

ORIGINAL ARTICLE

***Eurytion heurtaultae* sp. n. from Argentina and Uruguay with notes on *E. tenebrosus* and *E. yungarum* and a key to the Neotropical taxa of the genus (Chilopoda: Geophilomorpha: Geophilidae)**

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**Abstract**

*Eurytion heurtaultae* sp. n. (Chilopoda: Geophilomorpha: Geophilidae) is described from the Provinces of Santa Fe, Córdoba and Buenos Aires (Argentina) and Department of Lavalleja (Uruguay). The new species seems to be closely related to *Eurytion tenebrosus* (Meinert, 1886) from the Province of Formosa (Argentina) and Department of Treinta y Tres (Uruguay). Additional data for *Eurytion tenebrosus* complementing Meinert's (1886) original description and the description by Crabill (1968) are provided based on a re-examination of the type specimens. Additional details of intraspecific variation are also given. The female of *Eurytion yungarum* Pereira, 2005 is described from an additional specimen, from Parque Nacional Calilegua, Province of Jujuy, Argentina, which is a new locality for the geographical distribution of the species. A key to the Neotropical species of the genus is also included.

**Resumen**

*Eurytion heurtaultae* sp. n. (Chilopoda: Geophilomorpha: Geophilidae) es descrita para las Provincias de Santa Fe, Córdoba y Buenos Aires (Argentina) y Departamento de Lavalleja (Uruguay). La nueva especie parece estrechamente relacionada con *Eurytion tenebrosus* (Meinert, 1886) de la Provincia de Formosa (Argentina) y Departamento de Treinta y Tres (Uruguay). Datos adicionales sobre *Eurytion tenebrosus*, complementando la descripción original de Meinert (1886) y descripción de Crabill (1968), son provistos en base a los ejemplares tipo. Detalles adicionales sobre variación intraespecífica son también brindados. La hembra de *Eurytion yungarum* Pereira, 2005 es descrita en base a un espécimen adicional de Parque Nacional Calilegua, Provincia de Jujuy, Argentina, siendo ésta una nueva localidad para la distribución geográfica de la especie. Una clave para las especies Neotropicales del género es también aquí incluida.

**Keywords:** Argentina, *Eurytion*, Geophilomorpha, Neotropics, new species, Uruguay

**Introduction**

Thirty species are currently included in the genus *Eurytion* Attems, 1903 (Foddai et al., 2000; Pereira, 2005). Of these, nine (in addition to the new species described below) occur in the Neotropics, 18 are distributed in Africa and three in Australia.

In the present paper, a new species is described from Argentina and Uruguay on the basis of a large number of specimens, mostly collected by the author in several localities in the former country.

Up to now, only three species of the genus were known from Argentina, i.e. *Eurytion gracilis* (Gervais, 1849) from Neuquén and Tucumán Provinces (also

cited from Chile); *Eurytion tenebrosus* (Meinert, 1886) from Formosa Province (also cited from Uruguay: Department of Treinta y Tres) and *Eurytion yungarum* Pereira from Jujuy Province. *Eurytion heurtaultae* sp. n. is the fourth species of the genus for the Argentinian fauna and also the first record for this genus from the Santa Fe, Córdoba and Buenos Aires Provinces, thus extending the geographical range of the genus to the central-eastern region of the country. *Eurytion heurtaultae* is the second species of the genus to be recorded from Uruguay (and the first citation from the Lavalleja Department).

An opportunity to revise the type material of *Eurytion tenebrosus* (Meinert, 1886) has allowed the addition of further data, including information on intraspecific variation. *Eurytion yungarum* is recorded from a new locality in Argentina and its female is first described in this paper. A key to the Neotropical species of the genus is also included.

## Materials and methods

The type specimens herein designated are deposited at the Museum of La Plata (MLP); Muséum national d'Histoire naturelle, Paris (MNHN) and the Zoological Museum University of Copenhagen (ZMUC); other type material revised here is currently housed in the latter institution; non-type specimens have been deposited at MLP and Facultad de Ciencias de Montevideo, Sección Entomología (FCE).

All specimens were studied by light microscopy and the illustrations were made using a camera lucida drawing tube attached to it. Only temporary slides were prepared. The procedures employed for dissection and preparation of specimens for microscopical examination are those described in Pereira (2000), Foddai et al. (2002) and Bonato & Minelli (2004).

The following abbreviations are used in text and the legend of the figures: a.a., antennal article; b.l., body length; p.l., pairs of legs.

## Results

Family GEOPHILIDAE

Genus *Eurytion* Attems, 1903

### Diagnosis

Clypeal area finely punctate or granulate, not areolate. First maxillae with or without coxosternal lappets, telopodite lappets present. Second maxillae with coxosternites medially joined through a narrow, hyaline and non-areolate membranous isthmus only; antero-internal corners of coxosternum without processes; pore surrounded by sclerotized rim. Forcipulae: pleuroxosternal sutures extend parallel to the outer margin, chitinous lines absent. Sterna with pore fields. Last pair of legs with two tarsal articles; praetarsus of last legs claw-like, each coxopleuron of last leg-bearing segment with numerous coxal organs distributed in one of the following ways: (1) opening separately; (2) grouped in one or two well-defined clusters; (3) some organs opening separately, others arranged in ca. three irregular groups, each formed by the fusion of two to four organs sharing a common pore.

*Type of the genus. Geophilus (Eurytion) michaelseni* Attems, 1903 [currently *Eurytion michaelseni* (Attems, 1903)] by subsequent designation by Attems (1929, p. 254).

### Remarks

For a complete list of the Neotropical species currently included in the genus *Eurytion* and corresponding full citations, see Foddai et al. (2000).

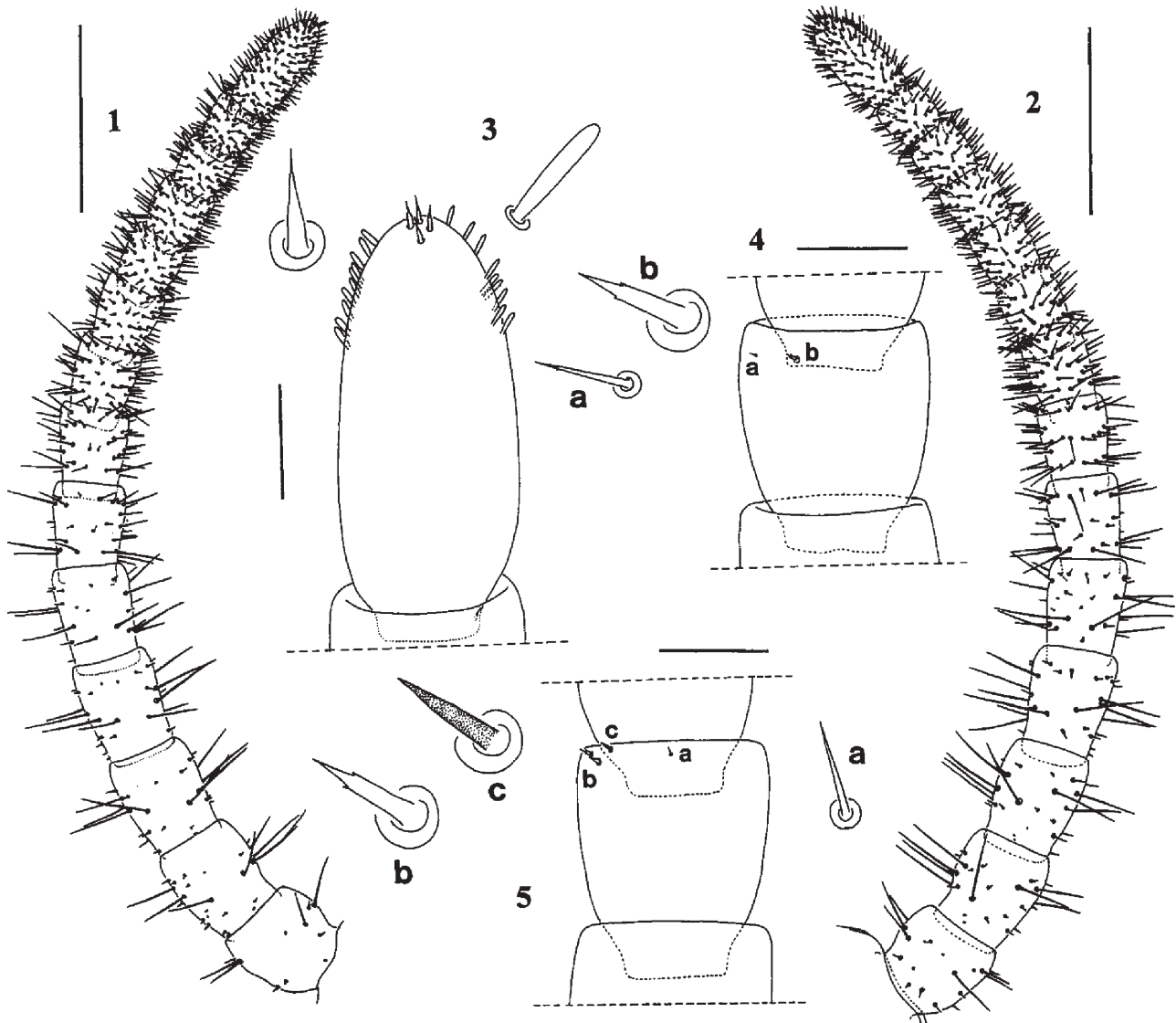
*Eurytion heurtaultae* sp. n. (Figures 1–50)

