

## *Spirula spirula* (Ram's Horn Squid)

Order: Spirulida (Ram's Horn Squid)

Class: Cephalopoda (Octopuses, Squid and Cuttlefish)

Phylum: Mollusca (Molluscs)



**Fig. 1.** Ram's horn squid, *Spirula spirula*, and its internal shell.

[[http://www.tolweb.org/Spirula\\_spirula/19989.htm](http://www.tolweb.org/Spirula_spirula/19989.htm), downloaded 28 March 2015;  
<http://en.wikipedia.org/wiki/Spirula>, downloaded 30 April 2015]

**TRAITS.** The ram's horn squid is the only living species in the order Spirulida. *Spirula* has a small squid-like body (Wikipedia, 2015) from 35-45mm in length. The skin is reddish-brown and smooth, and they have eight arms and two long tentacles. There is an internal calcareous shell in the shape of a coiled spiral, with the coils not touching (Fig. 1), which gives the animal its name and is often washed up on beaches. Their heads have tentacle pockets, there are no corneas present in their eyes, and the ink sac is smaller than in other squid. At the posterior end of the body, they have a large photophore (light-producing organ) (Fig. 2).

**DISTRIBUTION.** *Spirula* are mostly distributed in deep ocean waters at depths from 1000-2000 m. They are found in the tropical Atlantic and Indo-west Pacific Oceans, usually near the continental shelf or around oceanic islands.

**HABITAT AND ACTIVITY.** They prefer deep waters with temperatures around 10°C. When at rest, it stays in a vertical position with the head facing downwards and can drift in this position. Distribution in depth varies according to the time of day, with peak activity at night. It usually rests during the day at around 550-1000m, and is more active at night and rises closer to the surface to hunt and feed on fish at around 100-300m (Fig. 3).

**FOOD AND FEEDING.** *Spirula* hunts at night and feeds on small fish, crustaceans, echinoderms, cnidarians and other marine invertebrates, and uses the beaked mouth for feeding, and food is propelled to it by the tentacles. They can consume 30-60% of their body weight per day.

**POPULATION ECOLOGY.** There are no population size estimates but it has a wide geographic and depth distribution. Females leave their eggs on the ocean floor (Norman and Reid, 2000) which suggests that females are more abundant at greater depths than males. This species tends to live for about 18-20 months and become sexually mature at 12-15 months at about 30mm in mantle length. Males possess modified ventral arms that have finger-like outgrowths but do not have any suckers.

**REPRODUCTION.** Reproduction occurs when the males implant a sperm sac into the seminal receptacle of the female's mantle using a modified tentacle. Females are slightly bigger than males and lay their eggs on the ocean floor. The eggs are usually soft and clear. The period of time for hatching to occur is unknown. The paralarval planktonic young are found at great depths of the ocean close to where they were laid.

**BEHAVIOUR.** When a *Spirula* is disturbed, it can pull its head and arms within the mantle which can then close by folding over the flaps of the mantle margin. Its ink sac is reduced so therefore is unable to squirt as much ink as other species of squid and is not one of its main defense mechanisms. The photophore is able to glow and emit green light for hours (bioluminescence) and this can scare away predators. The shape of its head allows it to swim downwards rapidly with its terminal fins pointing upwards. They lack corneas but possess highly mobile irises that help them to see and escape predators. They are able to communicate using the photophore, the organ that emits light. They may also use chemical signalling as form of communication.

**APPLIED ECOLOGY.** It is listed as the least concern by the IUCN and is not an endangered species.

## REFERENCES

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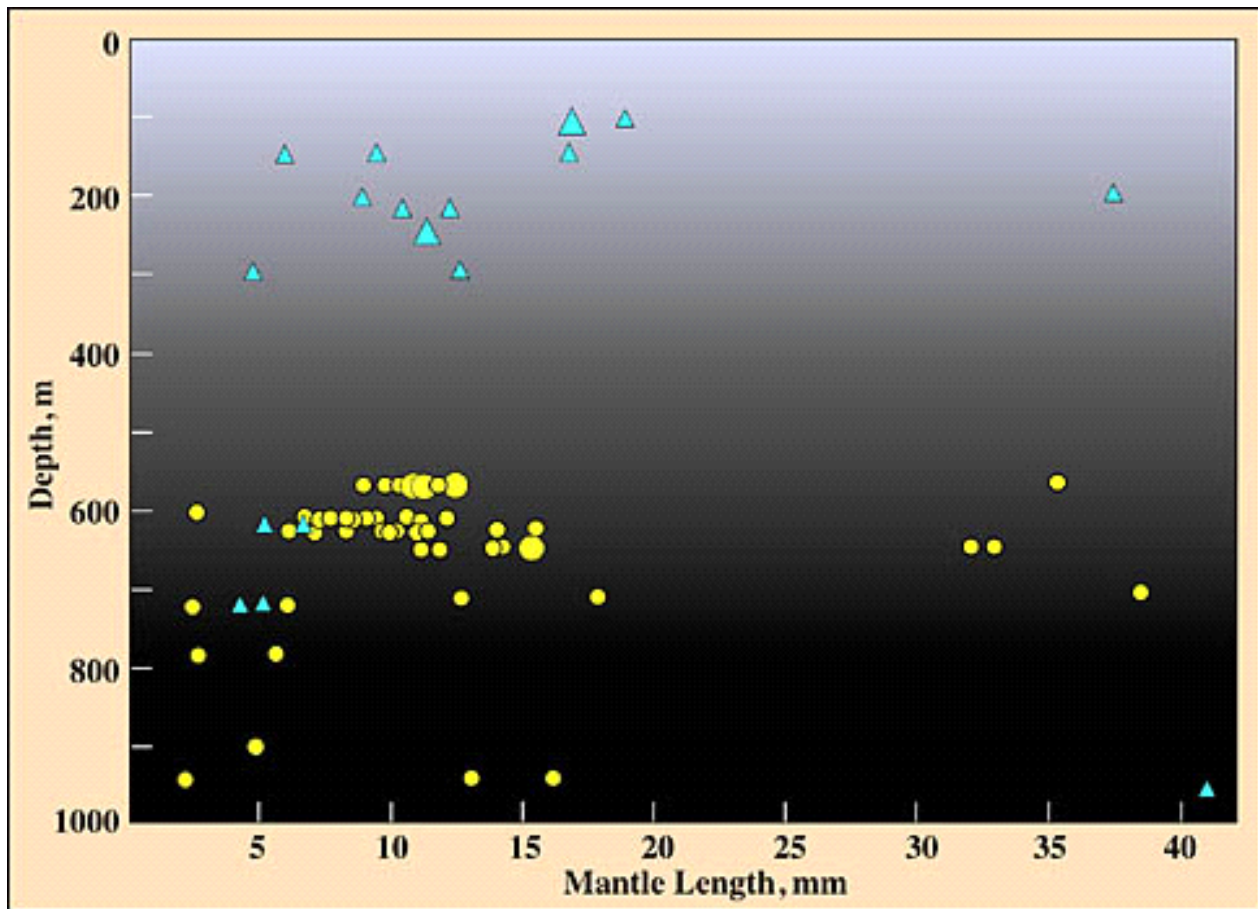
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**Fig. 2.** End of mantle showing the photophore (light-producing organ).

[<http://en.wikipedia.org/wiki/spirulaspirula>, downloaded 25 March 2015]



**Fig. 3.** Graph of water depths of 70 *Spirula spirula* captured with opening/closing nets near the Canary Islands. Yellow circles - day captures. Blue triangles - night captures.

[<http://www.tolweb.org/squids>, downloaded 23 March 2015]

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