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SHORT COMMUNICATION

# First record of *Petrolisthes virgatus* Paul'son, 1875 (Crustacea, Decapoda, Anomura, Porcellanidae) from the Persian Gulf and Gulf of Oman, Iran

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# ABSTRACT

Recent marine expeditions to the Abu-Musa Island (in the Persian Gulf) and Gulf of Oman yielded a first record of the porcelain crab *Petrolisthes virgatus* Paul'son, 1875, that had not been recorded from these water bodies. In both localities, specimens have been collected from rock crevices in the rocky-cobble shores of the low intertidal zone. Records of this species extend its range in the northwestern part of the Indian Ocean.

# **KEY WORDS**

*Petrolisthes virgatus,* Abu-Musa Island, Persian Gulf, Gulf of Oman, Indian Ocean.

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The *Petrolisthes* Stimpson, 1858 is the largest and morphologically most diverse genus of the family Porcellanidae, with nearly 100 known species (Hiller and Werding, 2007; De Grave *et al.*, 2009; Osawa and McLaughlin, 2010). This genus, like other members of its family, occupies variety of habitats including depressions under stones, spaces in worm tubes, cavities of sponges, and excavations in coral reefs (Rodríguez *et al.*, 2005). Several species of *Petrolisthes* are most common and widely distributed along the

Iranian coasts of the Persian Gulf and Gulf of Oman (Naderloo and Türkay, 2012; Naderloo *et al.*, 2013; 2015). Naderloo *et al.* (2013) recorded 11 species of Porcellanidae from the Qeshm Island in the Persian Gulf, of which three belonged to *Petrolisthes*. Recently, a new species, *Petrolisthes tuerkayi* was described from the Persian Gulf by Naderloo and Apel (2014). Currently, 16 species of Porcellanidae are recorded from the Gulf of Oman, of which seven are *Petrolisthes* (Naderloo *et al.*, 2015).

*Petrolisthes virgatus* Paul'son, 1875 (Fig. 1), in comparison with other species of the genus *Petrolisthes*, is relatively a rare species in the Persian Gulf and Gulf of Oman. During the several samplings along the Iranian coast of these Gulfs, only three specimens of this species have been collected, which presented here.



**Figure 1**. *Petrolisthes virgatus* Paul'son, 1875, adult female, carapace length = 6.19 mm, carapace breadth = 5.47 mm, Djod village, Gulf of Oman, 10 October 2014. (a) Dorsal view; (b) ventral view. Photo credit: R. Abdollahi.

# **S**YSTEMATICS

Infraorder Anomura MacLeay, 1838

Family Porcellanidae Haworth, 1825

Genus Petrolisthes Stimpson, 1858

#### Petrolisthes virgatus Paul'son, 1875

#### Remarks

The specimens were collected from northern coast of the Gulf of Oman (Djod village, 25°26.820'N 59°30.630'E, Fig. 2) and Abu-Musa Island (Park-e Qadir, 25°53.751'N 55° 02.643'E) in the Persian Gulf (Fig. 2) and deposited in the Zoological Museum, University of Tehran (ZUTC: 5346-8). The present specimens are in full agreement with the original

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description and illustrations of P. virgatus given by Paul'son (1875). The type locality and world distribution of this species are presented in Fig. 2. The distribution of *P. virgatus* in western Indian Ocean in comparison to western side of the Pacific Ocean includes more localities, and stretches from northern coast of the Arabian Sea to near the South Africa. The distribution of this species in both oceans has just been limited to western sides, in marine tropical and subtropical regions. This species has a symbiotic relationship with the sea urchin Echinometra mathaei (Blainville, 1825) that can be used as a clue for more effective sampling (Limviriyakul et al., 2016). So far, few specimens are known from the area and that it needs targeted sampling in the right habitats with respect to its relation to E. mathaei to find out more about its distribution and abundance in the region. Moreover, this species can be hidden within sponges,



