



## ***Thaumastaneis nigricans*, a new species of a remarkable ant-mimetic Larginae (Hemiptera: Largidae) and the discovery of an ant-mimetic complex**

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### **Abstract**

*Thaumastaneis nigricans*, a new species of Larginae from Bolivia, is described and compared with *T. montandoni* Kirkaldy & Edwards, the only other species known of the genus. This latter species is recorded from Paraguay for the first time, and its association with a *Camponotus* ant worker (Hymenoptera: Formicidae) and a Trigonidiidae cricket (Orthoptera) is mentioned. Several features of *Thaumastaneis montandoni* are illustrated via SEMs.

**Key words:** *Thaumastaneis*, Largidae, myrmecomorphic, new species, ant mimicry

### **Introduction**

Myrmecomorphy has been identified in nine arthropod orders (Mantodea, Orthoptera, Phasmida, Hemiptera, Thysanoptera, Coleoptera, Diptera, Lepidoptera, and Hymenoptera), and modification of body structure to resemble ants is known in eleven families of Heteroptera (Alydidae, Colobathristidae, Enicocephalidae, Geocoridae, Largidae, Miridae, Nabidae, Oxycarenidae, Pyrrhocoridae, Rhyparochomidae, and Saldidae). Poppius and Bergroth (1921), in an extensive paper, described several new myrmecoid heteropteran genera and species.

According to McIver and Stonedahl (1993), myrmecomorphic insects display some structural modifications that enhance mimicry, including silvery reflective hairs to increase body shine or, when arranged in bands, to act as an interruptive agent; changes in surface texture corresponding to smooth, roughened, or pitted areas on the ants' body; and sometimes thoracic or abdominal spines to mimic those on the alitrunk and petiole of some ants. All these features are found in *Thaumastaneis* species.

This largid genus was described by Kirkaldy & Edwards (1902) for *T. montandoni*, a myrmecomorphic species from Brazil. Hussey (1927) and Van Doesburg (1966) redescribed the genus and species, based on specimens from Brazil and Suriname, respectively. Schaefer (2000) described the fifth instar and extended the species' distribution to Bolivia. Carpintero *et al.* (2006) recorded this species from Argentina. Schaefer & Ahmad (unpublished data) are revising the Neotropical genera of Largidae, and they mention a close phylogenetic relationship between *Thaumastaneis* and the Neotropical myrmecomorphic genus *Vasarhelyecoris* Brailovsky & Barrera, mainly based on the patterns of pubescence on the abdomen. In the present paper we describe a new species of *Thaumastaneis* from Bolivia, and report an ant-mimetic complex involving *T. montandoni* Kirkaldy & Edwards.

The studied material belongs to the collections of the Museo de La Plata (MLP), Museo Argentino de Ciencias Naturales (MACN), and Instituto Miguel Lillo Entomological Collection (IML). Scanning electron

micrographs were made from a specimen mounted on stub, sputter-coated with a gold palladium alloy, and studied with a Jeol 6360 LV. Measurements are given in millimetres.

## Results

### *Thaumastaneis nigricans* n. sp.

(Figs 1–6)