### Diagnosis

An *Eurytion* species with lappets on coxosternum of first maxillae; anal organs present and second maxillary circumforaminal rim elongated, with the external margin accompanied by a very narrow and finely areolate hyaline strip. Among the Neotropical species currently included in the genus *Eurytion*, only the present species and *Eurytion tenebrosus* (Meinert) share these three combined traits. The new species can be differentiated from the second by means of the following characters (the corresponding ones in *E. tenebrosus* are given in parentheses): maximum body length 30 mm (40 mm); maximum body width 0.8 mm (1.10 mm); female with 49, 51 or 53 and male with 45, 47, 49 or 51 pairs of legs (female with 57 or 59 and male with 55 pairs of legs); maximum length of cephalic plate 1.0 mm (1.20 mm); maximum width of forcipular coxosternum 0.9 mm (1.10 mm); ground colour yellowish, cephalic shield and forcipular segment pale ochreous (ground colour brownish yellow, cephalic shield and forcipular segment pale ferruginous); dorsal side of a.a. IX and XIII with ca. one to three type c setae (with ca. five or six type c setae). Aspect and relative size of clypeal area as in Figures 7, 8, 12 (as in Figures 51, 52, 61, 68); sclerotized pore rim of the second maxillae slightly elongated, anterior and posterior parts, in respect to the metameric pore, subequal in size, as in Figures 12–14 (elongated, with posterior portion longer than the anterior; Figures 53, 54, 62, 63); each coxopleuron, with a maximum of ca. eight coxal organs, all opening separately (Figures 35–37, 43–50) (with a maximum of ca. 16 coxal organs, opening separately, or, in large specimens, some of them opening separately and others arranged in ca. three irregular groups, each formed by the fusion of two to four organs sharing a common pore; Figures 57–60, 64–67, 70, 72–75).

### Type material examined

All specimens from Argentina: Buenos Aires: Ensenada: Punta Lara, L. A. Pereira leg., 31



Figures 1–5. *Eurytion heurtaultae* sp. n. (male holotype; Argentina: Buenos Aires: Ensenada). (1) Left antenna, ventral. (2) Left antenna, dorsal. (3) Apical region of left a.a. XIV, ventral. (4) Left a.a. XIII, ventral (a, b: a, b type setae). (5) Left a.a. XIII, dorsal (a, b, c: a, b, c type setae). Scale bars: 0.3 mm (1, 2); 0.05 mm (3–5).

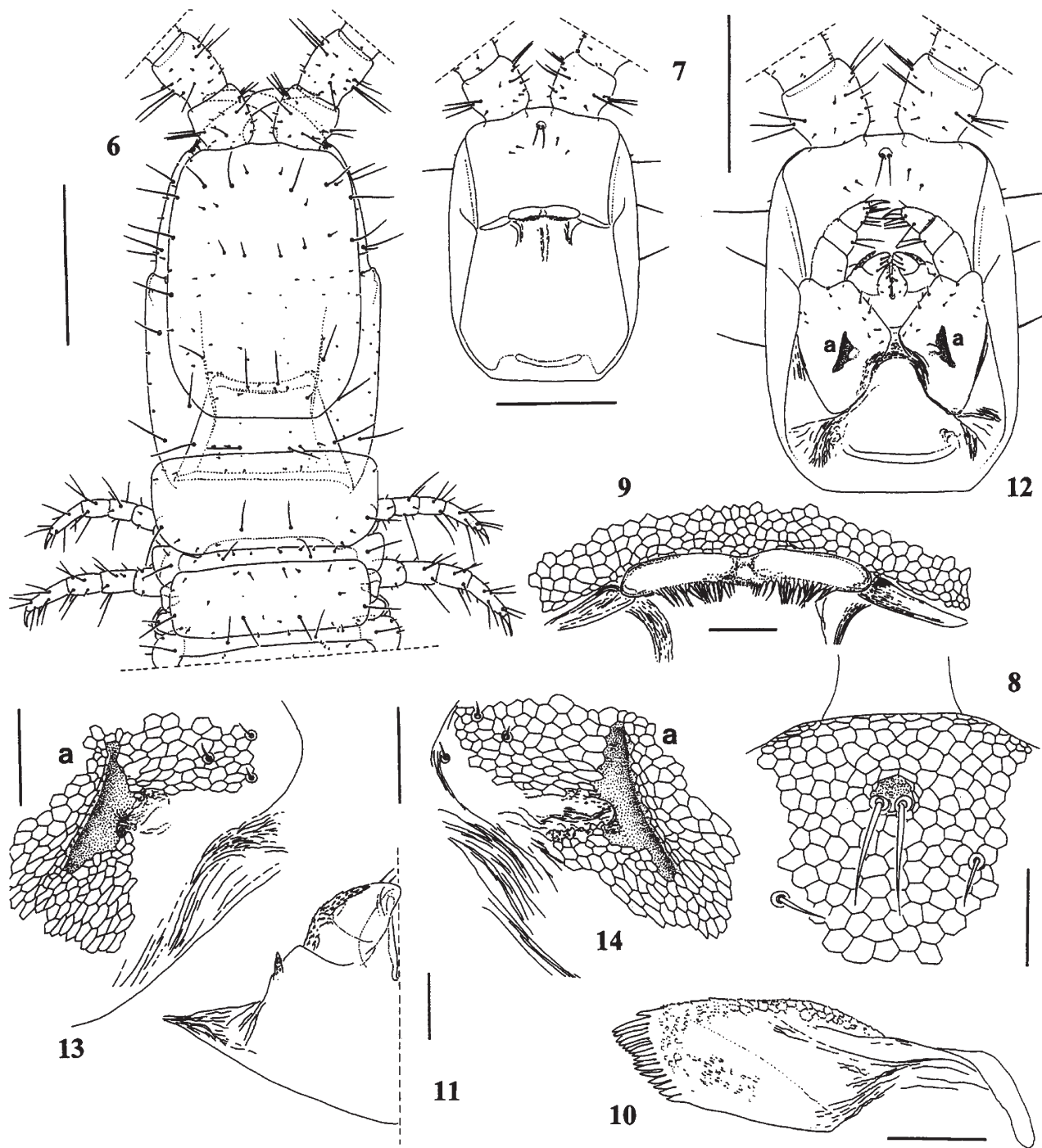
August 2001: holotype ♂, 47 p.l., b.l. 16 mm; paratype A (♀), 49 p.l., b.l. 16 mm; paratype B (♂), 47 p.l., b.l. 15 mm. Ibid., 30 September 2002: paratype C (♀), 49 p.l., b.l. 18 mm; paratype D (♀), 49 p.l., b.l. 20 mm; paratype E (♂), 49 p.l., b.l. 17 mm; paratype F (♂), 47 p.l., b.l. 16 mm; paratype G (♀), 49 p.l., b.l. 20 mm; paratype H (♀), 49 p.l., b.l. 16 mm. Ibid., 7 November 2002: paratype I (♀), 49 p.l., b.l. 25 mm; paratype J (♀), 49 p.l., b.l. 16 mm; paratype K (♂), 45 p.l., b.l. 14 mm. Ibid., 6 January 2003: paratype L (♂), 47 p.l., b.l. 16 mm.

#### Depository of types

MLP (holotype; paratypes A, B, I, J, L); MNHN, code M 346 (paratypes C, D, E); ZMUC (paratypes F, G, H, K).

#### Additional material examined

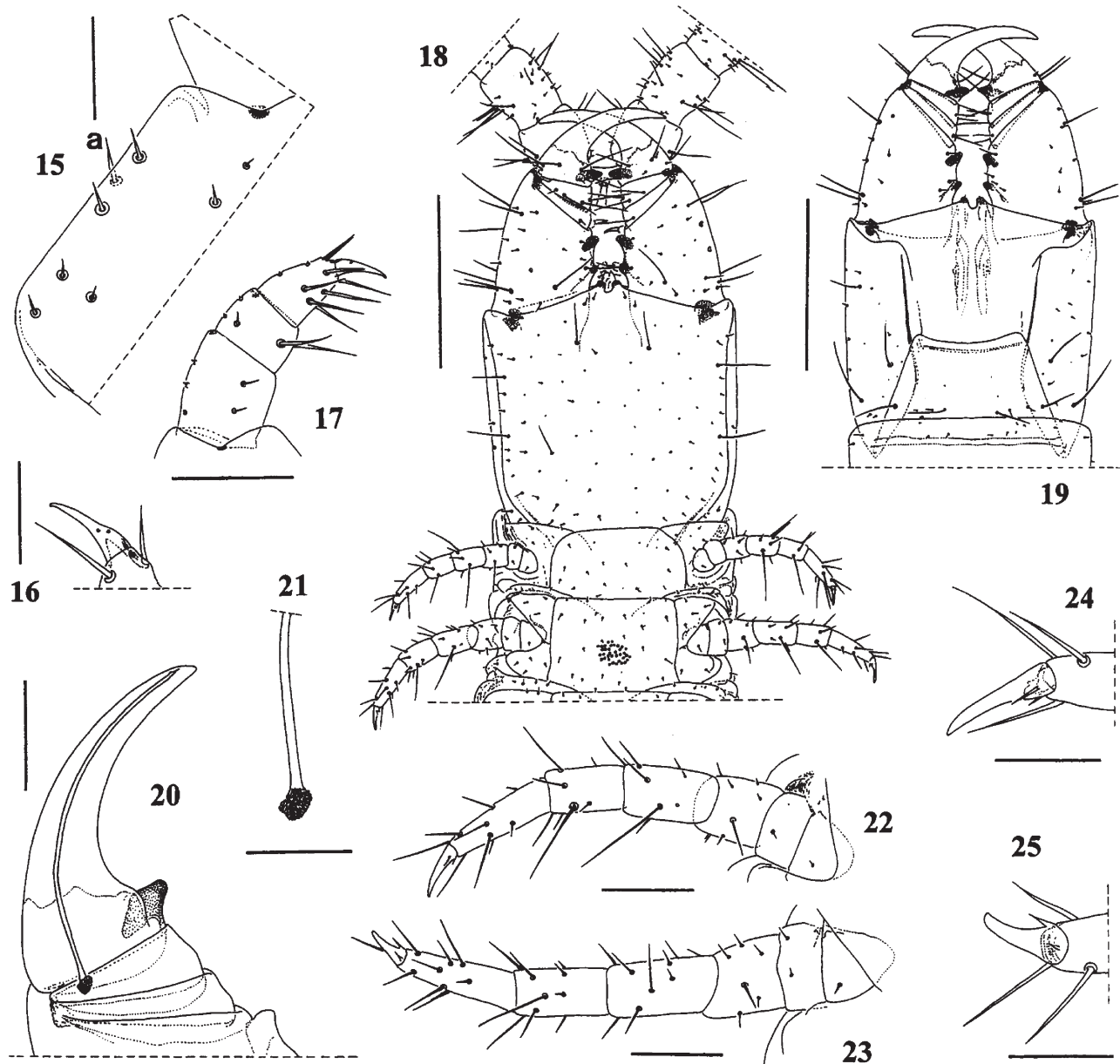
Argentina: Buenos Aires: Ensenada: Punta Lara, L. A. Pereira leg., 15 March 2001: 1♀, 49 p.l., b.l. 13 mm; 1♂ juv., with 2+2 coxal organs only, 47 p.l., b.l. 9 mm; 1 juv. (sex?) with 1+1 coxal organs only, 47 p.l., b.l. 7 mm (MLP). Ibid., 30 September 2002: 1♀ juv. with 2+2 coxal organs only, 49 p.l., b.l. 9 mm; 2 juv. (sex?) with 1+1 coxal organs only, 49 and 51 p.l., b.l. 7 mm; 1♀ fragmentary specimen (MLP). Ibid., 7 November 2002: 1♀ juv. with 2+2 coxal organs only, 49 p.l., b.l. 11 mm (MLP). Ibid., 6 January 2003: 1♀ (specimen “A”), 49 p.l., b.l. 20 mm, collected protecting 15 juveniles (sex?), all with 1+1 coxal organs only (10 with 47 p.l., three with 49 p.l. and two with 51 p.l., all with b.l. ca. 7 mm); 1♀, 49 p.l., b.l. 13 mm; 2♀♀, 49 p.l., b.l.



