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Contribution to the knowledge of Patagonia, Argentina: redescription of the genus *Xenogenus* Berg 1883 (Hemiptera: Heteroptera: Rhopalidae) and description of immature stages of *Xenogenus gracilis* Reed, 1899

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Abstract

This is a review of *Xenogenus* Berg 1883 a Neotropical genus with two species: *X. gracilis* Reed (1899) and *X. picturatum* Berg 1883. Males of *X. picturatum*, males and females of *X. gracilis* are redescribed and illustrated; instars II–V of *X. gracilis* are described and illustrated. The host plant and new record data are also given for the latter.

Key words: Nymphs, Host plant, *Xenogenus gracilis*, *Xenogenus picturatum.*

Introduction

The Rhopalidae has often been considered to be a subfamily of an inclusive Coreidae, but Chopra (1967) treated it as a distinct family. Chopra (1967) also presented a revision of the Rhopalidae (Hemiptera: Heteroptera), including keys to subfamilies, tribes, and genera. Göllner-Scheiding (1983) published a world catalog of the family. The family is a monophyletic group (Xinzheng Li 1996) and consists of two subfamilies: Rhopalinae and Serinethinae (Chopra 1967; Göllner-Scheiding 1983). Schaefer (1993) wrote about the origins and biogeography of the Rhopalinae in the New World. Rhopalinae have six tribe, Corizomorphini Chopra, Chorosomatini Douglas & Scott, Harmostini Stål, Maccevethini Chopra, Niesthrini Chopra and Rhopalini Amyot & Serville. The genus *Xenogenus* is a Chorosomatini (Schaefer 1994) with two species: *X. gracilis* (Reed 1899) and *X. picturatum* Berg 1883. The former occurs only in South America, whereas the latter is widespread throughout the New World (Schaefer 1993). Both species are present in Argentina (Coscarón submited). Berg (1883) described *X. picturatum*. Reed (1899) described *Harmostes gracilis*. Later, Harris (1942) transferred *Harmostes gracilis* to the genus *Xenogenus*. The two species are very similar to each another (Göllner-Scheiding 1980).

Until now, worldwide contributions on nymphs have included *Arhyssus hirtus* (Torre-Bueno) (Wheeler & Henry 1984), *A. lateralis* (Say) (Paskewitz & McPherson 1983), *Esperanza texana* Barber (Wheeler & Henry 1984), *Harmostes* (*Harmostes*) *reflexulus* (Say) (Yonke & Walker 1970), *Liorhyssus hyalinus* (Fabricius) (Cornelis *et al.* 2012), *Niesthrea louisianica* Sailer (Wheeler 1977), *Rhopalus* (*Brachycarenus*) *trigrinus* (Schilling) (Wheeler & Hoebeke 1988) and *R.* (*Rhopalus*) *parumpunctatus* Schill (Stroyan 1954).

In the present work, we give a diagnosis of *Xenogenus*, redescribe its species and describe the nymphs from instars II–V of *Xenogenus gracilis*. New distributional records are provided, and *Salsola* is recorded as a new host plant.

Material and methods

Specimens were collected with a garden vacuum model 56/86 Stihl and sweep-net with a diameter of 35 cm in

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February of 2013. All stages of *X. gracilis*, including nymphs and copulating adults were found on the same host plant *Salsola* sp. (Chenopodiaceae) and preserved in 75 % ethanol. A total of 45 males, 54 females and 51 nymphs were captured. The material of *X. picturatum* was provided by the Museo de La Plata Argentina (MLP), Argentina. The measurements are expressed in millimeters. In terminology, we follow Chopra (1967) and Göllner-Scheiding (1980).

Specific identification of nymphs was confirmed by associating the material studied with adults. The images were taken with a digital camera (PANASONIC DMC-S3).The material is deposited in the collection of the Museo de La Plata (MLP), Argentina.

Xenogenus Berg 1883

1883 *Xenogenus* Berg, 15:252.
1883 *Xenogenus picturatum* Berg, 15: 252 (Type specie).

Diagnosis. (after Chopra 1967; Göllner-Scheiding 1980; Pall & Coscarón 2012) Head longer than broad, tylus rounded anteriorly. First antennal segment only slightly surpassing the tylus. Anterolateral angles of the pronotum not pointed or produced. Hind femora incrassate, spined and as long as hind tibiae. Abdomen not dilated; hemelytra covering abdominal connexiva.

Xenogenus gracilis (Reed, 1899)

(Figs. 1A–B, 1D–E) (Figs. 2A–E) (Figs. 3A–D)

1899 *Harmostes gracilis* Reed, 3: 44.
1942 *Xenogenus gracilis:* Harris, 16: 360

Distribution in Argentina. Buenos Aires: Felipe Solá, La Plata; **Catamarca**: Miraflores; **Córdoba**: La Puerta; **La Pampa**: Gral. Pico, **La Rioja**: Nonogasta; Quimilí; **Tucumán**: La Cocha, Trancas (Pall *et al.* 2013).

