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RESEARCH PAPER

New hemipteran insects (Eoscarterellidae, Scytinopteridae, and Protopsyllidiidae) from the Upper Triassic Potrerillos Formation of Mendoza, Argentina

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Abstract New species of Eoscarterellidae, Scytinopteridae, and Protopsyllidiidae are described from the Upper Triassic Potrerillos Formation, Cuyana Basin, Mendoza Province, Argentina. These specimens represent the first record of Eoscarterellidae and Sternorrhyncha in South America, as well as the first record of a scytinopterid hindwing from this continent. Their taxonomic positions are briefly discussed.

Keywords Fossil insects · Hemiptera · Upper Triassic · Carnian · Potrerillos Formation · Argentina

Kurzfassung Neue Arten von Eoscarterellidae, Scytinopteridae und Protopsyllidiidae (Cicadomorpha, Sternorrhyncha, Insecta) werden aus der obertriassischen Potrerillos-Formation (Cuyana Basin) in der Provinz Mendoza (Argentinien) beschrieben. Diese sind der erste Nachweis von Eoscarterellidae und Sternorrhyncha in Südamerika sowie der erste Nachweis eines scytinopteriden Hinterflügels von diesem Kontinent. Ihre taxonomische Stellung wird kurz diskutiert.

Schlüsselwörter Fossile Insekten · Hemiptera · Ober-Trias · Karnium · Potrerillos-Formation · Argentinien

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Introduction

After the end-Permian mass extinction, the hemipteran fauna changed dramatically, partly due to evolutionary changes in the host-plant lineages (Shcherbakov 2000). Nearly half of the families became extinct (12 survived into the Triassic) and many new ones appeared: some taxa (Prosbolidae and Pereboriidae) were replaced by their descendants (Hylicellidae and Curvicubitidae) and other taxa—previously rare—became dominant (Dysmorphoptilidae, Dunstaniidae, Progonocimicidae), sometimes only for a short time before the crisis (Protopsyllidiidae, which only became abundant in the Jurassic) (Shcherbakov 2000). Most Middle and/or Late Triassic faunas were dominated by hylicellids, scytinopteroids, and/or dunstaniids, with dysmorphoptilids and fulgoroids subdominant (Shcherbakov 2000; Shcherbakov and Popov 2002).

Due to the high fossilization potential of their sclerotized forewings, Hemiptera, Coleoptera, and Blattodea are the most diverse and abundant insect orders in the Argentine localities. The first hemipteran recorded from the Triassic of South America (Argentina) was *Tipuloidea rhaetica* Wieland (1925), first described as a dipteran and later recognized by Tillyard (1926) as a hemipteran belonging to the family Chiliocyclidae (Scytinopteroidea). Later, Martins-Neto and Gallego (1999, 2001, 2006) and Martins-Neto et al. (2003, 2008) described new specimens from the Potrerillos Formation (Quebrada del Durazno,

Mendoza Province), Los Rastros Formation (Río Gualo, La Rioja Province), and Ischichuca Formation (Quebrada de Ischichuca, La Rioja Province). Thus far, 14 genera and 20 species of fossil hemipterans have been reported from the Triassic of Argentina (Table 1).

Here, we describe new hemipterans belonging to Scytinopteridae, Eoscarterellidae, and Protopsyllidiidae from the upper section of the Potrerillos Formation at the Puesto Miguez and Quebrada del Durazno localities, south of Cerro Cacheuta, Mendoza Province, Argentina. These new specimens not only add considerably to our knowledge of the entomofauna in the Triassic of Argentina and this order on the continent of Gondwana, but are also very important for advancing our understanding of the early evolution of hemipterans.

Geological setting

The Cuyana Basin is the largest Triassic rift basin of western Argentina. The Cuyana Basin contains thick

Table 1 Record of Triassic hemipterans from Argentina

Family	Species	Authors	Locality/formation/province
Chiliocyclidae Evans (1956) (Scytinopteroidea)	*Argentinocicada magna*	Martins-Neto and Gallego (1999)	Potrerillos Formation, Quebrada del Durazno locality, Cuyana Basin, Mendoza Province
	Argentinocicada minima		
Scytinopteridae Handlirsch (1906) (Scytinopteroidea)	*Potrerillia nervosa*		
	Australocicada arcucciae	Martins-Neto and Gallego (2001)	Los Rastros Formation, Río Gualo locality, Ischigualasto-Villa Unión Basin, La Rioja Province
	Gualoscytina mayae	Martins-Neto and Gallego (2003)	
	Argentinoscytina clara	Lara and Wang (this paper)	Potrerillos Formation, Puesto Miguez locality, Cuyana Basin, Mendoza Province
Uncertain family (Scytinopteroidea)	*Cacheutacicada kurtzae*	Martins-Neto et al. (2008)	Potrerillos Formation, Quebrada del Durazno locality, Cuyana Basin, Mendoza Province
Chiliocyclidae (Scytinopteroidea)	*Tipuloidea rhaetica*	Wieland (1925) review by (Tillyard 1926)	
Dysmorphoptilidae Handlirsch (1906) (Prosboloidea)	*Gallegomorphoptila acostai*	Martins-Neto and Gallego 1999	Potrerillos Formation, Quebrada del Durazno locality, Cuyana Basin, Mendoza Province/Los Rastros Formation, Río Gualo locality, Ischigualasto-Villa Unión Basin, La Rioja Province
	Gallegomorphoptila gigantea	Martins-Neto and Gallego (2001)	Los Rastros Formation, Río Gualo locality, Ischigualasto-Villa Unión Basin, La Rioja Province
	Gallegomorphoptila pulcherrima	Martins-Neto et al. (2003)	
	Gallegomorphoptila breviptera		
	Gallegomorphoptila kotejai	Martins-Neto and Gallego (2006)	Ischichuca Formation, Quebrada Ischichuca locality, Ischigualasto-Villa Unión Basin, La Rioja Province
Stenoviciidae Evans (1956) (Prosboloidea)	*Argentinopheloscyta forsterae*	Martins-Neto et al. (2003)	Los Rastros Formation, Río Gualo locality, Ischigualasto-Villa Unión Basin, La Rioja Province
Progonocimicidae Handlirsch (1906) (Coleorrhyncha)	*Yurigocimex popovi*		
	Popovigocimex yurii		
Prosbolidae Handlirsch (1906) (Prosboloidea)	*Lariojaprosbole melchori*	Martins-Neto and Gallego (2001)	Ischichuca Formation, Quebrada Ischichuca locality, Ischigualasto-Villa Unión Basin, La Rioja Province
Saaloscytinidae Brauckmann, Martins-Neto and Gallego (2006) (Scytinopteroidea)	*Saaloscytina carmonae*	Martins-Neto et al. (2006)	Los Rastros Formation, Los Chañares locality, Ischigualasto-Villa Unión Basin, La Rioja Province
Eoscarterellidae Evans (1956)	*Duraznoscarta ramosa*	Lara and Wang (this paper)	Potrerillos Formation, Quebrada del Durazno locality, Cuyana Basin, Mendoza Province
Protopsyllidiidae Carpenter (1931)	Gen. et sp. indet.		Potrerillos Formation, Puesto Miguez locality, Cuyana Basin, Mendoza Province

