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A new species of *Homonota* (Reptilia: Squamata: Gekkota: Phyllodactylidae) endemic to the hills of Paraje Tres Cerros, Corrientes Province, Argentina

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Abstract

The genus *Homonota* comprises nine South American species of terrestrial and nocturnal lizards. *Homonota* lizards lack the femoral pores typical of other South American Phyllodactylidae, and their infradigital lamellas are not expanded. We here describe a new species, *Homonota taragui* sp. nov., exclusively found on a small group of three hills up to 179 meters above sea level in central eastern Corrientes Province, Argentina. The new species differs from other *Homonota* species by a combination of characters, including: a well-marked dorsal, reticulate, dark pattern contrasting with a lighter colored background; small, star-shaped chromatophores on the abdomen; the post-orbital region of the head covered by granular scales; the dorsal and anterior regions of the thighs covered by keeled scales interspersed with cycloid scales; and the internasal scale in contact with rostral scales. The conservation status of *Homonota taragui* sp. nov. may be vulnerable, due to its localized endemism with populations on three small hills surrounded by intense agricultural and livestock activity. Two endemic plant species are known from these hills, and this new lizard represents the first endemic animal species.

Key words: *Homonota taragui* sp. nov., sky island, small hills, taxonomy

Introduction

The family Phyllodactylidae consists of geckos of trans-Atlantic distribution, with representatives distributed in the New World and in the Iberian Peninsula, Near East, and northern Africa (Gamble *et al.*, 2011). In South America, the family is represented by the genera *Bogertia*, *Garthia*, *Gymnodactylus*, *Homonota*, *Phyllodactylus*, *Phyllopezus*, and *Thecadactylus*. *Homonota* is distinguished from other South American Phyllodactylidae genera by having a depressed body, small cephalic scales, infradigital lamellas without expansions, and lacking femoral pores (Ceï, 1993; Abdala, 1998; Carreira, 2005; Daza *et al.*, 2009). *Homonota* is supported as monophyletic by morphological analyses and molecular phylogenetics (Abdala & Moro, 1996; Abdala, 1998; Gamble *et al.*, 2011). The genus *Garthia* has been included within *Homonota* (Kluge, 1965; 2001); but, recent molecular work inferred *Garthia* as sister to a clade consisting of *Homonota* + *Phyllodactylus* (Gamble *et al.*, 2011). The taxonomic identity of *Garthia* was also supported by morphology (Abdala & Moro, 1996; Abdala, 1998). The recent phylogeny of Pyron *et al.* (2013) recovered the same relationships indentified by Gamble *et al.*, (2011), but they considered *Garthia gaudichaudii* as *Homonota gaudichaudii*.

The genus *Homonota* currently consists of nine species of terrestrial and nocturnal lizards distributed in South America (Kluge, 1964; Ceï, 1993; Abdala, 1998; Avila *et al.*, 2012). Most species occur in Argentina, such as *H. andicola*, *H. darwinii*, *H. whitii*, *H. underwoodi*, *H. fasciata*, *H. borellii*, and *H. williamsii*. One species, *H. rupicola*, occurs in Paraguay, (Cacciali *et al.*, 2007), and another one, *H. uruguayensis*, in Uruguay and Brazil (Vaz-Ferreira & Sierra de Soriano, 1961). The species distributed in Argentina are found in 20 of the 23 provinces, including Corrientes (Abdala *et al.*, 2012).

The province of Corrientes is located in the Mesopotamian littoral of Argentina. Its territory is characterized by large wetlands, such as the Paraná and Uruguay rivers, on the eastern and the western borders, respectively, and the Iberá wetland in the central North. Biogeographically, the province is characterized by the convergence of three phytogeographic provinces, the "Espinal", "Paranaense", and "Chaqueña" (Cabrera & Willink, 1980). The diversity of wetlands and biogeographic provinces produces a mosaic of environments, harboring one of the highest concentrations of biodiversity in Argentina. With 59 amphibian and 100 reptile species, Corrientes is, in fact, one of the Argentinean provinces with the highest herpetological diversity (Vaira *et al.*, 2012; Abdala *et al.*, 2012; Giraudo *et al.*, 2012; Prado *et al.*, 2012a; Prado *et al.*, 2012b).

Historically, herpetological surveys in Corrientes have been conducted almost exclusively in the Paraná River Basin (Picaglia, 1887; Cei & Roig, 1961; Contreras & Contreras, 1982a; Contreras & Contreras, 1982b) and the Iberá wetland (Álvarez *et al.*, 2002; Giraudo *et al.*, 2006; Ingaramo *et al.*, 2012). In contrast, the Uruguay River Basin has literally been forgotten (Iriondo & Krohling, 2008). For instance, herpetological studies of this basin in Corrientes have been scarce, and the few published records make the Uruguay River Basin the least well-documented area of the province (see Álvarez *et al.*, 2002). This knowledge gap motivated us to conduct herpetological field surveys and explore the Uruguay River Basin in Corrientes.

During these surveys, we explored three small rocky outcrops, located at Paraje Tres Cerros, near the Uruguay River in Central East Corrientes Province. To our knowledge, this is the first herpetological survey in the area. On the quartz sandstone headlands found in the hills, we collected several specimens identified as *Homonota*, but with the scutellation and body coloration differing from any of the known species of the genus. The only *Homonota* species reported in the province of Corrientes is *H. fasciata*, known from the Paraná River Basin (Etchepare *et al.*, 2011). All the specimens of Paraje Tres Cerros can be assigned to the same, unknown species, and would represent the first record for the genus *Homonota* in the area. In this study, we describe the new species and discuss aspects of its distribution, habitat, ecology, conservation status, and natural history. We also report other lizard species found in this survey.

Materials and methods

Study area

Paraje Tres Cerros belong to the municipality of La Cruz, in the Department of General San Martín, in central East Corrientes Province, Argentina (Fig. 1). Biogeographically, this area part of the "Campos y Malezales", within the "Dominio Chaqueño" (Cabrera & Willink, 1980) characterized by savannah dominated by grasses and small scattered patches of hydrophilic forest. Geologically, Paraje Tres Cerros consists of a rock outcrop made of quartz sandstone dating from the Late Jurassic to the Early Cretaceous (Herbest & Santa Cruz, 1999). The outcrop includes three hills literally appearing as "sky islands" (Heald, 1967) surrounded by the vast plains of Corrientes. These three hills, named El Nazareno (179 m a.s.l.), El Capará (158 m a.s.l.), and El Chico (148 m a.s.l.) (Fig. 1), are the only ones found in the entire province and neighboring regions. They represent an isolated environment characterized by singular microhabitats of rocky grassland.

