

Distribution and Diversity of Freshwater Crabs (Decapoda: Brachyura: Potamidae, Gecarcinucidae) in Iranian Inland Waters

Ardavan Farhadi , Muzaffer Mustafa Harlioğlu 

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ABSTRACT

This article reviews the current knowledge of primary freshwater crabs (Decapoda, Brachyura) in Iranian inland waters, with the purpose of classifying the exact number of species, the threat status, and their distribution and diversity. Previous studies have reported that Iranian inland waters have eight freshwater crab species and there was no accurate information on the distribution of freshwater crab species in Iran. This review article describes that an additional six freshwater crab species, *Potamon gedrosianum*, *P. magnum*, *P. mesopotamicum*, *P. ilam*, *Sodhiana blanfordi*, and *S. iranica*, are also present in Iran. Therefore, there are 14 freshwater crab species currently known in Iran, which belong to two families (Gecarcinucidae and Potamidae). The genus *Potamon* is represented by 11 species, and the genus *Sodhiana* is represented by 3 species (found in south and south east of Iran). In addition, this review presents a distribution map and the possible threats for each species.

Keywords: Brachyura, decapoda, freshwater crabs, distribution, Iran

INTRODUCTION

Primary freshwater crabs (Yeo et al., 2008, 2012) include more than 1,476 species worldwide and occupy 20 percent of all the brachyurans (Yeo et al., 2008; Cumberlidge et al., 2009). They are composed of five families; Pseudothelphusidae Ortmann, 1893 (Neotropics; Wehrtmann et al., 2010) and Trichodactylidae H. Milne Edwards, 1853 (Mexico, Central and South America; Collins et al., 2006), Potamonautidae Bott, 1970 (Africa and Madagascar; Cumberlidge and Daniels, 2008), and, Potamidae Ortmann, 1896 (North Africa, southern Europe, Asia; Brandis et al., 2000), Gecarcinucidae Rathbun, 1904 (Seychelles, Asia; Shih and Ng, 2011),

Freshwater crabs live in both tropics and subtropics in most regions of the world (Yeo et al., 2008). They can be found in most freshwater ecosystems, from clear, quick-flowing rivers to moderate-flowing rivers, as well as in freshwa-

ter swamps, stagnant ponds and rice fields, and even in tree hollows and leaf axils (Yeo et al., 2008; Cumberlidge et al., 2009).

However, some freshwater crab species, such as *Potamon* Savigny, 1816, are only present in freshwater habitats and are not able to live or survive for a long time in saline water, while other genus, such as *Parathelphusa* H. Milne Edwards, 1853, is able to remain alive in saline water for a short time (Yeo et al., 2008). Terrestrial freshwater crab species can live far from continual freshwater sources; they are able to move among the forest floor litter or, sometimes, are even able to climb trees (Ng, 1988; Ng and Tay, 2001; Cumberlidge et al., 2005). Continual immersion in fresh water is not urgent for terrestrial freshwater crab species and they can receive water from food, drinking dew or casual water; they can obtain water by capillary or osmotic uptake from moist substrata (Yeo et al., 2008).

Firat University, Fisheries Faculty,
23119, Elazığ, Turkey

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Correspondence:
Ardavan Farhadi
E-mail:
Farhadi219@yahoo.com

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Freshwater crabs play important ecological roles especially in tropical regions (Dobson et al., 2007a,b). In addition, they are medically important as a threat to human health (i.e. as intermediate hosts of paragonimiasis in Asia, Africa, and the Neotropics) (Maleewong, 2003; Blair et al., 2008) and as a source of medical and pharmaceutical materials (i.e. chitin and chitosan) (Rinaudo, 2006). Freshwater crabs are not used only as a food source, but are also used as food additives and fertilizers, especially crab processing residues are used as feeding additive (Bilgin and Fidanbaş, 2011). Therefore, in addition to the importance of marine crabs, there has also been an increase in the value of freshwater crabs in recent years on a global scale (Yeo et al., 2008).

