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Sphecorydaloides lucchesei
A New Carboniferous Megasecopteran Insecta From Argentina

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Abstract - A new insect of the Ordo Megasecoptera from Argentina, *Sphecorydaloides lucchesei* Pinto, gen. et sp. nov. of a new family Sphecorydaloididae is here described. The fossil imprint comes from Pallero Member, Bajo de Velis Formation, Carboniferous from the Bajo de Velis locality, Provincia de San Luis, Argentina. The stratigraphical position of the type locality and the geological age of the Pallero Member are also discussed, reinforcing the determination of an Upper Carboniferous age for Bajo de Velis Formation.

Resumo - No presente trabalho é descrito um novo inseto da Ordem Megasecoptera da Argentina, *Sphecorydaloides lucchesei* Pinto, gen. et sp. nov. de Sphecorydaloididae, família nova. O fóssil provém do Membro Pallero, da Formação Bajo de Velis, Carbonífero, da localidade de Bajo de Velis, Provincia de San Luis, Argentina. É discutida a posição estratigráfica da localidade tipo bem como a idade geológica do Membro Pallero o que permite concluir que a Formação Bajo de Velis pertence ao Carbonífero Superior.

INTRODUCTION

The present paper continues describing the taphofauna of the Bajo de Velis Formation from the Bajo de Velis locality, Provincia de San Luis, Argentina. From the material of the Universidad Nacional de Cordoba sent to the author and those collected by Professor Mario A. Hünicken and the present author, some have already been described (Pinto & Ornellas, 1978a, b, 1980, Pinto & Hünicken, 1980). New species, genera and families were presented in these papers and also their stratigraphical position and chronological data discussed. In the present work, besides the systematic description of the specimen under study, new data are furnished for a more precise age determination.

TAXONOMY

Ordo Megasecoptera
Sphecorydaloididae Pinto, fam. nov.

Diagnosis - Slender wings, not petiolate. Similar venation of fore and hind wings, Sc remote from margin and terminating on R1 a little before the wing middle length; Sc remote from R; stem of M and R fused; MA anastomosed with Rs for a very short distance; Cu remotes from the stem R + M; CuA slightly anastomosed with M; cross-veins hardly visible in costal and sub-costal areas, straight, and forming complete rows in the main portion of the wing. Abdomen of moderate size.

Remarks - It presents very strong similarity with Corydaloididae Handlirsch, 1906, and Sphecopteridae Carpenter, 1951 from the Upper Carboniferous of Commeny, France. It differs from the first in having Sc ending on R1; CuA slightly linked to M; many cross-veins,

and no spines are seen on the postero-lateral corner of tergites; it also differs from the second family because it is not petiolate and has CuA linked to M.

Regarding the Upper Carboniferous Diaphanopterodae, Megasecopterodae insects from Argentina, *Philiaptilon huenickeni* Pinto & Ornellas, 1978a from Bajo de Velis, (Diaphanopterodae Handlirsch, 1906) and *Xenoptera riojaensis* Pinto, 1986 from Malanzan Formation the new family presents better and strong similarities with the Xenopteridae Pinto, 1986 (not Xenopteridae Riek, 1955), but differs from it in a narrow costal area, a little broader sub-costal area R vein reaching the posterior apical margin and the absence of the setae, seen all around the margin of the *X. riojaensis* wings.

Type-genus - *Sphecorydaloides*, gen. nov.

Sphecorydaloides Pinto, gen. nov.

Diagnosis - Wings: RS arising from R at 1/4 of the wing length and presenting four terminal branches; MA single; MP bifurcates a little after the separation from MA; CuA single; CuP sometimes bifurcated; Anal veins with 4 to 5 branches almost parallel to CuP; numerous cross-veins and distributed almost uniformly over the wing, in rows of around 10 straight cross-veins between Rs, M, Cu and A veins.

Type-species - *Sphecorydaloides lucchesei*, gen. et sp. nov.

Sphecorydaloides lucchesei Pinto, gen. et sp. nov.
Plates 1 and 2

Derivatio nominis - In honour to the eminent Heart Surgeon

Fernando Lucchese.

Holotypus - Insect imprint N° CORD-PZ-3205. Universidad Nacional de Cordoba, Argentina.

Locus typicus - Bajo de Velis, Provincia de San Luis, Argentina.

Stratum typicum - Pallero Member, Bajo de Velis Formation, Upper Carboniferous.

Diagnosis - Body about 35mm long, abdomen 25mm long with 9 visible segments with lateral processes. Wings, larger than body, slender, slightly narrowed basally. Anterior wing, 43mm long, 10 mm wide. Similar posterior wing, slightly broader than the anterior wing. R ending at the apical posterior corner of the wing. Rs with four branches; MP bifurcated and CuP sometimes forked.

