



ECOSYSTEMS

A new subgenus of *Nabis* Latreille (Heteroptera: Nabidae) from South America and a key to the subgenera worldwide, with notes about comparative morphology of the genitalia

MARCELA CORNELIS, FERNANDO DIEZ & MARÍA DEL CARMEN COSCARÓN

Abstract: A revision of the *Nabis punctipennis* complex is here provided. *Nabis* (*Austronabis*) subgen. nov. (type species: *N. (A.) punctipennis* Blanchard) from South America is described based on male and female genitalia. This new subgenus is compared with all the other *Nabis* subgenera in the world and a key for 13 *Nabis* subgenera is provided. *Nabis* (A.) subgen. nov. is composed of: *N. (A.) argentinus* Meyer-Dür, *N. (A.) faminei* Stål, *N. (A.) paranensis* Harris and *N. (A.) punctipennis*. Redescriptions of each species are given, with images of their male and female genitalia, including new characters of the male genitalia and new distributional records. We also discuss the taxonomic position of *Nabis ashworthi* Faúndez and Carvajal and propose that it should be transferred to the subgenus *Nabis* (*Dolichonabis*) Reuter, new combination.

Key words: Nabidae, *Nabis*, New subgenus, *Nabis* (*Austronabis*), Neotropical, Genital morphology.

INTRODUCTION

The Nabidae is a family of predaceous bugs regarded as beneficial insects, which has been the focus of extensive biological control studies in agroecosystems (Braman 2000). This family is relatively small and so far includes 31 genera and 386 species distributed in two subfamilies: Nabinae and Prostemmatinae (Henry 2009). The group has had a complex generic classification due to the great number of synonyms and revalidations at subgeneric level (Swanson 2012).

The Nabidae from different parts of the world have been taxonomically studied by several researchers: Harris (1928) wrote a monograph of the North American Nabidae, Henry & Lattin (1988) catalogued the nabids from Canada and the USA, Kerzhner (1996) and Ghahari et al. (2010) catalogued the Palearctic Nabidae, Péricart

(1987) studied the nabid species from Western Europe and northwest Africa, Volpi & Coscarón (2010), Coscarón & Volpi (2013) and Froeschner (1981, 1985, 1999) catalogued the Neotropical nabids, and Cassis (2016) provided a review of Australian Nabidae.

Nabis Latreille is the most diverse genus of the tribe Nabini. In the past, this genus gathered the majority of the Nabini. Later, *Nabis* was divided into numerous subgenera, some of which were subsequently raised to genus status (Péricart 1987). Reuter (1872, 1890, 1908) was the first to divide the genus into several distinct groups or subgenera. Later, different authors made changes in the *Nabis* conformation (Kiritschenko 1926, Stichel 1959-1960, Southwood & Leston 1959, among others). In addition, Kerzhner (1963, 1968, 1981, 1996) revised the nabid fauna and made several nomenclatural

changes in the group. His works comprise the morphological description, including that of the female and male genital structures, ecological characteristics and identification keys of each species.

Until now, *Nabis* comprises 12 subgenera worldwide: *N. (Australonabis)* (Australian region), *N. (Aspilaspis)* (Afrotropical, Oriental and Palearctic regions), *N. (Dolichonabis)* (Nearctic and Palearctic regions), *N. (Halonabis)* (Oriental and Palearctic regions), *N. (Limnonabis)* (Nearctic and Palearctic regions), *N. (Milu)* (Palearctic region), *N. (Nabicula)* (Nearctic and Palearctic regions), *N. (Nabis)* (Nearctic, Neotropical, Oriental and Palearctic regions), *N. (Omanonabis)* (Nearctic region), *N. (Philobatus)* (Palearctic region), *N. (Reduviolus)* (Nearctic and Palearctic regions), and *N. (Tropiconabis)* (Australian, Afrotropical, Nearctic, Neotropical, Oriental and Palearctic regions) (Kerzhner 1996, Kerzhner & Henry 2008, Volpi & Coscarón 2010, Coscarón & Volpi 2013, Cassis 2016).

In the Neotropical region, *Nabis* is represented by three subgenera and 15 species (Volpi & Coscarón 2010, Faúndez & Carvajal 2014, Coscarón et al. 2015). *Nabis fesus* (Linnaeus) and *N. crassipes* Reuter, cited by Volpi & Coscarón (2010) and Coscarón et al. (2015), correspond to *N. americoferus* Carayon according to Carayon (1961) and to *Hoplistoscelis dentipes* (Harris) according to Kerzhner (1992). Also, some of these species are not clearly designated under any subgenera. According to Harris (1939), the *Nabis punctipennis* complex is composed of four closely related species: *N. argentinus* Meyer-Dür, *N. faminei* Stål, *N. paranensis* Harris and *N. punctipennis* Blanchard. In previous works (Cornelis & Coscarón 2013), we have revised the Nabidae fauna of Argentina and provided a general description and geographical distribution for these species. Later, Faúndez & Carvajal (2014) described *Nabis ashworthi* within

the complex. These species are distributed in Argentina, Chile, Uruguay and Brazil (Volpi & Coscarón 2010, Faúndez & Carvajal 2014, Cornelis et al. 2016).

The position of this species group under some subgenera of *Nabis* is not well defined. This may be due to the scarcity of deep studies about the *Nabis* species of this region. Thus, in this work, we analyze the position of the *Nabis punctipennis* species complex and propose a new subgenus for them. We also propose new morphological characters for this group and discuss the relation with other subgenera. Finally, we provide a key to the *Nabis* subgenera of the world, including the new taxon here designed.

Additional information on adults of *N. argentinus*, *N. faminei*, *N. paranensis* and *N. punctipennis*, as well as descriptions, photographs and illustrations of male and female genitalia, are provided. The position of *N. ashworthi* in *Nabis* is analyzed and the transfer to the subgenus *Dolichonabis* Reuter is proposed.

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MATERIALS AND METHODS

Observations were made with a Leica MZ95 stereomicroscope and images were taken with a digital camera (Kodak 3.1 megapixels) and a Wild M-stereomicroscope. The terminology and methodology to prepare the male and female genitalia follow Carayon (1961), Kerzhner (1981) and Cornelis & Coscarón (2013); all dissected structures were stained with chlorazol black.

