THE TRIASSIC INSECT FAUNA FROM ARGENTINA. I. AUCHENORRHYNCHA, MIOMOPTERA AND ENSIFERA

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ABSTRACT

The present paper describes new fossil insect taxa from the Potrerillos and Los Rastros formations, from Mendoza and La Rioja Provinces respectively of Argentina, both of which are dated as late Middle Triassic to early Late Triassic. Three new genera and five new species are proposed, namely *Dysmorphoptiloides acostai* n. sp., *Argentinocicada magna* n. gen. et n. sp., *Argentinocicada minuta* n. sp., *Potrerillia nervosa* n. gen. et n. sp. (Auchenorrhyncha) and *Miomina mendozina* n. gen. et n. sp. (Miomoptera). The genus *Notopamphagopsis* Cabrera (Ensifera) is reviewed. These insects currently represent the most important documentation of a Triasssic insect fauna from South America.

Keywords: Fossil insects, South America Triassic, Auchenorrhyncha, Miomoptera, Ensifera.

RESUMEN

En este trabajo se describen algunos componentes de la paleoentomofauna triásica de Argentina hallados en las formaciones Potrerillos (Mendoza) y Los Rastros (La Rioja), ambas asignadas al lapso de finales del Triásico Medio al inicio del Triásico Tardío. Se proponen tres nuevos géneros y cinco nuevas especies: *Dysmorphoptiloides acostai* n. sp., *Argentinocicada magna* n. gen. et n. sp., *Argentinocicada minuta* n. sp., *Potrerillia nervosa* n. gen. et n. sp. (Auchenorrhyncha) y *Miomina mendozina* n. gen. et n. sp. (Miomoptera). Se brinda la revisión del genero *Notopamphagopsis* Cabrera (Ensifera). Estos hallazgos representan el registro más importante de insectos triásicos para América del Sur.

Palabras clave: Insectos fosiles, Triásico de América del Sur, Auchenorrhyncha, Miomoptera, Ensifera.

INTRODUCTION

This paper presents the description of a part of the fossil insect fauna from the Potrerillos and Los Rastros formations, respectively from the Mendoza and La Rioja Provinces of Argentina, both dated as late Middle Triassic to early Late Triassic. Insects of the orders Auchenorrhyncha, Miomoptera and Ensifera are dealt with.

The record of insects in the Triassic of South America is sparse; it has been summarized by Gallego (1997). From the Triassic of Brazil only three species are known: two Auchenorrhyncha, *Sanctipaulus mendesi* Pinto, 1956 and *Prosbolidinella riorastensis* Martins-Neto and Rohn, 1996 and one Blattoptera, *Triassoblatta cargnini* Pinto and Ornellas, 1974. In the Potrerillos Formation, more particularly the stratigraphic level at southern Cerro Cacheuta (Mendoza Province) contains the insects described by Cabrera (1928), Carpenter (1960), Pinto and Purper (1978) and Marquat (1991). For the Los Rastros Formation the only record is a short note by Frenguelli (1948), who mentioned coleopteran elytra, at the well known Ischigualasto locality in San Juan Province. Fuenzalida (1937) and Cecioni and Westermann (1968) cited the presence of undetermined insects from the "Rhaetic" of the Punta Puquin, Los Lobos and Los Molles localities, from the Quebrada del Peral, Province of Central Chile, in strata of the El Puquén Formation (probably equivalent to the Pichidangui Formation, *sensu* Rivano and Sepulveda, 1991).

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The specimens described in this paper are mainly from the Quebrada del Durazno locality, south of Cerro Cacheuta, (Lujan de Cuyo Department, Mendoza Province, Argentina); they were collected during a field trip in September 1995, by a team formed by the second author and A. M. Zavattieri, A. Menendez, J. Cruz, and A. Acosta. The material is housed in the Paleozoological Collection of the Facultad de Ciencias Exactas, Naturales y Agrimensura de la Universidad Nacional del Nordeste (Corrientes Province, Argentina) under the collection number PZ-CTES. Another specimen was collected from the Gualo locality (La Rioja Province, Argentina) during a field trip in April 1995, by another team formed by the second author and A. Arcucci, C. Forster, C. May, and R. Rogers. This specimen is housed in the Invertebrate Paleontological Collection of the Universidad Nacional La Rioja, under the collection number PULR(I). The terminology and classification adopted here conforms mainly to that of Kukalova-Peck (1991).

GEOLOGICAL ASPECTS

The insects found in southern Cerro Cacheuta, of Mendoza Province originate from the classic locality named Cacheuta or "Minas de Petroleo" within the upper horizon of the Potrerillos Formation of late Middle Triassic to early Late Triassic age.

In the locality mentioned above, the Potrerillos Formation is represented by the upper 125 m of strata, since the boundary with the porphyrites from Choiyoi Group of Early Permian to Early Triasssic age, to the Cacheuta Formation boundary, established as early Late Triassic (Stipanicic *et al.*, 1995, fig. 19).

The horizon from which the insects originate is within the rhytmite facies of Morel (1994) that are stratigraphically contained in tabular beds of 20 to 50 cm thickness. The tuffaceous, argillaceous strata that contain this fauna are claystones and limonitic volcanic shales that are often white to yellowish or grey to greyish. These strata are partly carbonatized and include carbonatized claystone lenses, as well as fossil plant impressions, conchostracans, cuticles and fish scales. They represent a flood plain environment. The thickness of the Potrerillos Formation in this locality is 125 m (Morel, 1994), i.e. thinner than other outcrops with this sedimentary succession, but characteristic of the marginal zone of the basin. The stratigraphic level containing insects could correspond to paleobotanic strata I and II of Morel (1994) (see Fig. 1). Possibly, the insects of the Order Plecoptera described by Pinto and Purper (1978) and of the Order Ensifera (*Notopamphagopsis* Cabrera, 1928) originated from this same horizon.

The ensiferans described in this paper come from the Gualo locality of La Rioja Province. They were collected at several levels of the Los Rastros Formation which outcrops extensively in this area. Apart from the specimens mentioned above, several others were also collected, that are currently being studied.

