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Studies on the chorionic structure of the eggs of Corixoidea (Hemiptera: Heteroptera) with scanning electron microscopy

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Abstract

The chorionic structure of the eggs of sixteen species of Corixoidea (*Ectemnostega (Ectemnostega) quadrata* (Signoret), *E. (Ectemnostegella) quechua* (Bachmann), *Trichocorixa mendozana* Jaczewski, *Centrocorisa kollari* (Fieber), *Heterocorixa brasiliensis* Hungerford, *Sigara (Aphelosigara) tucma* Bachmann, *S. (Tropocorixa) denseconscripta* (Breddin), *S. (T.) platensis* Bachmann, *S. (T.) rubyae* (Hungerford), *S. (T.) santiagiensis* (Hungerford), *S. (T.) schadei* (Hungerford), *S. (T.) yala* Bachmann, *Tenagobia (Incertagobia) incerta* Lundblad, *T. (Fuscagobia) fuscata* (Stål), *T. (Schadeogobia) schadei* Lundblad, and *T. (Tenagobia) pulchra* Hungerford) is described for the first time using scanning electron microscopy. In addition, the eggs of some of these species are described based on color and morphometry. The sculpturing of the chorion and the structure of the micropylar area here in studied using scanning electron microscopy together with the length of the stalk distinguish the eggs of the genera (except *Sigara*, genus without a uniform pattern on the sculpturing of the chorion) and subgenera (including *Aphelosigara* and *Tropocorixa*) of Corixoidea present in Argentina. The above mentioned characters, together with the egg length, proved to be useful for the identification of the Argentinian species. An identification key to the eggs of Argentinian species of Corixoidea based on the material herein studied, and additional data present in the literature, is provided.

Key words: Nepomorpha, morphology, egg, chorionic structure, key, scanning electron microscopy

Introduction

The eggs of Corixoidea are variable in shape and in the way of attachment to the substrate. Some are elongate and glued lengthwise to the substrate without a special fastening structure; other eggs are ovoid or top-shaped and placed upright by an adhesive pad with a very short or considerably long stalk. The external structure of the chorion is also variable, being either smooth or with projections. The eggs are laid underwater attached singly or together to aquatic plants, dead leaves and twigs, woody debris, stones, and other available substrates. The most unusual oviposition habit is displayed by *Ramphocorixa acuminata* (Uhler), which deposits its eggs on the exoskeletons of crayfish (Griffith 1945).

Although the taxonomy and systematic of the adults of Corixoidea are comparatively well known, very few studies on the morphology of the immature stages are available in the literature. Regarding the eggs, there are only data of macroscopic characteristics and studies of the polygonal pattern of the chorion by optical microscopy. Studies using scanning electron microscopy are still not presently available in the literature.

The existing works include figures and descriptions of the size, color, shape, external structure of the chorion and the attachment system of the eggs of species of several genera of Corixoidea, e.g., *Agraptocorixa* Kirkaldy (Hale 1922, under *Porocorixa* Hale; Hungerford 1948b; Walton 1962; Fernando & Leong 1963; Fernando 1965),

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Arctocorisa Wallengren (Hungerford 1919, 1948a), *Callicorixa* Buchanan White (Hungerford 1948a), *Cenocorixa* Hungerford (Hungerford 1948a; Scudder 1966), *Centrocorisa* Lundblad (Hungerford 1948a), *Corisella* Lundblad (Howard 1901, under *Corixa* Geoffroy; Heidemann 1911, under *Corixa*; Hungerford 1948a), *Corixa* (Poisson 1923, 1933), *Cymatia* Flor (Hungerford 1923, 1948a, b; Poisson 1933; Hutchinson 1940), *Dasycorixa* Hungerford (Hungerford 1948a), *Ectemnostega* Enderlein (Hungerford 1948a, under *Ectemnostegella* Lundblad; Konopko & Melo 2009; Konopko *et al.* 2010b; Konopko & Mazzucconi 2011; Konopko 2013a), *Graptocorixa* Hungerford (Hungerford 1948a), *Hesperocorixa* Kirkaldy (Hungerford 1948a), *Heterocorixa* Buchanan White (Hungerford 1948a), *Krizousacorixa* Hungerford (Hungerford 1948a, b; Peters & Spurgeon 1971), *Micronecta* Kirkaldy (Poisson 1933, 1938, 1957; Hungerford 1948b; Wróblewski 1958; Fernando & Leong 1963; Fernando 1965), *Neosigara* Lundblad (Padilla Gil & Nieser 1994), *Orocorixa* Nieser & Padilla Gil (Padilla Gil & Nieser 1994), *Palmacorixa* Abbott (Hungerford 1919, 1948a), *Pseudocorixa* Jaczewski (Hungerford 1948a), *Ramphocorixa* Abbott (Abbott 1912; Hungerford 1917, 1919, 1923, 1948b; Poisson 1933; Griffith 1945), *Sigara* Fabricius (Dufour 1833, under *Corixa*; Leuckart 1855, under *Corixa*; Buchanan White 1873, under *Corixa*; Poisson 1933, 1957; Hungerford 1948a, b; Bachmann 1981; Konopko 2012, 2013b), *Stenocorixa* Horvath (Hungerford 1948a), *Tenagobia* Bergroth (Hungerford 1948a; Bachmann 1979, 1981, 1983; Konopko *et al.* 2010a), *Trichocorixa* Kirkaldy (Hungerford 1948a; Sailer 1948; Davis 1965; Konopko *et al.* 2011), *Tropocorixa* Hutchinson (Fernando 1965), and *Xenocorixa* Hungerford (Hungerford 1948a). Cobben (1968) studied and figured the structure of the chorion and the aeropylar and micropylar systems of the eggs of representatives of Corixidae (*Agraptocorixa*, *Corixa,* and *Cymatia*), Diaprepocoridae (*Diaprepocoris* Kirkaldy) and Micronectidae (*Micronecta* and *Tenagobia*). Cobben's work (1968) is the most complete and detailed one in Corixoidea, including comparisons among its members and a preliminary phylogeny of the Heteroptera based on egg characters.

Regarding the fauna of Argentina, Hungerford (1948a) figured and described the external structure of the chorion, size, color, and shape of the egg of *Centrocorisa kollari* (Fieber). Cobben (1968) described and figured the structure of the chorion and the aeropylar, micropylar and attachment systems of the egg of *Tenagobia (Incertagobia) incerta* Lundblad. Bachmann (1979, 1981) figured and described the size and shape of the eggs of *Tenagobia (Fuscagobia) fuscata* (Stål) and *T. (I.) incerta*; the latter work also includes a figure of the egg of *Sigara (Aphelosigara) tucma* Bachmann. In 1983, the same author figured the egg of *Tenagobia (T.) pulchra* Hungerford. Later on, Konopko & Melo (2009) described the size, color, shape and external structure of the chorion of the egg of *Ectemnostega (Ectemnostegella) montana* (Lundblad). Recently, Konopko *et al.* (2010a, b, 2011) figured and described the size, color, and shape of the eggs of *Tenagobia* (*T. (Schadeogobia) schadei* Lundblad and *T. (I.) incerta*), *Ectemnostega (Ectemnostegella) stridulata* (Hungerford) and *Trichocorixa mendozana* Jaczewski, respectively; the last two works also include information on the external structure of the chorion. Finally, Konopko & Mazzucconi (2011) and Konopko (2012, 2013a, b, *In press*) figured and described the size, color, shape and external structure of the chorion of the eggs of *Ectemnostega (Ectemnostegella) quechua* (Bachmann), *Sigara (Tropocorixa) schadei* (Hungerford), *Ectemnostega (Ectemnostega) quadrata* (Signoret), *Sigara (Tropocorixa) santiagiensis* (Hungerford), and *Sigara tucma* (redescription), respectively.

According to Bachmann (1981, 1998), 28 species in five genera of Corixidae and seven species in one genus of Micronectidae are present in Argentina, of which 16 are studied in the present contribution: *Ectemnostega (Ectemnostega) quadrata, E. (Ectemnostegella) quechua*, *Trichocorixa mendozana*, *Centrocorisa kollari*, *Heterocorixa brasiliensis* Hungerford, *Sigara (Aphelosigara) tucma, S. (Tropocorixa) denseconscripta* (Breddin), *S. (T.) platensis* Bachmann, *S. (T.) rubyae* (Hungerford)*, S. (T.) santiagiensis, S. (T.) schadei*, *S. (T.) yala* Bachmann, *Tenagobia (Incertagobia) incerta, T. (Fuscagobia) fuscata, T. (Schadeogobia) schadei,* and *T. (Tenagobia) pulchra*.