To unify concepts of wing polymorphism in the group and to facilitate comparisons,

we followed the criteria of Péricart (1987) and Larivière (1994). We distinguished three wing morphologies: macropterous, submacropterous and brachypterous. The material examined was the same as that examined in Cornelis & Coscarón (2013); thus, only the new material examined for each species is indicated. For the classification of the genus *Nabis*, we followed Kerzhner (1996), Kerzhner & Henry (2008), Volpi & Coscarón (2010), Coscarón & Volpi (2013) and Cassis (2016). The key was made with information from the following bibliography: Dohrn (1862), Harris (1928), Kerzhner (1968, 1981, 1988, 1996), Péricart (1987), Strommer (1988), Asquith & Lattin (1991), Larivière (1994), Kerzhner & Henry (2008) and Swanson (2012).

The following acronyms of depositories were used: **BHM** Bernice P. Bishop Museum, Honolulu, Hawaii, United States; **(MACN)**, Museo Argentino de Ciencias Naturales “Bernardino Rivadavia” Buenos Aires, Argentina, when we finish future morphological studies.

RESULTS

Nabis (*Austronabis*) Cornelis and Coscarón subgen. nov.

ZooBank Life Science Identifier (LSID) - urn:lsid:zoobank.org:act:E07D523B-961C-48A1-B01B-2C58FB8EC144

Type species: *Nabis* (*Austronabis*) *punctipennis* Blanchard, 1852 (by present designation)

Diagnosis: Macropterous and submacropterous forms, *Nabis* (*Austronabis*) *paranensis* presents brachypterous forms (Figs. 1a–d, 2 a–d); male genital capsule slightly asymmetrical and with the right side swollen (Fig. 3a); disc of paramere narrow and elongated (in *N. (A.) argentinus*, moderately wide), sickle-shaped, hypophysis sharpened,

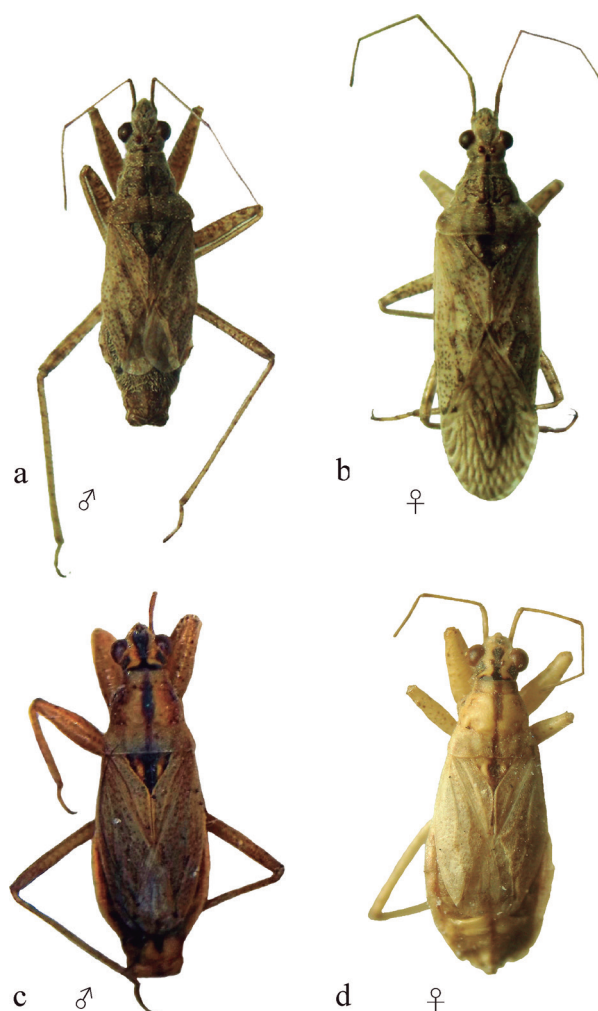


Figure 1. Dorsal view. a–b, *Nabis* (*Austronabis*) *argentinus*. c–d, *N. (A.) faminei*.

without reversible plate (Fig. 4 a–d); aedeagus with one long sclerite situated in the base, in *N. (A.) faminei* one smaller sclerite is added (Fig. 5 a–d); vagina asymmetrical, with a parietal gland asymmetrical, and a dorsal diverticulum on the right or left side (Figs. 6 a–d, 7 a–d).

Description: General color sordid light brown, except for the following parts being brown: middle stripe extending from the apex of the clypeus to the pronotum, head ventrally, lateral angles, central region and apex of the scutellum, and lateral band extending from the preocular region to the tip of the abdomen. Body covered

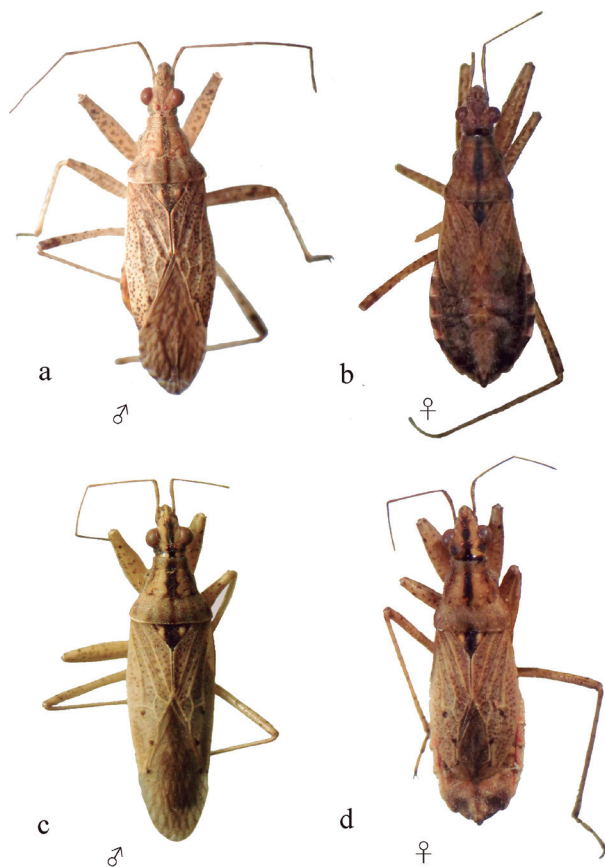


Figure 2. Dorsal view. a-b, *Nabis (Austronabis) paranensis*. c-d, *N. (A.) punctipennis*.

with short light adherent setae and scattered long setae, in *N. (A.) faminei* pilosity scarce. Head longer than wide; postocular region rounded and short, slightly longer than the distance between ocelli; eyes large, prominent, in lateral view reaching the dorsal surface of the head; ocelli well developed; rostrum slender, reaching procoxae or mesocoxae; antennal segments linear and thin, except for segment I slightly curved laterally, segment II longest, segment III longer than IV. Pronotum in macropterous forms broader than long, widened towards the posterior margin, posterior lobe in lateral view arched upwards; in submacropterous and brachypterous forms, pronotum narrowed to the posterior margin, and anterior lobe in lateral view arched upwards; collar with two fine

lateral dark lines, posterior lobe with three fine lateral dark lines, posterior lobe and collar with punctate surface. Scutellum wider than long and without circular granulate dark depression at each anterolateral angle, with two pale areas on the lateral margins. Corium and clavus with small brown dots, and three dark spots on veins; veins distinctly elevated; dorsal surface covered with short, reclined, brown setae, emerging on brown dots. In the macropterous form, membrane well developed, with three closed cells. Profemora thickened, mesofemora almost not incrassate; all appendages dotted with fuscous dark dots; legs with long scattered semierect setae. Generally, abdomen with a medial dark line on ventral surface.

