

## **LINOTHELE CAVICOLA, A NEW DIPLURINE SPIDER (ARANEAE, DIPLURIDAE) FROM CAVES IN ECUADOR**

**Pablo A. Goloboff:** Dept. of Entomology, The American Museum of Natural History;  
Central Park West at 79th Street, New York, New York 10024 USA

**ABSTRACT.** A new species of Dipluridae, *Linothele cavicola*, is described (from the female only) from caves in Ecuador.

The subfamily Diplurinae was re-limited by Raven (1985) to contain the genera *Linothele*, *Trechona* and *Diplura*, the only diplurids with bipectinate superior tarsal claws. Several diplurids from caves have been described (see Raven 1979; Gertsch 1982; and Coyle 1988 for reviews), but none of them belong to the Diplurinae. The Australian *Troglodiplura lowryi* Main 1969 was originally placed in the Dipluridae, but was later transferred by Raven (1985) (with reservations) to the Nemesiidae; Main & Gray's (1985) discussion and figures seem to support Raven's opinion.

The only cave mygalomorph reported for Ecuador (from Cueva de Los Tayos) is *Spelocteniza ashmolei* Gertsch (1982), which possibly belongs to the Microstigmatidae (Goloboff 1993). On a trip to Ecuador, Arturo and Sergio Roig collected in Cuevas de Jumandi several specimens of a cave-dwelling diplurine, of which additional specimens (from the same cave system!) were subsequently found in museum collections. Although the new species has well developed eyes and a normal pigmentation, it exhibits several features also found in other cave-dwelling mygalomorphs. The most notable of those features is the elongation of the appendages. It is interesting that reduction in the number of tarsal claw teeth has also been observed for some cave-inhabiting diplurids in the genus *Euagrus*, where the teeth are also short and basal (see Coyle 1988).

Measurements are in millimeters unless otherwise noted; the description format follows Goloboff & Platnick (1987). Abbreviations are: STC and ITC, superior and inferior tarsal claws; PLS and PMS, posterior lateral and median spinnerets. The STC teeth are listed in the same order for each tarsus, starting from the most 'anterior' row (external row of anterior claw) and ending with the most 'posterior' row (external row of

posterior claw). The specimens studied here were available through the courtesy of Arturo Roig Alsina (Museo Argentino de Ciencias Naturales "Bernardino Rivadavia," Buenos Aires; MACN), Herbert W. Levi (Museum of Comparative Zoology, Cambridge; MCZ) and Norman I. Platnick (American Museum of Natural History, New York; AMNH).

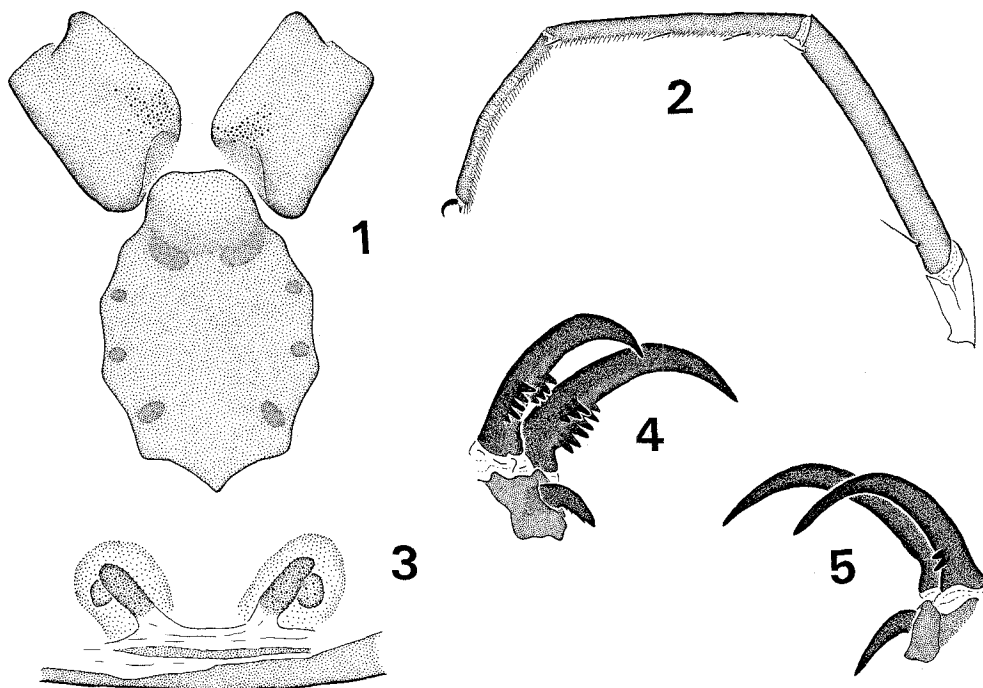
### *Linothele cavicola* new species Figures 1-5; Table 1

**Type.**—Female holotype, from Ecuador: Napo Prov., Cuevas de Jumandi, 2-3.II.1983, A. and S. Roig (MACN).

**Diagnosis.**—*L. cavicola* differs from other species in the genus by having very few teeth on the STC and strong ventral setae on the tarsi. Those characters, as well as the great elongation of the legs, spinnerets, and body, are possibly associated with the cave habitat. The eyes are well-developed. The pigmentation is normal, although the spider (in alcohol) appears slightly less sclerotized than other diplurines.