The Los Rastros Formation is 200 m thick in the Gualo area and is characterized by several sedimentary sequences that are repeated in vertical succession according a cyclicity of the pulsative type. These rhythmites are in ascending order as follows: a) dull sandstones and conglomerates, which matrix varying in color from green to green-yellowish; b) fine dark green sandstones and c) limy grey to dark claystones (Herbst, 1970; Stipanicic and Bonaparte, 1979), which are stratigraphically distributed in packages typically half a meter thick (see Fig. 1). Presently, new data are being collected and analyses made with regard to the sedimentology and paleoenvironmental conditions. The insect fauna is preserved in the clayey sediments.

SYSTEMATIC PALEONTOLOGY

ORDER AUCHENORRHYNCHA *sensu* Evans, 1956
Superfamily **CERCOPOIDEA** *sensu* Evans, 1956
Family **Dysmorphoptilidae** Handlirsch, 1906
Genus *Dysmorphoptiloides* Evans, 1956

Type-species: *Dysmorphoptiloides elongata* Evans, by original designation.

Dysmorphoptiloides acostai n. sp.

Fig. 2A

Derivatio nominis: Dedicated to Alberto Acosta, who collected several of the specimens dealt with this paper.

Holotype: PZ.CTES-5772, housed in the Paleozoological Collection of the Facultad de Ciencias Exactas, Naturales y Agrimensura de la Universidad Nacional del Nordeste, Mendoza, Argentina.

Type locality: 300 m west of Quebrada del Durazno. South of Cerro Cacheuta. Mendoza, Argentina, bands EP I and EP II of Morel (1994).

Type stratum: Upper section of the Potrerillos Formation.

Age: Late Middle Triassic to early Late Triassic.

Diagnosis

Wing similar to *Dysmorphoptiloides elongata* Evans, 1956 from the Australian Upper Triassic in the general aspects of the alar venation. **RA** fused to **RP** after **m-cu** level and before the **r-m** level. **MP1+2** unforked.

Description

Forewing fragment with 10 mm of length preserved. Parallel **RA** quite parallel to the costal margin, deflecting toward the apex at the emarginated portion of the costal margin, forward the limit of the apical margin. **RP** and **RA** fused at the boundary of the apical margin. **RA+RP** fuses to **MA1+2** by a cross vein occurring posterior to the **RA/RP** fusion. **MP** long, slightly curved, forking before the **RA/RP** fusion. **M1+2** unforked. **M3+4** forks at the level of **r+m**. **CuA** long, straight, forking after the **RA/RP** fusion. **CuA**

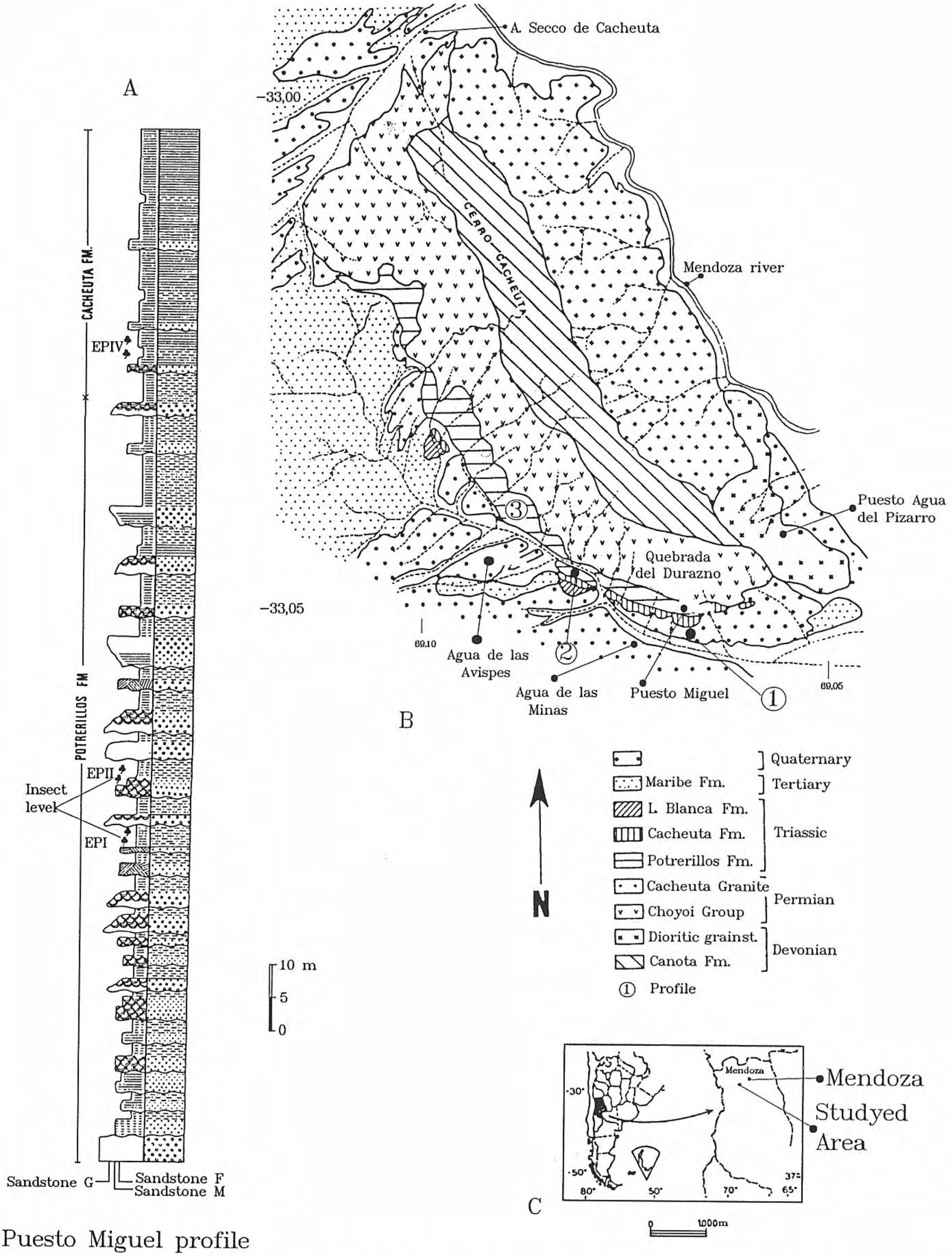

Figure 1. **A** Puesto Miguel profile and position of the collected specimens (after Morel, 1994, figs. 1-3). **B**. Geological map of the Cerro Cacheuta region. **C**. Geographic index map.

