

## Description of the first visually cryptic species of *Paratropis* (Araneae: Paratropididae) from Ecuador

**Nadine Dupérré:** Fundación OTONGA, Calle Rither y Bolivia, Quito, Ecuador; Research Associate, American Museum of Natural History, New York, NY 10024, USA. E-mail: nadineduperre@gmail.com

**Abstract.** A new species of Paratropididae is described, *Paratropis elicioi* n. sp., representing the first record of the family Paratropididae from Ecuador. A key to the genera of the subfamily Paratropidinae is provided.

**Keywords:** Spider, Mygalomorphae, taxonomy, new species

In May 2014, the spider biodiversity project of the cloud forest in the Chocó region of Ecuador was launched; its goal, to uncover the spider diversity hidden among the clouds. I present here our first discovery, the occurrence of the family Paratropididae in Ecuador with the description of a new species *Paratropis elicioi* n. sp. The family Paratropididae is composed of 10 species distributed in four genera, occurring in Mexico, Central America and South America (World Spider Catalogue 2014). Paratropididae are visually cryptic (camouflaged) spiders that live hidden in the dirt and can be recognized by their elevated eye tubercle, their weakly or ascopulate tarsi and a body encrusted with soil and dirt (Raven 1985:121).

The family includes two subfamilies, Paratropidinae and Glabropelmatinae (Raven 1985:121). The subfamily Paratropidinae is recognized by the presence of a long single tooth on tarsal claws, the steeply elevated eye tubercle and the absence of both a tibial spur and claw tufts (Raven 1985:121). Paratropidinae is composed of three genera: *Paratropis* Simon 1889, *Anisaspis* Simon 1891, *Anisaspoides* F.O.P.-Cambridge 1896 (Raven 1985:121). The genus *Paratropis* Simon 1889 includes five species from which only two

males have been described, *P. papilligera* F.O.P.-Cambridge 1896 and *P. tuxtelnis* Valdez-Mondragón, Mendoza & Francke 2014.

The genus *Paratropis* was originally differentiated from other Paratropidinae genera by the presence of a third claw on leg I and the absence of the third claw on leg II (Raven 1985:122). Valdez-Mondragón et al. (2014) mentioned that the female of their new species had a small, third claw on leg II. The new species presented here lacks the third claw on all legs. For now, the presence or absence of a third claw on legs I–II is an ambiguous character and cannot be used to define the species that are currently placed in the genus *Paratropis*. As mentioned by Valdez-Mondragón et al. (2014), further work is needed to test the validity of *Paratropis* and the other Paratropidinae genera. Valdez-Mondragón et al. (2014) diagnosed the genus using the combination of eight characters; unfortunately most of these characters pertain to the subfamily Paratropidinae, and are not helpful in recognizing the genus *Paratropis*. A simple key based on the information given by Raven (1985) is proposed in order to help distinguish between the different Paratropidinae genera.

### KEY TO THE GENERA OF THE SUBFAMILY PARATROPIDINAE

- |   |                     |
|---|---------------------|
| 1. Four spinnerets . . . . .                                      | <i>Paratropis</i>   |
| Two spinnerets . . . . .  | 2                   |
| 2. Teeth on both margins in two diagonally opposed rows . . . . . | <i>Anisaspis</i>    |
| Teeth on both margins in two juxtaposed rows . . . . .            | <i>Anisaspoides</i> |

### METHODS

Specimens were examined in 70% ethanol under a SMZ-U Nikon dissection microscope. A Nikon Coolpix 950 digital camera attached to the microscope was used to photograph all the structures to be illustrated. The digital photos were used to trace proportions and the illustrations were detailed and shaded by referring back to the structure under the microscope. Female genitalia were excised using a sharp entomological needle, washed in 80% alcohol, placed on a slide in lactic acid and observed under an AmScope XSG Series T-500 compound microscope. The structure was photographed and illustrated as explained above. Tarsal claws were observed and photographed under an AmScope XSG Series T-500 compound microscope. All measurements are in millimeters and were made using a micrometric ruler fitted on the eyepiece of the microscope.