Taxonomic sampling and morphological analyses

Field surveys were conducted between November and December of 2010, and during May of 2011. A total of 22 specimens of *Homonota* **sp. nov.** were collected. The lizards were found below the rocks and collected by hand during diurnal hours. In the laboratory, specimens were euthanized by a pericardial injection of a local anesthetic carticain, fixed with 10% formaldehyde, and then preserved in 70% alcohol. Prior to fixing, sex was determined by the eversion of hemipenes (males), and by the absence of these in females. Sex was additionally corroborated in some females, by the presence of eggs by visual and palpation inspection. Voucher specimens were deposited in the Herpetological Collection of Universidad Nacional del Nordeste (UNNEC, Corrientes Province, Argentina, 20 specimens deposited), and in the Herpetological Collection of Museo de La Plata (MLP, Buenos Aires Province, Argentina, two specimens deposited). Scale terminology follows Kluge (1964). Measurements (to the nearest 0.1 mm) were taken with digital caliper and are defined as: Total Length (TL, from the tip of the snout to the tip of the tail), Snout-Vent Length (SVL, from the tip of the snout to vent), Tail Length (TL, from the vent to tip of the tail), Head Length (HL, from the tip of the snout to the opening ear), Head Width (HW, at widest section), Eye Diameter

(ED), Ear Opening Diameter (EOD, at widest section), Eye-Nostril Distance (END, from the posterior edge of the nostril to the anterior edge of the eye), Eye-Ear Opening Distance (EEOD, from the posterior edge of the eye to the anterior edge of the ear opening), and Vent Width (VW). Scale characters were taken under Olympus SZX9 stereoscopy magnifying glass: Scales Around Midbody (SAM), Dorsal Scales (DS), Supralabial Scales (SL), Infralabial Scales (IS), Internasal Scale (IS), Keeled Scales of the Left Thigh (KSLT), Keeled Scales of the Right Thigh (KSRT), Infradigital Lamellae on Fingers of Hindlimbs (ILFH) and Infradigital Lamellae on Fingers of Forelimbs (ILFF).

We compare morphological data of the new species with specimens of all other *Homonota* species and their original descriptions (Peracca, 1897; Vaz-Ferreira & Sierra de Soriano, 1961; Kluge, 1964; Cei, 1978a; 1978b; Cacciali *et al.*, 2007; Avila *et al.*, 2012). Although we were unable to review holotype specimens, for three species (*H. andicola*, *H. borellii*, and *H. rupicola*) we were able to examine specimens from toptotypical localities. A list of the *Homonota* species and respective specimens examined is found in Appendix I.

Finally, to provide information about the natural history of the new species, we discuss and report field observations about its reproduction and microhabitat use.

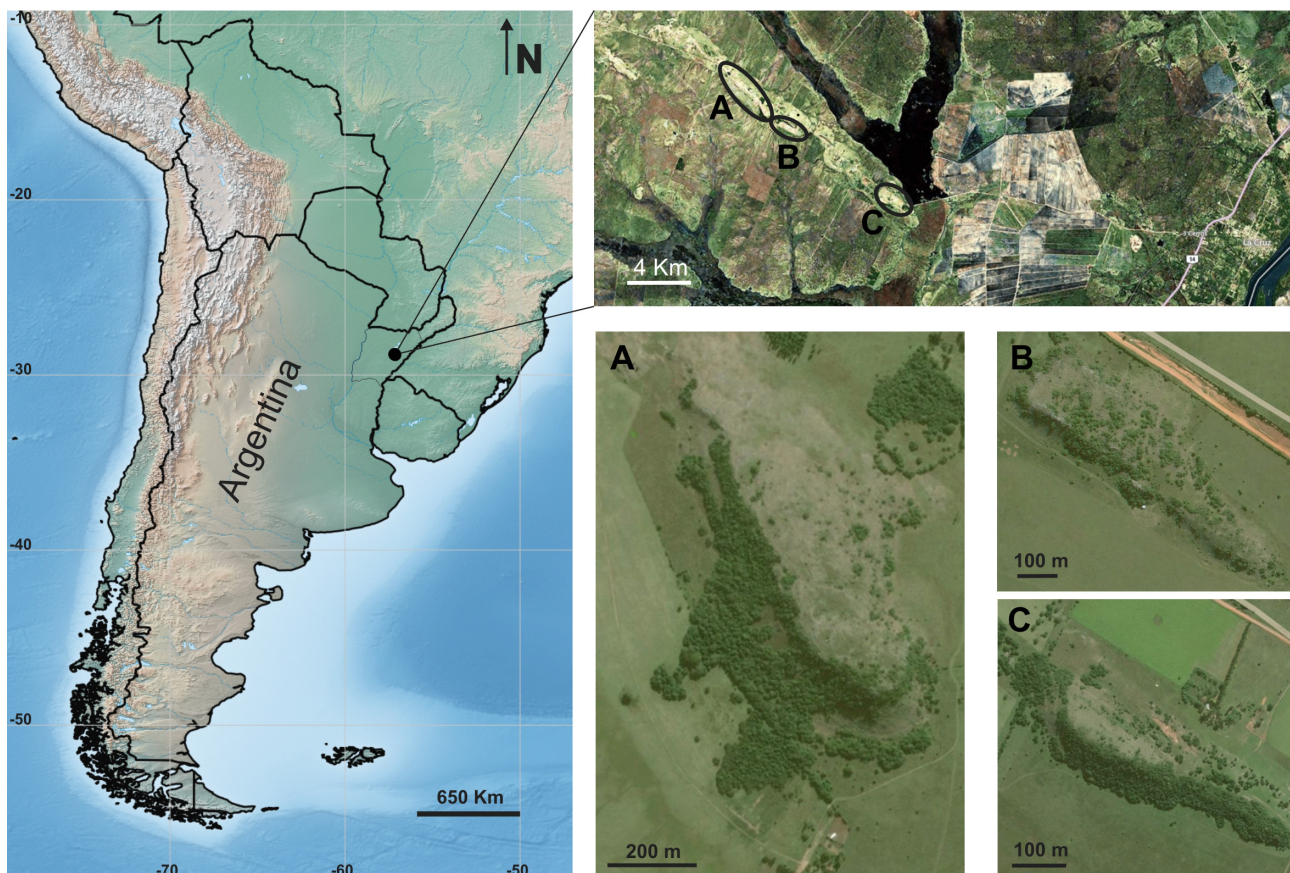


FIGURE 1. Map of Argentina showing the type locality of *Homonota taragui* sp. nov. (black dot) at Nazareno, Paraje Tres Cerros. Black ovals indicate the three hills Nazareno (A), Capará (B), and El Chico (C), respectively, where this new species is found.