longer than **CuA2**, curved. **MP** and **CuA** are linked by a cross-vein (**m-cu**) positioned before the forking of **CuA** and after the **RA/RP** fusion. **CuP** partially preserved, parallel to **CuA**. The entire surface of the wing is rugose, with a homogeneously granular surface (Fig. 2A).

Discussion

Dysmorphoptiloides acostai n. sp. is very similar to the specimen C614 figured by Evans (1956, fig. 17D) named as *D. elongata*, principally attributable to **RA/RP** fusion, not found in other specimens (for example Evans, 1971, figure 2). *D. acostai* n. sp. is separated from *D. elongata* Evans by having **MP1+2** unforked, which occurs in *Dysmorphoptila liasina* Handlirsch, 1906, described from the Lower Jurassic of England. However, the remaining venational pattern is dissimilar. *Dysmorphoptila notodon* Scherbakov, 1988, described from the Jurassic of Mongolia, have **M3+4** unforked. The same venational pattern occurs in *Mesatracis reducta* Bekker-Migdisova, 1949, described from the Lower Jurassic of Central Asia. *Dysmorphoptiloides parva* Evans, 1956 from the Upper Triassic of Australia and *Tennentsia protuberans* Riek, 1976 from the Upper Triassic of Africa are different from *D. acostai* n. sp. in having a significantly shorter apex. *D. acostai* n. sp. and *D. elongata* Evans are morphologically similar, suggesting perhaps a reliable cronostratigraphic index species for correlation between the classic sediments of Mt. Crosby, and the Ipswich "Series", both from the Australian Upper Triassic, and the Potrerillos Formation of the Upper Triassic in Argentina.

Family **Scytinopteridae** Handlirsch, 1906
Argentinocicada n. gen.

Type-species: *Argentinocicada magna* n. sp., by present designation.

Derivatio nominis: Argentina, from which the material originates, and cicada, from Cicadidae.

Diagnosis.

Wing similar to *Tipuloidea* Wieland, 1925 in the general aspect of the venation but with **RA3+4** unbranched and **MP2** and **MP4** branched; **MP3** originates far from the discal cell and **m-cua** not aligned with the discal cell and **MP1**.

Discussion

Tipuloidea Wieland, 1925 was one of the first insect genera described from the Triassic of Argentina. Despite the inappropriate name, in which a slight modification refers to a superfamily of nematocerous Diptera, and the incorrect original designation of a dipteran rather than an Auchenorrhyncha, several other problems bedevil this historically important material. In his original draft (Wieland, 1925, figs. 2, 3) there is no indication of **CuA** prolongation, linking it a **CuP**; **RA** is slightly curved; **RP** is longer and parallel to **RA**; and **CuP** and **CuA2** are distally fused (see figure 2F). In another paper, Wieland (1926, figure 2) drafts the same specimen differently, in which the **CuP** is not distally fused with **CuA2**; the **CuA** prolongation is not linked to the **CuP** base; **RA** is notably sigmoid and there is an extra branch of **MP4** (see figure 2D). Tillyard (1925) who is noted for the correct classification of the same specimen, redrew it but neglected the extra branch of **MP4** without discussing this feature (see figure 2F). With the discovery of new material we suggest that it belongs to the same above genus. Despite the evident inconsistency of the published drawings, a series of structural differences readily justifies generic separation. *Argentinocicada* n. gen. differs from *Tipuloidea* Wieland by having **RA3+4** unbranched and parallel to **RP**, in which distal extremities deflect at an angle approximately 45° forward the costal margin. **MP2** is branched, from which originate the two branches **MP2A** and **MP2B**, both of which are the same size, forking at the mid-length of **MP2**. **MP3** originates far from the discal cell, unlike *Tipuloidea* Wieland, which has its origin in the discal cell. **MP4** is branched, with **MP4A** parallel to **MP3**, and **MP4b** convergent to **CuA1**, unlike *Tipuloidea* Wieland which does not have **MP4** branched (except in the Wieland version of 1926). However, in the present interpretation, **MP4b** is regarded as sigmoid, divergent of **CuA1**, with both branches forming the base of the discal cell, unlike *Argentinocicada* n. gen. where **MP4A** forms the upper part and **MP4B** the lower part of the discal cell. Additionally, *Argentinocicada* n. gen. does not have **m-cua** aligned with the discal cell, and **MP1** is found as in *Tipuloidea* Wieland. In *Argentinocicada* n. gen. **m-cua** is aligned with a nodal line that follows the costal margin, the distal part of which provides a branch of **RA3+4**.

Argentinocicada magna n. sp.
Figs. 2C, 4A

Derivatio nominis: From Latin, big, alluding to the large size of the species.

Holotype: PZ-CTES-5729, housed at the Paleozoological Collection of the Facultad de Ciencias Exactas, Naturales y Agrimensura, de la Universidad Nacional del Nordeste. Corrientes Province, Argentina.

Type locality, type stratum and age: As for *Dysmorphoptiloides acostai* n. sp.

Diagnosis

As for the genus. Wing length approximately 30 mm, nearly three times longer than wide. Costal area broad at wing base.

