

## Two new species of dark sac spiders of the genus *Patelloceto* Lyle & Haddad, 2010 (Trachelidae) from Kenya

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### Abstract

*Patelloceto* Lyle & Haddad, 2010 is a small genus of dark sac spiders from the Afrotropical region, diagnosed by very distinct morphology of the genitalia, males with femoral, patellar, and tibial apophyses, females with a broad membranous median septum separating the small lateral spermathecae, and long, oblique, lateral epigynal hoods flanking copulatory openings. Here, two new species of *Patelloceto* are described from Kenya, from material collected by John and Frances Murphy almost half a century ago. Both new species are diagnosed and illustrated, an updated map of the distribution of the genus is provided, as well as an updated key to species of the genus. The number of *Patelloceto* species is increased from three to five, and the number of trachelid spiders recorded from Kenya is increased from four to six.

**Keywords:** Araneae • East Africa • species discovery • taxonomy

### Introduction

Trachelidae Simon, 1897 is a family of medium-sized spiders, elevated to family level by Ramírez (2014), having previously been considered a subfamily within Corinnidae Karsch, 1880. Substantial progress has been made in the taxonomy of the group over the past decades, particularly in the Afrotropical region, where nine new genera have been described since 2006 (Haddad 2006; Haddad & Lyle 2008; Lyle & Haddad 2009, 2010, 2018; Haddad *et al.* 2021), more than doubling the number of species known from the region.

*Patelloceto* was described by Lyle & Haddad (2010) and established based on unique genitalic morphology and reduced leg spination, separating it from *Afroseto* Lyle & Haddad, 2010. Prior to this study, *Patelloceto* contained three species: *P. denticulata* Lyle & Haddad, 2010, known from a male specimen from Ethiopia, *P. media* Lyle & Haddad, 2010 from East Africa, and *P. secutor* Lyle & Haddad, 2010 from South Africa and Mozambique.

Kioko *et al.* (2021) recorded only four species of Trachelidae in Kenya. John and Frances Murphy collected substantial spider material in Kenya in 1980–1990, and evaluation of the trachelids from these samples by the author revealed twelve species. Two undescribed species of *Patelloceto* are treated here. Additionally, a further six undescribed species

allied with *Trachelas* L. Koch, 1872 were found, but are not treated here for revisionary purposes.

Both new species are described from singletons, as further material either does not exist or could not be found in relevant African and European collections. Additionally, distinct variations in the highly conserved male genitalia allow the formation of clear morphological species hypotheses. Therefore, the objective of this paper is to describe the two new species of *Patelloceto*.

### Materials and methods

Material is preserved in 70% ethanol and deposited in the Manchester Museum, Manchester, UK. The left palp was dissected and illustrated. Examinations were carried out with an AmScope ZM-4T stereomicroscope or an Olympus BX61. Images were taken using either a Leica M125C automontage system or an Olympus BX61 with a DP74 camera. All images were z-stacked with between 10–30 images merged into a single photomontage using Helicon Focus 6.7 (www.heliconsoft.com). Palp illustrations were made using a Wacom One digital graphics tablet (www.wacom.com), with the program Autodesk Sketchbook (see Cala-Riquelme 2021). Images were underlain as reference and set at 70% opacity. Images were adjusted in Adobe Photoshop version 21.0.1 for contrast and white balance. Plates were also composed in Adobe Photoshop.

Format of descriptions follows Lyle & Haddad (2010). All measurements are in millimetres (mm). Abbreviations used in the text and figure plates are as follows: DTA = dorsal tibial apophysis, FA = femoral apophysis, PA = patellar apophysis, RTA = retrolateral tibial apophysis. The collection abbreviated in the text as MMUE, the Manchester Museum, University of Manchester, Manchester, UK (curator: D. V. Logunov).

### Order Araneae Clerck, 1757

#### Trachelidae Simon, 1897

#### *Patelloceto* Lyle & Haddad, 2010 (Fig. 1)

#### *Patelloceto murphyorum* sp. n. (Figs. 1–5)

*Type:* Holotype ♂ (MMUE, G7572.8000), KENYA: Kilifi Beach leaf litter, 3°35'05.0"S 39°53'37.1"E, 18 August 1980, J. & F. Murphy.