Species description

Homonota taragui sp. nov.

Figs. 2, 3

Holotype. Fig. 2, 3 UNNEC 11293, adult female from Paraje Tres Cerros, Cerro Nazareno (29°06'34,30"S, 56°55'51,92"W, 168 m a.s.l.), Estancia “La Higuera Cue”, General San Martín Department, Corrientes Province, Argentina, collected by R. Cajade, E.G. Etchepare, C. Falcione, and D.A. Barrasso on 21 November 2010.



FIGURE 2. *Homonota taragui* sp. nov. from Paraje Tres Cerros, Estancia “La Higuera Cue” (Cerro Nazareno), Corrientes, Argentina.

Paratypes. All paratypes (21 specimens) from the same locality as the holotype, but collected in different hills and dates:

Cerro Nazareno (29°06'34.30"S, 56°55'51.92"W, 168 m a.s.l.), Estancia “La Higuera Cue”, collected by R. Cajade and E.G. Etchepare on 12 November 2010: UNNEC 11287 a juvenile, UNNEC 11289 a juvenile, UNNEC 11297 an adult female, MLP.S 5796 an adult female. Cerro Nazareno (29°06'34.30"S, 56°55'51.92"W, 168 m a.s.l.), Estancia “La Higuera Cue”, collected by R. Cajade, E.G. Etchepare, C. Falcione, and D.A. Barrasso on 21 November 2010: UNNEC 11281 an adult female, UNNEC 11283 an adult male, UNNEC 11285 an adult female.

Cerro Capará (29°06'45.68"S, 56°55'13.10"W, 143 m a.s.l.), Estancia “La Higuera Cue”, collected by R. Cajade, E.G. Etchepare, C. Falcione, and D.A. Barrasso on 21 November 2010: UNNEC 11277 an adult male, UNNEC 11278 an adult female, UNNEC 11279 an adult male, UNNEC 11282 an adult female, UNNEC 11284 an adult female, UNNEC 11288 a juvenile, UNNEC 11291 a juvenile, UNNEC 11292 a juvenile, UNNEC 11303 a juvenile, UNNEC 11304 a juvenile, MLP.S 5797 a juvenile.

Cerro El Chico (29°09'14.30"S, 56°55'09.80"W, 140 m a.s.l.), Estancia “Las Marías”, collected by R. Cajade, E.G. Etchepare, and C. Falcione on 6 May 2011: UNNEC 11294 an adult female, UNNEC 11295 an adult female, UNNEC 11296 an adult male.

Diagnosis.—*Homonota taragui* is a small species of *Homonota* (SVL= 41.86 mm; Table 1) that can be distinguished from other species of the genus by the following set of characters: a well-marked dorsal, reticulate, dark pattern contrasting with the lighter colored background; small, star-shaped chromatophores on the abdomen; presence of an internasal scale contacting the rostral scales; granular scales covering the post-orbital region of the head; granular scales forming smooth edges of the meatus auditory; presence of moderately keeled scales on the dorsal and lateral surface of the body; keeled scales contiguously disposed on the dorsal surface of the body; cycloid scales covering the dorsal surface of the arms; moderately keeled scales interspersed with cycloid scales covering the dorsal and anterior regions of the thighs.

TABLE 1. Morphometric and meristic variation within *Homonota taragui* **sp. nov.** type series. Mean, standard deviation (\pm), and range (given in parentheses) are in mm for size measurements, and in numbers for scales quantity. See Materials and Methods for abbreviations.

	Males (N = 4)	Females (N = 10)
SVL	39.45 \pm 0.97 (38.25-40.35)	39.43 \pm 1.62 (36.72-41.86)
CL	43.11 \pm 1.48 (41.12-44.64)	34.77 \pm 14.19 (12.86-51.66)
HL	10.20 \pm 0.62 (9.3-10.73)	10.14 \pm 0.67 (8.78-10.91)
HW	8.23 \pm 0.68 (7.22-8.77)	7.85 \pm 0.33 (7.35-8.47)
ED	2.18 \pm 0.09 (2.07-2.29)	2.24 \pm 0.16 (2.05-2.53)
EOD	0.62 \pm 0.16 (0.41-0.8)	0.65 \pm 0.10 (0.43-0.76)
NEL	3.17 \pm 0.22 (2.91-3.47)	2.97 \pm 0.27 (2.51-3.25)
EEOD	3.66 \pm 0.08 (3.58-3.74)	3.25 \pm 0.32 (2.54-3.55)
VW	4.09 \pm 0.29 (3.79-4.42)	3.94 \pm 0.35 (2.36-4.43)
SAM	53 \pm 2.16 (50-55)	55.33 \pm 3 (52-60)
DS	125.5 \pm 15.63 (105-143)	129.22 \pm 9.47 (119-149)
KSLT	10.25 \pm 2.21 (7-12)	9.55 \pm 1.66 (8-13)
KSRT	9.75 \pm 4.27 (5-15)	8.44 \pm 1.81 (5-10)