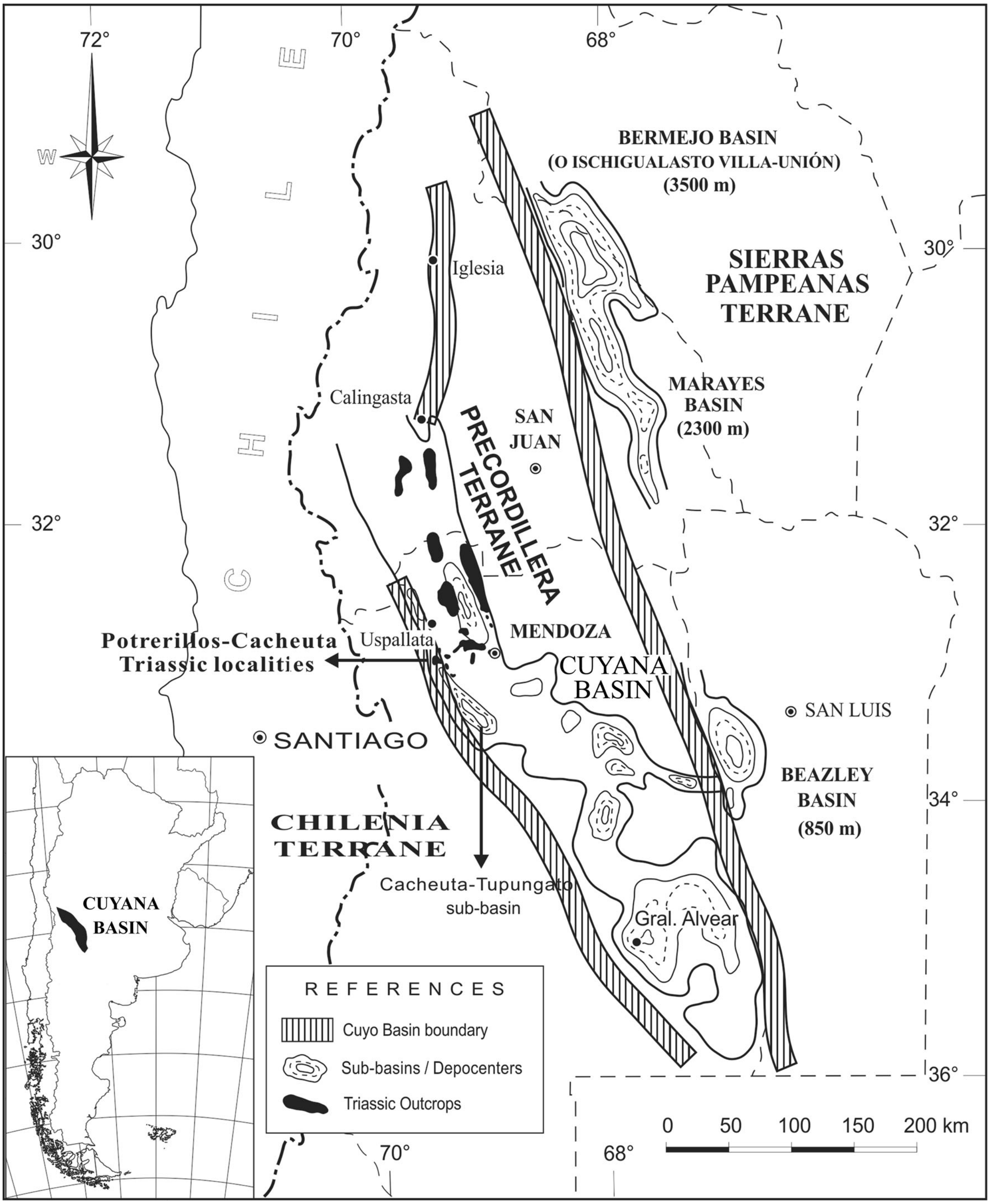

Fig. 1 Generalized reconstruction of the Triassic basins of central-western Argentina, showing the location and extent of the Cuyana Basin. *Filled black areas* show Triassic outcrops and *complete and dashed concentric lines* show the locations of the sub-basins of the Cuyana Basin (modified from Kokogian et al. 1993)

sedimentary sequences of continental rocks of predominantly alluvial, fluvial, and lacustrine origin interbedded with tuffs of coeval volcanism that together constitute the Uspallata Group (Stipanicic and Zavattieri 2002). The rift is composed of several asymmetric half-grabens. The Cacheuta Sub-basin outcrops constitute the southernmost exposures of the Cuyana Basin. The best outcrops are located in the southern flank of the Cerro Cacheuta and in the nearby Cerro Bayo in the Potrerillos locality, west of Mendoza City (Fig. 1).