Two different families of freshwater crabs are present in Iran i.e., Gecarcinucidae and Potamidae (Pretzmann, 1962). Many Potamid species moved to several geographically isolated areas, and adapted to dominant environments (Keikhosravi and Schubart, 2014a). These freshwater crabs in the Eurasian area have extended from the Mediterranean region to the east-Himalaya (Klaus et al., 2011; Gherardi, 2007). The genus *Potamon* in Iran includes three sub-genera; *Pontipotamon* Pretzmann, 1962 (Ashourdan et al., 2014), *Centropotamon* Pretzmann, 1962 (Nasrollahzadeh et al., 2011), and *Orientopotamon* Pretzmann, 1962 (Brandis et al., 2000).

The subgenus *Pontipotamon* is dominant in the south and the south-west Caspian region, the subgenus *Centropotamon* is dominant in the south Caspian Sea region in the center and south of Iran, while the subgenus *Orientopotamon* has been reported from the east Caspian Sea and southeast Iran (Pretzmann, 1962).

Brandis et al. (2000) and Sharifian et al. (2014), examined seven *Potamon* species (*Potamon bilobatum* Brandis, Storch and Türkay, 2000, *P. elbursi* Pretzmann, 1976, *P. ibericum* (Bieberstein, 1809), *P. persicum* Pretzmann, 1962, *P. ruttneri* Pretzmann, 1962, *P. strouhali* Pretzmann, 1962, *P. transcaspicum* Pretzmann, 1962) and one gecarcinucid species (*Sodhiana rokitanskyi* (Pretzmann, 1971)) from Iran. Recent active studies bring the number of Iranian species to 14 (Sharifian et al., 2014; Keikhosravi and Schubart, 2014a,b; Keikhosravi et al., 2016; Sharifian et al., 2017). The

genus *Potamon* is represented by 11 species in Iranian inland waters; *P. bilobatum*; *P. elbursi*; *P. gedrosianum* Alcock, 1909; *P. ibericum*; *P. mesopotamicum* Brandis, Storch and Türkay, 1998; *P. ilam* Keikhosravi and Schubart, 2014; *P. (Centropotamon) magnum* Pretzmann, 1962; *P. persicum*; *P. ruttneri*; *P. strouhali* and *P. transcaspicum*. In addition, three species of the genus *Sodhiana* are found in Iranian inland waters; *Sodhiana blanfordi* (Alcock, 1909); *Sodhiana iranica* Sharifian, Kamrani and Sharifian, 2014 and *S. rokitanskyi*. Figure 1 shows the distribution of freshwater crab species in Iran.

This study is aimed to consolidate and update the distribution and biodiversity of freshwater crabs in Iranian inland waters.

Taxonomy

Family Potamidae Ortman, 1896

Potamon bilobatum Brandis, Storch and Türkay, 2000

Potamon bilobatum Cumberlidge, 2008a (type locality: Mazandaran and Gilan provinces, Iran); Nasrollahzadeh et al., 2011: 280.

Potamon (Pontipotamon) bilobatum Brandis, Storch and Türkay, 2000: 26-28 (type locality: Mazandaran, Iran).

Distribution in Iran. This species was reported only in the north of Iran from the Elburs Mountains, in Gilan (Rasht, Kelachay), Mazandaran (Chalus, Tonekabon) and Golestan Provinces (Gorgan) (Cumberlidge, 2008a; Nasrollahzadeh et al., 2011).

Remarks. This species is listed as Least Concern in International Union for Conservation of Nature (IUCN) red list of threatened species. Since there is no record showing reduction in the extent and quality of its habitat. This species has been identified in three provinces in Iran (Cumberlidge, 2008a; Nasrollahzadeh et al., 2011). This species was found in Lakan stream when the water temperature, salinity, hardness, and pH was 16-18°C, 330-430 mg/l, 12-16°d, and 7-7.7 respectively (Nasrollahzadeh et al., 2011).