Etymology: The name refers to the geographical distribution of the species included.

***Nabis (Austronabis) argentinus* Meyer-Dür, 1870**

Nabis argentinus Meyer-Dür, 1870: 177; Walker, 1873: 144; Harris, 1939: 373; Torres, 1950: 15; Ruffinelli and Pirán, 1959: 40; Quintanilla et al., 1968: 32; Quintanilla et al., 1976: 122; Rizzo, 1976: 57; Volpi and Coscarón, 2010: 58; Carpintero and De Biase, 2011: 35; Dellapé and Carpintero, 2012: 130; Cornelis and Coscarón, 2013: 19; Coscarón et al., 2015: 297; Coscarón, 2017: 184.

Coriscus argentinus Stål, 1873: 114.

Coriscus punctipennis Berg, 1879: 143.

Nabis (Nabis) punctipennis Berg, 1892: 205.

Reduviolus punctipennis: Reuter, 1908: 122; Reuter, 1912: 23.

Nabis argentinensis Marrero et al., 2008: 31.

Nabis (Nabis) argentinensis Carpintero, 2009: 299.

Nabis (Nabis) argentinus Melo et al., 2011: 11; Carpintero, 2014: 376.

Redescription. Male. (Figs. 1a, 3a, 4a, 5a) Macropterous form. Body linear or slightly

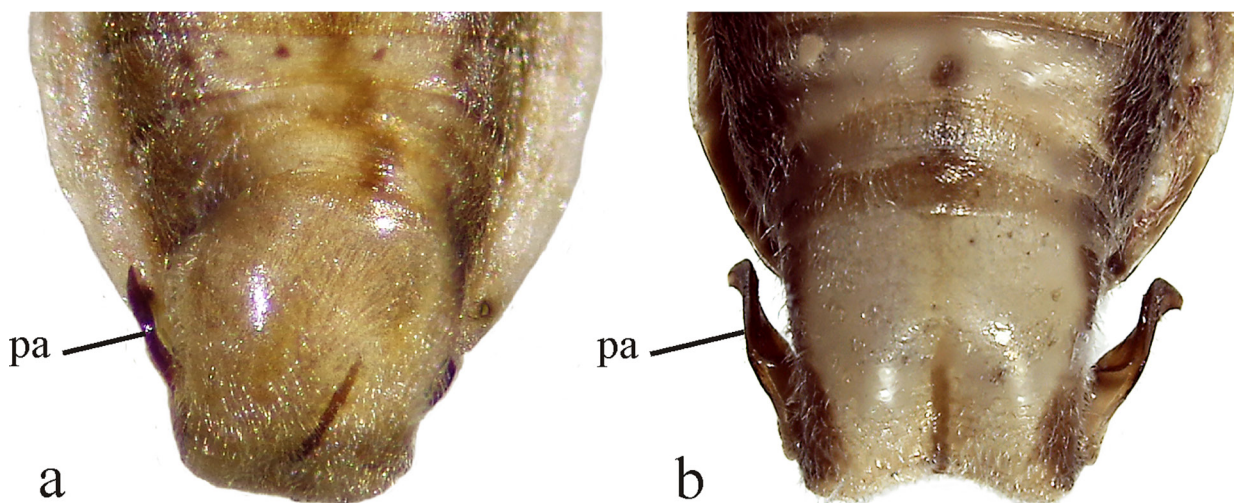


Figure 3. Male genital capsule. a, *Nabis (Austronabis) argentinus*. b, *N. (Dolichonabis) ashworthi*. (pa: paramere).

widened toward the middle. In some specimens, general coloration dark brown, in others brown areas absent or very pale. Ocelli large; rostrum reaching mesocoxae; antennal segment IV shortest; segments III and IV and internal margin of segment I, dark brown. Pronotum strongly widened towards the posterior margin. Hemelytra surpassing abdomen tip, slightly widened in the middle, exposing external edge of connexivum. Profemora thickened, mesofemora almost not incrassate; all appendages dotted with fuscous dark dots, coxae and trochanters weakly stained, tibiae and tarsi distally brown. Abdominal segments IV-VII ventrally with dark spots, shiny surface; connexival segments light brown with distal margin dark brown, external edge sawed. Genitalia: disc of paramere moderately wide, internal margin concave and distal region slightly elongated; basal region of disc with a protuberance on external margin, disc separated of base of paramere by a marked constriction (Fig. 4a); aedeagus with one pointed basal sclerite, middle and distal region of the aedeagus covered by slightly sharp denticles (Fig. 5a). Submacropterous form. Similar to macropterous form, except for: more widened toward the middle of abdomen; hemelytra

reaching between the half of segment VI and the basal margin of abdominal segment VII; hind wings visibly shorter than hemelytra.

Female. (Figs. 1b, 6a, 7a) Macropterous and submacropterous forms, similar to male of the same wing development. Genitalia: genital segments moderately protruded regarding abdominal segment VII; vagina in dorsal view with common oviduct situated on the left basal region, basal portion of lateral oviducts slightly constricted, distal portion globose; on the right basal region, a dorsal diverticulum near the oviducts (Fig. 6a); in ventral view, large and asymmetrical parietal gland on superior margin of the vagina (Fig. 7a).

New material examined: ARGENTINA:

Chubut: Los Altares: 43°53.082' S, 68°24.458' W, 21-II-2013 Coscarón M. C., Quirán E, Diez F. and Pall J. col., Cornelis M. det. 2016 2 males, 3 females (MACN), Puerto Pirámide: 42°26.222' S; 64°30.540' W, 11-I-2014 Coscarón M. C., Diez F. and Espindola M. col., Cornelis M. det. 2016 1 female (MACN); **La Pampa:** near Winifreda, 36°19'2.34" S, 64°12'3.21" W, 24-III-2017 Cornelis M. col., Cornelis M. det. 2017, 1 male, 5 females (MACN); **Neuquén:** Plottier: 38°57.491' S; 68°18.111' W, 07-I-2014 Coscarón M. C., Diez F. and Espindola M. col., Cornelis M. det.



