

Echidna catenata (Chain Moray)

Family: Muraenidae (Morays)

Order: Anguilliformes (True Eels and Morays)

Class: Actinopterygii (Ray-Finned Fish)



Fig. 1. Chain moray, *Echidna catenata*.

[<http://claycoleman.tripod.com/id130.htm>, downloaded 2 March 2016]

TRAITS. Chain morays, also commonly called little banded eels (Fig. 1), typically range from a few centimetres to a maximum of 70cm (Böhlke, 2013). Their physical appearance is a long, stout, snake-like body (Fig. 2), without ventral and pectoral fins. Beginning behind the head is a continuous fin, formed from the anal, dorsal and tail fins, which includes the tail and expands midway to the belly (Humann, 1989). Its head is short with a steep profile comprising of a short and rounded snout and its eyes are either above or just at the back of its mid jaw (Böhlke, 2013). The entire body lacks scales, but is covered by a protective layer of clear mucus. With regard to colouring, chain morays have yellow eyes and bodies that are dark brown to black with asymmetrical, chain like patterns. These chain-like markings are bright yellow and can be interconnected (Humann, 1989). Since they are carnivorous, they have short, powerful jaws, but unlike other eels, their teeth are short and blunt (Fig. 3) with some being molariform (Randall, 2004).

DISTRIBUTION. It is widely distributed and occurs in areas ranging from Florida to the Gulf of Mexico and the Florida Keys, the western Atlantic from Bermuda and throughout the Caribbean Sea, inclusive of the Bahamas. It can also be found along the South American coast to southern Brazil, Mexico including Tuxpan and Veracruz, to north-western Cuba. There is a presence in Ascension Island but not in the eastern Atlantic. In the Caribbean, it is native to almost all the countries inclusive of Curacao, Suriname, Trinidad and Tobago and much more (Fig. 4) (Smith and McCosker, 2015).

HABITAT AND ACTIVITY. Chain morays dwell in solitude in coral reefs, and in the shallow waters of rocky shores, as well as in the sand. There are also instances where they can be found in tide pools (Smith and McCosker, 2015). They exhibit a predatory function and hunt for prey mostly at night, although they may be sometimes tempted to feed during the day by the strong scent of a particular prey. Typically, they await the presence of prey at a close distance from their holes, then proceed to strike, as opposed to actively hunting (Randall, 2004). It is typical to observe the protrusion of chain morays' heads from holes in the reef during the day (Fig. 1). At night however, they may forage away from this area, in some instances of active hunting. Although literature on the residency of each moray in one specific hole is minimal, estimations suggest that their occupancies range from part of a day, to a few months (Gilbert et al., 2005).

FOOD AND FEEDING. Chain moray eels are well adapted to their diet, which includes various crustaceans, small fish, shrimp and octopi (Gilbert et al., 2005). Chain morays in particular have short, blunt and rounded teeth that enable the more efficient consumption of crustaceans. They also have short and powerful jaws which enable the mouth to completely close, and crush prey. Their food includes various species of crabs such as *Cronius tumidulus* and *Acanthonyx petiverii* and shrimp species like *Lysmata moorei*. They rely mostly on their olfactory senses to hunt food, which occurs actively mainly at night or passively if a prey is present close to their living areas (Randall, 2004). They have a very distinct and feeding pattern known as rotational feeding where they exhibit a type of feeding behavior called 'knotting.' Rotational feeding essentially is where an organism utilizes its longitudinal axis to spin, thereby enabling it to tear apart large prey. 'Knotting' can be denoted as a sequence of elaborate movements which include: the positioning of the tail in a backward movement, under the middle of its body, followed by the creation of a second loop by passing the tail back up and into the first loop. The two loops are then tightened, after which the eel draws its head backward through the loops (Fig. 5), thus rendering the prey decapitated, largely torn or swallowed (Miller, 1987).

POPULATION ECOLOGY. The primarily nocturnal chain moray is a solitary organism and inhabits the holes and crevices of coral reefs, rocky coastlines and areas with sand. It can also be regarded as a demersal species, living near the bottom. This is a common species, and also very widely distributed (Smith and McCosker, 2015). They are not very vicious for predatory organisms, but are shy cave dwellers, which do not associate with or attack humans unless provoked (Hunziker, 2005).

REPRODUCTION. Like other species of moray eels, the chain moray is oviparous, meaning that it produces eggs. The eggs and larvae are also pelagic (Robertson et al., 2015), meaning that unlike the adult moray, they are able to be dispersed long distances away from the parent and the

bottom of the ocean and can exist almost at the surface in some instances (Jones and McGraw, 2001).

BEHAVIOUR. Chain Morays are no more voracious than any other carnivorous predatory fish. Their shyness contributes to hasty retreats away from humans, unless provoked, in which they will attack (Hunziker, 2012). They only hunt actively during the night, making them primarily nocturnal (Smith and McCosker, 2015). In the other instance, they wait for the close presence of prey to their abode, which they instantly strike and consume after 'knotting' (Miller, 1987). While hunting for prey, it is able to withstand a lack of water for up to 30 minutes. It can also move up to six meters in one hour when foraging an open reef, and hunting typically yields a 50% success rate (Robins and Ray, 1986).

APPLIED ECOLOGY. The species is characterized as "Least Concern," based on the IUCN red list of threatened species. Currently, there is minimal threat to the species. They are occasionally caught for food purposes, however they are more popular in the aquarium trade (Smith and McCosker, 2015).

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Fig. 2. Picture of chain moray showing distinct markings and shape of body.

[<http://www.petsolutions.com/C/Live-Saltwater-Eels-Saltwater/I/Chain-Moray-Eel.aspx>, downloaded 2 March 2016]



Fig. 3. Picture showing the short, blunt teeth of the chain moray.

[<http://www.flickrriver.com/photos/brianmayes/tags/moray/>, downloaded 2 March 2016]



Fig. 4. Geographical distribution of the chain moray.

[www.iucnredlist.org/pdf/link.2401242, downloaded 2 March 2016]



Fig. 5. Diagram showing the 'knotting' feeding behaviour exhibited by chain morays.

[http://www.jstor.org/stable/1445576?seq=1#page_scan_tab_contents, downloaded 29 February 2016]

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