Potamon elbursi Pretzmann, 1976

Potamon elbursi Pretzmann, 1976b: (type locality: northern Iran); Keikhosravi and Schubart, 2014a: (Namak Lake and south Caspian Sea drainages).

Distribution in Iran. Keikhosravi and Schubart (2014a) re-described *Potamon elbursi*, proving its occurrence as a native species of northern Iran. *P. elbursi* is distributed from the north to the central and southern slopes of the western Alborz Mountains (the north of Tehran and Qazvin), and from the south to the sources of two drainage systems (northeast of Tehran), Namak Lake and south Caspian Sea drainages. Only at one point does the distribution extend northward through the Alborz Mountains (Sefidrud valley), reaching the Caspian Sea (Keikhosravi and Schubart 2014a; Keikhosravi et al., 2015).

Remarks. *P. elbursi* is distinguished from *P. persicum* by the morphology of the first gonopods in males (Keikhosravi and Schubart 2014a). Consistent and marked genetic divergence was also recognized in the mitochondrial 16S rRNA and cytochrome oxidase subunit I genes (Keikhosravi and Schubart 2014a).

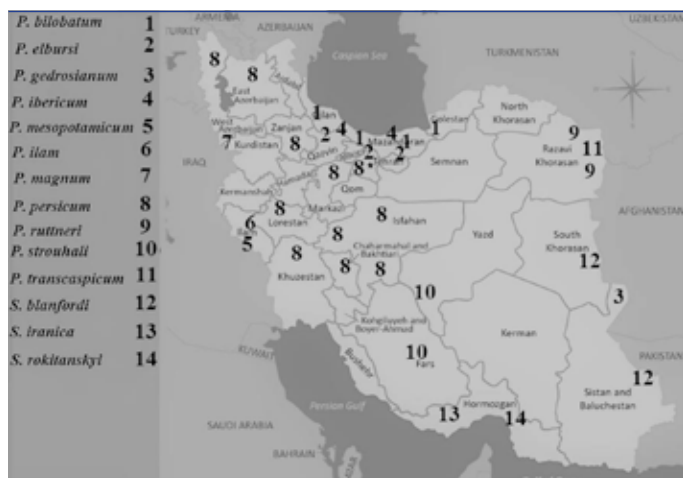


Figure 1. Distribution of freshwater crab species in Iran

Potamon gedrosianum Alcock, 1909

Potamon gedrosianum Alcock, 1909 (type locality: Pishin Valley, Baluchistan, Pakistan); Quddusi, et al., 2005 (Sindh, Punjab and Baluchistan Provinces, Pakistan); Keikhosravi et al. 2016 (Zabol, southeast of Iran).

Potamon gedrosianum waziristanis Pretzmann, 1965: 297 (Kabul, Afghanistan).

Potamon gedrosianum torbenwolffi Bott, 1967 (type locality: west of Afghanistan).

Distribution in Iran. *Potamon gedrosianum* is found in Afghanistan, northeastern Iran (Keikhosravi et al., 2016), northwestern Pakistan, western India and the western tributaries of the Indus River (Cumberlidge, 2008b). For the first time, in 2016, *P. gedrosianum* has been reported in Iran by Keikhosravi et al. (2016) in Zabol (southeast of Iran).

Remarks. Alcock (1909) reported a new subspecies of *Potamon fluviatile* (i.e. *P. f. gedrosianum*) from Pakistan. Recently, Brandis et al. (2000) synonymized this newer subspecies and ranked it at species level. *P. gedrosianum* and *P. ruttneri* have very similar morphology. Also, gonopod morphology is constant or has very limited variation at intraspecific level in both species (Brandis et al., 2000). However, *P. gedrosianum* and *P. ruttneri* are distinguished by the structure of the first male gonopod (G1) and carapace features (Brandis et al., 2000).