The study of the ultraestructure of the chorion of Heteroptera eggs is of great importance, because this character is related to morphological, physiological, distributional, phylogenetic, and taxonomic properties (e.g., Cobben 1968; Barata 1981; Candan & Suludere 1999; Suludere *et al.* 1999; Rosa *et al.* 2003; Obara *et al.* 2007; González *et al.* 2009; Matesco *et al.* 2009; Sandoval *et al.* 2011). The present paper contributes with the first study of the external morphology of eggs of Corixoidea using scanning electron microscopy. In particular the existence of identification keys based on eggs are of great value when only this developmental stage is available. The present work provides egg characters also important for determining classification and phylogenetic relationships in Corixoidea.

The main goals of this contribution are: (1) to describe and illustrate for the first time, using scanning electron microscopy, the external chorionic structure of the eggs of *Ectemnostega (Ectemnostega) quadrata, E. (Ectemnostegella) quechua*, *Trichocorixa mendozana*, *Centrocorisa kollari*, *Heterocorixa brasiliensis*, *Sigara (Aphelosigara) tucma, Sigara (Tropocorixa) denseconscripta*, *S. (T.) platensis, S. (T.) rubyae, S. (T.) santiagiensis, S. (T.) schadei*, *S. (T.) yala, Tenagobia (Incertagobia) incerta, T. (Fuscagobia) fuscata, T. (Schadeogobia) schadei,* and *T. (Tenagobia) pulchra*; (2) to provide for the first time additional descriptions based on color and morphometry of the eggs of *E. quechua, C. kollari*, *H. brasiliensis*, *S. denseconscripta*, *S. platensis, S. rubyae,* and *S. yala*; (3) to define the egg characters of taxonomic value in the genera *Centrocorisa, Ectemnostega, Heterocorixa, Tenagobia,* and *Trichocorixa*, and in the subgenera of *Ectemnostega* (subgenera *Ectemnostega* and *Ectemnostegella)*, *Sigara* (subgenera *Aphelosigara* and *Tropocorixa*), and *Tenagobia* (subgenera *Incertagobia, Fuscagobia, Schadeogobia,* and *Tenagobia*); and (4) to provide an identification key for the eggs of 16 Argentinian species of Corixoidea based on the material herein studied and additional data in the literature.

Material and methods

Material. The eggs were obtained by both oviposition in an aquarium (*Trichocorixa mendozana*, *Heterocorixa brasiliensis*, *Sigara denseconscripta*, *S. rubyae*, *S. schadei,* and *Tenagobia schadei*), and dissection from females (*Ectemnostega quadrata, E. quechua*, *Centrocorisa kollari*, *Sigara tucma*, *S. denseconscripta*, *S. platensis*, *S. santiagiensis*, *S. yala, Tenagobia incerta, T. fuscata,* and *T. pulchra*). The material is held in the collection of the División de Entomología, Museo Argentino de Ciencias Naturales "Bernardino Rivadavia" (MACN), Buenos Aires City, Argentina.

Examined material. ARGENTINA: *S. yala*: Jujuy Province, Volcán, 13/III/1982, A. O. Bachmann coll., 5 eggs; *T. pulchra*: Salta Province, Parque Nacional Baritú, 07/XII/1981, E. Tremouilles coll., 14 eggs; *S. tucma*: Salta Province, Parque Nacional El Rey, Arroyo Sala, 10/XI/2003, S. A. Mazzucconi coll., 9 eggs, and Tucumán Province, San Javier, 15/III/1961 and 18–28/I/1971, A. O. Bachmann coll., 10 eggs; *E. quechua*: Catamarca Province, Paso de San Francisco, 3925 m a.s.l., 27º 02'00'' S, 68º04'11'' W, 24/III/2001, M. Archangelsky coll., 4 eggs; *S. denseconscripta*: La Rioja Province, Anillaco, 1800 m a.s.l., 2/IV/1998, M. Archangelsky coll., 13 eggs, and Corrientes Province, Parque Nacional Mburucuyá, 17/I/2008, S. A. Mazzucconi coll., 7 eggs; *T. incerta:* Corrientes Province, Parque Nacional Mburucuyá, 02/VII/1997, S. A. Mazzucconi & M. L. López Ruf coll., 8 eggs; *T. schadei* and *H. brasiliensis*: Corrientes Province, Parque Nacional Mburucuyá, 15/I/2008, S. A. Mazzucconi coll., 8 eggs each; *S. platensis:* Corrientes Province, Iberá Wetlands, 02/XII/2012, S. A. Konopko coll., 8 eggs; *C. kollari*: Formosa Province, Ingeniero Juárez, 9/III/1960, A. O. Bachmann coll., 5 eggs; *S. schadei:* Buenos Aires Province, Club de Golf Lagos de Palermo, I–III/2008, S. A. Konopko coll., 9 eggs; *S. rubyae:* Buenos Aires Province, Las Toninas, I/2013, S. A. Konopko coll., 9 eggs; *T. fuscata*: Buenos Aires Province, General Pueyrredón, Arroyo Chapadmalal, 21/I/1989, J. L. Farina coll., 8 eggs; *T. mendozana*: Buenos Aires Province, Salinas Chicas, at the road-side to Laguna Chasicó, IV/2010, S. A. Konopko coll., 8 eggs; *E. quadrata*: Chubut Province, Arroyo Pescado, XII/2006, M. Archangelsky coll., 9 eggs; and *S. santiagiensis*: Chubut Province, Arroyo Nant and Fall, path to Corcovado, 05/II/2004, M. Archangelsky coll., 8 eggs.

Rearing in aquarium. The adults collected in the field were reared in the laboratory in a glass aquarium (15 cm in diameter, 20 cm high), filled with 10 cm dechlorinated tap water. Aquatic plants (*Elodea*) were added as support and sites for oviposition. Detritus, algae, cladocerans, and larvae of Chironomidae were supplied as food. Water was changed every 3–4 days. The rearing was made at room temperature (18–24ºC). The oviposited eggs were fixed and preserved in 70% ethyl alcohol. The oviposited eggs were not exposed to the ultrasonic cleaner, they were directly transferred to lactic acid for 1–2 days, as they were fairly clean and without the tissue from the reproductive tract, and then they were washed in 70% ethyl alcohol.

Dissected eggs. For the species that we did not have live specimens, eggs were dissected from females fixed and preserved in 70% ethyl alcohol. The females which abdomen in ventral view showed by transparency the presence of eggs in theirs oviducts, were selected. The dissection of the ventral side up females were made using a hooked needle which was inserted into the membrane of the lateral margin of the last abdominal segments, separating the sternum and laterotergites from the tergum, exposing the abdominal cavity. Only the eggs near the end of the reproductive tract, which were considered to be well-developed, were used. The dissected eggs were carefully removed from the abdomen and kept in 70% ethyl alcohol. Dissected eggs often had tissue from the reproductive tract glued to them. To remove this tissue, the eggs were rinsed with an ultrasonic cleaner for 1–3 minutes, submerged in a mixture of 70 % ethyl alcohol, 20 % ethyl acetate, and 10 % benzene. Subsequently, the eggs were examined under a microscope and any remaining tissue was carefully removed. Finally, they were transferred to 70% ethyl alcohol and rinsed again with the ultrasonic cleaner for 1–2 minutes.

Critical point drying and SEM. To prepare eggs for critical point drying, both dissected and oviposited eggs in 70% ethyl alcohol were dehydrated in microporous capsules through a graded alcohol series to 100% ethyl alcohol. The eggs were placed in ethyl acetate and were critical point dried. The eggs were mounted on a metallic holder, sputter-coated with Au-Pd alloy, examined and photographed using a Philips XL30 TMP scanning electron microscopy from the Museo Argentino de Ciencias Naturales "Bernardino Rivadavia".

Taxonomic descriptions. The taxonomic descriptions of the eggs were performed using a scanning electron microscopy (Philips XL30 TMP, at magnifications up to 2000X), used for the first time to describe the eggs of Corixoidea, an optical microscope (Olympus CX31, at magnifications up to 400X) and a stereomicroscope (Leitz, at magnifications up to 144X). Some eggs were mounted on standard glass slides with polyvinyl-lacto-glycerol. Observations and further examination for the resolution of the chorionic surface were made using scanning electron and optical microscopes.