Figure 4. Parameres. a, *Nabis (Austronabis) argentinus*. b, *N. (A.) faminei*. c, *N. (A.) paranensis*. d, *N. (A.) punctipennis*. (bp: paramere base; brd: basal region disc; d: disc; drd: distal region disc; hy: hypophysis).

2016 1 male, 1 female (MACN), Sierra Senillosa: 40°04.681' S; 64°28.706' W, 25-II-2013 Coscarón M. C., Quirán E, Diez F. and Pall J. col., Cornelis M. det. 2016 1 male (MACN); **Río Negro:** near General Conesa: 40°04.681' S; 64°28.706' W, 18-II-2013 Coscarón M. C., Quirán E, Diez F. and Pall J. col., Cornelis M. det. 2016 1 male, 4 females (MACN), near San Antonio: 39°30' S; 64°16.57' W, 12-I-2014 Coscarón M. C., Diez F. and Espindola M. col., Cornelis M. det. 2016 1 male (MACN).

New record: ARGENTINA: Chubut: Los Altares, Puerto Pirámide; **Neuquén:** Plottier, Sierra Senillosa

Remarks: This species was named under the subgenus *Nabis (Nabis)* by Carpintero (2009, 2014) and Melo et al. (2011), always forming part of a checklist, but the authors did not provide a basis for inclusion.

This species is very similar to *N. (A.) punctipennis* and *N. (A.) paranensis* (see discussion of *N. (A.) paranensis*), but differs because the pronotum in the macropterous form is greatly expanded behind. As in *N. (A.) punctipennis*, it presents submacropterous and

macropterous forms, but differs by the paramere and vaginal structure.

***Nabis (Austronabis) faminei* Stål, 1859**

(Figs. 1c–d, 4b, 5b, 6b, 7b)

Nabis faminei Stål, 1859: 260; Reuter, 1872: 92; Walker, 1873: 144; Breddin, 1897: 9; Pennington, 1921: 26; Harris, 1939: 372; Prado, 2008: 44; Volpi and Coscarón, 2010: 58; Cornelis and Coscarón, 2013: 22; Faúndez and Carvajal, 2014: 66; Coscarón et al., 2015: 297; Coscarón, 2017: 184.

Coriscus faminei Stål, 1873: 113; Berg, 1879: 145.

Nabis (Nabis) faminei Berg, 1895: 201; Berg, 1896: 132; Carpintero, 2014: 376.

Reduviolus punctipennis: Reuter, 1908: 122; Reuter, 1912: 23.

Redescription. Male. (Figs. 1c, 4b, 5b) Submacropterous form. Body oblong. In some specimens, general coloration dark brown. Body scarcely covered with short light adherent setae. Eyes large; ocelli small; rostrum reaching mesocoxae; antennal segment III slightly longer than IV; segment I shortest; segments III and IV and apex of II dark brown, segment I with

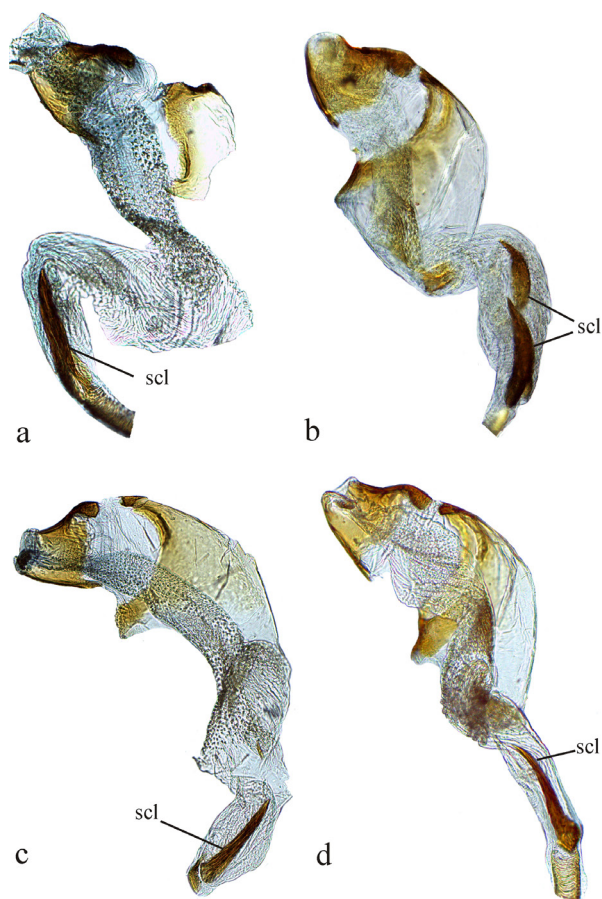


Figure 5. Aedeagus. a, *Nabis (Austronabis) argentinus*. b, *N. (A.) faminei*. c, *N. (A.) paranensis*. d, *N. (A.) punctipennis*. (scl: sclerite).

dark dots on ventral margin. Pronotum with anterior lobe in lateral view strongly arched upwards. Hemelytra reaching the base of abdominal segment VII, membrane small; hind wings visibly shorter than hemelytra. Profemora very thickened, mesofemora incrassate; all appendages dotted with fuscous dark dots, tibiae distally brown, tarsal segments I and III distally brown. Connexival segment dorsally dark brown, with a region on basal external margin pale. Abdomen ventrally with dark dots scattered (surface totally dark brown in some specimens); connexival segments ventrally with the same color pattern as dorsally, external edge sawed; surface of abdomen with abundant whitish setae. Genitalia: disc of paramere similar to that

of *N. (A.) punctipennis*, but without bulging on internal margin, distal region of disc elongated and thin, base of paramere nearly as wide as the disc, junction between disc and base almost forming a 90-degree angle (Fig. 4b); aedeagus with two thin sclerites, with apices oriented towards the same direction, one sclerite twice longer than the other; surface covered by sharp denticles, in the middle region densely arranged (Fig. 5b).

Female. (Figs. 1d, 6b, 7b). Submacropterous form, similar to male, except for hemelytra reaching the base of abdominal segment VI, membrane in some specimens with two closed cells. Genitalia: Genital segments moderately protruded regarding abdominal segment VII; vagina in dorsal view with common oviduct situated near the middle of basal region, the basal portion of lateral oviducts constricted and the distal portion becoming lost after treatment with KOH solution; on right basal region, a dorsal diverticulum; superior region, partially sclerotized (Fig. 6b); in ventral view, large and asymmetrical parietal gland on superior margin of the vagina (Fig. 7b).

