

Tingidae (Insecta, Heteroptera) from the Argentinan Yungas: new records and descriptions of selected fifth instars

Éric GUILBERT

Muséum national d'Histoire naturelle, Département Systématique et Évolution,
UMR 7205, case postale 50, 57 rue Cuvier, F-75231 Paris cedex 05 (France)
guilbert@mnhn.fr

Sara I. MONTEMAYOR

División Entomología, Museo de Ciencias Naturales de La Plata, UNLP,
Paseo del Bosque s/n°, 1900 La Plata, Buenos Aires (Argentina)
smontemay@fcnym.unlp.edu.ar

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ABSTRACT

The Yungas are an area of dense evergreen forests covering the eastern slopes of the Andes. Very few studies deal with the insects of this biotope. Here the results of a first study of the Tingidae (Insecta, Heteroptera) of these forests are presented. New distribution and records of species, as well as descriptions of the fifth instar larvae of *Corythucha tapiensis*, *Dictyla monotropida*, *Gargaphia dissortis*, *Leptopharsa firma*, *Sphaerocysta angulata*, *Tigava pulchella* are provided. The tingid fauna of the Yungas does not seem highly characteristic of this area, but it is poorly known, especially at high elevations.

RÉSUMÉ

Tingidae (Insecta, Heteroptera) des Yungas (Argentine): descriptions de larves V et nouvelles mentions.

Les Yungas désignent les forêts denses humides qui couvrent les contreforts des Andes. Très peu d'études traitent des insectes de ce biotope. Nous rapportons ici les résultats d'une première étude sur la faune de Tingidae (Insecta, Heteroptera) de ces forêts. De nouvelles mentions sur la distribution des espèces sont apportées et les larves V de *Corythucha tapiensis*, *Dictyla monotropida*, *Gargaphia dissortis*, *Leptopharsa firma*, *Sphaerocysta angulata*, *Tigava pulchella* sont décrites. La faune des Tingides des Yungas ne semble pas hautement caractéristique du milieu, mais elle reste largement inexplorée, surtout en altitude.

KEY WORDS

Insecta,
Heteroptera,
Tingidae,
larvae,
new records,
Argentina,
Yungas.

MOTS CLÉS

Insecta,
Heteroptera,
Tingidae,
larves,
nouvelles mentions,
Argentine,
Yungas.

INTRODUCTION

The Yungas is an area covering over 4000 km² that lies between Venezuela and northern Catamarca Province in Argentina, on the eastern slopes of the Andes, between 300 and 3500 m altitude (Cabrera 1971; Cabrera & Willink 1973; Brown 1995; Morales *et al.* 1995; Morrone 2000, 2001, 2006) with a rainy, humid, and warm climate. The Yungas forests are extremely diverse, ranging from moist lowland forest to evergreen montane forest and cloud forests. Until now, the biogeographic unit of the Yungas was almost exclusively characterized by its flora (Cabrera 1971; Hueck 1978). Whereas other taxonomic groups, as arthropods, were poorly recorded besides implicit mention of arthropods to characterize Yungas as a natural region (Cuezzo *et al.* 2007).

Some authors (Cabrera & Willink 1973; Brown 1995; Graham 1995; Prado 1995) consider that the Yungas are not a homogeneous unit, and that the major differences regarding fauna and flora are the result of climatic and historical factors. In fact, the age of the subtropical Yungas forest of northwestern Argentina and Bolivia dates to the end of Miocene-Pliocene (Hinojosa & Villagran 1997).

The World Wide Fund for Nature has delineated three yungas ecoregions along the eastern side of the Andes. The northernmost is called the Peruvian Yungas, the Bolivian Yungas lie to the south, mostly in Bolivia but including part of southern Peru, the Argentinean Yungas are part of the southern Andean Yungas, which begins in southern Bolivia and continues south into Argentina. The southern Andean Yungas are a humid forest region between the drier Gran Chaco Region to the east and the dry, high-altitude Puna grassland region to the west.

In Argentina it spans from north to south along over 600 km, occupying nearly 4.5 million hectares (in the provinces of Salta, Jujuy, Tucumán and Catamarca), and has an altitudinal range of 400 to 3000 m.

Regarding its flora and landscape, three altitudinal levels can be recognized:

1) premontane forest (300-600 m);

2) montane forest (600-1500 m), with two distinct forest types: basal forest (900-1200 m) and Myrtaceae forest (1200-1600 m);

3) montane cloud forest (1500-3000 m) (Cabrera 1971; Brown 1995; Prado 1995).

Over 150 000 hectares of Argentinean Yungas are protected in national parks such as El Rey, Calilegua, Baritú, San Javier, but only the montane forest is represented there (Brown & Grau 1993).

Very few studies have been done regarding the entomofauna of the Yungas. Cuezzo *et al.* (2007) listed a number of endemic species in 13 families of Diptera, Hymenoptera, and Lepidoptera. Von Ellenreider (2007), in an ecological study of the aquatic insects in the Yungas found 143 taxa among 55 families. The Hemiptera fauna, however, has never been studied.

Montemayor & Coscaron (2005) provided a list of 84 species of Tingidae Laporte 1833 from Argentina. Among them, only nine species were recorded from Jujuy and Salta provinces in northwestern Argentina: *Carvalhotingis hollandi* (Drake, 1935) from Jujuy; *Corythaica bosqi* Monte, 1938, *Corythucha acculta* Drake & Poor, 1942, *Gargaphia torresi* Costa, 1922, *Leptobyrsa mendocina* Pennington, 1919, *Sphaerocysta inflata* (Stål, 1858), and *Tigava bombacis* Drake & Poor, 1938 from Salta; and *Corythaica cyathicollis* (Costa, 1864) and *Corythaica monacha* (Stål, 1858) from Jujuy and Salta.

Because the tingid fauna of the Yungas in Salta and Jujuy provinces is so poorly known, we present the results of a survey made in June 2007. The fifth instars of *Corythucha tapiensis* Ajmat, 1991, *Dictyla monotropidia* (Stål, 1858), *Gargaphia dissortis* Drake, 1930, *Leptopharsa firma* Drake & Hambleton, 1938, *Sphaerocysta angulata* Monte, 1941, *Sphaerocysta inflata* (Stål, 1858) and *Tigava pulchella* Champion, 1897 are newly described. Three species are reported for the first time from Argentina: *Leptopharsa firma* and *Sphaerocysta angulata* previously known only from Brazil, and *Tigava pulchella* known from Mexico, Guatemala, Honduras and Cuba. Ten species are recorded for the first time for Jujuy province and nine for Salta province.

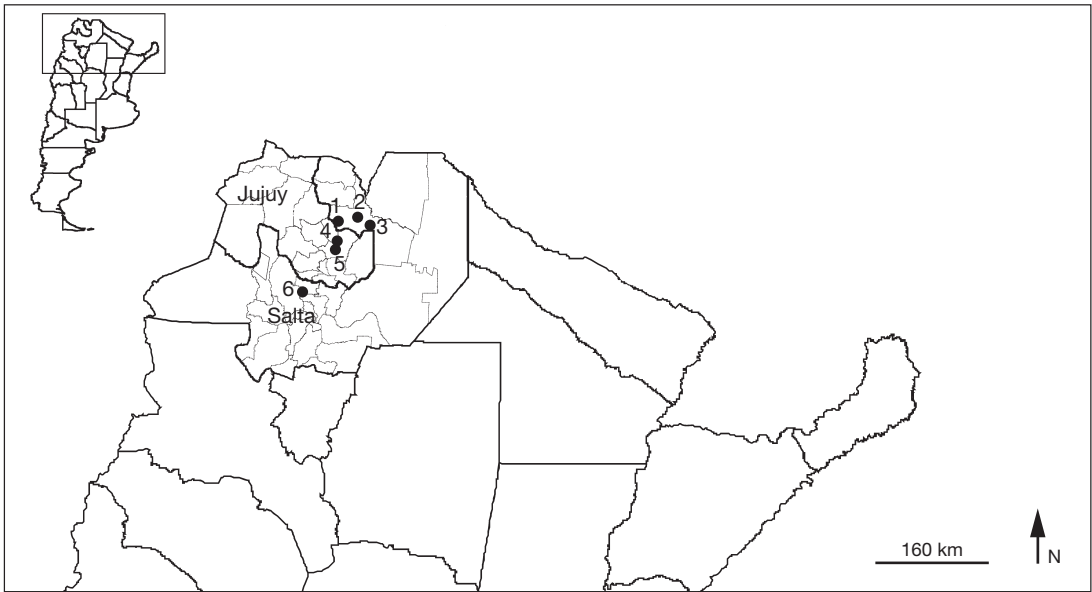


FIG. 1. — Distributive map of the species collected. See Table 2 for the list of species collected in localities 1-6.