Figure 2. The World distribution and new records of the *Petrolisthes virgatus* (Paul'son, 1875): (1) Goal or Ras Muhammad, Sinai Peninsula, Red Sea (type locality) (Paul'son, 1875); (2) Obock, Djibouti, Gulf of Aden (Nobili, 1906); (3) Shadwan Island in the mouth of the Gulf of Suez, Egypt, Red Sea (Balss, 1915); (4) Ghardaqa, Egypt, Red Sea (Ramadan, 1936); (5) Elath, Gulf of Aqaba, Red Sea (Lewinsohn, 1979); (6) unknown exact locality, Red Sea (E. Rüppell collector, 1826: deposited in Senckenberg Museum at Frankfurt, accessible via http://sesam.senckenberg.de/page/index.htm); (7) Tabuk, Saudi Arabia, Red Sea (B. Werding collector, 2013: deposited in Senckenberg Museum at Frankfurt, accessible via http://sesam.senckenberg.de/page/index.htm); (8) Mozambique (Barnard, 1955; Kalk, 1958; Macnae and Kalk, 1958; Kensley, 1970); (9) Dar es Salaam, Tanzania (Ortmann, 1894) as *P. trivirgatus* Ortmann, 1894; (10) Zanzibar, Tanzania (Lenz, 1905) as *P. trivirgatus* (see Taramelli, 1955); (11) Hirashima, Ogasawara Island, Japan (Ooishi, 1970); (12) Sar Uanle, south of Chisimaio, Somalia (Lewinsohn, 1969); (13) Mughsayl and Mirbat, southern Oman (Hogarth, 1988); (14) Socotra Island, Indian Ocean (Simões *et al.*, 2001); (15) Amami Group Island, Japan (Nakasone and Miyake, 1972); (16) Yakabi-Jima Island, Ryukyu Archipelago, Japan (Nomura *et al.*, 1996); (17) Fan-Zai-Aou Bay, southern East China Sea, off the coast of Keelung City in northern Taiwan (Limviriyakul *et al.*, 2016); with new records of this species from (18) the Djod Village, Sistan and Balouchestan Province, Gulf of Oman, Iran (present study) and (19) the Abu-Musa Island, Persian Gulf, Iran (present study).

coral and other spaced biogenic structures. It seems that more unrecorded or even undescribed species belonging to the genus *Petrolisthes* await discovery among the decapod fauna of the Persian Gulf and Gulf of Oman.

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# REFERENCES

- Balss, H. 1915. Die Decapoden des Roten Meeres. II. Anomuren, Dromiaceen und Oxystomen. Expeditionen SM Schiff "Pola" in das Rote Meer. Nördliche und südliche Häfte 1 895/96-1 897/98. Zoologische Ergebnisse XXXI. Denkschriften der Kaiserlichen Akademie der Wissenschaften in Wien Mathematisch-Naturwissenschaftliche Klasse, 92: 1–20.
- Barnard, K.H. 1955. Additions to the fauna-list of South African Crustacea and Pycnogonida. *Annals of The South African Museum*, 43: 1–107.

- De Grave, S.; Pentcheff, N.D.; Ahyong, S.T.; Chan, T-Y; Crandall, K.A.; Dworschak, P.C.; Felder, D.L.; Feldmann, R.M.; Fransen, C.H.J.M.; Goulding, L.Y.D.; Lemaitre, R.; Low, M.E.Y.; Martin, J.W.; Ng, P.K.L.; Schweitzer, C.E.; Tan, S.H.; Tshudy, D. and Wetzer, R. 2009. A classification of living and fossil genera of decapod crustaceans. *Raffles Bulletin of Zoology*, Suppl. 21: 1–109.
- Haworth, A.H. 1825. XVII. A new binary arrangement of the brachyurous crustacea. *Philosophical Magazine Series 1*, 65(322): 105–106.
- Hiller, A. and Werding, B. 2007. Redescription of *Petrolisthes edwardsii* (de Saussure) and description of a new sibling species from the eastern Pacific based on different colour, morphology and genetic identity (Crustacea: Anomura: Porcellanidae). *Organisms Diversity & Evolution*, 7(3): 181–194.
- Hogarth, P.J. 1988. Anomuran Crustacea (Paguridea, Porcellanidae, and Hippidea) from Oman, principally from Dhofar province, southern Oman. *Journal of Natural History*, 22(4): 1095–1110.
- Kalk, M. 1958. Ecological studies on the shores of Mozambique.1. The fauna of intertidal rocks at Inhaca Island, Delagoa Bay. *Annals of the Natal Museum*, 14(2): 189–242.
- Kensley, B.F. 1970. A small collection of decapod Crustacea from Moçambique. *Annals of the South African Museum*, 57: 103–122.
- Lenz, H. 1905. Ostafrikanische Dekapoden und Stomatopoden. gesammelt von Herrn Prof. Dr. A. Voeltzkow. Abhandlungen der Senckenbergischen Naturforschenden Gesellschaft, 27: 341– 392, pls. 47–48.
- Lewinsohn, C. 1969. Die Anomuren des Roten Meeres (Crustacea Decapoda: Paguridea, Galatheidea, Hippidea) 1). Zoologische Verhandelingen, 104(1): 1–210.
- Lewinsohn, C. 1979. Researches on the coast of Somalia. The shore and the dune of Sar Uanle: 23. Porcellanidae (Crustacea, Decapoda, Anomura): Pubblicazioni Del Centro Di Studio Per La Faunistica Ed Ecologia Tropicali Del CNR: CLXX *Monitore Zoologico Italiano. Supplemento*, 12(1): 39–57.
- Limviriyakul, P.; Tseng, L.-C.; Hwang, J.-S. and Shih, T.-W. 2016. Anomuran and brachyuran symbiotic crabs in coastal areas between the southern Ryukyu arc and the Coral Triangle. *Zoological Studies*, 55(7): 1–14.
- Macleay, W.S. 1838. Illustrations of the Annulosa of South Africa: Being a Portion of the Objects of Natural History Chiefly Collected During an Expedition Into the Interior of South Africa Under the Direction of Andrew Smith in the Years 1834, 1835, and 1836 : Fitted Out by "The Cape of Good Hope Association for Exploring Central Africa". London, Smith, Elder, 75p.
- Macnae, W. and Kalk, M. 1958. A Natural History of Inhaca Island, Moçambique. Johannesburg, Witswatersrand University Press, 163p.
- Naderloo, R. and Apel, M. 2014. A new species of porcelain crab, *Petrolisthes tuerkayi* n. sp. (Crustacea: Anomura:

