NEW EARLY CRETACEOUS LALACID FROM JINGXI BASIN OF BEIJING, CHINA (HOMOPTERA: FULGOROIDEA) *

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Abstract A new fossil genus and species Cretocixius stigmatosus gen. et sp. nov. is described in the present paper, which was collected from Early Cretaceous Lushangfen Formation (K_1^4l) of Jingxi Basin in 1999. The new genus differs from all other lalacids in having the combined characters of tegminal venation: costal margin of tegmen straight and incrassated obviously; apical margin with sclerous striations; pterostigma well-developed; vein Sc 2-branched in the pterostigmal area; vein R_1 simple and enclosing the posterior margin of pterostigma; CuA with 6 terminal branches; all crossveins thick obviously, r-m long and tegmen with 6 subapical and 14 apical cells. The holotype is deposited in the Beijing Forestry University.

Key words Early Cretaceous, Lushangfen Formation, Homoptera, Fulgoroidea, new genus, new species.

The Lower Cretaceous Lushangfen Formation of Jingxi Basin outcrops in the area from Tuoli, Gangshang, Yungang, Lushangfen to Qinglongtou Reservoir, and its typical section locates in the east of Lushangfen Village. Its geological age corresponds to the European Barremian stage (Table 1). It consists mainly of multicolored fine clasolites, with red-bedded sediments and some grayish-green, grayish-yellow mudstones and shales. It contains abundant fossil insects and is one of the important strata in studying the lower cretaceous entomofauna. The author collected the homopterous fossil that described in the present paper from Lushangfen Formation in Fangshan district of Beijing in 1999, and its part and counterpart are registered respectively by KL1017-1, KL1017-2.

Table 1 The Lower Cretaceous stratigraphical sequences around the Jingxi Basin of Beijing

Stratigraphical sequences		Entomofauna	Correspondent to Europe
Overlying strata: Changxindian Formation (E_2ch) or Quaternary sandstone or conglomerate (Q)			
K_1	Xiazhuang Formation ($K_1^{5\text{-}6}x$) 332.5[1)]-597.0[2)] m	Xiazhuang Entomofauna	Aptian-Albian stage ($K_1^{5\text{-}6}$)
	Lushangfen Formation (K_1^4l) 1 257.7-1 043.4 m	Lushangfen Entomofauna	Barremian stage (K_1^4)
	Tuoli Formation (K_1^3t) 709.4-766.4 m		Hauterivian stage (K_1^3)
	Dahuichang Formation (K_1^2d) 160.9-127.2 m	Jehol Entomofauna	Valanginian stage (K_1^2)
	Donglanggou Formation (K_1^1dl) 373.2-148.1 m		Berriasian stage (K_1^1)
Underlying strata: Wumishan Formation dolomite of Middle Proterozoic (Pt_2)			

1) After Hong, Y. C. et al., 1982; 2) after Xiao, Z. Z. et al., 1994.

* This work is supported by the National Natural Science Foundation of China (Nos. 49972001, 39870093) and Beijing Natural Science Foundation (No. 5002013).

Received 22 June 2001, accepted 7 Sep. 2001.

Fulgoroidea Kirkaldy, **1807**
Lalacidae Hamilton, **1990**
Cretocixius gen. nov.

Type species: Cretocixius stigmatosus sp. nov.

Etymology. From Greek Cretaceous-Geological period and extant genus Cixius.

Diagnosis. Costal margin of tegmen straight and incrassated obviously; appendix narrow, only apical margin with sclerous striations; pterostigma well-developed; Sc 2-branched in the pterostigmal area; vein R_1 simple and enclosing the posterior margin of pterostigma; CuA with 6 terminal branches; all crossveins thick obviously, r-m long; tegmen with 6 subapical and 14 apical cells.