Morphometric analysis. The following measurements were taken on the alcohol-preserved material, utilizing a Leitz stereomicroscope equipped with a micrometric ocular: egg length (EL); egg width (EW); micropyle length (ML); and stalk length (SL). The eggs of the following species were measured: *S. platensis* and *S. rubyae* (5 eggs each); *H. brasiliensis* (8 eggs); and *E. quechua*, *S. denseconscripta*, and *S. yala* (10 eggs each). Measurements are given in millimetres (Tables 1–2).

Key. The key allows to identify the eggs of the 16 species of Corixoidea from Argentina described up to the moment. The eggs must be identified by optical and also scanning electron microscopes. The micropylar area and the chorionic surface must be studied by scanning electron microscopy.

Results

Ectemnostega (Ectemnostega) quadrata
(Fig. 1)

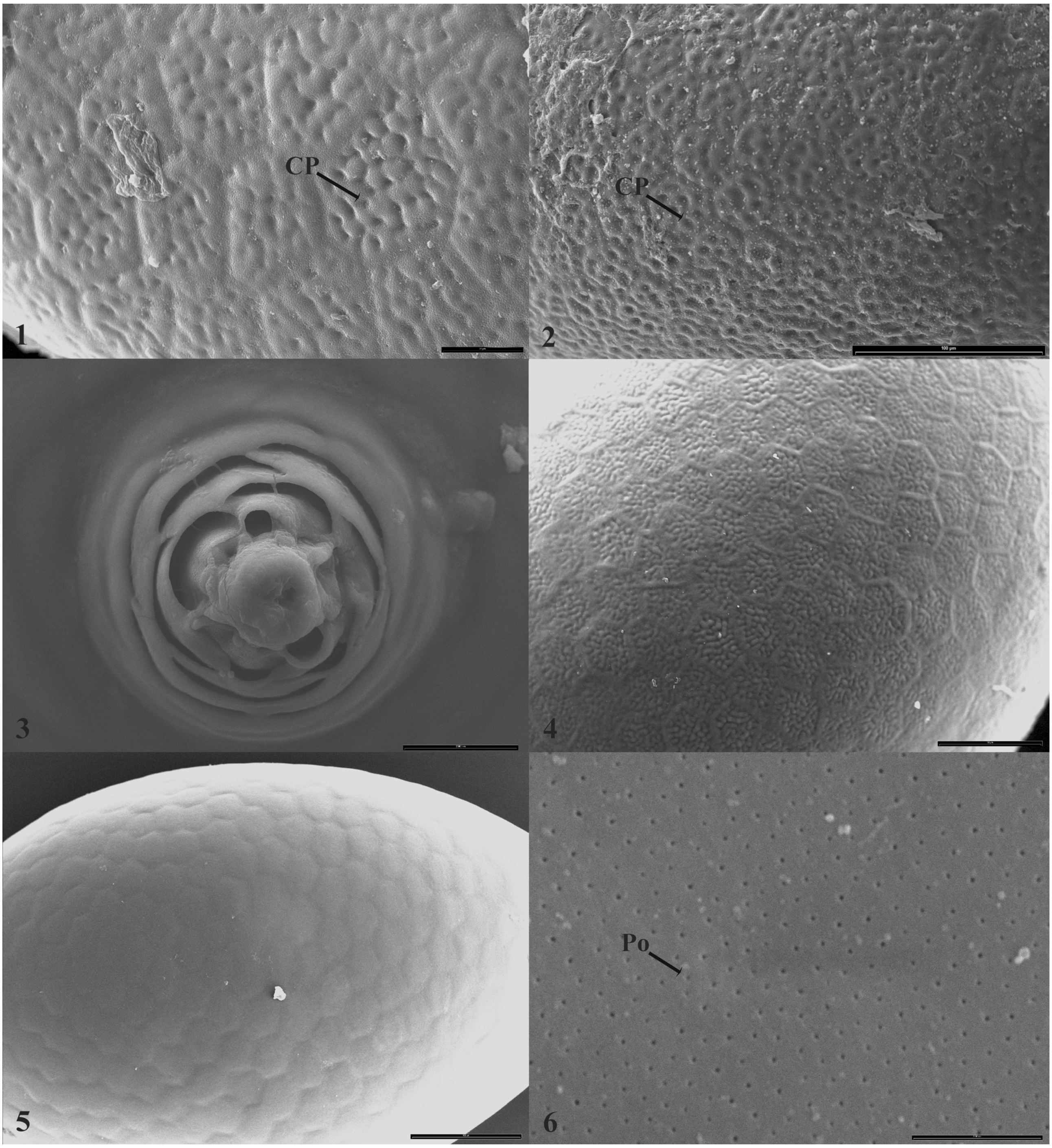
Chorionic surface densely and finely pored, with polygonal units delimited by clearly distinguishable edges not raised from the surface. Within each unit there are coarse punctures. A nipple structure occurs on the anterior micropylar area.

Ectemnostega (Ectemnostegella) quechua
(Fig. 2)

Chorionic surface with polygonal units delimited by clearly distinguishable edges not raised from the surface. Within each unit there are coarse punctures of similar shape, size and regular distribution; fine pores not distinguishable. A nipple structure occurs on the anterior micropylar area.

Trichocorixa mendozana
(Figs. 3–4)

Chorionic surface with polygonal units delimited by clearly distinguishable edges raised from the surface (Fig. 4). Within each unit there are numerous small equidistant protuberances (Fig. 4); fine pores not distinguishable. A nipple structure occurs on the anterior micropylar area, and is surrounded by a lamellated zone with a circular design (Fig. 3).



FIGURES 1–6. 1–2, Chorionic surface: **1,** *Ectemnostega (Ectemnostega) quadrata*; **2,** *Ectemnostega (Ectemnostegella) quechua*. **3–4,** *Trichocorixa mendozana*: **3,** micropyle; **4,** chorionic surface. **5–6,** *Centrocorisa kollari*: **5,** chorionic surface; **6,** detail of fine pores. CP: coarse puncture; Po: pore. Scale bars: Fig. 1 = 20 µm, Figs. 2, 5= 100 µm, Fig. 3= 20000 nm, Fig. 4= 50 µm, Fig. 6= 2000 nm.

Centrocorisa kollari
(Figs. 5–6)

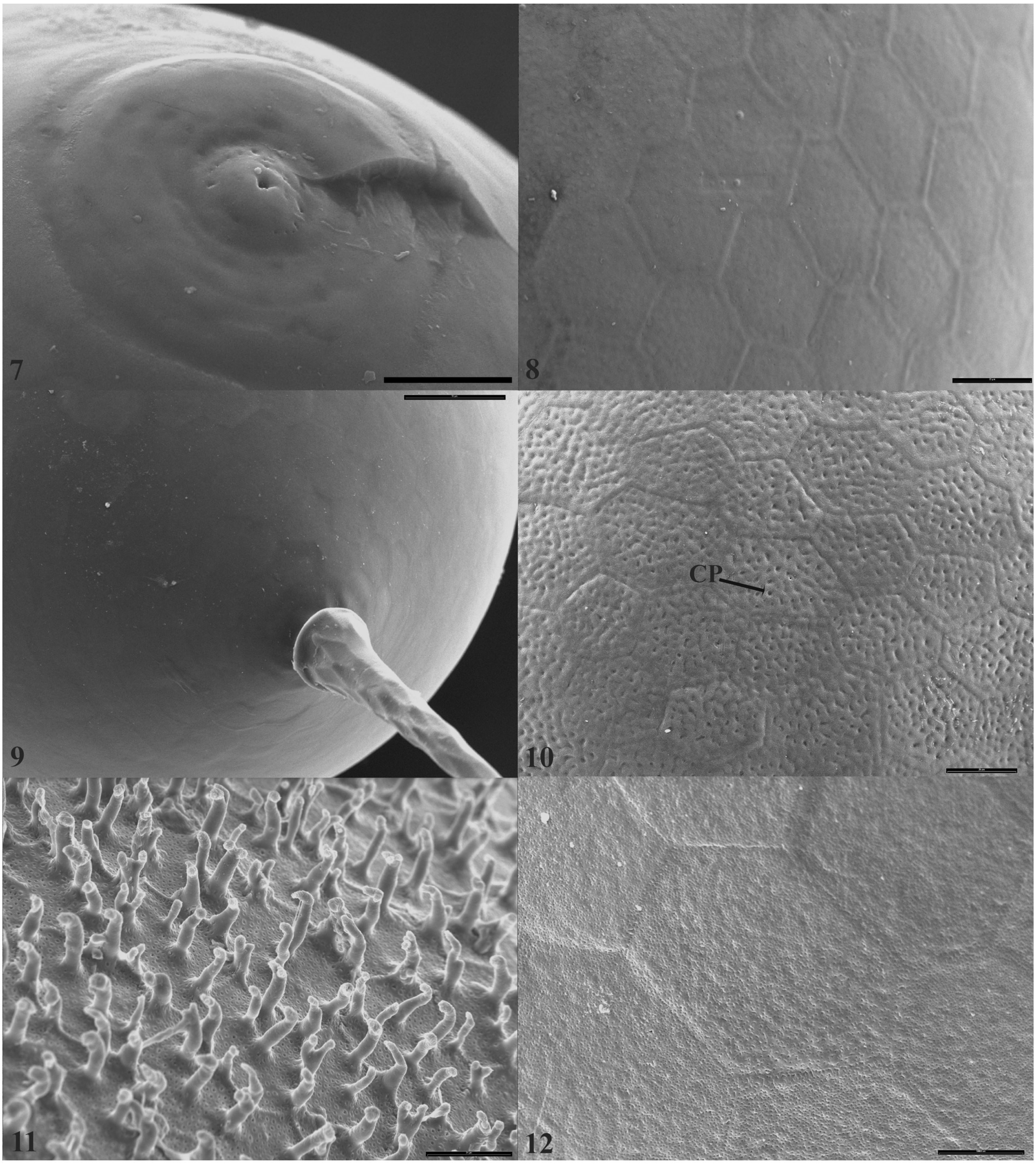
Chorionic surface densely and finely pored (Fig. 6), with polygonal units delimited by clearly distinguishable edges not raised from the surface (Fig. 5). A nipple structure occurs on the anterior micropylar area.

