

SPOTTED RATFISH

HYDROLAGUS COLLIEI (LAY & E.T. BENNET, 1839)

NATURAL HISTORY SUMMARY BY JAX ROBINSON

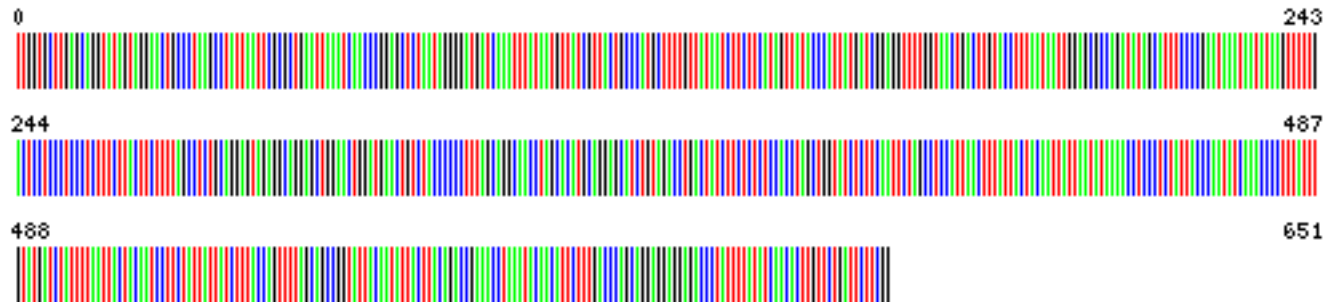


Figure 1. *Hydrolagus colliei* DNA Barcode - Barcode of Life Database - BOLD Systems (Ratnasingham and Hebert 2007)

Classification

Kingdom: Animalia
Phylum: Craniata
Class: Chondrichthyes
Order: Chimaeriformes
Family: Chimaeridae
Genus: *Hydrolagus*
Species: *H. colliei*

Description

The Spotted Ratfish, *Hydrolagus colliei*, is a small fish in the Chondrichthyes family, meaning that it is a cartilaginous fish with the appearance of a small shark (Allen and Smith 1988). It is brown and red in coloration, with small white spots on the head and trunk regions and a small and rounded snout (Barnett et al. 2015). The males are approximately 100 cm in length and stay fairly small throughout their life (Allen and Smith 1988). The first and last dorsal fins are equal in height, but much taller than the middle dorsal fin. Both the anterior and posterior edges of the dorsal fin are smooth, rather than serrated (Barnett et al. 2015). The anal fin is absent, but the pectoral fins are rather short such that when they are folded, they do not reach the origin of the pelvic fin (Allen and Smith 1988). The caudal fins are symmetrical in length and width as compared to the dorsal caudal fins, which are longer than the bottom portion (Allen and

Smith 1988). The epaxial and hypaxial musculature lobes that help with motion and support of the body, are equal in size (Barnett et al. 2015).

Distribution

Spotted Ratfish are located primarily within the Northeastern Pacific regions, along the west coast of North America, ranging from lower Alaska down to the Mexico and Costa Rica (Allen and Smith 1988). *Hydrolagus collieri's* [range map](#) is available at Barnett et al., 2015.

Diet

Spotted Ratfish is a deep-water fish that feeds primarily on mollusks, crustaceans, fishes, echinoderms, and worms, but it is also considered to be partially cannibalistic in that it eats its own egg casings and will occasionally eat other ratfish (Barnett et al. 2015; Allen and Smith 1988). Its prominent spine is considered dangerous and can be used to inflict pain on its prey before capture (Barnett et al. 2015).