Cumberlidge (2008b) listed *P. gedrosianum* as Least Concern in IUCN red list of threatened species in view of its wide distribution in four countries, tolerance of a degree of habitat modification, presumed large population, and because it is unlikely to be declining fast enough to qualify for listing in a more threatened category (Cumberlidge, 2008b).

Potamon ibericum (Bieberstein, 1809)

Cancer ibericum Bieberstein, 1809: 3-5 (type locality: Mazandaran, North of Iran).

Potamon ibericum Scombathy, 1916 (type locality: near Yerevan, Armenia.); Charmantier, 1992 (southern France).

Potamon (Pontipotamon) ibericum Bieberstein, 1808: (Mazandaran, North of Iran).

Potamon (Pontipotamon) ibericum tauricum natio bithyniensis Pretzmann, 1983: 281-300 (Turkey)

Potamon (Pontipotamon) ibericum tauricum natio cappadociensis Pretzmann 1983 (Cappadocia, central Turkey).

Potamon (Pontipotamon) ibericum tauricum natio troijensis Pretzmann (Thassos, Greek island).

Potamon albanicum Starobogatov and Vassilenko, 1979: 1795, (type locality: Cyprus).

Potamon ibericum meandris Pretzmann, 1963 (type locality: Shahpasant, Iran).

Thelphusa fluviatilis taurica Czerniavsky, 1884 (type locality: Chios, Greek islands). Pretzmann, 1976b (Rasht, Iran). Pretzmann, 1963: 376 (Trabzon, Turkey; Samsun, Turkey).

Distribution in Iran. *Potamon ibericum* occurs in a wide and highly fragmented regions. *P. ibericum* present from the Danube River to the Black Sea and the Caspian. *P. ibericum* is found in Bulgaria, Ukraine, Crimea, Georgia, Armenia, and Azerbaijan. *P. ibericum* is a species also present in the region to south of the Caspian Sea region in Turkmenistan (Cumberlidge, 2008c) and Iran. In Iran, *P. ibericum* is present in the north of Iran from the Elburs Mountains, in the Sefidrud opening connected to the Caspian Sea, and in the coastal region of the Caspian Sea, Gilan Province (Langerud, Rudsar, Kelachay) and Mazandaran Provinces (Chalus) (Ashourdan et al., 2014; Parvizi et al., 2017).

Remarks. *P. ibericum* has a wide distribution and the relatively high number of localities and records. *P. ibericum* is assessed here as Near Threatened (NT) in IUCN red list of threatened species. Because it is possible that populations of *P. ibericum* in parts of its range might be in danger of extirpation in the future, especially those on islands or near centers of human population on the mainland (Cumberlidge, 2008c).

Potamon mesopotamicum Brandis, Storch and Türkay, 1998

Potamon mesopotamicum Brandis, Storch and Türkay, 1998 (type locality: Khabur River, Syria); Naser, 2009 (southern regions of Iraq); Keikhosravi and Schubart, 2014b: 119 (Ilam, west of Iran).

Distribution in Iran. *Potamon mesopotamicum* is found at the Turkey-Syria border (Sanliurfa Province), Syria (sources of the Khabur River in Ras al-Ain; Nar al-Khabur) (Brandis et al., 1998; Esser and Cumberlidge, 2008a) and recently Naser (2009) extended the range of *P. mesopotamicum* to southern regions of Iraq, over 400 km to the southeast. In the Al-Huwaizah marshes, *P. mesopotamicum* lives in areas of still, shallow water, on mud or among submerged aquatic plants (*Ceratophyllum* sp.). In addition, recently *P. mesopotamicum* has been reported in the west of Iran (Ilam) on the Iran-Iraq border (Keikhosravi and Schubart, 2014b).

Remarks. Potential threats for the survival of *P. mesopotamicum* and other aquatic organisms in these marshes include the application of pesticides by fishermen and illegal overfishing (Al-Helfi, 2005).