Additional data. Shape oval; color yellow; flattened at one side, with a very short stalk.

Heterocorixa brasiliensis
(Figs. 7–9)

Chorionic surface with smooth polygonal units, delimited by clearly distinguishable raised edges (Fig. 8); fine pores not distinguishable. The polygonal units are also present in the transitional zone to the stalk (Fig. 9). There is no nipple structure on the anterior micropylar flat area (Fig. 7).

Additional data. Shape elongate, oval; color yellow; flattened at one side, with a very long stalk (Fig. 9).



FIGURES 7–12. 7–9, *Heterocorixa brasiliensis*: **7,** micropyle; **8,** chorionic surface; **9,** base of the stalk. **10–12,** chorionic surface: **10,** *Sigara (Aphelosigara) tucma*; **11,** *Sigara (Tropocorixa) denseconscripta*; **12,** *Sigara (Tropocorixa) platensis.* CP: coarse puncture. Scale bars: Figs. 7, 9= 50 µm, Figs. 8, 10, 11= 20 µm, Fig. 12= 10000 nm.

Sigara (Aphelosigara) tucma
(Fig. 10)

Chorionic surface densely and finely pored, with polygonal units delimited by clearly distinguishable edges not raised from the surface. Within each unit there are coarse punctures of different shape, size and irregular distribution. A nipple structure occurs on the anterior micropylar area.

Sigara (Tropocorixa) denseconscripta
(Fig. 11)

Chorionic surface densely and finely pored, with tubular projections with (usually 2) or without apical ramifications, delimiting small areas (polygonal units?). Within each area it presents 1–3 of these projections. A nipple structure occurs on the anterior micropylar area.

Additional data. Shape oval; color yellow; flattened at one side, with a very short stalk.

Sigara (Tropocorixa) platensis
(Fig. 12)

Chorionic surface densely and finely pored, with polygonal units delimited by clearly distinguishable edges not raised from the surface. A nipple structure occurs on the anterior micropylar area.

Additional data. Shape oval; color yellow; flattened at one side, with a very short stalk.

Sigara (Tropocorixa) rubyae
(Fig. 13)

Chorionic surface densely and finely pored, with polygonal units delimited by clearly distinguishable edges not raised from the surface. A nipple structure occurs on the anterior micropylar area.

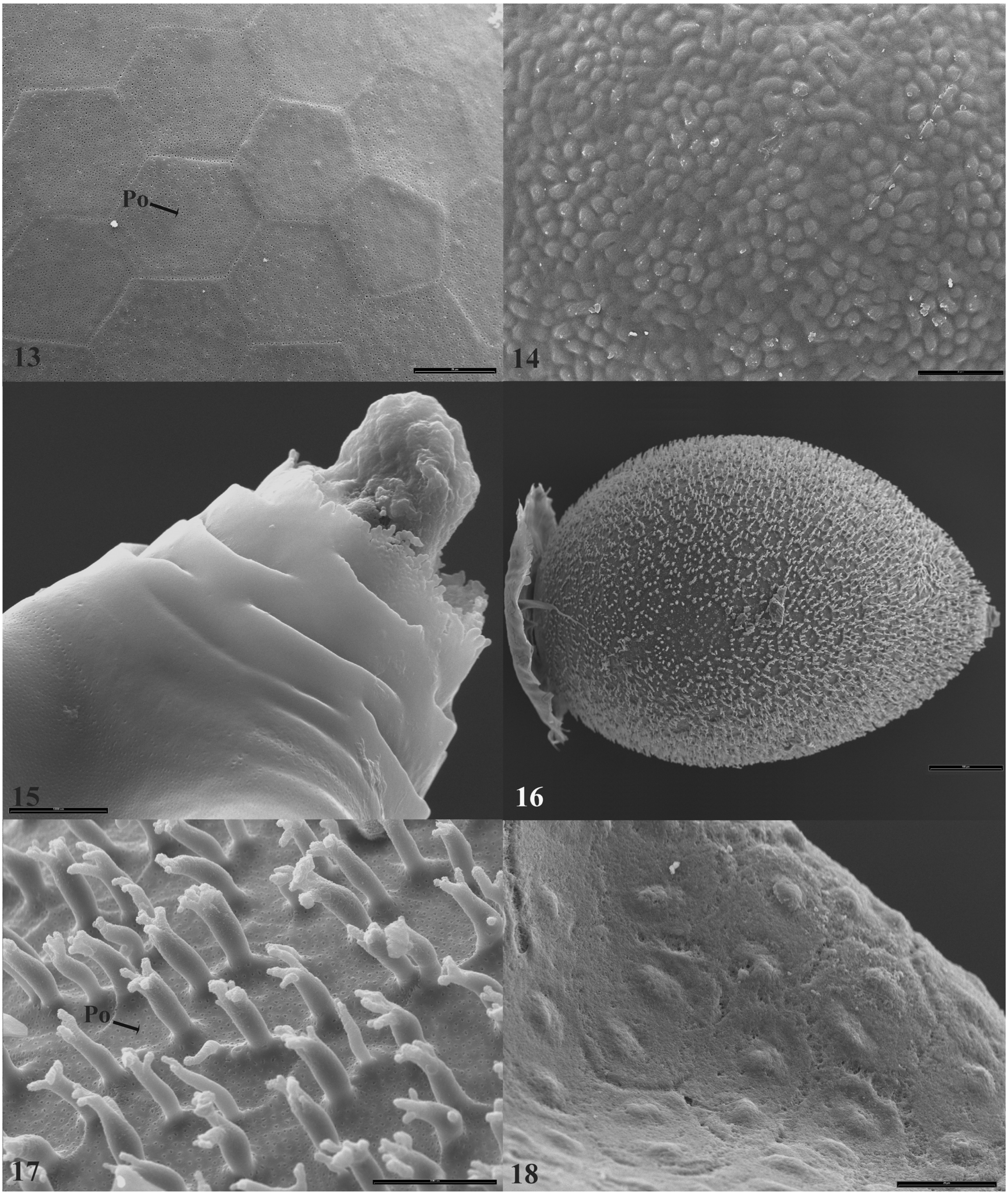
Additional data. Shape oval; color yellow; flattened at one side, with a very short stalk.

Sigara (Tropocorixa) santiagiensis
(Figs. 14–15)

Chorionic surface densely and finely pored, with polygonal units delimited by slightly distinguishable edges not raised from the surface (Fig. 14). Within each unit there are numerous small equidistant protuberances (Fig. 14). A nipple structure occurs on the anterior micropylar area, surrounded by a lamellated zone with a circular design (Fig. 15).