### ABBREVIATIONS

**Somatic.**—AME: anterior median eye; ALE: anterior lateral eye; PME: posterior median eye; PLE: posterior lateral eye; PLS: posterior lateral spinnerets; PMS: posterior median spinnerets.

**Genitalia.**—*Female:* s: spermathecae; ve: vesicles; *Male:* b: bulb; e: embolus.

### TAXONOMY

*Paratropis* Simon 1889

**Type species.**—*Paratropis scruposa* Simon 1889.

**Composition.**—*P. elicioi* n. sp., *P. papilligera* F.O.P.-Cambridge 1896, *P. sanguinea* Mello-Leitão 1923, *P. scruposa* Simon 1889, *P. seminermis* Caporiacco 1955, *P. tuxtelnis* Valdez-Mondragón, Mendoza & Francke 2014.

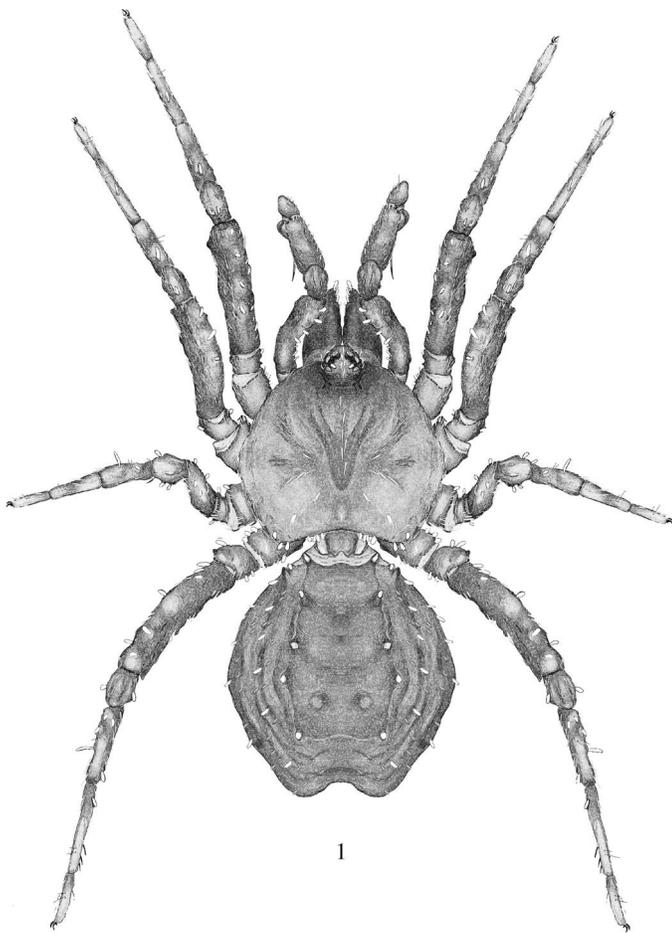


Figure 1.—Male holotype of *Paratropis elicioi* new species.

**Distribution.**—Mexico, Venezuela, Ecuador, Brazil and Peru.

*Paratropis elicioi* new species

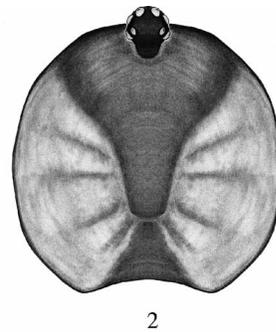
Figs. 1–13

**Type material.**—Male holotype from Ecuador, Cotopaxi Province, Otonga Biological Reserve (00.41941°S, 78.99607°W), 1717 m, pitfall near Rio Esmeraldas, 25.xi.2014, N. Dupérré & E. Tapia (QCAZ). Female paratype from Ecuador, Cotopaxi Province, Otonga Biological Reserve (00.41941°S, 78.99607°W), 1717 m, pitfall near Rio Esmeraldas, 03–16.viii.2014, N. Dupérré & E. Tapia (QCAZ).

