

Short communication

A new species of Chifengiinae (Orthoptera: Prophalangopsidae) from the Lower Cretaceous Zhonggou Formation of the Jiuquan Basin, Northwest China



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ABSTRACT

A new orthopteran species, *Ashanga jiuquanensis* Wang and Zhang sp. nov., is assigned to the subfamily Chifengiinae of Prophalangopsidae (Insecta: Orthoptera) and is reported based on male and female forewings from the Lower Cretaceous Zhonggou Formation in the Jiuquan Basin, Gansu Province, Northwest China. The discovery of the new species extends not only the age range of the subfamily Chifengiinae, but also the geographical distribution of the genus *Ashanga*.

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1. Introduction

As one of the 5 subfamilies of fossil Prophalangopsidae, Chifengiinae is thought to be closely related to Aboilinae, the most diverse subfamily of Prophalangopsidae (Gorochov, 2003; Fang et al., 2013). The most distinctive difference between the Chifengiinae and other subfamilies of fossil Prophalangopsidae is the reduction of vein C in this subfamily (Fang et al., 2013).

So far, 7 species in 4 genera have been assigned to the Chifengiinae from Middle Jurassic – Lower Cretaceous deposits of Russia, China and England (Table 1). In China, Chifengiinae was ever reported from the Lower Cretaceous Chijinpu Formation in the

Jiuquan Basin, Gansu Province (Wang et al., 2016). Recently, the authors investigated the Jiuquan Basin and recovered some insect fossils from the Lower Cretaceous Zhonggou Formation including two orthopteran forewings. The two forewings, a male and a female, are assigned to *Ashanga*, Chifengiinae and a new species is erected herein.

2. Material and methods

The two forewings (both consisting of part and counterpart) described in this paper are preserved as impressions on the surface of grey, clayey shales of the Zhonggou Formation and were collected at Hanxiagou, Chijin Town, Jiuquan City, Gansu Province, northwest China (Fig. 1A). The Lower Cretaceous Zhonggou Formation here unconformably underlies the Paleogene Huoshaogou Formation and conformably overlies the Lower Cretaceous Xiagou Formation (Fig. 1B). The specimens were examined dry using a Nikon SMZ1000 stereomicroscope. The photographs were taken using a NIKON D800 digital camera, and the line drawings were

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Table 1

Detailed information on fossil material assigned to Chifengiinae.

Subfamily/genus/species	Type material	Horizon	Age	Locality	References
CHIFENGIINAE Hong, 1982					
<i>Aenigmoilus</i> Gorochov et al., 2006					
<i>Aenigmoilus minutus</i> Gorochov et al., 2006	Female	Lower Cretaceous Lower Weald Clay	Late Hauterivian	Clockhouse Brickworks, Capel, Surrey, England	Gorochov et al. (2006)
<i>Ashanga</i> Zherikhin, 1985					
<i>Ashanga borealis</i> Fang et al., 2013	Male	Lower Cretaceous Yixian Formation	Aptian	Jiangzhangzi, Lingyuan, Liaoning, China	Fang et al. (2013)
<i>Ashanga clara</i> Zherikhin, 1985	Male	Upper Jurassic Uda Formation	Oxfordian– Kimmeridgian	Ashanga, Transbaikalia, Russia	Zherikhin (1985)
<i>Ashanga hongii</i> Meng and Ren, 2006	Female	Lower Cretaceous Yixian Formation	Aptian	Beipiao, Liaoning, China	Meng and Ren (2006); Gu et al. (2010)
<i>Asbanga jiuquanensis</i> sp. nov.	Female/male	Lower Cretaceous Zhonggou Formation	Albian	Jiuquan City, Gansu, China	This study
<i>Chifengia</i> Hong, 1982					
<i>Chifengia batuyingziensis</i> Wang, 1987	Male	Middle Jurassic Haifanggou Formation	Bajocian– Bathonian	Batuyingzi, Beipiao, Liaoning, China	Wang (1987)
<i>Chifengia mosaica</i> Hong, 1982	Male	Lower Cretaceous	Aptian	Chifeng, China	Hong (1982)
<i>Parahagla</i> Sharov, 1968					
<i>Parahagla sibirica</i> Sharov, 1968	Female/male	Lower Cretaceous Yixian Formation; Chijinpu Formation; Zaza Formation	Valanginian– Aptian	Baissa, Siberia, Russia; Beipiao, Liaoning, China; Luanping and Chengde, Hebei, China	Sharov (1968); Meng et al. (2006); Meng and Ren (2006); Ren (1995); Gu et al. (2010); Wang et al. (2016)

compiled by tracing the photographs using the image-editing software CorelDraw X5 and Adobe Photoshop CS. The specimens are deposited at the Nanjing Institute of Geology and Palaeontology (NIGP), Chinese Academy of Sciences, Nanjing, China.