Description

Forewing 28 mm in length and 10 mm wide. Costal area broad at wing base, narrowing slightly towards the apex. **RA** long, slightly curved, branching after half the distance to the wing apex, branching into **RA1+2** which is relatively long. **RA3+4** intersects the costal margin near the apical margin. **RP** long and its origin occurs approximately at the basal 1/3

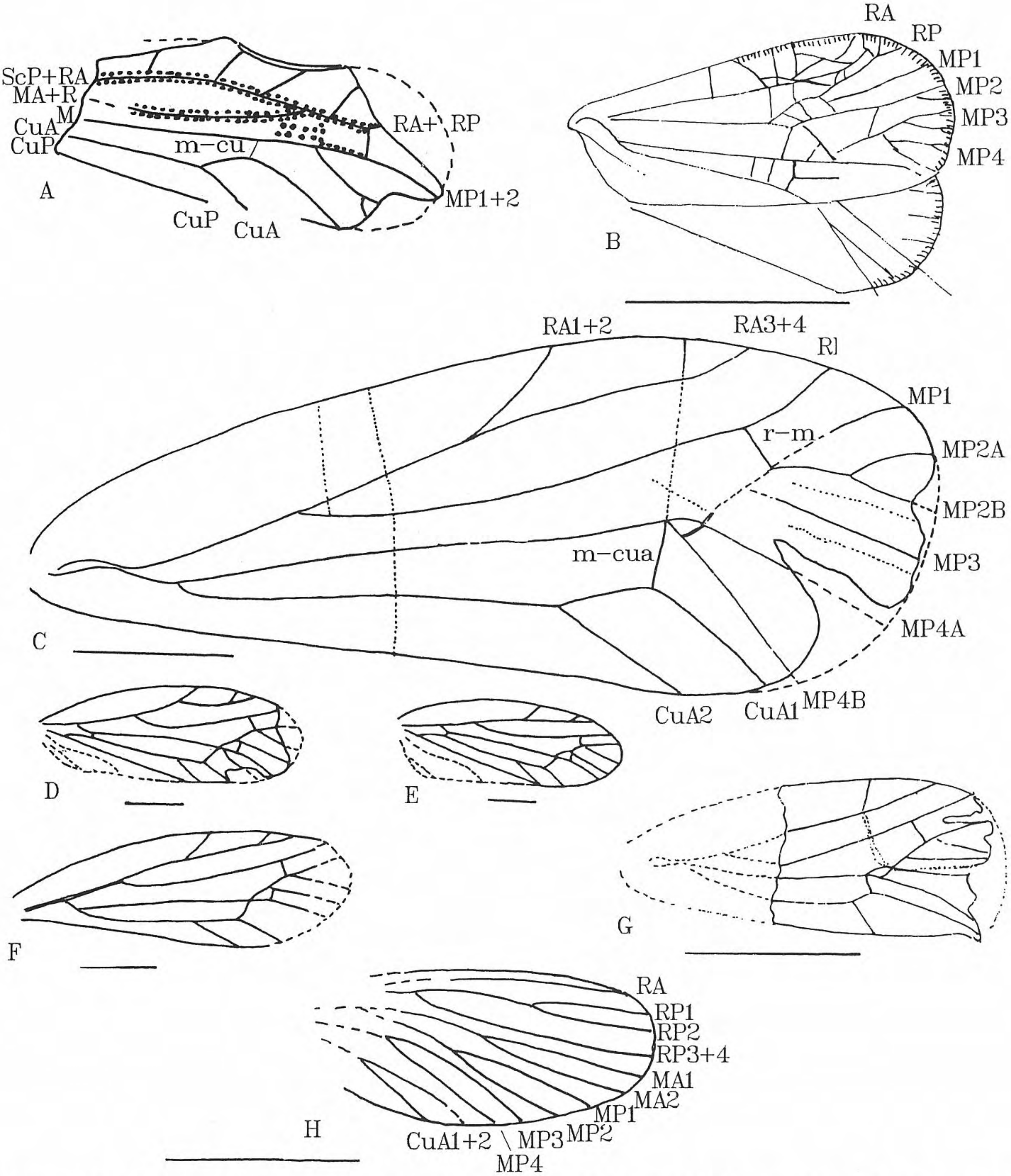

Figure 2. **A**. Forewing of *Dysmorphoptiloides acostai* n. sp., holotype. **B**. Forewing of *Potrerillia nervosa* n. sp., holotype. **C**. Forewing of *Argentinocicada magna* n. sp., holotype. **D**. Forewing of *Tipuloidea rhaetica* Wieland, redrawn from Wieland (1925, fig. 2). **E**. Forewing of *Tipuloidea rhaetica* Wieland, redrawn from Wieland (1926, fig. 2). **F**. Forewing of *Tipuloidea rhaetica* Wieland redrawn from Tillyard (1925, fig. 1). **G**. Forewing of *Argentinocicada minima* n. sp., holotype. **H**. Forewing of *Miomina mendozina* n. sp., holotype. Scale bar 5 mm. Terminology: **CuA**, **CuP**, anterior and posterior cubitus, respectively; **MA**, **MP**, anterior and posterior media, respectively; **RA**, **RP**, anterior and posterior radial, respectively; **ScP**, posterior subcostal; **cua-cup**, anterior cubital-posterior cubital cross-vein; **m-cu**, medial-cubital cross-vein; **r-m**, radial-medial cross-vein.

of the wing length, following in parallel fashion the **RA3+4** vein, deflecting apically toward the margin of both costal and apical areas. **M** long, originating in the central region of the wing, diverging into four secondary branches: **MP1** curved; **MP2** two branched (**MP2A** and **MP2B**), all of similar size; **MP3** straight and **MP4** two-branched (**MP4A** and **M4B**), both long and straight. Discal cell small, formed anteriorly by the **MP4a** base and posteriorly by the **MP4b** base, connected by an aligned cross-vein with the extension of **MP1**. **MP3** does not form the discal cell. **MP4a** parallel to both **MP3** and **MP4B**, and convergent to **CuA1**. **r-m** relatively long, placed in the **MP1+2** fork. **CuA** long, slightly divergent to **M**, distally forked. **CuaA1** curved, deflecting toward the apical margin, convergent to **MP4b**, but not fused to it. **CuA2** shorter, straight, attaining the anal margin near the boundary of the apical margin. **m-cua** long, straight, oblique to the anal margin; the anterior portion occurs within the **M** fork, an extension of which forms a nodal line that reaches the costal margin, forming a false **RA** fork (Fig. 2C).