TABLE 1. — List of Tingidae collecting sites with coordinates.

Locality	Date	Coordinates		Altitude (m)
Cerca Los Naranjos (10 km)	9.VI.2007	23°05,862'S	64°43,473'W	985
Cerca Orán, Ruta de San Andrés	5.VI.2007	23°05,586'S	64°22,381'W	366
Finca Urundel	6.VI.2007	23°26,638'S	64°30,428'W	575
Finca Urundel	7.VI.2007	23°26,638'S	64°30,428'W	575
Finca Urundel	8.VI.2007	23°26,638'S	64°30,428'W	575
PN Calilegua (Jujuy)	2.VI.2007	23°42,004'S	64°52,005'W	1155
PN Calilegua (Jujuy)	3.VI.2007	23°42,004'S	64°52,005'W	1155
PN Calilegua (Jujuy)	4.VI.2007	23°44,464'S	64°51,186'W	800
PN Calilegua (Jujuy)	5.VI.2007	23°44,464'S	64°51,186'W	800
PN Calilegua (Jujuy)	10.VI.2007	23°42,004'S	64°52,005'W	1155
Ruta 9, km 1640	1.VI.2007	24°25,671'S	65°16,728'W	1501
Ruta 9, km 1640	11.VI.2007	24°30,671'S	65°20,728'W	1501
Ruta 9, km 1640	12.VI.2007	24°30,671'S	65°20,728'W	1501

MATERIAL AND METHODS

Specimens were caught by beating and sweeping vegetation from understory and canopy vegetation. The canopy was accessed using tree climbing methods. Specimens were collected in 75° alcohol, later mounted on card, and examined under Leica MZ16 stereoscope. GPS coordinates and a distributive map are provided for the sites visited (Table 1; Fig. 1). New records for Argentina and the provinces of Jujuy

and/or Salta are indicated in Table 2. The material from this study is deposited in the Muséum national d'Histoire naturelle, Paris (MNHN) and Museo de La Plata (MLP). Larval description are based on the fifth instar. Comments are added for other instars when necessary. Larvae were washed with KOH, sonicated for 1 mn, dried, mounted on aluminium stubs, gold-coated (for 90 s) and examined under a JEOL Scanning Electron Microscope. All provided measurement are in millimetres.

RESULTS

Family TINGIDAE Laporte, 1833
Genus *Acanthocheila* Stål, 1958

Acanthocheila armigera (Stål, 1858)

Monanthia (Acanthocheila) armigera Stål, 1858: 61.

Monanthia (Acanthocheila) spinuligera Stål, 1858: 61.

Acanthocheila nigrescens – Monte 1937a: 31 (not Drake & Bondar 1932).

MATERIAL EXAMINED. — **Argentina.** Province of Jujuy, Calilegua, 4.VI.2007, Guilbert & Montemayor coll., 3 ♂♂, 1 ♀ (MNHN); 2 ♂♂, 1 ♀ (MLP). — Province of Salta, Orán, 9.VI.2007, Guilbert & Montemayor coll., 1 ♀ (MLP). — Urundel, 7.VI.2007, Guilbert & Montemayor coll., 1 ♂, 1 ♀ (MNHN); 1 ♂, 1 ♀ (MLP).

DISTRIBUTION. — Argentina (Formosa, San Juan), Bolivia, Colombia, Cuba, Ecuador, Guatemala, Haiti, Honduras, Jamaica, Mexico, Panama, Peru, Puerto Rico, Trinidad, Venezuela.

This species is widespread in South and Central America. It is known from Argentina but newly recorded for Jujuy and Salta. The specimens examined were collected by beating the understory.

HOST PLANTS. — *Nicotinia* sp. (Solanaceae) (Stonedahl & Dolling 1992: 439); *Nicotinia tabacum* L. (Monte 1940a: 100; Drake & Ruhoff 1965: 57); *Ouratea* sp. (Ochnaceae) (Silva 1956: 15; Drake & Ruhoff 1965: 57; Stonedahl & Dolling 1992: 439); *Pisonia* sp. (Nyctaginaceae) (Drake & Hambleton 1934: 442; Drake & Ruhoff 1965: 57; Stonedahl & Dolling 1992: 439); *Pisonia tomentosa* Casar (Monte 1940c: 74; Drake & Ruhoff 1965: 57).

Genus *Carvalhotingis* Froeschner, 1995

Carvalhotingis hollandi (Drake, 1935)

Acanthocheila hollandi Drake, 1935: 16.

Carvalhotingis hollandi – Froeschner 1995: 337.

MATERIAL EXAMINED. — **Argentina.** Province of Jujuy, Calilegua, 4.VI.2007, Guilbert & Montemayor coll. 2 ♂♂, 1 ♀ (MNHN); 1 ♂, 1 ♀ (MLP). — Province of Jujuy, Calilegua, 10.VI.2007, Guilbert & Montemayor coll., 1 ♀ (MNHN); 1 ♂, 1 ♀ (MLP). — Province of Salta, cerca Los Naranjos, 9.VI.2007, Guilbert & Montemayor coll., 1 ♂ (MLP).

DISTRIBUTION. — Argentina (Jujuy), Brazil, Paraguay. *Carvalhotingis hollandi* previously known from Jujuy, is reported for the first time from Salta.

HOST PLANTS. — Bignoniaceae (Drake & Hambleton 1938: 46; Drake & Ruhoff 1965: 58).

Genus *Corythaica* Stål, 1873

Corythaica monacha (Stål, 1858)

Tingis monacha Stål, 1858: 64.

Corythaica monacha – Stål 1873: 128.

Corythaica monacha [sic] – Drake 1930: 1.

MATERIAL EXAMINED. — **Argentina.** Province of Salta, Urundel, 6.VI.2007, Guilbert & Montemayor coll., 1 ♂, 1 ♀ (MLP). — Province of Salta, Urundel, 8.VI.2007, Guilbert & Montemayor coll., 1 ♂, 2 ♀♀ (MNHN); 1 ♂, 1 ♀ (MLP).

DISTRIBUTION. — Argentina: Córdoba (La Falda), Jujuy, Salta (Madrejones, Tabacal, Río Juramento, Aguas Blancas, San Ramón de la Nueva Orán, Urundel, Abra Grande), Santiago del Estero (San Pedro de Guasayán), Tucumán (Ticucho, Río Tapia, Las Cejas, El Cadillal, San Javier, San Pablo, Siambón, Benjazzmín Paz, Leales, Mansupa, Trancas, La Florida, La Virginia, Potrero de las Tablas, San Miguel de Tucumán).

This species is known from several northern provinces of Argentina. *Corythaica monacha* does not occur south of the 35°S. These specimens were collected by beating the understory.

HOST PLANTS. — This species is known to feed mainly on Malvaceae: *Abutilon grandifolium* Willd. (Ajmat 2000: 214); *Gaya* spp. (Ajmat 2000: 214); *Gossypium* L. (Monte 1937a: 30; 1940c: 87; Poor 1945: 83; Drake & Ruhoff 1965: 139); *Pavonia hastata* Cav. (Ajmat 2000: 214); *Sida argentina* K.Schum. (Ajmat 2000: 214); *Sida cordifolia* L. (Monte 1937a: 30; 1940d: 87; Poor 1945: 83; Drake & Ruhoff 1965: 139); *Sida rhombifolia* L. (Monte 1943a: 115; Poor 1945: 84; Silva 1956: 25; Drake & Ruhoff 1965: 139; Ajmat 2000: 214); *Sida ulmifolia* Cav. (Silva 1956: 25; Drake & Ruhoff 1965: 138); *Sida glomerata* Cav. (Drake & Hambleton 1934: 450). It is also reported from *Lycopersicon esculentum* Mill. (Solanaceae) (Drake & Ruhoff 1965: 139; Ajmat 2000: 214), and from *Richardia brasiliensis* Gomes (Rubiaceae) (Monte 1943a: 115; Drake & Ruhoff 1965: 139).

