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## First record and a new species of *Alvinocaris* Williams & Chace, 1982 (Crustacea: Decapoda: Caridea: Alvinocarididae) from the Indian Ocean

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### Abstract

A new species of the alvinocaridid shrimp genus *Alvinocaris* Williams & Chace, 1982 is described from the Solitaire hydrothermal vent field at 2606 m depth on the Central Indian Ridge. *Alvinocaris solitaire* sp. nov., the first species of the genus to be recorded from the Indian Ocean, is morphologically most similar to *A. lusca* Williams & Chace, 1982 from the Galapagos Rift, East Pacific Rise. The new species is distinguished from *A. lusca* by the less produced pterygostomial angle of the carapace, the presence of small teeth on the posterolateral margin of the third pleuron, and the lack of short plumose setae on the posteromedian margin of the telson. The genetic divergence of the mitochondrial cytochrome *c* oxidase subunit I (COI) gene (600 bp) among the nine *Alvinocaris* species analyzed clearly indicates that the new taxon is distinct from the congeneric species for which genetic data are available.

**Key words:** *Alvinocaris solitaire*, Solitaire hydrothermal vent field, Central Indian Ridge, YK13-02 cruise

### Introduction

The caridean family Alvinocarididae Christoffersen, 1986 is currently comprised of 27 described species in eight genera: *Alvinocaris* Williams & Chace, 1982, *Rimicaris* Williams & Rona, 1986, *Chorocaris* Martin & Hessler, 1990, *Opaepele* Williams & Dobbs, 1995, *Mirocaris* Vereshchaka, 1997, *Nautilocaris* Komai & Segonzac, 2004, *Shinkaicaris* Komai & Segonzac, 2005, and *Alvinocaridinides* Komai & Chan 2010. These species inhabit chemosynthetic environments (deep-sea hydrothermal vents and/or cold seeps) at depths of 252–4960 m (Nye *et al.* 2012; Lunina & Vereshchaka 2014). *Alvinocaris* is the most species-rich genus in the family, represented by 13 described species from the Atlantic and Pacific oceans (Table 1 and references therein).

Since the discovery of hydrothermal activity on the Central Indian Ridge, Indian Ocean, in 2000 (Hashimoto *et al.* 2001), several new species of decapod crustaceans have been described, viz., *Rimicaris kairei* Watabe & Hashimoto, 2002 and *Mirocaris indica* Komai, Martin, Zala, Tsuchida & Hashimoto, 2006 (Caridea: Alvinocarididae), *Munidopsis laticorpus* Cubelio, Tsuchida & Watanabe, 2008 (Anomura: Munidopsidae), and *Austinograea rodriguezensis* Tsuchida & Hashimoto, 2002 (Brachyura: Bythograeidae). During the research project “Quest for the Limit of Life (QUELLE) 2013” by the Japan Agency for Marine-Earth Science and Technology (JAMSTEC), the chemosynthetic assemblages of the recently discovered Dodo and Solitaire hydrothermal vent fields on the Central Indian Ridge (Nakamura *et al.* 2012) were investigated. Among the

**TABLE 2.** Genetic divergence of the mitochondrial cytochrome *c* oxidase subunit I gene among the nine species of *Alvinocaris* calculated from Kimura 2-parameter-corrected calculations.

Species	1	2	3	4	5	6	7	8
1. <i>Alvinocaris solitaire</i> <b>sp. nov.</b>								
2. <i>Alvinocaris muricola</i> EU031814	0.112							
3. <i>Alvinocaris markensis</i> AF125409	0.114	0.012						
4. <i>Alvinocaris longirostris</i> AB222050	0.129	0.063	0.059					
5. <i>Alvinocaris lusca</i> AF125407	0.140	0.072	0.070	0.050				
6. <i>Alvinocaris chelys</i> JX184903	0.163	0.154	0.159	0.180	0.189			
7. <i>Alvinocaris komaii</i> EU031816	0.163	0.177	0.177	0.193	0.206	0.191		
8. <i>Alvinocaris stactophila</i> AF125411	0.164	0.156	0.161	0.182	0.189	0.010	0.190	
9. <i>Alvinocaris dissimilis</i> AB779493	0.165	0.154	0.159	0.180	0.189	0.005	0.188	0.005

**Habitat and associated species.** The present specimen was collected in an assemblage of white predatory gastropods of the genus *Phymorhynchus*, which is distributed in the periphery of an actively venting area in the Solitaire hydrothermal vent field. The alvinocaridid shrimp *Mirocaris indica* and some species of polychaetes (e.g. *Archinome* sp.) and limpets (e.g. *Eulepetopsis* sp.) were collected with *A. solitaire* **sp. nov.**

**Etymology.** Named after the type locality, Solitaire hydrothermal vent field; used as noun in apposition. The name of the hydrothermal vent field, “Solitaire”, was derived from an extinct species of an endemic bird (Rodriguez solitaire, *Pezophaps solitaria*) inhabiting Rodriguez Island (Nakamura *et al.* 2012).

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