Potamon ilam Keikhosravi and Schubart, 2014

Potamon ilam Keikhosravi and Schubart, 2014b (type locality: Ilam, south west of Iran).

Distribution in Iran. *Potamon ilam* is found in most of the rivers in Ilam (south west Iran) that drain into the Tigris River (except for some rivers in the eastern part), but it is not found in the Tigris River itself, where *P. mesopotamicum*, *P. persicum*, and *P. magnum* occur (Keikhosravi and Schubart, 2014b).

Remarks. Keikhosravi and Schubart (2014b) suggested that *Potamon ilam* is distinguished from *P. persicum* and *P. mesopotamicum* by the shape of the first gonopod and carapace characters. In addition, other differences between these taxa are evi-

dent from nuclear 28S rRNA and mitochondrial 16S rRNA gene sequences (Keikhosravi and Schubart, 2014b).

Potamon magnum Pretzmann, 1962

Potamon (Centropotamon) magnum Pretzmann, 1962 (type locality: eastern Turkey); Alsalami and Rahma, 2015 (Al-Kufa river, Iraq); Luay and Jawair, 2013 (Greater Zab river Kurdistan Region-Iraq).

Distribution in Iran. *Potamon magnum* occurs mostly in eastern Turkey in the upper reaches of the Euphrates and Tigris Rivers, in northern Syria, northeast of Iraq, in western Armenia and western Iran (Baneh) (Cumberlidge, 2008d; Ali and Latef, 2017).

Remarks. Cumberlidge (2008d) assessed *Potamon magnum* as Least Concern in IUCN red list of threatened species based on its relatively wide distribution (EOO 145,000 km²) and the relatively high number of localities and records in five countries. *Potamon magnum* populations may nevertheless be under threat from rapid anthropogenic changes affecting their habitat, such as water diversion and pollution. No information exists on the population dynamic or density of *P. magnum* (Cumberlidge, 2008d). Alsalami and Rahma (2015) showed that the most important factors that affect presence of *P. magnum* is the water temperature and salinity. The highest density reached (32.89) individual / M⁰ at a temperature of 20°C during April, no crab observed was observed during January and February when the water temperature was 14.5°C and 14.1°C respectively (Alsalami and Rahma, 2015).

Potamon persicum Pretzmann, 1962

Potamon persicum Pretzmann, 1962: 205 (type locality: Isfahan, Iran); Khatami, 2002 (type locality: Jajrood River, Tehran, Iran); Ardalan et al., 2011: 179 (Elburs Mountains); Keikhosravi and Schubart, 2014a: 116 (Kohkiluyeh buyerahmad province, Chaharmahal Bakhtiari province Esfahan, Khuzestan province, Iran). Keikhosravi and Schubart, 2014b: 117 (Khuzestan province Tehran province, Iran).

Potamon (Centropotamon) hueceste armenicum Pretzmann, 1983 (type locality: Makoom Northwest of Iran).

Potamon (Centropotamon) magnum elbrusi Pretzmann, 1962 (type locality: Rasht, Iran).

Potamon (Centropotamon) magnum vangoelium Pretzmann, 1976a (Mazandaran, Iran part).

Potamon (Centropotamon) persicum Pretzmann, 1962 (type locality: Isfahan, Iran).

Potamon (Centropotamon) persicum kermanshahi Pretzmann, 1976b (type locality: Kermanshah, West of Iran)

Potamon magnum armenicum Pretzmann, 1962 (type locality: Northwest of Iran); Pretzmann, 1963: 375.

Distribution in Iran. *Potamon persicum* is found in Iran (Azarbayejane Gharbi, Azarbayejane Sharqi, Gilan, Markazi, Hamadan, Bakhtaran, Lorestan, Esfahan Provinces), Turkey, Iraq and in Armenia. Also, this species is found in the Tigris-Euphrates river systems and in the region from Lake Van to the Elburs Mountains

and in the region south of Esfahan in Iran (Cumberlidge, 2008e; Ardalan et al., 2011; Keikhosravi and Schubart 2014a,b).

