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# On the taxonomy of the tribe Pisachini (Hemiptera: Fulgoromorpha: Nogodinidae) with the description of new taxa from China and Vietnam

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## Abstract

*Goniopsarites* **gen. nov.** is described from China in the tribe Pisachini with *G. fronticonvexus* **sp. nov.** as the type species. The genus *Pisacha* is revised, four new species *P. yinggensis* **sp. nov.**, *P. baculiformis* **sp. nov.**, *P. falcata* **sp. nov.**, *P. balteiformis* **sp. nov.** are described, and *P. encaustica* (Jacobi, 1916) comb. nov. & stat. rev. is reestablished which has been treated as *P. naga* according to specimens from Taiwan. Identification keys to three genera of the tribe Pisachini and to all species of *Pisacha* are presented.

**Key words:** Fulgoroidea, new genus, new species, Nogodininae, taxonomy

## Introduction

The higher classification of the Nogodinidae was proposed by Fennah (1978, 1984, 1987). Recently, it was partly revised by Gnezdilov (2007a, 2008, 2009, 2012). Accoding to these works on Nogodinidae, 89 extant genera of Nogodinidae (Bourgoin, 2014) are included in three subfamilies: Nogodininae Melichar, 1898, Gastriniinae Fennah, 1987, Colpopterinae Gnezdilov, 2003 (Gnezdilov, 2012). The Nogodininae have eight tribes: Nogodinini Melichar, 1898, Epacriini Fennah, 1978, Bladinini Kirkaldy, 1907, Pisachini Fennah, 1978, Varciini Fennah, 1978, Mithymnini Fennah, 1967, Lipocalliini Fennah, 1984, Tongini Kirkaldy, 1907.

The tribe Pisachini was formerly erected by Fennah (1978), and can be characterized by "teeth on basal metatarsal segment arranged in a deep curve, partly enclosing a long setiferous eminence; third valvalae of ovipositor dilated and thickened in dorsal half, with posterior surface flattened and bearing a broad even tract of minute denticles". It was considered to comprise *Pisacha* Distant, 1906, *Soaemis* Jacobi, 1916 and *Goneopsara* Metcalf, 1952. The genus *Pisacha* Distant was erected for *Pisacha naga* Distant 1906 from India, later, the other species *P. kwangsiensis* Chou et Lu 1977 from China was reported. However, the genus *Soaemis* Jacobi was treated as a synonym of *Pisacha* Distant by Ishihara (1965). The genus *Goneopsara* Metcalf (new name for *Goniopsis* Melichar, 1899) has a single species *Goniopsara mystica* (Melichar, 1899) from Singapore. So far, two genera and three species are included in this tribe.

In the present paper, the genus *Goniopsarites* **gen. nov.** is described with only one species *G. fronticonvexus* **sp. nov.**, which is distributed in South China. In addition, three new species of genus *Pisacha* from South China and one new species from Vietnam are reported. Currently, All three included genera in tribe Pisachini are distributed in Oriental region.

## Material and methods

The external morphology was observed under a Leica MZ 125 microscope. All measurements are in millimeters (mm). The morphology terminology follows Chou *et al*. (1985), Bourgion *et al*. (2013) and Gnezdilov (2012) for

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in lateral view which similar to *Pisacha*, and in other tribes of the subfamilies Nogodininae, genital style more or less narrowing distally, nearly rectangular in lateral view (Fennah, 1969, p.94: fig. 511; 1978, p.116: fig. 16; Wu and Yang, 1989, p.164: fig. 1E; Chan & Yang, 1994, p.76,78: fig. 31F, 32F; Gnezdilov, 2007b, p. 59: fig. 14).

In the present paper, seven species of *Pisacha* are mentioned. These speices are externally similar to each other which easily make mistakes in the identification process. *P. naga* had been recorded in Hainan Province from China according to one female specimen by Fennah (1956). We found it is error identification and the female specimen should be *P. yinggensis* **sp. nov.**. Meanwhile, the distributional record of *P. naga* is removed from China. These speices of *Pisacha* differ from each other principally by the following characteristics: aspect ratio of frons, the colour and length of carinae on frons; anterior margin of vertex convex or concave or straight medially, tegmina with or without marking; the length of lateral carinae on mesonotum and the genitalic characters. In addition, we found these species distributed in different regions, geographical distribution could be considered as an important factor in species identification of this group.

Even the higher classification of the Nogodinidae had been proposed as we remarked in the introduction. However, as always, the family of Nogodinidae is poorly defined, and the phylogenetic analyses of the Nogodinidae also are unclear up to now. The molecular phylogenetics on the planthoppers has been indicated that Nogodinidae are polyphyletic (Urban and Cryan, 2007; Song and Liang, 2013). More studies are needed to better understand phylogenetic analyses of the Nogodinidae.

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