**Male.**—unknown.

**Female (holotype).**—Total length: 28 mm. Cephalothorax, 9.70 long, 8.95 wide. Cephalic region low, flat, 5.90 long, 5.25 wide. Fovea narrow, quite strongly recurved, rather deep, 1.35 wide. Eyes well-developed, apparently fully functional, on low tubercle; ocular quadrangle 1.65 long, 3.15 wide. Labium (Fig. 1) without cusps, 1.35 long, 1.80 wide. Maxillae with 36/40 cusps, with well-developed serrula on anterior side of lobe. Sternum flat, 4.65 long, 3.50 wide, with sigilla small and oval to rounded; sternum weakly rebordered. Anterior margin of chelicera with 11 teeth, fang furrow with 20 denticles more or less linearly arranged and *ca.* 55 much smaller denticles in front of those. Legs very long. Measurements are in Table 1.



Figures 1–5.—*Linothele cavicola*, new species (female). 1, sternum, labium and maxillae; 2, left tibia, metatarsus and tarsus I, retrolateral view; 3, spermathecae; 4, claws from right tarsus I, external view; 5, claws from right tarsus IV, external view.

*Chaetotaxy*: Femora: I, 1-1 P SUP (1:2 A), 1-1-1-1 D, 0-1-1-1 R SUP; II, 0-1-1 P SUP, 1-1-1-0 D, 1-1-1-1 R SUP (thinner); III–IV, 1-1-1-1 P SUP, 1-1-1-0 D, 1-1-1-1 R; palp, 1 P SUP A, 1-1-1-1 d (1:2 a), 1 R SUP. Patellae: I, 0; II, 1 P SUP A; III–IV, 1 P, 1 R; palp, 1 P SUP B. Tibiae: I, 1-1 P SUP, 1 R (1:3 B), 2-1-2 V; II, 1-1 P SUP, 2-1-2 V; III, 1-1 P, 1-1 D, 1 D POST B, 1-1 R, 2-2-2 V; IV, 1-1 P, 1-1-1 D, 1 D POST B, 1-1 R, 2-2-2 V; palp, 1-1 P, 1-1-2 V ANT, 2-1-1 V POST, 1 R (1:2 A). Metatarsi: I, 2-1-0-2 V; II, 1 P SUP (1:3 B), 2-1-1-0-2 V; III, 1-1-

0-1-0 P, 1-1-0-1 D ANT, 1 D POST B, 1-1-1 R SUP, 1-1-1 V ANT, 1-1-1-2 V POST; IV, 1-1-0-1 P, 1-1-1 D ANT, 1-1-1 D POST, 1-1-0 R SUP. Tarsi: I–IV, no spines, with series of very thick, almost spine-like ventral setae; palp, 2 V B. Tarsi I–II scopulate, III–IV ascopulate. Metatarsus I with scopula on 4:5 A, II with scopula on 2:3 A. Scopula I–II with band (about 3 rows) of scattered thick setae. Tarsi I–IV very flexible, pseudosegmented (Fig. 2). Metatarsal preening combs absent. STC with few basal and short teeth, less numerous on posterior legs: I (Fig. 4), 6 3 4 5; II, 5 3 3 4; III, 4 1 1 4; IV (Fig. 5), 2 0 0 3. Palpal claw with 5 teeth on promargin. ITC well-developed on tarsi I–IV, with several denticles on tarsus I, with denticles absent or less evident on the other tarsi.

PLS very long; length of basal:mesial:apical is 6.20:6.30:7.20. PMS, 2.00 long. Spermathecae as in Fig. 3, with more sclerotized transverse band between duct entrance and genital opening.

Cephalothorax, legs and palpi, light reddish brown; abdomen darker.

**Other specimens examined.**—ECUADOR: Napo Prov.: same locality, date and collectors as the holo-

Table 1.—Leg measurements for the holotype female of *Linothele cavicola*, new species. Measurements are in mm.

