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The Triassic insect fauna from Argentina. Coleoptera from the Los Rastros Formation (Bermejo Basin), La Rioja Province

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Abstract. New fossil insect taxa from the Los Rastros Formation (early Late Triassic), La Rioja Province (Argentina) are described. Four new genera and fourteen new species of the order Coleoptera are proposed: *Ademosyne arcucciae* Martins-Neto and Gallego sp. nov., *Ademosyne elongatus* Martins-Neto and Gallego sp. nov., *Ademosyne hexacostata* Martins-Neto and Gallego sp. nov., *Ademosyne punctuada* Martins-Neto and Gallego sp. nov., *Argentinosyne frenguellii* Martins-Neto and Gallego gen. *et* sp. nov., *Argentinosyne gonaldiae* Martins-Neto and Gallego sp. nov., *Argentinosyne gualoensis* Martins-Neto and Gallego sp. nov., *Argentinosyne rugosa* Martins-Neto and Gallego sp. nov., *Argentinosyne losrastrosensis* Martins-Neto and Gallego sp. nov., (Permosynidae Tillyard), *Argentinocupes pulcher* Martins-Neto and Gallego gen. *et* sp. nov., *Argentinocupes abdalai* Martins-Neto and Gallego sp. nov. (Cupedidae Lacordaire), *Gemelina triangularis* Martins-Neto and Gallego gen. *et* sp. nov., *Cardiosyne obesa* Martins-Neto and Gallego gen. *et* sp. nov., and *Cardiosyne elegans* Martins-Neto and Gallego sp. nov. (Elateridae? Leach). Additionally new specimens assigned to *Argentinosyne rugosa* Martins-Neto and Gallego sp. nov. and *Argentinosyne gonaldiae* Martins-Neto and Gallego sp. nov., from the Cacheuta Formation (early Late Triassic), Uspallata, Mendoza Province (a new locality for insects) are included in this paper.

Resumen. La fauna de insectos triásicos de la Argentina. Coleoptera de la Formación Los Rastros (Cuenca del Bermejo), provincia de La Rioja. En esta contribución se describen nuevos taxones de insectos fósiles provenientes de la Formación Los Rastros (Triásico Tardío bajo), provincia de La Rioja, Argentina. Se proponen cuatro géneros y catorce especies nuevas pertenecientes al orden Coleoptera: *Ademosyne arcucciae* Martins-Neto y Gallego sp. nov., *Ademosyne elongatus* Martins-Neto y Gallego sp. nov., *Ademosyne hexacostata* Martins-Neto y Gallego sp. nov., *Ademosyne punctuada* Martins-Neto y Gallego sp. nov., *Argentinosyne frenguellii* Martins-Neto y Gallego gen. *et* sp. nov., *Argentinosyne gonaldiae* Martins-Neto y Gallego sp. nov., *Argentinosyne gualoensis* Martins-Neto y Gallego sp. nov., *Argentinosyne rugosa* Martins-Neto y Gallego sp. nov., *Argentinosyne losrastrosensis* Martins-Neto y Gallego sp. nov, (Permosynidae Tillyard), *Argentinocupes pulcher* Martins-Neto y Gallego gen. *et* sp. nov., *Argentinocupes abdalai* Martins-Neto y Gallego sp. nov. (Cupedidae Lacordaire), *Gemelina triangularis* Martins-Neto y Gallego gen. *et* sp. nov., *Cardiosyne obesa* Martins-Neto y Gallego gen. et sp. nov., y *Cardiosyne elegans* Martins-Neto y Gallego sp. nov. (Elateridae? Leach). Adicionalmente, se incluyen en este trabajo nuevos especímenes asignados a *Argentinosyne rugosa* Martins-Neto y Gallego sp. nov. y *Argentinosyne gonaldiae* Martins-Neto y Gallego sp. nov., provenientes de la Formación Cacheuta (Triásico Tardío bajo), Uspallata, provincia de Mendoza (una nueva localidad para insectos).

Key words. Triassic insects. Coleoptera. Los Rastros Formation. Argentina.

Palabras clave. Insectos triásicos. Coleoptera. Formación Los Rastros. Argentina.

Introduction

The present contribution on Triassic insect faunas from Argentina describes fossil insects of the order Coleoptera from the Los Rastros Formation (Río Gualo, Picos Gemelos, Agua Escondida, and quebrada de Ischichuca Chica localities, La Rioja Province) (figure 1). Additionally, two species from the Cacheuta Formation (Cuyo Basin) at Paramillos de Uspallata (Mendoza Province, Argentina) are recorded, the first unquestionable insects from this formation (see Gallego, 1997). The history of research and the previously described species were discussed by Gallego (1997), Gallego and Martins-Neto (1999), Martins-Neto and Gallego (1999, 2001) and Martins-Neto *et al.* (2003, 2005).

The record of fossil coleopterans in the Argentinean Triassic includes studies by Frenguelli (1934, 1948) and Fossa Mancini (1941). Frenguelli (1948) mentioned the presence of coleopteran elytra in the Ischigualasto Formation (San Juan Province), but

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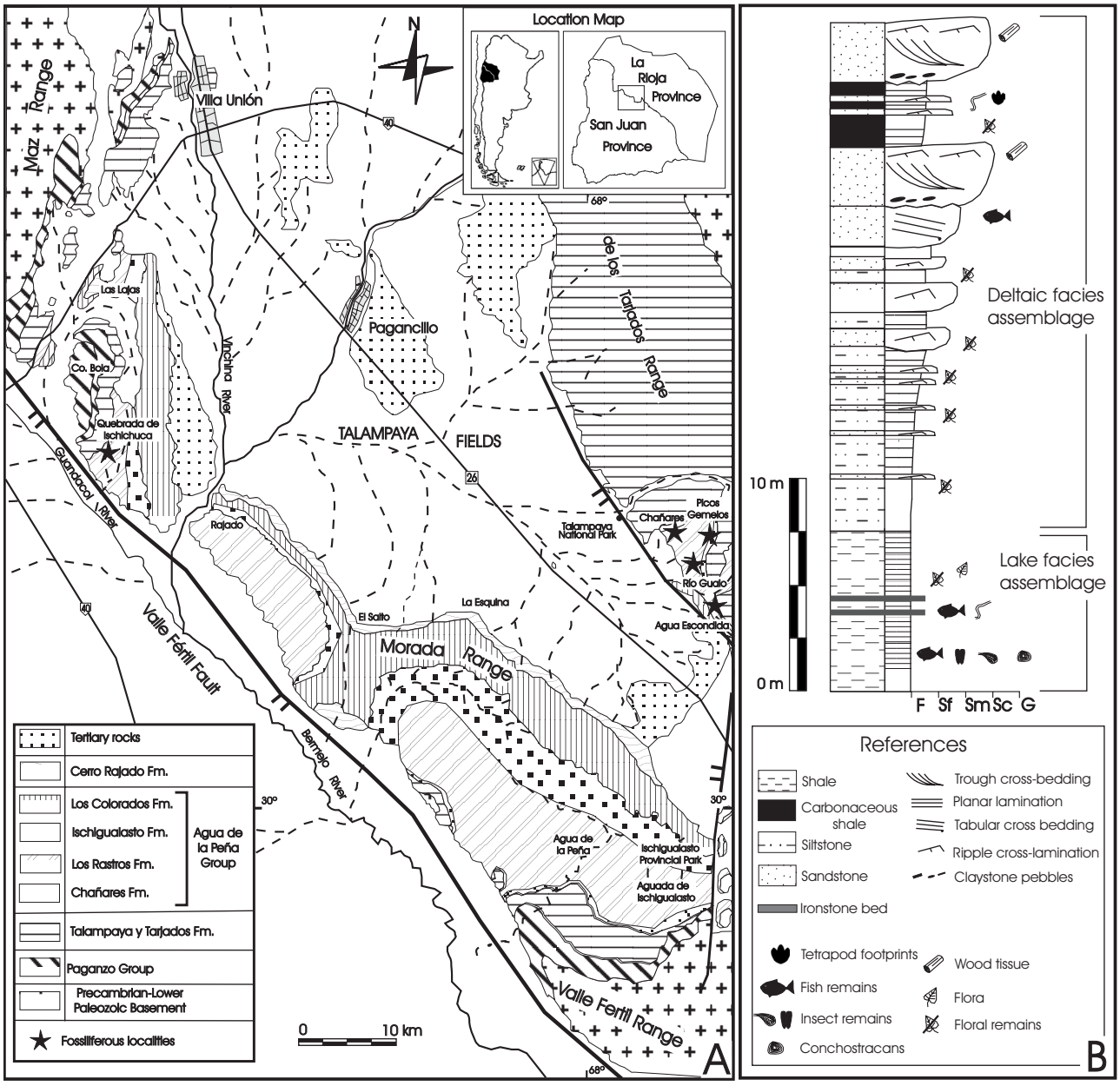


Figure 1. A, Geologic map of the Bermejo Basin (modified from Stipanicic and Bonaparte, 1979 and Kokogian *et al.*, 2001) / *mapa geológico de la Cuenca del Bermejo (modificado de Stipanicic y Bonaparte, 1979 y Kokogian* et al., *2001).* **B,** Schematic section of the Los Rastros Formation indicating fossiliferous horizons / *sección esquemática de la Formación Los Rastros indicando los horizontes fosilíferos.*

these levels probably correspond to the Los Rastros Formation (*sensu* Stipanicic and Bonaparte, 1979). In a recent field trip to the Ischigualasto park (San Juan Province), Gallego *et al.* (2004) found specimens probably assignable to the new genera *Argentinosyne* and *Argentinocupes* from the Los Rastros Formation. The only west Gondwanan coleopteran records are from the Jurassic of Antarctica (Zeuner, 1959; Tasch, 1973). Gallego and Covacevich (1998) mentioned the unique occurrences of fossil insects (probably coleopterans) in the Triassic of Punta Puquén and Los Molles areas in Chile (Fuenzalida, 1937; Cecioni and Westermann, 1968). Additional records referable to *Ademosyne hexacostata* sp. nov. (Permosynidae) came from the Upper Triassic of Bio-Bío river from southern central Chile (Gallego *et al.*, 2005) and from the Ischichuca Formation (late Middle Triassic - early Late Triassic) from La Rioja Province, Argentina.