*Etymology:* The specific epithet is a patronym in honour of the renowned British arachnologists, the late John Alan Murphy (1922–2021) and Frances Mary Murphy (1926–1995), collectors of the holotype of this species, among numerous other novelties from Kenya.

*Diagnosis:* *Patelloceto murphyorum* sp. n. is distinguished from all the congeners by a combination of characters of the male palp (Figs. 4–5): 1) FA denticulate, with a disc-like protrusion apically, 2) DTA projected between 2:30 and 2:45 o'clock in retrolateral view, just shorter than

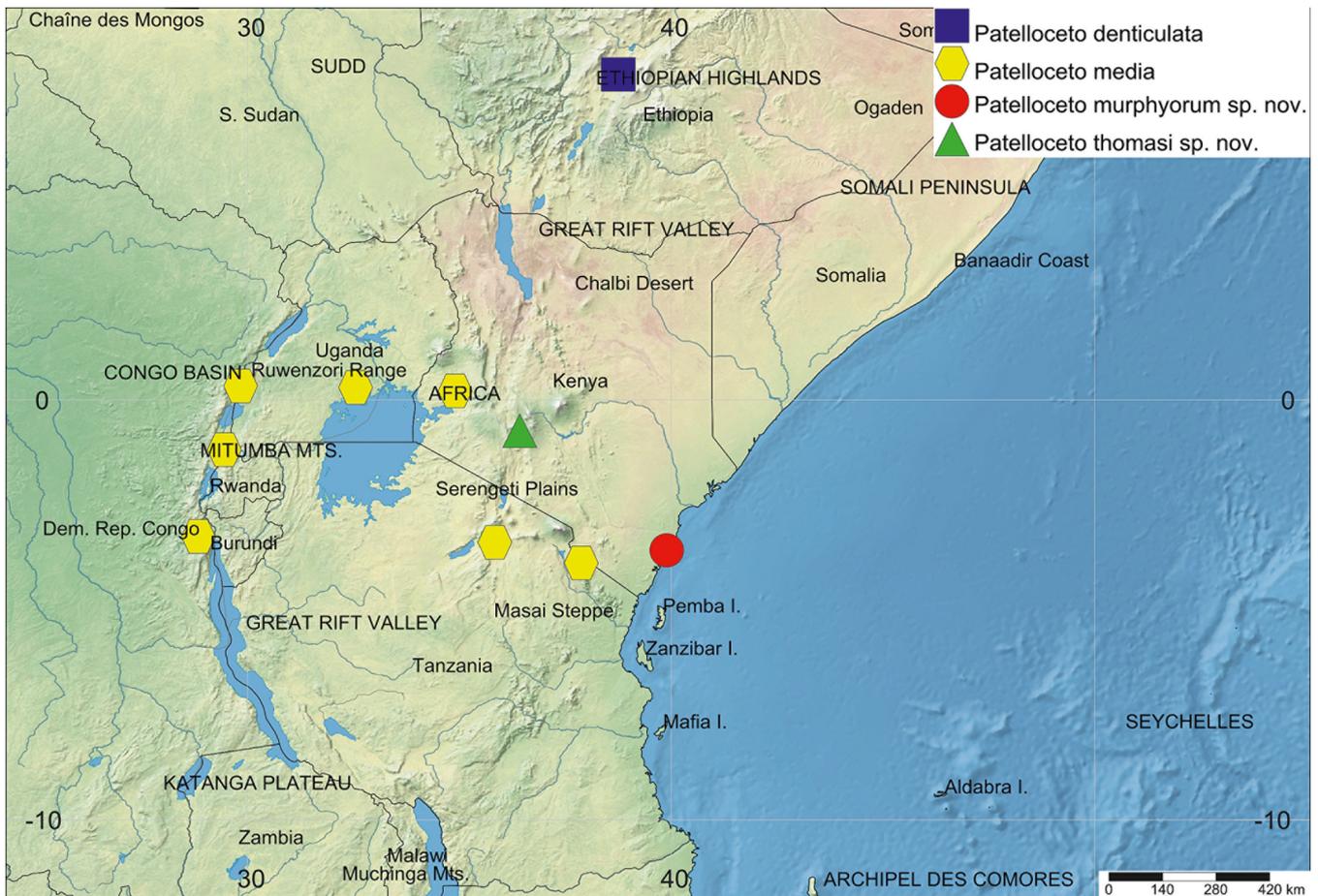


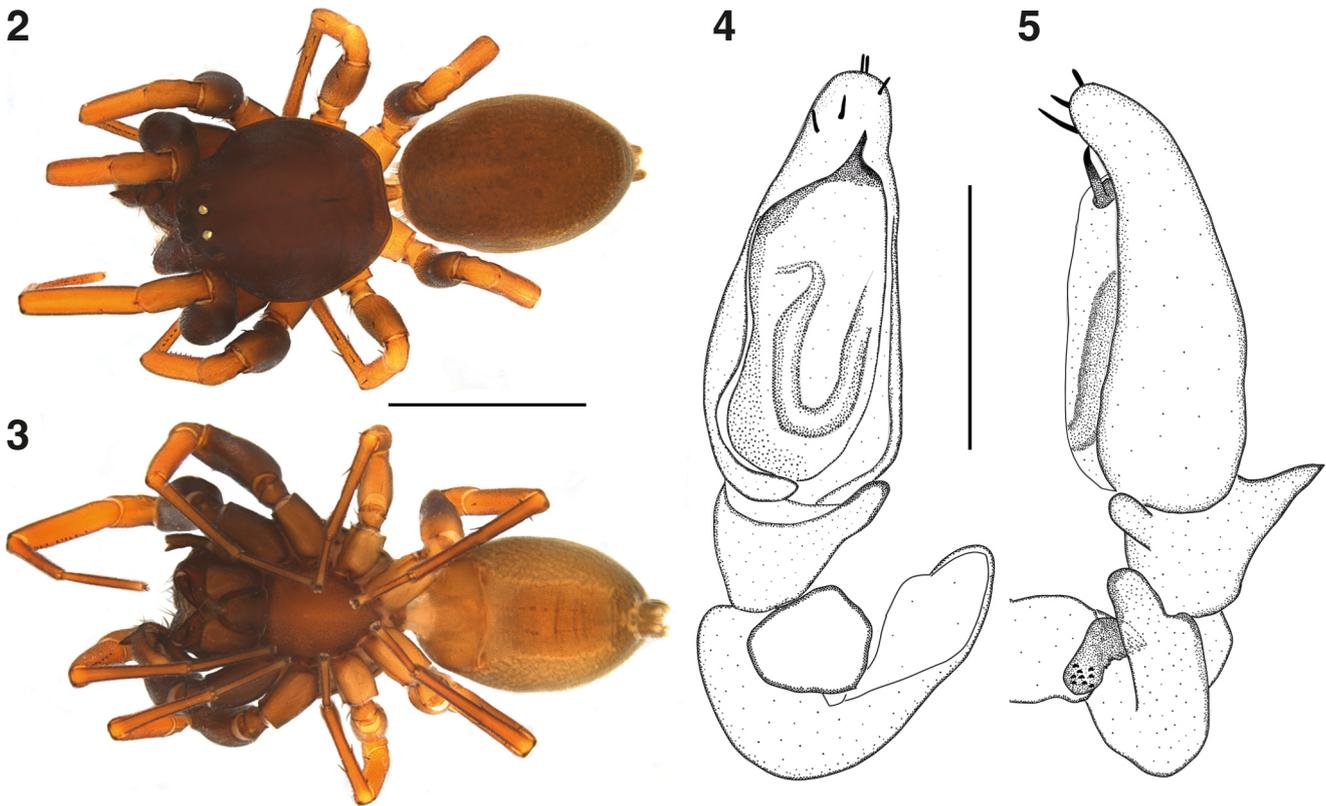
Fig. 1: Map of East Africa showing collecting localities of *Patelloceeto* species.

length of the tibia itself, 3) broad, thumb-like distal RTA, 4) embolus short and straight, directed distally and sharp, and 5) cymbium with five short distal spines, three ventrally (two prolateral, one retrolateral) and two blunter spines apically.

*Distribution:* Only the type locality (Fig. 1).