Distribution outside Argentina. Chile: Bañados de Cauquenes (Reed 1899; Göllner-Scheiding 1983).

Material examined. Argentina: Chubut: Los Altares (5♂, 5♀) Diez- Coscarón- Pall- Quirán col. 21/II/2013; altitude 253 meters, time: 20:00 hr.

New record. Argentina: Chubut: Los Altares.

Observation. The host plant preferences of the Chorosomatini have typically been reported to be grasses (Schaefer & Chopra 1982; Schaefer & Mitchell 1983). But we collected nymphs and copulating adults on the same plant, *Salsola* sp. (Chenopodiaceae). Being the first record of Rhopalidae on Chenopodiaceae host plant.

Remarks. Due to that great similarity between these two species, there were, unfortunately, misidentifications in Pall *et al.* (2013). The distributions we cite in the paper from Pall *et al.* (2013) have been corroborated with material from MLP.

Overall color light brown; in females, the overall color of some specimens is from light brown to light yellow. Postocular region, pronotum, propleuron, mesepisternum, mesepimeron, osteolar peritreme, scutellum, femora, tibiae, corium and ventral surface of abdomen with red to dark brown dots (Fig. 1 A–B). Body covered with abundant whitish pilosity. Head 1.20–1.50 times longer than head width. Head 1.77 (1.97 in female) times longer than anteocular region length. Head in dorsal view with two longitudinal dark brown bands, from ocelli to anterior margins of eyes and one irregular spot in the middle (Fig. 1 A–B). Lateral view with one dark brown line from posterior margins of the head to anterior margins of antenniferous tubercles. Labium reaching the posterior margin of the metasternum; first segment not surpassing the posterior margin of the eye. Ratio of labial segment lengths: 1: 1.09: 0.74: 0.72. Ratio of antennal segments: 1: 3.31: 3.62: 3.50. First antennal segment length 0.33–0.43 times as short as head length. Lateral and ventral surface of first antennal segment dark brown. Second and third antennal segments with a thin reddish line in dorsal and ventral sides. In some specimens with second antennal segment and third antennal segment totally light brown. Pronotum 1.46– 1.74 times wider than pronotum length. Anterior and posterior lobes clearly separated, anterior lobe with two depressions, posterior lobe coarsely punctate, posterior margin softly convex. Median longitudinal keel conspicuous, more conspicuous on the anterior lobe. In some

specimens pronotum partially to totally dark brown (Fig. 1 A–B). Whitish setae on lateral margins of the scutellum and posterior process rounded. Posterior femora longer than fore and middle femora, 1.76–1.93 times as long as fore femora, and 1.68–1.97 times as long as middle femora. Hind tibiae very long, 2.19–1.01 times longer than fore tibiae and 1.09–1.65 times longer than middle tibiae. First tarsi and hind tibiae black distally, third tarsi black. Hemelytra: corium and clavus hyaline, red dots on veins of corium; membrane hyaline, in some specimens with red dots and surpassing apex of abdomen. Abdomen, with red spots on ventral surface, more densely towards lateral margins.