The stratigraphic and geographic sources (figure 1) of these paleoentomofaunas are well documented in the Triassic literature and were briefly treated in other papers by the authors (Martins Neto *et al.*, 2003, 2005). The coleopterans specimens came from the lake facies assemblages of the first to fifth sedimenta-

ry cycles from the Los Rastros Formation, exposed at the localities mentioned above (figure 1).

The samples from the Los Rastros Formation were collected by OFG, A. Arcucci, C. Forster, C. May and R. Rogers during 1995 and by ACM, A. Arcucci and C. Marsicano in 1999, and from the Cacheuta Formation by OFG and R. Herbst during 1995.

The terminology adopted here conforms mainly that of Ponomarenko (1969).

The repository and institutional abbreviations used here are as follows. PULR-I: Paleontology Collection, Museo de Ciencias Naturales, Universidad Nacional de La Rioja, La Rioja, Argentina. CTES-PZ: Paleozoological Collection, Facultad de Ciencias Exactas y Naturales y Agrimensura, Universidad Nacional del Nordeste, Corrientes, Argentina. MCNAM-PI: Museo de Ciencias Naturales y Antropológicas "Cornelio Moyano", Mendoza, Argentina.

Systematic paleontology
(by Martins-Neto and Gallego)

Order COLEOPTERA Linnaeus, 1758
Family PERMOSYNIDAE Tillyard, 1924 (including Ademosynidae Ponomarenko, 1969)

Genus ***Ademosyne*** Handlirsch, 1906

Type species. *Ademosyne major* Handlirsch, 1906, Pl. 39, Fig. 14, from the Australian Triassic.

Ademosyne arcucciae Martins-Neto and Gallego sp. nov.
Figures 2.A1-A10, 4.A

1997. *Ademosyne* sp. Gallego, p. 513, lám. I, fig. G.
1999. *Ademosyne arcucciae* Gallego and Martins-Neto (*nomen nudum*), p. 88, Fig. 7.

Etymology. Dedicated to Andrea Arcucci for her great contribution to the knowledge of the Los Rastros fossil biota.

Material. Holotype: PULR-I 298 (figures 2.A1, 4.A). **Paratypes:** from Picos Gemelos (5th cycle), fifty-five specimens, PULR-I 300a, b, c, d (figures 2.A4, A5, A9, A10), CTES-PZ 7299; from Agua Escondida (4th cycle) eleven specimens, PULR-I 301a, b (figures 2.A3, A7); from Río Gualo (2nd, 3rd and 5th cycle) twenty-nine specimens, PULR-I 224a, b (figures 2.A2, A6), PULR-I 302a (figure 2.A8); from quebrada Ischichuca Chica (1st and 4th cycle) two specimens, PULR-I 306, (see table I).

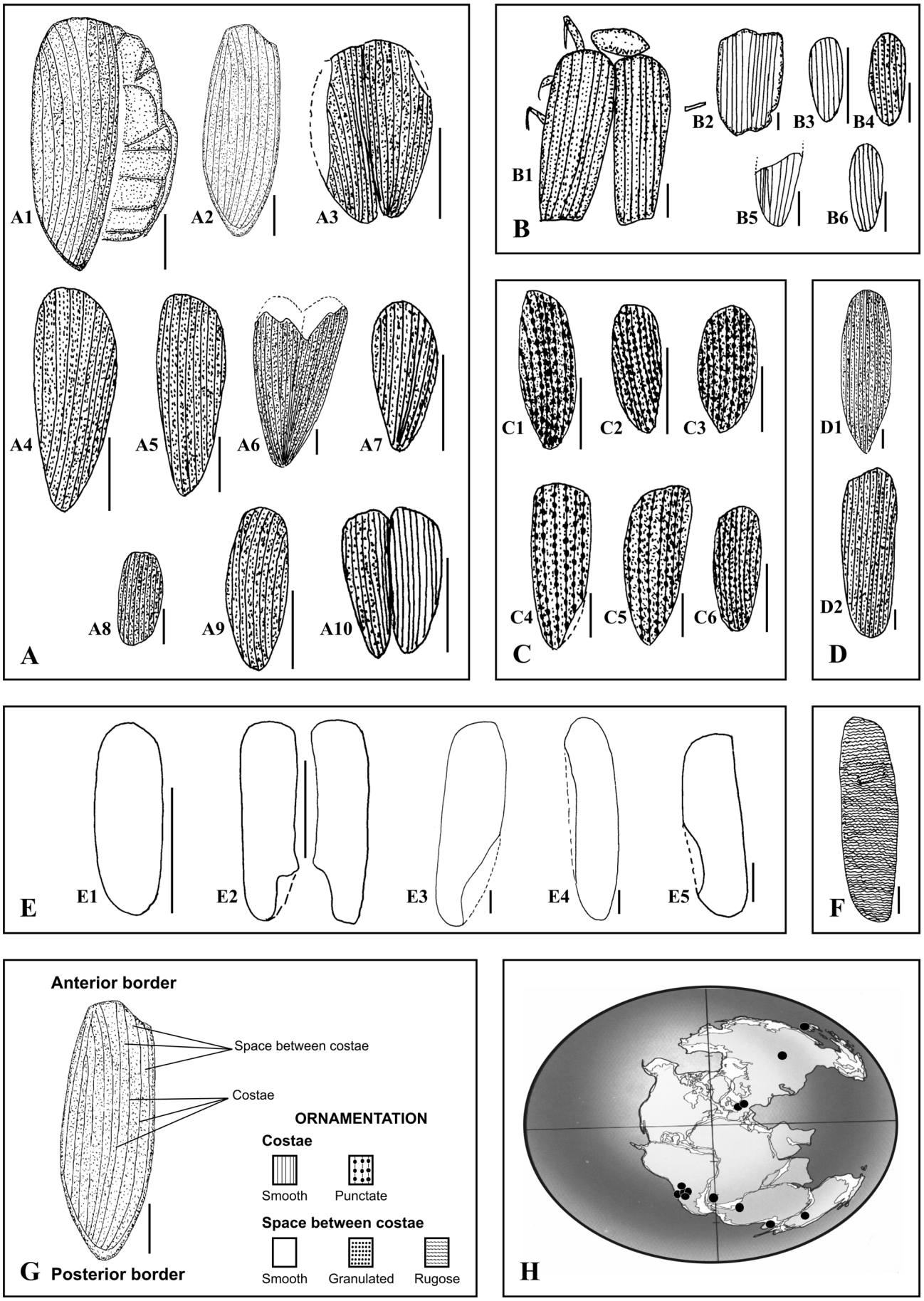
Type locality. Picos Gemelos, La Rioja Province, Argentina.
Type stratum. 5th cycle from the Los Rastros Formation.
Age. Early Late Triassic.
Diagnosis. Elytra length varying from 1.4 to 9.3 mm (media 3.9, standard deviation +/- 0.4) and width varying from 0.3 to 3.2 mm (media 1.52, standard deviation +/- 0.12). Length/width ratio varying from 1.4 to 3.6 (media 2.47, standard deviation +/- 0.28). Elytron with nine costae. Costae ornamentation smooth. Space between costae bears granulated ornamentation.
Description of the holotype (figures 2.A1, 4.A). Elytron 9.25 mm long and 3.02 mm wide (L/W relation = 3), with narrow lateral border. Nine smooth, non-convergent costae. Space between costae bearing small granules homogeneously distributed over the whole elytron surface.
Discussion. In the original diagnosis of *Ademosyne* by Dunstan (1923), the elytra are costate without any abnormally wide borders, while the number of costae or intervals, together with size, shape, and other features provide specific differences. The number of costae or intervals varies from eight to eleven, with nine generally present, and a variation in length of elytra between 1.8 mm and 6.2 mm. *Ademosyne arcucciae* sp. nov. has all the generic characters mentioned above. Its length range attains around 9.5 mm, and the smallest size is around 1.5 mm, differing from all the *Ademosyne* species proposed by Handlirsch (1906), Tillyard (1916) and Dunstan (1923), but not enough for the erection of a new genus. In this respect, *Ademosyne arcucciae* sp. nov. is more similar to *Ademosyne speciosa* Riek (1974), from the Molteno Formation (South Africa), but differing in having more conspicuous costae (faint in *Ademosyne speciosa*). *Ademosyne curvata* Dunstan (1923) is an Australian species with a more similar elytra shape.

Ademosyne elongatus Martins-Neto and Gallego sp. nov.
Figures 2.D1-D2, 4.B

Etymology. From Latin, *elongatus*, elongated.

Material. Holotype: PULR-I 303 (figures 2.D1, 4.B). **Paratypes:** PULR-I 304a-b (figure 2.D1), two specimens from Picos Gemelos (5th cycle).

Type locality. Gualo, La Rioja Province, Argentina.
Type stratum. 5th cycle from the Los Rastros Formation.
Age. Early Late Triassic.
Diagnosis. Elytron subelliptical, elongated in shape with length between 6 mm and 9 mm, width between 2 mm and 3 mm. Length/width ratio around 3. Eleven smooth, non-convergent costae. Space between costae bearing small square granules homo-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C2
C3
C4
C5
C6
C
D1
D2
D
E1
E2
E3
E4
E5
E
F
Anterior border
Space between costae
Costae
ORNAMENTATION
Costae
Smooth
Punctate
Space between costae
Smooth
Granulated
Rugose
G Posterior border
H

geneously distributed over the whole elytron surface.

Description of the holotype (figures 2.D2, 4.B). Elytron subelliptical elongated in shape with the proximal margin similar to the distal one, both semicircular, 9 mm long and 2.8 mm wide (L/W relation = 3.2, see table 1). Lateral border narrow. Eleven smooth costae. Ornamentation between costae consisting of small square granules homogeneously distributed over the whole elytron surface.

Discussion. *Ademosyne elongatus* sp. nov. differs from the previously described species by having eleven costae (nine in *A. arcucciae*) and a more elongated elytra (around three times longer than wide in *A. elongatus* and around two and a half times in *A. arcucciae*). *A. elongatus* slightly resembles *Simmondsia cylindrica* Dunstan (1923) from the Triassic of Australia, in general outline and square ornamentation between costae, but differs in the number of costae (eight in *S. cylindrica*), well marked scutellary margin, more conspicuous and strong ornamentation and less length/width ratio.

Ademosyne hexacostata Martins-Neto and Gallego sp. nov.
Figures 2.B1-B6, 4.C

Etymology. Refers to the number (six) of costae.

