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FIRST RECORD IN SINGAPORE OF A NEPENTHIPHILOUS CRAB, *GEOSESARMA PERRACAE* (CRUSTACEA: DECAPODA: SESARMIDAE)

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INTRODUCTION

The freshwater crabs of Peninsular Malaysia and Singapore have been described in detail by Ng (1988) and more recently by Yeo & Ng (1999), and Ng (2004). Of the wholly freshwater sesarmid crabs of the genus *Geosesarma* De Man, 1892, one species, *Geosesarma malayanum* Ng & Lim, 1986, has been observed to foray into pitchers of the narrow-lidded pitcher plant, *Nepenthes ampullaria* Jack (Ng, 1988; Ng & Lim, 1987). Although this crab is regarded as nepenthiphilous (associated with *Nepenthes* species), they are also found in other habitats not near *Nepenthes* species. During a recent survey of the streams at the Sime Road swamp forest, west of MacRitchie Reservoir at the Central Nature Catchment Nature Reserve (CCNR), a second species of *Geosesarma*, *Geosesarma perracae* (Nobili, 1903) was observed inside a pitcher of *Nepenthes ampullaria*. This record of a second *Geosesarma* species making forays into *Nepenthes* species' pitchers is not as surprising but noteworthy nonetheless.

OBSERVATIONS

A patch of *Nepenthes ampullaria* in the MacRitchie Reservoir area was noted to have aerial-growing, rosette-arranged pitcher leavess growing from the main stem, an atypical growth form for most *Nepenthes* species, but typical for this species (Clarke, 2001) (Fig. 1). There are at least three forms of *Nepenthes ampullaria*, one with green pitchers, one with red-mottled pitchers, and the other with completely red pitchers (Shivas, 1984; Tan, 1997; Clarke, 2001). Upon closer inspection, several red-mottled pitchers had bits of leaf litter in and around them, obstructing the pitcher mouth (this is a typical condition of the habitat the species is found in). While observing these ground-level pitchers (Fig. 2), one pitcher in particular had leaf litter that appeared to be moving (Figs. 3). This turned out to be caused by a large male *Geosesarma perracae* (Figs. 4 & 5) inside one of the pitchers. With a 11.6 mm-wide carapace, this is a fully-grown mature male crab with large chelae; but with two ambulatory legs on the left side just starting to regenerate. The almost squarish carapace was orange-red dorsally, and cream on the ventrum(Fig. 5). The other macro-inhabitants found within the same pitcher were aquatic larvae of dipteran flies and mosquitoes, as reported commonly for other *Nepenthes* species (Choo et al., 1997; Clarke, 2001).

The pitcher that the crab was found within had the following dimensions (all morphometry measured from point to point):

Height of pitcher = 63.0 mm
Width of pitcher (parallel to lid) = 47.0 mm
Width of pitcher (perpendicular to lid) = 35.0 mm
Length of lid = 30.0 mm
External diameter of pitcher mouth at lip = 32.0 mm
Internal diameter of pitcher mouth at lip = 16.5 mm
Lip width at lid position = 12.4 mm.

The biology of *Geosesarma perracae* has been well documented by Soh (1969) and other workers (Ng, 1988, 1990, 2004, unpublished data). This species is commonly found in swampy lowland habitats, usually near a streamline or water seepage. It is mainly a scavenger cum herbivore, and burrows into the wet ground. It exhibits abbreviated development, as the eggs hatch out into very advanced non-swimming zoeae at the base of their water-filled burrows, which quickly metamorphose into young crabs (Soh, 1969; Ng, 1990). This species has previously been documented from within the Bukit Timah Nature Reserve (Ng, 1990), Nee Soon Swamp Forest in the CCNR (Ng, 1990), MacRitchie forest in the CCNR (K. K. P. Lim, pers. comm.), and the periphery of Greenbank Park (THH, pers. obs.). Elsewhere, this species is known from lowland habitats in the southern part of Peninsular Malaysia (Ng, 1988).

Fig. 1. *Nepenthes ampullaria* rosette pitchers growing above ground.

Fig. 2. *Nepenthes ampullaria* ground level pitchers arranged in a rosette.op

Fig. 3. *Geosesarma perracae* in *Nepenthes ampullaria* pitcher (in-situ, 16 Oct.2008).

Fig. 4. *Geosesarma perracae*, male, ZRC 2008.1235, 11.6 mm carapace width.

Fig. 5. *Geosesarma perracae*, male, ZRC 2008.1235, 11.6 mm carapace width (dorsal view).

Ng (1990: 194) noted *Geosesarma perracae* foraging near the ground pitchers of *Nepenthes ampullaria*, but none had been found in the pitchers. This sighting thus confirms that this is the second recorded species of *Geosesarma* to be nepenthiphilous, and the first record of this kind for Singapore. Various other *Geosesarma* species (e.g., *Geosesarma nemesis* Ng, 1986, *Geosesarma scandens* Ng, 1986, and *Geosesarma cataracta* Ng, 1986) have been recorded to climb onto plants (Ng & Lim, 1987; Ng, 1990) and even *Geosesarma perracae* has been sighted on foliage about a metre off the ground in the CCNR (K. K. P. Lim, pers. comm.). *Geosesarma albomita* Yeo & Ng, 1999, was collected from the central rosette of leaves of herbaceous plants near the peak of Gunung Kajang (ca. 1000 m asl) in Pulau Tioman, Peninsular Malaysia (THH, pers. obs.). Thus, with more field observations, the aerial pitchers of *Nepenthes* and other forms of phytotelmic habitats may yield more surprises and new records.

Material examined: ZRC 2008.1235, 1 male, 11.6 mm carapace width, 1 juvenile, 2.4 mm carapace width; Singapore: Central Catchment Nature Reserve; 16 Oct 2008.

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