

Two new anaxyelid sawflies (Insecta, Hymenoptera, Siricoidea) from the Yixian Formation of western Liaoning, China

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Received 30 November 2002; accepted in revised form 28 November 2005
Available online 7 February 2006

Abstract

Two new species, *Brachysyntexis robusta* and *Syntexyela continentalis*, are described from the Yixian Formation of Beipiao, Liaoning Province, China and assigned to the subfamily Anaxyelinae of the Anaxyelidae. Their palaeobiology is briefly discussed. A review of anaxyelid sawflies previously described from the Mesozoic of China indicates that they do not belong in Anaxyelidae. Based on the new material, the character in the forewing with vein Sc meeting R just at the beginning of Rs is supplemented to the groundplan of the Anaxyelidae.

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Keywords: Hymenoptera; Anaxyelidae; Anaxyelinae; New taxa; Palaeobiology; Yixian Formation; China

1. Introduction

The Anaxyelidae is a small family with only one living species, *Syntexis libocedrii* Rohwer, in western North America (Rohwer, 1915; Benson, 1935). This family, however, flourished from the Late Jurassic to the Early Cretaceous and contains four subfamilies, Syntexinae Benson, Dolichostigmatinae Rasnitsyn, Kempendajinae Rasnitsyn and Anaxyelinae Martynov (Rasnitsyn, 1968, 1969, 1980, 1990). So far, 11 genera and 24 species assigned to the family have been reported from the Upper Jurassic of Kazakhstan and Lower Cretaceous of Russia, England, and Spain (Martynov, 1925; Rasnitsyn, 1963, 1968, 1969, 1990; Rasnitsyn et al., 1998; Rasnitsyn and Martínez-Delclòs, 2000) (see Table 1).

Here we describe two new species from the lower part of the Yixian Formation in Beipiao, Liaoning Province, China.

The stratigraphy of the locality has been described in detail by Zhang et al. (2002).

2. Systematic palaeontology

Order: Hymenoptera Linnaeus, 1758
Suborder: Symphyta Gerstaecker, 1867
Superfamily: Siricoidea Billberg, 1820
Family: Anaxyelidae Martynov, 1925
Subfamily: Anaxyelinae Martynov, 1925

Genus *Brachysyntexis* Rasnitsyn, 1969

1968 *Syntexyela* Rasnitsyn, p. 202, pl. 23, fig. 7; text-fig. 9
1969 *Brachysyntexis* Rasnitsyn, pp. 65, 70–71, pl. 6, fig. 15; text-figs. 101–103
1992 *Brachysyntexis* Carpenter, p. 459, fig. 248.2

Type species of Brachysyntexis. Syntexyela brachyura Rasnitsyn, 1968. By original designation. South Kazakhstan, Upper Jurassic.

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Table 1
Distribution of the known taxa of Anaxyelidae^a