Figures 6–14. *Eurytion heurtaultae* sp. n. (male holotype; Argentina: Buenos Aires: Ensenada). (6) Anterior region of the body, showing cephalic shield, bases of antennae and first two leg-bearing segments, dorsal. (7) Cephalic capsule and bases of antennae, ventral. (8) Clypeal area. (9) Labrum. (10) Right mandible, dorsal. (11) Left first maxilla, dorsal. (12) Head with bases of antennae and first and second maxillae, ventral (“a”: sclerotized rim). (13) Detail of sclerotized rim (“a”) of coxosternum of right second maxilla, ventral. (14) Detail of sclerotized rim (“a”) of coxosternum of left second maxilla, ventral. Scale bars: 0.4 mm (6); 0.3 mm (7); 0.05 mm (8–11, 13–14); 0.3 mm (12).

14 mm; 1♂, 45 p.l., b.l. 11 mm; 1♂, 47 p.l., b.l. 14 mm; 1 juv. (sex?) with 1+1 coxal organs only, 49 p.l., b.l. 8 mm (MLP). Argentina: Buenos Aires: Berazategui: Parque Pereyra Iraola, 1 May 1981, L. A. Pereira leg.: 1♀, 49 p.l., b.l. 15 mm; 3♀♀, 51 p.l., b.l. 25, 29 and 29 mm; 1♀ juv. (with 2+3 coxal

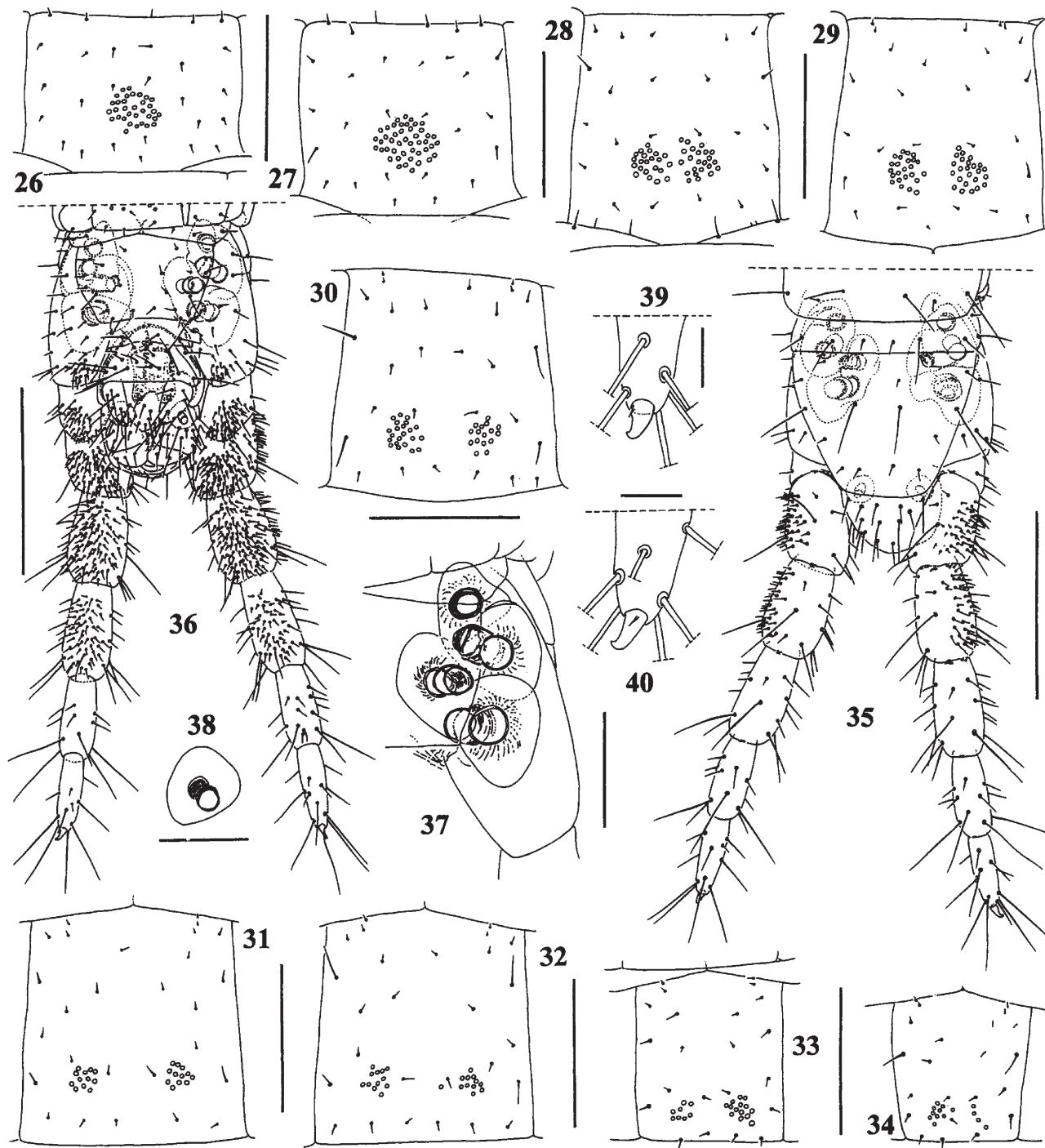
organs only), 51 p.l., b.l. 13 mm; 1♀ juv. (with 2+2 coxal organs only), 49 p.l., b.l. 13 mm; 12♀♀, 53 p.l., b.l. 16, 17, 17, 18, 18, 19, 20, 27, 28, 28, 29 and 30 mm; 1♂, 47 p.l., b.l. 18 mm; 2♂♂ juv. (with 2+2 coxal organs only), 49 p.l., b.l. 12 and 13 mm; 10♂♂, 49 p.l., b.l. 15, 15, 16, 16, 16, 18, 18, 18, 18



Figures 15–25. *Eurytion heurtaultae* sp. n. (male holotype; Argentina: Buenos Aires: Ensenada). (15) Antero-internal border of coxosternum of left second maxilla, ventral (“a”: dorsal seta). (16) Claw of left second maxilla, ventral. (17) Telopodite of left second maxilla, dorsal. (18) Anterior region of the body showing forcipular segment, bases of antennae and first two leg-bearing segments, ventral. (19) Forcipular segment, dorsal. (20) Detail of poison gland in right forcipular telopodite, ventral. (21) Detail of calyx of poison gland in right forcipular telopodite, ventral. (22) Right leg II, ventral. (23) Right leg XI, ventral. (24) Claw of right leg II, anterior view. (25) Claw of right leg XI, postero-ventral. Scale bars: 0.05 mm (15, 16, 21, 24, 25); 0.1 mm (17, 20, 22, 23); 0.4 mm (18, 19).

and 20 mm (MLP). Argentina: Buenos Aires: La Plata: M. B. Gonnet, L. A. Pereira leg., 26 July 1986: 1♀, 51 p.l., b.l. 26 mm; 1♂ juv. (with 2+2 coxal organs only), 49 p.l., b.l. 11 mm (MLP). Ibid., 10 January 1987: 1♀ juv. (with 2+2 coxal organs only) 53 p.l., b.l. 14 mm; 1 juv. (sex?) (with 1+1 coxal organs only), 49 p.l., b.l. 8 mm; 2 juv. (sex?) (with 1+1 coxal organs only), 53 p.l., b.l. 9 and 11 mm (MLP). Ibid., 2 February 1987: 2♀♀, 53 p.l., b.l. 17 and 27 mm (MLP). Argentina: Córdoba: Punilla: La Cumbre, 6 December 1991, L. A. Pereira leg.: 1♀ juv. (with 3+2 coxal organs), 51 p.l., b.l. 12 mm;