New material examined: ARGENTINA: Tierra del Fuego: Ushuaia 54°49'27.36" S, 68°20'44.31" W, 8-26.II.1961, Borys Malkin col., 2 males, 3 females (BHM).

Remarks: Berg (1895, 1896) included *Nabis (Austronabis) faminei* in the subgenus *Nabis (Nabis)*. However, later authors did not follow this classification, except for Carpintero (2014), who mentioned it in a checklist.

The material here examined and data collected from the literature (Cornelis & Coscarón 2013, Faúndez & Carvajal 2014) allow deducing that this species is only submacropterous, as described by Stål in his original publication. However, Berg (1895) mentioned that one male out of four specimens examined was macropterous.

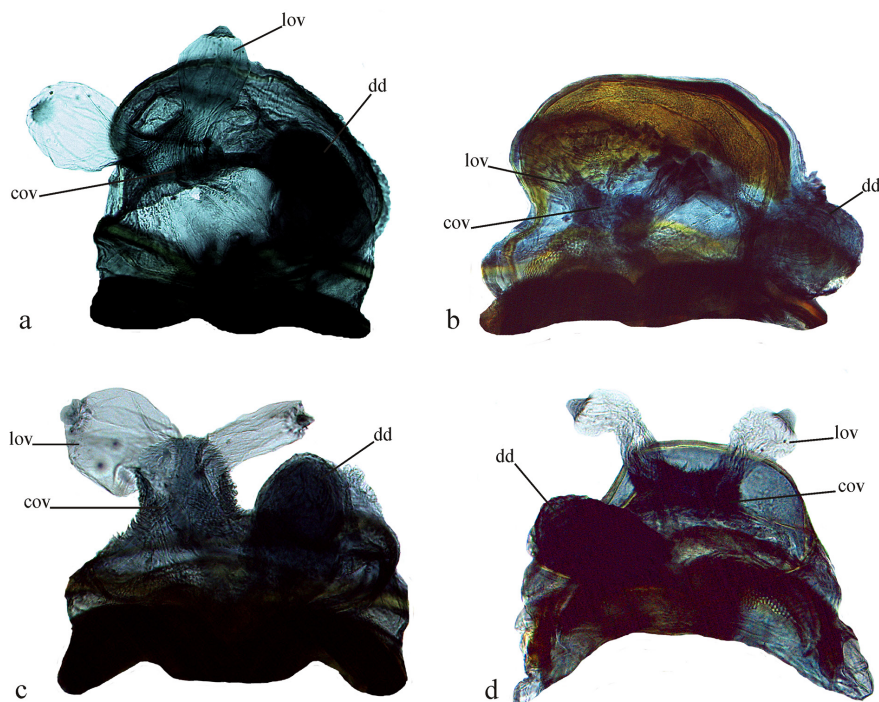


Figure 6. Vagina in dorsal view. a, *Nabis (Austronabis) argentinus*. b, *N. (A.) faminei*. c, *N. (A.) paranensis*. d, *N. (A.) punctipennis*. (cov: common oviduct; dd: dorsal diverticulum; lov: lateral oviducts).

Nabis (A.) faminei is very similar in appearance to the submacropterous form of *N. (A.) punctipennis*. Berg (1879) noted that “According to Stål description, it is very similar to *Coriscus punctipennis* Blanch., only smaller (from 41/2 to 51/2 mm in length), perhaps identical to it, representing a Southern climateric form”, whereas Harris (1939) pointed out that *N. (A.) faminei* is the closest to *N. (A.) punctipennis*. Nevertheless, it differs by presenting a robust and oval body, broader pro- and mesofemora, shorter legs, large eyes, two sclerites in the aedeagus and vagina with different shape.

***Nabis (Austronabis) paranensis* Harris, 1931**

Nabis paranensis Harris, 1931: 182; Harris, 1939: 374; Rizzo, 1976: 57; Quintanilla et al., 1968: 32; Volpi and Coscarón, 2010: 58; Cornelis and Coscarón, 2013: 17; Faúndez, 2015: 115; Coscarón et al., 2015: 297; Coscarón, 2017: 184.

Navis [sic] paranensis: Quintanilla et al., 1976: 122.

Nabis (Nabis) paranaensis: Carpintero, 2009: 299; Melo et al., 2011: 12; Carpintero, 2014: 376.

Nabis paranaensis: Dellapé and Carpintero, 2012: 130.

Redescription. Male. (Figs. 2a, 4c, 5c). Macropterous form. Body linear or oblong. Head with postocular region rounded and long, more than twice the distance between ocelli; ocelli large; rostrum reaching procoxae; antennal segments III longer than IV and I, I and IV equal in length. Hemelytra surpassing abdomen tip, slightly widened in the middle, exposes external edge of connexivum. Profemora thickened, mesofemora almost not incrassate; all appendages dotted with fuscous dark dots, femora and tibiae distally and last tarsus distal region dark brown. Abdomen on ventral surface with small dark dots scattered, connexival segments light brown, region of stigma and distal external margin dark brown, external edge smooth. Genitalia: disc of paramere with a bulging on internal margin, distal region elongated and thin, disc separated from the base of the paramere by constriction,