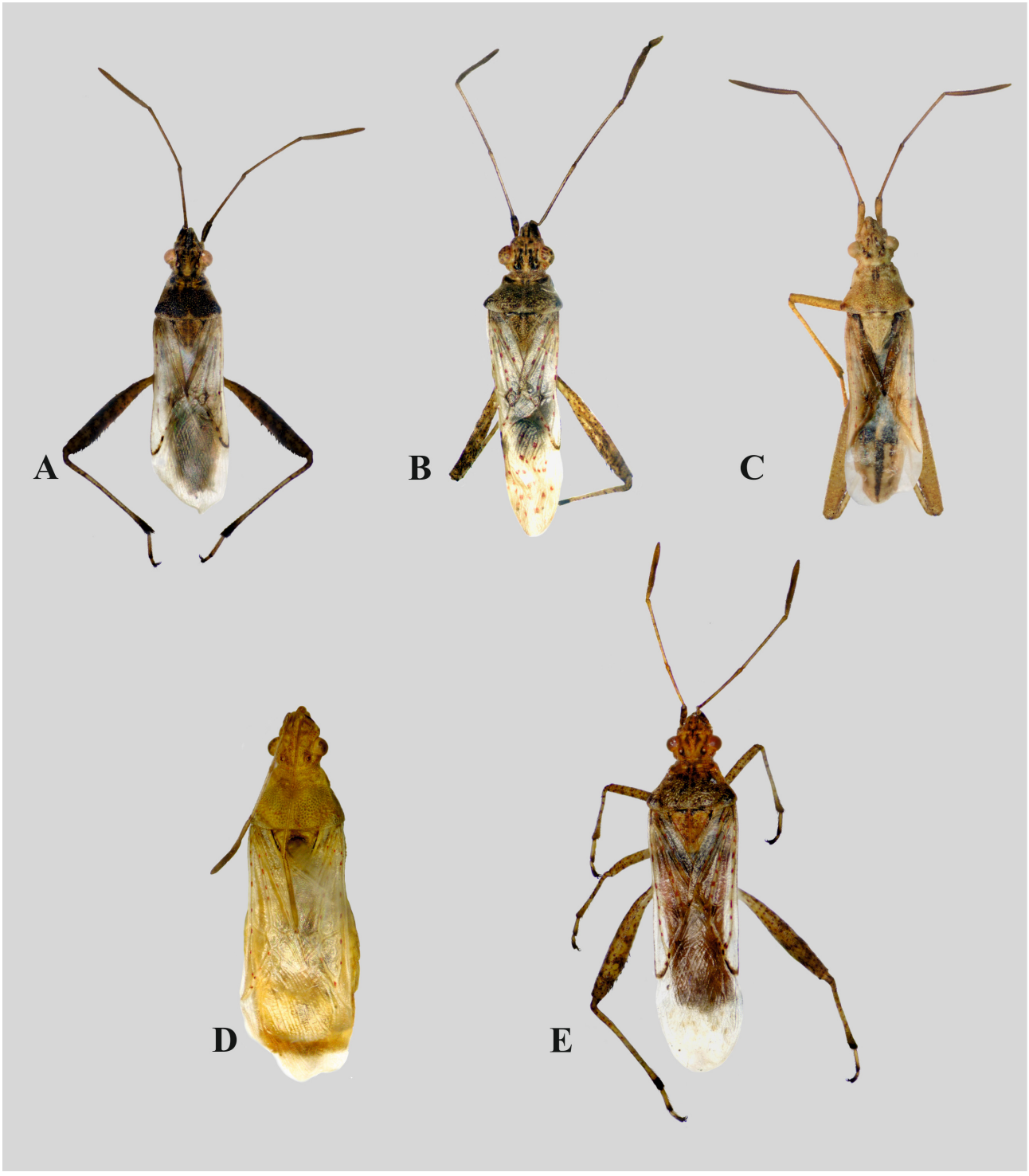

FIGURE 1. General aspect. *X. gracilis* ♂, dorsal view (A–B); *X. picturatum* ♂, dorsal view (C); *X. gracilis* ♀ dorsal view (D–E).

