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Original Article

Comparative Study on the Karyotype of Two Species of *Megaulacobothrus* Caud., 1921 (Acridoidea)

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Abstract

Key words: Chromosome, karyotype, *Chorthippus (Megaulacobothrus) aethalinus*, *Chorthippus (Megaulacobothrus) chinensis*

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The karyotypes of *Chorthippus* (*Megaulacobothrus*) *aethalinus* (Zubovsky, 1899) and *Chorthippus* (*Megaulacobothrus*) *chinensis* Tarbinsky, 1927 were compared by means of the conventional cytogenetic method. The results showed that chromosome numbers of two species were 2n(♂)=17=16+XO, in which three pairs of autosomal and sex chromosomes were terminal chromosomes, and the other five pairs of autosomal ones were metacentric chromosomes, which are the diagnostic characters of *Chorthippus*. However, these two species could be identified by the different formulae and the relative length of chromosomes. The chromosome formula of *Chorthippus (M.) aethalinus* is K(2n,♂)=6m+11t=6L+6M+4S+XO, whereas that of *Chorthippus (M.) chinensis* is K(2n,♂)=6m+11t=6L+8M+2S+XO. In addition, we found that the location and the relative length of sex chromosomes in the two species were different from each other. Sex chromosome of *Chorthippus (M.) aethalinus* located at fifth position and its relative length was equal to 8.33%, whereas that of *Chorthippus (M.) chinensis* was at eighth position and its relative length was equal to 5.53%. These results showed that significant different karyotype features exist in the two compared species of *Chorthippus*.

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Introduction

The subgenus *Megaulacobothrus* Caudell, 1921 belongs to the genus *Chorthippus* Fieber, 1852 (Catantopinae, Acrididae, Orthoptera). *Chorthippus* is one of the largest genera in Catantopinae, and believed to the main group of grasshoppers in the northern China. More than 200 species of this genus were recorded from Europe, Asia, Africa and USA. Up to date, 76 species of the genus including 4 subgenera, such as *Megaulacobothrus*, *Glybtobothrus*, *Altrichorthippus*, *Chorthippus* were recorded in China (Zheng & Xi, 1998). The comparison of the karyotypes in grasshoppers not only displays their evolutionary process and trend, but also reveals the phylogeny and taxonomic status of the species. In addition, it could also provide the scientific basis for the pest control (Zhang *et al*., 2003; Ma *et al*., 2000). According to literatures, there are about 10,000 species of grasshoppers worldwide, and the chromosomes of the over 1000 species have been analyzed (Ma & Zheng, 1989). Currently, karyotypes of only some species of the families Pamphagidae, Pyrgomorphidae, Oedipodidae and Arcypteridae in China have been reported (Yan, 2001; Yang *et al*., 2008).

Members of *Chorthippus* are the main grassland pests, which emergence every year. They have high density and serious harmfulness