Homonota taragui differs from *H. andicola* in the following characters: presence of keeled scales on the dorsal and lateral surface of the body and dorsal surface of the thighs (keeled scales absent in *H. andicola*); the auditory meatus with smooth edges formed by granular scales (serrated edges formed by conical scales in *H. andicola*). *Homonota taragui* differs from *H. borellii* in the following characters: presence of keeled scales on the lateral surface of the body and dorsal surface of the thighs (keeled scales absent in *H. borellii*, Fig. 4); presence of an internasal scale contacting the rostral scales (internasal scales absent in *H. borellii*, Fig. 5). *Homonota taragui* differs from *H. darwinii* in the following characters: keeled scales extended along the whole dorsal body surface (keeled scales only on the posterior half of the dorsal body surface in *H. darwinii*); presence of keeled scales on the lateral surface of the body and dorsal surface of the thighs (keeled scales absent in *H. darwinii*); subcaudal scales transversely rectangular (vertically rhomboid in *H. darwinii*, Fig. 6); the auditory meatus with smooth edges formed by granular scales (serrated edges formed by conical scales in *H. darwinii*). *Homonota taragui* differs from *H. fasciata* in the following characters: rows of keeled scales on dorsal surface of the body composed by moderately keeled scales disposed contiguously (composed by strongly keeled scales separated from each other in *H. fasciata*); dorsal surface of the arms covered by cycloid scales (covered by keeled scales in *H. fasciata*); presence of an internasal scale contacting the rostral scales (internasal scale absent in *H. fasciata*, Fig. 5); subcaudal scales transversely rectangular (rhomboid vertically and transversely rounded in *H. fasciata*, Fig. 6); the auditory meatus with smooth edges formed by granular scales (serrated edges formed by conical scales in *H. fasciata*). *Homonota taragui* differs from *H. rupicola* in the following characters: presence of keeled scales on the lateral surface of the body and dorsal surface thighs (keeled scales absent in *H. rupicola*, Fig. 4); presence of an internasal scale contacting the rostral scales (internasal scale absent in *H. rupicola*, Fig. 5). *Homonota taragui* differs from *H. underwoodi* in the following characters: presence of chromatophores on the abdomen (chromatophores on abdomen absent in *H. underwoodi*); presence of keeled scales on the dorsal and lateral surface of the body and dorsal surface of the thighs (keeled scales absent in *H. underwoodi*); presence of an internasal scale contacting the rostral scales (internasal scales absent in *H. underwoodi*, Fig. 5); subcaudal scales transversely rectangular (vertically rhomboid in *H. underwoodi*); the auditory meatus with smooth edges formed by granular scales (serrated edges formed by conical scales in *H. underwoodi*). *Homonota taragui* differs from *H. uruguayensis* in the following characters: rows of moderately keeled juxtaposed scales on the dorsal surface of the body (strongly keeled imbricate scales in *H. uruguayensis*); dorsal surface of the arms covered by cycloid scales (covered by keeled scales in *H. uruguayensis*); the post-orbital region of the head covered only with granular scales (covered with granular scales interspersed with large keeled scales in *H. uruguayensis*, Fig. 7). *Homonota taragui* differs from *H. whitii* in the following characters: presence of keeled scales on the dorsal and lateral surface of the body and dorsal surface of the thighs (keeled scales absent in *H. whitii*); presence of an internasal scale contacting the rostral scales (internasal scale absent in *H. whitii*, Fig. 5); subcaudal scales transversely rectangular (rounded and

longitudinally elongated in *H. whitii*, Fig. 6); the auditory meatus with smooth edges formed by granular scales (serrated edges formed by conical scales in *H. whitii*). *Homonota taragui* differs from *H. williamsii* in the following characters: presence of keeled scales on the lateral surface of the body and dorsal surface of the thighs (keeled scales absent in *H. williamsii*); subcaudal scales transversely rectangular (longitudinally elongated in *H. williamsii*, Fig. 6); the auditory meatus with smooth edges formed by granular scales (serrated edges formed by conical scales in *H. williamsii*).



FIGURE 3. *Homonota taragui* sp. nov. holotype adult female in dorsal and ventral view (UNNEC 11293), from Paraje Tres Cerros, General San Martín Department, Corrientes Province, Argentina.

Description of holotype.—Body short, 3.9 times as long as the head. Head subtriangular, slightly widened, snout rounded, and neck moderately defined. Eyes diameter 4.1 times smaller than head length, and the pupil vertical with irregular edges. Measurements: SVL = 41.3 mm; TL = 53.8 mm; HL = 10.3 mm; HW = 8.5 mm; ED = 2.5 mm; EOD = 0.7 mm; END = 2.9 mm; EEOD = 3.6 mm; VW = 4.3 mm. Dorsal surface of the head covered by granular scales, with notably larger scales between the eyes and snout. Rostral scales pentagonal, wider than high, with two oblique grooves extending from the nostrils to the central region of the scale where end. Seven supralabial scales and five infralabial scales present on each side of the upper and lower jaws, respectively. One

internasal scale in contact with the rostral scales. Nostril bordered by the first supralabial, rostral, supranasal and two postnasal scales. Thirty supraciliary scales forming a ruffle orbit edge. Auditory meatus small, elliptical, and oblique with respect to the sagittal plane, with smooth edges formed by 16 small granular scales on each meatus. Mental scale hexagonal, longer than wide. Three postmental scales. Post-orbital region covered by granular scales. Scales of the gular region contiguous and cycloid in shape. Scales of the throat region imbricated, cycloid, and larger than the scales of the gular region. Fifty scales around the midbody. One hundred fifty-six dorsal scales. Vertebral line formed by two series of contiguous granular scales. Dorsal surface of the body with four series of moderately keeled scales on each side of the vertebral line and extended onto approximately the first 4 mm of the dorsal tail surface. First three longitudinal keeled series on each side of the vertebral line separated by two series of smaller granular scales. Third series of longitudinal keeled scales separated from lateral scales by one series of both cycloid and granular scales. Lateral scales in four contiguous series of moderately keeled scales. The fifth series of moderately keeled scales interspersed with cycloid scales at the ventral margin of the flanks. Axillar and inguinal region covered by small granular scales. Ventral scales cycloid and imbricate, with the posterior edge 3-5 lobed. Dorsal and anterior region of the arm and forearm covered with imbricate cycloid scales. Posterior and inner region of the arms covered with very small granular scales. Dorsal and anterior region of the thighs covered by keeled scales interspersed with cycloid scales, both scale types imbricate. Dorsal and anterior region of the lower leg covered by keeled scales. Ventral and posterior region of the lower leg covered by cycloid scales. Subdigital lamellae of the hands imbricate, numbering: I: 7/7; II: 10/10; III: 14/13; IV: 16/14; V: 11/12. Subdigital lamellae of the foot imbricate, numbering: I: 7/7; II: 9/9; III: 12/12; IV: 12/11; V: 9/10. Dorsal and lateral surface of the tail covered by cycloid and imbricate scales. Subcaudal scales imbricate, enlarged, and transversely rectangular. Lateral margin of the vent bordered by two smaller scales.