Taxa	Distribution	References
Syntexinae Benson, 1935		
<i>Cretosyntexis montsecensis</i> Rasnitsyn and Martínez-Delclòs, 2000	L. Cret. lithographic limestones; La Cabrúa, Montsec Range, Lleida, Spain	Rasnitsyn and Martínez-Delclòs (2000)
<i>Eosyntexis catalonicus</i> Rasnitsyn and Martínez-Delclòs, 2000	L. Cret. lithographic limestones; La Cabrúa, Montsec Range, Lleida, Spain	Rasnitsyn and Martínez-Delclòs (2000)
<i>Eosyntexis tuffinae</i> Rasnitsyn and Jarzembowski in Rasnitsyn et al., 1998	L. Cret. Lulworth Fm; Durlston Bay, Dorset, England	Rasnitsyn et al., 1998
<i>Eosyntexis senilis</i> Rasnitsyn, 1990	L. Cret. Turga Fm; Turga, Transbaikalia, Russia	Rasnitsyn (1990)
<i>Syntexis libocedrii</i> Rohwer, 1915	Extant; western North America	Rohwer (1915)
Dolichostigmatinae Rasnitsyn, 1968		
<i>Dolichostigma tenuipes</i> Rasnitsyn, 1968	L. Cret. Zaza Fm; Baisa, Transbaikalia, Russia	Rasnitsyn (1968, 1969)
Anaxyelinae Martynov, 1925		
<i>Anasyntexis strophandra</i> Rasnitsyn, 1968	U. Jur. Karabastau Fm; Karatau, South Kazakhstan	Rasnitsyn, 1968, 1969
<i>Anaxyela destructa</i> Rasnitsyn, 1969	U. Jur. Karabastau Fm; Karatau, South Kazakhstan	Rasnitsyn (1969)
<i>Anaxyela gracilis</i> Martynov, 1925	U. Jur. Karabastau Fm; Karatau, South Kazakhstan	Martynov (1925); Rasnitsyn (1969)
<i>Anaxyela parvula</i> Rasnitsyn, 1963	U. Jur. Karabastau Fm; Karatau, South Kazakhstan	Rasnitsyn (1963, 1969)
<i>Anaxyela nana</i> (Rasnitsyn, 1968)	U. Jur. Karabastau Fm; Karatau, South Kazakhstan	Rasnitsyn (1968, 1969)
<i>Brachysyntexis brachyura</i> (Rasnitsyn, 1968)	U. Jur. Karabastau Fm; Karatau, South Kazakhstan	Rasnitsyn (1968, 1969)
<i>Brachysyntexis micrura</i> Rasnitsyn, 1969	U. Jur. Karabastau Fm; Karatau, South Kazakhstan	Rasnitsyn (1969)
<i>Brachysyntexis nova</i> Rasnitsyn, 1969	U. Jur. Karabastau Fm; Karatau, South Kazakhstan	Rasnitsyn (1969)
<i>Brachysyntexis robusta</i> sp. nov.	U. Jur. or L. Cret. Yixian Fm; Beipiao, Liaoning, China	this paper
<i>Kulbastavia macrura</i> (Rasnitsyn, 1963)	U. Jur. Karabastau Fm; Karatau, South Kazakhstan	Rasnitsyn (1963, 1969)
<i>Sphenosyntexis antonovi</i> (Rasnitsyn, 1963)	U. Jur. Karabastau Fm; Karatau, South Kazakhstan	Rasnitsyn (1963, 1969)
<i>Sphenosyntexis pallicornis</i> Rasnitsyn, 1968	U. Jur. Karabastau Fm; Karatau, South Kazakhstan	Rasnitsyn (1968, 1969)
<i>Syntexyela asiatica</i> Rasnitsyn, 1968	U. Jur. Karabastau Fm; Karatau, South Kazakhstan	Rasnitsyn (1968, 1969)
<i>Syntexyela continentalis</i> sp. nov.	U. Jur. or L. Cret. Yixian Fm; Beipiao, Liaoning, China	this paper
<i>Syntexyela gracilicornis</i> Rasnitsyn, 1968	U. Jur. Karabastau Fm; Karatau, South Kazakhstan	Rasnitsyn (1968, 1969)
<i>Syntexyela inversa</i> Rasnitsyn, 1968	U. Jur. Karabastau Fm; Karatau, South Kazakhstan	Rasnitsyn (1968, 1969)
<i>Syntexyela media</i> (Rasnitsyn, 1963)	U. Jur. Karabastau Fm; Karatau, South Kazakhstan	Rasnitsyn (1963, 1968, 1969)
<i>Urosyntexis depressa</i> Rasnitsyn, 1969	U. Jur. Karabastau Fm; Karatau, South Kazakhstan	Rasnitsyn (1969)
<i>Urosyntexis drepanura</i> (Rasnitsyn, 1968)	U. Jur. Karabastau Fm; Karatau, South Kazakhstan	Rasnitsyn (1968, 1969)
<i>Urosyntexis magna</i> (Rasnitsyn, 1968)	U. Jur. Karabastau Fm; Karatau, South Kazakhstan	Rasnitsyn (1968, 1969)
Kempendajinae Rasnitsyn, 1980		
<i>Kempendaja jacutensis</i> Rasnitsyn, 1968	L. Cret.; Kempendaj, Yakutia, Russia	Rasnitsyn (1968, 1969, 1980)

Abbreviations: U. Jur., Upper Jurassic; L. Cret., Lower Cretaceous.

^a *Anaxyela dubia* Rasnitsyn, 1963 was transferred to *Symphlyopteris* Rasnitsyn assigned to Ephialtitidae (Rasnitsyn, 1975, p. 43, fig. 31).

Species included. Four species including the new one described below (see Table 1).

Diagnosis. Antenna thick basally, gradually becoming thin apically. Mesoscutellum with anterior margin acute. Forewing with pterostigma sclerotized, ending before middle of cell 3r; Rs + M shorter than section CuA between M and cu-a, ending before middle of 1m-cu; section M between 2m-cu and 3r-m longer than half of 2m-cu. Hindwing with r-m close to m-cu; cu-a near the middle of m-cu. Ovipositor with sheaths not longer than half of valvifer.

Remarks. Rasnitsyn (1968) erected the genus *Syntexyela* consisting of eight species including *Syntexyela brachyura*. Soon after he (Rasnitsyn, 1969) established a new genus, *Brachysyntexis*, and designated *S. brachyura* as its type species.

Brachysyntexis robusta sp. nov.

Fig. 1

Derivation of name. Latin, *robustus*, strong.

Material. Holotype LBSH98017/NIGP135548 (female), part and counterpart, from Huangbanjigou Village, Beipiao, Liaoning Province, China; deposited in the Nanjing Institute of Geology and Palaeontology, Chinese Academy of Sciences.

Diagnosis. Three species of *Brachysyntexis* are known, *B. brachyura* (Rasnitsyn), *B. nova* Rasnitsyn and *B. micrura* Rasnitsyn from the Upper Jurassic of South Kazakhstan (Rasnitsyn, 1968, 1969). Unlike all previously described species, this anaxyelid has a transversely oval head, comparatively large eyes, and a forewing with cell 3r rounded apically. Besides these characters, it differs from *B. brachyura* in having a body with prescutum as large as the scutellum, ovipositor sheaths are comparatively short, and crossvein 3r-m is longer than 2m-cu. It differs from *B. nova* in having a prescutum distant from the scutellum, thin hind femora, and distinct crossvein Sc, and from *B. micrura* in having a broad mesonotum and a forewing with crossvein 3r-m longer than 2m-cu.

Description. Female (male unknown). In dorsal aspect with antenna, legs and wings slightly damaged; brown. Head

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