

A SECOND FINDING OF *VERCOIA INTERRUPTA* KIM & FUJITA, 2004 (CRUSTACEA, DECAPODA, CRANGONIDAE), A REMARKABLE SHRIMP IMITATING DEAD SNAIL SHELLS

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ABSTRACT. – *Vercoia interrupta* Kim & Fujita, 2004, a crangonid shrimp from coral rubble habitats, is reported from Balicasag (Bohol) and Ponson (Cebu), in the central Philippines. This is the first finding of this rare species since its discovery in Okinawa and represents a considerable extension of its distribution range southwards. This shrimp also appears to be a remarkable imitator of dead cerithiid shells.

KEY WORDS. – Caridea, Crangonidae, *Vercoia*, shrimp, shell imitation, Philippines.

INTRODUCTION

Camouflage in the form of imitation of shape and colour of the surrounding environment has evolved in many families of the large crustacean order Decapoda (Noël, 1999; Debelius, 2001). For instance, many symbiotic decapods very convincingly imitate the shape and/or the external texture as well as the colour pattern of their living hosts. The best-known examples are caridean shrimps, especially in the families Palaemonidae (e.g. *Laomenes*, *Periclimenes*, *Pontonides*, *Dasycaris*, *Izucaris*), Gnathophyllidae (*Levicaris*, *Gnathophylloides*), Pandalidae (*Miopandalus*), Hippolytidae (*Hippolyte*, *Tozeuma*, *Gelastocaris*), and Alpheidae (*Arete*) (Debelius, 2001; Minemizu et al., 2001; Bauer, 2004). Many shrimps associated with sea grasses and algae, especially numerous Hippolytidae (*Hippolyte*, *Latreutes*, *Heptacarpus*, *Tozeuma*) and some Palaemonidae (*Leander*), blend in almost perfectly with the background when resting on leaves, stems or algal thalli (Noël, 1999; Debelius, 2001; Bauer, 2004). Host imitation is also not uncommon among brachyuran and anomuran crabs, e.g. in symbiotic species of the families Majidae (*Hoplophrys*), Epialtidae (*Xenocarcinus*), Portunidae (*Lissocarcinus*, *Caphyra*), Eumedonidae (*Zebida*, *Harrovia*), and Porcellanidae (*Lissoporcellana*, *Aliaporcellana*) (e.g. Debelius, 2001; Minemizu et al., 2001; Kuitert & Debelius, 2009), while some algae-associated Epialtidae (e.g., *Mocosoa*, *Huenia*, *Pugettia*) are remarkable imitators of *Halimeda*, kelp, coralline algae, or other seaweeds (e.g. Jensen, 1995; Debelius, 2001).

Imitation of non-living environment, such as sand, rocks or rubble, is also common and widespread among the Decapoda, especially in crabs, including the Calappidae (*Calappa*),

Aethridae (*Aethra*), Parthenopidae (e.g. *Parthenope*, *Daldorfia*, *Heterocrypta*), Leucosiidae (e.g., *Uhlias*, *Oreotlos*, *Lithadia*), Xanthidae (*Glyptoxanthus*, *Hepatoporus*, *Hypocolpus*), Grapsidae (*Pseudograpsus*, *Cyclograpsus*), Ocypodidae (*Ocypode*) and several other families. The same camouflage tactic is used by some dendrobranchiates (e.g., *Sicyonia*) and a number of caridean shrimps, mostly from the families Crangonidae (*Crangon*, *Philocheras*, *Pontophilus*, *Vercoia*) and Hippolytidae (*Spirontocaris*, *Trachycaris*). Many crangonid shrimps have very cryptic, sand-imitating colour patterns, as well as a dorsoventrally flattened body and a semi-burrowing life style (Jensen, 1995; Bauer, 2004). An alerted crangonid shrimp would quickly submerge most of its body in the sand or mud, except for the frontal region with eyes and the most dorsal portion of the carapace and abdomen. Most crangonids are either cold-water or deep-water shrimps, with only a few genera, such as *Vercoia* Baker, 1904, found in shallow tropical waters.

Vercoia presently includes four species in the Indo-West Pacific: *V. gibbosa* Baker, 1904, from southern and eastern Australia and Marshall Islands; *V. socotrana* Duris, 1992, from Socotra Island and the Gulf of Aden, Yemen; *V. japonica* Komai, 1995, from Izu Islands, Japan; and *V. interrupta* Kim & Fujita, 2004, from Okinawa, Ryukyu Islands, southern Japan (Baker, 1904; Balss, 1921; Devaney & Bruce, 1987; Duris, 1992; Komai, 1995; Kim & Fujita, 2004; Duris, 2007). Despite the wide distribution range of *Vercoia*, all species of this genus are known from a handful of specimens, in some cases only from the holotype.