The eastern margin of the sub-basin was developed over Paleozoic metasedimentites, and/or over the volcanics of the Permian–Triassic Choiyoi Group complex. The Triassic column in this depocenter was formed by the early depositional phase (Synrift I). The succession is characterized by reddish conglomerates of alluvian fan facies (Río Mendoza Formation) related to the active margins of the rift. They laterally interfinger with multicolored mudstones, fine-grained sandstones, and tuffs of ephemeral-fluvial and playa-lake origin deposited basinward. In the depressed areas of the sub-basin, shallow lake facies were accumulated, which were characterized by the deposition of relatively thin siliciclastic beds and stromatolitic limestones interbedded with tuffs (Cerro de Las Cabras Formation). This first sequence is separated by a regional unconformity from the second depositional phase (Synrift II) (Kokogian and Boggetti 1986; Kokogian et al. 1993). Synrift II is a fining-upward succession (Potrerillos and Cacheuta formations) that is mainly represented by lower-energy facies and fine-grained deposits than the underlying sequence. It was accumulated on a lower relief due to the infilling of the depocenter. The Potrerillos Formation is characterized by fluvial conglomerates at the base intercalated with light-greenish cross-bedded sandstones, and light tuffaceous sandstones of perennial braided river origin; these fluvial deposits grade basinward to greenish-gray laminated siltstone and sandstones interbedded with black bituminous shales and tuffs, related to high-sinuosity river systems. These facies laterally interfinger and are covered by the widespread lacustrine black shales of the Cacheuta Formation. In the maximum transgression of the lake, the lacustrine facies overlaps the fluvial deposits of the Potrerillos Formation to the borders of the basin. Finally, the post-rift phase in the depocenter is characterized by the red sandstones, mudstones, and tuffs of the Río Blanco Formation. This succession has an onlap relationship with the underlying beds and represents the instauration of a fluvial-deltaic system over the lacustrine black shales (Fig. 2).

Paleofloristic analysis of the macrofloras preserved in almost the whole column indicates the presence of subtropical floras (evergreen forests) adapted to seasonally dry climatic conditions. Recently, U-Pb SHRIMP ages of tuffaceous beds at the top of Cerro de Las Cabras and the base of the Potrerillos Formation have constrained the initial infilling of the Cacheuta Sub-basin (Synrift I) and the beginning of Synrift II to the early Anisian and the Anisian–Ladinian boundary, respectively. The Potrerillos Formation is assigned as a whole to the Ladinian–Carnian. The studied outcrops containing insect remains come from the uppermost levels of the unit, so the insect assemblage of the Potrerillos Formation is Carnian in age.

The insect fauna from the Potrerillos Formation is diverse, and includes representatives of the following orders: coleopterans, blattids, hemipterans, grylloblattids, dipterans, hymenopterans, mecopterans, miomopterans, plecopterans, odonatans, and orthopterans (Martins-Neto et al. 2008; Gallego et al. 2011; Lara and Lukashevich 2013; Lara et al. 2012, 2014, 2015). The material comes from two specific areas: (a) south of Cerro Cacheuta (at the Quebrada del Durazno, Puesto Miguez, and Agua de las Avispas localities) (Fig. 3) and (b) north of the Cerro Bayo (Quebrada del Puente locality), Potrerillos area.

Materials and methods

The specimens, IANIGLA-PI 3028-3030, are housed in the Colección Paleontológica del Instituto Argentino de Nivología, Glaciología y Ciencias Ambientales (IANIGLA-CCT-CONICET), Mendoza City. They were examined using an Olympus SZ51 stereomicroscope, and photos of the specimens were taken using an Olympus SP-350 digital camera (8.0 megapixels). Line drawings were prepared based on photographs using the CorelDraw 16 image-editing software.

We tentatively follow the traditional venational terminologies (Emeljanov 1977; Shcherbakov 1981) with minor modifications.

Systematic descriptions

Order Hemiptera Linnaeus 1758

Suborder Auchenorrhyncha (=Cicadina) Duméril 1805

Infraorder Cicadomorpha Latreille 1802

Superfamily Prosboloidea Handlirsch 1906

Family Eoscarterellidae Evans 1956

Duraznoscarta gen. nov.

Etymology

Durazno refers to the locality of Quebrada del Durazno and –*scarta* is commonly found in the names of fossil and recent hemipterans.

Type species

Duraznoscarta ramosa gen. et sp. nov.

Diagnosis

Forewing small, sclerotized, emarginated about one-third wing length from base, R with several short branches to costal margin, and M_1 branched.