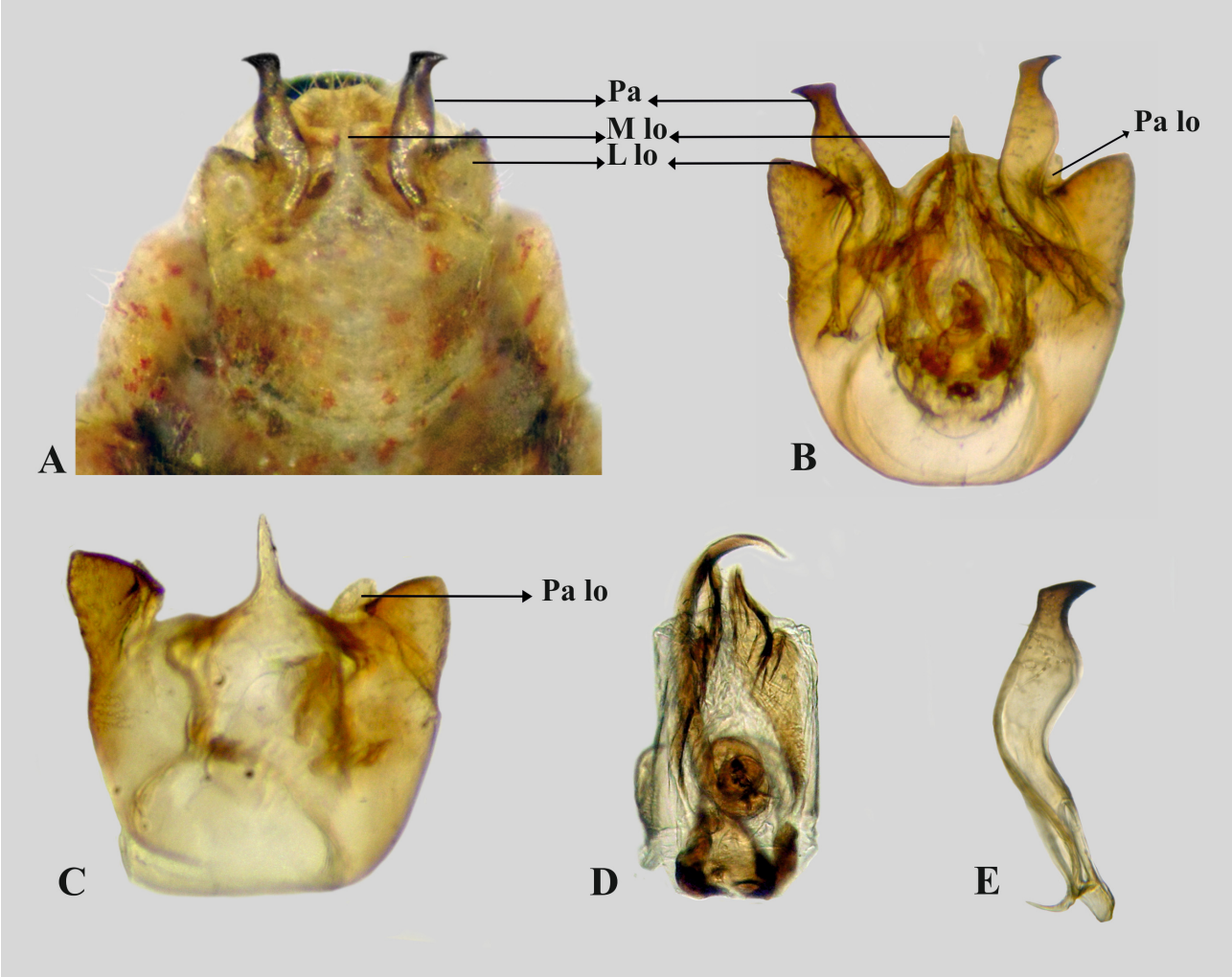

FIGURE 2. Male genitalia. *X. gracilis.* Genital capsule in situ (A), genital capsule (B), pygophore (C), male phallus (D), paramere (E). L lo: lateral lobe; M lo: medial lobe; Pa: paramere; Pa lo: Paralateral lobes.

Male genitalia. (Figs. 2A–E). Pygophore with lateral lobes triangular (Fig. 2A–C); paralateral lobes triangular and apex round (Fig. 2B); paramere curved, large and protruding (the apex of the lateral lobes reach the middle of the paramere) (Fig. 2A–B). Internal margin of paramere curved inwards, distally contracted, apex triangular and acuminate (Fig. 2E).

Immature stages (Figs. 3A–D)

Instar II: (Fig. 3A) (n=5) General color similar to instar V. Total length 2.50–2.90 (mean = 2.74). Head: length 0.64–0.81 (mean = 0.76), width 0.56–0.60 (mean = 0.57); width of eyes 0.09–0.12 (mean = 0.11), interocular width 0.38–0.48 (mean = 0.43). Labium passing beyond metacoxae, Ratio of labial segment lengths 1: 0.75: 0.77: 0.98. Antennae setose, abundant distally, ratio of segment lengths 1: 2.66: 2.70: 3.04. Pronotum length 0.24–0.30 (mean = 0.27), width 0.70–0.75 (mean = 0.72). Wing pad length 0.32–0.35 (mean = 0.34). Abdomen: length 1.61–1.74 (mean = 1.66), width 1.08–1.25 (mean = 1.17). Abdomen with four dark tubercles with one seta in the apex and five to eight small, hyaline tubercles scattered on the dorsal surface of abdomen.

Instar III: (Fig. 3B) (n=5) General color similar to instar V. Total length 3.49–3.63 (mean = 3.52). Head: length 0.84–1.00 (mean = 0.91), width 0.64–0.70 (mean = 0.67); eyes width 0.12–0.16 (mean = 0.14), interocular width 0.46–0.52 (mean = 0.48). Ratio of labial segment lengths about 1: 0.85: 0.50: 0.83. Antennae setose, abundant distally, ratio of segment lengths 1: 2.54: 2.61: 3.25. Pronotum length 0.28–0.36 (mean = 0.32), width 0.83–0.97 (mean = 0.90). Wing pad length 0.64–0.68 (mean = 0.65). Abdomen: length 1.81–2.24 (mean = 2.03), width 1.32–1.48 (mean = 1.39). Abdomen with six dark tubercles with one seta in the apex and three to six small, hyaline tubercles scattered on the dorsal surface of abdomen.