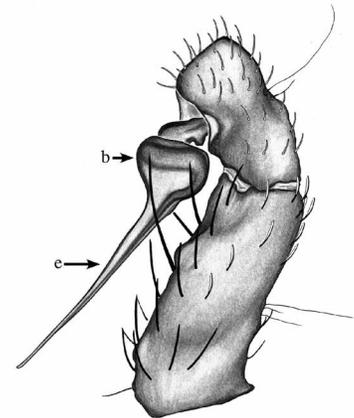
**Etymology.**—The specific epithet is in honor of biologist, Elicio Eladio Tapia for his work in discovering and preserving Ecuador's biodiversity.

**Diagnosis.**—Males and females can be distinguished from all other *Paratropis* by the absence of the third tarsal claw on all legs (Figs. 10–13). Furthermore, males and females are diagnosed from *P. tuxtelsis* by their trichobothrial pattern (Figs. 6–9).

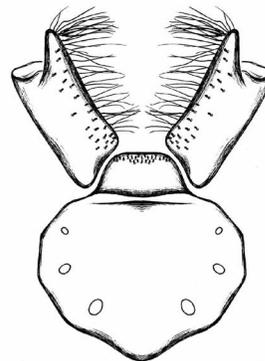
**Description.**—*Male*: Total length: 8.5; carapace length: 3.5; carapace width: 3.3; abdomen length: 5.0. **CEPHALOTHORAX**: Carapace encrusted with sand and dirt: light brown, covered with long barbed setae along midline and margin, with clubbed setae at base (Fig. 1). Carapace cleaned: slightly longer than wide, concave posteriorly, dark reddish; pars



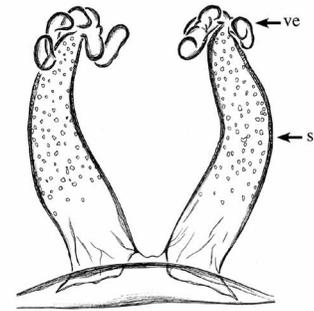
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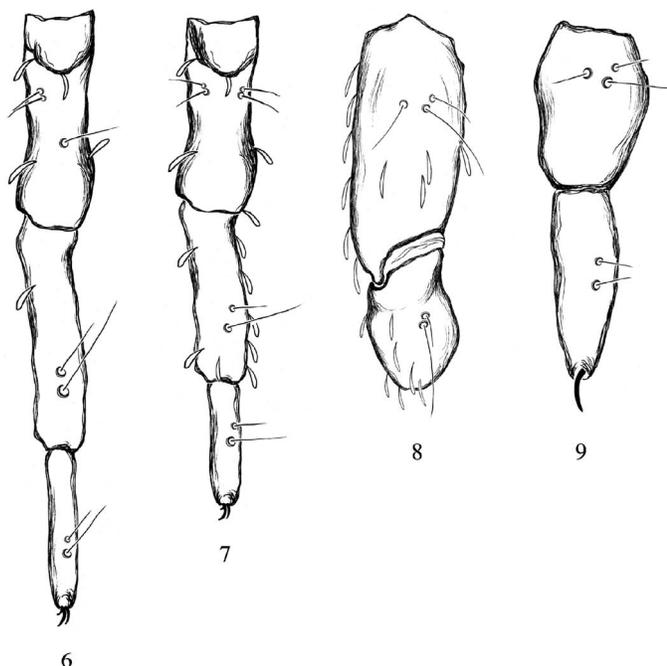
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Figures 2–5.—*Paratropis elicioi* new species. Male 2–4. Female 5. 2. Carapace, dorsal view. 3. Palp, retrolateral view. 4. Sternum and endites, ventral view. 5. Internal genitalia, dorsal view.

