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A new genus of Scoliidae (Insecta: Hymenoptera) from the Lower Cretaceous of northeast China

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ABSTRACT

A new genus and species of Scoliidae (Hymenoptera), *Sinoproscolia yangshuwanziensis* gen. et sp. nov., is described from the Lower Cretaceous Yixian Formation in Inner Mongolia, China and attributed to the subfamily Proscoliinae. Some characteristics, including complete crossveins 1r-rs and 2r-m in the forewing, and a free section present in almost all longitudinal veins indicate a basal position of the new genus in Proscoliinae. The presence of vein 2A suggests its atavistic origin in *Sinoproscolia* gen. nov. rather than a true plesiomorphy.

1. Introduction

Scoliidae is a small family of aculeate wasps and is subdivided into three subfamilies: Scoliinae, Proscoliinae and Archaeoscoliinae (Rasnitsyn, 1977, 1993). It is composed of about 500 extant species that occur worldwide (Brothers, 1975; Rasnitsyn, 1993) and 18 extinct species (Heer, 1865; Day et al., 1981; Osten, 1987; Zhang, 1989, 2004, 2006; Rasnitsyn, 1993; Rasnitsyn and Martínez-Delclòs, 1999, 2000; Zhang et al., 2002; Nel et al., 2013). The subfamily Proscoliinae Rasnitsyn includes just two genera: the extant genus *Proscolia* Rasnitsyn with two closely related species, *P. archaica* Rasnitsyn, 1977 and *P. spectator* Day, 1981, and the Early Cretaceous genus *Cretaproscolia* Rasnitsyn and Martínez-Delclòs with two species, *C. josai* Rasnitsyn and Martínez-Delclòs, 1999 and *C. asiatica* Zhang, 2006 (Day et al., 1981; Rasnitsyn and Martínez-Delclòs, 1999; Zhang, 2006).

In the Cretaceous of China, all scoliids are known from the Early Cretaceous Jehol Biota including 7 species in 3 genera within 2 subfamilies: *Protoscolia sinensis* Zhang et al., 2002, *P. normalis* Zhang et al., 2002, *P. imperialis* Zhang et al., 2002, *Cretoscolia formosa* Zhang, 2004, *C. laiyangica* Zhang, 2004, *C. rasnitsyni* Zhang, 2004 (Archaeoscoliinae), and *Cretaproscolia asiatica* Zhang, 2006 (Proscoliinae) (Zhang et al., 2002, 2010; Zhang, 2004, 2006).

A new genus and species is described herein from the Jehol Biota in Inner Mongolia, China and assigned to the subfamily Proscoliinae.

2. Material and methods

The new genus and species established herein is based on a specimen found near Yangshuwanzi Village in the Bisiyingzi Township, Ningcheng County, Chifeng City, Inner Mongolia (41° 25′ N, 118° 57′ E) (Fig. 1) and deposited in the Nanjing Institute of Geology and Palaeontology, Chinese Academy of Sciences. The specimen is from the lacustrine Yixian Formation and its horizon is equivalent to the lower Aptian Jianshangou Bed (Wang and Zhang, 2011).

The specimen was prepared with PaleoTools Micro-Jack 3, examined dry and immersed in ethanol under a NIKON SMZ1000 microscope with fibreoptics and photographed with a digital camera (DXM1200) connected to the microscope at the State Key Laboratory of Palaeobiology and Stratigraphy, Nanjing. Line

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drawings were made using CorelDraw X5.0 software. The nomenclature of the wing venation follows that of Rasnitsyn (1980).

3. Systematic palaeontology

Order: Hymenoptera Linnaeus, 1758
Suborder: Apocrita Gerstäcker, 1867
Superfamily: Vespoidea, Latreille, 1802
Family: Scoliidae Latreille, 1802
Subfamily: Proscoliinae Rasnitsyn, 1977

Proscoliinae: Rasnitsyn, 1977, 523

Type genus. Proscolia Rasnitsyn, 1977

Diagnosis. Eyes without deep excision (unlike Scoliinae). Mouth cavity and mouthparts short (unlike Scoliinae). Neither metasomal dorsum (mesoscutellum + metanotum + propodeal dorsum) nor metasomal venter (meso- + metaventer) level (i.e. not strictly in the same plane unlike Scoliinae). Wings with outer membrane regularly corrugated (unlike Archaeoscoliinae), pterostigmal base separated from C and R by distinct groove continuing posteriorly into cell 1(+2)r (unlike Scoliinae).

Genera included. *Proscolia* Rasnitsyn, 1977, *Cretaproscolia* Rasnitsyn et Martínez-Delclòs, 1999 and *Sinoproscolia* gen. nov.

