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Pesquisas em Geociências, 17 (1-2): 3-6, Set./Dez., 1990.

Versão online disponível em:

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Publicado por

Instituto de Geociências

Portal de Periódicos
UFRGS

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DO RIO GRANDE DO SUL

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Data de publicação - Set./Dez., 1990

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Permian Insects from Paraná Basin, South Brazil VI. Homoptera — 3. Fulgoringruidae

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(Recebido em 19/07/90. Aceito para publicação em 20/11/90.)

Abstract — A new Permian insect is described collected from km 185+500 of BR-290 Road between Porto Alegre and Uruguaiana, Rio Grande do Sul, Brazil, which belongs to the new family Fulgoringruidae, *Fulgoringruo kukalovae* Pinto gen. et sp. nov. This insect is associated with important group described for that locality and, moreover, with great number of crustaceans from group Pygocephalomorpha, with some fish scales and plants Glossopteridales. The author comments also on the Fauna and Flora of Iratí Formation and its meaning to the Continental Drift.

Resumo — É descrito um novo inseto permiano procedente do km 185 + 500 da Rodovia BR-290, trecho Porto Alegre-Uruguaiana, RS, que pertence à nova família Fulgoringruidae, *Fulgoringruo kukalovae* Pinto gen. et. sp. nov. Este inseto está associado a importante grupo descrito para aquela localidade e, ainda, a grande número de crustáceos do grupo Pygocephalomorpha, algumas escamas de peixes e plantas (Glossopteridales). Ainda comenta-se neste trabalho o significado da fauna e da flora da Formação Iratí e a sua importância para a Deriva dos Continentes.

INTRODUCTION

This paper follows those describing the associated fauna discovered at the road BR-290, km 185+500 (ex km 78), Porto Alegre-Uruguaiana of Rio Grande do Sul State, Brazil.

From that place was described insects of Mecoptera (Pinto, 1972 b), Neuroptera (Pinto et Ornellas, 1980), Homoptera (Pinto et Ornellas, 1981), Homoptera (Pinto, 1987a), Coleoptera (Pinto, 1987b) associated to crustaceans (Pygocephalomorpha), fishes scales and plants (Glossopteridales).

STRATIGRAPHICAL AND GEOGRAPHICAL DISTRIBUTION

This insect was found in a road cut BR-290, km 185 + 500, Porto Alegre-Uruguaiana, RS, near Minas do Leão coal mines, 3.5 km west of the Arroio Taquara in sediments of the Iratí Formation.

The age of Iratí Formation and the significance of these fossils for Continental Drift was already discussed in a paper on crustaceans (Pinto, 1972 a) and in papers about insects mentioned before, where the author calls attention to the following data:

a) The Pygocephalomorpha crustaceans are normally associated to the reptile *Mesosaurus*, an association correspondent to that of the Upper Dwyka Shales Upper Permian in South Africa.

b) The association of insects formed by the orders Mecoptera, Neuroptera, Homoptera and Coleoptera is quite similar to those of the Kuznetzk Basin, USSR.

c) This association, of the Iratí Formation, corresponds to that of the Group Illinsk (Kazanian) or Kuznetzk, considered by most Russian Geologists as Upper

Permian. However, some authors consider the Kuznetzk as the upper part of the Lower Permian.

In addition to these, two other facts must be taken into account:

d) The Permian insect described by Rösler et al. (1981) from Iratí Formation presents also affinity with insects from Iva Gora, Kazanian, USSR.

e) The pollen analysis of the Iratí Formation also indicate its Upper Permian age (Daemon et Quadros, 1970; Dellazzana, 1976).

Based on these data the author considers that: a) Iratí Formation is of Upper Permian age. b) Based in the kinds of plants, vertebrates, insect associations and stratigraphical distribution, the position of the Angara Continent in relation to the Gondwanaland must be revised. As Pinto, (1972a) has pointed out Asia was part of the Gondwanaland during the Paleozoic.

TAXONOMY

Infra Classis Neoptera
Supra Ordo Rhynchota
Ordo Homoptera

Familia Fulgoringruidae Pinto, fam. nov.

Forewing small, around 5 mm of length; elongated, costal field narrow; SCA long; SCP is distinct at the base of the forewing, somewhat convex along R+M and coalesces with R after the point where it branches. RS forks distally, M forking much more distal than R, having three branches. There is slanting bend in CuA at the basal portion where it is connected to M by a short cross-vein, CuA bifurcates distally; anal veins coalesce distally forming a Y-vein. The hindwing is unknown.

Remarks — The present species presents some characteristics very similar to the Inguinae (Cicadidea) and others to Fulgoridae (Fulgoridea), but exist some other characters that typically did not correspond to either of them. Because of this it was impossible to locate it in any of these groups. So, its similar:

I - to Inguinae in having:

- 1 - The forewing elongate.
- 2 - SCP distinct at the base of the forewing, convex along R+M and coalescing with R.
- 3 - M with three branches.
- 4 - CuA with the median part long and linked to M by a short cross-vein.
- 5 - CuA bifurcating distally.
- 6 - A₁ and A₂ coalescing distally and forming a Y-vein.