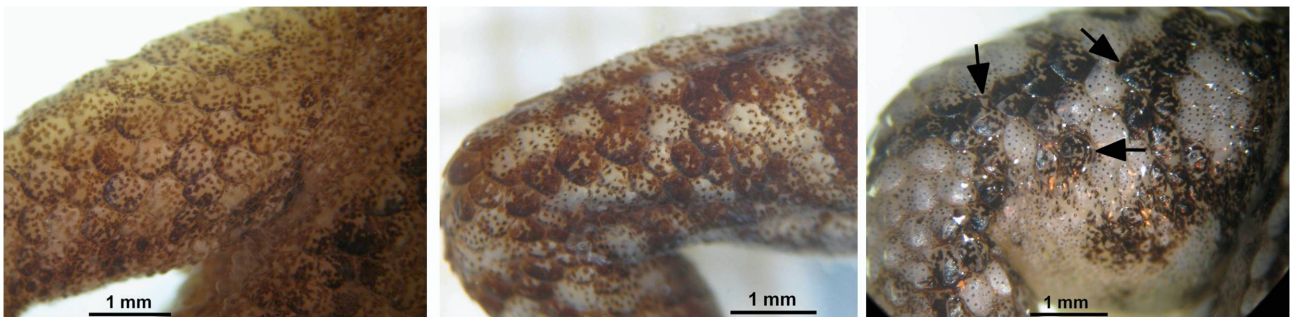


FIGURE 4. Thigh surface in *Homonota* species. (A) *H. borellii*, (B) *H. rupicola*, and (C) *H. taragui* sp. nov. (UNNEC 11293). Arrows indicate several keeled scales in the new species.

Coloration *in vivo*. Dorsal body side covered with irregular, dark brown spots with well-defined edges, which contrast sharply with the beige background, resulting in a well-marked reticulate pattern. Towards the flanks of the body, a continuous dark brown mark is extended from the posterior edge of the orbit to behind the insertion of the forelegs. Loreal regions covered with a dark spot extending from the snout tip to the anterior edge of the orbits. On the ventral body side, chest and abdomen immaculate gray; limbs, groin, neck, and head dirty brownish with dark chromatophores scattered on the scales.

Coloration in fixed specimens. On the body dorsum, the reticulate pattern tends to become black and the beige background coloration tends to become gray. On the ventral body side, the coloration remains the same, but less intense.

Variation. Based on ten adult females and four adult males (Tables 1, 2). UNNEC 11281 with six supralabial scales on left side and seven at right side, two postmental scales, and six infralabial scales on right side and five on left side. UNNEC 11277 with six infralabial scales on right side and five on left side. UNNEC 11297 with seven supralabial scales on left side and six on right side. UNNEC 11282 with seven supralabial scales on left side and eight on right side, two postmental scales. UNNEC 11283 with two postmental scales. UNNEC 11278 with six supralabial scales on left side and seven on right side. UNNEC 11284 with six supralabial scales on left side and seven on right side. UNNEC 11285 with two postmental scales, five infralabial scales on left side and six on right side. MLP. S. 5796 with six supralabial scales on each side, two postmental scales. UNNEC 11294 with six supralabial scales on left side and seven on right side, two postmental scales. UNNEC 11295 with six supralabial

scales on left side and seven on right side, six infralabial scales on each side. UNNEC 11296 with two postmental scales, six infralabials on each side.

Etymology. The species epithet derives from the language of the South American Guarani culture, which inhabited the area currently corresponding to Corrientes Province. The term is translated as “lizard” (Vázquez de Espinosa, 1948; Sorg, 2007), but current inhabitants use it to refer to the territory of the province.

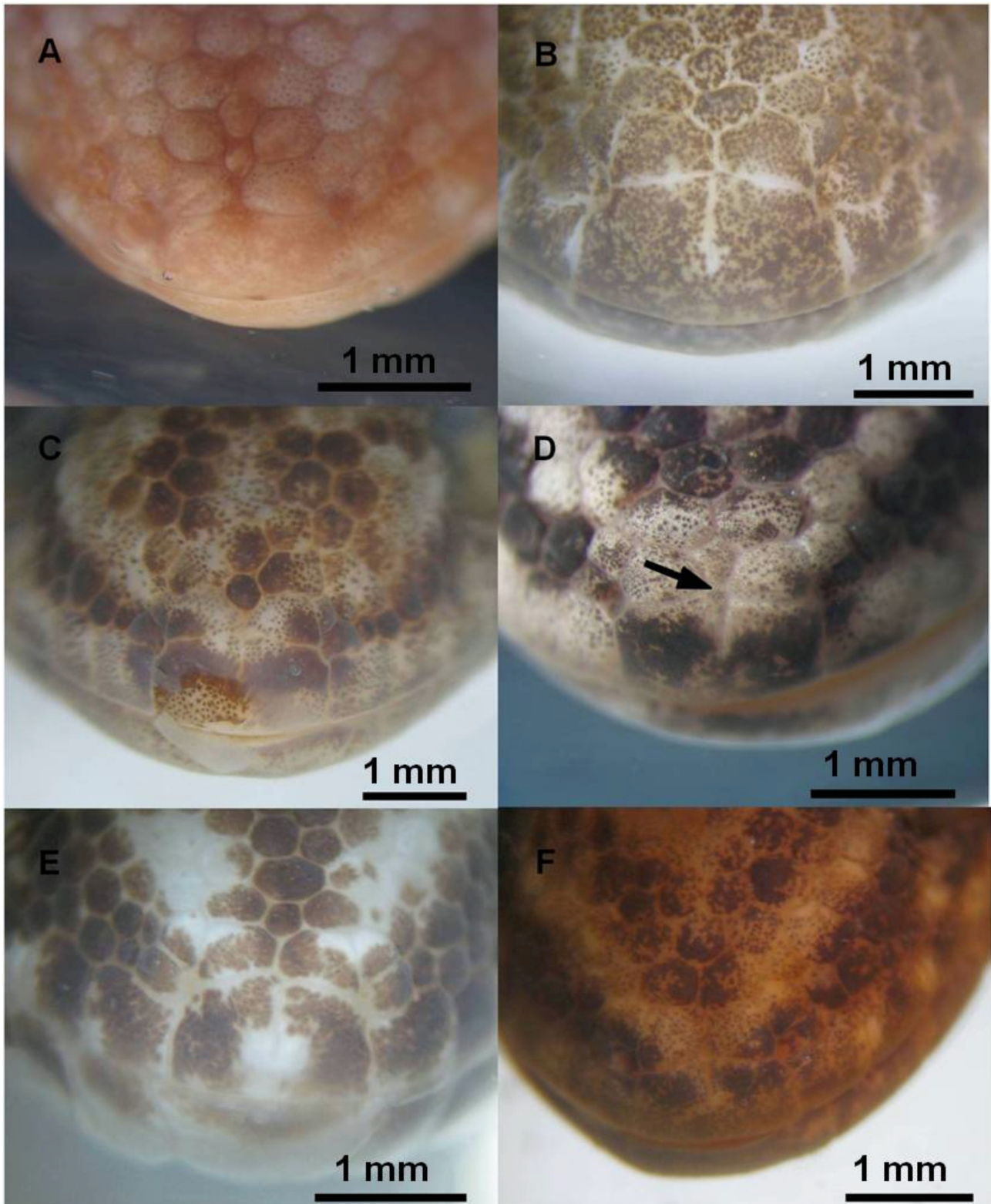


FIGURE 5. Snout scalation in *Homonota* species. (A) *H. borellii*, (B) *H. fasciata*, (C) *H. rupicola*, (D) *H. taragui* sp. nov. (UNNEC 11293), (E) *H. underwoodi*, and (F) *H. whitii*. Arrow indicates the contact between internasal and rostral scales.