Discussion

In addition to generic characters already discussed, *Argentinocicada magna* n. sp. differs from *Tipuloidea rhaetica* Wieland, 1925, by having a greater length (28 mm) and a greater length/wide ratio: approximately 3 in *Argentinocicada magna* and 2.5 in *Tipuloidea rhaetica*. *Argentinocicada magna* n. sp. also possesses a relatively longer costal area.

Argentinocicada minima n. sp.

Figs. 2G, 4B-C

Derivatio nominis: From Latin, small, alluding to the small size of the species.

Holotype: PZ-CTES n° 5776 (Figs. 2G, 4C), housed at the Paleozoological Collection of the Facultad de Ciencias Exactas, Naturales y Agrimensura de la Universidad Nacional del Nordeste at Corrientes, Argentina.

Suplementary specimen: PZ-CTES-5733 (Fig. 4B). Housed in the same institution as above.

Type locality, type stratum and age: As for *Dysmorphoptiloides acostai* n. sp.

Diagnosis

Wing similar to *Argentinocicada magna* n. sp. in general venational aspect, but much smaller. Length approximately 15 mm; width approximately 7 mm. **CuA1** relatively longer.

Description

Forewing apical fragment 7 mm in length and 7 mm wide. Costal area narrowing towards the apex. **RA** long, slightly curved. **RA3+4** connects to the costal margin near the boundary of the wing apical margin. **RP** long, straight, rather parallel to **RA**. **M** with four secondary branches: **MP1** curved; **MP2** shorter; **MP3** parallel to posterior margin of the wing and **MP4** with two long branches (**MP4a** and **MP4b**). Discal cell small, formed anteriorly by the **MP4a** base and posteriorly by the **MP4b** base, linked by a cross-vein aligned with the **MP1** extension. **MP3** does not belong to the discal cell. **MP4a** parallel to **MP3** and **MP4b,** convergent to **CuA1**. **r-m** relatively long, occurring anterior to the **MP1+2** fork. **CuA** long, distally forked: **CuA1** curved, long, deflected towards the anal margin. **CuA2** shorter, quite straight, reaching the anal margin at 1/3 of the distance to the wing apex. **m-cua** relatively short, oblique to **CuA2** of which the anterior part lies in the **M** fork (Fig. 2G).

Discussion

Argentinocicada minima n. sp. differs of *A. magna* n. sp., found in the same sediments, by a notably smaller size. Additionally, *A. minima* n. sp. has a truly distal bifurcation in the **RA** vein and an absence of a nodal line linking **m-cua** to the costal margin. The **m-cua** cross-vein is more oblique and smaller than **r-m,** unlike *A. magna* n. sp. with its **m-cua** quite vertical and longer than **r-m**. Other differences such as an unbranched **MP2**, relatively longer **CuA2** and **MP4a** horizontal, are characteristics that clearly distinguish this taxon from the other species of *Argentinocicada*.

Potrerillia n. gen.

Type-species: *Potrerillia nervosa* n. sp., by present designation.

Derivatio nominis: Alusive to Potrerillos, local stratigraphic unit.

Diagnosis

Forewing with the radial area bearing rich cross veined venation forming a mosaic of cells. **M** with four principal secondary branches, each of which is dichotomous. **CuA** long and straight terminating at the anal margin apically.

Discussion

Forewing similar to *Permopibrocha* Martynov, 1936, of the the Russian Lower Permian, in its general venational aspect and principally by having a similar network of cross-veins and by a dichotomizing **M**. However, *Potrerillia* n. gen. differs from *Permopibrocha* by having cross-veins in the subcostal area and a long and straight cubital vein. In this respect, *Potrerillia* n. gen. is similar to *Permobrachus* Evans, 1943, described from the Australian Upper Permian, but differs from it in all other observed aspects. The large number of cells and rich venation in the subcostal area are characters found in *Mesocixiella* Martynov, 1937, described from the Russian Lower Jurassic, which includes a long cubital vein. *Potrerillia* n. gen. differs, however, by having a larger number of **M** branches. The classification in the Family Scytinopteridae is based on the presence of accessory veins. These accessory veins occur in all of the constituent genera and also in *Orthoscytina* Tillyard, 1926, described from the Australian Permian,