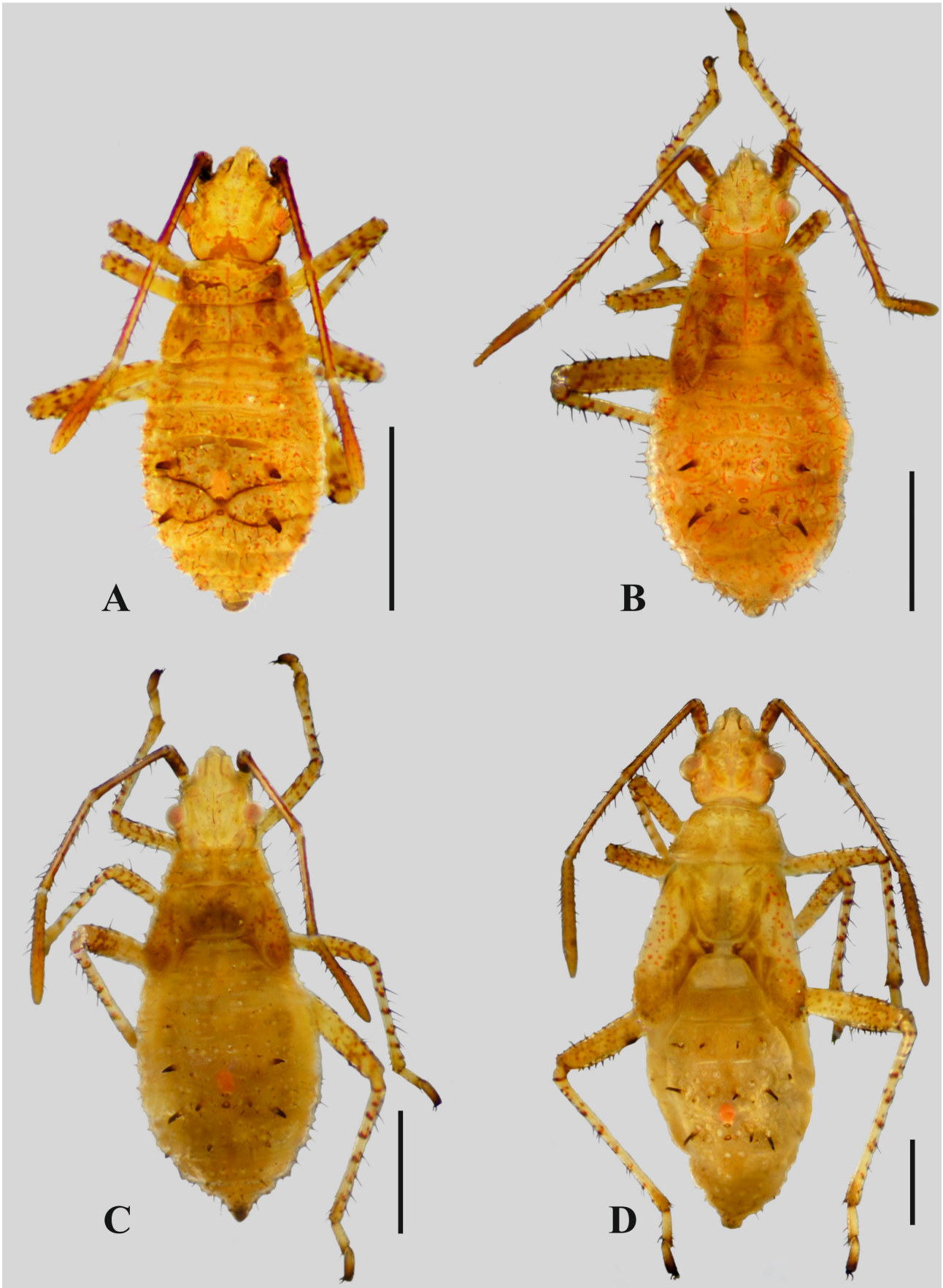

FIGURE 3. Nymphal stages. *X. gracilis*, dorsal view; second instar (A), third instar (B), fourth instar (C), fifth instar (D). scale line: 1mm.

TABLE 1. Measurements (mm.) of *Xenogenus gracilis* (Reed) and *Xenogenus picturatum* Berg.