7♀♀, 51 p.l., b.l. 17, 18, 20, 20, 22, 23 and 23 mm; 2♀♀, 53 p.l., b.l. 15 and 24 mm; 1♂ juv. (with 3+4 coxal organs), 47 p.l., b.l. 11 mm; 3♂♂, 47 p.l., b.l. 15, 17 and 20 mm; 1♂ juv. (with 2+2 coxal organs only), 49 p.l., b.l. 10 mm; 7♂♂, 49 p.l., b.l. 16, 16, 17, 17, 18 and 19 mm (MLP). Argentina: Santa Fe: Las Colonias: Esperanza, 9 March 1986, E. Kruse leg.: 1 juv. (sex?) with 1+1 coxal organs only, 49 p.l., b.l. 9 mm; 2♂♂, 49 p.l., b.l. 14 and 19 mm (MLP). Uruguay: Lavalleja: 9 km S of Minas (Parque U.T.E.), L. A. de Gambardella leg., 26 June 1966: 1♂, 51 p.l., b.l. 18 mm; km 115 of road



Figures 26–40. *Eurytion heurtaultae* sp. n. (male holotype; Argentina: Buenos Aires: Ensenada). (26–34) Sterna II, VII, XIII, XIV, XV, XXV, XXXV, XLV, XLVI. (35) Last leg-bearing segment and terminal segments, dorsal. (36) Last leg-bearing segment and terminal segments, ventral. (37) Left coxal organs, ventral. (38) Left anal organ, ventral. (39) Detail of distal end of last podomere of left last leg, ventral. (40) Detail of distal end of last podomere of right last leg, ventral. Scale bars: 0.2 mm (26–34); 0.3 mm (35, 36); 0.1 mm (37); 0.05 mm (38); 0.03 mm (39, 40).

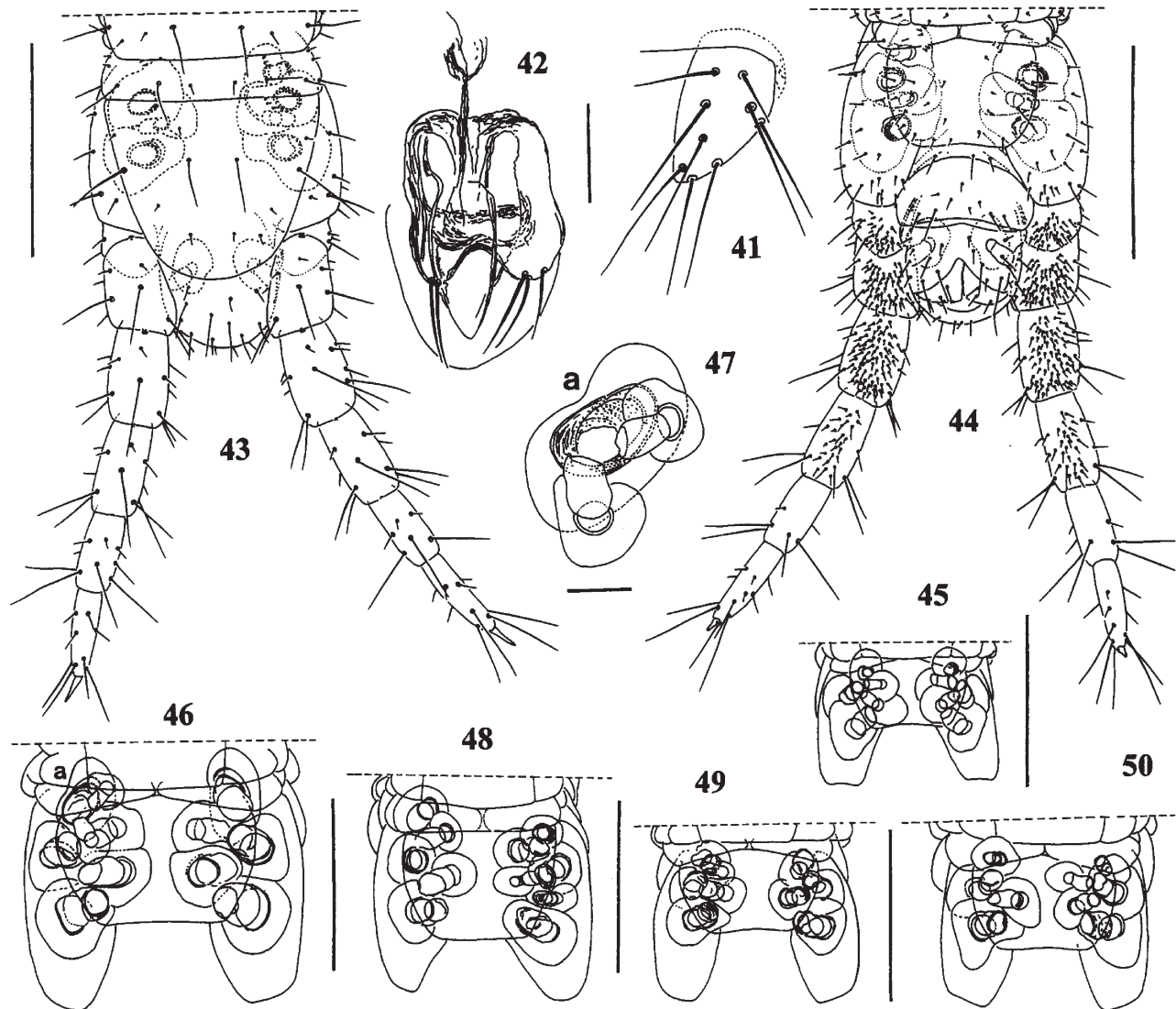
no. 8 (Fabrica de Portland), under stone, F. Achaval leg., 26 June 1966: 1♂, 51 p.l., b.l. 15 mm (FCE).

*Description*

*Male holotype.* Forty-seven pairs of legs, body length 16 mm, maximum body width 0.5 mm; length of

cephalic shield 0.65 mm; width of forcipular coxosternum 0.55 mm. Ground colour (of preserved specimen in alcohol) yellowish, cephalic shield and forcipular segment darker (pale ochreous).

Antennae: relatively short, ca. 2.6 times as long as the cephalic plate, distally only slightly attenuate, all



Figures 41–50. (41, 42) *Eurytion heurtaultae* sp. n. (male holotype; Argentina: Buenos Aires: Ensenada): (41) left gonopod, ventral; (42) penis, dorsal. (43, 44) *Eurytion heurtaultae* sp. n. (female paratype “A”; Argentina: Buenos Aires: Ensenada): (43) last leg-bearing segment and terminal segments, dorsal; (44) last leg-bearing segment and terminal segments, ventral. (45) *Eurytion heurtaultae* sp. n. (male paratype “B”; Argentina: Buenos Aires: Ensenada): coxal organs, ventral. (46, 47) *Eurytion heurtaultae* sp. n. (female paratype “I”; Argentina: Buenos Aires: Ensenada): (46) coxal organs, ventral (“a”: group of three coxal organs, opening separately); (47) detail of “a” in Figure 46. (48) *Eurytion heurtaultae* sp. n. (female paratype “J”; Argentina: Buenos Aires: Ensenada): coxal organs, ventral. (49) *Eurytion heurtaultae* sp. n. (male paratype “L”; Argentina: Buenos Aires: Ensenada): coxal organs, ventral. (50) *Eurytion heurtaultae* sp. n. (female, specimen “A”; Argentina: Buenos Aires: Ensenada): coxal organs, ventral. Scale bars: 0.05 mm (41, 42, 47); 0.3 mm (43–46, 48–50).

articles longer than wide. Setae on a.a. I–VI of different lengths and few in number; those of remaining articles progressively shorter and more numerous towards the tip of the appendage (Figures 1, 2). Terminal antennal article with ca. nine claviform sensilla on the external border and ca. 10 on the internal border. Distal end of this a.a. with ca. four very small sensilla, apparently not split apically (Figure 3). Dorsal and ventral surface of a.a. II, V, IX and XIII (Figures 4, 5) with very small specialized sensilla. On the ventral side these sensilla are restricted to an internal latero-apical area and are represented by two different types: a and b. Type a

setae are very thin and not divided apically, type b setae are very similar to those of the apex of the terminal article but with two very small sub-apical branches (Figure 4: a, b). Specialized sensilla on dorsal side are restricted to an external latero-apical area and are represented by three different types: a and b similar to a and b of ventral side; type c setae similar to type b, undivided apically and darker (brownish ochre) in colour (Figure 5: a, b, c). In both ventral and dorsal side, type b setae on a.a. II and V shorter than those on a.a. IX and XIII. Distribution of type a, b and c sensilla as in Table I.

Table I. Number of type a, b and c setae on antennal articles II, V, IX and XIII in the male holotype of *Eurytion heurtaultae* sp. n.

	Ventral			Dorsal			Figures
	a	b	c	a	b	c	
II	–	1	–	–	1	–	
V	1	1	–	1	1	–	
IX	1	1	–	1	1	2	
XIII	1	1	–	1	2	1	4, 5

Cephalic plate: nearly rectangular but sides curved, distinctly longer than wide (ratio 1.5:1). Shape and chaetotaxy as in Figure 6.

Clypeus: with two setae located on the clypeal area and 2+2 setae posterior to it, the remaining clypeal surface without setae (Figure 7). Clypeal area relatively small, minutely punctate or granulate, not areolate (Figures 7, 8).

Labrum: mid-piece and sclerotized, with five relatively short and sharply pointed teeth. Side-pieces with 16+18 long hyaline filaments (Figure 9).