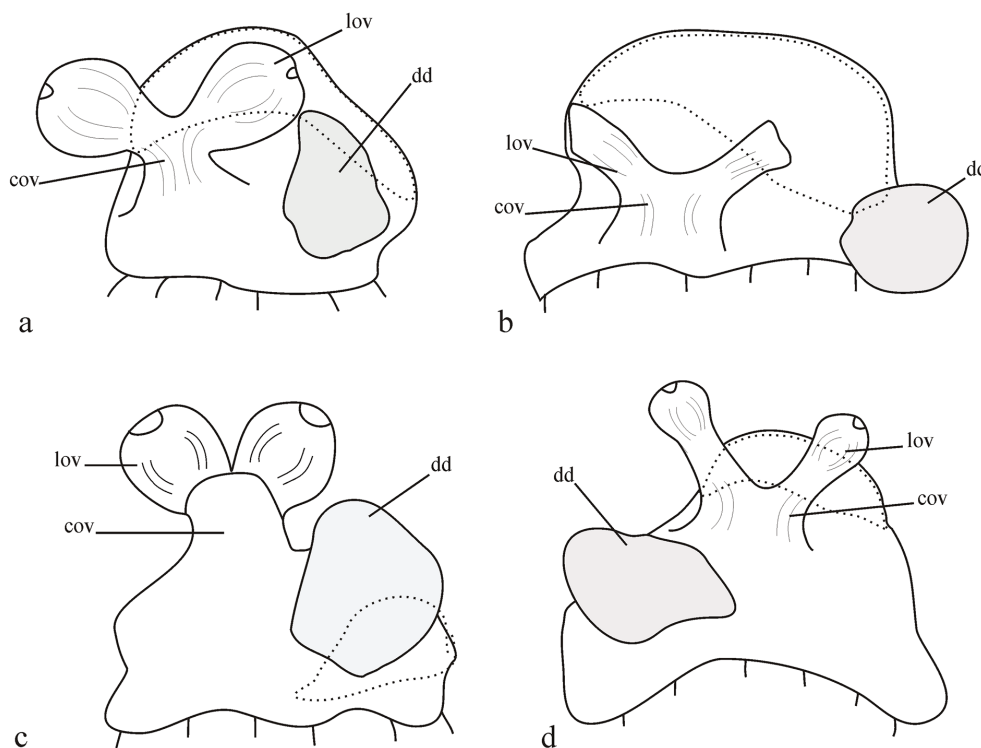


Figure 7. Vagina in dorsal view. a, *Nabis (Austronabis) argentinus*. b, *N. (A.) faminei*. c, *N. (A.) paranensis*. d, *N. (A.) punctipennis*. (cov: common oviduct; dd: dorsal diverticulum; lov: lateral oviducts). The parietal glands are marked with dotted lines.

less marked than in *N. (A.) argentinus*; base of paramere nearly as wide as the disc (Fig. 4c), aedeagus with one thin basal sclerite, surface beyond the sclerite densely covered by slightly sharp denticles (Fig. 5c).

Brachypterous form. Similar to macropterous form, except for: hemelytra reaching between the half of segment IV and the distal margin of abdominal segment V, membrane very reduced. Hind wings visibly shorter than hemelytra, reaching half of segment III.

Female. (Figs. 2b, 6c, 7c). Macropterous and brachypterous forms, similar to the male of the same wing development. Genitalia: Genital segments moderately protruded regarding abdominal segment VII; vagina in dorsal view with very large common oviduct situated on left basal region, basal and distal portion of lateral oviducts globose, more than in *N. (A.) argentinus* and *N. (A.) punctipennis*, with a sclerotized dorsal diverticulum on right anterior basal region (Fig. 6c); in ventral view, asymmetrical parietal gland

on basal right margin of the vagina, smaller than in *N. (A.) argentinus* (Fig. 7c).

New material examined: ARGENTINA: La Pampa: near Winifreda, 36°19'2.34" S, 64°12'3.21" W, 24-III-2017 Cornelis M. col, Cornelis M. det. 2017, 5 males, 5 females (MACN).

Remarks: This species was named under the subgenus *Nabis (Nabis)* by Carpintero (2009, 2014) and Melo et al. (2011), always forming part of a checklist, but the authors did not provide a basis for inclusion.

Nabis (A.) paranensis is very similar to *N. (A.) argentinus*. The macropterous forms of both species are difficult to separate, and the structure of the aedeagus is similar, but they differ by the shape of the paramere and the conformation of the vagina.

Nabis (A.) paranensis differs by having the first antennal segment equal in length or slightly shorter than the distance between the eyes; in the other species of the group, the length of the first antennal segment is markedly shorter than

the distance between the eyes. In addition, this is the only species of the group that presents brachypterism, with the hind wings slightly shorter than the hemelytra.

***Nabis (Austronabis) punctipennis* Blanchard, 1852**

Nabis punctipennis Blanchard, 1852: 161; Signoret, 1863: 577; Reuter, 1872: 92; Walker, 1873: 143; Pennington, 1921: 26; Van Duzee, 1937: 114; Harris, 1939: 370; Quintanilla et al., 1968: 32; Viana and Williner, 1972: 28; Quintanilla et al., 1976: 122; Rizzo, 1976: 57; Prado, 2008: 44; Volpi and Coscarón, 2010: 59; Cornelis and Coscarón, 2013: 24; Faúndez and Carvajal, 2014: 67; Coscarón et al., 2015: 297; Coscarón, 2017: 185.

Coriscus punctipennis: Stål, 1873: 113; Berg, 1879: 143.

Nabis (Nabis) punctipennis Berg, 1892: 205; Carpintero, 2014: 376.

Reduviolus punctipennis: Reuter, 1908: 122.

Redescription. Male. (Figs. 2c, 4d, 5d). Macropterous form. Body linear. In some specimens, general coloration very pale. Ocelli medium; often head ventrally with two thin lines on the outer edges, near the eyes, light brown; rostrum reaching procoxae; antennal segment I shortest; segments III and IV, and apex of II (in some specimens) dark brown, segment I with dark dots. Hemelytra surpassing abdomen tip. Profemora thickened, mesofemora almost not incrassate; all appendages dotted with fuscous dark dots, coxae and trochanters weakly stained, tibiae and tarsi distally brown. Ventral surface of abdomen with small dark dots scattered; connexival segments light brown with distal external margin dark brown, sometimes with red external line running longitudinally, external edge sawed. Genitalia: disc of paramere similar to that of *N. (A.) paranensis*, but thinner, and slightly bulging on internal margin, distal region of disc elongated and thin, base of

paramere nearly as wide as the disc with the base; junction between disc and base almost forming a 90-degree angle (Fig. 4d); aedeagus with one thin basal sclerite (Fig. 5d), basal region of aedeagus beyond the sclerite covered by slightly sharp denticles arranged spacedly, middle and distal region of aedeagus densely covered by blunt denticles.

Submacropterous form. Similar to macropterous form, except for: more widened toward the middle of the abdomen; head wider than long; hemelytra reaching the distal margin of abdominal segment VII, membrane reduced, with one cell closed; hind wings visibly shorter than hemelytra.

Female. (Figs. 2d, 6d, 7d). Macropterous and submacropterous forms, similar to the male of the same wing development. Genitalia: genital segments moderately protruded regarding abdominal segment VII; vagina in dorsal view with common oviduct situated in the middle region, the basal portion of lateral oviducts constricted and the distal portion slightly globose, on left basal region, a dorsal diverticulum under the oviduct (Fig. 6d); in ventral view, asymmetrical parietal gland on superior margin of the vagina (Fig. 7d).