Habitat and ecology

The Spotted Ratfish is commonly found in shallower waters, at the bottom of the ocean (Barnett et al. 2015). Within its range along the western coast of North America, it is found closer to shore in the northern regions (as compared to the southern regions near Mexico). This could be due to the fact that they enjoy cooler and more temperate waters, around 14 degrees Celsius (Allen and Smith 1988). While they prefer to be close to the shore, throughout the seasons they move to match their preferred water temperatures (Barnett et al. 2015). For instance, in the autumn and spring they are found in shallower waters, whereas in the summer and winter they move to deeper waters. The Spotted Ratfish's depth range has been noted to be as deep as 913 m, but it occurs in most abundance from 50 to 400 m. Another behavior of note is the Spotted Ratfish's tendency to separate into groups based on sex and size (Allen and Smith 1988).

Compared to its predators, the Spotted Ratfish is rather small. However, their skin is bland and leaves an unpleasant taste in its predators mouth after they are bitten, making them less likely to be preyed upon (Allen and Smith, 1988). Spotted Ratfish

predators include: Dogfish (Squalidae), Soupfin Sharks (*Galeorhinus galeus*), Pacific Halibut (*Hippoglossus stenolepis*), Pinnipeds (Odobenidae, Otariidae, Phocidae), and Pigeon Guillemots (*Cephus Columba*) (Barnett et al. 2015).

Reproduction and life cycle

Spotted Ratfish are oviparous, meaning that they lay their eggs with little or no embryonic development within the female (Barnett et al. 2015). The female will lay egg cases in pairs, once every 17-19 days, or 20-29 eggs in each six to eight-month reproductive cycle (Barnett et al. 2015). When the eggs leave the body, they are held within a leathery capsule, taking about 30 hours to fully export both (Allen and Smith, 1988). The eggs then fall to the ocean floor, held by a long filament, for about four to six days (Barnett et al. 2015). Female ratfish usually stay near the egg capsules to protect them against predators. The eggs can take up to a year to develop, and the young can be up to 14 cm in length (Allen and Smith 1988). They usually grow throughout maturation but do not take on any other morphological characteristics. Spotted Ratfish can give birth all year round, but the peak for spawning is primarily within the spring and autumn seasons (Barnett et al. 2015). This species is not known to migrate for spawning. In this species, pair copulation is common. Male ratfish have a unique head clasper (the tenaculum) that they use to force the females into copulation and large forked claspers to pass their sperm onto the females. (Allen and Smith 1988)

Conservation status

In 2015, the Spotted Ratfish was listed as a species of “Least Concern” by the International Union for Conservation of Nature Red List of Threatened Species (Barnett et al., 2015). It is not considered endangered or threatened as it is abundant along the Pacific coast of North America. Due to its bland taste, it is not usually used as a human food source so it is not threatened by commercial or recreational overfishing (Barnett et al., 2015). Spotted Ratfish can be accidentally caught by fisherman trying to catch other types of fish, specifically in trawls (Barnett et al. 2015). In fact, this species has increased in abundance in the past years and seems to recover from any misfortunes of species lost fairly well (Allen and Smith 1988).

Cultural significance

The Spotted ratfish liver oil was once used as machine oil (Armstrong 1996).

Specimen specific detail

The Spotted Ratfish (*Hydrolagus colliei*) specimen from the [Burton Ostenson Museum of Natural History](#) at Pacific Lutheran University was caught in Point Defiance Park in Pierce County, Washington, on February 14, 1961 by Jens Knudsen. For being 56 years old, the specimen has held its natural form pretty well. All the claspers and fins appear to resemble what they would have looked like in their natural habitat. Point Defiance Park is in a coastal region of the Pacific Ocean common for Spotted Ratfish. It was not reported if the specimen was found in the shallow or deep regions of the water but given that it was collected in February, it was probably found in the deeper regions.

In 1961, the Civil Rights Movement's Freedom Rides were taking place, it was the height of the Cold War tensions, and the Apollo space race was underway.

Jens Knudsen was a student and then a Professor of Biology at Pacific Lutheran University. *Leptodactylus knudseni* or Knudsen's Thin-toed Frog from Amazonian Ecuador, was named in his honor by a former student (Heyer 1972). He was an accomplished biologist and accomplished artist who constructed the giant slug and open coast dioramas in the Reinke lobby area.

Literature Cited:

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