In 2008 and 2009, two shrimps from the genus *Vercoia* were photographed in situ by Dr. Guido Poppe at two

different locations in the central Philippines: the first off Ponson Island, Pilar, Cebu, and the second off Balicasag Island near Panglao, Bohol. Only the latter specimen, an ovigerous female, was collected, preserved in 75% ethanol, and sent to the author for identification. This specimen was identified as *Vercoia interrupta*, a species previously known only from a single holotype, an ovigerous female collected at Cape Maeda in Okinawa, at a depth of 8.5 m (Kim &

Fujita, 2004). Thus, the Balicasag specimen of *V. interrupta*, deposited in the collections of the Oxford University Museum of Natural History, Oxford, United Kingdom (OUMNH), is the second known specimen of this species, and represents the first record of a species of *Vercoia* for the Philippines. The carapace length (CL, in mm) was measured along the mid-dorsal line from the tip of the rostrum to the posterior margin of the carapace.

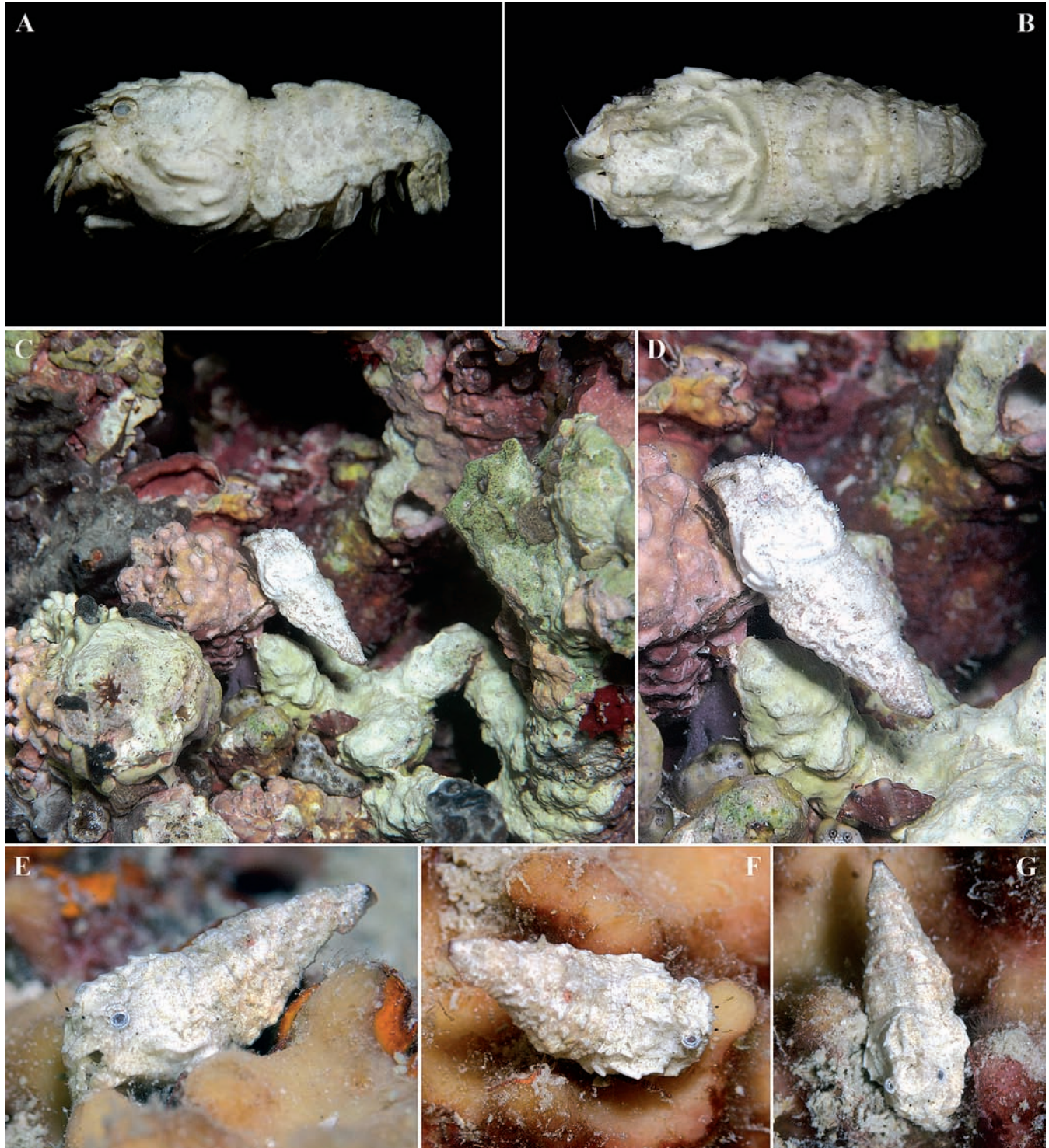


Fig. 1. *Vercoia interrupta* Kim & Fujita, 2004: A–D, ovigerous female from Balicasag Island, Panglao, Bohol, Philippines; E–G, ovigerous female from Ponson Island, Pilar, Cebu, Philippines. A, recently preserved specimen, lateral view; B, same, dorsal view; C, living shrimp in situ, showing microhabitat; D, same, close-up; E, living shrimp (different individual) in situ, lateral view; F, same, dorsolateral view; G, same, anterodorsal view. (C–G, photographs by Guido Poppe).

TAXONOMY

Crangonidae Haworth, 1825

Vercoia Baker, 2004*Vercoia interrupta* Kim & Fujita, 2004

(Fig. 1)

Material examined. – 1 ovigerous female (CL 6.5 mm), OUMNH 2009-18-0046, The Philippines, Bohol, Balicasag Island near Panglao, 9°31'05.07"N 123°40'52.25"E, early night dive, depth 3–5 m, coll. G. Poppe, 26 Jan. 2009 [photographed].

Additional specimen observed in situ, not collected. – 1 ovigerous female, The Philippines, Cebu, Ponson Island off Pilar, 10°43'54.75"N 124°31'00.43"E, night dive, rubble, depth 20 m, 12 Oct. 2008 [photographed].

Description. – Kim & Fujita (2004) provided an excellent description of *V. interrupta*, with numerous illustrations of the adult morphology, as well as the first to fourth zoea.