New material examined: ARGENTINA:
Chubut: Los Altares: 43°53.082' S, 68°24.458' W, 21-II-2013 Coscarón M. C., Quirán E., Diez F. and Pall J. col. Cornelis M. det. 2016 2 males, 2 females (MACN), Parque Nacional Los Alerces 42°51.684' S; 71°37.478' W, 23-II-2013 Coscarón M. C., Quirán E., Diez F. and Pall J. col., Cornelis M. det. 2016 1 male, 2 females (MACN); **Neuquén:** Lago Lacar, Pucará I-1952 N. Kormilev col. 1 female (BHM); Rucahoroi: 39°14.226' S; 71°10.882' W, 25-II- 2013 Coscarón M. C., Quirán E., Diez F. and Pall J. col. Cornelis M. det. 2016 2 males, 2 females (MACN); San Martín de Los Andes: 40°09.616 S; 71°20.89' W, 09-I-2014 Coscarón M. C., Diez F. and Espindola M. col., Cornelis M. det. 2016 3 males, 3 females

(MACN), near Villa La Angostura 40°36.377' S, 71°42.484' W, 09-I-2014 Coscarón M. C., Diez F. and Espindola M. col., Cornelis M. det. 2016 10 males, 10 females (MACN); **Río Negro**: near San Carlos de Bariloche: 41°02.140' S; 71°16.219' W, 09-I-2014, Coscarón M. C., Diez F. and Espindola M. col., Cornelis M. det. 2016 1 male, 1 female (MACN), near El Bolsón: 41°36.853' S; 71°28.032' W, Coscarón M. C., Diez F. and Espindola M. col., Cornelis M. det. 2016 2 females (MACN). **CHILE: Magallanes**: Isla Novarino: Pto. Williams 54°56'7.23" S, 67°36'18.35" W, I-1964 J. C. Boyd col. Road Nothofagus woods 1 male (BHM); **Maule**: Talca: 35°25'23.68" S, 71°38'54.53" W, 2-XI-1970 J. and M. Sellacek col. 1 male (BHM).

Remarks: Berg (1892) included *Nabis punctipennis* in the subgenus *Nabis* (*Nabis*) based on Reuter's description. However, later authors did not follow this classification, except for Carpintero (2014), who mentioned it in a checklist.

Nabis (A.) *punctipennis* often has a very pale overall body color, differing from the other species in the group.

DISCUSSION

The members of *Nabis* (*Austronabis*) are very similar in general structure and coloration; their wing polymorphism makes it often necessary to examine structures of male and female genitalia to obtain accurate identifications. Harris (1939) defined this group of closely related species, whose names (except for *N. (A.) paranensis*) have remained for some time as synonyms for *N. (A.) punctipennis*.

In external appearance, *N. (Austronabis)* species are similar to those of *Nabis* (*Nabis*); in fact, some authors included these species (see remarks of each species) within the subgenus *Nabis*, unfortunately without giving

fundamentals. *N. (Austronabis)* differs from other subgenera by having the genital capsule of the male slightly asymmetrical and with the right side swollen, the paramere with disc not widened, sickle-shaped, without reversible plate and the vagina asymmetrical with a dorsal diverticulum.

The presence of the genital capsule of the male slightly asymmetrical and with the right side swollen is a new morphological character for *Nabis*. According to the literature, until the present, in all members of the genus, the male genital capsule is symmetrical and with parallel sides, except in *Nabis (Milu) apicalis* (Matsumura), where the capsule is asymmetrical (Kerzhner 1963). However, the capsule form of *N. (M.) apicalis* and the kind of asymmetry differs from that of *N. (Austronabis)*.

According to Kerzhner (1981), the habit, color, shape of paramere and armament of the aedeagus of the subgenus *Nabis* (*Philobatus*) (represented by the single species *N. (P.) christophi* (Dohrn), which lives under the shrubs in the semi-desert regions of Central Asia) are very similar to that of the *N. (A.) punctipennis* species group of South America. However, considering the structure of the vagina, this similarity is purely convergent and associated with life in similar arid conditions. *Nabis* (*Philobatus*) also differs from *N. (Austronabis)* by presenting a genital capsule with parallel sides, laterally with an acute protuberance.

Nabis ashworthi differs from *N. (Austronabis)* species by the following characters: symmetrical genital capsule and with parallel sides (Fig. 3b), paramere disc moderately broad and not sickle-shaped, and symmetrical vagina without dorsal diverticulum (Cornelis et al. 2016).

In addition, *N. ashworthi* presents a prominent, conspicuously depressed, shining circular spot at each anterolateral scutular angle, a characteristic shared with the

subgenera *N. (Dolichonabis)*, *N. (Nabicula)* and *N. (Limnonabis)*. In the past, these taxa were included in the genus *Nabicula*, outside *Nabis*, based on the following combination of characteristics: bodies elongated and slender (generally abdomen with sides parallel in male or widened in the middle in female), strongly shortened hemelytra, absence of three dark spots on the corium in macropterous forms, and other biological characteristics such as more or less humid environments in which they live and overwintering in egg stages (Kerzhner 1981). However, they differ from each other by characters of the aedeagus and vagina, and in most cases by their appearance (Larivière 1994). According to Kerzhner (1981), some morphological characteristics may be due not to the phylogenetic relationship, but to the adaptation to similar environmental conditions. For example, in humid habitats, the overwintering in egg stage is beneficial, which leads to a shortening of the hemelytra, which correlates with the appearance of shiny areas in the anterior corners of the scutellum.

We propose assigning *N. ashworthi* to the subgenus *N. (Dolichonabis)*, new combination, an opinion based on diagnostic characters of *N. (D.) ashworthi*: hemelytra strongly shortened, not extending beyond third abdominal segment; hind wings reduced, forming short, more or less fan-shaped lobe with rounded tip (such as *N. (Dolichonabis) americolimbata* Carayon, *N. (D.) limbata* (Dahlbom) and *N. (D.) nigrovittata nearctica* (Kerzhner) (Larivière 1994)); shape of paramere, aedeagus with one simple basal sclerite and small spines distally; and vagina symmetrical with parietal gland symmetrical (very similar to that of *N. (D.) tesquorum* Kerzhner).

The holotype of *N. (D.) ashworthi* was recorded in the Valdivian rainforest on *Fuchsia magellanica* Lam. (Onagraceae), a moist

environment (Faúndez & Carvajal 2014, Cornelis et al. 2016). This environment is characterized by a mean annual rainfall that oscillates from 2000 to 3000 mm (González-Reyes & Muñoz 2013) and mean temperatures that oscillate from 12°C to 15°C (Smith-Ramírez 2004). Also, this area has a large number of endemic species (Morrone 2015). This environment coincides with that described for *N. (Dolichonabis)*, *N. (Limnonabis)* and *N. (Nabicula)* species (Kerzhner 1981, Larivière 1994). Unfortunately, no data are available about overwintering of this species. Also, as we mentioned in Cornelis et al. (2016), it is possible that macropterous forms of *N. (D.) ashworthi* exist, but such specimens have not been recorded. For this reason, it is necessary to increase the sampling effort, and carry out further studies to gain insights into the biology of *N. (D.) ashworthi*. Also, a phylogenetic analysis of species belonging to the subgenus *N. (Dolichonabis)* is needed to clarify whether or not *N. (Dolichonabis)* is a monophyletic group.