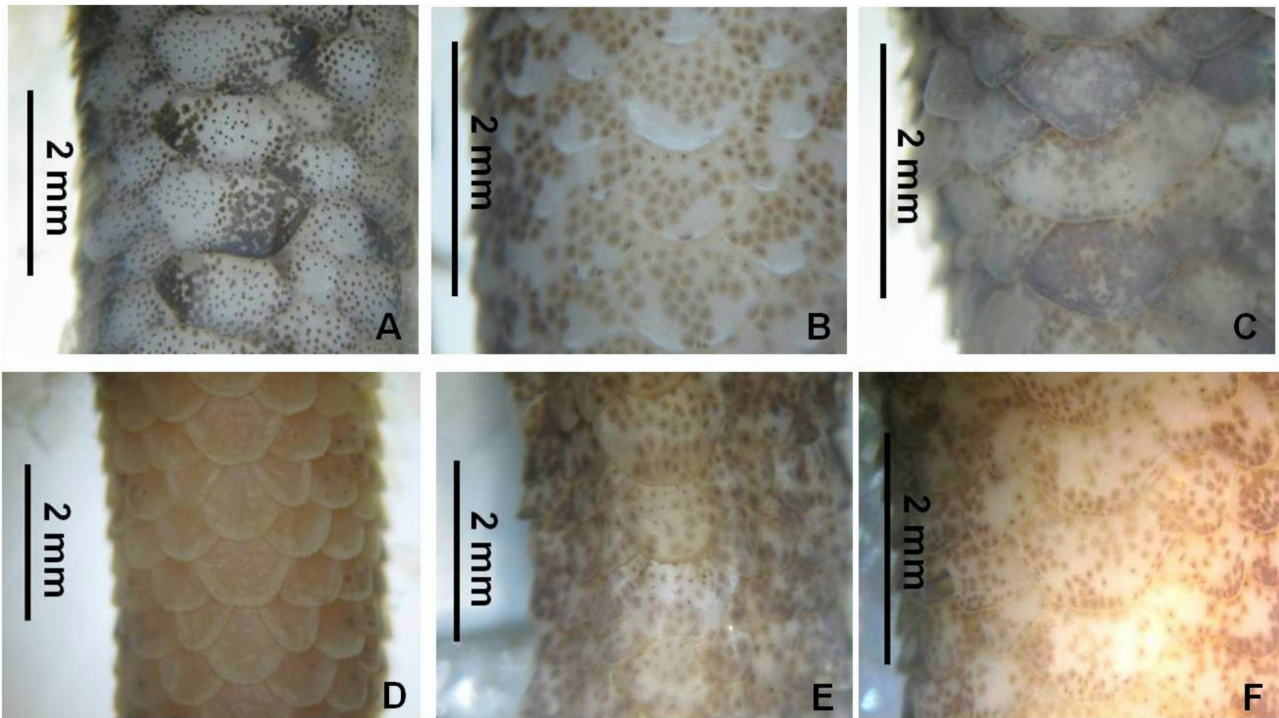


FIGURE 6. Subcaudal scales in *Homonota* species. (A) *H. taragui* sp. nov. (UNNEC 11295) (B) *H. darwinii*, (C) *H. fasciata*, (D) *H. underwoodi* (E) *H. williamsii*, and (F) *H. whitii*. Scale bar = 2mm.

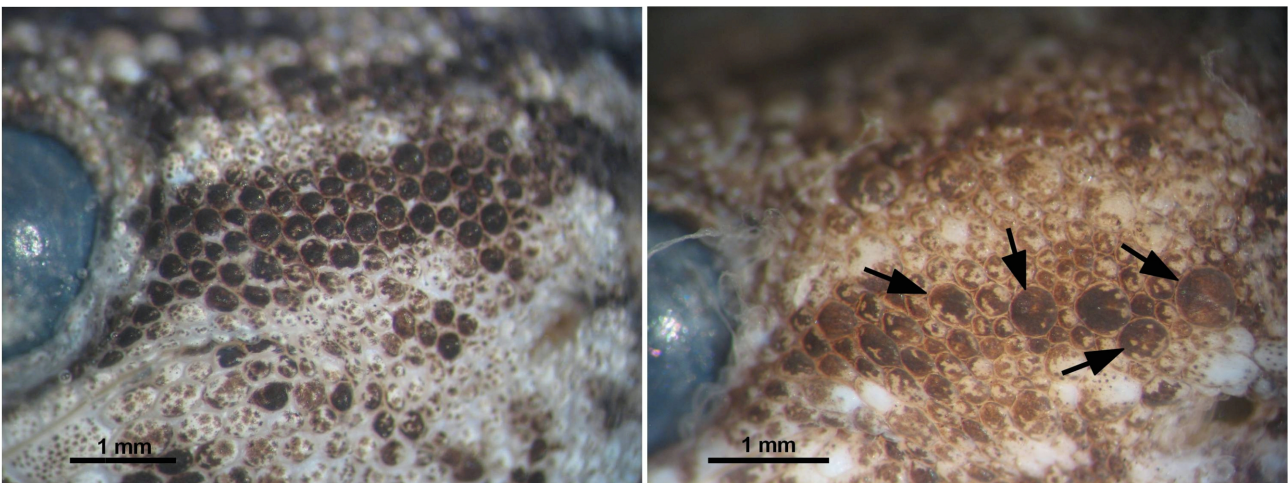


FIGURE 7. Scalation of temporal region in two *Homonota* species. (A) *H. taragui* sp. nov. (UNNEC 11293), and (B) *H. uruguayensis*. Arrows indicate keeled scales.

Distribution. *Homonota taragui* is currently only known from the hills at Paraje Tres Cerros, Corrientes Province, Argentina (Fig. 1). Field surveys around the base of the hills failed to find any specimens, suggesting that the new species is endemic in these hills.

Habitat. Rocky grasslands in which grasses and cacti are the dominant elements (Fig. 8; Parodi, 1943). Individuals are found under rocks that lay on a rocky substrate, and especially in sites where the rocks lay on large, exposed outcrops of quartz sandstone.