Material. Holotype: PULR-I 305 (figures 2.B1, 4.C). **Paratypes:** from Pico Gemelos (5th cycle), three specimens, PULR-I 307, from Río Gualo (5th cycle), twelve specimens (PULR-I 308a-e, figures 2.B2 - B6).

Type locality. Río Gualo, La Rioja Province, Argentina.

Type stratum. 5th cycle from the Los Rastros Formation.

Age. Early Late Triassic.

Diagnosis. Elytron elliptical, elongated in shape with length varying between 1.1 and 9 mm (media 2.7, standard deviation +/- 1.31), width varying between 0.33 and 3.3 mm (media 0.99, standard deviation +/- 0.5). Length/width ratio varying between 2.2 and 3.5 (media 2.72, standard deviation +/- 0.33). Six smooth, subparallel costae. Space between costae bearing small granules homogeneously distributed over the whole elytron surface.

Description of the holotype (figures 2.B1, 4.C). Elytron elliptical elongated in shape with the proximal margin similar to the distal one, both semicircular, 5.3 mm long and 1.58 mm wide (L/W ratio = 3.3, see table 1). Lateral border narrow. Six subparallel costae. Ornamentation consisting of small granules homogeneously distributed over the whole surface of elytron.

Discussion. *Ademosyne hexacostata* sp. nov. differs from the previously described species by the costae number (six in *A. hexacostata*, nine in *A. arcucciae*, eleven in *A. elongatus* and eight to eleven in Australian species, *sensu* Dunstan, 1923, p. 73). The L/W ratio in *A. hexacostata* (2.72) is similar to that of *A. arcucciae* (2.65), but differs in having the costae subparallel (divergent in the previously described species).

Ademosyne punctuada Martins-Neto and Gallego sp. nov.
Figures 2.C1-C6, 5.A

Etymology. Refers to the ornamentation of punctated costae.

Material. Holotype: PULR-I 309 (figures 2.C1, 5.A). **Paratypes:** from Picos Gemelos (5th cycle), three specimens (PULR-I 309a; CTES-PZ 7298), from Río Gualo (2nd cycle), five specimens (PULR-I 313a, c-e figures 2.C2, C4-C6) and from Agua Escondida (4th cycle), one specimen (PULR-I 313b, figure 2.C3).

Type locality. Picos Gemelos locality, La Rioja Province, Argentina.

Type stratum. 5th cycle from the Los Rastros Formation.

Age. Early Late Triassic.

Diagnosis. Elytron elliptical, elongated in shape with length varying between 2.83 mm and 4.5 mm (media 3.91, standard deviation +/- 0,4), width varying between 1.16 and 1.66 mm (media 1.52, standard deviation +/- 0.12). Ratio of length/width varying from 2.2 to 2.7 (media 2.47, standard deviation +/- 0.28). Six to nine punctate, non-convergent costae. Space between costae bearing small granules homogeneously distributed over the whole elytron surface.

Figure 2. A1-A10, ***Ademosyne arcucciae*** Martins-Neto and Gallego sp. nov. **A1,** holotype / *holotipo*, PULR-I 298. **A2-A10,** paratypes / *paratipos*, PULR-I 224a, b (A2, A6), PULR-I 302 (A8), PULR-I 300a, b, c, d (A4, A5, A9, A10), PULR-I 301a, b (A3, A7). **B1-B6,** ***Ademosyne hexacostata*** Martins-Neto and Gallego sp. nov. **B1,** holotype/ *holotipo*, PULR-I 305. **B2-B6,** paratypes/ *paratipos*, PULR-I 308a-e. **C1-C6,** ***Ademosyne punctuada*** Martins-Neto and Gallego sp. nov., **C1,** holotype / *holotipo*, PULR-I 309. **C2-C6,** paratypes / *paratipos*, PULR-I 313a-e. **D1-D2,** ***Ademosyne elongatus*** Martins-Neto and Gallego sp. nov. **D1,** paratype / *paratipo*, PULR-I 304. **D2,** holotype / *holotipo*, PULR-I 303. **E1-E5,** ***Argentinosyne gualoensis*** Martins-Neto and Gallego sp. nov. **E1-E4,** paratypes / *paratipos*, PULR-I 311a-d. **E5,** holotype / *holotipo*, PULR-I 320. **F,** ***Argentinosyne rugosa*** Martins-Neto and Gallego sp. nov., holotype / *holotipo*, PULR-I 319. **G,** Schematic drawing of the coleopteran elytron, showing the main diagnostic characters used in the text / *dibujo esquemático del élitro de un coleóptero, mostrando los principales caracteres diagnósticos usados en el texto*. Scale bar / *Escala* = 1 mm. **H,** Paleogeography of known *Ademosyne* species (map adapted from Czerkas and Czerkas, 1990) / *paleogeografía de las especies de* Ademosyne *(mapa adaptado de Czerkas y Czerkas, 1990)*.

Description of the holotype (figures 2.C1, 5.A). Elytron elliptical, elongated in shape with the proximal margin similar to the distal one, both semicircular, with 4.5 mm long and 1.66 mm wide (relation L/W = 2.7, see table 1). Nine punctate, non-convergent costae. Ornamentation consisting of small granules homogeneously distributed over the whole elytron surface.

Discussion. *Ademosyne punctuada* sp. nov. has a combination of characters present in the previously described species such as the L/W ratio (2.47 in *A. punctuada*; 2.72 in *A. hexacostata* and 2.65 in *A. arcucciae*), usually nine costae (as in *A. arcucciae*), occasionally six (as in *A. hexacostata*), costae not convergent, subparallel (as in *A. hexacostata*), and the space between costae bearing small, homogeneously distributed granules (as in all previously described species). The presence of punctate costae is unique for *Ademosyne punctuada* sp. nov., also only previously reported for *A. parva* Dunstan and *A. brevi*s Dunstan from the Ipswich series (Australia). Both forms differ from *A. punctuada* sp. nov. in the costae convergent to the elytron apex, L/W ratio (1.8 in *A. brevis*), and general ovate outline.

Argentinosyne Martins-Neto and Gallego gen. nov.

1997. *Tillyardopsis* in Gallego, p. 514, lám. IH, partim.
1997. *Mesostigmodera*? in Gallego, p. 514, lám. IJ, partim.
1999. *Mesostigmodera* in Gallego and Martins-Neto, p. 87, Fig. 6, partim.

Type species. *Argentinosyne frenguellii* Martins-Neto and Gallego sp. nov., designated here.

Etymology. Refers to República Argentina, and *syne*, common suffix for Permosynidae.

Diagnosis. Elytron length varying from 1.4 mm to 18 mm, width varying from 0.5 mm to 5.5 mm. Length / width ratio varying from 1.4 to 4.3. Elytron without costae and ornamentation varying from homogeneous granules to rugose.

Discussion. *Argentinosyne* gen. nov. differs from *Ademosyne* Handlirsch (1906) and *Platycrossos* Dunstan (1923) in the absence of costae (well-defined in *Ademosyne* as well as *Platycrossos*), as well as by the great size and shape of the elytra. Non-costate genera from Australia, as *Tillyardiopsis* Dunstan, *Mesostigmodera* Handlirsch and *Reeveana* Dunstan slightly resemble the new genus. Due to this fact, in Gallego (1997) and Gallego and Martins-Neto (1999) different specimens of the new genus were tentatively assigned to the first two genera. The three Australian taxa differ from *Argentinosyne* gen. nov. in the elytron shape (equal sutural and lateral borders and boat-like outline in *Reeveana* and *Tylliardiopsis*), broad sutural border and acutelly apex (in *Mesostigmodera*) and ornamentation (smooth only in *Reeveana*, with sigmoid rows of granules in *Mesostigmodera* and convergent in *Tylliardiopsis*).

Argentinosyne frenguellii Martins-Neto and Gallego sp. nov.
Figures 3.A1-A5, 4.D

1997. *Tillyardopsis* sp. Gallego, p. 513, lám. IH.
1997. *Mesostigmodera* ? sp. Gallego, p. 513, lám. IJ.
1999. *Mesostigmodera frenguelli* Gallego and Martins-Neto (*nomen nudum*), p. 88, Fig. 6.

Etymology. In honor of the notable Argentinean naturalist and paleobotanist Joaquín Frenguelli.

Material. Holotype: PULR-I 227 (figures 3.A1, 4.D), CTES-PZ 7297 (counterpart). **Paratypes:** From Picos Gemelos (5th cycle), PULR-I 225 (figure 3.A2), PULR-I 326a-c (figures 3.A3-A5), four specimens.

Type locality. Río Gualo, La Rioja Province, Argentina.