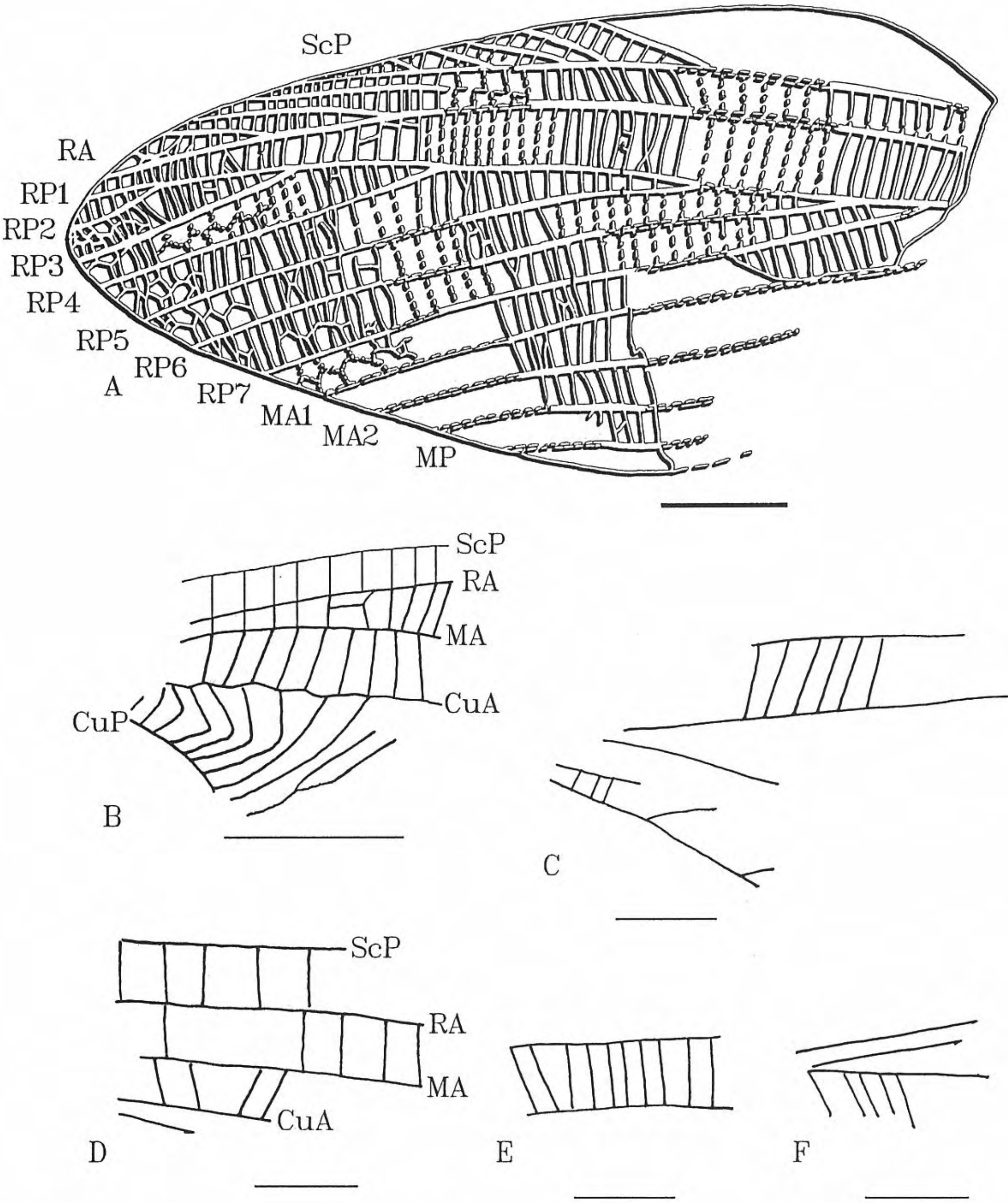

Figure 3. **A**. Forewing of *Notopamphagopsis bolivari* Cabrera, 1928, drawn from holotype. **B-F**. *Notopamphagopsis ?* sp. wing fragments. Terminology see Fig. 2. Scale bar 5 mm.

Mesodipthera Tillyard, 1922, described from the Australian Upper Triassic, and *Triassoscytinops* Evans, 1956, also from the Australian Triassic.

Potrerillia nervosa n. sp.

Figs. 2B, 5A

Derivatio nominis: Referring to the high number of accessory veins.

Holotype: PZ-CTES-5728, housed at the Paleozoological Collection of the Facultad de Ciencias Exactas, Naturales y Agrimensura de la Universidad Nacional del Nordeste at Corrientes, Argentina.

Type locality, type stratum and age: As for *Dysmorphoptiloides acostai* n. sp.

Diagnosis

As for the genus. Forewing length around 8 mm.

Description

Forewing 7.8 mm long. Costal and apical margins very corrugated. Subcostal area relatively wide, filled by several cross-veins and accessory veins. **RA** long, distally deflected, often broken by cross-veins. **RP** short, originating near the apex. **M** with four principal secondary branches: **MP1, MP2** and **MP3,** all of which have marginal dichotomies; **MP4** with four secondary dichotomies, all possessing supplementary marginal dichotomies. **CuA** long, straight, terminating at the anal margin apically. **CuP** divergent from **CuA** and reaching the anal margin beyond half the distance from the wing base to apex (Fig. 2B).

ORDER MIOMOPTERA Martynov, 1927
Family indeterminate
Miomina n. gen.

Type-species: *Miomina mendozina* n. sp., by present designation.

Derivatio nominis: Indicative of the order Miomoptera.

Diagnosis

Forewing with **RA** and **RP3+4** unforked; **CuP** and **AA** forked.

Discussion

This specimen differs from all known genera by having **CuP** and **AA** forked, and by **RA** and **RP3+4** unforked. Single **RA** and **RP3+4** occur in some species of the genus *Delopterum* Sellards, 1909, such as *D. incertum* Martynova, 1958 (Upper Permian of Russia) and *D. sinuosum* Kukalova-Peck ,1991 (Fig. 6.26; Lower Permian of the Czech Republic). In *Palaeomantis schmidti* Handlirsch, 1904 (Lower Permian of Russia) **RA** is forked although **RP3+4** is single; in all above mentioned species **CuP** is unforked. *Tychtodelopterum relictum* Martynova, 1958 (Upper Permian of the Kuznetsk Basin, Russia) has a **RA** single and **CuP** forked, but four bifurcations in **RP** (**RP1** to **RP4**). This cluster of characters only occurs in *Miomina* n. gen. In consequence, it is proposed that a new genus be created for the Argentine material.

Miomina mendozina n. sp.
Figs. 2H, 5B

Derivatio nominis: From Mendoza, the province from which the material originates.

Holotype: PZ-CTES-5731, housed in the Palaeozoological Collection of the Facultad de Ciencias Exactas, Naturales y Agrimensura de la Universidad Nacional del Nordeste at Corrientes, Argentina.

Type locality, type stratum and age: As for *Dysmorphoptiloides acostai* n. sp.

Diagnosis

As for the genus.