Remarks. The position of *Cretaproscolia asiatica* Zhang, 2006 in that genus and in Proscoliinae in general is questionable because the regular corrugation is described as invisible in the outer wing membrane but is present in the type species, *C. josai* Rasnitsyn et Martínez-Delclòs, of *Cretaproscolia* (Rasnitsyn and Martínez-Delclòs, 1999). Absence of corrugation is not characteristic of Proscoliinae but of Archaeoscoliinae and would suggest a transfer of *C. asiatica* to the subfamily Archaeoscoliinae. The combined cell 2+3rm present in *C. asiatica*, however, is characteristic of Proscoliinae rather than Archaeoscoliinae. Therefore we refrain from making the transfer until restudying the type material.

The systematics of *C. asiatica* might suggest synonymising Proscoliinae and Archaeoscoliinae, particularly if the membrane corrugation, their only discriminating character still available, is found to vary in its distinctness. More data are necessary to resolve the issue.

Genus *Sinoproscolia* gen. nov.

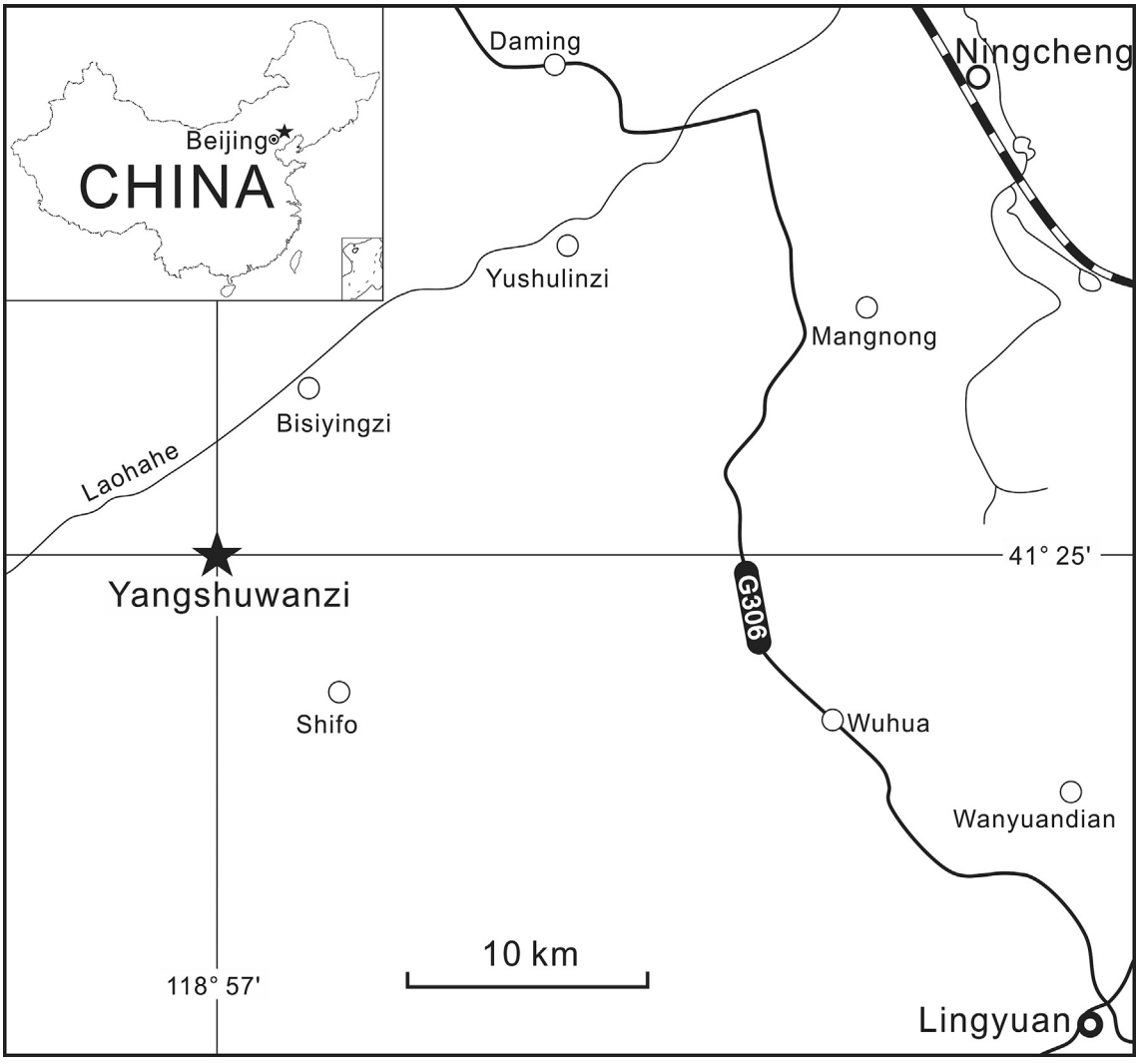

Fig. 1. Geographic map showing the location of the type locality near Yangshuwanzi Village.