	Leg number and palp				
	I	II	III	IV	Palp
Femur	11.40	11.00	10.30	12.40	7.40
Patella	5.40	4.70	4.30	4.60	3.75
Tibia	11.50	10.20	9.50	12.20	6.40
Metatarsus	10.65	10.30	11.50	15.60	—
Tarsus	8.00	7.50	6.90	8.20	5.20
Total	46.95	43.70	42.50	53.00	22.75

type, 1 large ♀, 3 smaller ♀♀ (that may be juvenile), 8 juvs. (MACN); Cuevas de Jumandi, Archidona, 600 m, 5.VII.1976, S. and J. Peck, 1 ♀, 6 juvs. (AMNH); Archidona Cave (Tena), VI.1965, L. Peña, 1♀, 1 juv. (MCZ).

**Relationships.**—Raven (1985) re-limited the Diplurinae to include only the genera *Diplura*, *Trechona*, and *Linothele*. *Diplura* and *Trechona* share the presence of a maxillary lyra (a character about which there had been a long standing confusion before Raven 1985), and those two genera therefore appear to be sister groups. The species currently assigned to *Linothele* share only the absence of a maxillary lyra; *Linothele*, therefore, may well be a paraphyletic group.

**Natural history.**—All the diplurines whose mode of prey capture has been reported build extensive capture webs (Goloboff 1982; Coyle 1988; Paz 1988). The long spinnerets of diplurids in general have traditionally been considered an adaptation for spinning sheet-webs. Despite their very long spinnerets, specimens of *L. cavicola* apparently do not make webs. The (numerous) specimens collected by A. and S. Roig were found walking on the ground or walls of the cave (A. Roig, pers. comm.). The very long spinnerets of *L. cavicola* therefore seem part of the general trend in appendage elongation, rather than any kind of special adaptation to spinning webs. Another diplurine that seems not to spin webs is *Diplura garleppi* (Simon 1892) from Bolivia. I have collected that species from a deep wide burrow with smooth silk-lined walls (ca. 25 cm deep and 2 cm wide), with an open entrance, in rather hard soil (Bolivia: Dpto. La Paz: San Lorenzo, 12 km from Caranavi, Jan. 1–2, 1991; AMNH). Unlike the spinnerets of *L. cavicola* and most diplurines, the spinnerets of *D. garleppi* are short (which explains the otherwise surprising mistake of Simon in originally placing the species in a cyrtaucheniid genus!).

#### ACKNOWLEDGMENTS

Frederick A. Coyle, Charles D. Dondale, Norman I. Platnick and Robert J. Raven provided

useful comments on a draft of the manuscript. The financial support of the American Museum of Natural History is greatly appreciated.

#### LITERATURE CITED

- Coyle, F. A. 1986. The role of silk in prey capture of non-araneomorph spiders. Pp. 269–305, *In* Spiders: webs, behavior, and evolution. (W. A. Shear, ed.), Stanford Univ. Press; Stanford, California.
- Coyle, F. A. 1988. A revision of the American funnel-web mygalomorph spider genus *Euagrus* (Araneae, Dipluridae). Bull. American Mus. Nat. Hist., 187: 203–292.
- Gertsch, W. J. 1982. The troglobitic mygalomorphs of the Americas (Arachnida, Araneae). Assoc. Mexican Cave Studies Bull., 8:79–94.
- Goloboff, P. A. 1982. Descripción de la hembra de *Achetopus paraguayensis* (Gerschman y Schiapelli, 1940) (Araneae, Dipluridae). Physis (Buenos Aires), Physis, Secc. C, 41:103–105.
- Goloboff, P. A. 1993. A reanalysis of Mygalomorph spider families (Araneae). American Mus. Novitates, 3056. 32 pp.
- Goloboff, P. A. & N. I. Platnick. 1987. A review of the Chilean spiders of the superfamily Migoidea (Araneae, Mygalomorphae). American Mus. Novitates, 2888. 15 pp.
- Main, B. Y. & M. R. Gray. 1985. Further studies on the systematics of Australian Diplurinae (Chelicerata: Mygalomorphae: Dipluridae): description of the male of *Troglodiplura lowryi*, with notes on its affinities. Psyche, 92:151–162.
- Paz, N. 1988. Ecología y aspectos de comportamiento en *Linothele* sp. (Araneae, Dipluridae). J. Arachnol., 16:5–22.
- Raven, R. J. 1979. Systematics of the Mygalomorph spider genus *Masteria* (Masteriinae: Dipluridae: Arachnida). Australian J. Zool., 27:623–636.
- Raven, R. J. 1985. The spider infraorder Mygalomorphae (Araneae): cladistics and systematics. Bull. American Mus. Nat. Hist., 182:1–180.
- Simon, E. 1892. Etudes arachnologiques. 24e mémoire. XXXIX. Descriptions d'espèces et de genres nouveaux de la famille des Aviculariidae (suite). Ann. Soc. Ent. France, 61:271–284.

*Manuscript received 24 May 1993, revised 24 August 1993.*