

Rock Crab (*Cancer irroratus*)

Description, Distribution and Biology

Rock crab is one of the more prevalent species inhabiting near shore regions of Atlantic Canada. *C. irroratus* has a broad, oval, carapace with nine shallow, smooth-edge teeth along each side of the front region of the carapace. Its eyes are round and located on thick short stalks. This species is typically yellow-brown with purple or crimson spots on its back shading to a pale yellow towards its abdomen (Fig. 1). The shell of both claws and carapace are relatively smooth in comparison to other crab species such as the Jonah crab (*Cancer borealis*). This species can grow to a maximum carapace width of 14 cm and weigh approximately 0.25 kg.



Figure 1. Rock crab. Source: Department of Fisheries and Aquaculture, St. John's, NL.

The rock crab is distributed throughout the northwest Atlantic Ocean from southern Labrador to Miami, Florida. It is frequently found in shallow water areas, particularly in bays on sandy or mud bottoms and prefers depths from 0 to 575 m. On Canada's east coast, the rock crab is common in inshore areas of depths ranging from 5 to 20 m. In its southern most range this species is often found in deeper water.

The rock crab typically reaches sexual maturity between 1 and 2 years. The size of the rock crab at time of maturity varies according to location. In coastal areas around the Atlantic provinces, female rock crab are considered sexually mature at a carapace width of 5.5 and 6 cm, while males are sexually mature at 7 cm. Mating occurs when females are in a soft shell condition. A female with a carapace between 2.1 and 8.8 cm can produce anywhere from 4,000 to 330,000 eggs. Eggs are generally extruded during mid to late autumn and continue until the following spring or early summer. The eggs are usually bright orange-red, turning darker red to brown prior to hatching.

Free-swimming larvae hatch during late spring and early summer and immediately join near-surface plankton. The larvae will remain in the upper water column before undergoing six stages of moulting and settling on the bottom. Settlement usually occurs inshore, on gravel or cobble substrates. Rock

crab larvae are considered omnivorous planktivores. The main predators during the larvae stage are larger zooplankton and planktonic fish species.

After settlement, the rock crab will go through its juvenile stage until it reaches sexual maturity. In the first two years, both female and male juvenile rock crab will grow from 1.4 to 4 cm in carapace width. However, after the second year, males typically grow faster than females, reaching 14 cm by the seventh year in comparison to 8.9 cm for females. The diet of juvenile and adult rock crab includes juvenile Icelandic and sea scallop, mussels, snail, green sea urchin, brittlestar, sand shrimp and polychaete. Furthermore, larger adult rock crabs are known to prey on small lobster. The main predators for adult rock crabs are lobster and green crab (*Carcinus maenas*), a non-indigenous species accidentally introduced into the northwest Atlantic Ocean.

Harvesting, Technology and Resource Management

Prior to 1973, this species was chiefly harvested as a by-catch species in the commercial lobster fishery. Commercial fishing of the rock crab has been insignificant in terms of both harvesting effort and landings over the years. During the 1980s, annual landings for Atlantic Canada, principally from the Northumberland Strait in the Gulf of St. Lawrence, reached 500 metric tonnes with a value of over \$110,000. The development of this fishery throughout Atlantic Canada has been limited by the rock crab's small size, low meat yields, and processing costs. In 1995, the Canada/Newfoundland Cooperation Agreement for Fishing Industry Development (CAFID) conducted an experiment of rock/toad crab fishing in coastal areas around Newfoundland and Labrador, particularly in Greenspond, Bonavista Bay to Twillingate and Notre Dame areas. The research concluded that rock and toad crab resources were abundant and well distributed around the province and that a modified snow crab pot with 3-3/4" mesh and a variety of bait types proved to be efficient in harvesting both species. The Marine Institute conducted research in 1999 to reduce the by-catch of lobster in rock crab pots. It resulted in plastic barriers being required in all pots.

Management measures for rock crab have not been developed in Newfoundland and Labrador, however regulations have been established for the rock crab fishery in the Maritime region. The minimum size limit for male rock crab was set at 10.2 cm carapace width. Modified lobster traps and conical crab traps are permitted with a trap limit of 150. Traps are required to have a minimum of 2 escape gapes with a diameter of 6.35 cm. Future development of this fishery in Atlantic Canada will require further investigation into resource abundance. Rock crab removals during lobster fishing are an important piece of missing information required for stock assessment.

Processing and Markets

With a very limited commercial fishery, there is a lack of knowledge and technology available for processing rock crab in this province. Rock crab sections are much smaller compared to snow crab, therefore the traditional method of using saws for separation of leg/shoulders cannot be applied to rock crab. Furthermore, rock crab claws are smaller than snow crab and cannot be used as cocktail claws. Meat has to be extracted from the legs by means of compressed air. The meat is then crushed and tumbled prior to packaging. Although a limited market exists for this species, it has been suggested as an alternative for snow crab meat in North American markets since most of the snow crab production is sold as sections and very little meat is produced (sections or whole crab).

ADDITIONAL READINGS:

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- DFO. (1998). Eastern Nova Scotia Offshore Multi-species Crab Fishery Integrated Management Plan. Department of Fisheries and Oceans, Scotia-Fundy Fisheries, Maritime Region.
- DFO. (Undated). Offshore/Inshore Fisheries Development. Atlantic Coast CRABS. Communication Directorate, Department of Fisheries and Oceans, Ottawa, Ontario, Canada. Retrieved from the World Wide Web {May 27/02}. <http://www.mi.mun.ca/mi-net/fishdeve/atlantic.htm>.
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- Squires, H.J. (1990). Decapod Crustacea of the Atlantic Coast of Canada. Can. Bull. Fish. Aquat. Sci., 221: 532 p.

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