Reproduction. Gravid females of *H. taragui* were found during November and December, and the egg clutches in December. Egg clutches in the field and those laid by females in captivity consisted of a single egg (Fig. 9). This pattern is also observed in other species of the genus, such as *H. borellii*, *H. fasciata* and *H. underwoodi* (Gallardo, 1977; Abdala, 1997). In the field, egg clutches were laid under the rocks above cockroach droppings, and were always found with one to three adult individuals. Egg size ($n = 4$) were $9.82 \text{ mm} \pm 0.120$ long (min = 9.72; max = 9.98), and had an average width of $7.7 \text{ mm} \pm 0.11$ (min = 7.58; max = 7.86).

Other lizard species. Four other lizard species were found to occur syntopically with *H. taragui*, *Cercosaura schreibersii*, *Cnemidophorus* sp., *Teius ocellatus*, and *Tupinambis merianae*.

Conservation status. Individuals of *H. taragui* are common and easy to find on the hills of Paraje Tres Cerros. Yet, the extremely restricted range of distribution of this species indicates that it is potentially vulnerable to changes in environment. The rocky grassland of the hills is used as pasture for cattle. In surrounding areas, livestock activity with intentional fire set to promote grass growth for pasture represents the major threat for the hills' fauna and flora. Provincial governmental authorities seem to be interested in protecting these hills by turning them into a nature reserve. We recommend that a monitoring study of the populations of *H. taragui* be included in the management plan of the future nature reserve. Such a study would allow us to understand population dynamics in this species, and accurately evaluate its conservation status.

TABLE 2. Variation of infradigital lamellae in *Homonota taragui* sp. nov. type series. The data are presented from left to right. Abbreviations: f, forelimbs; h, hindlimbs. Roman numerals represent the digit number. A dash represents the absence of fingers.

	MLP. S 5796	UNNEC 11277	UNNEC 11278	UNNEC 11279	UNNEC 11281	UNNEC 11282	UNNEC 11283	UNNEC 11284	UNNEC 11285	UNNEC 11294	UNNEC 11295	UNNEC 11296
f I	7/7	6/6	6/6	7/6	7/-	-/6	6/6	8/8	6/6	9/-	7/8	7/7
f II	10/10	9/9	10/9	10/9	11/10	10/10	10/9	10/10	10/9	-/10	10/11	11/10
f III	10/11	-/9	12/12	13/12	12/12	12/12	11/11	11/-	12/11	10/12	12/12	13/12
f IV	12/12	12/-	13/13	13/13	13/13	13/13	13/12	11/12	12/13	12/13	13/13	-/13
f V	9/8	-/8	10/10	10/10	10/10	11/9	10/10	10/10	9/9	11/10	10/10	11/10
h I	7/7	6/6	6/6	6/7	7/7	8/8	7/8	8/8	7/7	8/8	7/8	8/8
h II	10/10	8/8	11/11	-/10	11/11	10/10	10/10	10/10	10/10	11/11	11/11	11/12
h III	13/13	-/12	14/13	14/14	12/12	13/14	12/13	13/13	13/13	14/15	-/11	14/14
h IV	10/8	14/14	15/13	15/17	17/16	-	16/16	14/-	14/15	17/16	16/16	14/15
h V	12/12	11/12	13/13	14/14	14/14	14/14	-/12	12/13	13/11	14/14	13/-	14/-



FIGURE 8. Rocky grassland inhabited by *Homonota taragui* sp. nov.



FIGURE 9. Nest site microhabitat of *Homonota taragui* sp. nov. The nest is hidden below the rock (arrow) resting on a large stone block (upper image). One egg (arrow) is found on nesting sites (rock removed; center image). Egg laid on a bed of cockroach excrement (lower image).

Discussion

The isolated group of three small hills at Paraje Tres Cerros and surrounding areas in Corrientes, a province known in Argentina for its high biodiversity, remained unexplored for a long time. Our field surveys represent the first herpetological reports about this area and resulted in the present description of a new lizard species of the genus *Homonota*.

Morphological comparison. Kluge (1964) defined a number of species groups within the genus *Homonota* based on external morphological features. For instance, his “group 1” (that initially consisted of *H. borellii*, *H. fasciata*, and *H. uruguayensis*) was defined by the presence of rows of keeled scales on the dorsal body surface. *Homonota taragui* and the recently described *H. rupicola* and *H. williamsii*, also share this feature (rows of keeled scales on the dorsal body surface) and could be assigned to the Kluge’s “group 1”. However, phylogenetic analyses by Abdala (1998) rejected the taxonomic identity of the “group 1”. At moment, the *H. fasciata* + *H. uruguayensis* clade obtained by (Abdala 1998) is supported by two synapomorphies: body surface of the flanks covered by keeled scales, and dorsal surface of the arms covered by keeled scales (Abdala, 1998). *Homonota rupicola* and *H. williamsii* (as well as *H. borellii*) lack keeled scales along the body flanks or the dorsal surface of the arms. *Homonota taragui* have its flanks covered by keeled scales, but the dorsal surface of its arms is not. In this context, *H. taragui* could represent a species morphologically intermediate between the species without keeled scales at surface of the flanks and arms (*H. borellii*, *H. rupicola*, *H. williamsii*) and the *H. fasciata* + *H. uruguayensis* clade of Abdala (1998). Respect to others morphological features *H. taragui* is similar to *H. borellii* and *H. rupicola*, as the three species have a small size, a graceful body structure, and the same shape, size, and disposition of the keeled scales on the dorsal body surface. The shape of the margin of the meatus auditory in *H. taragui* is similar to that of *H. borellii* and *H. rupicola*, and also *H. uruguayensis*. Nevertheless, *H. taragui* possesses keeled scales on the dorsal surface of thighs and along flanks, as *H. fasciata* and *H. uruguayensis*, whereas *H. borellii*, *H. rupicola*, and *H. williamsii* lack these scales. Furthermore, *H. taragui*, *H. williamsii*, and *H. uruguayensis* possess an internasal scale contacting the rostral scales, which is also present in *H. darwinii*. However, *H. darwinii* is considered more distantly related from species with rows of keeled scales along the whole body (i.e., non-group 1 species; Kluge, 1964; Abdala, 1988). In summary, we observed that *H. taragui* presents morphological similarities with *H. borellii* and *H. rupicola*, on one hand, and with *H. uruguayensis* and *H. williamsii* on the other.