Mandible: pectinate lamella with ca. 17 hyaline teeth with shape as in Figure 10.

First maxillae: with small lappets on coxosternum; telopodites with lappets a little shorter than the telopodite (Figure 11). Coxosternum without setae; median projections of coxosternum subtriangular, and provided with 2+1 large setae and 2+2 small sensilla. Article II of telopodite with 3+3 ventral setae, dorsal surface apparently without sensilla (Figures 11, 12).

Second maxillae: coxites with 11+10 ventral setae and 1+1 dorsal setae (Figures 12, 15), medially joined by a very narrow, hyaline and finely areolate membranous isthmus only (Figure 12). Sclerotized rim slightly elongated with anterior and posterior portions, in respect to the metameric pore, similar in size, with the external margin accompanied by a very narrow and finely areolate hyaline strip (Figures 12–14). Apical claw of telopodite, curved internally at the tip (Figure 16). Chaetotaxy of coxosternum and telopodites as in Figures 12, 15–17.

Forcipular segment: when closed, the telopodites reach the level of the anterior margin of the head or project slightly beyond. Forcipular tergum trapeziform with anterior and posterior margins, respectively, covered by the cephalic plate and the tergum of first leg-bearing segment (Figure 6); chaetotaxy represented by an irregular transverse row of eight setae on the middle and a very few additional smaller setae dispersed on the remaining surface (Figures 6, 19). Coxosternum without chitinous lines, middle part of anterior border with two denticles, ochreous in colour.

Telopodites: trochanteropraefemur with two denticles, both deeply pigmented, proximal denticle

shorter than the distal (Figures 18, 19). Femur and tibia without denticles. Tarsungulum basally with a deeply pigmented denticle; dorsal and ventral edge of the unguular blade not serrulate. Calyx of poison gland subtriangular (Figures 20, 21). Chaetotaxy of coxosternum and telopodites as in Figures 18, 19.

Walking legs: first pair shorter than the second (ratio ca. 0.8:1). Femur and tibia of legs I–VIII each with a very long ventral seta (Figure 22). Remaining legs with shorter setae and similar chaetotaxy (Figure 23). Claws ventrally with two basal parungues, the anterior larger than the posterior (Figures 24, 25).

Sterna: pore fields present from the second to the penultimate sternum. Fields undivided on sterna II–XIII and divided in two subsymmetrical areas in all the remaining ones. Form of fields changing along the trunk as in Figures 26–34. Number of pores on selected sterna: on sternum II, 33 pores; on VII, 45; on XIII, 45; on XIV, 24+24; on XV, 22+16; on XXV, 12+12; on XXXV, 12+12; on XLV, 8+14; on XLVI, 10+4.

Last leg-bearing segment: without pleurites at the sides of praetergum. Praesternum divided along the sagittal plane; shape and chaetotaxy of tergum and sternum as in Figures 35, 36. Coxopleura apparently not protruding at their distal ventral ends, setae numerous on the distal ventral area, the remaining surface with few larger setae. Each coxopleuron with four single coxal organs opening independently on the membrane between coxopleuron and sternum, partially covered by the latter (Figures 36, 37). Last legs with seven podomeres, form and chaetotaxy as in Figures 35, 36. Praetarsus unguiform, relatively smaller than those of the preceding legs, with a single internal parunguis basally (Figures 39, 40).

Terminal segments: intermediate tergum with posterior margin convex, intermediate sternum with posterior margin slightly concave. First genital sternum with posterior border nearly straight. Gonopods uniarticulate with ca. nine setae (Figure 41); penis dorsally with 2+3 apical setae (Figure 42). Anal organs present (Figures 35, 36, 38).

*Female (paratype A)*. Forty-nine pairs of legs, body length 16 mm, maximum body width 0.5 mm.

All features similar to those in the male except for the shape and pilosity of the last leg-bearing segment and terminal segments.

Last leg-bearing segment: form and chaetotaxy of tergum and sternum as in Figures 43, 44. Coxopleura apparently not protruding at their distal ventral ends, with ca. six to eight small setae on the distal internal edge, the remaining surface with few larger setae. Left coxopleuron with three coxal organs, right coxopleuron with four (Figures 43,

44). Podomeres of terminal legs with shape and chaetotaxy as in Figures 43 and 44.

Terminal segments: intermediate tergum with posterior margin convex, intermediate sternum with posterior margin concave, first genital sternum with posterior margin slightly concave. Gonopods uniaarticulate and very poorly developed (Figure 44).

*Remarks.* Most specimens examined were reproductive males with tubula seminifera full of mature spermatozoa and females with spermathecae containing spermatozoa.

#### Variation

Maximum body length in adult males 20 mm, in adult females 30 mm.

Pairs of legs: 45, 47, 49 or 51 in the males and 49, 51 or 53 in the females.

Chaetotaxy of coxosternum of first maxillae: without setae or with one to three small setae.

Pore fields: undivided pore fields of anterior third of the body extend from sternum II to XIII–XVI; divided fields from XIV–XVII to penultimate.

Coxal organs: adult specimens showed the following numbers: 3+4; 4+3; 4+4; 4+5; 5+4; 5+5; 5+6; 6+4; 6+5; 6+6; 6+7; 7+5; 7+8 (Figures 35–37, 43–50), the largest specimens have the largest numbers of coxal organs. Organs always opening separately. In female paratype “I”, anterior part of right coxopleuron with three coxal organs distributed very close one to each other but not fused (Figures 46, 47).

Non-significant variation was detected in other characters.

All specimens examined have 1+1 anal organs.

*Remarks.* The different proportions of males with 45, 47 and 49 pairs of legs and females with 49, 51 and 53 pairs of legs, taken in each collecting locality from Argentina, are summarized in Table II.

A larger number of specimens should be collected in these and other localities in order to test if the

mentioned differences are due to sampling, are caused by different environmental conditions in the collecting sites or are just populational variations independent of the environment.

#### Etymology

This species is named in memory of our late colleague Jacqueline Heurtault (1936–2000) as a personal homage and fond remembrance for the kindness and help she always provided during my several stays at the Laboratoire de Zoologie (Arthropodes), Muséum national d’Histoire naturelle, Paris, France.

*Eurytion tenebrosus* (Meinert, 1886) (Figures 51–75)

*Geophilus tenebrosus* Meinert, 1886, p. 146–147.

*Brachygeophilus tenebrosus*: Attems, 1929, p. 192.

*Eurytion tenebrosus*: Crabill, 1968, p. 229.

*Eurytion tenebrosus*: Foddai, Pereira & Minelli, 2000, p. 75.

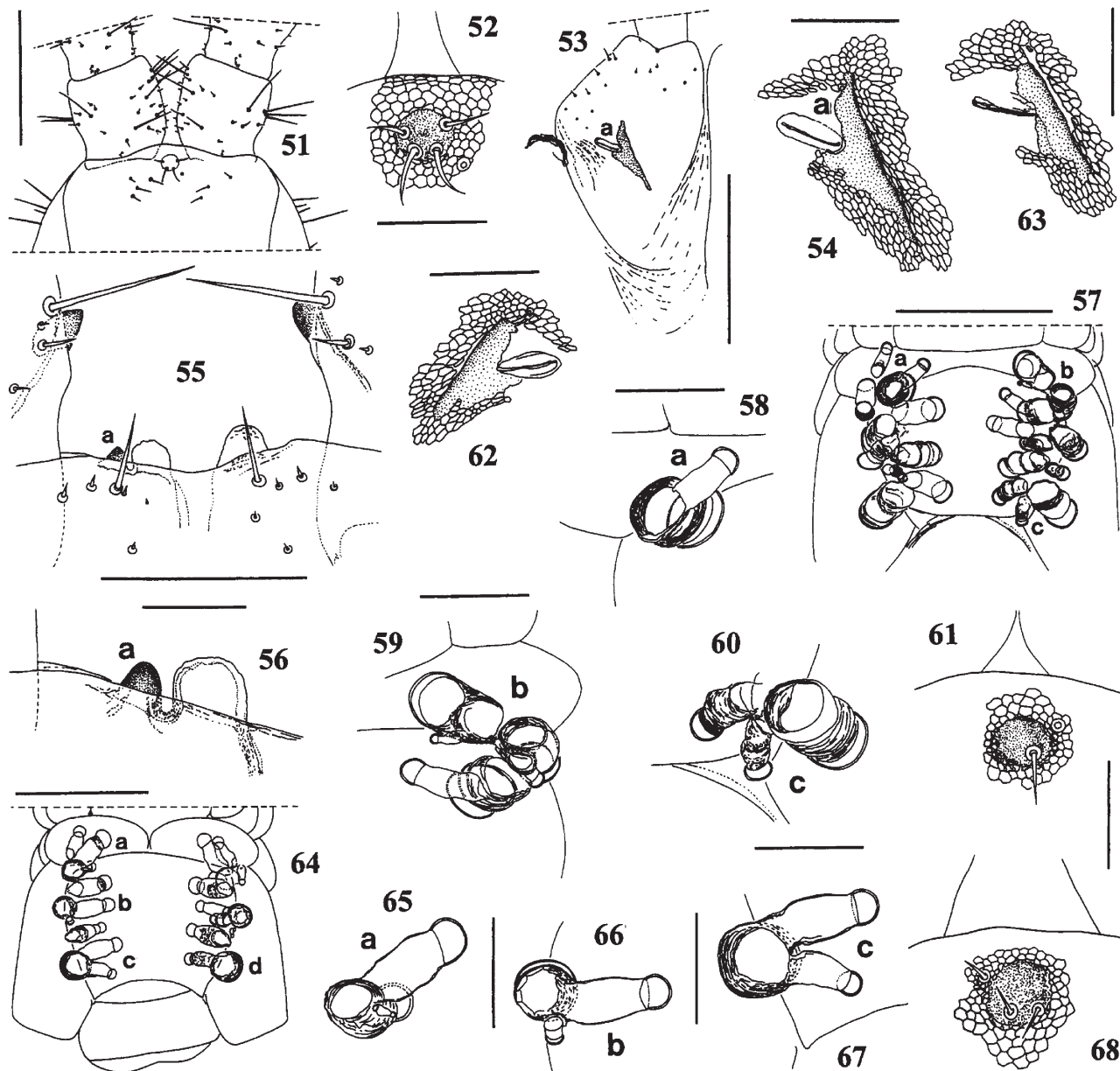
*Eurytion tenebrosus*: Pereira, 2005, p. 2.