Discussion. Up to now, a lot of fulgoroid fossils ranges from Permian to Tertiary have been reported (Carpenter, 1992). Hamilton (1990) established a new extinct family Lalacidae based on 36 specimens, which were yielded from the Santana Formation, Lower Cretaceous of Brazil. They were assigned to 24 species in 8 genera. The family Lalacidae is affinitive with Cixiidae, Kinnaridae, Delphacidae and Meenoplidae, and its distinct characters in venation are tegmina held tectiform, with ambient vein and appendix narrow, reinforced margin with sclerous striations and r-m long. This new genus should be assigned to Lalacidae because it also has these characters mentioned above. This new genus resembles the genera Kinnarocixius, Carpopodus and Psestocixius of Lalacidae and Lapicixius, Oliarus of Cixiidae in tegminal venational features, but can be distinguished by pterostigma well-developed, Sc 2-branched in the pterostigmal area, CuA with 6 terminal branches from Kinnarocixius and Psestocixius, by the characters that vein R_1 simple and enclosing the posterior margin of pterostigma, ambient vein present from Lapicixius and Oliarus. The new genus Cretocixius has six cubital branches as in the genus Carpopodus, but it is also easily distinguished from the latter by the characters of pterostigma and vein Sc (Chou, 1985; Hamilton, 1990; Ren, 1998).

In extant fulgoroids, it had not been reported that the tegmen has ambient vein (Chou, 1985). In the new genus as well as Lalacidae, tegmen has ambient vein, moreover, the characters of tegmen indicate they are exactly fulgoroids. So whether or not the ambient vein is the common character of Homoptera and its homogeny should be further studied through the increasing discovered fossils.

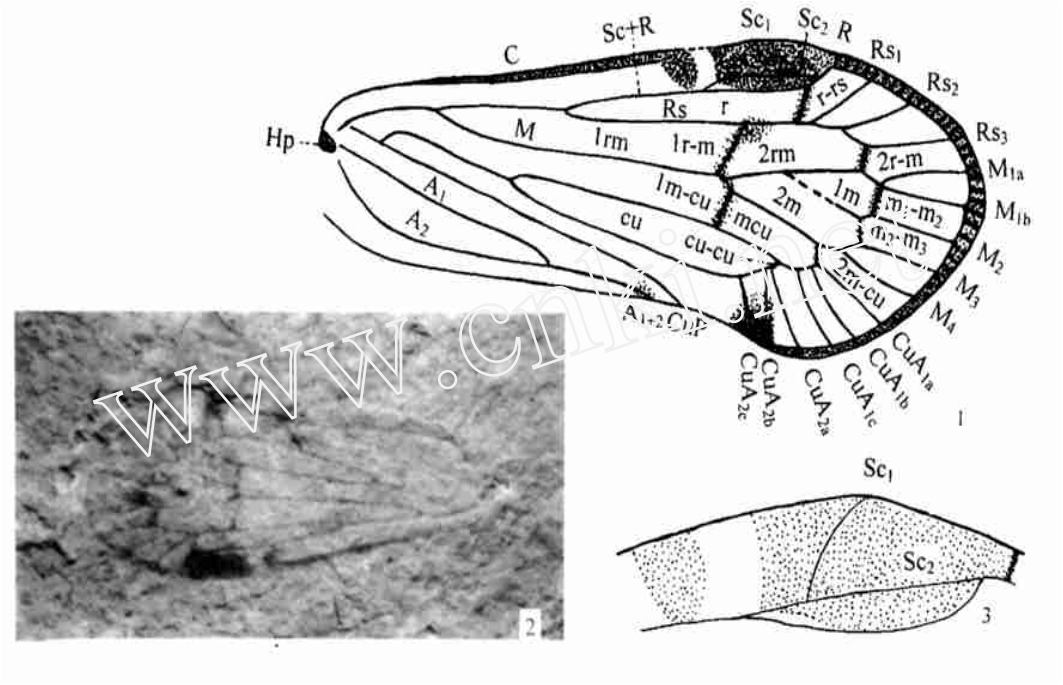
Cretocixius stigmatosus sp. nov. (Figs. 1-2)

Etymology. This species is named from its well-developed ptero-stigma.