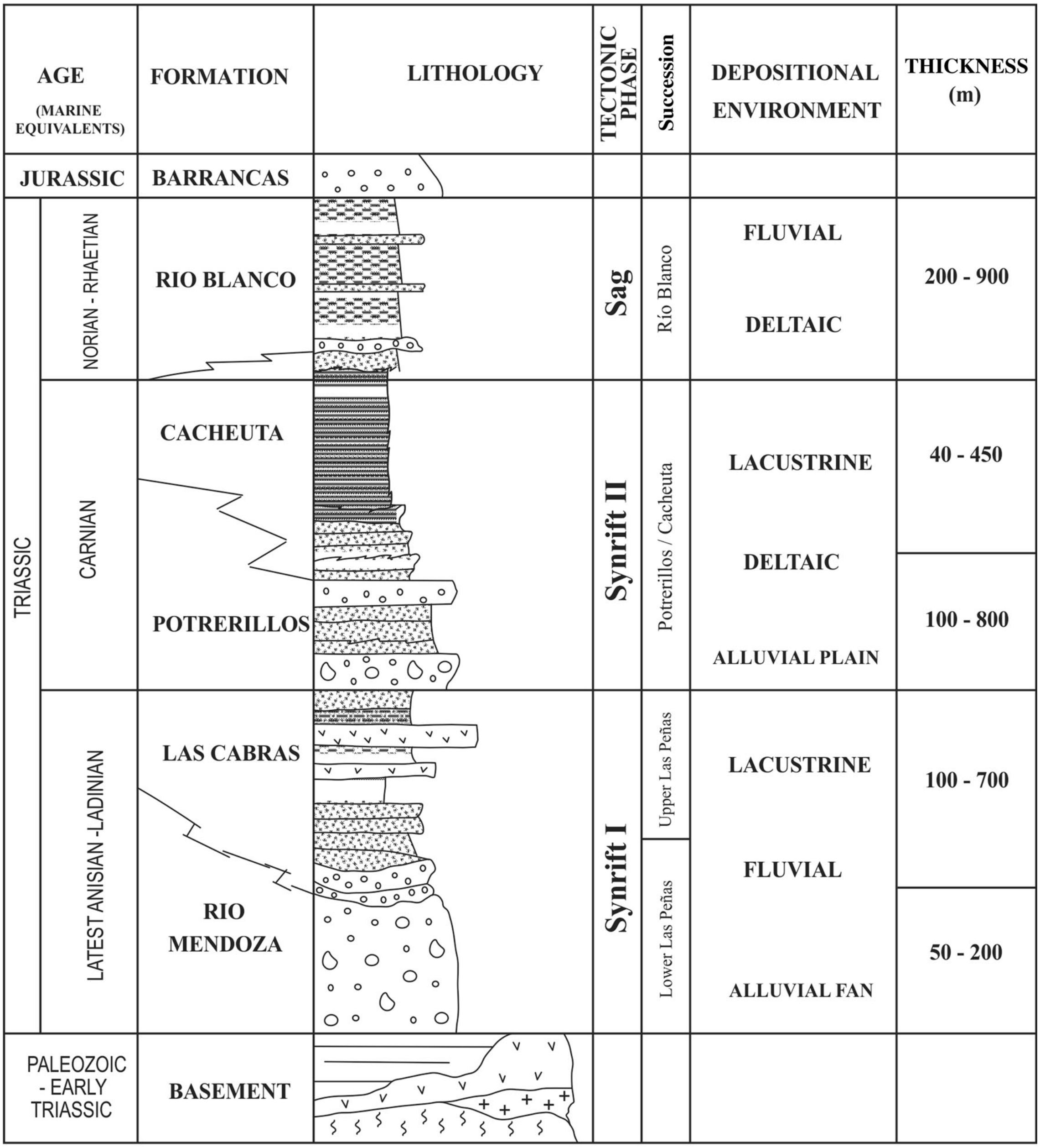

Fig. 2 Generalized stratigraphic column of the Cacheuta Sub-basin (also known in the oil industry as the Cacheuta-Tupungato Sub-basin or depocenter), Cuyana Basin, northern Mendoza Province, and the corresponding interpretation of tectonic evolutionary phases (modified from Boggetti et al. 2002)

Remarks

Duraznoscarta gen. nov. is assigned to Eoscarterellidae based on the following characters: Sc present as a short vein curving distally towards the base of R+M, RA branched, RP arising from R about one-third wing length from base, Cu not fused basally with M and proximally straight. It differs from Dysmorphoptilidae in the different wing shape and M basally fused with R.

Duraznoscarta ramosa sp. nov.
See Fig. 4.