Description - The cephalic region presents so many lines (Pl.1, Figs. 2a-c) making it very difficult to guarantee they are all interpreted correctly. It looks like as if there be a small ovate head, wider than longer; antennae, strong, with richly segmented articles; thorax with the prothorax wider than longer with large round lobes at the sides; mesothorax longer than wide; metathorax with the same width as length (Pl.1, Figs. 1a-b); abdomen with nine visible segments; I to VIII rectangular, apparently with a spineless lateral process: the first ones are five times longer than wider, the VI to VIII a little longer; the ninth being twice as long as its width and presenting a structure similar to the male apparatus of *Lemmatophora typica* Sellards as shown in Fig. 12 of Tillyard, 1928. The so called copulatory hook presents almost the same shape but it is more developed in having the two paraprocts smaller at its sides. It also presents some similarity with the sexual organ in the abdominal segment of *Prochoroptera calopteryx* Handlirsch, 1911, fig. 61.

Wings - Fore and hind wings are similar, being the hind wing a little broader basally. They are slightly convex anteriorly and almost straight posteriorly. Sc remote from costal and radial veins, ending on R a little before 2/3 of the wing length. A narrow area between C, Sc and R veins. The space between R and Rs is broader; Rs originated from R at 1/5 of the wing length and presents 4 single branches. M is fused basally with R and separates from it at some distance before the origin of Sc, a bit farther it bifurcates and the branch MA is fused shortly with the stem of Rs, it is single. MP bifurcates just after the level of the fusion of MA with Sc, forming two long branches. All these branches of M run parallel to the first branch of Rs. The stem of the cubital veins is remote from R+M and bifurcates a little before the separation of M from R; the branch CuA a bit farther fuses shortly with M; CuP sometimes bifurcates distally. Four to five anal veins, appearing to converge and fuse at the base of the wing.

DISCUSSION AND CONCLUSIONS

Based on Hünicken & Pensa (1975), Pinto & Ornellas (1978a) presented a detailed description of the type locality from which the insect here studied was collected. The insect taphofauna collected in that locality is of great importance because it brings up very useful new data for the age determination. As it was discussed in Pinto & Ornellas (*op. cit.*) there is some disagreement between the paleobotanists on the exact age of the Bajo de Velis Formation. Some say Lower Permian, others, Carboniferous. However, up till now, all the taphofauna certainly indicate a Carboniferous age as it is pointed out by the data that follows:

a) The present species of insects and others under study from Bajo de Velis show very strong similarities to Carboniferous insects such as: *Corydaloides scudderi* Brongniart, 1893 and *Sphecoptera gracilis* Brongniart, 1893 from Commeny Basin, Carboniferous of France, species which are redescribed by Carpenter, 1951; also to *Prochoroptera calopteryx* Handlirsch, 1911 of the Carboniferous from the Vicinity of Mazon Creek, Illinois, USA.

b) *Philiaptilon huenickeni* Pinto & Ornellas, 1978a belongs to the Suborder Eudiaphanoptera exclusively Carboniferous in Asia, Europe and North America (Martinov, 1938; Meunier, 1909; Carpenter, 1963), and the genus *Philiaptilon*, is only found in the Lower Balachonian of the Kuznetz Basin, Carboniferous of Asia (Zalessky, 1931).

c) *Gondwanarachne argentinensis* Pinto & Hünicken, 1980 belongs to an order of Arachnida, Trigonotarbida exclusively Carboniferous in Europe and North America.

d) *Paranarkemina kurtzi* Pinto & Ornellas, 1980 belongs to a group of insects Narkemidae - Cacurgidae, of the Carboniferous. (Pinto & Ornellas 1978b).

e) Another amazing similarity is that with *Xenoptera riojaensis* Pinto, 1986 from the Divisoria Member, Malanzan Formation, Middle Carboniferous, Early Westphalian or Namurian, according to Riek & Kukalová - Peck, 1984, based on a dragonfly wing.

f) Some round maculations are seen in the wings and according to Carpenter (1951) "such markings being unknown in Permian Megasecoptera".

So, all these data suggest that the Pallero Member of the Bajo de Velis Formation must be Carboniferous in age. This reinforces the proposition of Pinto, 1972 and Pinto *et al.*, 1980 of a Carboniferous age for that Formation.

Plate 1

Sphecopterydaloides lucchesei Pinto, gen. et sp. nov.

Pallero Member, Bajo de Velis Formation - Upper Carboniferous, Bajo de Velis, Provincia San Luis, Argentina.