Holotype. KL1017-1. Tegmen with its venation was preserved completely.

Type locality and horizon. Lower Cretaceous Lushangfen Formation (K_1^4l), Fangshan district of Beijing.

Description. Tegmen length 9.5 mm; width 4.0 mm. Costal margin straight and incrassated obviously, appendix narrow, apical margin with sclerous striations; pterostigma well-developed; Sc 2-branched in pterostigmal area and separated from R before pterostigma; R_1 simple and enclosing the posterior of pterostigma; Rs arising from R at basal 3/8 of tegmen, the same level as anal veins united; Rs 3-branched, M with very long stem and forked at 2/3 from base of tegmen, anterior branch of M with three branches reaching margin (M_{1a}, M_{1b}, M_2), the posterior branch of M with two short branches (M_3, M_4), CuA derived from CuP (claval suture) and with a long forking, CuA_1 and CuA_2 both with three terminal branches, the last two cubital branches turned to anal angle abruptly; claval veins uniting before a third of length of clavus from apex, common claval vein not reach the apex of clavus. All crossveins thick obviously, r-m and m-cua almost at the same level of M forking, r-m long, subapical cells 2rm, 1m, 2m and mcu distribut-



Figs. 1-2 The tegminal venation of Cretocixius stigmatosus sp. nov.

Fig. 3 The magnified pterostigmal area

C-Costa, Sc + R-conjoint vein of Subcosta and Radius, Sc_1, Sc_2-1st and 2nd branches of Subcosta, R-Radius, Rs-Radial sector, Rs_1, Rs_2, Rs_3-1st-3rd branches of Radial sector, M-Media, M_{1a}, M_{1b}, M_2, M_3, M_4-1st-4th branches of Media, CuA-Cubitus, $CuA_{1a,b,c}$, $CuA_{2a,b,c}$-branches of anterior Cubitus, CuP-posterior Cubitus, A_1, A_2-1st and 2nd Analis, r-rs-crossvein of Radius and Radial sector, 1r-m, 2r-m-1st and 2nd crossveins of Radial sector and Media, 1m-2m-crossvein of M_1 and M_2, 2m-3m-crossvein of M_2 and M_3, 1m-cu, 2m-cu-1st and 2nd crossveins of Media and Cubitus, cu-cu-crossvein of CuA_1 and CuA_2, r-radial cell, 1rm, 2rm-1st and 2nd radomedial cells, 1m, 2m-1st and 2nd medial cells, mcu-medocubitial cell, cu-cubitial cell, Hp-humeral plate

ed compactly, many brown spots distributing beneath the pterostigma and at anal angle, subapical line and outer margin curved with same radian, so apical cells with the same large approximately. Tegmen with 6 subapical and 14 apical cells.

Acknowledgements The author is indebted to my supervisors Prof. HONG You-Chong and Prof. LI Zhen-Yu for directing and very grateful to Prof. REN Dong lending me references and Prof. XU Zhi-Chun, Prof. WANG Wen-Li for photographic works.

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北京京西盆地早白垩世同翅目化石一新属
(同翅目:蜡蝉总科)

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摘　要

记述了北京京西盆地早白垩世卢尚坟组同翅目一新属新种翅痣白垩蜡蝉 Cretocixius stigmatosus gen. et sp. nov.,化石采自卢尚坟组昆虫的典型产地卢尚坟村,时代属早白垩世巴列姆期(Barremian Stage),归卢尚坟昆虫群;在分类上属蜡蝉总科拉蜡蝉科。模式标本保存于北京林业大学。

关键词　早白垩世,卢尚坟组,同翅目,蜡蝉总科,新属,新种.
中图分类号　Q915.8197, Q969.36