Sigara (Tropocorixa) schadei
(Figs. 16–17)

Chorionic surface densely and finely pored, with tubular projections with apical ramifications (usually more than 2), delimiting small areas (polygonal units?) (Figs. 16–17). Within each area it presents 1–3 of these projections. A nipple structure occurs on the anterior micropylar area (Fig. 16).

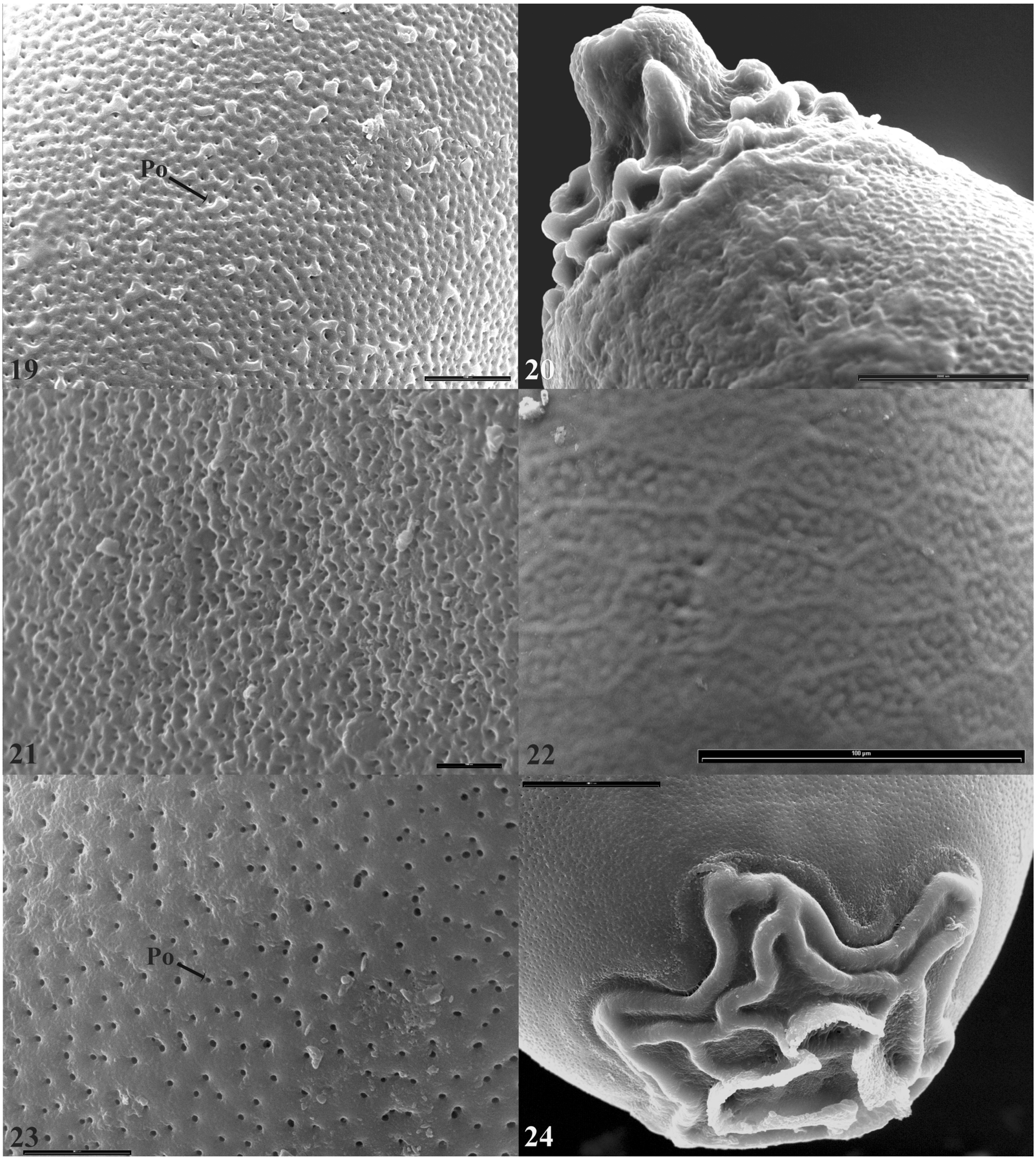


FIGURES 13–18. 13–14, Chorionic surface: **13,** *Sigara (Tropocorixa) rubyae*; **14,** *Sigara (Tropocorixa) santiagiensis*. **15,** *Sigara (Tropocorixa) santiagiensis*, micropyle. **16–17,** *Sigara (Tropocorixa) schadei*: **16,** general view of the egg; **17,** chorionic surface. **18,** *Sigara (Tropocorixa) yala*, chorionic surface. Po: pore. Scale bars: Figs. 13–14, 18= 20 µm, Fig. 15= 10000 nm, Fig. 16= 100 µm, Fig. 17= 20000 nm.

Sigara (Tropocorixa) yala
(Fig. 18)

Chorionic surface with polygonal units delimited by slightly distinguishable edges not raised from the surface. Within each unit there are two oval protuberances; fine pores not distinguishable. A nipple structure occurs on the anterior micropylar area.

Additional data. Shape oval; color yellow; flattened at one side, with a very short stalk.



FIGURES 19–24. 19–20, *Tenagobia (Incertagobia) incerta*: **19,** chorionic surface; **20,** micropyle. **21–22,** chorionic surface: **21,** *Tenagobia (Fuscagobia) fuscata*; **22,** *Tenagobia (Schadeogobia) schadei*. **23–24,** *Tenagobia (Tenagobia) pulchra*: **23,** chorionic surface; **24,** micropyle. Po: pore. Scale bars: Fig. 19= 10000 nm, Figs. 20, 24= 20000 nm, Fig. 21= 2000 nm, Fig. 22= 100 µm, Fig. 23= 5000 nm.

Tenagobia (Incertagobia) incerta
(Figs. 19–20)

Chorionic surface densely and finely pored, without distinguishable polygonal units, with thickenings of irregular distribution (Fig. 19). A nipple structure occurs on the anterior micropylar area, surrounded by vaguely defined projections with a circular design (Fig. 20).

Tenagobia (Fuscagobia) fuscata
(Fig. 21)

Chorionic surface densely and finely pored, without distinguishable polygonal units, with thickenings over all its surface. A nipple structure occurs on the anterior micropylar area.

Tenagobia (Schadeogobia) schadei
(Fig. 22)

Chorionic surface with polygonal units delimited by clearly distinguishable raised edges. Within each unit there are numerous small equidistant protuberances; fine pores not distinguishable. There is no nipple structure on the anterior micropylar flat area.

Tenagobia (Tenagobia) pulchra
(Figs. 23–24)

Chorionic surface densely and finely pored, without distinguishable polygonal units (Fig. 23). An elaborate, sinuous, rosette-like structure occurs on the anterior micropylar area (Fig. 24).

Key to the eggs of the Argentinian species of Corixoidea

1 Long stalk 2
- Short stalk 4
2 Micropylar area with a nipple structure. Chorionic surface without distinguishable polygonal units (Fig. 21). . . . . *Tenagobia (Fuscagobia) fuscata*
- Micropylar area flat (Fig. 7). Chorionic surface with polygonal units clearly distinguishable (Figs. 8, 22) 3
3 Polygonal units without protuberances (Fig. 8) . . . . *Heterocorixa brasiliensis*
- Polygonal units with protuberances (Fig. 22) . . . . *Tenagobia (Schadeogobia) schadei*
4 Micropylar area with an elaborate, sinuous, rosette-like structure (Fig. 24) . . . . *Tenagobia (Tenagobia) pulchra*
- Micropylar area with a nipple structure (Fig. 15) 5
5 Chorionic surface with protuberances (Figs. 4, 11, 14, 17–18, 22) 6
- Chorionic surface without protuberances (Figs. 2, 6, 10, 12–13) 10
6 Chorionic surface with tubular projections (Figs. 11, 17) 7
- Chorionic surface not as above 8
7 Chorionic tubular projections with apical ramifications (usually more than two) (Fig. 17). . . . . . *Sigara (Tropocorixa) schadei*
- Chorionic tubular projections without apical ramifications (if present, usually two) (Fig. 11) . . . . *Sigara (Tropocorixa) denseconscripta*
8 Polygonal units with 2 protuberances only (Fig. 18) . . . . *Sigara (Tropocorixa) yala*
- Polygonal units with numerous protuberances (Figs. 4, 14) 9
9 Polygonal units delimited by slightly distinguishable edges not raised from the surface (Fig. 14) . . . . *Sigara (Tropocorixa) santiagiensis*
- Polygonal units delimited by clearly distinguishable edges raised from the surface (Fig. 4) . . . . *Trichocorixa mendozana*
10 Polygonal units with coarse punctures (Figs. 1, 2, 10) 11
- Polygonal units without coarse punctures (Figs. 6, 12–13, 19) 13
11 Egg length ≤ 0.70 mm . . . . *Sigara (Aphelosigara) tucma*
- Egg length > 0.70 mm 12