Genus *Corythucha* Stål, 1873

Corythucha tapiensis Ajmat, 1991

Corythucha tapiensis Ajmat, 1991: 144.

MATERIAL EXAMINED. — **Argentina.** Province of Salta, Orán, 5.VI.2007, Guilbert & Montemayor coll., 1 ♀ (MNHN). — Province of Salta, Urundel, 6.VI.2007, Guilbert & Montemayor coll., 1 instar V (MNHN); 1 instar V (MLP). — Province of Jujuy, Calilegua, 10.VI.2007, Guilbert & Montemayor coll., 1 ♂ (MLP).

DISTRIBUTION. — Argentina, Tucumán (Tapia).

HOST PLANTS. — *Celtis pubescens* (Kunth) (Ulmaceae) (Ajmat 1991: 144).

DESCRIPTION OF FIFTH INSTAR (FIG. 2)

Body yellow to brown with margins somewhat transparent; shiny, glabrous. Body length 1.83 mm; width 1.05 mm (Fig. 2A). All the dorsum covered with small conical microstructures (Fig. 2B).

Head armed with five tubercles; frontal pair long, simple, spiny, base stout and the rest slender, ending with a seta at the apex; median tubercle bifid, stout at base, made of two slender, spiny branches, ending with a seta at apex of each; occipital pair with a bulbous and pedunculate base, made of two long and slender tubercles and a short one, all three ending with a seta at apex, with two additional long setae directly on base, as long as tubercles (Fig. 2C).

Pronotum short and wide, with lateral margins expanded far from head, with a swollen conical area just behind anterior margin followed posteriorly by a longitudinal, median keel, slightly angulate backwards on posterior margin; armed with two pairs of long slender, simple tubercles on the submedian line, one anterior at the apex of the swollen part and one posterior on the keel; margins armed with four tubercles each, three short, slender, simple tubercles, the most anterior shorter and the most posterior longer; the fourth posterior to the other three, composed of a short pedunculate, with two long, slender tubercles and a seta as long as tubercles; all tubercles ending with a short seta at the apex.

Wing pads slightly wider than pronotum, armed with a submedian pair of tubercles and four marginal tubercles on each side; the submedian tubercles in

contact with posterior margin of pronotum, made of a bulbous and pedunculate base with two slender, simple tubercles, a short one and a long one, and two long setae; marginal tubercles divided into a group of three short, simple, slender tubercles on the anterior half of margins, the most anterior shorter and the most posterior longer, and the fourth tubercle on posterior half of margin made of a bulbous base bearing three slender, simple tubercles, unequal in size and a seta as long as the tubercle.

Abdominal tergites with lateral expansions as wide as wing pads; first tergite without tubercles; second tergite with a submedian pair of slender, simple tubercles on each side of the median; third tergite without tubercles; fourth to ninth tergites with a tubercle on each lateral margin, the tubercle slightly bulbous at base, simple, long, slender; a seta at the base as long as tubercle on fourth to seventh tergites but without setae on eighth and ninth segments; fifth, sixth and eighth tergites with a submedian pair of tubercles and a marginal tubercle on each side, submedian tubercles bulbous at base, with an erect, long, slender, simple tubercle, with two setae at base, as long as tubercle on fifth and sixth and one seta on eighth; all tubercles erect and ending with a short seta at apex.

REMARKS

This species is similar to *Corythucha pellucida* Drake & Hambleton, 1938. The latter is slightly smaller and has two or three rows of areolae on the costal area whereas *C. tapiensis* has only two. These two species could be synonyms; however, we have not examined enough specimens to be certain. *Corythucha pellucida* is only known from the Brazilian state of São Paulo, on *Celtis brasiliensis* Planch. and *Celtis ferruginea* Walp., whereas *C. pellucida*, is restricted to Argentina. The latter is here newly recorded from Jujuy and Salta. All specimens were collected by beating the understory.

The immatures of all species of *Corythucha* have similar protuberances, i.e. a bulbous base with several tubercles and setae. Thus, they are difficult to distinguish. These tubercles are characteristic of the genus, and have not been observed in other larvae (Guilbert 2005).

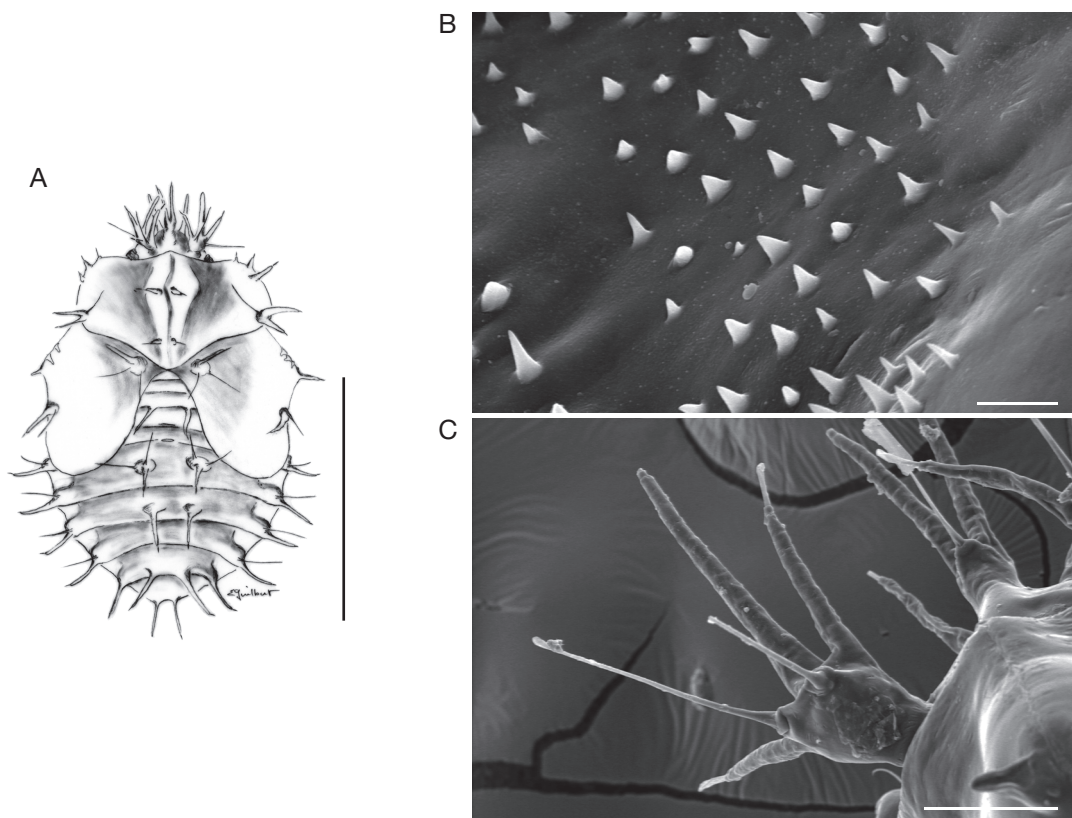


FIG. 2. — Instar V of *Corythucha tapiensis* Ajmat, 1991: **A**, habitus; **B**, microstructures on instar V dorsum; **C**, cephalic tubercle. Scale bars: A, 1 mm; B, 10 µm; C, 100 µm.

Genus *Dictyla* Stål, 1874

Dictyla monotropidia (Stål, 1858)

Monanthia (*Physalocheila*) *monotropidia* Stål, 1858: 63.

Monanthia monotropidia – Stål 1873: 133.

Dictyla monotropidia – Drake & Ruhoff 1960: 51.

MATERIAL EXAMINED. — **Argentina**. Province of Jujuy, Calilegua, 2.VI.2007, Guilbert & Montemayor coll., 3 ♂♂, 3 ♀♀, 2 instars V, 1 instar IV, 1 instar III (MLP); 3 instars V, 1 instar III (MNHN). — Province of Jujuy, Calilegua, 3.VI.2007, Guilbert & Montemayor coll., 1 ♂ (MLP). — Orán, 5.VI.2007, Guilbert & Montemayor coll., 1 ♂ (MNHN). — Province of Salta, Urundel, 7.VI.2007, Guilbert & Montemayor coll., 2 ♂♂, 3 ♀♀ (MNHN). — Province of Salta, Urundel, 8.VI.2007, Guilbert & Montemayor coll., 1 ♂, 2 ♀♀ (MLP).