*Description of holotype male:* Measurements: TL 4.40, CL 2.06, CW 1.79, SL 1.12, SW 1.04, AL 2.34, AW 1.48, chelicera length 1.76, width 0.90, AME-AME 0.07, AME-ALE 0.04, ALE-ALE 0.38, PME-PME 0.15, PME-PLE 0.14, PLE-PLE 0.62. Length of leg segments (totals in parentheses): I: 1.72, 0.60, 1.40, 1.19, 0.82 (5.73); II: 1.52, 0.64, 1.22, 1.08, 0.64 (5.10); III: 1.16, 0.48, 0.82, 1.06, 0.45 (3.97); IV: 1.60, 0.56, 1.24, 1.48, 0.54 (5.42). Colouration (in ethanol *c.* 1980; Figs. 2–3). Carapace reddish brown. Slightly darker region in between AMEs. Abdomen pale to yellow, with clear orangish dorsal scutum, grey venations throughout, indistinct faint greyish sigilla. Legs light brownish to orange, leg I and II darker, femur I and II dark brown. Epigastric sclerite yellowish, venter yellowish medially. Carapace posterior third sloping abruptly to pedicel, mostly uniform height, convex, highest point at ocular region. Sternum surface smooth with fine, scattered setae, margins rebordered. Eyes: AER slightly recurved, AME appear slightly larger than ALE, AME slightly closer to

ALE than to each other, PER slightly recurved, PME closer to PLE than to each other. PME slightly oval and silvery. Chelicera with scattered setae anteriorly, longer at fang base. Three teeth on promargin, distal tooth largest, two retromarginal teeth, proximal tooth largest. Abdomen broadest at midpoint, scutum covering almost entire dorsum. Palp orange-brown; femur with small FA, with denticles extending on posterior face; patella with large, lobed, retrolateral PA, longer than patella but not reaching base of cymbium, dorsomedian protrusion at level of tibial base; tibia with pointed DTA, projected dorsally at 2:45 o'clock (in retrolateral view), DTA slightly less than length of tibia, with relatively sharp apex, thumb-like distal retrolateral apophysis about same length as DTA; embolic region arises slightly retrolateral of apical tegular midpoint and joins median sclerotized region; embolus very short, straight and pointed distally; cymbium with five short distal spines, three ventrally (two prolateral and one retrolateral) and two at the apex of cymbium. Spination: femora I pl1, II pl1, III pl1, IV 0; tibiae (all have one pair of spines apically plv and rlv) I plv12 cusps, II plv8 cusps, III pl1, plv1, IV plv1; metatibiae I plv17 cusps, rlv9 cusps, II plv14 cusps, rlv8 cusps, III pl1 plv1 rlv1, IV 1pl 1plv 1rlv; tarsus I plv9 cusps, rlv7 cusps, II plv3 cusps, III 0, IV: 0.



Figs. 2–5: *Patellocecto murphyorum* sp. n., holotype male. **2** habitus, dorsal view; **3** same, ventral view; **4** palp, ventral view; **5** same, retrolateral view. Scale bars = 2 mm (2–3), 0.5 mm (4–5).

***Patellocecto thomasi* sp. n.** (Figs. 1, 6–11)

*Type:* Holotype ♂ (MMUE, G7572.4488), KENYA: Lake Naivasha, 0°42'47.8"S 36°24'10.4"E, 03 August 1974, J. & F. Murphy.