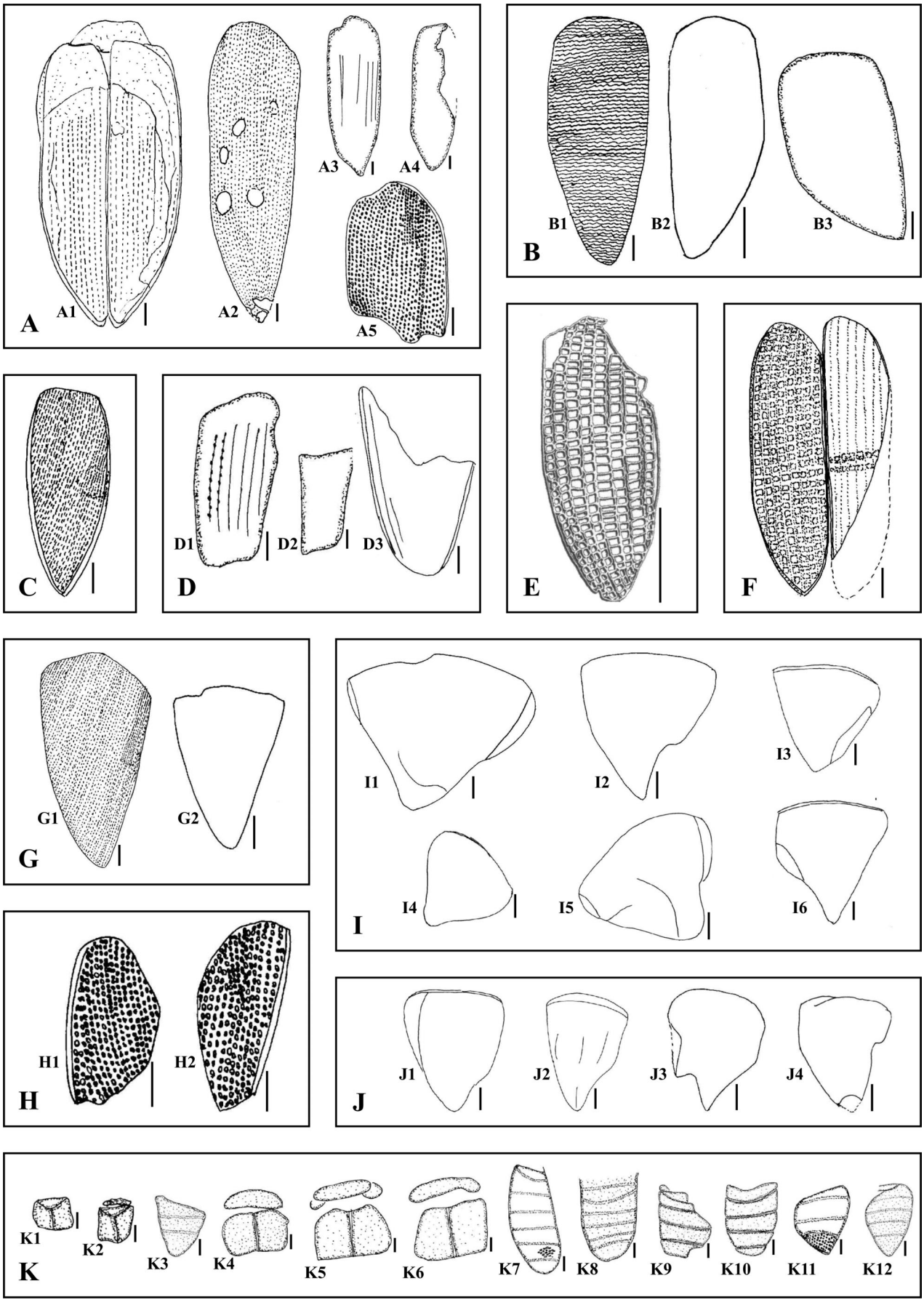
Type stratum. Los Rastros Formation.

Age. Early Late Triassic.

Diagnosis. Elytron length varying from 1.4 mm to 18 mm (media 14.88, standard deviation +/- 1.8), width varying from 3.5 to 5.5 mm (media 4.4, standard deviation +/- 0.65). Length/width ratio varying from 3.6 to 4.2 (media 3.48, standard deviation +/- 0.46). Ornamentation of homogeneous granules.

Description of the holotype (figures 3.A1, 4.D). Rather large permosynid, without well-delimited costae, around four-times longer than wide. Elytron 14.5 mm long and 3.5 mm wide (L/W ratio = 4.14, see table 2), with conspicuous lateral border. Ornamentation consisting of small granules homogeneously distributed over the whole elytron surface.

Figure 3. A1-A5, ***Argentinosyne frenguellii*** Martins-Neto and Gallego gen. *et* sp. nov. **A1,** holotype / *holotipo*, PULR-I 227. **A2-A5,** paratype / *paratipo*, PULR-I 225 (A2), PULR-I 326a-c (A3-A5). **B-C,** ***Argentinosyne gonaldiae*** Martins-Neto and Gallego sp. nov. **B1,** holotype / *holotipo*, PULR-I 321. **B2,** paratype / *paratipo*, PULR-I 322. **B3,** paratype / *paratipo*, CTES-PZ 7305a. **C,** paratype / *paratipo*, MACNM 24259. **D,** ***Permosynidae*****?** indet., CTES-PZ 7305b (D1), PULR-I 332 (D2), PULR-I 333 (D3). **E,** ***Argentinocupes pulcher*** Martins-Neto and Gallego gen. *et* sp. nov., holotype / *holotipo*, PULR-I 299. **F,** ***Argentinocupes abdalai*** Martins-Neto and Gallego sp. nov., holotype / *holotipo*, PULR-I 310. **G,** ***Gemelina triangularis*** Martins-Neto and Gallego gen. *et* sp. nov. **G1,** holotype / *holotipo*, PULR-I 280a. **G2,** paratype / *paratipo*, PULR-I 323. **H,** Gen. *et* sp. indet. 1. **H1-H2,** PULR-I 328- 329. **I,** ***Cardiosyne obesa*** Martins-Neto and Gallego gen. *et* sp. nov. **I1,** holotype / *holotipo*, PULR-I 324. I2-I6, paratype / *paratipo*, PULR-I 325a-e. **J,** ***Cardiosyne elegans*** Martins-Neto and Gallego sp. nov. **J1,** holotype / *holotipo*, PULR-I 312. J2-J4, paratype / *paratipo*, PULR-I 327a-c. **K,** Isolated and fragmented Coleoptera bodies / *fragmentos aislados de Coleoptera*. **K1-K5,** CTES-PZ 7305c; **K6-K8,** PULR-I 226; **K9-K10,** PULR-I 330; K11-K12, PULR-I 331. Scale bar / *escala* = 1 mm.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B3
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D3
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G1
G2
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H2
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I2
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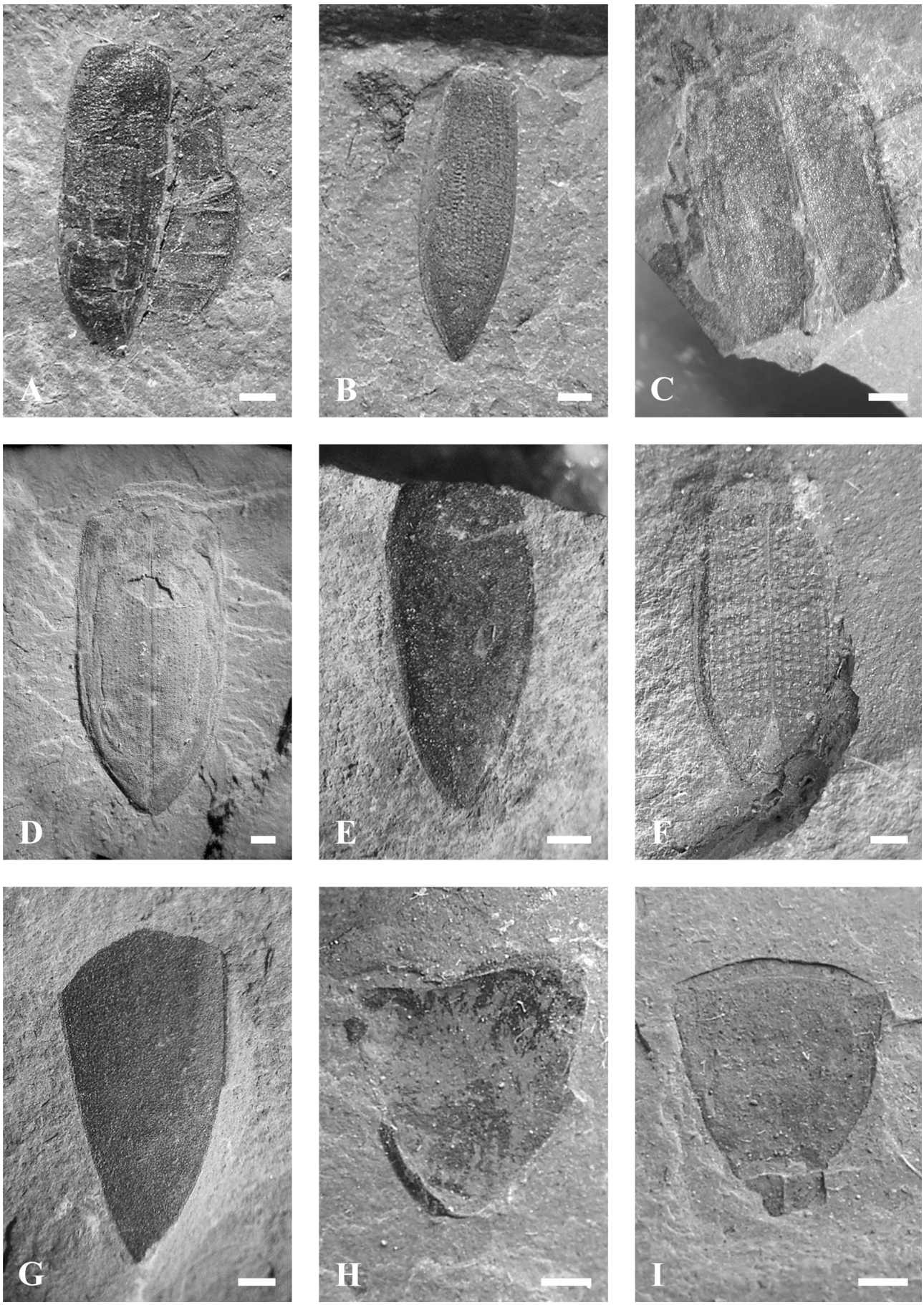
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Discussion. *Tylliardopsis tuberculata* Dunstan and *T. variotuberculata* Dunstan differ from the new species in boat-like elytron shape, ornamented with 9 to 16 convergent rows of granules (more than 15 straight rows in *A. frenguellii*) and the L/W ratio (2.6 in both species). *Mesostigmodera typica* Etheridge and Olliff differs from *A. frenguellii* sp. nov. in the broad sutural border and the acutelly apex, elytron ornamented with sigmoid rows of granules and the L/W ratio (3.1 in *M. typica*).

Argentinosyne gonaldiae Martins-Neto and Gallego sp. nov.
Figures 3.B1-B3, C, 4.E

Etymology. Dedicated to the anthropologist María Elena Gonaldi from the Museo de Ciencias Naturales, Universidad Nacional de La Rioja.

Material. Holotype: PULR-I 321 (figures 3.B1, 4.E). **Paratypes:** from Río Gualo (5th cycle form the Los Rastros Formation), two specimens (PULR-I 322, figure 3.B2; CTES-PZ 7305a, figure 3.B3); from Cacheuta Formation (southeast of the Cerro Los Colorados, Paramillos de Uspallata, Mendoza Province, Argentina), one specimen (MCNAM 24259, figure 3.C).

Type locality. Río Gualo, La Rioja Province, Argentina.
Type stratum. 3rd cycle from the Los Rastros Formation.
Age. Early Late Triassic.
Diagnosis. Elytron from 5 to 8 mm long and 2 mm to 3.5 mm wide. L/W ratio 2.4. Ornamentation consisting of rugose waves of granules homogeneously distributed over the whole elytron surface.
Description of the holotype (figures 3.B1, 4.E). Rather medium-sized permosynid, without well-delimited costae, two and half-times longer than wide. Elytron 7.91 mm long and 3.25 mm wide (L/W relation = 2.4, see table 2), with conspicuous lateral border. Ornamentation consisting of rugose waves of granules homogeneously distributed over the whole elytron surface.

