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***Uca (Xeruca)*, a new subgenus for the Taiwanese fiddler crab *Uca formosensis* Rathbun, 1921 (Crustacea: Decapoda: Ocypodidae), based on morphological and molecular evidence**

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Abstract

The fiddler crab *Uca formosensis* Rathbun, 1921 (Crustacea: Decapoda: Ocypodidae), restricted to the western part of Taiwan and the offshore Penghu (Pescadores) Islands in the Taiwan Strait, has been placed under the subgenus *Uca (Gelasimus)* Latreille, 1817 (= *Uca (Thalassuca)* Crane, 1975) based on only less than a dozen specimens, but later suggested under the subgenus *Tubuca* Bott, 1973 because the similarity of external morphology. A suite of characters of carapace, major cheliped, gastric mill, male first gonopod, and chela handedness, as well as the phylogenetic relationships (mitochondrial 16S rDNA and cytochrome oxidase subunit I, and nuclear 28S rDNA), nevertheless support this species belongs to its own subgenus. A new subgenus *Uca (Xeruca)* **subgen. nov.** is herein established for *U. formosensis*.

Key words: *Xeruca*, new subgenus, *Uca formosensis*, fiddler crab, Ocypodidae, taxonomy, Taiwan, 16S rDNA, cytochrome oxidase subunit I, 28S rDNA

Introduction

There are 102 extant species of fiddler crabs (Ocypodidae: genus *Uca*) in the world (Crane 1975; Rosenberg 2001; Beinlich & von Hagen 2006; Ng *et al.* 2008; Landstorfer & Schubart 2010; Naderloo *et al.* 2010; Shih *et al.* 2010, 2012, 2013a, b). The 44 Indo-West Pacific (IWP) species belong to six subgenera, including the narrow-fronted *Australuca* Crane, 1975, *Gelasimus* Latreille, 1817, and *Tubuca* Bott, 1973, and the broad-fronted *Austruca* Bott, 1973, *Cranuca* Beinlich & von Hagen, 2006, and *Paraleptuca* Bott, 1973 (see Crane 1975; Shih *et al.* 2013b). Among them, the subgenus *Tubuca*, composed of 14 species, is a group with the highest species diversity (see Ng *et al.* 2008).

Crane's (1975) monograph of *Uca* is a landmark publication for ocypodid researchers, with major updates by Rosenberg (2001) and Beinlich & von Hagen (2006). One taxon, which Crane regarded as "elusive" is *Uca formosensis* Rathbun, 1921, a species endemic to Taiwan, with only less than a dozen preserved specimens at the time of her study. She had tried to collect specimens in Danshuei (= Tamsui) in northwestern Taiwan during late April to May 1963 (Crane 1975; Sakai 1981), but was unsuccessful, probably because the habitat of this locality has substantially changed since the 1950s with a dense growth of mangroves now dominating (Shih 1997). She places *U. formosensis* in the subgenus *Thalassuca* Crane, 1975 (= *Gelasimus* Latreille, 1817), with other two species, *U. tetragonon* and *U. vocans* (with six subspecies). After examining more specimens from various localities in Taiwan, Shih *et al.* (1999) suggested the morphology of *U. formosensis* was closer to members of the subgenus *Tubuca* Bott, 1973 (= *Deltuca* Crane, 1975). The ecology and behavior of *U. formosensis* are nevertheless peculiar compared to other IWP narrow-fronted species. Its preferred habitat is in the high intertidal mudflat with clay sediment, and is only immersed by the high tide during spring tide; in addition, the male builds a tall chimney (mean height 9.2 cm) for underground mating during the neap tide (Shih *et al.* 2005). Other *Tubuca* species however generally inhabit in the wet areas between low and middle intertidal zones (Crane 1975). Although some species construct chimneys around burrow entrance, the builder is of either sex or at least the