Description

Preserved forewing length 8 mm. The base and the costal margin of the wing are not preserved. **RA** long, unforked, terminating at the costal margin near the apex. **RP** with two principal branches: **RP1+2** dichotomizing into two relatively long branches: **RP1** and **RP2** and **RP3+4** which is unbranched, and reaches the wing apex. **MP** forks anteriorly to the level of the **RP1+2** forks, near half of the distance to the wing apex. **MP1+2** and **MP3+4** are longer than both **RP1** and **RP2**. **CuA** dichotomizes shortly anterior to the **MP** fork, resulting in two branches (**CuA1** and **CuA2**) slightly shorter than both **MP1+2** and **MP3+4**. **CuP** forks anteriorly of the **RP1+2** and **RP3+4** forks, and forks into two long branches (**CuP1** and **CuP2**) that are longer than **RP**, **MP** and **CuA**. **AA** forks shortly anterior of the **CuP** forks, dichotomizing into two branches of similar size to the **RP1** and **RP2** ones. The wing surface is covered by a fine homogeneous granulation (Fig. 2H).

Discussion

The combination of characteres of *Miomina mendozina* n. sp. is unique, distinguishing it from all described species of Miomoptera. Despite the description of a nymph from the same region, *Triasseuryptilon acostai* (Marquat) Storozhenko, 1997 (not the Miomoptera of Marquat, 1991, but the Grylloblattida of Storozhenko, 1997), it is virtually impossible to assimilate it with the material described here. Although the known adult specimens are morphologically close to the genera *Palaeomantis* Handlirsch, 1904 and *Delopterum* Sellards, 1909, they can be separated morphologically from *Miomina mendozina* n. sp., which justifies its new taxonomic status.

ORDER ENSIFERA *sensu* Martins-Neto, 1991
Family **Haglidae** *sensu* Gorochov, 1995
Notopamphagopsis Cabrera, 1928

Type-species: *Notopamphagopsis bolivari* Cabrera, 1928, by original designation.

Diagnosis

Similar to *Apsataboilus* Gorochov, 1990a, from the Upper Mesozoic of Eastern Transbaikalia by having four secondary branches of **ScP**, differing however by having seven branches of **RP** (five in *Apsataboilus* Gorochov) and a narrower costal field. Distal part of **MA** and **MP** veins as for *Apsataboilus* Gorochov.

Discussion

Notopamphagopsis is very similar in all preserved venational aspects to the Russian genus *Apsataboilus* described from the Upper Cretaceous of Transbaikalia, and differs only in the presence of additional **RP** secondary branches.

Notopamphagopsis bolivari Cabrera, 1928
Fig. 3A

*1928 *Notopamphagopsis bolivari* Cabrera, 372, figs. 1 and 2.

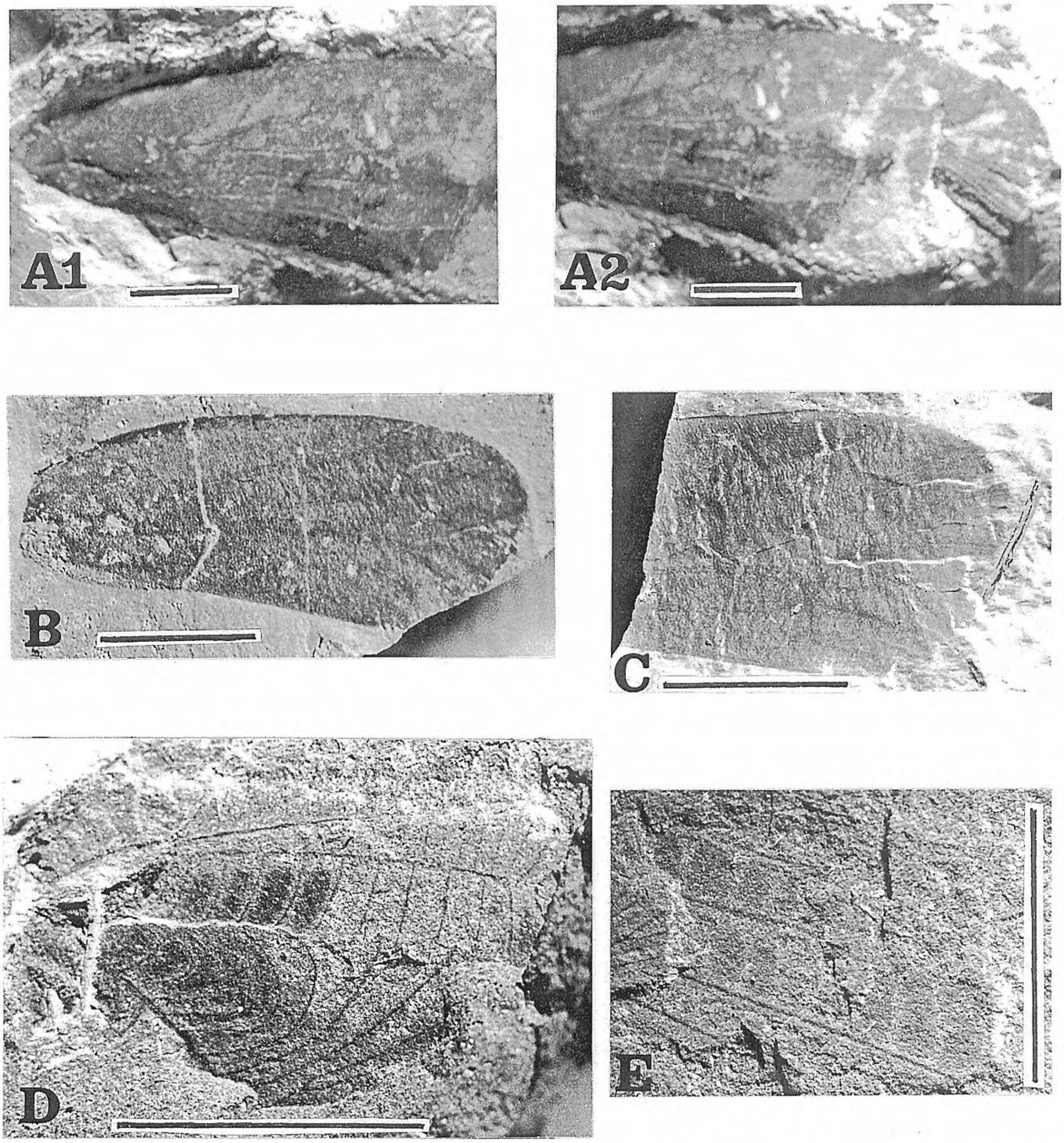

Figure 4. **A**. *Argentinocicada argentina* n. sp., holotype, respectively the basal part (A1) and the apical part (A2) of the same specimen. **B-C**. *Argentinocicada minima* n. sp., respectively a complementary material (B) and the holotype (C). **D-E**. *Notopamphagopsis* sp, isolated fragments. Scale bar 5 mm.

