

Aratus pisonii (Mangrove Tree-climbing Crab)

Order: Decapoda (Crabs, Lobsters and Shrimps)

Class: Malacostraca (Crustaceans: Crabs, Sand-hoppers and Woodlice)

Phylum: Arthropoda (Arthropods)



Fig. 1. Mangrove tree-climbing crab, *Aratus pisonii*.

[http://www.discoverlife.org/IM/I_AMC/0033/320/aratus_pisonii,_on_rhizophora_mangle,_near_smallwood_store,_chokoloskee_island,_collier_county,_florida_1,I_AMC3376.jpg, downloaded 4 February 2016]

TRAITS. *Aratus pisonii* is an arboreal (tree-climbing) crab, its carapace is flattened and olive-green to brown in colour (Kaplan, 1988). The average carapace width differs slightly between the sexes; in males it is larger, up to 27mm and up to 25mm in females (Diaz and Conde, 1989). The carapace is widest at the anterior of the crab and tapers at the posterior end (Abele and Kim, 1968). The sternum is usually enfolded into the carapace (Fratini et al., 2005). The legs of this species are brown to mottled (Kaplan, 1988). The walking legs have short dactyli (outermost sections) and comparatively long propodi (adjacent sections) (Fratini et al., 2005). The eyes are located at the front corners of the carapace. The H-shaped, bilaterally symmetrical male reproductive organs are found in the cephalothorax to the front and below the dorsal carapace. The female has a pair of ovaries which are also located to the front of the cephalothorax and are connected by a transverse bridge (Nicolau et al., 2011).

DISTRIBUTION. *Aratus pisonii* is found in the western Atlantic region from Florida through to northern Brazil and the Caribbean islands. It is also found on the Pacific coast from Nicaragua to Peru (Diaz and Conde, 1989; De Arruda Leme and Negreiros-Fransozo, 1998) (Fig. 2). It is native to Trinidad and Tobago.

HABITAT AND ACTIVITY. *Aratus pisonii* spends its early larval stages in the sea. The juveniles then migrate in to the mangroves where they reside at the lowest portion of the mangrove trees and use the bark or the ground for hiding (Von Hagen, 1977). The adults generally reside on *Rhizophora mangle* (red mangrove), on the supralittoral zone of the roots, the branches, as well as in the canopy (Diaz and Conde, 1989). The habitat of *Aratus pisonii* is affected by the changes in tide such that during the high tide they occupy the higher region of the tree and at low tide they migrate vertically down to the roots. Although they mainly inhabit red mangroves, they could also be found on *Laguncularia racemosa* (white mangrove) and *Avicennia germinans* (black mangrove) (Diaz and Conde, 1989).

FOOD AND FEEDING. According to Warner (1967), this species of crab was described as being herbivorous, but recent studies have shown it to be a more opportunistic feeder. In the study done by Diaz and Conde (1989) in Morrocoy National Park, Venezuela, they were able to capture *A. pisonii* using fish bait. In contrast, in a separate location, Laguna de Tacarigua, *A. pisonii* preferred to feed on filamentous algae and mangrove leaves solely (Diaz and Conde, 1989). In Trinidad however the main food source preferred by *A. pisonii* was the detritus-covered algae which is encrusted on the mangal roots and is exposed during low tide (Von Hagen, 1977). Continuous feeding was only observed during the low tide period since the moist roots would be exposed (Von Hagen, 1977). Apart from this main feeding time, occasional feeding was noted on decaying tissues of the mangrove roots and on the faeces of other *Aratus* species (Von Hagen, 1977).

POPULATION ECOLOGY. In a study carried out by De Arruda Leme (2002) on the northern coast of Sao Paulo State, Brazil, 1801 individuals of *A. pisonii* were collected, of which 785 were males, 958 were females and 58 were juveniles which were not morphologically sexually identifiable. The carapace widths were larger in males (4.2-25.7mm) compared to females (4.1-24.4mm). The sex ratio of *A. pisonii* obtained in a study by Diaz and Conde (1989) showed that the female to male ratio was 1.3:1 where there were more females to males. The relative growth of *A. pisonii* was described as being linear and almost perfect for both males and females as the carapace width and length showed an isometric relationship (Diaz and Conde, 1989). *A. pisonii* population structure showed stability and had a symmetrical size distribution throughout the year (Diaz and Conde, 1989). The mortality rate was difficult to determine however it was observed that the main cause of mortality was during escape by jumping into the water and being attacked by the fish and to a less extent from predation by other crabs and birds. *A. pisonii* was described as being sedentary as no significant migrations were observed with this species (Diaz and Conde, 1989).