Porcellanidae), from the Persian Gulf. *Zootaxa*, 3881(2): 190–194.

- Naderloo, R.; Ebrahimnezhad, S. and Sari, A. 2015. Annotated checklist of the decapod crustaceans of the Gulf of Oman, northwestern Indian Ocean. *Zootaxa*, 4028(3): 397–412.
- Naderloo, R. and Türkay, M. 2012. Decapod crustaceans of the littoral and shallow sublittoral Iranian coast of the Persian Gulf: faunistics, biodiversity and zoogeography. *Zootaxa*, 3374: 1–67.
- Naderloo, R.; Türkay, M. and Sari, A. 2013. Intertidal habitats and decapod (Crustacea) diversity of Qeshm Island, a biodiversity hotspot within the Persian Gulf. *Marine Biodiversity*, 43(4): 445–462.
- Nakasone, Y. and Miyake, S. 1972. Four unrecorded porcellanid crabs (Anomura: Porcellanidae) from Japan. *Bulletin of the College of Science. University of the Ryukyus*, 15: 136–147.
- Nobili, G. 1906. Faune carcinologique de la mer Rouge Décapodes et Stomatopodes. *Annales des sciences naturelles*, 4(9): 1–347.
- Nomura, K.; Nagai, S.; Asakura, A. and Komai, T. 1996. A preliminary list of shallow water decapods Crustacea in the Kerama Group, the Ryukyu Archipelago. *Bulletin of the Biogeographical Society of Japan*, 51(2): 7–21.
- Ooishi, S. 1970. Marine invertebrate fauna of the Ogasawara and Volcano Islands collected by S. Ooishi, Y. Tomida, K. Izawa and S. Manabe. In: *Report on the marine biological expedition to the Ogasawara (Bonin) Islands*, 75–89.
- Ortmann, A.E. 1894. Crustaceen. Jena, G. Fischer, 108p.
- Osawa, M. and McLaughlin, P.A. 2010. Annotated checklist of anomuran decapod crustaceans of the world (exclusive of the Kiwaoidea and families Chirostylidae and Galatheidae of the Galatheoidea) Part II–Porcellanidae. *The Raffles Bulletin* of Zoology, Suppl. 23: 109–129.
- Paul'son, O.M. 1875. Studies on Crustacea of the Red Sea: With Notes Regarding Other Seas. Kiev, SV Kul'zhenko, 164p.
- Ramadan, M.M. 1936. Report on a Collection of Stomatopoda and Decapoda from Ghardaga, Red Sea. Giza, Egyptian University, 43p.
- Rodríguez, I.T.; Hernandez, G. and Felder, D.L. 2005. Review of the Western Atlantic Porcellanidae (Crustacea: Decapoda: Anomura) with New Records, Systematic Observations, and. *Caribbean Journal of Science*, 41(3): 544–582.
- Simões, N.; Apel, M. and Jones, D. A. 2001. Intertidal habitats and decapod faunal assemblages (Crustacea: Decapoda) of Socotra Island, Republic of Yemen. *Hydrobiologia*, 449(1–3): 81–97.
- Taramelli, E. 1955. Crostacei di Zanzibar (Decapodi e Stomatopodi). *Ramo editoriale degli Agricoltori*, 15: 29–47.
- Stimpson, W. 1858. Prodromus descriptionis animalium evertebratorum, quae in expeditione ad oceanum pacificum septentrionalem, a republica federata missa, Cadwaladaro Ringgold et Johanne Rodgers ducibus, observavit et descripsit. Pars VII. Crustacea Anomura. Proceedings of the Academy of Natural Sciences of Philadelphia, 10, 225–252.