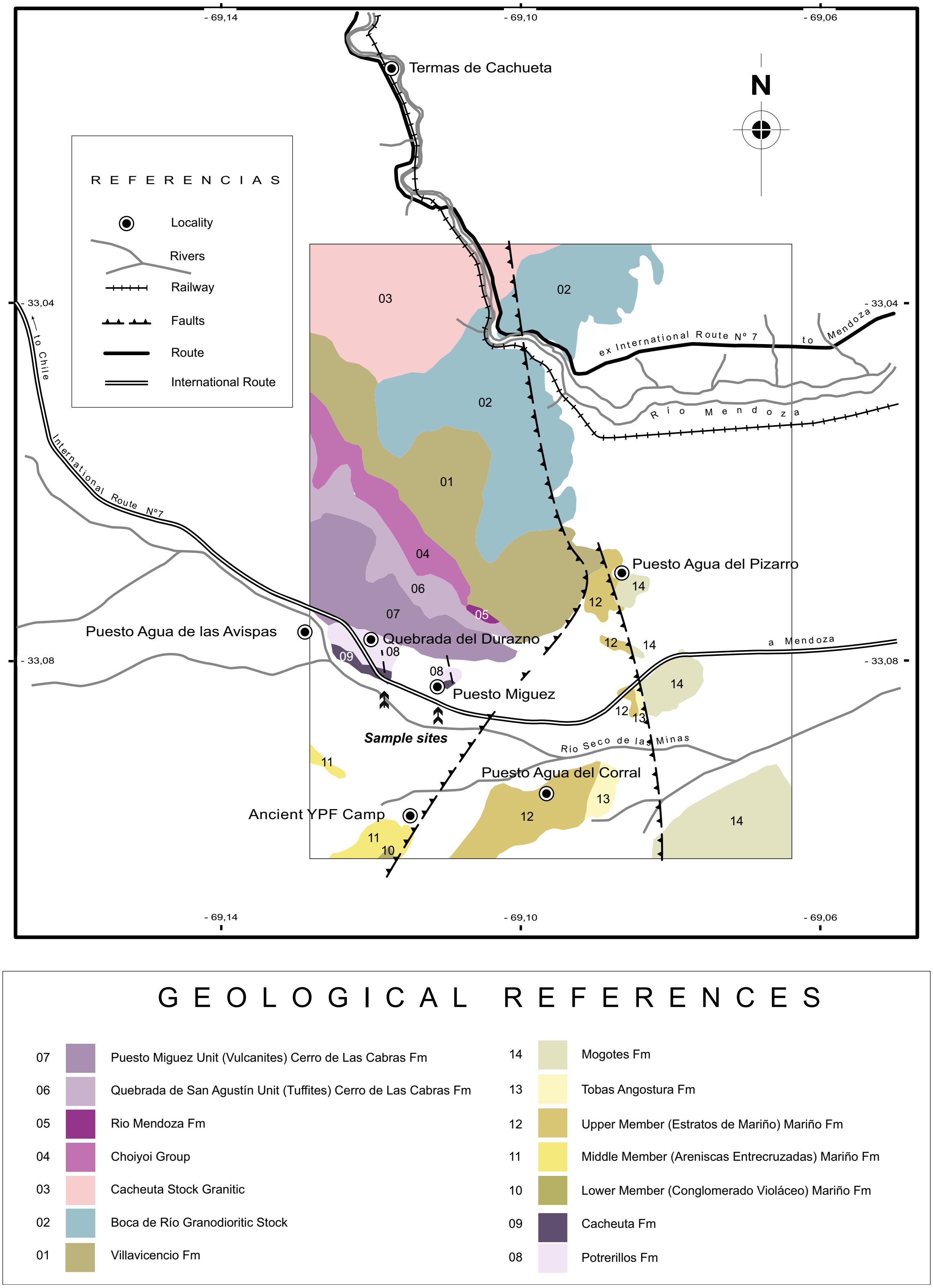

Fig. 3 Geological map of the southern Cerro Cacheuta area and fossiliferous localities at Quebrada del Durazno and Puesto Miguez, Mendoza Province, Argentina (modified from Morel 1994)

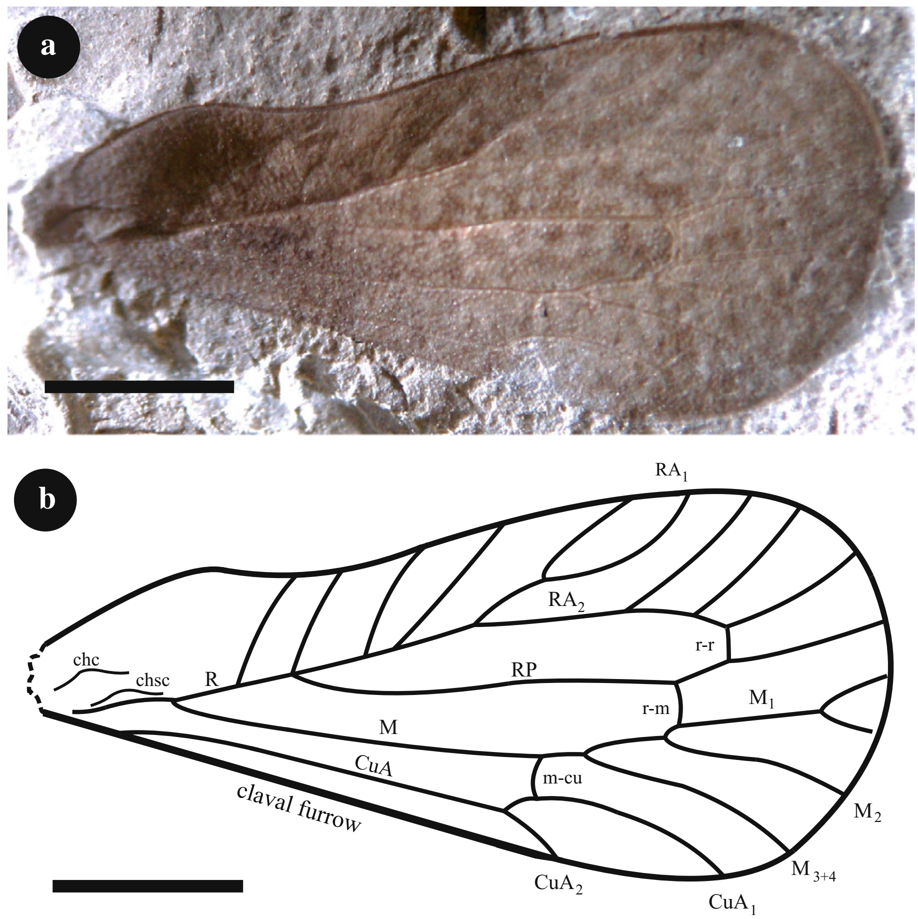

Fig. 4 *Duraznoscarta ramosa* gen. nov. et sp. nov., holotype IANIGLA-PI 3028. **a** Photo and **b** drawing. *Scale bar* 2 mm

Etymology

Specific epithet is from the Latin *ramosus*, branched, in reference to several branches between R and costal margin.

Holotype

IANIGLA-PI 3028 (part and counterpart of isolated wing).

Locality and horizon

Quebrada del Durazno, southern flank of Cerro Cacheuta, southern end of the Precordillera, Cuyana Basin, Mendoza Province, Argentina; upper part of the Potrerillos Formation; early Late Triassic (Carnian).

Description

Forewing length 8.91 mm, width 3.42 mm. Rugose and pigmented, broadest in distal half. Hypocostal (hcc) and hyposubcostal carinae (hscc) obvious. R long (5.9 mm), nearly parallel with costal margin and connected to costal margin by 4 veinlets. RA forked in midlength of wing into RA_1 and RA_2. RA_1 branched and RA_2 with 3 branches extending to margin of tegmen and linked with RP by straight crossvein. RP (6.3 mm) arising from about one-third wing length from base. R and M arched basally. RP and M parallel for most of their lengths. Stem M long (4.5 mm), almost straight, branched into M_{1+2} (0.76 mm) and M_{3+4} (2.5 mm). M_{1+2} forked into M_1 (1.55 mm, branched) and M_2 (2 mm, simple). Stem CuA long (4.29 mm), straight and separate from M. CuA forked into CuA_1 (2.65 mm, simple, arched) and CuA_2 (0.82 mm, simple). Crossveins r–r (0.39 mm), r-m (0.54 mm) and m-cua (0.52 mm) obvious. Clavus detached, not preserved.