Example: Figures 1,2 *Permododa membracoides* and *Inguina* gen. sp. Becker-Migdisova in Rodendorf, 1961. But it differs from them in having:

- a - A well developed SCA, forking distally.
- b - R much longer.
- c - RS branched.
- d - Branches of CuA long and narrow.

Fulgoridium fractum Handlirsch, 1939 Taf XIII fig. 235 which has similar shape; the same kind of SC, RS, A₁ and A₂; M forking at the same level, but differing in the number of branches of M and CuA and specially because CuA branches basally. However even *Metafulgoridium spilotum* Handlirsch, 1939, Taf XV fig. 286, has M with three branches only as the new species, but differing as the other Fulgoridae in having CuA branching basally.

All these facts has lead to the proposition of a new family.

Figure 1 — *Permododa membracoides* Becker-Migdisova, 1961.

Figure 2 — *Inguina* gen. sp. Becker-Migdisova, 1961.

II - to Fulgoridea in having the above characters 1, 3, 5, a, b, and c, but it differs substantially in CuA which forks basally and several times in Fulgoridea. Example: Figures 3, 4.

Figure 3 — *Fulgoridium fractum* Handlirsch, 1939.

Figure 4 — *Metafulgoridium spilotum* Handlirsch, 1939.

***Fulgoringruo* Pinto, gen. nov.**

Small insect with elongated forewing, SCA long; SCP along R+M and R reaching 4/5 of the wing length; RS bifurcation apically; M with three branches; CuA with two long branches.

Type species: *Fulgoringruo kukalovae* Pinto, gen. et sp. nov.

***Fulgoringruo kukalovae* Pinto, sp. nov.**

Figures 5 and 6

Designatio nominis: in honour to Dr. Jamila Kukalova-Peck

Holotypus: A mold of a forewing. UFRGS, MP-I-5273

Locus typicus: A cutting at BR-290, km 185+500 of the road Porto Alegre-Uruguaiana, Rio Grande do Sul State, Brazil

Stratum typicum: Irati Formation, Upper Permian.

Diagnosis — Forewing narrow elongate with the subcostal and anal area rugose; length 4.9 mm, width 1.6 mm. SCA long reaching about 3/5 of the length three times as long as R₂, five times as long as R₁ and a little longer than RS. The branches of CuA are narrow and long.

Discription — Forewing narrow elongated; anterior margin slightly convex, posterior margin straight until CuP, at this point there is a slight break where it curves to form the round apical portion of the forewing. SCA long reaching 3/5 of the length bifurcating apically, one branch reaching the C and the other R₁ presenting basally a humeral cross-vein. ScP slightly convex, passes close to R+M and combines with it in front of the point it branches; R+M is short, its length is less than six times the length of the forewing; the trunk of R is much more longer than R+M and 2.1 times the length of R₂; R₁ almost straight and R₂ slightly curved anteriorly; at

the base Rs forms sharp angular bend but is then straight almost parallel to R_2 , bending at the point where is the cross-vein r-m and forking distally. M long almost straight, connected by cross-veins basally with CuA and distally with the anterior branch of CuA; it branches much more distally the CuA and has three branches being $M_1 + M_2$ connected to Rs by a cross-vein; CuA has its middle portion straight and bends basally where it is connected to M by a small cross-vein; its distal fourth forms a large furcation, whose external branch is slightly curved and the internal branch almost straight; they are three times shorter than CuA trunk. CuP almost straight and reaching about $3/5$ of the wing

length. A_1 parallel to CuP; A_2 curves to the posterior margin and runs parallel to it, fusing distally with A_1 and forming a clear Y-vein. Besides those in the costal area, three cross-veins clearly seen, presenting the same dark brown colour of the main veins. They are: the cross-vein that links basally CuA to M; the rs- m_{1+2} and the m-cua $_1$. A fourth one not very clear appears more or less colored m_{3+4} - cua $_1$. Many other cross-veins as light impression, can be seen as showed in the drawing light lines (Fig. 1). They are seen in all the wing, when is used an adequate incident light. The forewing is 4.9 mm long and 1.6 mm wide; the ratio of length to width is 3:1.

Figures 5, 6 — *Fulgoringruo kukalovae* Pinto, gen. et sp. nov.

Holotypus: UFRGS MP-1-5273. Length 4.9mm. From km 185 + 500 of BR-290, Iratí Formation, Upper Permian, Rio Grande do Sul, Brazil.

Acknowledgments — Thanks are due to Dr. Elena E. Becker-Migdisova of the Academy of Sciences, USSR, for comments on the insects under description; to Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq); to Fundação de Amparo à Pesquisa do Estado do Rio Grande do Sul (FAPERGS), and to Câmara Especial de Pós-graduação e Pesquisa, UFRGS for their continuous support to the author's researches.

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