12 Polygonal units homogeneous in shape, with few coarse punctures of similar shape and size (Fig. 2) .... *Ectemnostega (Ectemnostegella) quechua*

\- Polygonal units heterogeneous in shape, with many coarse punctures of different shape and size (Fig. 1) .... *Ectemnostega (Ectemnostega) quadrata*

13 Egg length > 0.70 mm .... *Centrocorisa kollari*

\- Egg length ≤ 0.70 mm 14

14 Chorionic surface without distinguishable polygonal units (Fig. 19) .... *Tenagobia (Incertagobia) incerta*

\- Chorionic surface with polygonal units clearly distinguishable (Figs. 12–13) 15

15 Egg length > 0.50 mm .... *Sigara (Tropocorixa) rubyae*

\- Egg length ≤ 0.50 mm .... *Sigara (Tropocorixa) platensis*

TABLE 1. Measurements (in mm), ratios, and stalk lengths of the eggs of genera of Corixoidea. A: absent; D: dissected eggs; L: long; ND: no data available; O: oviposited eggs; S: short. See *Material and Methods* for additional abbreviations.

Genera (species)	Information source	EL	EW	ML	SL	EL/EW	Stalk
Diaprepocoridae							
Diaprepocoris (*D. zealandiae*)	Cobben 1968	0.95	0.34	ND	ND	2.80	A
Micronectidae							
Micronecta (*M. browni, M. meridionalis, M. poweri, M. quadristrigata, M. scholtzi, M. scutellaris*)	Poisson 1933, 1938, 1957; Hungerford 1948b; Wróblewski 1958; Fernando & Leong 1963; Cobben 1968	0.37–0.51	0.14–0.23	0.02–0.03	ND	2.13–3.36	A
Tenagobia (*Fuscagobia*) (*T. fuscata, T. selecta*)	Hungerford 1948a; Bachmann 1979, 1981	0.50	0.22–0.32	0.02–0.04	0.35–0.36	1.56–2.27	L
T. (Incertagobia) (*T. incerta*)	Cobben 1968; Bachmann 1979, 1981; Konopko *et al.* 2010a	0.38–0.48	0.21–0.23	0.02–0.04	0.01–0.03	1.67–2.29	S
T. (Tenagobia) (T. pulchra)	Bachmann 1983	0.30	0.13	0.02	0.06	2.31	S
T. (Schadeogobia) (T. schadei)	Konopko *et al* 2010a	0.44	0.20	0.01	0.28	2.20	L
Corixidae							
Agraptocorixa (*A. eurynome, A. gestroi, A. hyalipennis*)	Hale 1922; Hungerford 1948b; Walton 1962; Fernando & Leong 1963; Fernando 1965; Cobben 1968	0.84–1.00	0.60–0.77	0.04–0.06	1.03–1.62	1.25–1.40	L
Arctocorixa (A. alternata, A. lawsoni)	Hungerford 1919, 1948a	0.37–0.92	0.37–0.65	0.09	0.04	0.99–1.42	S
Callicorixa (C. noorvikensis)	Hungerford 1948a	0.88	0.58	0.06	0.07	1.52	S
Cenocorixa (C. bifida, C. expleta)	Hungerford 1948a; Scudder 1966	0.78–0.89	0.50–0.57	0.07	0.03	1.78	S
Centrocorisa (*C. kollari*)	Hungerford 1948a	0.98	0.68	0.04	0.07	1.44	S

......*continued on the next page*

TABLE 1. (Continued)

Genera (species)	Information source	EL	EW	ML	SL	EL/EW	Stalk
Corisella (*C. decolor, C. edulis, C. mercenaria*)	Howard 1901 (in Heidemann 1911); Hungerford 1948a	0.74–1.27	0.43–0.72	0.07–0.12	0.07	1.72–1.76	S
Corixa (*C. geoffroyi, C. panzeri, C. punctata*)	Poisson 1933; Cobben 1968	ND	ND	ND	ND	ND	S
Cymatia (*C. americana, C. apparens, C. bonsdorffi, C. coleoptrata*)	Hungerford 1923, 1948a, b; Poisson 1933; Hutchinson 1940; Cobben 1968	0.52–1.41	0.41–0.60	0.03	0.60–0.90	1.27–2.35	L
Dasycorixa (*D. rawsoni*)	Hungerford 1948a	1.15	0.84	0.12	0.10	1.37	S
Ectemnostega (*Ectemnostega*) (*E. quadrata*)	Konopko 2013a	0.84–0.99	0.55–0.64	0.05–0.06	0.03–0.04	1.35–1.55	S
Ectemnostega (*Ectemnostegella*) (*E. montana, E. peruana, E. quechua, E. stridulata*)	Hungerford 1948a; Konopko & Melo 2009; Konopko *et al* 2010b; Konopko & Mazzucconi 2011; this work	0.79–1.22	0.47–0.78	0.05–0.25	0.06–0.24	1.27–2.10	S
Graptocorixa (*G. abdominalis, G. melanogaster, G. serrulata*)	Hungerford 1948a	0.69–1.30	0.49–0.98	0.06–0.12	0.03–0.04	1.33–1.50	S
Hesperocorixa (*H. linnei, H.mandshurica*)	Hungerford 1948a; Cobben 1968	0.73–1.05	0.60–0.71	0.03–0.06	0.05–0.07	1.22–1.48	S
Heterocorixa (*H. brasiliensis, H. chapadiensis, H. hesperia venezuelana*)	Hungerford 1948a; this work	0.50–0.69	0.45–0.56	0.01–0.03	0.70–0.80	1.11–1.50	L
Krizousacorixa (*K. azteca, K. femorata*)	Hungerford 1948a, b; Peters & Spurgeon 1971	0.26–0.86	0.36–0.71	0.06	0.03–0.09	1.63–2.39	S
Neosigara (*N. aristera, N. columbiensis, N. murilloi, N. sterea*)	Padilla Gil & Nieser 1994	D: 0.46–0.51 (O: 0.53–0.62)	D: 0.34–0.50 (O: 0.43–0.50)	0.06–0.08	0.04	1.13–1.28	S
Orocorixa (*O. makrocheira*)	Padilla Gil & Nieser 1994	D: 0.60–0.80 (O: 0.83)	D: 0.48–0.60 (O: 0.65)	0.15	0.08	1.28	S
Palmacorixa (*P. buenoi, P. gillettei*)	Hungerford 1919, 1948a	0.55–0.72	0.33–0.49	0.03–0.07	0.04	1.47–1.68	S

......*continued on the next page*

TABLE 1. (Continued)

Genera (species)	Information source	EL	EW	ML	SL	EL/EW	Stalk
Pseudocorixa (*P. beameri*)	Hungerford 1948a	1.01	0.68	0.10	0.09	1.49	S
Ramphocorixa (*R. acuminata*)	Abbott 1912; Hungerford 1917, 1919, 1923, 1948b; Poisson 1933; Griffith 1945	0.58–0.90	0.35–0.52	0.05	0.12	1.12–2.57	S
Sigara (Allosigara) (S. alternata, S. decorata)	Hungerford 1948a, b	0.55–0.96	0.35–0.86	0.04–0.07	0.04–0.07	1.12–1.57	S
Sigara (Aphelosigara) (*S. tucma*)	Bachmann 1981; Konopko *In press*	0.58–0.64	0.46–0.54	0.02–0.04	0.04–0.05	1.16–1.40	S
Sigara (*Phaeosigara*) (*S. paludata*)	Hungerford 1948a	0.65	0.50	0.01	0.03	1.30	S
Sigara (Sigara) (S. stagnalis, S. striata)	Poisson 1933, 1957; Hungerford 1948b	ND	ND	ND	ND	ND	S
Sigara (Subsigara) (*S.distincta*)	Hungerford 1948a	0.68	0.60	0.01	0.03	1.13	S
Sigara (Tropocorixa) (S. denseconscripta, S. irrorata, S. meridionalis, S. platensis, S. rubyae, S. santiagiensis, S. schadei, S. yala)	Hungerford 1948a; Konopko 2012, 2013b; this work	0.44–0.86	0.31–0.72	0.02–0.13	0.03–0.10	1.16–1.66	S
Sigara (Vermicorixa) (S. alternata)	Hungerford 1948a, b	0.55	0.35	0.04	0.04	1.57	S
Stenocorixa (S. protrusa)	Hungerford 1948a	1.15	0.58	0.03	0.09	1.98	S
Trichocorixa (T. kanza, T. mendozana, T. naias, T. sexcincta)	Hungerford 1948a; Sailer 1948; Davis 1965; Konopko *et al* 2011	0.50–0.74	0.36–0.44	0.03–0.04	0.03–0.05	1.19–1.80	S
Tropocorixa (T. pruthiana)	Fernando 1965	ND	ND	ND	ND	ND	S
Xenocorixa (*X. vittipennis*)	Hungerford 1948a	1.01	0.49	0.04	0.04	2.06	S

TABLE 2. Measurements (in mm), ratios, and stalk lengths of the eggs of the species of Corixoidea present in Argentina. L: long; S: short. See *Material and Methods* for additional abbreviations.