Colour pattern. – Carapace and abdomen mostly opaque whitish with some greyish areas; walking legs dark purple; antennular flagella with blackish spot proximally, pale yellow distally (Fig. 1).

Distribution. – Presently known only from the type locality in Okinawa, Ryukyu Islands (Kim & Fujita 2004) and Balicasag (Bohol) and Ponson (Cebu) in the central Philippines (present study). The present record of *V. interrupta* from the Philippines extends its distribution range southwards by around 1,800 km.

Habitat. – Coral rubble with encrusting algae and sponges (Fig. 1C), at depths of 3–8.5 m, possibly down to 20 m (Kim & Fujita 2004; present study).

Biology. – *Vercoia interrupta* uses a rather remarkable camouflage strategy. As in other species of *Vercoia* and some other Crangonidae, the body of *V. interrupta* is compact and heavily sculptured (“bumpy”), being covered with numerous tubercles and several ridges (Fig. 1A, B; see also Kim & Fujita 2004), and has a uniform “dirty whitish” colour, the dark purple walking legs being mostly invisible in dorsal view (Fig. 1B, G). Kim & Fujita (2004) noted that *V. interrupta* resembles a “small piece of rubble”, which would make it cryptic on a rubble bottom. However, by stretching the abdomen completely, with its tail fan almost pointing posteriorly (Fig. 1D–G), the shrimp also remarkably resembles a dead and encrusted cerithiid snail shell, more specifically that of *Cerithium rostratum* G. B. Sowerby II, 1855, which is common in the area (G. Poppe, pers. comm.). Even when moving *V. interrupta* resembles a cerithiid shell occupied by a hermit crab more than a shrimp, and would probably be ignored by most visually hunting predators. Night activity (all individuals of *V. interrupta* were found at night) may further increase the survival chances of this peculiar shrimp.

Remarks. – Behavioural observations and photographs of *Vercoia* spp. are extremely rare. To the author’s best knowledge, the only other published photograph of *Vercoia* is that of *V. gibbosa* (Gowlett-Holmes, 2008), which also seem to mimic shell fragments. All species of *Vercoia* may be imitators of dead shells or at least shell fragments, based on their morphological similarity with *V. interrupta*, although the latter species seems to do so most convincingly.

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