1939 *Notopamphagopsis bolivari* Cabrera; Zeuner, 18.
1962 *Notopamphagopsis bolivari* Cabrera; Rohdendorf, 201.
1968 *Notopamphagopsis bolivari* Cabrera; Sharov, 51.
1991 *Notopamphagopsis bolivari* Cabrera; Martins-Neto, 26.
1992 *Notopamphagopsis bolivari* Cabrera; Carpenter, 168.
1995 *Notopamphagopsis bolivari* Cabrera; Gorochov, 137.
1997 *Notopamphagopsis bolivari* Cabrera; Gallego, 511.

Holotype: MLP Nº 4354, housed in the Departamento de Paleontologia, Invertebrados, Museo de La Plata, Argentina.

Type locality: Cerro Cacheuta, Mendoza. Argentina (possibly the same horizon as EP I and EP II of Morel, 1994).

Type stratum: Potrerillos Formation.

Age: Late Middle Triassic to early Late Triassic.

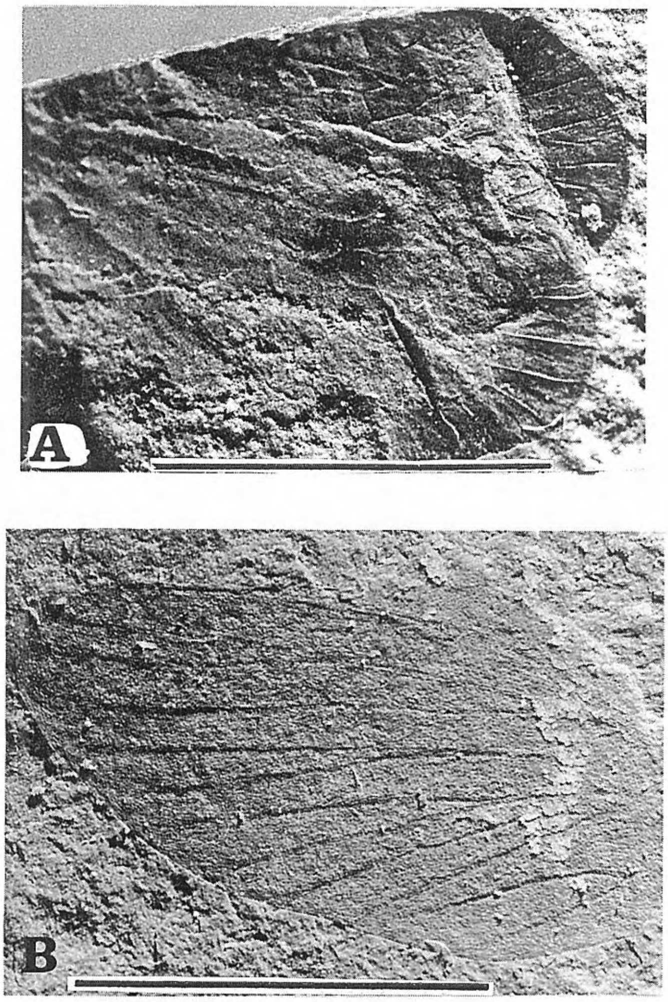

Figure 5. A. *Potrerillia nervosa* n. sp., holotype. **B**. *Miomina mendozina* n. sp., holotype. Scale bar 5 mm.

Diagnosis

As for the genus.

Description

Preserved apical part of forewing length 36 mm. Costal area wide, narrowing toward the apex. **ScP** long, terminating at the costal margin near the apex. Costal field filled by several cross-veins and an archedictyon. **RA** long, four-branched, parallel to **ScP. RP** seven-branched. **MA1, MA2** and **MP** preserved only distally, all which are parallel to **RP**7. Several cross-veins traverse the wing, forming rectangular cells and archedictions in the apical region.

Remarks.

This wing fragment is very similar to several haglid taxa, especially the genus *Prophalangopsis*, including the Tettavidae. The apical arrangement of the secondary branches of **RA** resembles *Apsataboilus sibiricus* Gorochov, 1990a, differing by the number of **RP** branches: seven in *Notopamphagopsis bolivari*, five in *Apsataboilus sibiricus* as well as in several related species of *Aboilus* Martynov.

Notopamphagopsis ? sp.
Fig. 3B-F

Material: PULR(I)- 223, housed in the Invertebrate Palaeontological Collection, Universidad Nacional de La Rioja, Argentina.

Locality: Gualo, La Rioja Province, Argentina.

Description

Forewing basal fragment of a male specimen. **RP** and **MP** slightly divergent with six preserved cross-veins. **MP** somewhat curved. **CuA** poorly preserved and the area between **MP** and **CuA** with cross-veins relatively long, forming squarish cells, relatively homogeneous in both size and form. Cubital area with eleven cross-veins, all which are long; the first ones are notably curved, forming the harp of a stridulatory apparatus. **CuP** partially preserved (Fig. 3B).

Remarks

This specimen probably belongs to the genus *Notopamphagopsis*. However, its venation is very similar to several genera such as *Hagla* Giebel, 1856, *Aboilus* Martynov, 1925, *Archihagla* Sharov, 1968, *Isfaroptera* Martynov, 1937, *Afrohagla* Gorochov, 1990b and several related genera. Other fragments found in the same area (Figs. 3C, D, E and F) probably also belong to *Notopamphagopsis*.

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