Discussion. This new species differs from *Argentinosyne frenguellii* sp. nov. in having a rather smaller size and distinct ornamentation pattern (rugose in *A. gonaldiae* sp. nov., granulated in *A. frenguellii* sp. nov.), and small length/width ratio (2.4 in *A. gonaldiae* sp. nov., 3.5 in *A. frenguellii* sp. nov.). *Tillyardiopsis granulata* Dunstan differs from the new species in the elytron shape (equal sutural and lateral borders and boat-like outline, narrow sutural and moderate wide lateral borders, acutelly apex and smooth or slightly rugose-granulate ornamentation. *Reeveana mayor* Dunstan and *R. minor* Dunstan differ from *A. gonaldie* in the elytron shape (equal sutural and lateral borders and boat-like outline), narrow sutural border and smooth ornamentation.

Argentinosyne gualoensis Martins-Neto and Gallego sp. nov.
Figures 2.E1-E5, 5.C

Etymology. Refers to the Río Gualo locality, from which the material came.

Material. Holotype: PULR-I 320 (figures 2.E5, 5.C). **Paratypes:** From Río Gualo, twelve specimens (PULR-I 311a-d, figures 1.E1-E4).

Type locality. Río Gualo, La Rioja Province, Argentina.
Type stratum. 5th from the Los Rastros Formation.
Age. Early Late Triassic.
Diagnosis. Elytron elliptical, elongated in shape with length varying from 2.83 mm to 8.16 mm (media 4.91, standard deviation +/- 1.72), width varying from 0.79 to 2.5 mm (media 1.56, standard deviation +/- 0.54). Ratio of length/width varies from 2.7 to 4.3 (media 3.36, standard deviation +/- 0.39). Elytron without costae or ornamentation (smooth).
Description of the holotype (figures 2.E5, 5.C). Elytron elliptical elongated in shape with the proximal margin similar to the distal one, both semicircular, with 5.3 mm long and 1.58 mm wide (L/W relation = 3.3, see table 2), elliptical-elongated shape,

Figure 4. A, *Ademosyne arcucciae* Martins-Neto and Gallego sp. nov., holotype / *holotipo*, PULR-I 298, partially articulated specimen with the right elytron absent showing a dorsal view of the thorax and abdomen / *espécimen parcialmente articulado con el élitro derecho ausente mostrando una vista dorsal del tórax y abdomen*. **B, *Ademosyne elongatus*** Martins-Neto and Gallego sp. nov., holotype / *holotipo*, PULR-I 304. **C, *Ademosyne hexacostata*** Martins-Neto and Gallego sp. nov., holotype / *holotipo*, PULR-I 305, partially articulated specimen with both elytra, pronotum and three appendages in the left side of the photograph / *espécimen parcialmente articulado con ambos elitros, el pronoto y tres apéndices del lado izquierdo de la fotografía*. **D, *Argentinosyne frenguellii*** Martins-Neto and Gallego gen. *et* sp. nov., holotype / *holotipo*, PULR-I 227, partially articulated specimen with both elytra / *espécimen parcialmente articulado con ambos elitros*. **E, *Argentinosyne gonaldiae*** Martins-Neto and Gallego sp. nov., holotype / *holotipo*, PULR-I 321. **F, *Argentinocupes abdalai*** Martins-Neto and Gallego sp. nov., holotype / *holotipo*, PULR-I 310, partially articulated specimen with both elytra / *espécimen parcialmente articulado con ambos elitros*. **G, *Gemelina triangularis*** Martins-Neto and Gallego gen. *et* sp. nov., holotype / *holotipo*, PULR-I 280a. **H, *Cardiosyne obesa*** Martins-Neto and Gallego gen. *et* sp. nov., holotype / *holotipo*, PULR-I 324. **I, *Cardiosyne elegans*** Martins-Neto and Gallego sp. nov., holotype / *holotipo*, PULR-I 312. Scale bar / *escala* = 1 mm.

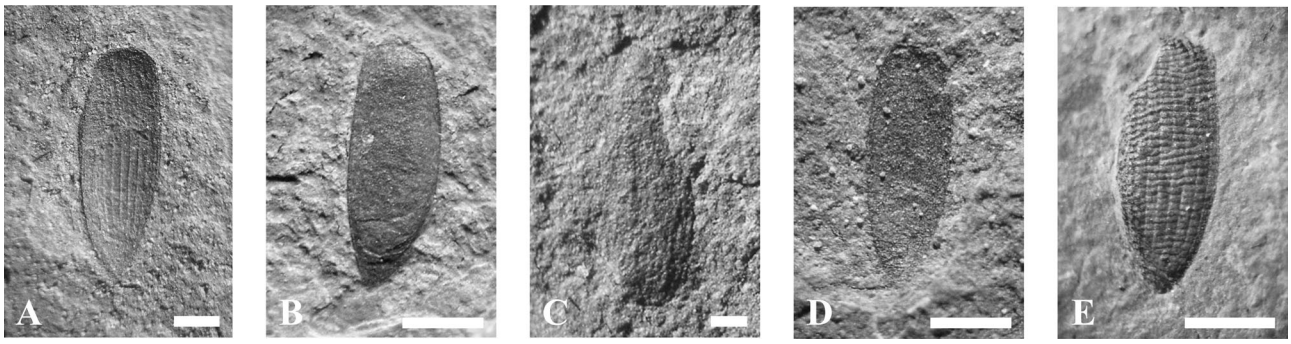

Figure 5. A, ***Ademosyne punctuada*** Martins-Neto and Gallego sp. nov., holotype / *holotipo*, PULR-I 309. **B,** ***Argentinosyne rugosa*** Martins-Neto and Gallego sp. nov., holotype / *holotipo*, PULR-I 319. **C,** ***Argentinosyne gualoensis*** Martins-Neto and Gallego sp. nov., holotype / *holotipo*, PULR-I 311. **D,** ***Argentinosyne losrastrosensis*** Martins-Neto and Gallego sp. nov., holotype / *holotipo*, PULR-I 344. **E,** ***Argentinocupes pulcher*** Martins-Neto and Gallego sp. nov., holotype / *holotipo*, PULR-I 299. Scale bar / *escala* = 1 mm.

without narrow lateral border. Costae absent and smooth ornamentation.

Discussion. *Argentinosyne gualoensis* sp. nov. differs from the previously described species in the elytra shape, with the anterior border similar to the posterior border, and the elytron more than three times longer than wide. *A. gualoensis* sp. nov. has an elytron without costae but is totally smooth, whereas *Argentinosyne frenguellii* sp. nov. has a granulated ornamentation. The Australian species *Lobites granulatus* Dunstan resembles *A. gualoensis* in the elytron shape, but differs in the sigmoid lower sutural border and granulate ornamentation.

Argentinosyne rugosa Martins-Neto and Gallego
Figures 2.F, 5.B

Etymology. Refers to the surface of the elytron.

Material. Holotype: PULR-I 319 (figures 2.F, 5.B). **Paratypes:** From Río Gualo (Los Rastros Formation), two specimens (PULR-I 319); from the Cacheuta Formation (southeast of the "Cerro Los Colorados", Paramillos de Uspallata, Mendoza Province, Argentina), one specimen (MCNAM 24258).

Type locality. Río Gualo, La Rioja Province, Argentina.

Type stratum. 5th cycle from the Los Rastros Formation.

Age. Early Late Triassic.

Diagnosis. Elytron elliptical, elongated in shape with length varying from 1.9 mm to 7.4 mm (media 4.4, standard deviation +/- 2.8), width varying from 0.83 mm to 2 mm (media 1.38, standard deviation +/- 0.58). Length/width ratio varies from 2.3 to 3.7 (media 2.96, standard deviation +/- 0.7). Elytron without costae, with rugose ornamentation.

Description of the holotype (figures 2.F, 5.B). Elytron elliptical elongated in shape with the proximal margin similar to the distal one, both semicircular, 7.4 mm long and 2 mm wide (L/W relation = 3.7, see table 1). Costae absent. Ornamentation rugose, homogeneously distributed over the whole elytron surface.

Discussion. *Argentinosyne rugosa* sp. nov. is similar to *A. gualoensis* sp. nov. in having an elongated elytron, more than three times longer than wide, but differs in having a rugose ornamentation (without ornamentation in *A. gualoensis)*. In this respect *A. rugosa* is similar to *A. gonaldiae*, though it differs in its notably greater L/W ratio.

Argentinosyne losrastrosensis Martins-Neto and Gallego sp. nov.
Figure 5.D

Etymology. Relative to Los Rastros, the stratigraphic unit from which the material came.

Material. Holotype PULR-I 344 (figure 5.D). **Paratype.** From the Picos Gemelos, one specimen (PULR-I 343).

Type locality. Río Gualo, La Rioja Province, Argentina.

Type stratum. 5th cycle from the Los Rastros Formation

Age. Early Late Triassic.

Diagnosis. Elytron boat-like shape, smooth with length varying from 1.25 mm to 4.08 mm, and width from 0.58 mm to 2.08 mm. Length/width ratio average 2.12, standard deviation +/- 0.48. Costae absent and ornamentation smooth.

Description of the holotype (figure 5.D). Rather small permosynid, without costae, around two-times longer than wide. Elytron boat-like shape, smooth, 2.9 mm long and 1 mm wide (L/W ratio = 2.9).

Discussion. *A. losrastrosensis* sp. nov. iffers from *Argentinosyne frenguellii* Martins-Neto and Gallego, *A. gonaldiae* Martins-Neto and Gallego, *A. rugosa*

Martins-Neto and Gallego, and *A. gualoensis* Martins-Neto and Gallego in having a rather smaller size and distinct ornamentation pattern (rugose in *A. gonaldiae* and *A. rugosa*, granulated in *A. frenguellii*), and the smallest length/width ratio (2.4 in *A. gonaldiae*, 3.5 in *A. frenguellii*, 2.9 in *A. rugosa* and 3.3 in *A. gualoensis*). *A. losrastrosensis* sp. nov. is similar to *A. gualoensis* Martins-Neto and Gallego by having no ornamentation, differing however in having a notably small L/W ratio.

