VI. Tergite VII pentacarinate, with lateral pairs of carinae moderate to strong; median carinae present in proximal half, moderately developed. Intercarinal spaces with a moderately marked granulation; similar to that of carapace. Sternites without granulations, smooth; spiracles short; sternite VII with a few granulations and with four carinae. Pectines small; pectinal teeth count 10-10 in holotype; fulcra totally inconspicuous, almost absent. Metasoma: Segment I with 10 carinae, crenulate; II to IV with 8 carinae, crenulate. Segment V with five carinae; presence of one strong posterior spinoid granule on the dorsal carinae of segments I-IV. Dorsal furrows of all segments weakly developed and with some thin granulations; intercarinal spaces weakly granular to smooth. Telson elongated and weakly granular, with one ventral and two lateral carinae; aculeus long and moderately curved; subaculear tubercle moderate and spinoid in shape; two conspicuous ventral granules. Chelicerae with the dentition characteristic of the buthids (Vachon 1963); two small but well distinct basal teeth on movable finger. Pedipalps: Femur pentacarinate; all carinae moderately crenulate. Patella with seven carinae, moderately crenulate; dorsointernal carinae with 7-8 spinoid granules. Chela with vestigial dorso-external carinae weakly crenulated, and some minute internal granules. Intercarinal spaces weakly granular on femur and patella; almost smooth on chela. Dentate margins on movable and fixed fingers composed of 6-7 linear rows of granules; internal and external accessory granule present. Trichobothrial pattern type A, orthobothriotaxic (Vachon 1974); dorsal trichobothria of femur in *β* (*beta*) configuration (Vachon 1975). Legs: ventral aspect of tarsi with a brush-like group of setae. Tibial spurs present on legs III-IV, moderately developed; pedal spurs present on all legs; reduced on legs I and II.

RELATIONSHIPS. From its general morphology, *Lychas kaimana* sp. n. is most certainly related to *Lychas eliseanneae* Lourenço, 2011, described from the Island of Misool, located only 250 km from West Papua. *Lychas kaimana* sp. n. can, however, be distinguished from *L. eliseanneae* by a number of characters: (i) a distinct pattern of pigmentation; carapace and tergites with a more intense variegated pigmentation; pedipalps and ventral aspect less pigmented, (ii) distinct shape of the subaculear tooth, thin and spinoid, (iii) pedipalp fingers with better marked external accessory granules (iv) fulcra inconspicuous but not totally absent (see also taxonomic remarks after the description).

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Author's address:

Dr. W. R. LOURENÇO, Muséum national d'Histoire naturelle, Département de Systématique et Evolution, UMR7205, CP 053, 57 rue Cuvier, 75005 Paris, France (e-mail: arachne@mnhn.fr).