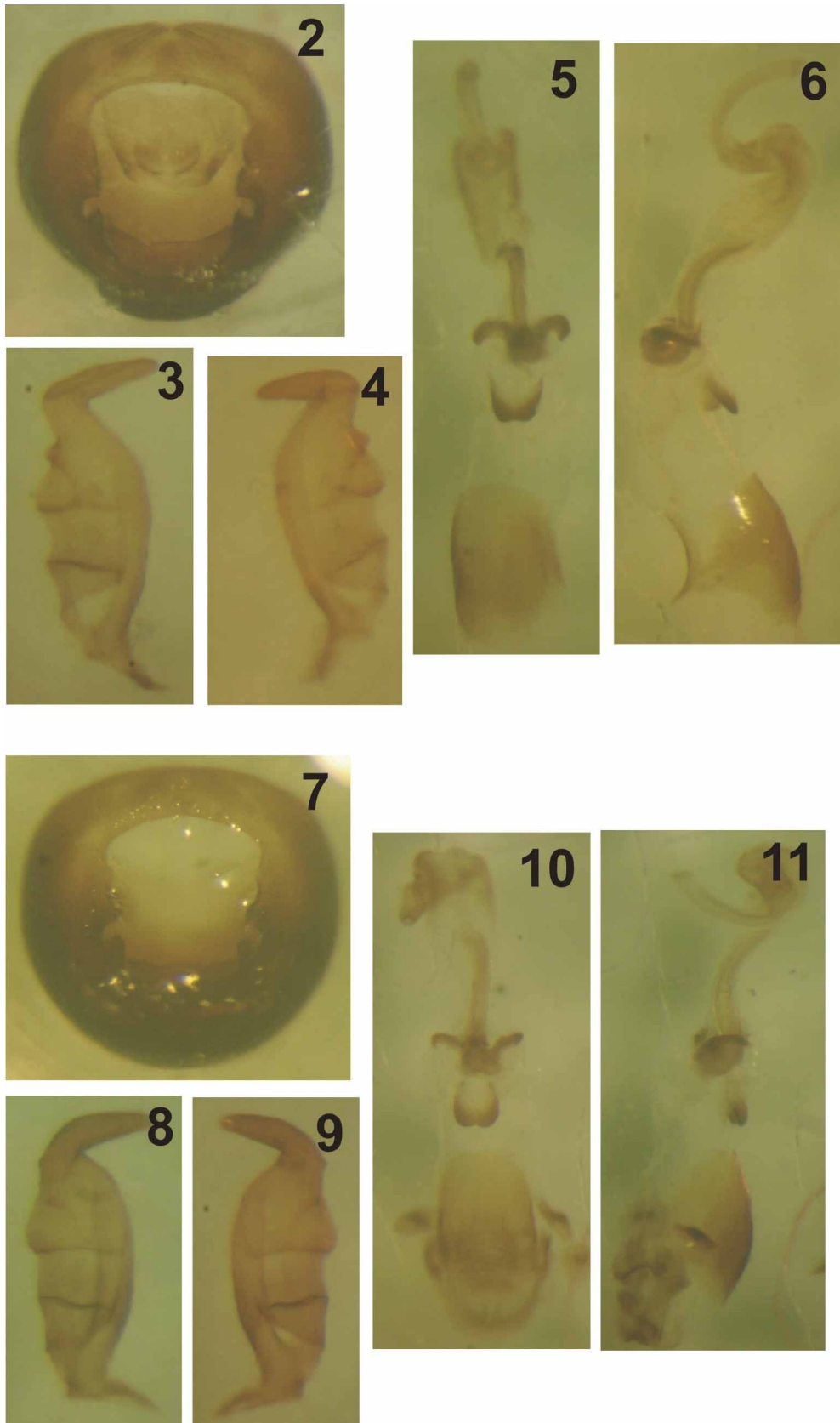
**Material examined.** Holotype: male, BOLIVIA: Trinidad, X-1917, 50276, *Thaumastaneis montandoni* Kirkaldy & Edwards, det. N. Kormilev (MACN).

Paratype: female, BOLIVIA: Santiago, Chiquitos, Santa Cruz, 8/13-II-1958, Monrós col., *Thaumastaneis* sp. det. M. V. Ahmat 1982 (IML).

**Diagnosis.** General color black except tibiae and tarsi slightly paler, and antennae reddish brown. Heme-lytra with apex rounded. Parameres with an oblique ridge near apex well developed forming an acute tubercle.



**FIGURE 1.** *Thaumastaneis nigricans* n. sp.



**FIGURES 2–11.** *Thaumastaneis* sp., male genitalia. (2–6) *Thaumastaneis montandoni* Kirkaldy & Edwards. (2) pygophore, dorsal view; (3) right paramere, outer view; (4) right paramere, inner view; (5) aedeagus, anterior view; (6) aedeagus, lateral view; (7–11) *Thaumastaneis nigricans* n. sp. (7) pygophore, dorsal view; (8) right paramere, outer view; (9) right paramere, inner view; (10) aedeagus, anterior view; (11) aedeagus, lateral view.

**Description.** Male (Fig. 1): General color black. Total length 10.26. **Head** strongly globose with black and white long erect setae, adpressed silver setae and a triangular patch of black semidecumbent setae between eyes. Head length 2.43 [in lateral view, a tangential line to inferior margin of eye from vertex to apex of tylus], postocular length 1.70, width 2.30, width before eyes 1.70, interocular space 1.54. *Antennae* reddish brown, distiflagellomere paler; scapus with erect setae, rest of antennae with very short semidecumbent setae. Antennal length: scapus 2.02, pedicellus 0.90, basiflagellomere 0.51, distiflagellomere 2.21. *Eyes* small, protruberant. *Rostrum* shorter than head including neck; with erect setae ventrally. Rostrum length: article I 0.54, II 0.61, III 0.70, IV 0.42. Neck long; dorsal surface with minute pitted texture.