Family Permosynidae?
gen. *et* sp. indet.
Figures 3.D1-D3

Material. CTES-PZ 7305b, PULR-I 332, 333, collected at Río Gualo, La Rioja Province, Argentina.

Stratigraphical unit and age. 2nd cycle from the Los Rastros Formation, early Late Triassic.
Description. Fragmentary material lacking the distal and/or proximal elytra margin, but they are too poorly preserved to assign them to any known genus.
Remarks. The specimen PULR-I 333 (figure 3.D3) could belong to *Argentinosyne gonaldie*.

Family Cupedidae Lacordaire, 1857

Argentinocupes Martins-Neto and Gallego gen. nov.

Type species. *Argentinocupes pulcher* Martins-Neto and Gallego sp. nov.

Etymology. Refering to República Argentina, from which the material came, and *cupes*, common suffix for cupedid-like elytra.
Diagnosis. Elytron with seven slightly curved granulated costae. Space between costae filled by eight homogeneous rows with square-granulated ornamentation.
Discussion. Similar to *Simmondsia* Dunstan, 1923 from the Australian Triassic (Ipswich series) and *Moltenocupes* Zeuner, 1961 from the Molteno Formation (South Africa) in its ornamentation pattern (homogeneous rows of square granulated ornamentation), but differing in the number of costae (seven in *Argentinocupes* gen. nov., nine in *Simmondsia* Dunstan and ten in *Moltenocupes* Zeuner). Additionally *Argentinocupes* gen. nov. has costae slightly curved (*versus* quite straight in *Simmondsia*, straight upward and curved downward in *Moltenocupes*).

Argentinocupes pulcher Martins-Neto and Gallego sp. nov.
Figures 3.E, 5.E

Etymology. From Greek, *pulchrus*, beautiful.

Material. Holotype: PULR-I 299 (figures 3.E, 5.E).

Type locality. Río Gualo, La Rioja Province, Argentina.
Type stratum. 2nd cycle from the Los Rastros Formation.
Age. Early Late Triassic.
Diagnosis. Elytron small, elliptical with around 3 mm long, as preserved, and 1.2 mm wide. L/W ratio 2.4. Elytron apex rounded and base slightly convex. Costae narrow.
Description of the holotype (figures 2.E, 5.E). Elytron 2.9 mm long as preserved, and 1.2 mm wide with seven slightly curved granulated costae. Space between costae filled by eight homogeneous rows with square-granulated ornamentation.
Discussion. *Simmondsia sub-piriformis* Dunstan and *Moltenocupes townrowi* Zeuner, the more close Triassic cupedid-like coleopterans from Gondwana, differ from the new species in the elytron shape, more acutelly elytron apex and the more regular square ornamentation between costae. Also *M. townrowi* Zeuner remains are constituted by the head, mouth parts, antennae and sternites; its total length (from the head to the etrytron apex) is 23 mm.

Argentinocupes abdalai Martins-Neto and Gallego sp. nov.
Figures 3.F, 4.F

Etymology. Dedicated to Fernando Abdala for his contributions on Argentinean Triassic tetrapods.

Material. Holotype: PULR-I 310 (figures 3.F, 4.F).

Type locality. Río Gualo, La Rioja Province, Argentina.
Type stratum. 2nd cycle from the Los Rastros Formation.
Age. Early Late Triassic.
Diagnosis. Elytron large, boat like shape with 9.3 mm long and 2.6 mm wide. L/W ratio 3.6. Costae broad.
Description of the holotype (figures 3.F, 4.F). Elytron 9.3 mm long and 2.6 mm wide with seven quite straight granulated costae. Space between costae filled by eight homogeneous rows with square-granulated ornamentation.
Discussion. *Simmondsia cylindrica* Dunstan differs from the new species in the elytra shape, less acutely elytra apex, narrow lateral border and the rectangular ornamentation between costae. *Moltenocupes townrowi* Zeuner differs also in the characters mentioned above (see discussion of *A. pulcher*) and in the narrow costae. *Argentinocupes abdalai* sp. nov. differs from *Argentinocupes pulcher* sp. nov. in having the elytra three and a half times longer than wide (*versus*

two and a half times longer in *Argentinocupes pulchrer* sp. nov.) and shape (elliptical in *A. pulchrer*). Also, it differs in the more wide costae and square ornamentation between them (in *A. abdalai*).

Family Elateridae? Leach, 1815

Gemelina Martins-Neto and Gallego gen. nov.

Type species. *Gemelina triangularis* Martins-Neto and Gallego sp. nov.

Etymology. Diminutive of Gemelos, related to Picos Gemelos, the geographic locality from which the material came.
Diagnosis. Elytron two times longer than wide, triangular shape, with granulated surface. Proximal margin roof-like.
Discussion. Similar to *Elaterites* Dunstan, 1923, from the Australian Triassic in the general elytra habitus, but differing in having a proximal margin of elytron roof-like (*versus* quite straight in *Elaterites* Dunstan). *Gemelina* gen. nov. is also similar to an unnamed species figured by Brauckmann and Schlüter (1993, Fig. 18), from the Triassic of Lower Franconia (Germany), although without the proximal margin of the elytron preserved for comparison.

Gemelina triangularis Martins-Neto and Gallego sp. nov.
Figures 3.G1-G2, 4.G

Etymology. Related to the triangular elytron shape.

Material. Holotype PULR-I 280a, part (figures 3.G1, 4.G); counterpart, CTES-PZ 7275a. **Paratype.** From quebrada Ischichuca Chica, one specimen (PULR-I 323, figure 2.G2).

Type locality. Picos Gemelos, La Rioja Province, Argentina.
Type stratum. 5th cycle from the Los Rastros Formation.
Age. Early Late Triassic.
Diagnosis. As for the genus. Elytron 9.6 mm long and 4.9 mm wide. L/W relation 1.9
Description of the holotype (figures 3.G1, 4.G). Elytra 9.6 mm long and 4.9 mm wide, covered by a granulated ornamentation. Proximal elytra margin roof-like. Anterolateral margin slightly curved; posterolateral margin straight. Margin border not well-defined. Apex slightly acuminate.
Discussion. *Elaterites subulatus* Dunstan is one of the four elaterid-like species described from the Ipswich series (Australia). It differs from the new species in the symmetrical shape and the smaller and rugose ornamentation of the elytron surface.

Cardiosyne Martins-Neto and Gallego gen. nov.

Type species. *Cardiosyne obesa* Martins-Neto and Gallego sp. nov.

Etymology. Related to the heart-shaped elytra.
Diagnosis. Elytron about twice as long as wide, heart shaped, with smooth surface. Proximal margin roof-like with a thick and conspicuous border.
Discussion. *Cardiosyne* gen. nov. differs from all known Triassic genera in having a peculiar elytra shape, heart-like, thick and smooth. This new genus is apparently endemic to the Argentinean Triassic, and is relatively abundant, mainly at the Gualo locality. The shape of the elytra indicates a very wide coleopteran; the body width could attain circa 15 mm. The assignment to Elateridae is merely tentative and it is probable that this new genus belongs to a new family.

Cardiosyne obesa Martins-Neto and Gallego sp. nov.
Figures 3.I1-I6, 4.H

Etymology. Related to the fat elytra.

Material. Holotype PULR-I 324 (figures 3.I1, 4.H), CTES-PZ 7300. **Paratype.** From Río Gualo, five specimens (PULR-I 325a-e, figures 2.I2-I6), all from the 5th cycle, except PULR-I 325a from the 2nd cycle from the Los Rastros Formation.

Type locality. Picos Gemelos, La Rioja Province, Argentina.
Type stratum. 5th cycle from the Los Rastros Formation.
Age. Early Late Triassic.
Diagnosis. Elytra heart-like shape, 4 mm to 6 mm long and 4.5 mm to 7 mm wide. L/W ratio 0.8 to 1.1. Anterolateral margin slightly sigmoid; posterolateral one convex.
Description of the holotype (figures 3.I1, 4.H). Elytra heart-like shape, 5.83 mm long and 7 mm wide. L/W relation 0.8. Proximal elytra margin roof-like with a thick and conspicuous border. Anterolateral margin slightly sigmoid; posterolateral one convex. Elytra apex slightly acuminate.

Cardiosyne elegans Martins-Neto and Gallego sp. nov.
Figures 3.J1-J4, 4.I

Etymology. Related to the elytra shape.

Material. Holotype PULR-I 312 (figures 3.J1, 4.I). **Paratype.** From Río Gualo, three specimens (PULR-I 327a-c, figures 3.J2-J4).

Type locality. Río Gualo, La Rioja Province, Argentina.

Type stratum. 5th cycle from the Los Rastros Formation.
Age. Early Late Triassic.
Diagnosis. Elytra elongated, 4mm to 6 mm long and 3.5 mm to 6 mm wide. L/W relation 1.2 to 1.4. Anterolateral margin slightly curved; posterolateral one sigmoid.
Description of the holotype. (figures 3.J1, 4.I). Elytra elongated, heart-shaped, 6.08 mm long and 4.16 mm wide. L/W ratio 1.4. Proximal elytra margin roof-like with a thick and conspicuous border. Anterolateral margin slightly curved; posterolateral one sigmoid. Elytra apex slightly acuminate.
Discussion. *C. elegans* sp. nov. differs from *C. obesa* sp. nov. in having a more elongate elytra and with a more conspicuously convex posterolateral margin.

Family uncertain
gen. *et* sp. indet. 1
Figures 3.H1-H2

Material. PULR-I 328, collected at Picos Gemelos and PULR-I 329, collected at Agua Escondida locality, La Rioja Province, Argentina.

Stratigraphical unit and age. 3rd cycle from the Los Rastros Formation, early Late Triassic.
Description. PULR-I 328 (figure 3.H1) triangular elytra fragment 3.6 mm long as preserved, and 2 mm wide, with a pronounced posterolateral border. The specimen PULR-I 329 (figure 3.H2) is a triangular elytra fragment 4.5 mm long as preserved, and 1.8 mm wide, also with a pronounced posterolateral border.
Remarks. Two similar fragments collected from two distinct localities have the same preservation stage, elytra shape, ornamentation pattern and a conspicuous posterolateral border. These characters are not found in any previously described species, indicating a possible new genus for this material, but it is too fragmentary for a formal description and taxonomic treatment.

