

Panulirus guttatus (Spotted Spiny Lobster)

Order: Decapoda (Shrimps, Lobsters and Crabs)

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

Phylum: Arthropoda (Arthropods)



Fig. 1. Spotted spiny lobster, *Panulirus guttatus*.

[<http://reefguide.org/keys/spottedlobster.html>, downloaded 28 March 2015]

TRAITS. The maximum length of adult *P. guttatus* is 20cm while the common length is 15cm. Its colour varies from blue to brown and green and it is covered with spots cream in colour that extends onto the legs. On three of the anterior pairs of walking legs longitudinal strips are seen. The spotted spiny lobsters have long antennae over their eyes and antennules that can detect movement and sense chemicals in water.

DISTRIBUTION. *P. guttatus* can be found within the geographical range (Fig. 2) of the western Atlantic Ocean ranging from the coastal waters of Bahamas, Belize, Bermuda, South Florida, Panama and the Caribbean Arc, from Cuba to Trinidad, Bonaire, Curacao, Los Roques and Suriname.

HABITAT AND ACTIVITY. The spotted spiny lobster is a benthic crustacean that is found in shallow waters of coral reefs inhabiting rocky places, crevices (Fig. 3) and under coral heads, at depths of 5-10m. *P. guttatus* is a nocturnal, philopatric (remaining in one place) carnivore which consumes small herbivorous reef invertebrates.

FOOD AND FEEDING. *P. guttatus* being benthic, highly sedentary crustaceans feeds primarily on bivalves, carrion, chitons and gastropods from the floor of the ocean. Their diet may also consist of worms, sea urchins, crustaceans and plants. For a short period of time during the night, they emerge from their shelters of crevices and caverns to forage, and retreat to avoid predators.

POPULATION ECOLOGY. The spotted spiny lobster is solitary apart from the juvenile stage where they gather in their protective habitat. When maturity is reached, they migrate to offshore reefs. Functional maturity varies in population according to size. In male spotted spiny lobsters the walking legs are long relative to carapace length as the front walking legs are used in dominance displays and mating. Size of maturity may be affected by many factors such as its growth that is dependent on density, fishing pressure, availability and quality of food and the temperature of the water. The pueruli larvae of *P. guttatus* inhabit the underside of the reef where they are restricted to the outmost shallow reefs. During summer the female migrates to the reef-crest when they are prepared to breed. This recurring migration is coupled with the discharge of larvae into the ocean current and return of females to the reef flats and patch reefs during October to December where mating occurs in spring. Some large females can spawn more than one time during the year. Adult males can moult up to three times per year, however injury decreases moult increments and growth.

REPRODUCTION. Developmental stages (Fig. 4) of females with eggs are located in the coral reef barrier where eggs are hatched. Post larvae inhabit the reefs while the adults rarely leave the reefs they live on. Due to irregular settlement of *P. guttatus* on isolated patches they develop varying size, structures and sex ratios resulting in varying reproductive success amongst the small, disjointed population. Females choose larger males to ensure a high fertilization success, spawning throughout the year. The presence of a spermatophore, that is a pouch where sperm are passed to the female following the release from the gonopore of the male, indicates successful mating. After the female sheds her exoskeleton the male turns her body over and cradles her where he mounts her and inserts the first pair of gonopods into the seminal receptacle. The male pushes the spermatophore through the groove into the seminal receptacle. Outside the female's receptacle, the male attaches a gelatinous material where it hardens plugging the female to avoid the loss of the spermatophore. When this is complete the female is flipped back and released. After a couple of days the plug falls off and the hardened spermatophore is left behind. The female holds the eggs under her tail for approximately 2-3 weeks until they hatch. At first eggs are orange in colour and when ripe becomes dark brown. They may be able to produce two to three broods yearly. The breeding season in Bermuda is restricted from May to October but they reproduce all year round in other areas.

BEHAVIOUR. The postlarve of *P. guttatus* directly settles into an adult habitat. They remain in the crevices during daylight and come out to forage at night without responding to any disturbance. This is a way in which they avoid diurnal predators. Being non-migratory species they may not leave the patch where they settle. As they grow older and undergo metamorphosis

they develop an exoskeleton which may be used as protection. An anti-predation method whereby the shy spotted spiny lobster uses is the tailflip. Here the organism rapidly swims backward, propelled by a tailfan and powered by muscles of the abdomen that eventually becomes fatigued. Even though it is a rapid escape, the tailflips have limited time and distance. They tend to retreat while fending predators of with their antennae or tailflip simultaneously producing a sound as a defense mechanism.

APPLIED ECOLOGY. Under the IUCN Red List, *P. guttatus* is listed as of least concern. This species is very common and despite being harvested it is not seriously threatened by large fishing operations. It is indirectly protected by the management methods for other organisms.

REFERENCES

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Posted online: 2015



Fig. 2. Distribution map of *P. guttatus*.

[<http://maps.iucnredlist.org/map.html?id=169988>, downloaded 29 March 2015]



Fig. 3. Spotted spiny lobster in a crevice.

[<http://reefguide.org/spottedlobster.html>, downloaded 29 March 2015]

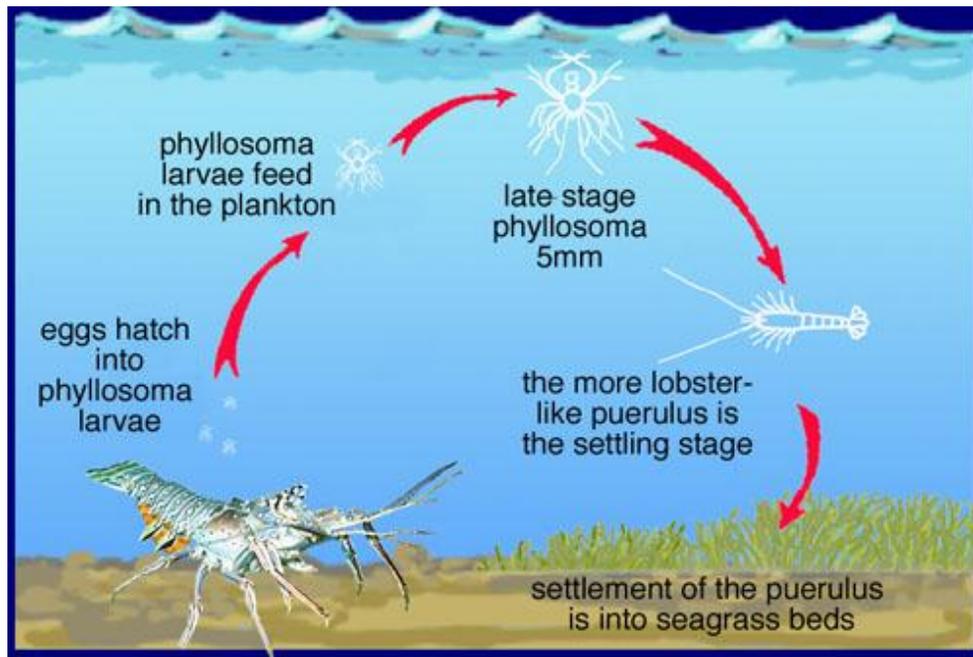


Fig. 4. Life cycle of a spiny lobster.

[<http://www.mousetrapmultimedia.com/virtualcoralreefdive/FILES/RECRUITMENT/surv.php>, downloaded 29 March 2015]