cephalica elevated, black with prominent eye tubercle with narrow base; pars thoracica flat, black; fovea transverse (Fig. 2). Chelicerae brown encrusted with sand and dirt; promargin and retromargin juxtaposed with rows of nine teeth; fang furrow very narrow without denticles. Labium dark reddish brown, without soil, trapezoidal with ~25 cuspules. Maxillae orange brown, without soil, with conical projection anteriorly and ~25 cuspules. Sternum encrusted with sand and dirt, light brown; cleaned dark reddish brown, slightly wider than long, flat, with three oval sigilla (Fig. 4). **EYES**: Eight eyes on a high tubercle, AME rounded, separated by half their width; LE oval, touching, ALE the largest; PME oval the smallest, separated by three times their diameter; anterior row recurved, posterior row recurved (Fig. 2). **ABDOMEN**: Inverse heart-shaped, light brown heavily encrusted with dirt and sand; dorsally with five tubercles each bearing a large clubbed seta, depressed in the middle; laterally with one apical tubercle bearing a large clubbed seta, and numerous clubbed setae (Fig. 1); ventrally covered by numerous clubbed setae. Booklung apertures without dirt and sand, oval, well sclerotized. **SPINNERETS**: PLS light brown, lightly encrusted with dirt and sand; basal and medial short, apical segment cylindrical; respectively 0.3/0.2/0.6; PMS very small,

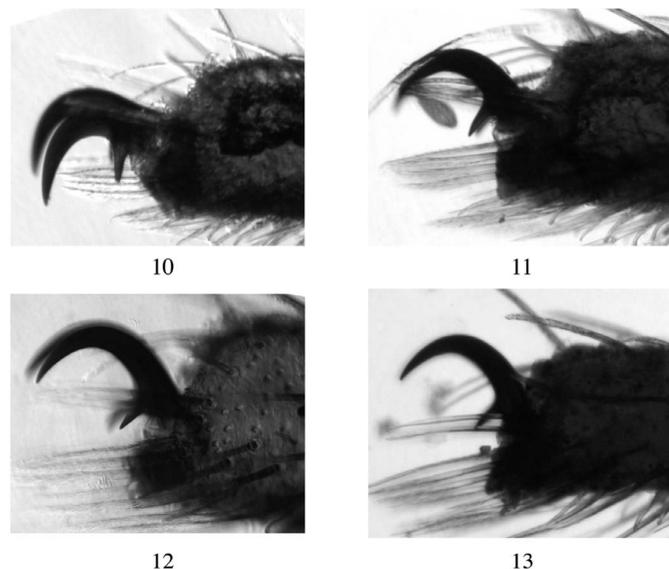


Figures 6–9.—*Paratropis elicioi* new species. Male 6–8. Female 9. 6. Tibia, metatarsus and tarsus IV, dorsal view. 7. Tibia, metatarsus and tarsus III, dorsal view. 8. Palpal tibia and cymbium, dorsal view. 9. Palpal tibia and tarsus, dorsal view.

light brown, encrusted with dirt and sand. LEGS: Light brown encrusted with dirt and sand, covered with barbed and clubbed setae; leg I without tibial spur; leg formula 1423; total length: I 11.2 II 8.0 III 7.5 IV 10.2; (Fig. 1). Leg trichobothria: tibia IV with three (Fig. 6), tibia I–III with four (as in Fig. 7); metatarsus and tarsus I–IV with two (as in Figs. 6, 7); palpal tibia with three trichobothria, palpal cymbium with two trichobothria (Fig. 8). Paired tarsal claws with one elongated tooth; third claw absent on all legs (Figs. 10–13). GENITALIA: Palpal tibia covered with soil and dirt; palpal cymbium pointed; bulb pyriform; embolus transparent, long and thin almost reaching the base of the tibia, tip slightly curved (Fig. 3).