Discussion

The genus *Ademosyne* Handlirsch has a world wide distribution (figure 2.H) with representatives in Argentina (this paper), Chile (Gallego *et al*., 2005), South Africa (Riek, 1974, 1976), Australia (Handlirsh, 1906; Tillyard, 1916; Dunstan, 1923), Germany (Brauckmann and Schlütter, 1993), Japan (Fujiyama, 1973), and Russia (Ponomarenko, 1969), consisting of a typical group of Coleoptera for Triassic sediments (although some scant records for Jurassic sediments are also known). The elytra shape and ornamentation pattern of this group are highly variable, which creates a major taxonomic problem. Authors such as Dunstan (1923) considered each variation as a diagnostic character at the specific or sometimes, generic level (number of costae, costae ornamentation, ornamentation between costae, elytra shape and size). Because of this, several new species have been proposed in the past. The lack of consistent characters based only on the morphology of isolated elytra does not allow a phylogenetic approach. Evidently a broad revision of the *Ademosyne*-like group is necessary. *Ademosyne* is probably a paraphyletic group.

The situation of the *Ademosyne*-like specimens collected from the Argentinean Triassic is not very different. Several morphotypes are present, with a great variation in shape, costae number and ornamentation. The size of specimens and their respective variation can demonstrate paleoecological and/or taphonomic problems (sometimes a smooth elytra does not necessarily indicate a distinctive character, but merely a preservational problem of a moult; sometimes the part preserves the ornamentation and the counterpart does not). The presence or absence of punctate costae can indicate merely sexual dimorphism or just a taphonomic problem. The same can be said for the elytra shape, adding other geological problems (not easily detected), such as sediment compaction after burial (resulting in a deformed elytra of unexpected shape), chemical factors destroying the elytron surface, sediments washing and polishing the elytra surface after burial (eliminating the weak ornamentation pattern), and so on. The ademosynid specimens from the Argentinean Triassic sediments indicate a moderate transport before burial (more than 90% of the specimens consist of isolated elytra).

The most useful of the morphometric parameters used here is the length/width ratio, which defines distinct species reasonably well (this parameter is not dependent of the size variability), but evidently it does not solve the phylogeny of the group. A systematic approach based also on body morphology as proposed by Ponomarenko (1969) is certainly the best, but around 99% of the known ademosynid-like fossils consist only of isolated elytra, making if impossible to take this path. Only a single elytron, possibly associated with the body, was found in the Argentinean Triassic, as well as around 2% of isolated and fragmented Coleoptera bodies, CTES-PZ 7305c, PULR I 226, 330, 331- see figures 3.K1-K12).

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Apéndice

Table 1. Morphometric variation (mm), ornamentation type and preservation degree on ***Ademosyne*** spp. / *Variación morfométrica (mm), tipo de ornamentación y grado de preservación en* Ademosyne spp. Abbreviations / *Abreviaturas*: *, as preserved / *como se preserva;* Bet. costae, between costae / *entre costillas*; Frag., fragmented / *fragmentado*; Compl., complete / *completo*; Art., articulated / *articulado*; Disart., disarticulated / *desarticulado*.

Ademosyne arcucciae Martins-Neto and Gallego sp. nov.

Picos Gemelos

Specimen		Elytron			Ornamentation			Preservation			
Collection Number	Fig. 2	Length	Width	L/W	Costa	Bet. costae	N. costa	Art.	Compl.	Frag.	Disart.
PULR-I 298	A1	9.25	3.02	3.0	smooth	granulated	9		X		X
PULR-I 300 a	A4	5.91	2.16	2.7	smooth	granulated	9		X		X
PULR-I 300		5.75	2.33	2.4	smooth	granulated	9		X		X
PULR-I 300		5.00	1.58	3.1	smooth	granulated	9		X		X
PULR-I 300 b	A5	4.91	1.58	3.1	smooth	granulated	9		X		X
PULR-I 300		4.90	1.41	3.4	smooth	granulated	9		X		X
PULR-I 300		4.83	1.83	2.6	smooth	granulated	9		X		X
PULR-I 300		4.75	1.66*	2.8	smooth	granulated	9			X	X
PULR-I 300		4.58	1.50	3.0	smooth	granulated	9			X	X
PULR-I 300		4.50	1.62	2.7	smooth	granulated	9		X		X
PULR-I 300		4.41	1.66	2.6	smooth	granulated	9		X		X
PULR-I 300		4.41	1.83	2.4	smooth	granulated	9		X		X
PULR-I 300		4.31	1.58	2.7	smooth	granulated	9		X		X
PULR-I 300		4.16	1.41	2.9	smooth	granulated	9		X		X
PULR-I 300		4.16	1.16	2.6	smooth	granulated	9		X		X
PULR-I 300		4.12	1.90	2.1	smooth	granulated	9		X		X
PULR-I 300		4.08	1.29	3.1	smooth	granulated	9		X		X
PULR-I 300 c	A9	4.00	1.58	2.5	smooth	granulated	9		X		X
PULR-I 300		4.00	1.33	3.0	smooth	granulated	9		X		X
PULR-I 300		4.00	1.16	3.4	smooth	granulated	9		X		X
PULR-I 300		3.83	1.83	2.1	smooth	granulated	9		X		X
PULR-I 300		3.83*	1.54	2.5	smooth	granulated	9			X	X
PULR-I 300		3.66	1.41	2.6	smooth	granulated	9		X		X
PULR-I 300		3.58	1.66	2.1	smooth	granulated	9		X		X
PULR-I 300		3.50	1.50	2.3	smooth	granulated	9			X	X
CTES-PZ 7299 a		3.33*	1.50	2.2	smooth	granulated	9			X	X
PULR-I 300		3.33*	1.41	2.3	smooth	granulated	9			X	X
PULR-I 300		3.25	0.91	3.6	smooth	granulated	9		X		X
PULR-I 300		3.25	1.04	3.1	smooth	granulated	9		X		X
PULR-I 300		3.16	1.16	2.7	smooth	granulated	9		X		X
PULR-I 300		3.16	1.00	3.1	smooth	granulated	9		X		X
PULR-I 300		3.08	1.25	2.4	smooth	granulated	9		X		X
PULR-I 300 d	A10	3.00	0.91	3.3	smooth	granulated	9	X	X		
CTES-PZ 7299 b		2.95	1.48	2.0	smooth	granulated	9		X		X
PULR-I 300		2.90	1.16	2.5	smooth	granulated	9		X		X
PULR-I 300		2.83	1.16	2.4	smooth	granulated	9		X		X
PULR-I 300		2.66	1.16	2.3	smooth	granulated	9		X		X
PULR-I 300		2.58	0.83	3.1	smooth	granulated	9		X		X
PULR-I 300		2.45	1.08	2.2	smooth	granulated	9		X		X
PULR-I 300		2.50	0.90	2.9	smooth	granulated	9		X		X
PULR-I 300		2.41	0.91	2.6	smooth	granulated	9		X		X
PULR-I 300		2.33	1.16	2.0	smooth	granulated	9		X		X
PULR-I 300		2.33	1.16	2.0	smooth	granulated	9		X		X
PULR-I 300		2.16	0.83	2.60	smooth	granulated	9		X		X
PULR-I 300		2.16*	0.70	3.1	smooth	granulated	9			X	X
PULR-I 300		2.16	0.91	2.4	smooth	granulated	9		X		X
PULR-I 300		2.04	0.66	3.1	smooth	granulated	9		X		X
PULR-I 300		2.00*	0.70	2.8	smooth	granulated	9			X	X
PULR-I 300		2.00	0.66	3.0	smooth	granulated	9		X		X
PULR-I 300		1.91	0.75	2.5	smooth	granulated	9		X		X
PULR-I 300		1.83	0.66	2.7	smooth	granulated	9		X		X
PULR-I 300		1.62	0.66	2.4	smooth	granulated	9		X		X
PULR-I 300		1.58	0.70	2.2	smooth	granulated	9		X		X
PULR-I 300		1.41	0.58	2.4	smooth	granulated	9		X		X

Table 1. (continuation)

Specimen		Elytron			Ornamentation			Preservation			
Collection Number	Fig. 2	Length	Width	L/W	Costa	Bet. costae	N. costa	Art.	Compl.	Frag.	Disart.
Ademosyne arcucciae Martins-Neto and Gallego sp. nov.											
Agua Escondida											
PULR-I 301 a	A3	4.33	1.66	2.6	smooth	granulated	9	X			X
PULR-I 301		4.16	1.83	2.3	smooth	granulated	9		X		X
PULR-I 301		4.08	1.83	2.2	smooth	granulated	9		X		X
PULR-I 301		3.58	1.66	2.1	smooth	granulated	9		X		X
PULR-I 301		3.58	1.41	2.5	smooth	granulated	9		X		X
PULR-I 301		3.50	1.25	2.8	smooth	granulated	9		X		X
PULR-I 301 b	A7	3.25	1.45	2.2	smooth	granulated	9		X		X
PULR-I 301		2.66	0.83	3.2	smooth	granulated	9		X		X
PULR-I 301		2.50	1.83	3.0	smooth	granulated	9		X		X
PULR-I 301		2.00	0.75	2.6	smooth	granulated	9		X		X
PULR-I 301		1.83	0.66	2.7	smooth	granulated	9		X		X
PULR-I 224 b	A6	6.25*	1.66	3.76*	smooth	granulated	9			X	X
PULR-I 224 a	A2	6.00	2.00	3.0	smooth	granulated	9		X		X
Río Gualo											
PULR-I 302		5.50	1.66	3.3	smooth	granulated	9			X	X
PULR-I 302		5.25	1.58	3.3	smooth	granulated	9				
PULR-I 302		4.83	1.66	2.9	smooth	granulated	9		X		X
PULR-I 302		4.33	1.58	2.7	smooth	granulated	9		X		X
PULR-I 302		4.29	1.50	2.8	smooth	granulated	9		X		X
PULR-I 302		4.00	1.83	2.2	smooth	granulated	9		X		X
PULR-I 302		3.75	1.33	2.8	smooth	granulated	9		X		X
PULR-I 302		3.66	1.66	2.2	smooth	granulated	9			X	X
PULR-I 302		3.58	1.25	2.8	smooth	granulated	9		X		X
PULR-I 302		3.62	1.41	2.5	smooth	granulated	9		X		X
PULR-I 302		3.50	1.33	2.6	smooth	granulated	9		X		X
PULR-I 302		3.50	2.00	1.75	smooth	granulated	9		X		X
PULR-I 302		3.08	1.25	2.4	smooth	granulated	9		X		X
PULR-I 302		3.08	1.16	2.6	smooth	granulated	9		X		X
PULR-I 302		3.08	1.08	2.8	smooth	granulated	9			X	X
PULR-I 302 a	A8	2.91	1.41	2.0	smooth	granulated	9		X		X
PULR-I 302		2.83	1.00	2.8	smooth	granulated	9		X		X
PULR-I 302		2.58	1.00	2.6	smooth	granulated	9			X	X
PULR-I 302		2.50	0.66	3.8	smooth	granulated	9			X	X
PULR-I 302		2.50	0.83	3.1	smooth	granulated	9		X		X
PULR-I 302		2.33	0.83	2.8	smooth	granulated	9		X		X
PULR-I 302		2.33	0.75	3.1	smooth	granulated	9		X		X
PULR-I 302		2.00	1.00	2.00	smooth	granulated	9		X		X
PULR-I 302		2.00	0.75	2.6	smooth	granulated	9		X		X
PULR-I 302		1.91	0.80	2.4	smooth	granulated	9		X		X
PULR-I 302		1.83	0.83	2.2	smooth	granulated	9		X		X
PULR-I 302		1.66	0.75	2.2	smooth	granulated	9		X		X
Quebrada Ischichuca Chica											
PULR-I 306		5.16	1.85	2.8	smooth	granulated	9		X		X
PULR-I 306		2.60	1.58	1.64	smooth	granulated	9		X		X
Ademosyne elongatus Martins-Neto and Gallego sp. nov.											
Agua Escondida											
PULR-I 304 a	D1	6.75	2.16	3.1	smooth	granulated	11		X		X
PULR-I 304 b		4.41*	2.16	3.0*	smooth	granulated	11			X	X