Characters	*Xenogenus gracilis*						*Xenogenus picturatum*		
	N=5 Male			N=5 Female			N=4 Male		
	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max
Total length	6.12	6.99	8.30	6.66	6.92	7.14	6.00	7.5	10
Head length	1.06	1.31	1.48	1.33	1.42	1.52	1.14	1.25	1.48
Head width across eyes	1.09	1,33	1.48	1.44	1.46	1.48	1.13	1.22	1.29
Anteocular region length	0.66	0.74	0.95	0.68	0.72	0.76	0.57	0.61	0.63
Anteocular region width	0.69	0.84	0.95	0.95	0.96	0.98	0.69	0.76	0.83
Postocular region length	0.19	0.25	0.33	0.30	0.33	0.38	0.15	0.23	0.33
Postocular region width	0.83	0.98	1.12	1.10	1.12	1.14	0.79	0.92	0.98
Interocular space dorsal view	0.56	0.64	0.72	0.72	0.78	0.83	0.56	0.64	0.68
Interocular space ventral view	0.66	0.77	0.85	0.83	0.86	0.87	0.63	0.70	0.76
width of eyes	0.26	0.40	0.49	0.30	0.33	0.36	0.29	0.32	0.34
Juga length	0.29	0.32	0.36	0.30	0.32	0.38	0.19	0.22	0.26
First labial segment length	1.15	1.17	1.22	1.10	1.12	1.14	0.86	0.97	1.08
Second labial segment length	0.83	1.04	1.15	1.10	1.12	1.17	0.79	0.94	1.08
Third labial segment length	0.53	0.71	0.82	0.72	0.76	0.79	0.53	0.61	0.72
Fourth labial segment length	0.59	0.69	0.82	0.76	0.78	0.79	0.55	0.55	0.56
First antennal segment length	0.46	0.50	0.56	0.49	0.57	0.64	0.53	0.57	0.60
Second antennal segment length	1.29	1.71	2.04	1.52	1.65	1.78	1.29	1.54	1.71
Third antennal segment length	1.49	1.87	2.14	1.59	1.69	1.78	1.39	1.55	1.71
Fourth antennal segment length	1.46	1.80	2.07	1.55	1.77	2.01	1.59	1.80	2.01
Pronotum length	1.26	1.27	1.67	1.29	1.36	1.44	1.09	1.08	1.14
Anterior lobe of pronotum length	0.22	0.23	0.26	0.26	0.27	0.30	0.22	0.25	0.26
Anterior lobe of pronotum width	0.83	1.07	1.32	0.26	0.27	00.30	0.79	0.95	1.06
Posterior lobe of pronotum length	0.83	1.03	1.19	1.02	1.08	1.10	0.76	0.83	0.87
Posterior lobe of pronotum width	1.89	2.03	2.21	1.14	1.22	1.29	1.74	1.70	1.90
Scutellar width at base	0.89	0.92	0.95	0.91	0.97	1.10	0.76	0.82	0.93
Scutellar length	0.95	1.03	1.12	0.98	1.02	1.06	0.79	0.91	0.95
Fore femora length	1.98	2.02	2.10	1.86	1.90	1.93	1.86	1.95	2.20
Middle femora length	1.99	2.14	2.31	1.90	1.99	2.05	1.79	2.00	2.31
Posterior femora length	3.66	3.73	3.89	3.49	3.56	3.64	3.10	3.33	3.80
Fore femora width	0.19	0.23	0.26	0.19	0.21	0.22	0.16	0.20	0.22
Middle femora width	0.19	0.22	0.26	0.19	0.23	0.26	0.19	0.20	0.22
Posterior femora width	0.39	0.45	0.52	0.45	0.53	0.64	0.39	0.40	0.41
Fore tibiae length	2.16	2.29	2.40	2.05	2.09	2.12	2.12	2.23	2.29
Middle tibiae length	2.23	2.30	2.36	2.01	2.07	2.16	1.97	2.08	1.97
Posterior tibiae length	2.83	3.21	3.63	3.04	3.18	3.26	3.38	3.41	3.43
Fore tibiae width	0.08	0.09	0.09	0.11	0.11	0.11	0.07	0.09	0.09
Middle tibiae width	0.09	0.10	0.13	0.11	0.11	0.11	0.07	0.08	0.09
Posterior tibiae width	0.09	0.12	0.13	0.11	0.14	0.15	0.13	0.13	0.15
Hemelytra length	4.83	5.15	5.25	3.15	4.46	5.58	4.20	4.42	5.05
Hemelytra at maximum width	1.38	1.85	2.11	1.62	1.72	1.86	1.35	1.38	1.40
Abdominal length	3.15	3.47	3.99	2.82	3.01	3.12	3.30	3.56	3.83
Abdomen at maximum width	1.30	1.51	1.84	1.74	1.89	2.16	1.35	1.37	1.40

Instar IV (Fig. 3C) (n=5) General color similar to instar V. Total length 3.82–4.22 (mean = 4.06). Head: length 0.80–0.89 (mean = 0.84), width 0.70–0.76 (mean = 0.72), eyes width 0.14–0.16 (mean = 0.15), interocular width 0.52–0.56 (mean = 0.54). Ratio of labial segment lengths about 1: 1: 0.62: 0.83. Ratio of antennal segment lengths 1: 2.67: 2.70: 3.16. Pronotum light brown with red dots, length 0.30–0.38 (mean = 0.34), width 0.88–0.94 (mean = 0.91). Wing pad light brown, length 0.80–0.83 (mean = 0.81). Abdomen: length 2.07–2.40 (mean = 2.24), width 1.18–1.65 (mean = 1.42). Abdomen with ten dark tubercles with one seta in the apex and numerous small, hyaline tubercles scattered on the dorsal surface of abdomen.