DISTRIBUTION. — **Argentina**: Misiones (Loreto, San Ignacio, San Javier). **Bolivia**, **Brazil**, **Colombia**, **Costa Rica**, **Cuba**, **El Salvador**, **Guatemala**, **Haiti**, **Honduras**, **Jamaica**, **Mexico**, **Panama**, **Paraguay**, **Peru**, **Puerto Rico**, **Trinidad**, **Venezuela**. This species is widespread throughout South and Central America, including Argentina. It is, however, newly recorded from Jujuy and Salta. The specimens were collected by beating the understory.

HOST PLANTS. — *Cordia* sp. (Boraginaceae) (Drake & Hambleton 1938: 45; Monte 1940c: 124; Drake & Ruhoff 1965: 191); *Cordia alliodora* (Ruiz & Pav.) Cham. (Hurd 1946: 451; Drake & Ruhoff 1965: 191); *Cordia curassavica* (Jacq.) Roem. & Schult. (Silva 1956: 43); *Cordia gerascanthus* L. (Fenton 1934: 199; Drake & Poor 1937: 302; Drake & Ruhoff 1965: 191); *Cordia tomentosa* Lam. (Monte 1937b: 71; Drake & Ruhoff 1965: 191); *Cordia trichotoma* (Vell.) Steud. (Monte 1937a: 33); *Gossypium* sp. (Fenton 1934: 199; Drake & Ruhoff 1965: 191).

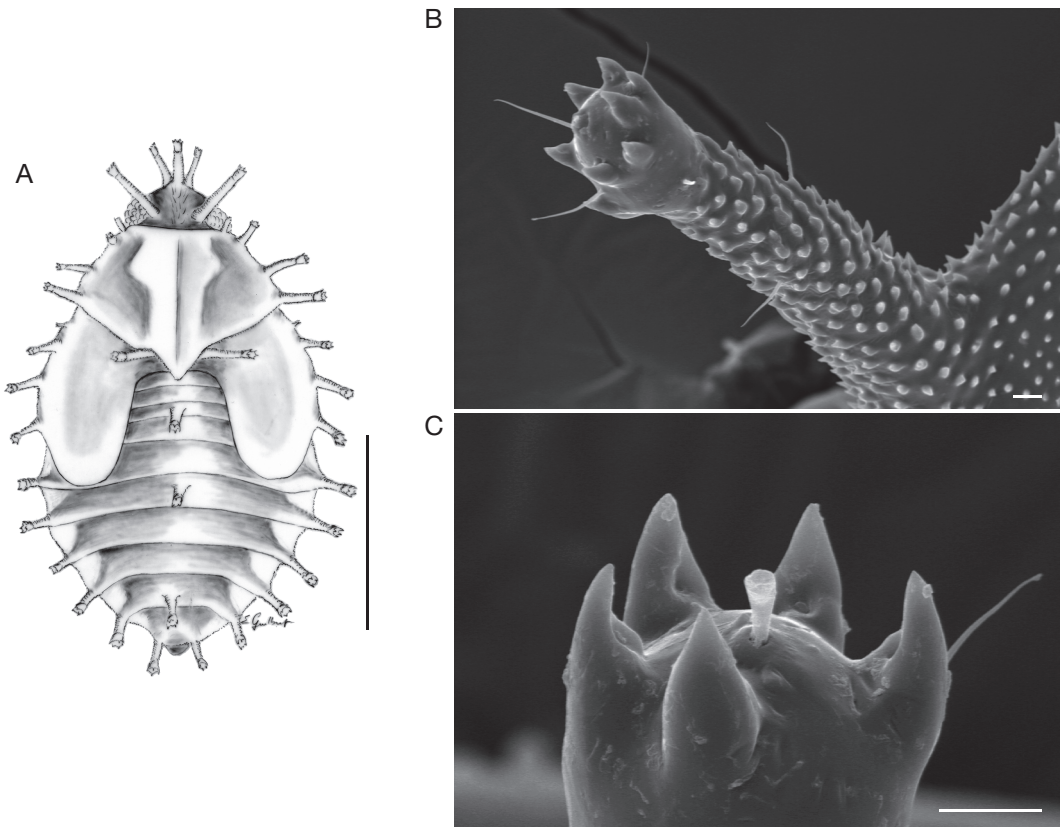


FIG. 3. — Instar V of *Dictyla monotropidia* (Stål, 1858): **A**, habitus; **B**, pronotal tubercle of instar V; **C**, detail of the apex of a tubercle of instar V. Scale bars: A, 1 mm; B, C, 10 μ m.

DESCRIPTION OF FIFTH INSTAR (FIG. 3)

Body brown, with antero-lateral parts and postero-medial part of pronotum, a transversal band across middle of wing pads, and a small spot in the middle of fourth abdominal tergite yellowish; legs yellowish (Fig. 3A). Dorsum covered with tiny tooth-like protuberances, including sides of tubercles; body with sparse, tiny, whitish trumpet-like tubercles. Body with set of tubercles; tubercles erect, slender, long, ending in a bulge bearing four to ten spiny petal-like protuberances around edge, with a seta at the middle; tubercle length 0.25 to 0.43 mm. Body length 2.75 mm; width 1.68 mm (Fig. 3B, C).

Head armed with five tubercles, a frontal and an occipital pair, and one at median, with some small setae longitudinally arranged at the middle.

Pronotum wide, widened posteriorly, medially swollen anteriorly; with a submedian pair of tubercles near anterior margin on swollen part; lateral margins armed with three long, erect tubercles, a fourth shorter one anterior to the others.

Wing pads wider than pronotum, armed with a submedian pair of long, erect tubercles, separate by angulate apex of posterior pronotal margin; lateral margins with three long, erect tubercles, a fourth much shorter tubercle anterior to the others as on lateral pronotal margins.

Abdominal tergites as wide as wing pads, middle widely swollen; second, fifth and eighth tergites with a median tubercle, the same length as marginal tubercle on pronotum and wing pads; fourth to ninth tergites with a tubercle on posterior part of lateral margins, the same length as submedian tubercles.

REMARKS

Instars III and IV have the same habitus as instar V. However, there are different combinations of tubercles among the different instars. Lateral margins of pronotum and wing pads bear three tubercles, the most posterior one the longest and the most anterior one the smallest in instars III and IV. The second and third abdominal tergites bear a tubercle on each lateral margin in instar III, whereas only the third one has a tubercle in instar IV. The number of tubercles on abdominal margins decreases whereas it increases on the margins of the wing pads. These observations are similar to the translocation suggested by Štusák & Štys (1959), and noted by Péricart (1983) and Guilbert (2004). In addition, the combinations of tubercles differ in being smaller, more slender, and without denticles in instar III.

Genus *Gargaphia* Stål, 1862

Gargaphia dissortis Drake, 1930

Gargaphia dissortis Drake, 1930: 3.

MATERIAL EXAMINED. — Province of Jujuy, Calilegua, 2.VI.2007, Guilbert & Montemayor coll., 2 ♂♂, 3 ♀♀, 3 instars V, 2 instars IV, 1 instar III (MNHN); 3 ♂♂, 4 ♀♀, 2 instars V, 2 instars IV (MLP). — Province of Jujuy, Calilegua, 3.VI.2007, Guilbert & Montemayor coll., 1 ♂, 2 ♀♀ (MNHN); 2 ♂♂, 1 ♀ (MLP). — Province of Jujuy, Calilegua, 4.VI.2007, Guilbert & Montemayor coll., 2 instars V, 2 instars IV, 1 instars III (MNHN); 3 instars V, 2 instars IV (MLP). — Province of Jujuy, Calilegua, 5.VI.2007, Guilbert & Montemayor coll., 1 ♀, (MLP). — Province of Jujuy, Calilegua, 10.VI.2007, Guilbert & Montemayor coll., 2 ♂♂, 1 ♀, (MLP). — Province of Salta, Ruta 9, 1.VI.2007, Guilbert & Montemayor coll., 3 ♂♂, 2 ♀♀ (MLP); 4 ♂♂, 1 ♀ (MNHN). — Province of Salta Ruta 9, 11.VI.2007, Guilbert & Montemayor coll., 1 ♂, 3 ♀♀, (MNHN).

DISTRIBUTION. — Argentina: Córdoba (Agua de Oro). Brazil.