REPRODUCTION. The reproductive patterns of *A. pisonii* was observed by De Arruda Leme and Negreiros-Fransozo (1998) on the northern coast of Brazil. Of 598 females collected for the study, 131 were ovigerous (with eggs), which were present nearly all year, but in some months less than others; for example zero in June but 68% of the females in March. Warner (1968) showed that the larval development occurs in four stages which consists of four zoeal larvae and a

megalopa larva which takes place in one month. Spawning frequently occurs in the rainy season which is advantageous since it causes change in the salinity of the water as well as increased nutrients and plankton growth, and hence enhances the primary productivity of the water. This would be beneficial to the zoeal larvae as it would prevent osmoregulatory stress and stranding (De Arruda Leme and Negreiros-Fransozo, 1998). Males normally have a faster growth rate since females have a higher reproductive effort and hence do not moult while incubating their eggs (Warner, 1967).

BEHAVIOUR. A main behavioural pattern which distinguishes adult *A. pisonii* from other species is that it shows preference to walking on any substratum at various speeds whilst still being able to walk side-ways (Von Hagen, 1977). To escape predation, they spend most of their time in the canopy of the tree and only venturing downwards when foraging for food at low tides. During the reproductive period in females, they usually migrate towards the mangrove fringes which has suitable characteristics such as humidity for egg development and larval release (De Arruda Leme and Negreiros-Fransozo, 1998). This movement to the fringes may also serve as a way to encounter possible mates (Christy and Salmon, 1984). Juveniles of *A. pisonii* show a behavioural response to predators by hiding behind narrow objects such as behind branches to escape predation (Diaz et al., 1995).

APPLIED ECOLOGY. There is no published information on this species by the IUCN Red List.

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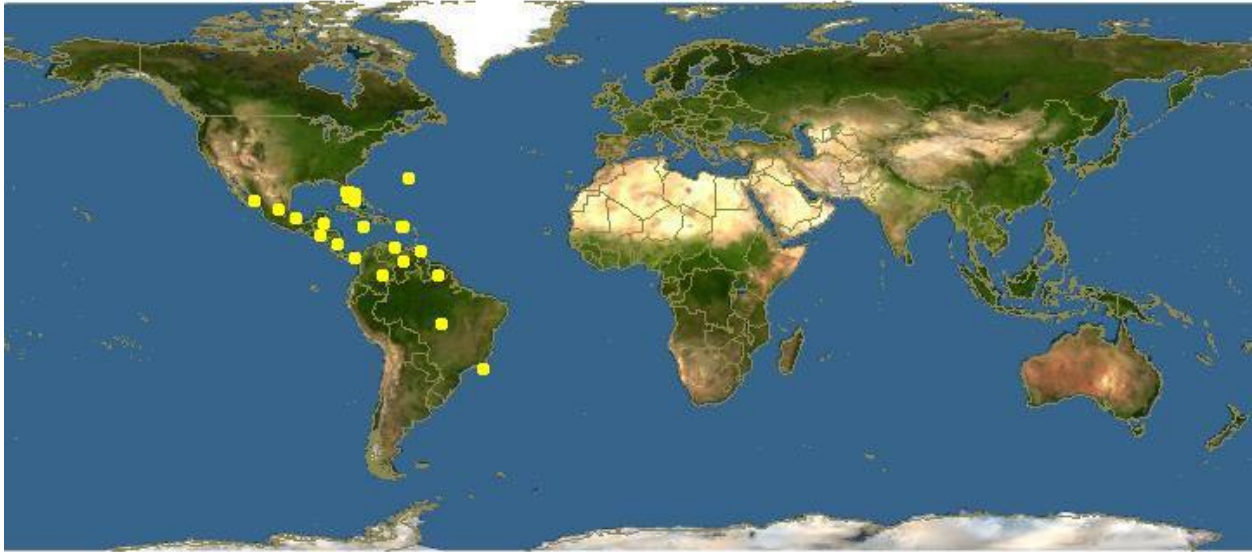


Fig. 2. *Aratus pisonii* geographic distribution.

[http://eol.org/data_objects/21110566, downloaded 11 March 2016]

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