Remarks. Cumberlidge (2008e) assessed *Potamon persicum* as Least Concern in IUCN red list of threatened species based on its wide distribution (EOO 1 million km²) and the high number of localities and records from Iran, Turkey, Iraq and Armenia (Cumberlidge, 2008e).

Potamon ruttneri Pretzmann, 1962

Potamon ruttneri Pretzmann, 1962 (type locality: Amirabad, Tabas, Iran); Keikhosravi et al., 2016 (Khorasan Razavi, Iran and Herat, Afghanistan).

Potamon gedrosianum lindbergi Pretzmann, 1966: 297 (type locality: west of Afghanistan)

Potamon gedrosianum linberglundii Bott, 1967 (type locality: northwestern Afghanistan).

Distribution in Iran. *P. ruttneri* is found in northeastern Iran between Mashhad and Birjand. It is also found in northwestern Afghanistan (Herat and Oruzgan Provinces) (Cumberlidge, 2008f; Keikhosravi et al., 2016).

Remarks. *Potamon ruttneri* is listed as Least Concern in IUCN red list of threatened species because of its wide distribution in Iran and Afghanistan (Cumberlidge, 2008f).

Potamon strouhali Pretzmann, 1962

Potamon strouhali Pretzmann, 1962: 205 page (type locality: Yazd, Iran); Farzanpay and Pretzmann, 1974 (type locality: southeast Iran).

Potamon (Orientopotamon) eiselti Pretzmann, 1976a (type locality: Niriz, Iran)

Potamon (Orientopotamon) strouhali Pretzmann, 1962; 205 (type locality: Yazd, Iran); Pretzmann, 1963: 379.

Potamon strouhali shurium Pretzmann, 1976b (type locality: Shiraz, Iran).

Distribution in Iran. *Potamon strouhali* is found in southeast Iran (Yazd and Shiraz) up to the Afghan border region.

Remarks. *P. strouhali* is listed as Least Concern in IUCN red list of threatened species in (Cumberlidge, 2008g).

Potamon transcaspicum Pretzmann, 1962

Potamon transcaspicum Pretzmann, 1962: 205 (type locality: northeast Iran); Keikhosravi et al., 2016 (type locality: Zabul, Afghanistan and Zardkoohi, Sabzevar, Iran).

Potamon (Orientopotamon) transcaspicum Pretzmann, 1962 (Bojnourd, Iran).

Potamon (Orientopotamon) turkmenicum Pretzmann, 1962 (Bojnourd, Iran); Pretzmann, 1976b.

Potamon (Potamon) zarudnyi Starobogatov and Vassilenko, 1979: 1790-1801 (type locality: Cyprus).

Distribution in Iran. *Potamon transcaspicum* is found in Ukraine (Crimea), Turkmenistan and north east of Iran Khorasan Province (Sabzevar) (Cumberlidge, 2008h; Keikhosravi et al., 2016).

Remarks. *P. transcaspicum* is listed as Least Concern in IUCN red list of threatened species because of its wide distribution (Cumberlidge, 2008h).

Family Gecarcinucidae Rathbun, 1904

Sodhiana blanfordi (Alcock, 1909)

Paratelpusa (*Paratelpusa*) *blanfordi* Alcock, 1909: 375 (Type locality: Baluchistan, Pakistan); Pretzmann, 1963: 379.

Sartoriana blanfordi Bott 1970 (Type locality: Southern Iran); Cumberlidge, 2008i (Type locality: Baluchistan, Pakistan); Kamrani et al., 2009 (Type locality: Southern Iran).

Sodhiana blanfordi Yeo and Ng, 2012 (Baluchistan, Pakistan); Sharifian et al., 2014 (south east of Iran).