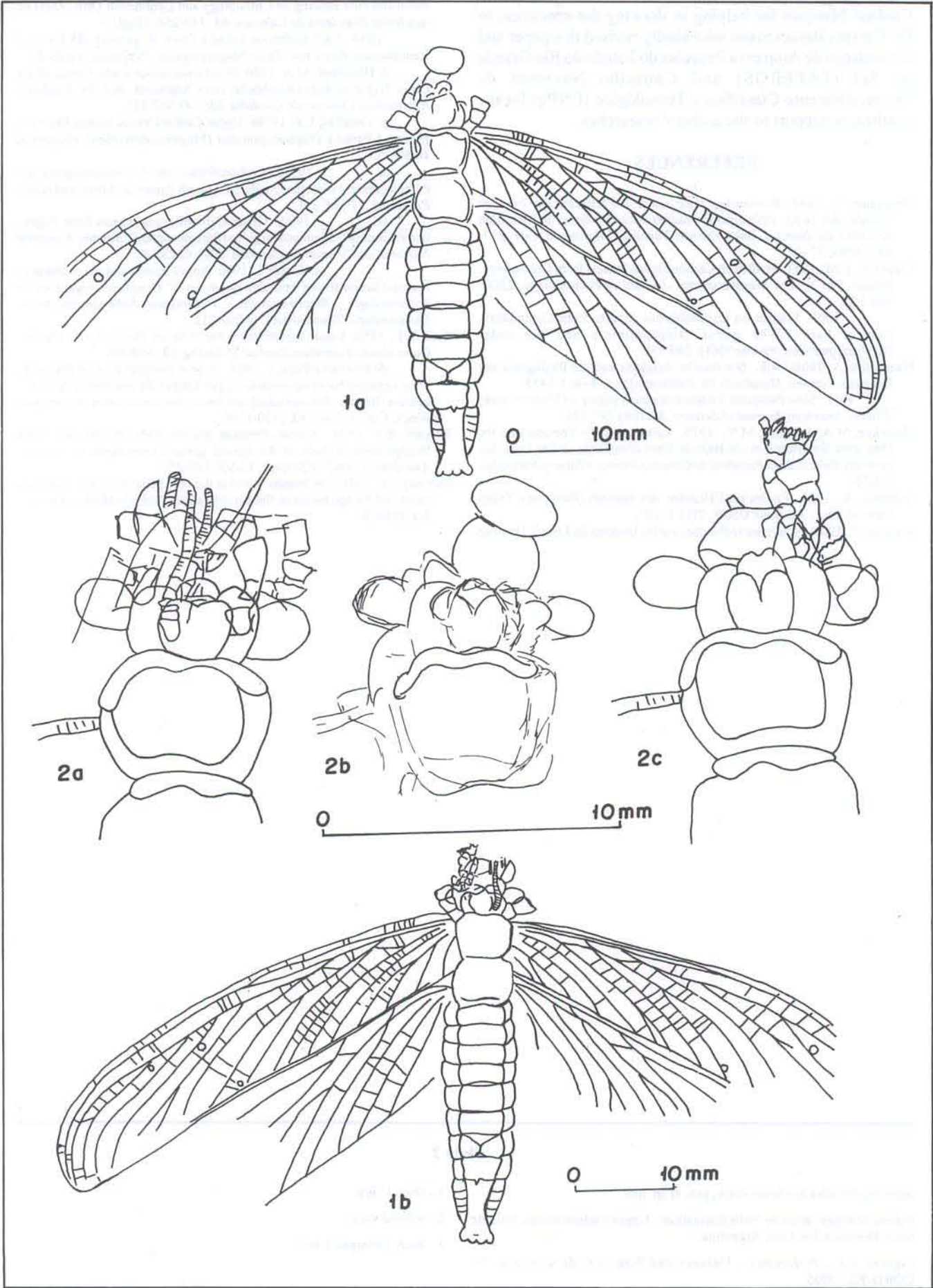
Figures 1a-b and 2a-c - *Holotypus* - Universidad Nacional de Cordoba, N°

CORD-PZ - 3205.

1a - Dorsal view.

1b - Ventral view.

2a-c - Details of the head.



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Plate 2

Sphecorydaloides lucchesei Pinto, gen. et sp. nov.

Pallero Member, Bajo de Velis Formation - Upper Carboniferous, Bajo de Velis Provincia San Luis, Argentina.

Figures 1-3 - *Holotypus* - Universidad Nacional de Cordoba, N° CORD-PZ - 3205.

1 - Dorsal view.

2 - Ventral view.

3 - Body (enlarged 4.6x).