This species, previously known from Argentina, is here newly recorded from Jujuy and Salta. The specimens examined were collected on plants in the understory.

HOST PLANTS. — Unrecorded.

DESCRIPTION OF LARVA (FIG. 4)

Body yellowish brown; shiny, glabrous. Body length (without tubercles) 1.61 mm; width 0.68 mm (Fig. 4).

Head armed with five tubercles, all simple and covered with scattered setae; frontal pair moderately short, slender, directed forward and subparallel; median tubercle stout, long and erect; occipital pair stout, long, suberect, and divergent.

Pronotum short and wide, with lateral margins expanded far from head on both sides, with median part swollen anteriorly, with a median longitudinal keel; armed with a pair of very short, suberect, divergent tubercles on swollen part; with a pair of long, suberect, divergent tubercles directed upward in the middle line across the keel; the margins armed on the anterior part with a few, short, tubercles, two long, simple, tubercles and two longer tubercles on the posterior part; all tubercles ending with a short seta at the apex.

Wing pads with some short tubercles, posteriorly with two long tubercles on each side, mesonotum armed at the middle with a pair of long, slender, divergent tubercles directed upward.

Metanotum armed with a pair of very short, slender tubercles directed backward. All thoracic tubercles are covered with scattered setae.

Abdominal tergites more slender than wing pads; fourth to ninth with a long simple tubercle on each side; first and second terga with paired, divergent tubercles directed backwards, the first pair long and the second pair very short; fifth, sixth and eighth terga with a long median tubercle; all abdominal tubercles covered with scattered setae.

REMARKS

Instar III and IV have a similar habitus as instar V. They are, however, smaller. The same combination of tubercles are resented in these two earlier instars but all tubercles are stouter when compared with other structures. Tubercles in the fifth instar are more slender.

Gargaphia lunulata (Mayr, 1865)

Monanthia lunulata Mayr, 1865: 441.

Gargaphia lunulata – Stål 1873: 124.

Gargaphia lasciva Gibson, 1919: 198.

MATERIAL EXAMINED. — **Argentina**. Province of Salta, Orán, 5.VI.2007, Guilbert & Montemayor coll., 1 ♀ (MNHN).

DISTRIBUTION. — Argentina: Buenos Aires (Chacabuco), Chaco (Presidente Roque Saenz Peña), Córdoba, Tucumán. Brazil, Colombia, Paraguay, Uruguay.

This species, known from several provinces in Argentina, is here newly recorded from Salta. All specimens were collected in the understory by beating vegetation.

HOST PLANTS. — This polyphagous species is known to feed on several plant families. Malvaceae: *Abelmoschus esculens* Moench (Silva 1956: 32; Drake & Ruhoff 1965: 227), *Gossypium* sp. (Stonedahl & Dolling 1992: 439), *Gossypium arboreum* L. (Drake & Hambleton 1934: 450; Drake & Ruhoff 1965: 227), *Hibiscus* sp. (Stonedahl & Dolling 1992: 439), *Hibiscus esculentus* L. (Drake & Hambleton 1934: 450; Drake & Ruhoff 1965: 227), *Chorisia speciosa* A.St.-Hil. (Drake & Hambleton 1934: 450; Drake & Ruhoff 1965: 227), *Urena* sp. (Stonedahl & Dolling 1992: 439), *Urena lobata* L. (Drake & Hambleton 1934: 450; Silva 1956: 32; Drake & Ruhoff 1965: 227); Fabaceae (Stonedahl & Dolling 1992: 438), *Glycine max* (L.) Merr. (Drake & Hambleton 1934: 450; Drake & Ruhoff 1965: 227), *Meibomia ascendens* Sw. (Silva 1956: 32; Drake & Ruhoff 1965: 227), *Canavalia ensiformis* (L.) DC. (Drake & Hambleton 1934: 450; Silva 1956: 32; Drake & Ruhoff 1965: 227), *Phaseolus lunatus* L. (Silva 1956: 32; Drake & Ruhoff 1965: 227), *Phaseolus vulgaris* L. (Drake & Hambleton 1934: 450; Silva 1956: 32; Drake & Ruhoff 1965: 227), *Zornia diphylla* (L.) Pers. (Silva 1956: 32; Drake & Ruhoff 1965: 227); Caesalpiniaceae: *Cassia fistula* L. (Drake & Hambleton 1934: 450; Monte 1938a: 131; Silva 1956: 32; Drake & Ruhoff 1965: 227), *Cassia imperialis* Hort. (Costa Lima 1936: 127; Drake & Ruhoff 1965: 227); Euphorbiaceae (Stonedahl & Dolling 1992: 438), *Euphorbia heterophylla* L. (Silva 1956: 32; Drake & Ruhoff 1965: 227), *Cnidoscolus* sp. (Silva 1956: 32; Drake & Ruhoff 1965: 227), *Manihot utilissima* Pohl. (Drake & Hambleton 1934: 450; Drake & Ruhoff 1965: 227), *Ricinus communis* L. (Drake & Hambleton 1934: 450; Silva 1956: 32; Drake & Ruhoff 1965: 227); Leguminosae: *Dolichos lablad* L. (Costa Lima 1936: 127; Silva 1956: 32; Drake & Ruhoff 1965: 227); Passifloraceae: *Passiflora caerulea* L. (Berg 1884: 190; Monte 1938b: 388; Drake & Ruhoff 1965: 227), *Passiflora violacea* Vell. (Drake & Hambleton 1934: 450; Drake & Ruhoff 1965: 227); Rosaceae: *Pyrus communis* L. (Drake & Hambleton 1934: 450; Drake & Ruhoff 1965: 227), *Rosa* sp. (Silva 1956: 32; Drake & Ruhoff 1965: 227); Malpighiaceae: *Stigmaphyllon* sp. (Drake & Hambleton 1934: 450; Drake & Ruhoff 1965: 227).

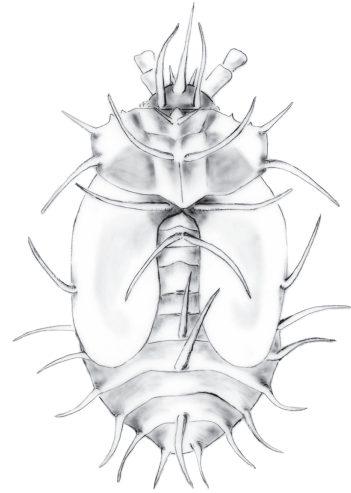


FIG. 4. — Habitus of instar V of *Gargaphia dissortis* Drake, 1930. Scale bar: 1 mm.

Gargaphia subpilosa Berg, 1879

Gargaphia subpilosa Berg, 1879: 42.

Gargaphia iridescens – Bergroth 1922: 149 (not Champion 1897).

Gargaphia bergi Monte, 1940b: 306.

Gargaphia penningtoni Drake, 1928: 75.

MATERIAL EXAMINED. — **Argentina**. Province of Jujuy, Calilegua, 4.VI.2007, Guilbert & Montemayor coll., 1 ♂, 1 ♀ (MNHN). — Orán, 5.VI.2007, Guilbert & Montemayor coll., 2 ♂♂, 2 ♀♀ (MLP). — Province of Salta, Urundel, 6.VI.2007, Guilbert & Montemayor coll., 1 ♂, 1 ♀ (MLP). — Province of Salta, Urundel, 7.VI.2007, Guilbert & Montemayor coll., 1 ♂ (MNHN). — Province of Salta, Ruta 9, 11.VI.2007, Guilbert & Montemayor coll., 1 ♂ (MNHN).

DISTRIBUTION. — Argentina: Buenos Aires (Baradero, Chacabuco, Lomas, Tigre), Mendoza (Potrerillo), Santiago del Estero. Bolivia, Brazil.