Distribution in Iran. It is found in the south east of Iran, Sistan and Baluchestan Province and Hormozgan Province (Bastak), Pakistan and Afghanistan (Cumberlidge, 2008i; Sharifian et al., 2014).

Remarks. It is listed as Least Concern in IUCN red list of threatened species. *Sodhiana blanfordi* extent of occurrence is in area less than 2,000 km² and all individuals occur in fewer than five localities (Cumberlidge, 2008i).

Sodhiana iranica Sharifian, Kamrani and Sharifian, 2014

Sodhiana iranica Sharifian, Kamrani and Sharifian, 2014 (type locality: Bastak region in the south of Iran).

Distribution in Iran. This species is a gecarcinucid crab from the Bastak region in the south of Iran (Bandar Abbas), only recently reported to be a new species (Sharifian et al., 2014). It inhabits a freshwater spring located in a semi-mountainous area in Iran (Eellod area), covered by dense stands of common reeds and salt cedar trees in the periphery, with algae mats on the bottom (Sharifian et al., 2014).

Remarks. *S. iranica* is easily separated from *S. rokitanskyi* by having the epigastric cristae lower and less pronounced, and coming close to or almost in contact with the postorbital cristae, whereas they are more prominent in *S. rokitanskyi* (Sharifian et al., 2014).

Sharifian et al. (2017) studied population dynamic of *S. iranica*. No significant differences were detected among mean male and female carapace widths and the sex ratio (male:female) was 1:0.7 in *S. iranica*. The maximum life span of *S. iranica* is evaluated to be 1.1- 4.9 years (Sharifian et al., 2017). In addition, Sharifian et al. (2017) suggested that suitable management is essential for conservation of *S. iranica* in the freshwater spring of the Eellood Area (near Bandar Abbas).

Sodhiana rokitanskyi (Pretzmann, 1971)

Liotelpusa (*Sartoriana*) *rokitanskyi* Pretzmann, 1971 (type locality: Minab, Iran).

Sartoriana rokitanskyi Esser and Cumberlidge, 2008b: (type locality: Minab, Iran); Mirzadeh et al., 2011 (Hormozgan Province, Iran).

Sodhiana rokitanskyi Yeo and Ng, 2012 (south of Iran).

Distribution in Iran. *Sodhiana rokitanskyi* is only found in Iran. The type locality is the Minab River near Minab, east of Bandar Abbas, Geno and Rudan marshes, in Hormozgan Province, southern Iran (Esser and Cumberlidge, 2008b; Mirzadeh et al., 2011; Yeo and Ng, 2012). Kamrani et al. (2009) described the characteristics of the marsh crab, *S. rokitanskyi*. *S. rokitanskyi* belongs to the family Gecarcinucidae, which is related to true crabs.

Remarks. Yeo and Ng (2012) subsequently revised *Sartoriana* Bott, 1969, and transferred three species to a new genus, *Sodhiana*: *S. blanfordi* (Alcock, 1909), *S. afghaniensis* (Pretzmann, 1963), and *S. rokitanskyi* (Pretzmann, 1971).

There is not enough information about this species to make a thorough assessment of *S. rokitanskyi*. Therefore, *S. rokitanskyi* is listed as Data Deficient (Esser and Cumberlidge, 2008b).

CONCLUSION

Studies on freshwater crabs in Iranian inland waters are limited to species reorganization and their diversity. Further studies are required to investigate habitat requirements, population structure, disease, biology and ecology of Iranian freshwater crabs. In addition, further studies are needed to survey fisheries (i.e. evaluate maximum sustainable yield and economy benefits), aquaculture (i.e. assay possibility of successful aquaculture) and industry importance (i.e. chitin and chitosan levels) of freshwater crabs in Iran.

Conservation measures require a complete inventory of distribution and habitat requirements of freshwater crab species, evaluations of population levels and trends, and creation of protected areas. Fortunately, most of the freshwater crabs of Iran are listed as Least Concern in the IUCN Red List of Threatened Species.

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