



Taxonomy of the sand bubbler crabs *Scopimera globosa* De Haan, 1835, and *S. tuberculata* Stimpson, 1858 (Crustacea: Decapoda: Dotillidae) in East Asia, with description of a new species from the Ryukyus, Japan

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Abstract

Sand bubbler crabs of the genus *Scopimera* are common on sandy shores in East Asia yet the taxonomy of the species remains unclear. *Scopimera globosa* De Haan, 1835, the type species, was described from Japanese specimens and also occurs in Korea and China. *Scopimera tuberculata* Stimpson, 1858, described from Japan, has been regarded a junior synonym of *S. globosa*, but the types had long been lost. Some workers have considered the two taxa distinct and *S. tuberculata* has been recorded from South China. In the present study, we confirm using male gonopod morphology and molecular analysis, that the early records of *S. tuberculata* from Hong Kong and *S. globosa* from Taiwan are in fact *S. intermedia* Balss, 1934. The present study regards *S. tuberculata* as a subjective junior synonym to *S. globosa*. A new species, *Scopimera ryukyuensis* **sp. nov.** from the Ryukyus, is identified and described herein. The new species is close to *S. globosa* but can be separated by carapace characters. The mitochondrial cytochrome oxidase I (COI) gene revealed basepair (bp) difference between the new species and other *Scopimera* spp. to be at the interspecific level, at least 28 bp (4.3%).

Key words: *Scopimera ryukyuensis*, Dotillidae, cytochrome oxidase I, taxonomy, Ryukyus, Japan

Introduction

Sand bubble crabs of the genus *Scopimera* De Haan, 1835, are common on Indo-West Pacific tropical and subtropical sandy shores (Yamaguchi & Tanaka 1974; Koga 1995). Taxonomic studies of *Scopimera* in the region, especially in East Asia, have not yet been received extensive attention, resulting in confusions of some morphologically similar species. De Haan (1835) identified the type species of *Scopimera*, *S. globosa* (as *Ocypode (Scopimera) globosa*) from Japan, without stating a precise locality (see also De Haan's re-examined material by Yamaguchi & Baba 1993). Miyake (1983) reported *S. globosa* as being distributed in Korea, North China, mainland Japan, the Ryukyus and Taiwan, implying a wide distribution in the region. Stimpson (1858) identified *S. tuberculata* from Simoda (= Shimoda), Japan, during his North Pacific Exploration Expedition and argued that *S. tuberculata* was different from *S. globosa* by having a rough, tubercle-covered carapace surface (Stimpson 1858, 1907). Stimpson's description of the new species was, however, too brief and uninformative, fitting more than one species of the genus and making realistic comparisons with other species difficult. In addition, the type specimen of *S. tuberculata* was almost certainly destroyed in the Great Chicago Fire of 1871 (Stimpson 1907; Evans 1967; Vasile *et al.* 2005; Manning & Reed 2006). Subsequently, *S. tuberculata* has been considered a junior synonym of *S. globosa* since Koelbel (1897) (see Tesch 1918; Kemp 1919; Sakai 1939, 1976; Tweedie 1950; Ng *et al.* 2001, 2008).

Shen (1935) reported on the specimens of *Scopimera* from South China (including Hong Kong). He reported that *S. tuberculata* was present and suggested that both *S. globosa* and *S. tuberculata* should be treated as distinct species. This recommendation was supported by several workers (e.g., Tweedie 1937; Dai