**Thorax:** Pronotal collar with adpressed silver setae; anterior lobe globose, shiny, with long erect setae; posterior lobe short, with long erect setae and adpressed silver setae, pruinose medially, humeral angles with a long stout spine slightly curved at apex and with a few long erect setae. Pronotal length 1.66, width 1.28. *Scutellum* with large conical tubercle at base, with sparse long erect setae and adpressed silver setae. Scutellar length 1.02, width 0.48. *Hemelytra* with adpressed silver setae, apex rounded slightly surpassing abdominal segment II. Hemelytral length 1.86. Pleura and sterna shiny, with adpressed setae and sparse long erect setae. Metepimeron swollen. *Legs:* Coxae with adpressed silver setae, procoxae with a tubercle. Femora with long erect setae; profemur with two subapical spines, apicalmost smaller; metafemur longer, with long plectrum over basal half. Tibiae slightly paler with long erect setae and spiniform setae apically. Tarsi slightly paler with semidecumbent setae and spiniform setae on tarsomere I. First tarsomere two times longer than II + III, tarsomere II shortest.

**Abdomen** constricted at base and swollen at middle. Laterotergites with adpressed silver setae, tergites shiny with sparse long erect setae, sternites shiny with long erect setae and patches of adpressed short silver setae. Margins of segments II to IV finely rugose. Three abdominal scent gland openings on segments III/IV, IV/V and V/VI. *Male genitalia* (Figs. 2–6): Pygophore, dorsal aperture as fig. 2. Paramere (Figs. 3–4) with oblique ridge near apex well developed forming an acute tubercle (Fig. 4). Spur perpendicular to shaft. Aedeagus (Figs. 5–6) with ejaculatory reservoir rounded, wings curved backward and conjunctiva with subquadrangular sclerotized posterior lobe.

*Female.* Similar to male in all respects except with less globose anterior pronotal lobe, less developed and less curved humeral spines, less prominent scutellar tubercle, less punctate hemelytra and posterior pronotal lobe, and with adpressed setae on abdominal tergites.

*Measurements:* Total length 12.66. Head length 3.04, postocular length 1.98, width 2.78, width before eyes 2.18, interocular space 1.79. Antennal length: scapus 2.69, pedicellus 1.28, basiflagellomere 0.74, distiflagellomere 2.27. Rostrum length: article I 0.86, II 0.77, III 0.80, IV 0.54. Pronotal length 1.63, width 1.66. Scutellar length 0.99, width 0.61. Hemelytral length 1.89.

**Etymology.** The name refers to the blackish coloration of this new species.

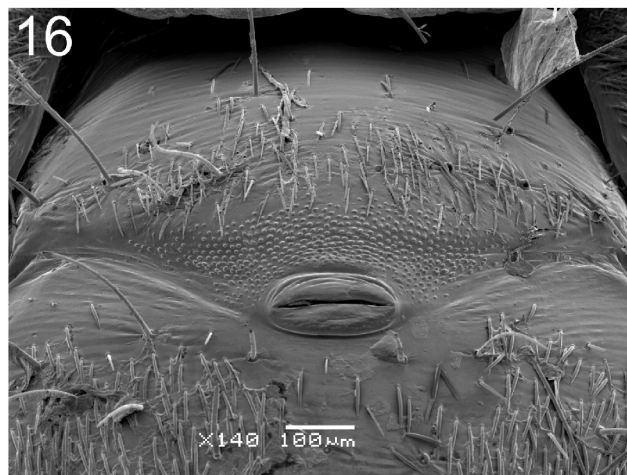
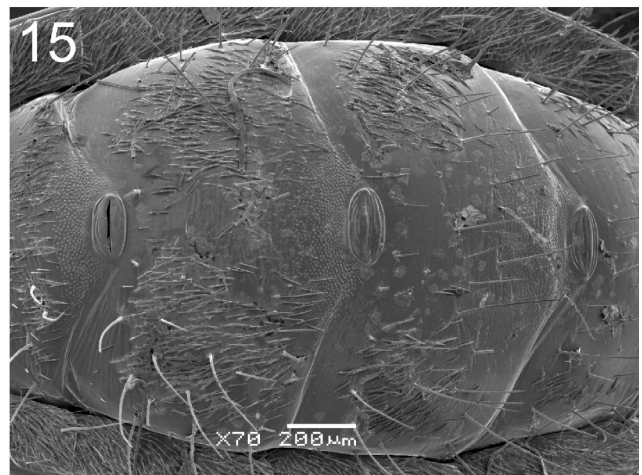
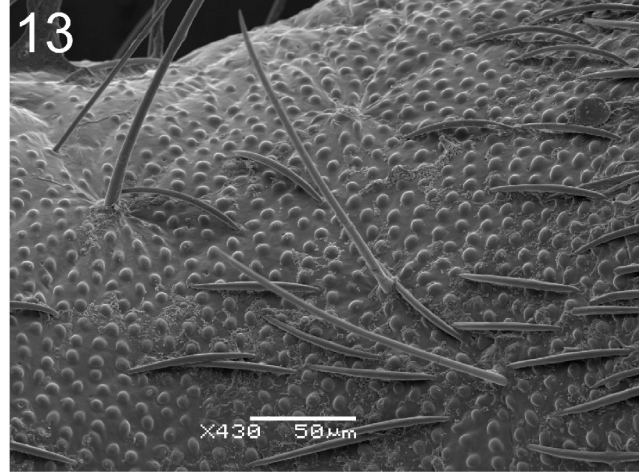
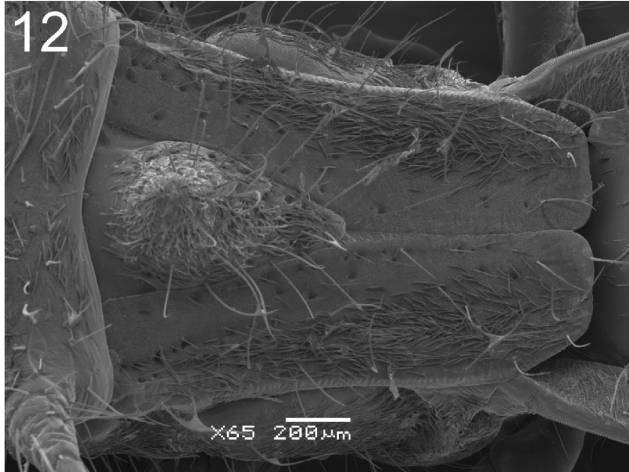
**Discussion.** In addition to the characters mentioned in the diagnosis, *T. nigricans* can be distinguished from *T. montandoni* by its more elongate head, males with humeral spines more elongate and with fewer setae, posterior pronotal lobe without punctures or these less conspicuous than in *T. montandoni*, absence of adpressed setae on anterior pronotal lobe, and setae on legs of equal length. The male genitalia of the species (Figs. 2–11) have more differences. The parameres of *T. montandoni* (Figs. 8–9) have a less developed tubercle and the spur is shorter and more curved than in *T. nigricans*. The aedeagi are quite similar, but in *T. montandoni* the sclerotized posterior lobe of the conjunctiva is more rounded (Figs. 10–11).

