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A new genus and new species of Paguridae (Crustacea: Decapoda: Anomura) from shallow subtidal waters in Okinawa Island, the Ryukyu Islands, Japan

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Abstract

During a survey on decapod crustacean fauna of shallow coral reefs and nearby environments in Okinawa Island, Ryukyu Archipelago, Japan, four specimens of a small but distinctive undescribed species of pagurid hermit crab, which could not be referred to any known genus, were collected. The new taxon, *Eutrichopagurus shirakawai* n. gen., n. sp., is described and illustrated herein. The new genus is characterized by the possession of 11 pairs of deeply quadriseriate phyllobranchiate gills, the third maxilliped with well-developed crista dentata and one or two accessory teeth on the ischium, the presence of unpaired left gonopore in the female, the absence of paired first pleopods in the female, and the telson with prominent tuft of setae on the lateral margin of the posterior lobes; the male is unknown at present. It appears close to *Trichopagurus* de Saint Laurent, 1968, but the deeply quadriseriate gills immediately distinguish *Eutrichopagurus* from *Trichopagurus*. The new genus is also compared with other genera characterized by the possession of 11 pairs of quadriseriate phyllobranchiate gills and the lack of paired first pleopods in females.

Key words: *Eutrichopagurus shirakawai*, Okinawa, *Trichopagurus*

Introduction

Recent studies in the last decade have revealed the presence of a rich pagurid fauna in shallow coral reefs and nearby environments, with continuous discovery of new species (Komai & Rahayu 2004; Osawa & Takeda 2004; Asakura 2005, 2010; Komai & Osawa 2005, 2006, 2007, 2009, 2012; Komai 2006, 2009, 2010, 2013; Komai & Takeda 2006; Osawa et al. 2006, 2013; Osawa & Komai 2007; Osawa & Okuno 2007; McLaughlin & Rahayu 2008; Osawa & Fujita 2008; Komai & Okuno 2009; Komai et al. 2010; McLaughlin & Okuno 2010; Komai & Poupin 2012, 2013; Komai & Rahayu 2013a, 2013b, 2013c, 2013d). The vast majority of those species are small in size and often cryptic in habitats, and thus sampling is not easy. Cooperation between taxonomists and professional SCUBA diving instructors and amateur divers has contributed to accumulate material for taxonomic studies in recent years (e.g., Kato & Okuno 2001; Kawamoto & Okuno 2003; Komai et al. 2010; Arima 2014).

While studying material from shallow waters around Okinawa Island, the Ryukyu Islands, collected through cooperation with skillful SCUBA divers, four female specimens of a pagurid hermit crab that could not be satisfactorily assigned to any known genus were encountered. The combination of the presence of 11 pairs of deeply quadriseriate phyllobranchiate gills, the possession of an unpaired left female gonopore and the lack of paired first pleopods in the female is characteristic within Paguridae. Although substantial similarities to the genus *Trichopagurus* de Saint Laurent, 1968 were noticed, a new monotypic genus, *Eutrichopagurus*, is proposed to accommodate the new species, *E. shirakawai*. Because of the similarities in the gill number and structure, and the absence of paired first pleopods in the female, four other pagurid genera, *Cestopagurus* Bouvier, 1897, *Pagurodes* Henderson, 1888, *Pseudopagurodes* McLaughlin, 1997, and *Turleania* McLaughlin, 1997 are also compared with the new genus.

Material examined in this study is deposited in the collection of the Natural History Museum and Institute, Chiba (CBM). General terminology follows McLaughlin (2003), except for numbering of thoracic sternites. Shield length (sl), measured from the tip of the rostrum to the midpoint of the posterior margin of the shield, indicates specimen size.

Variation. The number of accessory teeth of the third maxilliped is variable in the specimens examined, one on either side (non-ovigerous female paratype, CBM-ZC 12570) or two (holotype, CBM-ZC 12569; and two paratypes, CBM-ZC 12571, 12572). Spination on the carpi and meri of second pereopods is also variable. In the holotype (CBM-ZC 12569) and the two non-ovigerous paratypes (CBM-ZC 12570, 12572, carpi of the second pereopods each bears a minute spine on the dorsal surface proximal to the midlength, whereas in the ovigerous paratype (CBM-ZC 12571), such a spine is absent. Similarly, the meri of the second pereopods has a minute spine on the ventral surface in the holotype (CBM-ZC 12569) and two non-ovigerous paratypes (CBM-ZC 12570, 12572), while unarmed in the ovigerous paratype (CBM-ZC 12571).

Coloration in life. Shield, ocular peduncles, antennal peduncles, chelipeds and ambulatory legs generally white, without conspicuous markings; cornea gray; posterior carapace and pleon transparent (Fig. 5A, B). Eggs orange-yellow.

Distribution and habitat. At present, known only from Okinawa Island (Ginowan, Chatan and Onna), Ryukyu Islands; shallow subtidal, 3–5 m. All the four specimens examined were found under large coral rocks on sand substrates (N. Shirakawa, pers. com.). Found to use gastropod shells for housing (Fig. 5B).

Etymology. The new species is dedicated to Mr. Naoki Shirakawa, a SCUBA diving instructor at Naha, Okinawa. He has much contributed to accumulate material of marine invertebrates from subtidal shallow waters in the Ryukyu Islands for taxonomic studies.

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