There is no consensus on the interpretation of wing-venation nomenclature of Orthoptera; here we follow that proposed by Zeuner (1939), Sharov (1968, 1971), and amended by Gorochov (1986, 1995). The venational abbreviations used by Béthoux and Nel (2001, 2002) are given here in parenthesis following the corresponding ones in Gorochov (1995) if any significant differences are present between the two terminologies: C (ScA), costa; Sc (ScP),

subcosta; RA, radius anterior; RS (RP), radial sector; M (M + CuA), media; MA (M), media anterior; MP (CuA), media posterior; Cu (CuP), cubitus; CuA (CuPa), cubitus anterior; CuP (CuPb), cubitus posterior; A, analis; 1A, first anal vein; 2A, second anal vein; “handle vein”, special crossvein between CuA₁ and CuA₂.

3. Systematic palaeontology

Order: Orthoptera Olivier, 1789

Family: Prophalangopsidae Kirby, 1906

Subfamily: Chifengiinae Hong, 1982

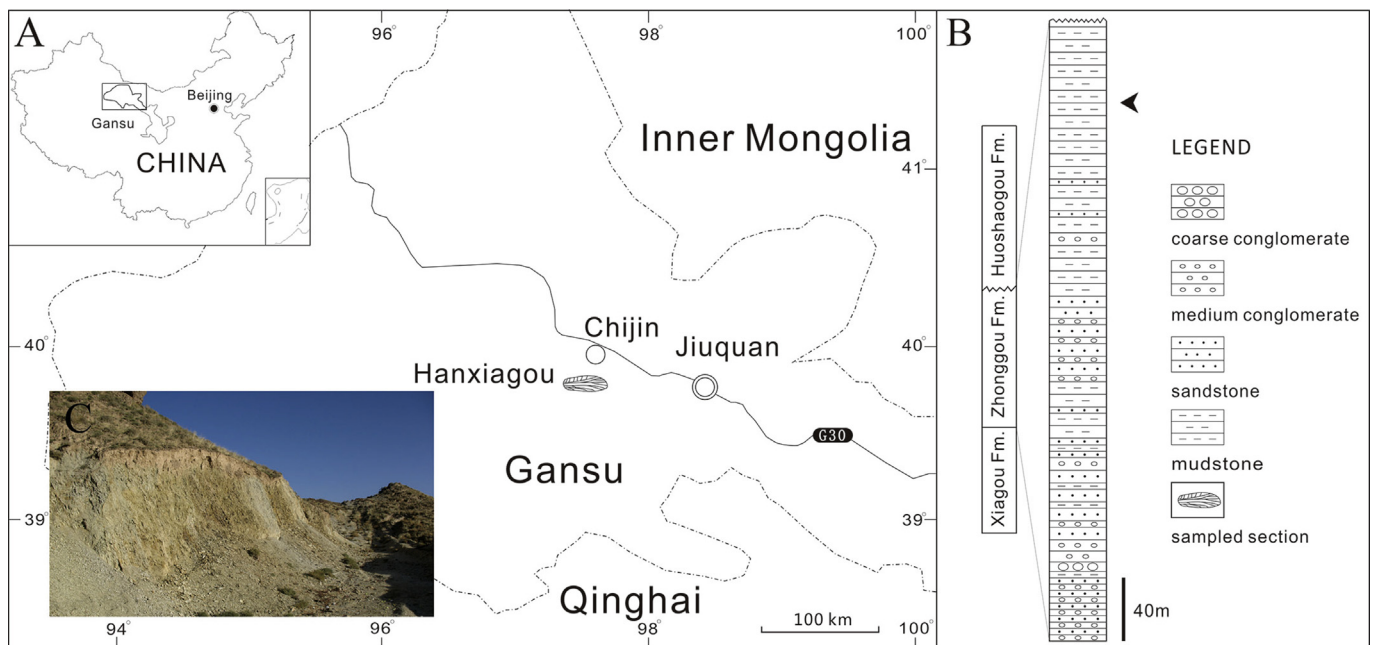


Fig. 1. Geographical and stratigraphical details of the orthopteran *Ashanga jiuquanensis* sp. nov. A. Sketch map of Jiuquan City, Gansu Province, China, showing the locality of the Hanxiagou Section. B. General section showing the lithology of the Zhonggou Formation and the position (arrow) of the material collected in the Hanxiagou outcrop. C. Photo showing the Hanxiagou Section (revised from Zheng et al., 2015).

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