New phylogenetic analyses, including our newly described *Homonota* species and other recently described species are needed to resolve relationships within the genus. The morphological variation observed among the studied species is reflected in the heterogeneity of the genus *Homonota* and suggests that more detailed morphological analyses are required. Identifying further phylogenetically informative features and the combination with molecular datasets will be crucial to increase our understanding of relationships within *Homonota*.

Natural history. The combination of isolation and environmental singularity of Paraje Tres Cerros makes this an ideal place for the evolution of endemic species. Indeed, two endemic plant species are known from these hills, *Gymnocalycium angelae* (Mercadalli, 1998) and *Amaryllis euryphylla* (Ravenna, 2003), which means that the new lizard species described in this study is the first endemic animal species in these hills. The biogeographic context of the Paraje Tres Cerros suggests that the small group of hills emerging in the middle of the vast plains of Corrientes Province represent a “sky island.” This concept is referred to mountains that are isolated by surrounding lowlands of a dramatically different environment, a situation which, in combination with the altitudinal zonation of ecosystems, has significant implications for natural habitats. Thus, some species evolved in isolation within their current range, adapting to their local environment, and resulting in further speciation and endemism (Heald, 1967). Another *Homonota* species (Cacciali *et al.*, 2007; Vaz-Ferreira & Sierra de Soriano, 1961; Avila *et al.*, 2012) and species of the genus *Liolaemus* (Vega *et al.*, 2008) have also been suggested to represent endemics of isolated mountain systems.

Remarks on biogeography. In their study on Paraguayan *Homonota* species, Cacciali *et al.* (2007) pointed out that *H. rupicola* and *H. uruguayensis* represent relict populations of an ancestor that was distributed more widely. Interestingly, the two extant species are restricted to mountain systems in Paraguay (*H. rupicola*) and Uruguay and Brazil (*H. uruguayensis*). In this context, *H. taragui* at Parajes Tres Cerros is geographically located between *H. rupicola* and *H. uruguayensis*, as to “fill a gap” between the distributions of *H. rupicola* and that of *H. uruguayensis*. This intermediate geographic positioning may explain the morphological similarities that the new species shares with the other two species, and would be in line with the speculations of Cacciali *et al.* (2007). The

fact that relict populations are another common phenomenon of sky islands (Heald, 1967) could support Cacciali *et al.* (2007), if the mountains where *H. rupicola* and *H. uruguayensis* occur represent such isolated systems. Phylogenetic analyses disentangling relationships among species of the genus *Homonota* will be necessary to test this hypothesis and elucidate the biogeographic history of these endemics.

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Appendix I. List of *Homonota* species and specimens studied. The number of specimens examined is provided in parenthesis.

***Homonota andicola* (1):** Uspallata, Las Heras Department, Mendoza Province, Argentina: UNNEC 07715.

***Homonota borelii* (14):** Mendoza, Capital Department, Mendoza Province, Argentina: UNNEC 07714, UNNEC 07716. Sierra de Paganzo, Independencia Department, La Rioja Province: UNNEC 07700, UNNEC 07743. Santa Clara, Coronel Felipe Varela Department, La Rioja Province, Argentina: UNNEC 07704, UNNEC 07719, UNNEC 07792, UNNEC 07699. Río Paganzo, Independencia Department, La Rioja Province, Argentina: UNNEC 07740. Las Tuscas, Valle Fértil Department, San Juan Province, Argentina: UNNEC 07741. La Rioja, Capital Department, La Rioja Province, Argentina: UNNEC 07701. Salta, Capital Department, Salta Province, Argentina: MLPS 1377, MLPS 1378, MLPS 1379.

***Homonota darwini* (8):** Península Valdés, Viedma Department, Chubut Province, Argentina: UNNEC 04630, UNNEC 04636, UNNEC 04671, UNNEC 04876, UNNEC 04877, UNNEC 06422. Zapala, Zapala Department, Neuquén Province, Argentina: UNNEC 07845. Cerro Lotena, Zapala Department, Neuquén Province, Argentina: UNNEC 07844.

***Homonota fasciata* (14):** Paraje los Pichis (25°39'25" S, 61°08'46" W), General Güemes Department, Chaco Province, Argentina: UNNEC 10612, UNNEC 10613, UNNEC 10614, UNNEC 10615. Reserva Natural Formosa, Bermejo Department, Formosa Province, Argentina: UNNEC 07817, UNNEC 7818, UNNEC 7822. Cañada El Rosillo, Matacos Department, Formosa Province, Argentina: UNNEC 7815, UNNEC 7819. Achiras, Río Cuarto Department, Córdoba Province, Argentina: UNNEC 7814, UNNEC 7821, UNNEC 07816, UNNEC 07820. Marayes, Caucete Department, San Juan Province, Argentina: UNNEC 10096.

***Homonota rupicola* (5):** Formación Cordillera de los Altos, Cordillera Department, Paraguay: UNNEC 04934, UNNEC 04738, UNNEC 04739, UNNEC 04740, UNNEC 05290.

***Homonota underwoodi* (16):** Medanitos, Tinogasta Department, Catamarca Province, Argentina: UNNEC 07838, UNNEC 07839, UNNEC 07840, UNNEC 07841, UNNEC 07842, UNNEC 07843. Santa Clara, Coronel Felipe Varela Department, La Rioja Province, Argentina: UNNEC 07695, UNNEC 07696, UNNEC 07697, UNNEC 07705, UNNEC 07721, UNNEC 07722, UNNEC 07745, UNNEC 07746, UNNEC 07790, UNNEC 07694.

***Homonota uruguayensis* (10):** Estancia Don Venancio, Artigas Department, Uruguay: UNNEC 07828, UNNEC 07829, UNNEC 07837. La Bolsa, Salto Department, Uruguay: UNNEC 07825, UNNEC 07831. Cerro Do Jarau, Quaradi, Rio Grande Do Sul, State, Brasil: UNNEC 05167, UNNEC 06806, UNNEC 07826, UNNEC 07827, UNNEC 07830.

***Homonota whitii* (8):** El Zapato, Punilla Department, Córdoba Province, Argentina: UNNEC 07748, UNNEC 07749, UNNEC 07791. Achiras, Río Cuarto Department, Córdoba Province, Argentina: UNNEC 03982, UNNEC 04990, UNNEC 04991, UNNEC 04992, UNNEC 08981.

***Homonota williamsii* (2):** Laguna La Brava (37°52'30,24" S, 57°59'31,78" W) Sierra de Los Padres, General Pueyrredón Department, Buenos Aires Province, Argentina: UNNEC 11763, UNNEC 11764.