HOST PLANTS. — This polyphagous species is known to feed on several plant families. Asteraceae: *Ambrosia tenuifolia* Spreng. (Monte 1938b: 389; Drake & Ruhoff 1965: 233), *Helianthus annuus* L. (Bosq 1937: 129; Monte 1938b: 387; Drake & Ruhoff 1965: 233), *Mikania auricularis* Griseb. (Berg 1879: 42; Fenton 1934: 199; Monte 1938b: 387; 1940b: 302; Drake & Ruhoff 1965: 233); Malvaceae: *Gossypium* sp. (Fenton 1934: 199; Monte 1938b: 389; Drake & Ruhoff 1965: 233), *Wissadula* sp. (Monte 1937a:

36; Drake & Ruhoff 1965: 233); Convolvulaceae: *Ipomoea bonariensis* Hook. (Bosq 1937: 129; Monte 1938b: 387; Drake & Ruhoff 1965: 233); Fabaceae: *Phaseolus vulgaris* L. (Bosq 1937: 129; Monte 1938b: 387; Drake & Ruhoff 1965: 233); Rosaceae: *Prunus cerasus* L. (Bosq 1937: 129; Monte 1938b: 387; Drake & Ruhoff 1965: 233); *Prunus persica* (L.) (Bosq 1937: 129; Monte 1938b: 387; Drake & Ruhoff 1965: 233); *Pyrus communis* L. (Bosq 1937: 129; Monte 1938b: 387; Drake & Ruhoff 1965: 233); Solanaceae: *Solanum tuberosum* L. (Bosq 1937: 129; Monte 1938b: 387; Drake & Ruhoff 1965: 233).

REMARKS

Gargaphia penningtoni Drake, 1928 was recently synonymized with *G. subpilosa* (Montemayor & Delapé 2010). Thus, the distribution of *G. subpilosa* is extended to Buenos Aires (La Plata), Misiones (San Ignacio) and Paraguay. In addition, host plants now include *Abutilum* spp. (Drake & Hambleton 1934: 450; Monte 1938b: 388; Monte 1940d: 100; Drake & Ruhoff 1965: 231); *Acalypha* sp. (Drake & Hambleton 1934: 450; Monte 1940d: 100; Drake & Ruhoff 1965: 231); *Cajanus indicus* (Monte 1938b: 388; Drake & Ruhoff 1965: 231); *Croton lobatus* (Monte 1940d: 193; Drake & Ruhoff 1965: 231); *Phaseolus* spp. (Monte 1939: 70; Monte 1940d: 100; Drake & Ruhoff 1965: 231); *Sida* spp. (Monte 1939: 70; 1940d: 100; Drake & Ruhoff 1965: 231); *Sida acuta* (Drake & Hambleton 1934: 450; Drake & Ruhoff 1965: 231); *Wissadula* spp. (Monte 1940d: 193; Drake & Ruhoff 1965: 231). *Gargaphia subpilosa* is exclusively distributed in Southern South America. This species has a wide distribution in Argentina, which is here extended to Jujuy and Salta.

Genus *Leptopharsa* Stål, 1873

Leptopharsa firma Drake & Hambleton, 1938

Leptopharsa firma Drake & Hambleton, 1938: 53.

MATERIAL EXAMINED. — **Argentina.** Province of Jujuy, Calilegua, 4.VI.2007, Guilbert & Montemayor coll., 2 ♂♂, 1 ♀ (MNHN). — Province of Jujuy, Calilegua, 10.VI.2007, Guilbert & Montemayor coll., 1 ♀ (MNHN); 1 ♀ (MLP). — Province of Salta, Orán, 5.VI.2007, Guilbert & Montemayor coll., 2 ♂♂, 1 ♀, 1 instar V (MLP). — Province of Salta, Urundel, 7.VI.2007, Guilbert & Montemayor coll., 1 ♂, 1 ♀ (MNHN); 1 ♂, 1 ♀ (MLP).

DISTRIBUTION. — Brazil.

This species is newly recorded for Argentina, from Jujuy and Salta. It was found on vines extending up to 30 metres in the canopy in Calilegua park.

HOST PLANTS. — Unrecorded.

DESCRIPTION OF FIFTH INSTAR (FIG. 5)

Body whitish to yellowish, medially brownish; shiny, glabrous. Body length (without tubercles) 1.64 mm; width 0.80 mm (Fig. 5A).

Head armed with five simple, slender tubercles bearing scattered setae; frontal pair moderately long, directed forward and subparallel; median tubercle long and directed upward; occipital pair long, suberect and divergent.

Pronotum short and wide, median part swollen anteriorly, with a longitudinal small median keel; armed with a pair of short, suberect, divergent tubercles on swollen part; with a pair of long, suberect, divergent tubercles on middle line across keel and a long tubercle posteriorly on each margin; tubercles with several scattered setae (Fig. 5B).

Wing pads with two tubercles on each side, mesonotum armed on middle with a pair of long, slender, divergent tubercles; all tubercles covered with scattered setae.

Metanotum armed with a pair of slender, divergent, very short tubercles.

Abdominal tergites with a long, marginal tubercle on each side; tergites second, fifth, sixth and eighth with an erect, simple, median tubercle with a few scattered setae.

REMARKS

Until now, only the fifth instar of *Leptopharsa gibbicarina* (Guilbert 2005) have been described. The fifth instar of *L. firma* can be distinguished from that of *L. gibbicarina* by the number of cephalic tubercles, the former species having five tubercles and the latter having three.

Genus *Phymacysta* Monte, 1942

Phymacysta magnifica (Drake, 1922)

Gelchossa magnifica Drake, 1922: 373.

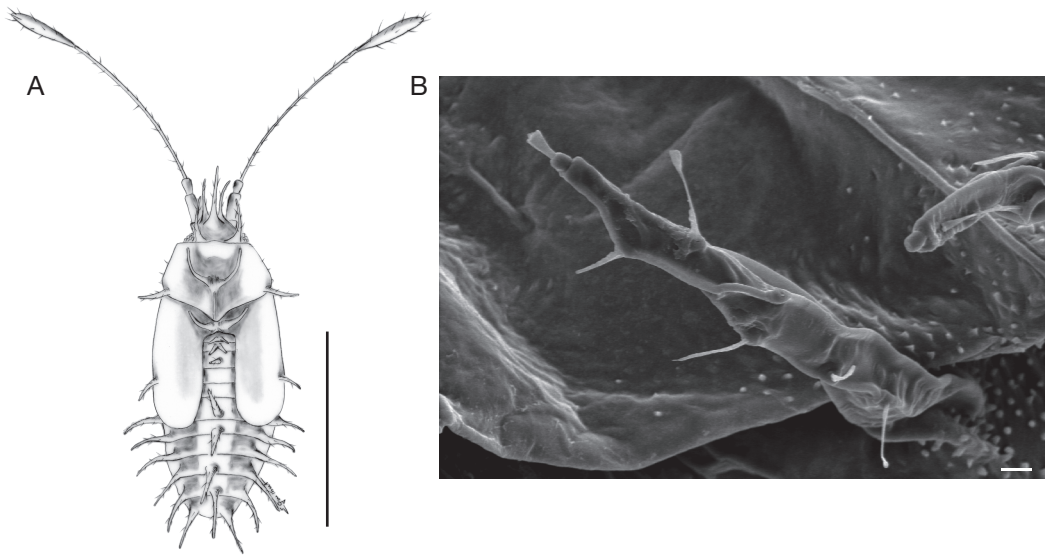


FIG. 5. — Instar V of *Leptopharsa firma* Drake & Hambleton, 1938: **A**, habitus; **B**, pronotal tubercle. Scale bars: A, 1 mm; B, 10 µm.

Leptopharsa magnifica – Drake 1930: 1.

Phymacysta magnifica – Monte 1942: 107.

MATERIAL EXAMINED. — **Argentina**. Province of Salta, Ruta 9, 11.VI.2007, Guilbert & Montemayor coll., 1 ♀ (MNHN).

DISTRIBUTION. — Argentina, Misiones (Posadas). Brazil, Paraguay.

This species is here newly recorded for Salta. It seems to be restricted to northern Argentina. This specimen was collected in the understorey.

HOST PLANTS. — *Chuquiraga glabra* Backer (Asteraceae) (Drake & Hambleton 1938: 63; Monte 1940c: 115; Drake & Ruhoff 1965: 326).

Genus *Sphaerocysta* Stål, 1873

Sphaerocysta angulata Monte, 1941

Sphaerocysta angulata Monte, 1941: 373.

MATERIAL EXAMINED. — **Argentina**. Province of Jujuy, Calilegua, 4.VI.2007, Guilbert & Montemayor coll., 1 ♂, 2 ♀♀ (MLP). — Province of Salta, Urundel, 7.VI.2007, Guilbert & Montemayor coll., 1 ♂, 1 instar V (MNHN).

DISTRIBUTION. — Brazil.