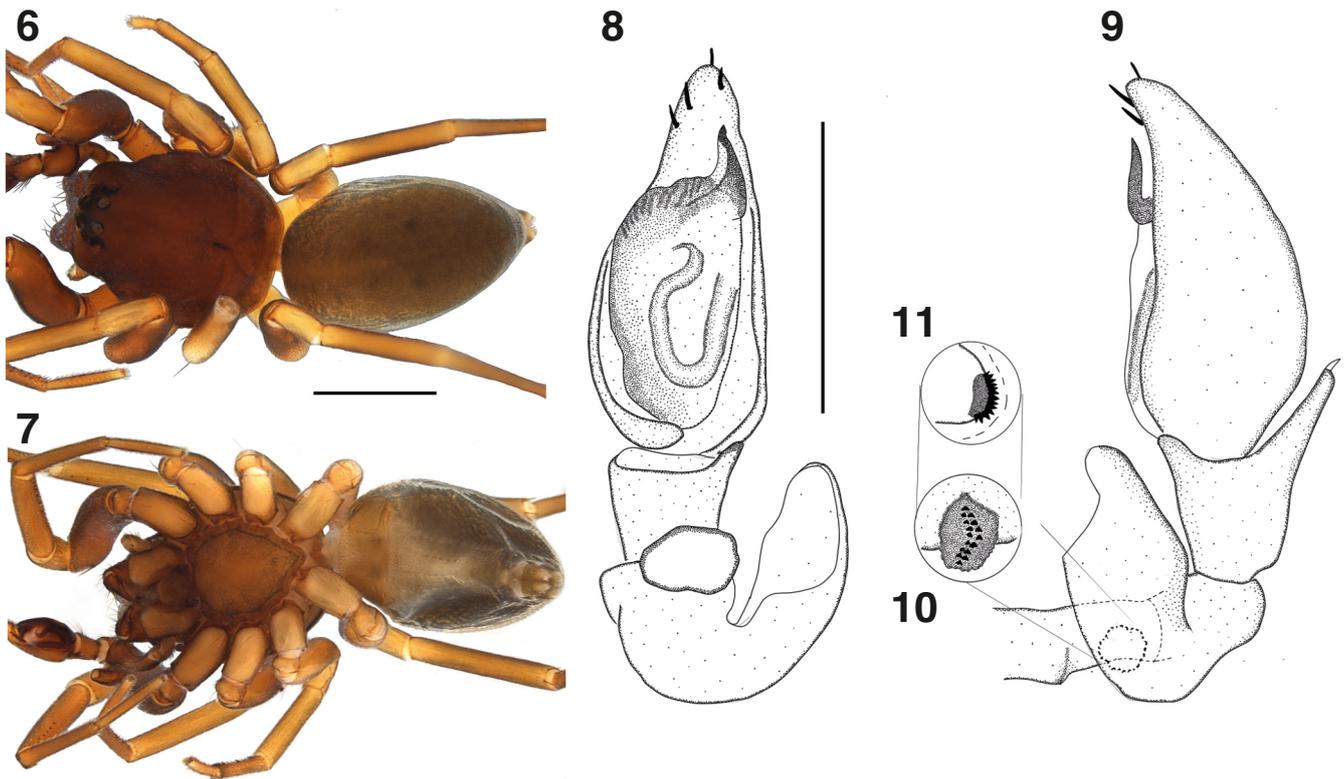
*Etymology:* The species epithet is a genitive patronym in honour of the author's grandfather Thomas Matthew Patrick Pett, for always encouraging me to pursue my passions throughout life.

*Diagnosis:* *Patellocecto thomasi* sp. n. can be distinguished from all the congeners by a combination of characters of the male palp (Figs. 8–11): 1) small FA with denticles arranged like a fan, just prior to femoral apex on retrolateral face (Figs. 10–11), 2) DTA that is projected at about 1:30 position when viewed retrolaterally, and is roughly 1.1–1.2× the length of tibia (Fig. 9), 3) embolus with retrolateral loop on bulb's distal face, well sclerotized retrolaterally and translucent aspect prolaterally, apex sharp and directed distally (Fig. 8), and 4) cymbium with four short distal spines, three ventrally (two prolateral, one retrolateral) and one blunter spine apically (Fig. 8).

*Distribution:* Only the type locality (Fig. 1).

*Description of holotype male:* Measurements: TL: 3.71, CL 1.63, CW 1.42, SL 0.90, SW 0.80, AL 2.08, AW 1.24, chelicera length 0.65, width 0.32; Length of leg segments (totals in parentheses): I 1.39, 0.50, 1.18, 0.84, 0.67 (4.58); II 1.24, 0.54, 1.02, 0.84, 0.62 (4.26); III (left missing, measurements from right leg III) 0.80, 0.40, 0.70, 0.82, 0.42 (3.14); IV 1.34, 0.48, 1.12, 1.24, 0.56 (4.74). AME-AME 0.06, AME-ALE 0.01, ALE-ALE 0.28, PME-PME 0.12,