Discussion

The eoscarterellid family includes three species: *Belmontocarta perfecta* Evans 1958 from the Permian of Australia; *Eoscarterella media* Evans 1956 and *Eoscartoides bryani* Evans 1956 from the Triassic of Australia. *Duraznoscarta ramosa* sp. nov. represents the first record of the Eoscarterellidae in the Americas. This new species can be separated from other species by the following characters: emarginate forewing shape, several branches between R and the costal margin, M_1 with two short branches CuA_1 and CuA_2 of different lengths, and position of the crossveins r-m and m-cu.

Superfamily Scytinopteroidea Handlirsch 1906
Family Scytinopteridae Handlirsch 1906
Argentinoscytina gen. nov.

Etymology

Argentino- refers to the country of Argentina and –*scytina* to the Scytinopteridae, a typical Permotriassic hemipteran family.

Type species

Argentinoscytina clara gen. et sp. nov.

Diagnosis

Hindwing with costal margin convex distally; RP arising from R before midwing; M forking into M_{1+2} and M_{3+4} distal of CuA branching; M and CuA almost straight from their bases; ambient vein distinct, and anal region extended posteriorly.

Remarks

Argentinoscytina can be attributed to the scytinopterid family based on the following characters: costal margin with a shallow indentation near middle of wing; RP unbranched; M and CuA distally branched. It differs from other genera in having vein RP arising basally, M forking distal of CuA branching, M_{1+2} branching distally, and ambient vein distinct.

Argentinoscytina clara sp. nov.
See Fig. 5a–c.
*2012 Lara et al. Fig. 6j

Etymology

Specific epithet is from Latin *clara*, in reference to the excellent preservation of the hindwing.

Holotype

IANIGLA-PI 3029 (part and counterpart of isolated wing).

Locality and horizon

Puesto Miguez, southern flank of Cerro Cacheuta, southern end of the Precordillera, Cuyana Basin, Mendoza Province, Argentina; upper part of the Potrerillos Formation; early Late Triassic (Carnian).

Description

Hindwing length 19.17 mm, width 8.97 mm. Elongate and costal margin with shallow convexity at base of wing and distally. Marginal membrane clear and wider than vein width. Costal area long, with a marked medial depression and convex area. Veins R, M, and Cu branching at same level. Vein R forking into RA and RP. RA long (17.29 mm), simple, and terminating on costal margin. RP (14.61 mm) arising before midwing and running close to RA. RP terminating in apical margin and connected to M by r-m crossvein. Stems M and CuA long, straight, and parallel. M (11.3 mm) arising basally and forking into M_{1+2} (3.68 mm) and M_{3+4} (5.59 mm), terminating after midwing. M_{1+2} branching into M_1 (3.38 mm) and M_2 (3.06 mm). Veins M_1, M_2, M_{3+4} branching from stem M but not at the same point. M connected to CuA_1 by m-cu curved, at level M bifurcation. CuA (8.33 mm) forked nearer to M fork than to R fork into CuA_1 (7.06 mm) and CuA_2 (4.57 mm). Vein CuP long 10.65 mm), unbranched, straight, and arising from base of wing. Anal area markedly expanded. Veins A_1 (9.34 mm) and A_2 (5 mm) simple, almost straight and parallel, slightly bent toward wing hind margin. Jugum folded alongside the jugal fold over the wing.

Discussion

Argentinoscytina clara can be distinguished from other scytinopterid hindwings from the Permian of Russia (*Scytinoptera reducta* Martynov, 1928, *S. kaltanica* Becker-Migdisova 1961, and *Permolamproptera grandis* Becker-Migdisova 1961) in the wing shape, M with 3 branches, M and CuA almost straight, and CuA branching at midwing.

Suborder Sternorrhyncha Amyot and Serville, 1843
Infraorder Psylliformes sensu Schlee 1969
Superfamily Protopsyllidioidea Carpenter 1931
Family Protopsyllidiidae Carpenter 1931
See Fig. 6.
*2012 Lara et al. Fig. 6m

Holotype

IANIGLA-PI 3030 (part and counterpart of body).

Locality and horizon

Puesto Miguez, southern flank of Cerro Cacheuta, southern end of the Precordillera, Cuyana Basin, Mendoza Province, Argentina; upper part of the Potrerillos Formation; early Late Triassic (Carnian).