This species is newly recorded for Argentina from Jujuy and Salta. All specimens were collected by beating vegetation in the understorey.

HOST PLANTS. — Bignoniaceae.

DESCRIPTION OF FIFTH INSTAR (FIG. 6)

Body whitish to yellowish; dull, glabrous, sparsely covered with slender, straight, whitish tubercles. Body with long, erect, slender tubercles, bearing several setae on short pedunculates, and a seta at apex; length, 0.25 to 0.38. Body length (without tubercles), 0.96 mm; width, 0.46 mm (Fig. 6).

Head armed with five long tubercles, a median tubercle, a frontal pair and an occipital pair.

Pronotum wider than head with a small, median tumid elevation near anterior margin, prolonged posteriorly by a small keel; armed with two submedian pairs of tubercles as long as cephalic ones, one pair on anterior tumid elevation and one pair on keel near posterior margin; lateral margins armed with a long tubercle on posterior part, two smaller simple, tubercles without setae along anterior part, the most anterior the smallest, a tubercle between posterior and anterior tubercles, with a bulbous base bearing three short peduncles each with an apical seta.

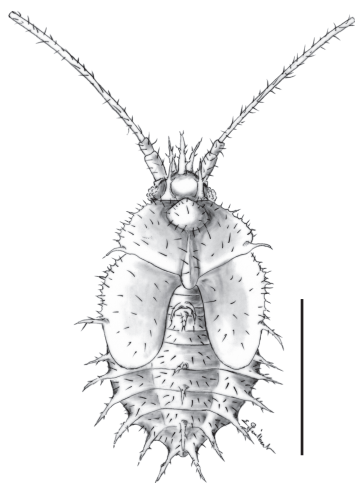


FIG. 6. — Habitus of instar V of *Sphaerocysta angulata* Monte, 1941. Scale bar: 1 mm.

Wing pads slightly wider than pronotum, armed with a submedian pair of long tubercles, lateral margins with a long, erect tubercle on posterior part, with six simple, smaller tubercles of different length, without setae along anterior part; five to seven short peduncles bearing a seta at apex on the middle of pads.

Abdominal tergites with central part slightly swollen; first tergites bearing a median tubercle, bifid at base, simple, with a seta at apex of each branch; second, fifth, sixth and eighth tergites with long, erect, submedian tubercles; fourth to ninth tergites with a long, erect tubercle on each lateral margin.

Sphaerocysta inflata (Stål, 1858)

Tingis inflata Stål, 1858: 64.

Sphaerocysta inflata – Stål 1873: 128.

MATERIAL EXAMINED. — **Argentina.** Province of Jujuy, Calilegua, 4.VI.2007, Guilbert & Montemayor coll., 1 ♂, 3 ♀♀ (MNHN). — Province of Jujuy, Calilegua, 10.VI.2007, Guilbert & Montemayor coll., 1 ♂, 4 ♀♀ (MLP). — Province of Salta, Urundel, 7.VI.2007, Guilbert & Montemayor coll., 1 ♂, 1 instar V, 1 instar III (MNHN). — Province of Salta, Urundel, 8.VI.2007, Guilbert & Montemayor coll., 3 ♂♂, 3 ♀♀ (MNHN), 4 ♂♂, 2 ♀♀ (MLP).

DISTRIBUTION. — Argentina: Chaco (Puerto Tirol), Misiones, (El Dorado, San Ignacio), Salta (Pocitos, Urundel). Bolivia, Brazil, Paraguay.

This is the first record of this species for Jujuy. All specimens were collected by beating the understorey.

HOST PLANTS. — Unrecorded.

DESCRIPTION OF LARVA (FIG. 7)

Body uniformly dark brown, shiny, glabrous, with long, slender, simple, erect tubercles, with several setae along and one at the apex; length, 0.25 to 0.31 mm. Body length (without tubercles), 2.25 mm; width, 0.95 mm (Fig. 7A, B). Dorsum sparsely covered with slender, straight, whitish tubercles (Fig. 7C).

Head armed with five tubercles, a frontal pair, a median tubercle, and an occipital pair.

Pronotum as wide as long, wider than head, with two tumid elevations on median plane, a large one near anterior margin and a smaller one near posterior margin, both joined by a longitudinal keel; armed with two submedian pairs of short tubercles, one on the anterior elevation, one just in front of posterior elevation, tubercles half the length of the cephalic ones; lateral margins armed with a short tubercle on the posterior part of the margin, and five to eight other very short, spiny protuberances bearing a seta at apex anterior to the short tubercle.

Wing pads as wide as pronotum, armed with a submedian pair of tubercles, slightly longer than the one on pronotum; lateral margins with a tubercle on posterior part, tubercle as long as the one on pronotal margins, with five to eight other tiny protuberances as on pronotal margins.

Abdominal tergites with central part swollen and margins flat and expended laterally, as wide as wing pads; first tergite with a submedian pair of short tubercles; second, fifth, sixth and eighth tergites with a median tubercle, longer than the one on first tergite; fifth to ninth tergites with a long, erect tubercle posteriorly on each margin.

REMARKS

Instar III has the same number of tubercles on the dorsum as instar V, but are smaller (about 0.19 mm). The pronotum lacks tumid elevations on both anterior and posterior margins. The occipital

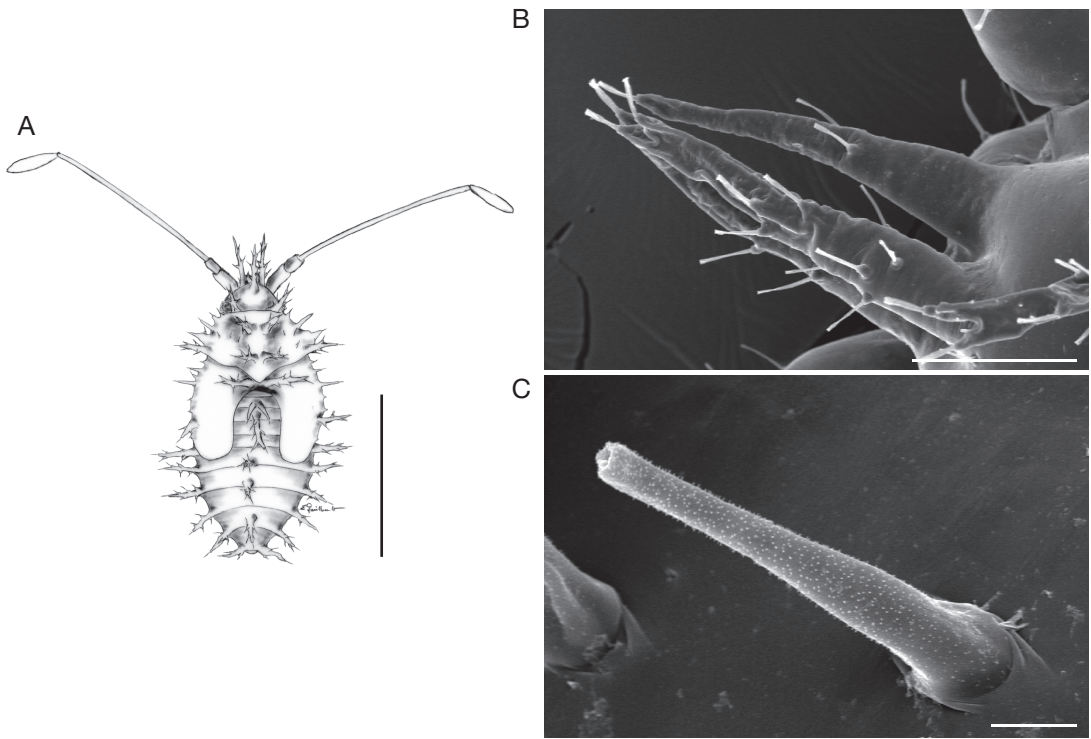


FIG. 7. — Instar V of *Sphaerocysta inflata* Monte, 1941: **A**, habitus; **B**, cephalic tubercles; **C**, abdominal protuberance. Scale bars: A, 1 mm; B, 100 µm; C, 10 µm.

tubercles, the submedian tubercles on second, fifth, sixth and eighth abdominal tergites are bifid at the apex and end with two setae. The wing pads are not developed.