PME-PLE 0.08, PLE-PLE 0.47. Colouration (in ethanol *c.* 1974; Figs. 6–7). Carapace orange to brownish orange, chelicerae darker. Slightly darker region in between AMEs. Sternum orange. Abdomen beige, grey to black venations laterally, indistinct greyish sigilla. Legs light brownish, with almost pale patellae. Epigastric sclerite yellowish, venter cream medially. Carapace posterior third sloping abruptly to pedicel, otherwise of uniform height, convex at ocular region. Sternum surface smooth, with fine, scattered setae, margins rebordered. Eyes: ocular region generally much smaller than in other species in the genus, AER slightly recurved, AME slightly larger than ALE, PER slightly recurved, PME closer to PLE than to each other. PME slightly oval and silvery. Chelicerae with scattered setae anteriorly, longer at fang base. Number of teeth on promargin not checked due to brittle specimen. Abdomen broader anteriorly, tapering in final third. Scutum almost covering entire length of abdomen. Palp orange-brown; femur with small, distal, retrolateral FA, with denticles arranged fan-like; patella with large, lobed retrolateral PA, longer than patella and extending beyond base of cymbium, hollowed medially with slightly translucent hood at ventral posterior margin; tibia with pointed DTA, projected antero-dorsally at 1:30 position (in retrolateral view), DTA about length of tibia, with a sharp finger-nail-like apex, short thumb-like distal RTA; embolus broad and weakly sclerotized basally, looping retrolaterally before sclerotized portion arises prolaterally and projected nearly straight apically; cymbium with four short distal spines, three ventrally (two prolateral and one retrolateral) and one at the apex of cymbium. Spina-



Figs. 6–11: *Patelloceo thomasi* sp. n., holotype male. **6** habitus, dorsal view; **7** same, ventral view; **8** palp, ventral view; **9** same, retrolateral view; **10** FA, retrolateral view; **11** same, ventral view, distal to femoral depression. Scale bars = 1 mm (6–7), 0.5 mm (8–9).

tion: femora I pl1 II pl1 III pl1 IV 0; tibiae (all have one pair of spines apically plv and rlv) I plv7 cusps, II plv2 cusps, III 0, IV 0; metatibiae I plv9 cusps, rlv8cusps, II plv12 cusps, rlv3 cusps, III plv2, IV rlv1; tarsus I plv7 cusps, rlv3 cusps, II plv2 cusps, III 0, IV: 0.

**Updated key to *Patelloceo* species** (adapted from Lyle & Haddad 2010)

- 1 Males ..... 2
- Females (unknown in *P. denticulata*, *P. murphyorum* sp. n., and *P. thomasi* sp. n.) ..... 6
- 2 Thumb-like RTA present..... 3
- Thumb-like RTA absent..... 5
- 3 Anterior face of DTA more than half dorsal cymbium length; FA without distal denticles (Lyle & Haddad 2010: fig. 135).....*P. secutor* Lyle & Haddad, 2010
- Anterior face of DTA clearly less than half dorsal cymbium length; FA with denticles ..... 4
- 4 Anterior face of DTA slightly shorter than tibia length, DTA projected at between 2:30 and 2:45 o'clock in retrolateral view; FA with disc-like protrusion apically, extending beyond femoral apex; embolus short, straight, directed distally and sharp .....*P. murphyorum* sp. n.
- Anterior face of DTA about 1.1–1.2× tibia length, DTA projected at about 1:30 o'clock with fingernail-like apex; FA fan-like, posterior to femoral apex; embolus with retrolateral loop on bulbs distal face, well sclero-

- tized retrolaterally and with translucent aspect prolaterally.....*P. thomasi* sp. n.
- 5. Embolus with post-tegular section forming broad loop, directed prolaterally distally, broader, tapering distally to sharp tip; cambium with three distal ventral spines (Lyle & Haddad 2010: fig. 140).....*P. denticulata* Lyle & Haddad, 2010
- Embolus with post-tegular section nearly straight in ventral view, directed distally, fine with swollen tip; cymbium with two distal ventral spines (Lyle & Haddad 2010: fig. 143).....*P. media* Lyle & Haddad, 2010
- 6. Lateral epigynal ridges oblique, extending medially along their anterior margin; copulatory openings in same plane as bilobed ST II (Lyle & Haddad 2010: fig. 136); ST I oval, not reaching epigastric fold (Lyle & Haddad 2010: fig. 137).....*P. secutor* Lyle & Haddad, 2010
- Lateral epigynal ridges ending abruptly and not extended medially along their anterior margin; copulatory openings placed anterior of simple oval ST II (Lyle & Haddad 2010: fig. 144); ST I teardrop shaped, extending to epigastric fold (Lyle & Haddad 2010: fig. 145).....*P. media* Lyle & Haddad, 2010

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