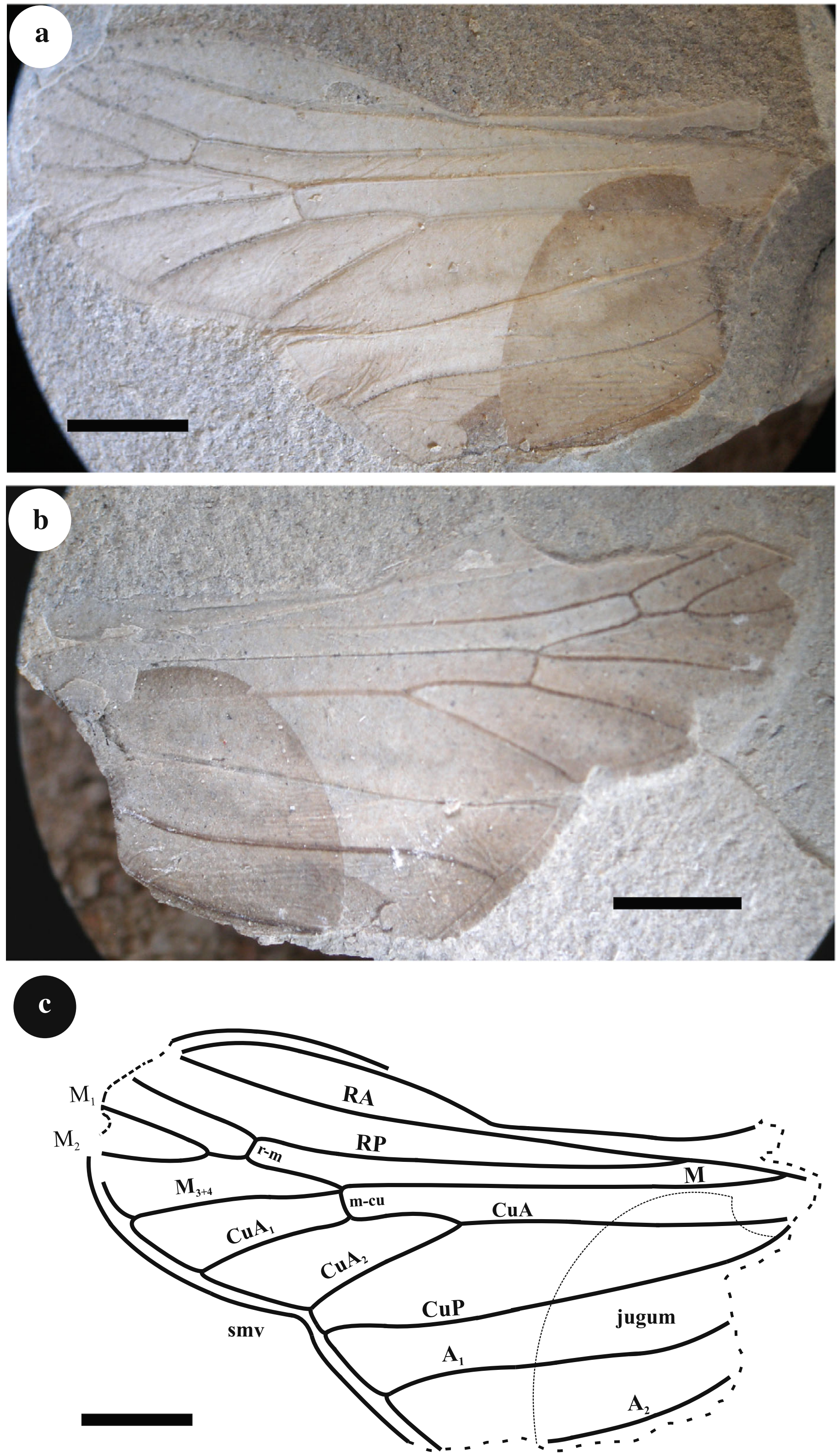

Fig. 5 *Argentinoscytina clara* gen. nov. et sp. nov., holotype IANIGLA-PI 3029. **a** Photo of part, **b** photo of counterpart, and **c** drawing of part. *Scale bar* 3 mm

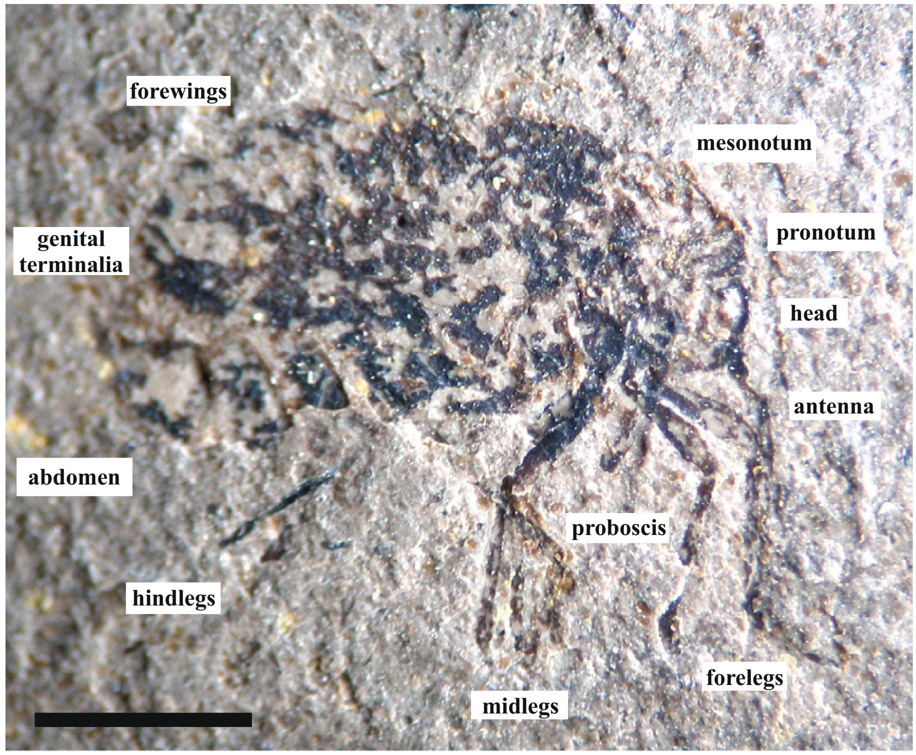

Fig. 6 Protopsyllidiidae figured specimen IANIGLA-PI 3030. *Scale bar* 1 mm

Description

Female Body length 2.96 mm. Head length 0.27 mm, width 0.42 mm. Antenna (length 0.67 mm) 2.5 times as long as head (segments not visible), scapus and pedicel cylindrical, long rostrum, length 0.53 mm (segments not visible). Forewing length 2.07 mm, wing extending distinctly beyond abdominal tip. Veins not preserved. Pronotum length 0.24 mm, width 0.37 mm; mesonotum length 5.75 mm, width 0.40 mm. Legs partly preserved, foreleg length 1.70 mm, middle leg length 1.70 mm, hindleg length 1.97 mm. Coxae, trochanters, femora (about twice as thick as tibiae), tibiae, and part of tarsi of forelegs and midlegs preserved; coxae and tibiae of hindlegs partly visible; femora stout and subequal in length. Abdomen (length 1.90 mm) roughly oval with 6 visible segments. Genital terminalia visible (length 0.25 mm).