Instar V: (Fig. 3D) (n=5) Overall color light brown, ventral surface pale yellowish. Dorsal surface with sparse long black setae (Fig. 3D). Total length 5.9–6.4 (mean = 6.16) Head: length 0.99–1.18 (mean = 1.10), width 0.72–0.89 (mean = 0.80), dorsal view with reddish dots and one longitudinal red line in lateral view, from eyes to antenniferous tubercles (Fig. 3D); eyes width 0.19–0.26 (mean = 0.22), interocular width 0.56–0.62 (mean = 0.59). Rostrum passing beyond metacoxae, ratio of segment lengths about 1: 0.86: 0.63: 0.75. Antennae light brown, first antennal segment dark brown, second and third antennal segments with one longitudinal, reddish line in dorsal and ventral surface (Fig. 3D), setose, abundant distally, ratio of segment lengths 1: 2.57: 2.54: 3.26. Pronotum light brown with red dots, posterior edges brown; length 0.45–0.50 (mean = 0.46), width 1–1.35 (mean = 1.22). Wing pad light brown with the internal edges brown to dark brown and red dots on the veins (Fig. 3D); length 1.65–1.71 (mean = 1.67). Legs pale brown; trochanter pale; femur and tibia pale brown with brown spots and tibia brown distally; pretarsus brown (Fig. 3D). Abdomen: length 0.90–1.01 (mean = 0.93), width 1.51–1.98 (mean = 1.69). Abdomen with eleven–twelve dark tubercles with one seta in the apex and numerous small, hyaline tubercles scattered on the dorsal surface of abdomen.

Xenogenus picturatum Berg 1883

(Fig. 1 C) (Figs. 4A–E)
http://heteroptera.myspecies.info/taxonomy/term/2160

1893 *Xenogenus extensum* Distant, 1: 461.
1893 *Darmistidus maculatus* Uhler, 707. Synonymized by Torre-Bueno (1941).

Distribution in Argentina. Buenos Aires: José C. Paz, (Pall & Coscarón 2012), Sierras Tandilenses (Dellapé & Carpintero 2012); **Catamarca**: Belén; **San Juan**: Villa Aberastein (Pall & Coscarón 2012); **La Rioja** (Pennington 1922); **Salta**: General Güemes; **Santiago del Estero**: Quimilí (Pall & Coscarón 2012).

Distribution outside Argentina. Uruguay: Banda Oriental (Berg 1883). Bolivia (Pennington 1922). Central America, North America and South America (Göllner Scheiding 1983). Cuba; Mexico; Nicaragua; Puerto Rico; USA (Maes & Göllner Scheiding 1993).

Material examined. Argentina: Catamarca: Belén (1♂, MLP) Torres-Ferreyra col. 9/III/62; Santiago del Estero: Quimilí (1♂, MLP) Biraben-Bezzi col. 9/XII/1939; Jujuy: Pampa Blanca (1♂, MLP) Biraben-Scott col. 13/II/1939; Chubut: Esquel (1♂) Col. Diez-Coscarón-Pall-Quirán 22/II/2013, altitude 562 meters, time: 18:00 hr; Neuquén: near Junín de los Andes (1♂) Col. Diez-Coscarón-Ruiz Spindola, altitude 902 meters, time: 18:00 hr.

New record. Argentina: Chubut: Esquel.

Observation. The species currently assigned to the taxon is listed in Coscarón *et al.* (2014).

Remarks. Pall (*et al.* 2013) due to that great similarity of this two species made a mis identifications. The distributions we cited from Pall *et al.* (2013) were corroborated.

Overall color light brown, with propleuron, thoracic pleura, femora, tibiae, corium and ventral surface of abdomen a few red to dark brown dots (Fig. 1 C). Body covered with abundant whitish pilosity. Head 1.58 times longer than head width, one irregular spot in the middle (Fig. 1 C). Total length of head 2.04 times longer than anteocular region. Labium reaching the posterior margin of the metasternum. First segment not surpassing the posterior margin of the eye. Ratio of labial segment lengths: 1: 0.92: 0.61: 0.65. Ratio of antennal segment: 1: 2.16: 2.33: 2.66. First antennal segment length 0.47 times as short as head length. Lateral surface of first antennal segment brown. Second and third labial segments totally light brown. Pronotum 2.15 times wider than pronotum length. Anterior and posterior lobes clearly separated, anterior lobe with two depressions, posterior lobe coarsely punctate, posterior margin softly convex. Median longitudinal keel conspicuous, more conspicuous on the anterior lobe. Whitish setae on lateral margins of the scutellum and posterior process rounded. Posterior femora longer than

fore and middle femora, 1.86 times as long as fore femora, and 1.72 times as long as middle femora. Posterior tibiae very long, 1.41times longer than fore tibiae and 1.48 times longer than middle tibiae. First tarsi and hind tibiae black distally, third tarsi black. Hemelytra: clavus dark brown, corium hyaline, red dots on veins of corium; membrane hyaline, in some specimens with red dots and surpassing apex of abdomen. Abdomen, with red spots on ventral surface, most densely towards lateral margins.

Male genitalia (Figs. 4A–E): pygophore with lateral lobes subtriangular, contracted in base (Figs. 4A–C); paralateral lobes slender, triangular and apex acute (Fig. 4B); paramere a little curved and protruding (the apex of the lateral lobes reaching 2/3 of the paramere) (Figs. 4A–B): Paramer with internal margin not inwards, apex quadrangular and blunt (Fig. 4E).