	Information source	EL	EW	ML	SL	EL/EW	Stalk length
Micronectidae							
Tenagobia (*Fuscagobia*) *fuscata*	Bachmann 1979, 1981	0.50	0.22	0.02	0.35	2.27	L
Tenagobia (*Incertagobia*) *incerta*	Cobben 1968; Bachmann 1979, 1981; Konopko *et al.* 2010a	0.38–0.48	0.21–0.23	0.02–0.04	0.01–0.03	1.67–2.29	S
Tenagobia (*Tenagobia*) *pulchra*	Bachmann 1983	0.30	0.13	0.02	0.06	2.31	S
Tenagobia (*Schadeogobia*) *schadei*	Konopko *et al* 2010a	0.44	0.20	0.01	0.28	2.20	L
Corixidae							
Centrocorisa kollari	Hungerford 1948a	0.98	0.68	0.04	0.07	1.44	S
Ectemnostega (Ectemnostega) quadrata	Konopko 2013a	0.84–0.99	0.55–0.64	0.05–0.06	0.03–0.04	1.35–1.55	S
Ectemnostega (Ectemnostegella) montana	Konopko & Melo 2009	0.93–1.03	0.73–0.78	0.25	0.24	1.27–1.34	S
Ectemnostega (Ectemnostegella) quechua	Konopko & Mazzucconi 2011; this work	0.81–0.88	0.54–0.59	0.05	0.08	1.44–1.59	S
Ectemnostega (Ectemnostegella) stridulata	Konopko *et al* 2010b	0.79–0.87	0.47–0.57	0.07	0.06	1.43–1.75	S
Heterocorixa brasiliensis	This work	0.50–0.55	0.45	0.03	0.70–0.80	1.11–1.22	L
Sigara (Aphelosigara) tucma	Konopko *In press*	0.58–0.64	0.46–0.54	0.02–0.04	0.04–0.05	1.16–1.40	S
Sigara (Tropocorixa) denseconscripta	This work	0.45–0.50	0.40–0.45	0.05	0.10	1.39–1.51	S
Sigara (Tropocorixa) platensis	This work	0.44–0.50	0.31–0.38	0.13	0.06	1.16–1.42	S
Sigara (Tropocorixa) rubyae	This work	0.55–0.63	0.38–0.44	0.13	0.06	1.25–1.66	S
Sigara (Tropocorixa) santiagiensis	Konopko 2013b	0.71–0.77	0.50–0.57	0.02–0.03	0.03–0.04	1.31–1.47	S
Sigara (Tropocorixa) schadei	Konopko 2012	0.72–0.77	0.57–0.62	0.05–0.06	0.07–0.08	1.18–1.29	S
Sigara (Tropocorixa) yala	This work	0.51–0.59	0.40–0.45	0.03–0.04	0.05–0.06	1.29–1.35	S
Trichocorixa mendozana	Konopko *et al* 2011	0.62–0.74	0.37–0.42	0.03–0.04	0.05	1.47–1.80	S

Discussion

Regarding the way of attachment to the substrate, there are three types of eggs in Corixoidea (Table 1): those without a stalk as in the eggs of the genera *Diaprepocoris* and *Micronecta*; with a short basal stalk as in the eggs of the genera *Arctocorisa, Callicorixa, Cenocorixa, Centrocorisa, Corisella, Corixa, Dasycorixa, Ectemnostega, Graptocorixa, Hesperocorixa, Krizousacorixa, Neosigara, Orocorixa, Palmacorixa, Pseudocorixa, Ramphocorixa, Sigara, Stenocorixa, Tenagobia* (subgenera *Incertagobia* Nieser and *Tenagobia* Bergroth), *Trichocorixa, Tropocorixa* and *Xenocorixa*; and with a very long stalk as in the eggs of the genera *Agraptocorixa, Cymatia, Heterocorixa* and *Tenagobia* (subgenera *Fuscagobia* Nieser and *Schadeogobia* Nieser) (Hungerford 1917, 1919, 1923, 1948a,b; Hale 1922; Poisson 1923, 1933, 1938, 1957; Hutchinson 1940; Griffith 1945; Sailer 1948; Walton 1962; Fernando & Leong 1963; Davis 1965; Fernando 1965; Scudder 1966; Cobben 1968; Peters & Spurgeon 1971; Bachmann 1979, 1981, 1983; Padilla Gil & Nieser 1994; Konopko & Melo 2009; Konopko *et al.* 2010a,b, 2011; Konopko & Mazzucconi 2011; Konopko 2012, 2013a, b, *In press*). There are three types of micropylar areas in Corixoidea, based on the material herein studied and additional data present in the literature: one flat as in the eggs of the genera *Cymatia* (Cobben 1968), *Heterocorixa* and *Tenagobia* (subgenus *Schadeogobia*); with a nipple structure, as in the eggs of the genera *Agraptocorixa* (Hale 1922; Walton 1962), *Centrocorisa, Corisella* (Howard 1901 en Heidemann 1911), *Corixa* (Cobben 1968), *Cymatia* (Hungerford 1923), *Ectemnostega, Sigara, Trichocorixa* and *Tenagobia* (subgenera *Fuscagobia* and *Incertagobia*); and with an elaborate, sinuous, rosette-like structure, as in the eggs of the genus *Tenagobia* (subgenus *Tenagobia*).

In *Tenagobia* the presence of a micropylar area with an elaborate, sinuous, rosette-like structure (Fig. 24) or a chorion with thickenings (Figs. 19, 21) or a micropylar area flat together with chorion with protuberances (Fig. 22), distinguish the eggs of *Tenagobia* from those of the genera of Corixidae present in Argentina. The following combination of characters distinguish the eggs of the subgenera of *Tenagobia* from each other: short stalk, micropylar area with a nipple structure, chorion without distinguishable polygonal units, without coarse punctures, and with thickenings, in *T. (Incertagobia)* (Figs. 19–20); long stalk, micropylar area with a nipple structure, chorion without distinguishable polygonal units, without coarse punctures, and with thickenings, in *T. (Fuscagobia)* (Fig. 21); long stalk, micropylar area flat, chorion with distinguishable polygonal units, without coarse punctures, and with protuberances, in *T. (Schadeogobia)* (Fig. 22); and short stalk, micropylar area with an elaborate, sinuous, rosette-like structure, chorion smooth (without distinguishable polygonal units, coarse punctures, protuberances and thickenings), in *T. (Tenagobia)* (Figs. 23–24). The absence of sculpturing in the eggs of *T. selecta* (Hungerford) mentioned by Hungerford (1948a) needs confirmation using scanning electron microscopy. The attachment system of the eggs distinguishes groups of species and subgenera (Table 1): *T. (Incertagobia) incerta* and *T. (Tenagobia) pulchra*, with short stalk, and *T. (Fuscagobia) fuscata*, *T. (F.) selecta* and *T. (Schadeogobia) schadei*, with long stalk. The size of the eggs distinguishes the species with short stalk (see Table 2), and the length/width ratio together with the stalk length distinguish those with long stalk (see Table 2; *Tenagobia selecta*, in Hungerford 1948a: EL/EW, 1.56; SL, 0.36 mm).