### ***Thaumastaneis montandoni* Kirkaldy and Edwards 1902** (Figs 7–17)

Until now nothing has been reported about the biology of this species. Van Doesburg (1966) only mentioned that “the strongly ant-like appearance suggests some relation with ants”. The authors collected in Ituzaingó, Corrientes prov. (Argentina) several adults of *T. montandoni* (Fig. 17) (deposited in MLP).

Scanning electron microscopy shows some structural modifications that enhance mimicry: silvery reflective hairs on lateral regions of the hemelytra (Fig. 12), pitted areas on the neck (fig. 13), and thoracic spines (Fig. 14).

Van Doesburg (1966) and Schaefer (2000) described the antennae, tibiae, and tarsi of *T. montandoni* as light brown or yellowish brown. These structures are reddish in the field and in recently collected specimens, although after a short time we observed they had turned to light brown.



**FIGURES 12–16.** *Thaumastaneis montandoni* Kirkaldy & Edwards. (12) scutellum and hemelytra, dorsal view; (13) detail of the pitted areas on neck; (14) head and thorax, dorsal view; (15) abdomen, dorsal view; (16) detail of abdominal scent gland opening between abdominal segments III and IV.



**FIGURES 17–19.** (17) *Thaumastaneis montandoni* Kirkaldy & Edwards; (18) *Camponotus* sp. (19) Trigonidiidae cricket sp.

We also note that although Schaefer (2000) described in *Thaumastaneis montandoni* fifth instar as having only two dorsal abdominal scent gland openings (between terga III–IV and IV–V), we find three in the adults of both species of *Thaumastaneis*, the third lying between terga V–VI. Moreover, the first gland appears to be functional (Figs. 15–16).

Associated with *T. montandoni* we collected adult workers of a species of the ant genus *Camponotus* (Fig. 18) (Hymenoptera: Formicidae), as well as an undescribed species of myrmecomorphic cricket (Fig. 19) (Orthoptera: Trigonidiidae). The general color of these species is black, with particular regions of the legs reddish: coxae, trochanters, and femora in the ants; femora and tarsi in the cricket. This color pattern and the ant-like appearance of both the heteropteran and the orthopteran suggests the presence of a mimetic complex.

We also record *Thaumastaneis montandoni* for the first time from Paraguay, Dept. San Pedro, Carumbé; the specimens examined (2 males, 3 females) belong to the Instituto Miguel Lillo Entomological Collection.

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