It is usually difficult or even impossible in many cases to distinguish species of *Sphaerocysta* based on larvae. However, the fifth instars of the two species described here are quite different. *Sphaerocysta inflata* is shiny while *S. angulata* is flat, and lacks the posterior tumid elevation on pronotum. The submedian pair of tubercles on first abdominal tergite are separated at the basis in *S. inflata* whereas they are basally joined in *S. angulata*.

Genus *Teleonemia* Costa, 1864

Teleonemia bosqi Monte, 1943

Teleonemia bosqi Monte, 1943b: 202.

MATERIAL EXAMINED. — **Argentina.** Province of Salta, Urundel, 8.VI.2007, Guilbert & Montemayor coll., 1 ♀ (MNHN); 1 ♀ (MLP).

DISTRIBUTION. — **Argentina:** Misiones (El Dorado). This species is restricted to Argentina, and is recorded here for the first time for Salta. All specimens were collected in the understory.

HOST PLANTS. — Unrecorded.

Genus *Tigava* Stål, 1858

Tigava pulchella Champion, 1897

Tigava pulchella Champion, 1897: 32.

MATERIAL EXAMINED. — **Argentina.** Province of Jujuy, Calilegua, 4.VI.2007, Guilbert & Montemayor coll., 1 ♂ (MNHN). — Province of Salta, Cerca Orán, Ruta de San Andrés, 5.VI.2007, Guilbert & Montemayor coll., 3 ♂♂, 4 ♀♀, 5 instars V (MLP).

TABLE 2. — List of species collected in the Jujuy and Salta provinces, Argentina. See Figure 1 for the correspondence of localities numbers.

Species	Localities	New for Jujuy	New for Salta	New for Argentina	Endemic to Argentina
<i>Acanthocheila armigera</i> (Stål, 1858)	1, 3, 5	●	●		
<i>Carvalhotingis hollandi</i> (Drake, 1935)	1, 4, 5		●		
<i>Corythaica monacha</i> (Stål, 1858)	3				●
<i>Corythucha tapiensis</i> Ajmat, 1991	2, 3, 4	●	●		●
<i>Dictyla monotropidia</i> (Stål, 1858)	2, 3, 4	●	●		
<i>Gargaphia dissortis</i> Drake, 1930	2, 4, 5	●	●		
<i>Gargaphia lunulata</i> (Mayr, 1865)	2		●		
<i>Gargaphia subpilosa</i> Berg, 1879	2, 3, 5, 6	●	●		
<i>Leptopharsa firma</i> Drake & Hambleton, 1938	2, 3, 4, 5	●	●	●	
<i>Phymacysta magnifica</i> (Drake, 1922)	1, 6		●		
<i>Sphaerocysta angulata</i> Monte, 1941	3, 5	●	●	●	
<i>Sphaerocysta inflata</i> (Stål, 1858)	3, 4, 5	●			
<i>Teleonemia bosqi</i> Monte, 1943	3		●		●
<i>Tigava pulchella</i> Champion, 1897	5	●		●	
<i>Vatiga pauxilla</i> (Drake & Poor, 1939)	5	●			●

DISTRIBUTION. — Cuba, Guatemala, Honduras, Mexico.

This species is here newly recorded for Argentina from Jujuy. It is quite surprising to find this species in Argentina, as until now it was known only from Cuba, Mexico and Central America. The other members of the genus are widely distributed in Central and South America, suggesting that the large distributional gap of *T. pulchella* is a consequence of inadequate fieldwork. The only other species of *Tigava* recorded from Argentina is *T. bombacis* Drake & Poor, 1938, found in Salta (Tartagal). These specimens were collected on *Chorisia* sp.

HOST PLANTS. — *Solanum torvum* Sw. (Solanaceae) (Drake & Bruner 1924: 146), *Chorisia* spp. (Bombacaceae) is a new record.

DESCRIPTION OF LARVA (FIG. 8)

Body yellowish brown except for a pair of dark brown, Y-shaped stripes at the margins of the pronotum converging medially at the posterior process into one stripe running along the mid-line of abdominal tergites; shiny, glabrous. Body length (without tubercles) 2.36 mm; width 0.74 mm (Fig. 8).

Head triangular, medially with a slender furrow, armed with three simple tubercles, a long, erect, slender median tubercle and a long, erect, robust occipital pair with scattered setae.

Pronotum wider than long, with a small, longitudinal, median, keel; armed with a pair of divergent tubercles at middle across keel; the antero-median

lateral margins armed with short, scattered, tubercles, posterior margins armed with a long, simple, tubercle.

Wing pad lateral margin armed with scattered, short tubercles; mesonotum with a pair of long, divergent, simple tubercles.

Metanotum with a pair of long, divergent, simple tubercles.

Abdominal tergites more slender than wing pads; fourth to ninth with a long simple tubercle on each side; first tergum with a pair of very short tubercles, second, fifth, sixth and eighth terga with a median tubercle.

REMARKS

This is the first larva described for the genus. The fifth instars of *Tigava pulchella*, and probably of the other members of the genus, are nearly as long and slender as the adult and have only simple tubercles.

Genus *Vatiga* Drake & Hambleton, 1946

Vatiga pauxilla (Drake & Poor, 1939)

Leptopharsa pauxilla Drake & Poor, 1939: 32.

Vatiga pauxilla – Drake & Ruhoff 1960: 29.

MATERIAL EXAMINED. — **Argentina.** Province of Jujuy, Calilegua, 4.VI.2007, Guilbert & Montemayor coll., 1 ♀ (MNHN).

DISTRIBUTION. — Argentina: Corrientes (Empedrado). The genus is distributed from Central to South America, with only the two species *V. manihotae* (Drake, 1922) and *V. pauxilla* known from Argentina. *Vatiga pauxilla*, exclusively distributed in Argentina, is here recorded for the first time from Jujuy. It was collected in the canopy of a tree at 25 m above the ground in Calilegua park.

HOST PLANTS. — Unrecorded.

DISCUSSION

Fifteen species were collected in the Yungas of Jujuy and Salta provinces. Among them, 14 species are newly recorded for at least one of the two provinces sampled (10 for Jujuy, 11 for Salta), three are new to Argentina (see Table 2). Only one species, *Corythaica monacha*, was previously known from both provinces. Such a result shows that the Yungas are undersampled and their fauna remains largely unknown. Ten out of the 14 species of this study are known from other countries where there are no forests corresponding to the type found in the Yungas.

Six species were already known from one of the two provinces, but were not collected in this study (see Montemayor & Coscaron 2005). These were mainly reported from the province of Salta around Orán and Urundel, two sites around which we collected. However, it is not clear whether these species were collected in the Yungas; thus, the fauna of the Yungas includes at least 15 species, not restricted to the Yungas.

Among the 14 newly recorded species, two are widespread and eight have distributions restricted to an area between 15 and 35°S, including southern Brazil, Uruguay, Paraguay, northern Argentina and southern Bolivia. Four species are restricted to Argentina, and only one, *Tigava pulchella*, occurs in Central America.

In their study of the insects from the Yungas, Cuezco *et al.* (2007) found 23 endemic species, representing 8% of the total of insect species registered in this biotope, which is quite low. None of the species recorded here are endemic to the Yungas.

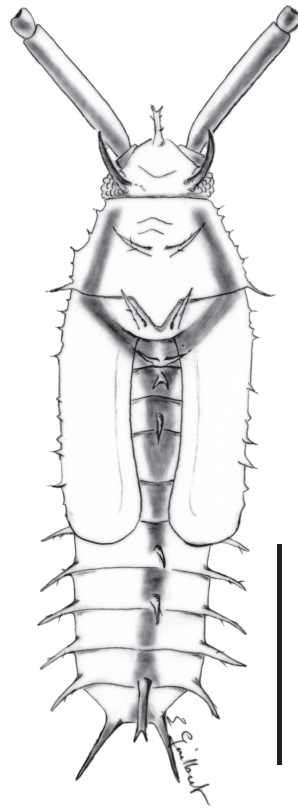


FIG. 8. — Habitus of instar V of *Tigava pulchella* Champion, 1897. Scale bar: 1 mm.

The endemicity of the entomofauna in the Yungas seems to be quite low. However, considering the area covered by the Yungas, our study is far from exhaustive, being limited in area (13 localities in two provinces) and altitude (366-1501 m). It would be interesting to see whether these species are restricted to these altitudes and which species inhabits higher altitudes. Nevertheless, we do highlight the lack of knowledge of the entomofauna of the Yungas.

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