#### Diagnosis

Am *Eurytion* species with lappets on coxosternum of first maxillae; anal organs present and circumforaminal rim of the second maxillae elongated, with the external margin accompanied by a very narrow and finely areolate hyaline strip. Among the Neotropical species currently included in the genus *Eurytion*, only the present species and *Eurytion heurtaultae* sp. n. share these three combined traits. *Eurytion tenebrosus* can be differentiated from the second by means of the following characters (the corresponding ones in *Eurytion heurtaultae* sp. n. are given in parentheses): maximum body length 40 mm (30 mm); maximum body width 1.10 mm (0.8 mm); female with 57 or 59 and male with 55 pairs of legs (female with 49, 51 or 53 and male with 45, 47, 49 or 51 pairs of legs); maximum length of cephalic plate 1.20 mm (1.0 mm); maximum width of forcipular coxosternum 1.10 mm (0.9 mm);

Table II. Number of males with 45, 47 and 49 pairs of legs and females with 49, 51 and 53 pairs of legs of *Eurytion heurtaultae* sp. n., taken in the collecting localities from Argentina.

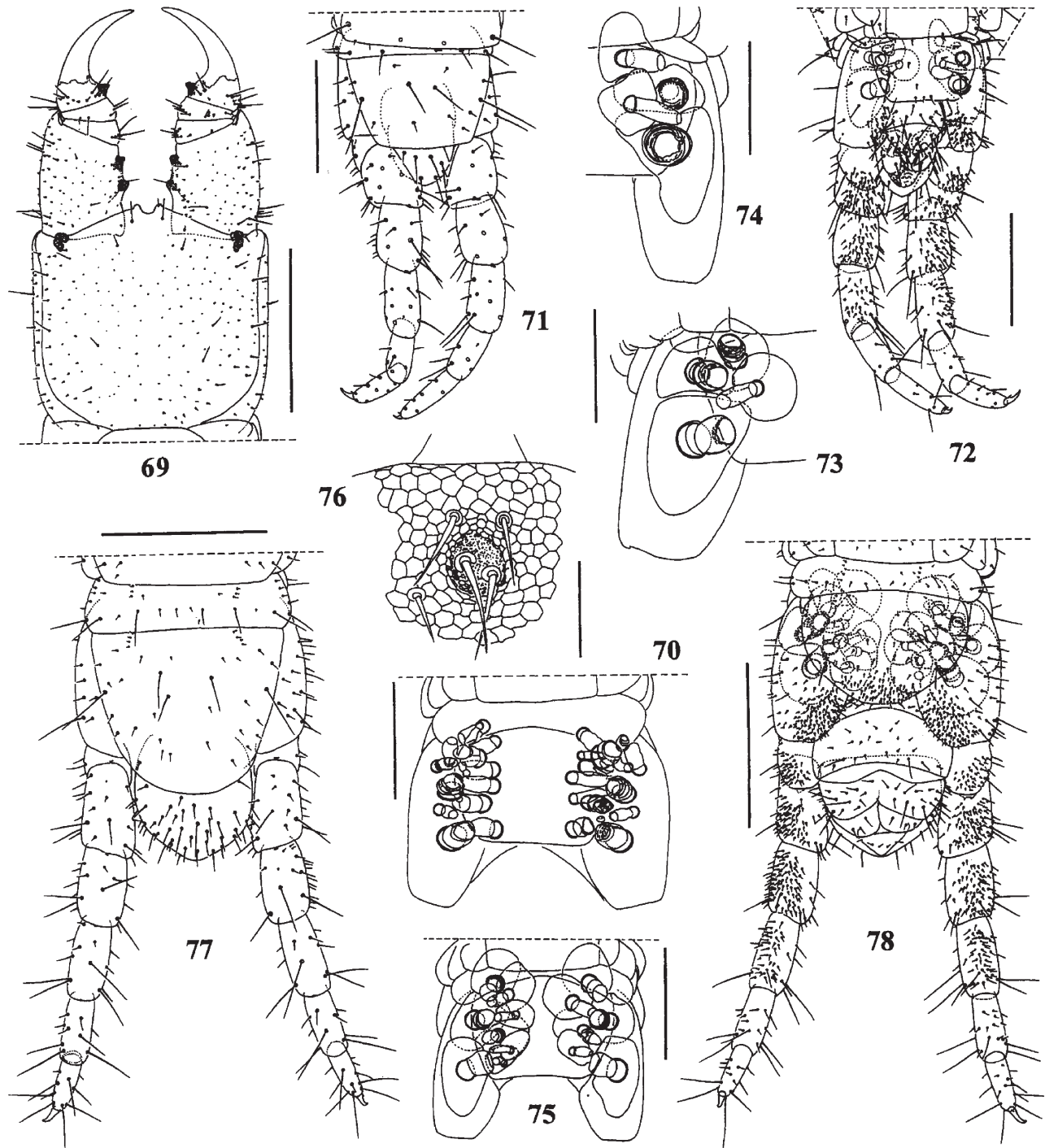
Pairs of legs	Punta Lara (Buenos Aires Province)		Parque Pereyra Iraola (Buenos Aires Province)		M. B. Gonnet (Buenos Aires Province)		La Cumbre (Córdoba Province)		Esperanza (Santa Fe Province)	
	♂♂ (9)	♀♀ (15)	♂♂ (13)	♀♀ (18)	♂♂ (1)	♀♀ (4)	♂♂ (12)	♀♀ (10)	♂♂ (2)	♀♀ (0)
45	2									
47	6		1				4			
49	1	14	12	1	1		8		2	
51		1		4		1		8		
53				13		3		2		



Figures 51–68. (51–60) *Eurytion tenebrosus* (Meinert) (female lectotype; Argentina: Formosa: Riacho de Oro): (51) clypeus and bases of antennae; (52) clypeal area; (53) coxosternum of left second maxilla, ventral (“a”: sclerotized rim); (54) detail of sclerotized rim (“a”) in previous figure; (55) middle part of anterior border of forcipular coxosternum showing a teratological extra tooth (“a”); (56) detail of “a” in previous figure; (57) coxal organs, ventral (“a”: fusion of two coxal organs; “b”: three groups of coxal organs, each one formed by the fusion of two organs; “c”: group of three coxal organs all opening separately); (58) detail of “a” in Figure 57; (59) detail of “b” in Figure 57; (60) detail of “c” in Figure 57. (61–67) *Eurytion tenebrosus* (Meinert) (female paralectotype “A”; Argentina: Formosa: Riacho de Oro): (61) clypeal area; (62) sclerotized rim of coxosternum of right second maxilla, ventral; (63) sclerotized rim of coxosternum of left second maxilla, ventral; (64) coxal organs, ventral (“a”, “b”: fusion of two coxal organs, a third small organ opening separately, “c”: fusion of three coxal organs, “d”: fusion of two coxal organs); (65) detail of “a” in Figure 64; (66) detail of “b” in Figure 64; (67) detail of “c” in Figure 64. (68) *Eurytion tenebrosus* (Meinert) (female paralectotype “B”; Argentina: Formosa: Riacho de Oro): clypeal area. (The figures of coxal organs only show internal chitinous structure.) Scale bars: 0.4 mm (51, 53); 0.1 mm (52, 54, 58–63, 65–68); 0.2 mm (55); 0.05 mm (56); 0.3 mm (57, 64).

ground colour brownish yellow, cephalic shield and forcipular segment pale ferrugineus (ground colour yellowish, cephalic shield and forcipular segment pale ochreous); dorsal side of a.a. IX and XIII with ca. five to six type c setae (with ca. one to three type c setae). Aspect and relative size of clypeal

area as in Figures 51, 52, 61, 68 (as in Figures 7, 8, 12); second maxillary sclerotized rim elongated, with posterior portion longer than the anterior in respect to the metameric pore, as in Figures 53, 54, 62, 63 (slightly elongated, with anterior and posterior portions subequal in size, Figures 12–14); each



Figures 69–78. (69, 70) *Eurytion tenebrosus* (Meinert) (female paralectotype “B”; Argentina: Formosa: Riacho de Oro): (69) forcipular segment, ventral; (70) coxal organs, ventral (only internal chitinous structure shown). (71–74) *Eurytion tenebrosus* (Meinert) (male paralectotype “C”; Argentina: Formosa: Riacho de Oro): (71) last leg-bearing segment and terminal segments, dorsal; (72) last leg-bearing segment and terminal segments, ventral; (73) right coxal organs, ventral; (74) left coxal organs, ventral. (75) *Eurytion tenebrosus* (Meinert) (female paralectotype “E”; Argentina: Formosa: Riacho de Oro): coxal organs, ventral. (76–78) *Eurytion yungarum* Pereira (female; Argentina: Jujuy: Ledesma: Parque Nacional Calilegua): (76) clypeal area; (77) last leg-bearing segment and terminal segments, dorsal; (78) last leg-bearing segment and terminal segments, ventral. Scale bars: 0.8 mm (69); 0.3 mm (70, 77, 78); 0.2 mm (71, 72, 75); 0.1 mm (73, 74); 0.05 mm (76).

coxopleuron with a maximum of ca. 16 coxal organs, opening separately, or, in large specimens, some of them opening separately and others arranged in ca. three irregular groups, each formed by the fusion of

two to four organs sharing a common pore, as in Figures 57–60, 64–67, 70, 72–75 (with a maximum of ca. eight coxal organs, all opening separately; Figures 35–37, 43–50).