In *Heterocorixa* the following combination of characters distinguish the eggs of this genus from those of the remaining genera of Corixoidea present in Argentina: long stalk, micropylar area flat and smooth polygonal units (without coarse punctures, protuberances or thickenings) (Figs. 7–8). The absence of sculpturing in the eggs of *H. chapadiensis* Hungerford and *H. hesperia venezuelana* Hungerford mentioned by Hungerford (1948a) needs confirmation using scanning electron microscopy. The length together with the width of the eggs distinguish *H. brasiliensis* (in Table 2: EL, 0.50–0.55 mm; EW, 0.45 mm), *H. chapadiensis* (in Hungerford 1948a: EL, 0.69 mm; EW: 0.46 mm) and *H. hesperia venezuelana* (in Hungerford 1948a: EL, 0.62 mm; EW, 0.56 mm).

In *Ectemnostega* the following combination of characters distinguish the eggs of this genus from those of the remaining genera of Corixoidea present in Argentina: micropylar area with a nipple structure, chorion with distinguishable polygonal units, with coarse punctures, and without protuberances and thickenings (Figs. 1–2). The shape of the polygonal units and the pattern of the coarse punctures distinguish the subgenenus *Ectemnostega* (Fig. 1) from the subgenus *Ectemnostegella* (Fig. 2). The absence of sculpturing in the eggs of *E. peruana* (Jaczewski) mentioned by Hungerford (1948a) needs confirmation using scanning electron microscopy. The length/width ratio of the eggs distinguishes *E. peruana* (EL/EW, 2.10, in Hungerford 1948a) from *E. quadrata, E. montana*, *E. quechua* and *E. stridulata* (see Table 2), and the width of the eggs distinguishes *E. montana* from *E. quadrata, E. quechua* and *E. stridulata* (see Table 2).

In *Trichocorixa* the following combination of characters distinguishes the eggs of this genus from those of the remaining genera of Corixoidea present in Argentina: micropylar area with a nipple structure, chorion with distinguishable polygonal units, without coarse punctures, and with protuberances (Figs. 3–4). The eggs of *T. mendozana* and *T. kanza* Sailer (Sailer 1948; Konopko *et al.* 2011) share the presence of a surface ornamented by polygonal units. The absence of sculpturing in the egg of *T. sexcincta* (Champion) mentioned by Hungerford (1948a) needs confirmation using scanning electron microscopy. The length together with the length/width ratio of the eggs distinguish *T. kanza* (EL, 0.50 mm; EL/EW, 1.41), *T. mendozana* (EL, 0.62–0.74 mm; EL/EW, 1.47–1.80), *T. naias* (Kirkaldy & Torre-Bueno) (EL, 0.58 mm; EL/EW, 1.32) and *T. sexcincta* (EL, 0.50 mm; EL/EW, 1.19) (Hungerford 1948a; Sailer 1948; Davis 1965; Konopko *et al.* 2011).

In *Centrocorisa*, the presence of smooth polygonal units (without coarse punctures, protuberances and thickenings) together with the micropylar area with a nipple structure (Figs. 5–6) distinguishes the eggs of this genus from those of the remaining genera of Corixoidea present in Argentina. According to Hungerdord (1948a) the eggs of *C. kollari* are not sculptured. Our study using scanning electron microscopy shows the presence of sculptures in this species.

The sculpturing of the chorion in *Sigara* does not have a uniform pattern; the short stalk and the micropylar area with a nipple structure are the only characteristics present in all the studied species. The following characteristics distinguish groups of species of *Sigara* from each other: chorion with coarse punctures, in *S. (Aphelosigara) tucma* (Fig. 10), characteristic shared with the genus *Ectemnostega* (Figs. 1–2); chorion with tubular projections, in *S. (Tropocorixa) denseconscripta* (Fig. 11) and *S. (T.) schadei* (Fig. 17); chorion with polygonal units smooth (without coarse punctures, protuberances and thickenings), in *S. (T.) platensis* (Fig. 12) and *S. (T.) rubyae* (Fig. 13), characteristic shared with the genus *Centrocorisa* (Fig. 6) and *Heterocorixa* (Fig. 8); and chorion with protuberances different from above, in *S. (T.) santiagiensis* (Fig. 14) and *S. (T.) yala* (Fig. 18), characteristic shared with the genus *Trichocorixa* (Fig. 4). A chorion with coarse punctures distinguishes the subgenus *Aphelosigara* (Fig. 10) from the subgenus *Tropocorixa* (Figs. 11–14, 17–18). Chorionic tubular projections (Figs. 11, 17) are present in the genus *Sigara* only. According to Hungerford (1948a), the eggs of *Sigara alternata* (Say), *S. decorata* (Abbott), and *S. distincta* (Fieber) are not sculptured and the eggs of *S. irrorata* (Fieber), *S. meridionalis* (Wallengren), and *S. paludata* Hungerford are minutely wrinkled. These observations need confirmation using scanning electron microscopy.

The sculpturing of the chorion and the structure of the micropylar area of the eggs here studied using scanning electron microscopy together with the egg and the stalk lengths, proved to be useful for the identification of the Argentinian species. The eggs of *Ectemnostega quadrata* (Fig. 1), *E. quechua* (Fig. 2), *Trichocorixa mendozana* (Fig. 4), *Centrocorisa kollari* (Fig. 5), *Heterocorixa brasiliensis* (Fig. 8), *Sigara tucma* (Fig. 10), *S. platensis* (Fig. 12), *S. rubyae* (Fig. 13), *S. santiagiensis* (Fig. 14), *S. yala* (Fig. 18), and *Tenagobia schadei* (Fig. 22) have polygonal units on the chorionic surface, indistinguishable in *Tenagobia incerta* (Fig. 19), *T. fuscata* (Fig. 21) and *T. pulchra* (Fig. 23). The small areas delimited by tubular projections in *Sigara denseconscripta* (Fig. 11) and *S. schadei* (Fig. 17) are probably polygonal units. The following chorionic ornaments are shared by groups of species: coarse punctures in *Ectemnostega quadrata* (Fig. 1), *E. quechua* (Fig. 2), and *Sigara tucma* (Fig. 10); tubular projections in *Sigara denseconscripta* (Fig. 11) and *S. schadei* (Fig. 17); protuberances not as above in *Sigara santiagiensis* (Fig. 14), *S. yala* (Fig. 18), *Tenagobia schadei* (Fig. 22), and *Trichocorixa mendozana* (Fig. 4); thickenings in *Tenagobia incerta* (Fig. 19) and *T. fuscata* (Fig. 21). Coarse punctures, protuberances and thickenings are absent in *Centrocorisa kollari* (Fig. 6), *Heterocorixa brasiliensis* (Fig. 8), *Sigara platensis* (Fig. 12), *S. rubyae* (Fig. 13), and *Tenagobia pulchra* (Fig. 23). A nipple structure is present on the micropylar area of all the Argentinian species examined, except in *T. pulchra* (elaborate, sinuous, rosette-like structure, Fig. 24), *T. schadei* (flat) and *H. brasiliensis* (flat, Fig. 7). Differences among the Argentinian species regarding the sculpturing of the chorion and the structure of the micropylar area are given in the descriptions with more detail and included in the key. The ornamentation of the chorion present in *C. kollari, E. quadrata, S. platensis, S. rubyae, S. santiagiensis, S. tucma,* and *Trichocorixa mendozana* using scanning electron microscopy was not observed with optical microscopy; only polygonal units with an apparently smooth surface were visible with optical microscopy (Konopko *et al.* 2011; Konopko 2013a, b, *In press*).

Among the genera of Corixoidea present in Argentina, the size easily distinguishes the eggs of *Tenagobia* (EL: 0.30–0.50 mm; EW: 0.13–0.23 mm) from those of *Centrocorisa* (EL: 0.98 mm; EW: 0.68 mm) and *Ectemnostega* (EL: 0.79–1.03 mm; EW: 0.47–0.78 mm). The size of the eggs of the remaining genera is similar and intermediate between the above mentioned genera: *Heterocorixa*, EL: 0.50–0.55 mm, EW: 0.45 mm; *Sigara*, EL: 0.44–0.77 mm, EW: 0.31–0.62 mm; *Trichocorixa*, EL: 0.62–0.74 mm, EW: 0.37–0.42 mm (Table 2).

Further research including descriptions of the eggs of the species of Corixoidea is needed. In particular, studies including additional species are needed to confirm the characters herein established for separate genera and subgenera of Corixoidea. The egg morphology and chorionic structure within the families Corixidae and Micronectidae need to be assessed through more detailed approaches as they are still poorly known. Future studies should focus on providing useful morphological data, which will improve the resolution of analyses of the phylogeny of the Corixoidea.

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