Specimen		Elytron			Ornamentation			Preservation			
Collection Number	Fig. 2	Length	Width	L/W	Costa	Bet. costae	N. costa	Art.	Compl.	Frag.	Disart.
Río Gualo											
PULR-I 303	D2	9.00	2.80	3.2	smooth	granulated	11		X		X
Ademosyne hexacostata Martins-Neto and Gallego sp. nov.											
Picos Gemelos											
PULR-I 307		2.91	1.00	2.9	smooth	granulated	6		X		X
PULR-I 307		2.08	0.91	2.2	smooth	granulated	6		X		X
PULR-I 307		1.83	.58	3.1	smooth	granulated	6		X		X
Río Gualo											
PULR-I 308		4.16	1.41	2.9	smooth	granulated	6		X		X
PULR-I 305	B1	8.6*	3.30	2.7	smooth	granulated	6	X		X	
PULR-I 308 a	B2	6.5*	2.00	3.2	smooth	granulated	6	X		X	
PULR-I 308		3.41	1.50	2.3	smooth	granulated	6		X		X
PULR-I 308		3.33*	1.50	2.2	smooth	granulated	6			X	X
PULR-I 308		3.00	1.00	3.0	smooth	granulated	6		X		X
PULR-I 308		2.75	1.00	2.7	smooth	granulated	6		X		X
PULR-I 308 d	B5	2..3*	1.25	2.0*	smooth	granulated	6		X	X	
PULR-I 308 c	B4	2.08	0.75	2.7	smooth	granulated	6		X		X
PULR-I 308		2.08	0.91	2.3	smooth	granulated	6		X		X
PULR-I 308		1.90	0.58	3.3	smooth	granulated	6		X		X
PULR-I 308 e	B6	1.83	0.66	2.7	smooth	granulated	6		X		X
PULR-I 308		1.80*	0.75	2.4	smooth	granulated	6		X	X	
PULR-I 308 b	B3	1.16	0.33	3.5	smooth	granulated	6		X		X
Ademosyne punctuada Martins-Neto and Gallego nov. sp.											
Picos Gemelos											
*PULR-I 309	C1	4.50	1.66	2.7	punctate	granulated	9		X		X
*PULR-I 309 a		3.08	1.33	2.3	punctate	granulated	9		X		X
Río Gualo											
PULR-I 313 c	C4	4.16	1.41	2.9	punctate	granulated	6		X		X
PULR-I 313 d	C5	4.16	1.58	2.2	punctate	granulated	7		X		X
PULR-I 313 a	C2	2.83	1.16	2.4	punctate	granulated	9		X		X
PULR-I 313 e	C6	2.08	0.91	2.3	punctate	granulated	9		X		X
Agua Escondida											
PULR-I 313 b	C3	3.66	1.66	2.2	punctate	granulated	9		X		X

Table 2. Morphometric variation (mm), ornamentation type and preservation degree on other Coleoptera species / *variación morfométrica (mm), tipo de ornamentación y grado de preservación en otras especies de Coleoptera.* Abbreviations / *abreviaturas*: *, as preserved / *como se preserva*; Bet. costae, between costae / *entre costillas*; Frag., fragmented / *fragmentado*; Compl., complete / completo; Art., articulated / *articulado*; Disart., disarticulated / *desarticulado*.

Argentinosyne frenguelli Martins-Neto and Gallego sp. nov.

Río Gualo

Specimen		Elytron			Ornamentation			Preservation			
Collection Number	Fig. 3	Length	Width	L/W	Costa	Bet. costae	N. costa	Art.	Compl.	Frag.	Disart.
PULR-I 227	A1	14.5	3.5	4.14		granulated		X	X		
PULR-I 225	A2	18.0	5.1	3.6		granulated			X		X
PULR-I 326	A3	14.6	5.0	2.9		granulated					X
PULR-I 326	A4	13.5	4.16	3.2		granulated ?			X		X
PULR-I 326	A5	13.8*	4.25	3.6*		granulated				X	X
PULR-I 321	B1	7.91	3.25	2.4		rugose			X		X
PULR-I 322	B2	5.10	2.08	2.4		rugose			X		X

Table 2. (continuation)

Argentinosyne gonaldiae Martins-Neto and Gallego sp. nov.											
Río Gualo											
CTES-PZ 7305 a	B3	7.6	4.2	1.8		rugose			X		X
MCNAM 24259	C	6.33	2.66	2.4		rugose			X		X
PULR-I 311 c	E3	8.16	2.50	3.3		Smooth				X	X
PULR-I 311 d	E4	7.50	1.66*	4.3*		Smooth				X	X
Uspallata											
PULR-I 311		5.30	1.58	3.3		Smooth			X		X
PULR-I 311		5.00*	2.25	3.3*		Smooth				X	X
Argentinosyne gualoensis Martins-Neto and Gallego sp. nov.											
Río Gualo											
PULR-I 311 b	E2	4.83	1.91	3.4		Smooth			X		X
PULR-I 320	E5	4.41	1.33	3.3		Smooth				X	X
PULR-I 311 a	E1	4.33	1.58	2.7		Smooth			X		X
PULR-I 311		3.50	1.08	3.2		Smooth				X	X
PULR-I 311		3.33	1.00	3.3		Smooth			X		X
PULR-I 311		2.83	0.79	3.5		Smooth			X		X
Argentinosyne rugosa Martins-Neto and Gallego sp. nov.											
Río Gualo											
PULR-I 319	F	7.40	2.00	3.7		Rugose			X		X
PULR-I 319		3.90*	1.33	2.9*		Rugose				X	X
PULR-I 319		1.90	0.83	2.3		Rugose			X		X
Uspallata											
MCNAM 24258		4.33	1.33	3.2		Rugose				X	X
Argentinosyne losrastrosensis Martins-Neto and Gallego sp. nov.											
Picos Gemelos											
PULR-I 343		3.50	1.50	2.3	Smooth	granulated	?		X		X
PULR-I 343		1.25	0.58	2.1	Smooth	granulated	?		X		X
PULR-I 343		2.9	1.0	2.9	Smooth	granulated	?		X		X
Río Gualo											
PULR-I 344		4.08	2.08	1.9	Smooth	granulated	?		X		X
PULR-I 344		3.50	1.58	2.2	Smooth	granulated	?		X		X
PULR-I 344		2.33	0.75	3.1	Smooth	granulated	?	X	X		
PULR-I 344		1.91	1.00	1.9	Smooth	granulated	?		X		X
PULR-I 344		1.66	1.16	1.4	Smooth	granulated	?		X		X
PULR-I 344		1.40	0.66	2.1	Smooth	granulated	?		X		X
Argentinocupes pulcher Martins-Neto and Gallego sp. nov.											
Río Gualo											
PULR-I 299	E	2.9	1.2	2.41	Granulated	square granules	7		X		X
Argentinocupes abdalai Martins-Neto and Gallego sp. nov.											
Río Gualo											
PULR-I 310	F	9.30	2.60	3.6	granulated	square granules	7	X	X		
Gemelina triangularis Martins-Neto and Gallego sp. nov.											
Picos Gemelos and quebrada Ischichuca Chica											
PULR-I 280 a	G1	9.60	4.90	1.9		granulated			X		X
PULR-I 323	G2	9.20*	3.00*	1.9*		granulated				X	X
Cardiosyne obesa Martins-Neto and Gallego sp. nov.											
Picos Gemelos and Río Gualo											
PULR-I 324	I1	5.83	7.00	0.8		smooth			X		X
PULR-I 325 a	I2	5.66	5.16	1.1		smooth			X		X
PULR-I 325 d	I5	5.50	6.58	0.8		smooth			X		X

Table 2. (continuation)

Cardiosyne obesa Martins-Neto and Gallego sp. nov.											
Picos Gemelos and Río Gualo											
PULR-I 325 e	I6	5.41	5.00*	1.0*		smooth				X	X
PULR-I 325 b	I3	5.33	5.33	1.0		smooth			X		X
PULR-I 325 c	I4	4.25	4.55	0.9		smooth			X		X
Cardiosyne elegans Martins-Neto and Gallego sp. nov.											
Picos Gemelos and Río Gualo											
PULR-I 312	J1	6.08	4.16	1.4		smooth			X		X
PULR-I 327 b	J3	5.91	4.83	1.2		smooth			X		X
PULR-I 327 c	J4	4.33	3.41	1.3		smooth				X	X
PULR-I 327 a	J2	4.16	3.50	1.2		smooth				X	X
Gen. et sp. indet. 1											
Picos Gemelos and Agua Escondida											
PULR-I 328	H1	3.60*	2.00	1.8*		granulated				X	X
PULR-I 329	H2	4.50	1.80	2.5		granulated				X	X