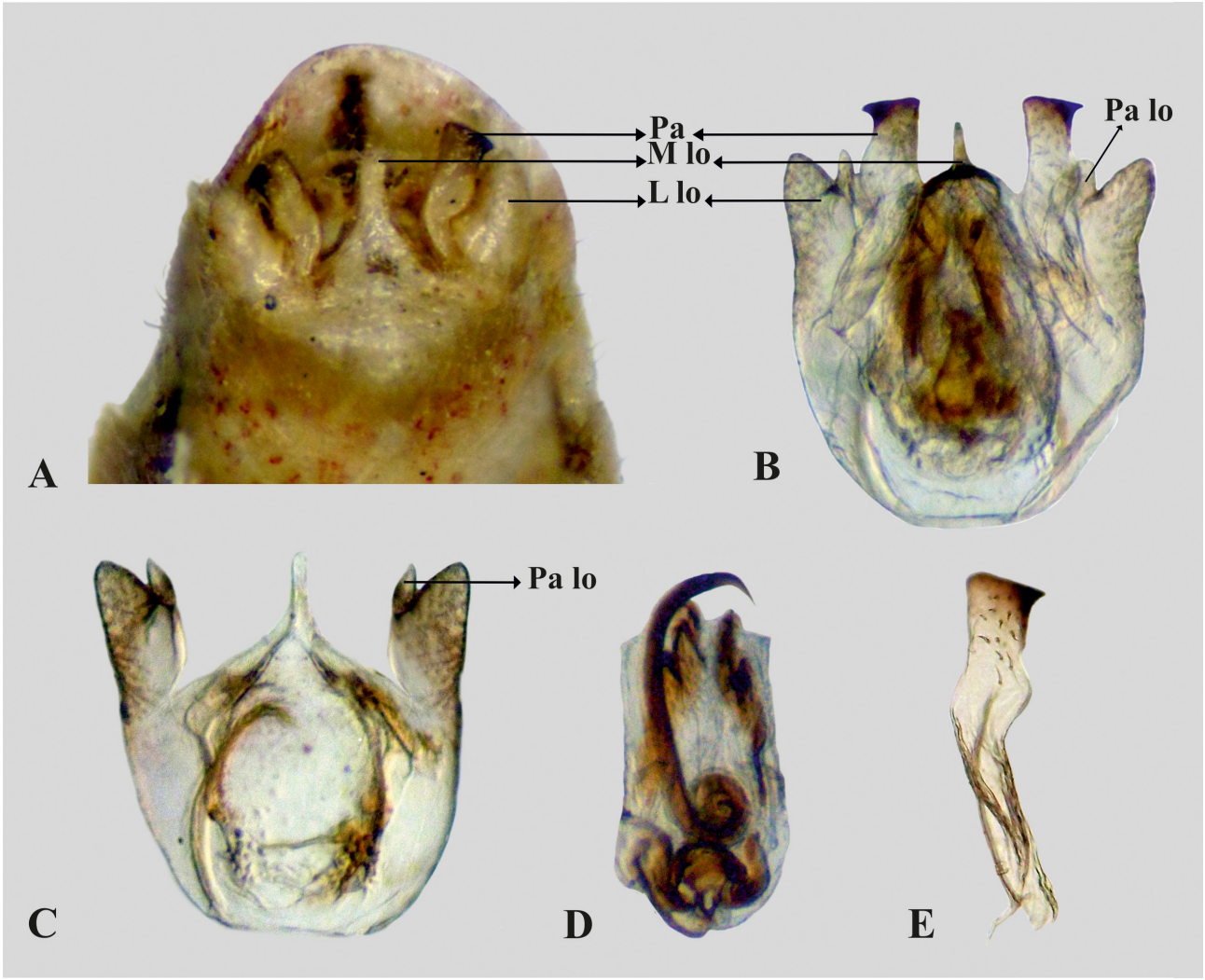

FIGURE 4. Male genitalia. *X. picturatum.* Genital capsule in situ (A), genital capsule (B), pygophore (C), male phallus (D), paramere (E). L lo: lateral lobe; M lo: medial lobe; Pa: paramere; Pa lo: Paralateral lobes.

Discussion

We agree with Gollner Scheiding (1980), the morphology of parameres and lateral lobes of the pygophore in males are good characters to differentiate the two species belonging to *Xenogenus*. The lateral lobes of the pygophore of *X. gracilis* are triangular with acute apices, whereas those of *X. picturatum* are subtriangular and more elongate with the apices rounded.

The parameres of *X. picturatum* are quadrangular whereas those of *X. gracilis* are triangular distally. The constriction in the last third of the paramere, which is present in *X. gracilis*, is not present in *X. picturatum*. Also, the parameres of *X. gracilis* are more protruding than those of *X. picturatum*.

The color of antennae, pronotum and the distribution of red dots are not reliable characters to differentiate these two species. We expand the distributions of both species to southern Argentina. The southern limit of distributions of both species is between latitudes 42°S and 43°S in the province of Chubut.

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