Remarks

The forewings held roof-like over the body is a typical feature of Sternorrhyncha and Auchenorrhyncha. The long rostrum arising from the posterior part of the head, long antennae, less-developed postclypeus and reduced ovipositors show that this insect belongs to Protopsyllidiidae (Sternorrhyncha). However, further taxonomic allocation cannot be made because of the rather poor preservation and unidentifiable wing venation.

Conclusion

Auchenorrhynchan insects (Hemiptera) are phytophagous, feeding on plant sap, and include pests of agricultural crops and trees. The oldest records are from the early Permian (Li et al. 2013). The infraorders Fulgoromorpha and Cicadomorpha diverged before the mid-Permian (Shcherbakov 1996). Cicadomorphans have inhabited the Earth for at least 280 million years (Shcherbakov 1996) and have therefore evolved coincidentally with the major lineages of plants. They have witnessed the development of complex terrestrial ecosystems, the mass extinctions at the Permian–Triassic and Cretaceous–Tertiary boundaries, the break-up of Pangea, and countless smaller-scale geological events that have shaped the present-day terrestrial realm (Dietrich 2002).

So far, due to its poor fossil record, the family Eoscarterellidae Evans (1956) has attracted little attention. Shcherbakov (1984) treated it as a synonym of Dysmorphoptilidae, but Hamilton (1992) restored it as separate family belonging to Dysmorphoptiloidea. Lambkin (2015) proposed to assign all genera from both families to Dysmorphoptilidae and suggested that the determination of generic relationships requires more analysis and the re-examination of many type species.

Eoscarterellidae appeared by the end of the Permian with the record of *Belmontocarta perfecta* from Australia (Evans 1958). Then they crossed the P/T boundary like

other families of hemipterans (Pincombeidae, Archescytinidae, Surijokocixiidae, Ignotalidae, Dunstaniidae, Dysmorphoptilidae, Protopsyllidiidae, Progonocimicidae, and four scytinopteroid families) and became abundant and dominant in the Triassic, along with Hylicellidae and derived scytinopteroid families (Shcherbakov 1993, 2000). There are three species described from the Late Permian (Belmont, New South Wales) and Upper Triassic (Mount Crosby, Queensland) of Australia: *Belmontocarta perfecta* (Evans 1958), *Eoscarterella media*, and *Eoscartoides bryani* (Evans 1956). The family is represented by insects that had wings that expanded distally with a rugose surface, color pattern, and length from 9 to 12 mm. This type of morphology in tegmina is also observed in dysmorphoptilids, saaloscytinids, ipsviciids, and manguviopseids; it was probably a camouflage that protected them against predators (Barth et al. 2011).

Duraznoscarta ramosa sp. nov. from the Triassic of Argentina represents the first record of Eoscarterellidae from the American continent. This new species is closely related to two families (Carpenter 1992): Dysmorphoptilidae (with several branches from R to costal margin; branched R1a and R1b) and Eoscarterellidae (forewing shape, greater development of M, and its basal association with R and not with Cu). We consider this new species to be a member of Eoscarterellidae, and hopefully new specimens will allow us to clarify its taxonomic position and increase our information about this family.

The superfamily Scytinopteroidea Handlirsch, 1906 was thought to be a group derived from Ingruidae, Cicadomorpha: Prosboloidea (Shcherbakov 1996, 2000). It is numerous in Late Permian and Triassic fossil localities (their remains seem to be more abundant in near-shore than offshore facies of freshwater ecosystems) and had its coriaceous forewings fixed on the thorax in repose. Also, like its descendants the Heteroptera, it may have been capable of subelytral air storage (probably the only amphibiotic homopterans known, that possibly feed on emergent water plants) (Shcherbakov and Popov 2002).

The superfamily Scytinopteridae is known from the Ufimian–Early Kazanian; it dominates assemblages in the lower latitudes together with the family Prosbolidae (Shcherbakov 1984). During the Triassic, the family had a predominant fossil record in the continent of Gondwana, with records in Argentina (Martins-Neto and Gallego 1999, 2001; Martins-Neto et al. 2003, 2008) and Australia (Tillyard 1919, 1922); in addition, it is also known from China (Lin 1986). However, the specimens from Triassic sediments of Argentina (*Australocicada arcucciae*, *Potrerillia nervosa*, *Gualoscytina mayae, Cacheutacicada kurtzae*) should be re-examined for their venation patterns. We placed *Argentinoscytina clara* sp. nov. tentatively in Scytinopteridae because these types of hindwings are little known and less informative than forewings.

The Sternorrhyncha (aphids, whiteflies, plant lice, and scale insects) comprises some 16,000 described species divided into four major recent groups and a few extinct ones, all entirely phytophagous. The suborder is usually thought to be monophyletic (supported in particular by molecular data), but opinions based on paleontological interpretation considered this group to be paraphyletic (Drohojowska et al. 2013).

The Protopsyllidiidae, diverse in the early Mesozoic, are known from the Late Permian to the Late Cretaceous (Grimaldi 2003). So far, 31 genera and 58 species have been described in this family. There are 28 species known from the Permian (Australia, Russia, and South Africa), 2 species from the Triassic (Australia and South Africa), 21 species from the Jurassic (China, Germany, Kazakhstan, Kyrgyzstan, Mongolia), and 7 species from the Cretaceous (Lebanon, Mongolia, Burma, United States). The most recent interpretation of sternorrhynchan relationships placed Protopsyllidiidae as the sister group of remaining sternorrhynchans (Drohojowska et al. 2013). The new specimen is the first Triassic record of Sternorrhyncha and the first complete adult insect from Argentina and Gondwana, confirming the high preservational potential of the Argentinean fossil deposits.

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