*Type material examined*

Female lectotype with 57 p.l., b.l. 34 mm, several parts (head capsule, mouth parts, forcipular segment, leg-bearing segments I–XVI and leg-bearing segments LI–LVII followed by terminal segments) in a permanent slide, but leg-bearing segments XVII–L in alcohol. Female paralectotype “A” with 57 p.l., b.l. 37 mm, several parts (head capsule with mouth parts not dissected, forcipular segment followed by leg-bearing segments I–VII and leg-bearing segments LI–LVII followed by terminal segments) in a permanent slide, but leg-bearing segments VIII–L in alcohol. Female paralectotype “B” with 59 p.l., b.l. 40 mm, in alcohol. Male paralectotype “C” with 55 p.l., b.l. 17 mm, in alcohol. Female paralectotype “D” with 57 p.l., b.l. 36 mm (in alcohol). Female paralectotype “E” with 59 p.l., b.l. 24 mm, in alcohol. All specimens from Argentina: Formosa: Riacho de Oro, 27°03’S, 58°33’W; labelled as *Geophilus tenebrosus* Meinert (ZMUC).

*Remarks.* The syntypical series was revised by R. E. Crabill; according to his handwritten labels the “lectotype” and “paratypes A, B, C, D, E” (“paralectotypes” in the present account) were designated by him on 28 April 1960. The same author (1968) stated that this series comprised five specimens, but it comprises six.

The slides were made by Crabill with Hoyer’s mounting medium. Due to its action, the forcipular telopodites of lectotype and paralectotype “A” as well as the antennae of this last have their articles inflated and have burst, and the forcipular coxosternum of the paralectotype “A” is inflated but has not burst. Other structures mounted on slides are well preserved.

*Type locality*

Argentina: Formosa: Riacho de Oro, 27°03’S, 58°33’W.

*Known range.* Argentina: Formosa: Riacho de Oro; Uruguay: Treinta y Tres: Santa Clara de Olimar.

*Remarks.* Meinert (1886) mentions as type locality “Riacho del Oro” but the correct spelling is Riacho de Oro. Crabill (1968) assigns the type locality to the “State of Gran Chaco” but this locality corresponds to the Province of Formosa.

*Additional information*

To complement Meinert’s (1886) original description and the description by Crabill (1968) based on a specimen from Santa Clara de Olimar (Uruguay),

the following information is provided on the basis of the type specimens.

*Female lectotype.* Maximum body width 0.85 mm; length of cephalic shield 1.18 mm; width of forcipular coxosternum 0.90 mm. Specialized sensilla on a.a. II, V, IX and XIII similar to those present in *E. heurtaaultae* sp. n. with number and distribution as in Table III. Clypeal area with aspect, relative size and pilosity as in Figures 51, 52; distribution of clypeal setae as in Figure 51. Chaetotaxy of coxosternum of left second maxilla as in Figure 53; form and relative size of sclerotized rim on coxosternum of left second maxilla as in Figures 53, 54. Pore fields single on sterna II–XV, divided on two subsymmetrical areas on sterna XVI to penultimate; last leg-bearing segment with right coxopleuron provided with 11 coxal organs, nine opening separately and two fused in an anterior group (“a”; Figures 57, 58); left coxopleuron with 14 coxal organs, six of them arranged in three anterior groups of two organs each (“b”; Figures 57, 59), remaining eight organs opening separately (three of these very close together) (“c”; Figures 57, 60).

Anterior border of forcipular coxosternum with an abnormal condition: on its right side, there is a small tooth, similar to the teeth on the internal border of the forcipular trochanteropraefemur (“a”; Figures 55, 56).

*Female paralectotype “A”.* Maximum body width 0.95 mm; length of cephalic shield 1.03 mm; clypeal area as in Figure 61; form and relative size of second maxillary sclerotized rim as in Figures 62, 63; last leg-bearing segment with 12 coxal organs on both coxopleura (Figure 64). Right coxopleuron with three groups of organs, the anterior (“a”; Figures 64, 65) and the middle one (“b”; Figures 64, 66) formed by the fusion of two organs (in both places, a third small organ opens separately nearby); posterior group (“c”; Figures 64, 67) formed by the fusion of three organs. Remaining three coxal organs opening separately (Figure 64). Left coxopleuron with a posterior group of two fused

Table III. Number of type a, b and c setae on antennal articles II, V, IX and XIII in the female lectotype of *Eurytion tenebrosus* (Meinert, 1886).

	Ventral		Dorsal		
	a	b	a	b	c
II	–	2	–	3	–
V	1	2	1	3	–
IX	1	2	1	4	5
XIII	1	2	1	2	6

coxal organs (d; Figure 64), remaining 10 organs opening separately (Figure 64).

*Female paralectotype "B"*. Maximum body width 1.10 mm; length of cephalic shield 1.18 mm; width of forcipular coxosternum 1.09 mm; clypeal area as in Figure 68. Form and chaetotaxy of forcipular segment as in Figure 69. Coxopleura of last leg-bearing segment with ca. 14+16 coxal organs mostly distributed on anterior part, where some organs open separately and others are fused as described above; middle and posterior parts with organs more dispersed and opening separately (Figure 70).

*Male paralectotype "C"*. Maximum body width 0.5 mm; length of cephalic shield 0.6 mm; width of forcipular coxosternum 0.55 mm. Coxopleura with 4+4 coxal organs opening separately (Figures 72–74). Last leg-bearing segment and terminal segments as in Figures 71, 72.

*Female paralectotype "D"*. Maximum body width 0.95 mm; length of cephalic shield 1.08 mm; width of forcipular coxosternum 0.95 mm. Coxopleura of last leg-bearing segment with ca. 15+14 coxal organs, the majority of them concentrated on anterior part, where some organs open separately and others are fused as described above; remaining coxal organs dispersed on middle and posterior portions of coxopleura, most of them opening separately.

*Female paralectotype "E"*. Maximum body width 0.6 mm; length of cephalic shield 0.80 mm; width of forcipular segment 0.6 mm. Coxopleura of last leg-bearing segment with 8+6 coxal organs all opening separately and distributed as in Figure 75.

*Remarks.* Females with spermathecae at level of segments LIV–LV in lectotype and paralectotype "A", LV–LVI in paralectotype "D", LVI–LVII in paralectotype "B" and LVII in paralectotype "E". The spermathecae are full of spermatozoa in lectotype and paralectotypes "A", "B" and "D" (which is an indication of the adult condition of these specimens). Paralectotype "E" apparently without spermatozoa within spermathecae (subadult?).

The male paralectotype "C" has mature spermatozoa in the anterior part of the tubula seminifera; despite of the small size of the specimen and the low number of coxal organs, this presence would confirm the adult condition of the specimen (possibly a "maturus junior"?). All characters, except morphology of last leg-bearing segment and terminal segments similar to those in the accompanying females, which would indicate its conspecificity with them.

All specimens have 1+1 anal organs.

For the non-type specimen he described from Uruguay, Crabill (1968, p. 229) wrote: "Each coxopleuron with three gland complexes, each heterogeneous in the form of a vague rosette". The arrangement of the coxal organs in the six specimens of the type series revised here does not agree exactly with this, nevertheless they are evidently conspecific: the term "vague rosette" by Crabill apparently refers to the fact that some coxal organs are arranged in ca. three irregular groups, each formed by the fusion of two to four organs sharing a common pore, together with a few organs, opening separately. This particular distribution of the coxal organs occurs in the largest specimens of the type series, which also have the largest numbers of coxal organs (Figures 57–60, 64–67, 70). In the smallest specimens of the series (male paralectotype "C", Figures 72–74; female paralectotype "E", Figure 75) all coxal organs open separately.

*Eurytion yungarum* Pereira, 2005 (Figures 76–86)  
*Eurytion yungarum* Pereira, 2005, p. 3.

#### *Material examined*

Female with spermathecae full of spermatozoa, 53 p.l., b.l. 24 mm. Argentina: Province of Jujuy: Ledesma: Parque Nacional Calilegua (entry area), 23–24 September 1995, M. Ramirez, P. Goloboff and C. Szumik, leg. (MLP).

#### *Known range*

Argentina: Jujuy: Ledesma: ca. 50 km W of Fraile Pintado; Parque Nacional Calilegua.

#### *Remarks*

This species was described on the basis of a single specimen (male holotype) by Pereira (2005, p. 3).