Key to the subgenera of *Nabis* from the world

1. General color greenish or pale red.....
.....***N. (Aspilaspis)*** Stål
 - General color light brown, dark brown or black (in *N. (Nabicula) subcoleoptratus* (Kirby)), never dominant color green.....**2**
2. Aedeagus with a row of numerous similar sclerites in basal half and with four or five dissimilar sclerites in apical half. Mostly brachypterous, hemelytra about twice the length of scutellum, without membrane; or apterous..... ***N. (Australonabis)*** Strommer
 - Aedeagus without a row of numerous similar sclerites in basal half and with a variable number of different sclerites in the apical half, or without them. Macropterous or brachypterous forms.....**3**

3. Genital capsule very large, length equal to all anterior segments combined, anterolateral surface with small tooth on either side.....

N. (Omanonabis) Asquith and Lattin

- Genital capsule always shorter than all anterior segments combined, without anterolateral teeth.....**4**

4. Lateral corners of scutellum with prominent, conspicuously depressed, shining circular area, sometimes, especially in macropterous specimens, very small, visible only in oblique lateral view. Hemelytra usually strongly shortened, leaving uncovered not less than half the abdomen; if rarely hemelytra longer, three dark dots on veins of corium absent.....**5**

- Lateral corners of scutellum without depressed shining area. Hemelytra in general complete, surpassing or reaching the tip of abdomen, sometimes shorter (*N. (Milu)*); with three dark dots on veins of corium.....**7**

5. Connexivum ventrally flat. Margins of head beyond eyes converging posteriorly. Width of abdomen not less than 2 mm in males and 2.7 mm in females. Lateral margin of hemelytra curved obtuse-angulately near the middle. Aedeagus with two rows of small hooks on apical region. Vagina with rounded-triangular anterior sac and two parietal glands..... **N.**

(Nabicula) Kirby

- Connexivum ventrally at least slightly thickened in the form of a bolster in inner part. Margins of head beyond eyes diverging, parallel or slightly converging posteriorly. Width of abdomen not more than 1.8 mm in males and 2.2 mm in females. Lateral margin of hemelytra straight or arch-shaped. Aedeagus and vagina structure different.....**6**

6. Margins of head beyond eyes diverging; if parallel or slightly converging posteriorly (*N. (Limnonabis) sauteri* (Poppius)), shortened hemelytra reaching at least abdominal tergite VI. Aedeagus with three or four relatively large sclerites or plates. Vagina with thin-walled sac separated by a strangulation.....

.....**N. (Limnonabis)** Kerzhner

- Margins of head beyond eyes parallel or slightly converging posteriorly. Shortened hemelytra as a rule not reaching beyond posterior margin of abdominal tergite III. Aedeagus with one or two large sclerites. Vagina without thin-walled sac separated by strangulation..... **N.**

(Dolichonabis) Reuter

7. Connexivum almost flat ventrally or only with very low roll along a shallow groove that separates it from the abdomen. Vagina with strongly sclerotized ventral sac; two parietal glands situated in anterior corners of this sac..... **N. (Milu)** Kirkaldy

- Connexivum ventrally of different form. Vagina without sclerotized sac, with one or two parietal glands.....**8**

8. Body oblong-oval, 3.2-3.5 times longer than pronotal rear width. Paramere very elongated.....**9**

- Body more slender and narrow, 4-7 times longer than pronotal rear width. Paramere shorter, often with a semicircular disc or a sickle-shaped disc.....**10**

9. Membrane of hemelytra with veins very branched with numerous short branches (including inside cells), ending in a rounded extension. Hamus on posterior wings leaves from transverse vein. Genital capsule of male with acute protuberance laterally.....

.....**N. (Philobatus)** Kerzhner

- Membrane of hemelytra with veins weakly branching, not branching inside cells, not

widened at the end. Hamus on posterior wings leaves from Cu. Genital capsule of male without acute protuberance laterally.....

N. (*Halonabis*) Reuter

10. Genital capsule of male asymmetrical, aedeagus with a thin and elongated simple sclerite (two in *N.(A.) famineii*), vagina asymmetrical, often with a dorsal diverticulum and one asymmetrical parietal gland..... **N. (*Austronabis*)** subgen. nov.

- Genital capsule of male symmetrical; aedeagus with one or more sclerites, or without them. Sclerites simple or with basal plate. Vagina generally symmetrical, with one or two parietal glands.....**11**

11. Aedeagus without sclerites, with a longitudinal strip or continuous cover of sharp small spin es..... **N. (*Reduviolus*)** Kirby

- Aedeagus with different structure, with one or more sclerites.....**12**

12. Macropterous, hemelytra extending well beyond end of abdomen. Aedeagus with two larger sclerites pointing in opposite directions; in *N. (T.) kinbergii* Reuter there is a third sclerite smaller.....**N. (*Tropiconabis*)** Kerzhner

- Macropterous, submacropterous and brachypterous forms. Aedeagus with one or two sclerites, if there are two vertices, they are oriented parallel or perpendicular to each other..... **N. (*Nabis*)** sensu stricto Latreille

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MARCELA CORNELIS¹

<https://orcid.org/0000-0002-7362-7555>

FERNANDO DIEZ¹

<https://orcid.org/0000-0002-5545-3205>

MARÍA DEL CARMEN COSCARÓN²

<https://orcid.org/0000-0002-2573-935X>

¹Universidad Nacional de La Pampa, Facultad de Ciencias Exactas y Naturales, Uruguay 151, L6300CLB, Santa Rosa, La Pampa, Argentina

²Centro Austral de Investigaciones Científicas (CADIC-CONICET), Houssay 200, 9410, Ushuaia, Tierra del Fuego, Argentina

Correspondence to: **Marcela Cornelis**

E-mail: cornelismarcela@gmail.com

Author contributions

Marcela Cornelis's contributions: description of specimens; key to the subgenera; collecting; writing and photographs. Fernando Diez's contributions: collecting, description of specimens and photographs. María del Carmen Coscarón's contributions: collecting and work's supervision.