*Female*: Total length: 11.5; carapace length: 5.0; carapace width: 4.5; abdomen length: 6.5. CEPHALOTHORAX: As in male. Chelicerae as in male; promargin with row of 10 teeth juxtaposed to retromargin with row of eight teeth; fang furrow narrow without denticles. Labium, maxillae and sternum as in male. EYES: As in male. ABDOMEN: As in male. SPINNERETS: PLS light brown, lightly encrusted with dirt and sand; basal and medial short, apical segment cylindrical; respectively 0.5/0.3/0.9; PMS very small, light brown, encrusted with dirt and sand. LEGS: as in male; leg formula 4123; total length: I 12.6 II 10.5 III 9.8 IV 14. Leg trichobothria: as in male; palpal tibia with three trichobothria; palpal tarsus with two trichobothria (Fig. 9). Paired and third tarsal claws as in male; palpal tarsus with one claw, without tooth (Fig. 9). GENITALIA: Internal genitalia with elongated spermathecae curved inwards with oval vesicles apically (Fig. 5).

**Other material examined.**—*Cotopaxi Province*: Otonga Biological Reserve (00.41941°S 78.99607°W), 1717 m, pitfall near Rio Esmeraldas, 1 male, 25.xi–08.xii.2014, N. Dupérré &



Figures 10–13.—*Paratropis elicioi* new species. Male 10–13. 10. Claw I, lateral view. 11. Claw II, lateral view. 12. Claw III, lateral view. 13. Claw IV, lateral view.

E. Tapia (DTC); pitfall near Rio Esmeraldas, 1 juvenile, 16.viii–05.ix.2014, N. Dupérré & E. Tapia (DTC); sifting litter, 3 juveniles, 04–07.ix.2014, N. Dupérré, E. Tapia, C. Tapia (DTC); (00.41994°S 79.00623°W), 1997 m, pitfall, 1 juvenile, 05–19.ix.2014, N. Dupérré & E. Tapia (DTC).

**Distribution.**—Ecuador, Cotopaxi province.

**Natural history.**—Specimens were collected in a low evergreen montane forest from 1717 m up to 1997 m. At 1717 m, specimens were collected by pitfall traps near a stream "Rio Esmeraldas". Adult males and females were collected in the same pitfall line but during a different period.

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#### LITERATURE CITED

- Conservation International. 2013. The Tumbes-Chocó-Magdalena corridor, a biodiversity hotspot: an online reference. Online at [http://www.conservation.org/where/priority\\_areas/hotspots/south\\_america/Tumbes-Choco-Magdalena/Pages/default.aspx](http://www.conservation.org/where/priority_areas/hotspots/south_america/Tumbes-Choco-Magdalena/Pages/default.aspx)
- Cambridge, F.O.P.. 1896. On the Theraphosidae of the lower Amazons: being an account of the new genera and species of this group of spiders discovered during the expedition of the steamship "Faraday" up the river Amazons. Proceedings of the Zoological Society of London 1896:716–766.
- Raven, R.J. 1985. The spider infraorder Mygalomorphae (Araneae): Cladistics and systematics. Bulletin of the American Museum of Natural History 182:1–180.

- Simon, E. 1889. Arachnides. *In* Voyage de M. E. Simon au Venezuela (décembre 1887–avril 1888). 4e Mémoire. Annales de la Société Entomologique de France (6) 9:169–220.
- Simon, E. 1891. On the spiders of the island of St. Vincent. Part 1. Proceedings of the Zoological Society of London 1891:549–575.
- Valdez-Mondragón, A., J.I. Mendoza & O.F. Francke. 2014. First record of the mygalomorph spider family Paratropididae (Arachnida, Araneae) in North America with the description of a new species of *Paratropis* Simon from Mexico, and with new ultramorphological data for the family. ZooKeys 416:1–21. doi:10.3897/zookeys.416.7253.
- World Spider Catalog. 2014. World Spider Catalog, version 15.5. Natural History Museum Bern. Online at <http://wsc.nmbe.ch>

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