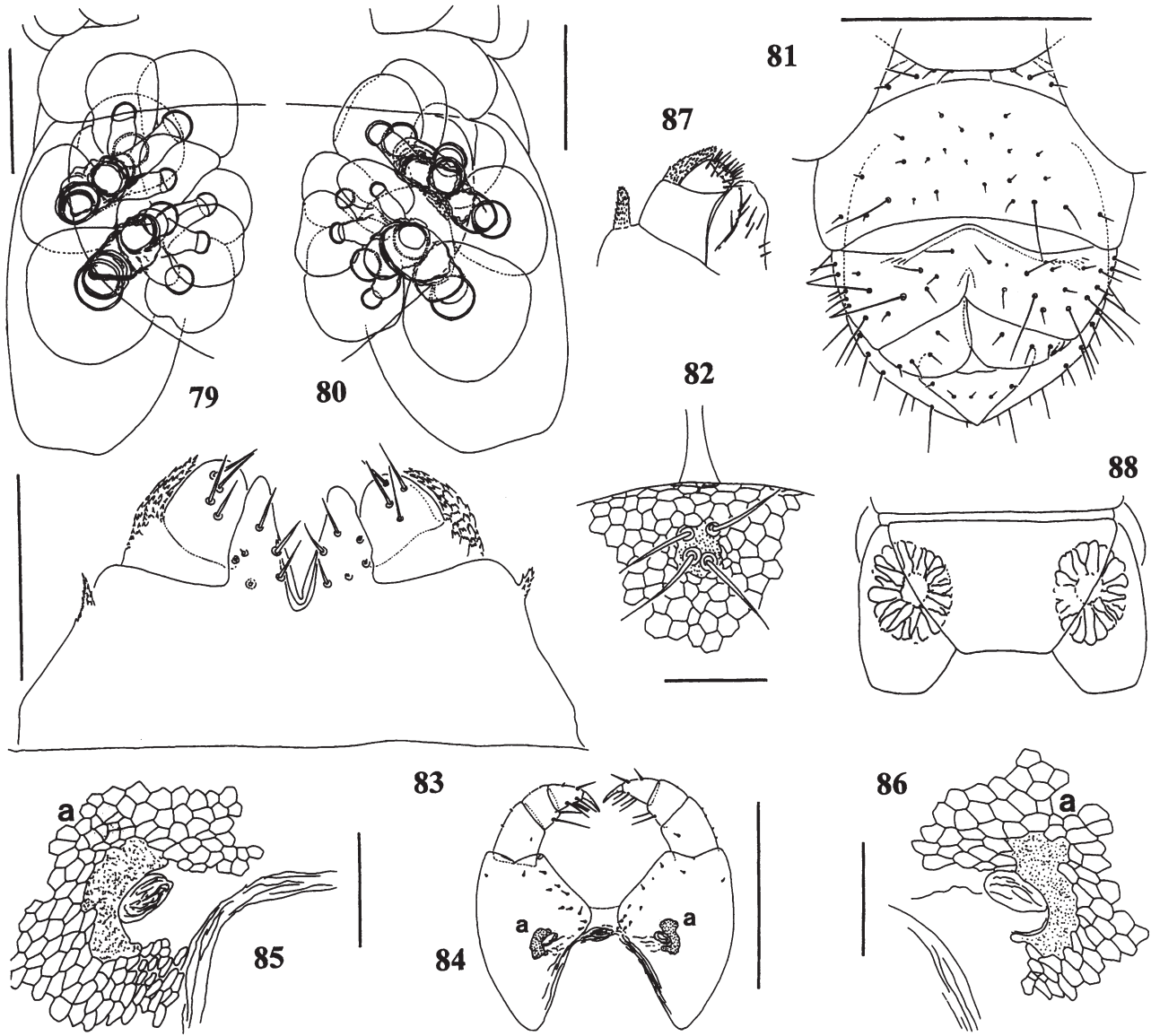
#### *Description of the female*

Fifty-three pairs of legs, b.l. 24 mm, maximum body width 0.70 mm; length of cephalic shield 0.80 mm; width of forcipular coxosternum 0.70 mm.

Clypeal area with two setae (Figure 76).

All features similar to those in the male except for the shape and chaetotaxy of the last leg-bearing segment and terminal segments.

Last leg-bearing segment: shape and chaetotaxy of tergum and sternum as in Figures 77, 78. Coxopleura slightly protruding at their distal ventral ends, setae numerous on the distal internal area, the remaining surface with less numerous larger setae. Anterior clusters with 4+5 coxal organs, posterior



Figures 79–88. (79–81) *Eurytion yungarum* Pereira (female; Argentina: Jujuy: Ledesma: Parque Nacional Calilegua): (79) right coxal organs, ventral; (80) left coxal organs, ventral; (81) detail of terminal segments, ventral. (82–86) *Eurytion yungarum* Pereira (male holotype; Argentina: Jujuy: Ledesma: 50 km W of Fraile Pintado): (82) clypeal area; (83) first maxillae, ventral; (84) second maxillae, ventral (“a”: sclerotized rim); (85) detail of sclerotized rim (“a”) of coxosternum of right second maxilla, ventral; (86): detail of sclerotized rim (“a”) of coxosternum of left second maxilla, ventral (from Pereira, 2005). (87, 88) *Eurytion mundus* (Chamberlin) (Chile: 35 km E of Temuco): (87) right first maxilla, ventral; (88) coxopleura and sternum of last leg-bearing segment (showing coxal organs), ventral (from Chamberlin, 1955–1956). Scale bars: 0.1 mm (79, 80, 83), 0.2 mm (81); 0.05 mm (82, 85, 86); 0.3 mm (84); scale not available (87, 88).

clusters with 4+7 (Figures 78–80). Articles of last legs with form and chaetotaxy as in Figures 77, 78.

Terminal segments: intermediate tergum with posterior margin convex, intermediate sternum and first genital sternum with posterior margin concave (Figures 77, 78). Gonopods uniarticulate and poorly developed (Figures 78, 81).

*Variation*

Male with 49 pairs of legs, female with 53 pairs of legs, clypeal area with two or four setae (Figures 76, 82).

**Key to the Neotropical species of *Eurytion* Attems, 1903**

- 1. Coxosternum of first maxillae with lappets . . . 2
- Coxosternum of first maxillae without lappets . . . . . 5
- 2. Coxal organs arranged in 1+1 or 2+2 well-defined clusters, each opening through a single large pore which is partly or entirely covered by the sternum . . . . . 3
- Coxal organs opening separately (some organs can be arranged in ca. three irregular groups

- each formed by the fusion of two to four organs sharing a common pore) . . . . . 4
3. Coxal organs in 1+1 large clusters (Figure 88); body length 35–45 mm; lappets of first maxillae with relative size as in Figure 87; mid-piece of labrum small transversally subelliptic, without teeth on caudal margin . . . . .  
. . . . . *E. mundus* (Chamberlin)
- Coxal organs in 2+2 clusters (each formed by ca. three to seven organs, Figures 78–80); body length 24 mm; lappets of first maxillae with relative size as in Figure 83; mid-piece of labrum well developed, trapeziform, with ca. seven small tuberculate teeth on caudal margin . . . . . *E. yungarum* Pereira
4. Female with 57, 59 and male with 55 pairs of legs; maximum body length 40 mm; dorsal side of a.a. IX and XIII with ca. five to six type c setae; aspect and relative size of clypeal area as in Figures 51, 52, 61, 68; second maxillary sclerotized rim with posterior portion, in respect to the metameric pore, longer than the anterior (Figures 53, 54, 62, 63); each coxopleuron with a maximum of ca. 16 coxal organs, opening separately or (in largest specimens) some organs opening separately and others arranged in ca. three irregular groups each formed by the fusion of two to four organs sharing a common pore (Figures 57–60, 64–67, 70, 72–75) . . . . . *E. tenebrosus* (Meinert)
- Female with 49, 51, 53 and male with 45, 47, 49 or 51 pairs of legs; maximum body length 30 mm; dorsal side of a.a. IX and XIII with ca. one to three type c setae; aspect and relative size of clypeal area as in Figures 7, 8, 12; second maxillary sclerotized rim with anterior and posterior portions, in respect to the metameric pore, similar in size (Figures 12–14); each coxopleuron with a maximum of ca. eight coxal organs all opening separately (Figures 35–37, 43–50) . . . . . *E. heurtaultae* sp. n.
5. Coxal organs arranged in 1+1 or 2+2 clusters 6  
– Coxal organs single . . . . . 7
6. Coxal organs in 1+1 clusters; 49 pairs of legs (sex?) . . . . . *E. zapallar* (Chamberlin)
- Coxal organs in 2+2 clusters; 59 pairs of legs (female) . . . . . *E. lethifer* Crabill
7. Ventral pores present only on the anterior region of the body; 49 pairs of legs. . . . .  
. . . . . *E. metopias* Attems
- Ventral pores present along all the body length; 63–73 pairs of legs . . . . . 8
8. Coxopleura with ventral, lateral and dorsal pores; anal organs present . . . . .  
. . . . . *E. michaelsoni* Attems

- Coxopleura with pores on ventral surface only (distributed at the border of the sternum); anal organs absent. . . . . *E. moderatus* Attems

## Discussion

The remarkable variation in the number and arrangement of coxal organs in adult and possibly sub-adult specimens of *Eurytion tenebrosus* indicates that this character must be used with great care when discriminating species within this genus, especially when large series of specimens are not available. The variation of this character throughout the post-embryonic development must also be taken into account.

Most of the species of *Eurytion* described from the Neotropical region are poorly known, only scanty characters of specific value are described or illustrated in the original descriptions, partly due to a possible scarcity of them in this genus. Due to this lack of adequate knowledge, the key provided here is only a provisional tool for species identification. *Eurytion gracilis* (Gervais, 1849) is not included in the key due to lack of sufficient characters of specific value in the original description.

Unsorted samples from Argentina, deposited at the Museum of La Plata and containing unstudied specimens of *Eurytion*, show that the geographical range (and possible species richness) of the genus is larger than known at present for this country. In addition, the fact that *Eurytion yungarum* Pereira is present in the subtropical forests of Northwestern Argentina (Biogeographical Province of the “Yungas”) and *Eurytion lethifer* Crabill occurs in Central Peru (also within the Yungas) suggests that the genus should also be present in the intervening areas of this Biogeographical Province, including Bolivia. According to Cabrera and Willink (1973), this Province, apt to facilitate dispersion of many groups of invertebrates, is represented by a relatively narrow strip on the oriental Andean slope in an altitudinal range between 500 and approximately 3500 m, extending from northern Venezuela to north-western Argentina.

Intensive collections in Argentina and other Andean countries of the region (together with the revision of all poorly known South American taxa and the study of collected material) must be undertaken, in order to get a better knowledge about species diversity and geographical distribution of the genus in the Neotropical Region.

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