

# Reappraisal of the Systematic Position of the Supposed Pinnotherid Crab *Pseudopinnixa carinata* (Crustacea: Decapoda: Brachyura)

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The systematic position of the monotypic eubrachyuran genus *Pseudopinnixa* Ortmann, 1894, which traditionally has been placed in the family Pinnotheridae, is reassessed on the basis of the adult morphology. The structure of the thoracic sternum, third maxilliped, and male abdomen strongly suggests a close relationship between *Pseudopinnixa* and members of the subfamily Gaeticinae in the family Varunidae. Consequently, the genus is transferred to this varunid subfamily. This assignment is also supported by the first zoeal morphology. The type species, *P. carinata* Ortmann, 1894, is redescribed and illustrated in detail.

**Key Words:** Crustacea, Decapoda, Brachyura, Varunidae, *Pseudopinnixa*, redescription.

## Introduction

Recent studies have rearranged or questioned the classification of the taxa traditionally placed in the eubrachyuran family Pinnotheridae (Ng *et al.* 2008; Ahyong and Ng 2009; Naruse and Clark 2009; Palacios-Theil *et al.* 2009). The monotypic genus *Pseudopinnixa* was originally established by Ortmann (1894) in his new family Pinnotheridae, to accommodate *P. carinata* Ortmann, 1894 (Ortmann 1894: 690). Since then, this genus has remained in this family (e.g., Tesch 1918; Schmitt *et al.* 1973; Sakai 1965, 1976; Ng *et al.* 2008); however, based on DNA sequences and larval morphology, Cuesta *et al.* (2005) suggested that *P. carinata* is actually allied to the Macrophthalmidae Dana, 1851 instead. Ng *et al.* (2008) pointed out that a reappraisal of the systematic position of this taxon is necessary. Palacios-Theil *et al.* (2009), using molecular datasets, investigated the phylogenetic relationships among selected taxa of Pinnotheridae and their results indicate that the family is polyphyletic. *Pseudopinnixa carinata*, in particular, was positioned basally to all other pinnotheroid groups, but in a poorly resolved polytomy.

This study focuses mainly on the adult morphology of *Pseudopinnixa carinata* in order to assess its phylogenetic position. Our morphological studies strongly suggest that *Pseudopinnixa* is closely allied to the subfamily Gaeticinae Davie and Ng, 2007 in the family Varunidae Milne Edwards, 1853, currently represented by three genera, *Gaetice* Gistel, 1848, *Gopkittisak* Naruse and Clark, 2009, and *Sestrostoma* Davie and Ng, 2007 (Davie and Ng 2007; Naruse and Clark 2009). This relationship is supported by the structure of the

third maxilliped, thoracic sternum, and male abdomen. Consequently we propose to transfer *Pseudopinnixa carinata* to the Gaeticinae in the Varunidae.

## Materials and Methods

Material examined in this study is deposited in the Natural History Museum and Institute, Chiba (CBM) and the Musée Zoologique, Strasbourg (ZMS). The measurements provided, in millimeters, are of the carapace length and width, respectively. For comparison, the following material was examined.

*Gaetice depressus* (De Haan, 1833): 1 male (13.0×16.0 mm), Uchinoura Bay, Usa, Kochi Prefecture, intertidal, 12 September 1999, coll. H. Endo, CBM-ZC 5222.

*Gopkittisak gallardoi* (Serène and Soh, 1976): 2 females, Ko Sirei, Phuket, Thailand, intertidal sand flat, 22 December 2009, yabbie pump, coll. T. Komai, CBM-ZC 10225.

*Sestrostoma balsi* (Shen, 1932): 1 male (9.2×11.3 mm), 1 female (9.9×12.7 mm), Miho Bay, Tottori Prefecture, 35°28.903'N, 133°18.576'E, 12 m, sand, 18 August 2003, Smith-McIntyre grab, CBM-ZC 8146.

## Systematics

Superfamily **Grapsoidea** MacLeay, 1838  
Family **Varunidae** Milne Edwards, 1853  
Subfamily **Gaeticinae** Davie and Ng, 2007  
Genus ***Pseudopinnixa*** Ortmann, 1894