CHIMAERAS

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GENERAL REMARKS

Chimaeras are somewhat compressed, sharklike fishes that resemble grenadiers (Macruridae) in shape but are true cartilaginous fishes (Chondrichthyes), with no bone in the skeleton, no bony fin rays, and no bony plate scales. Unlike sharks and rays (Elasmobranchii), chimaeras (Holocephalii) have only 4 pairs of gill openings on the sides of the head, which are hidden by a pair of soft gill covers that extend to the bases of the pectoral fins and form a single external gill opening on each side of the head. Chimaeras have prominent, large eyes on the sides of the head but no spiracles; the mouth is small, ventral, and connected to the nostrils by a pair of deep grooves, which serve to channel water from the nostrils to the mouth for respiration; the teeth in the mouth are formed into two pairs of ever-growing toot:h plates in the upper jaw and one pair in the lower jaw, which unlike sharks and rays are not serially replaced; these protrude from the mouth like rodent's incisors, and have suggested the names ratfish or rabbitfish for some of the species. The pectoral fins are broad, leaf-shaped, and with a delicate external fin web supported by connective tissue fin rays ceratotrichia; the pectorals serve to propel these fishes slowly through the water; all chimaeras have 2 dorsal fins, the first erectile, with a slender, toxic spine and the second long and spineless; an anal fin is either present or absent. The tail of chimaeras is elongated and tapering, with a sharklike, asymmetrical (heterocercal) or straight, leaf-shaped (diphycercal) caudal fin, often with a long terminal filament extending beyond the fin. All living chimaeras have virtually naked skin, except for a few dermal denticles on the back and along the lateral line canals in some species and on the claspers and tentacula of males. The canals of the lateral line system on the head and sides of the body and tail are superficial in the skin and very prominent, unlike sharks and rays where they are more or less hidden under the skin. Male chimaeras have a pair of cylindrical or forked copulatory organs or claspers on their pelvic fins, used for internal fertilization of the eggs of females; adult males additionally have a pair of denticle-studded grasping organs, the prepelvic tentaculae, just in front of the pelvic fin bases, and a knocker-like, denticle-covered frontal tentaculum on the forehead; these structures aid the male in grasping the female during copulation. Chimaeras are oviparous, depositing eggs on the bottom in long-necked, spindle or bottle-shaped egg cases, with a pair of narrow or broad, delicate side fins variably developed. Mature chimaeras vary in length from about 40 to 200 cm, the females being generally larger than males.

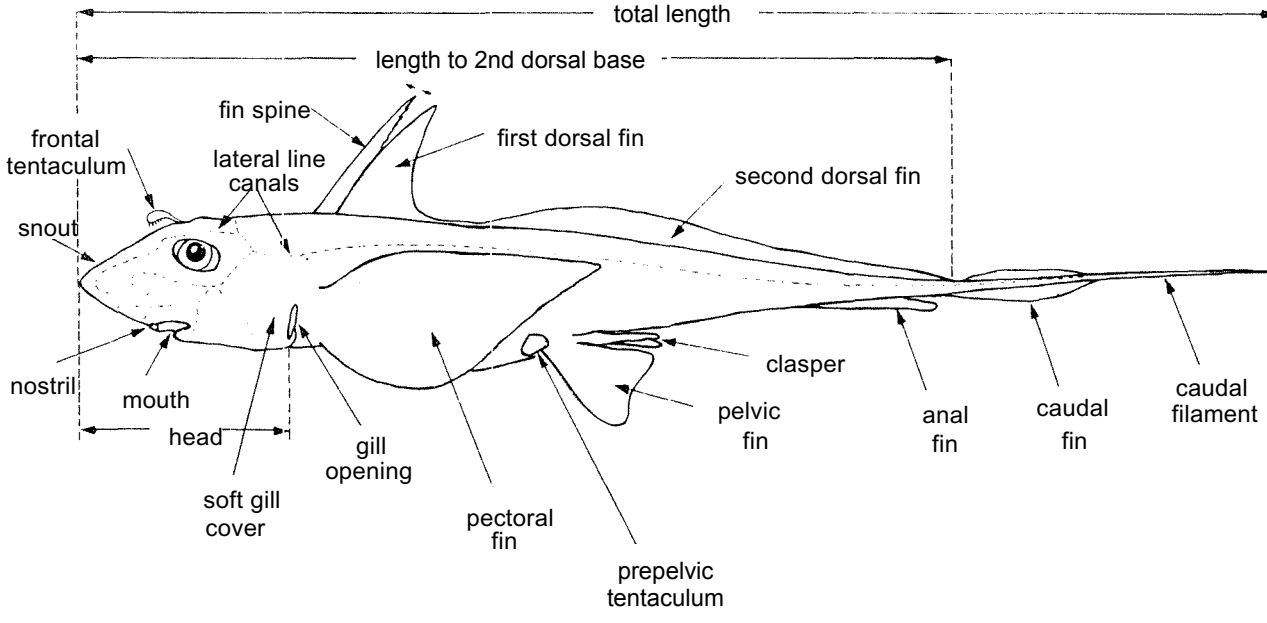


diagram of a male chimaera

(Chimaera)

Chimaeras are predators on small bottom invertebrates and small fishes. which are crushed or cut up by their tooth plates. These fishes are entirely marine and have their greatest diversity on the upper continental and insular slopes. down to at least 2 600 m. but some species are common on continental and insular shelves. from well offshore on the outer shelf to inside shallow bays and in the intertidal. Chimaeras are widely, although spottily distributed in all oceans, from arctic and subantarctic waters to the tropics. All occur on or usually near the bottom close to land; none are oceanic.

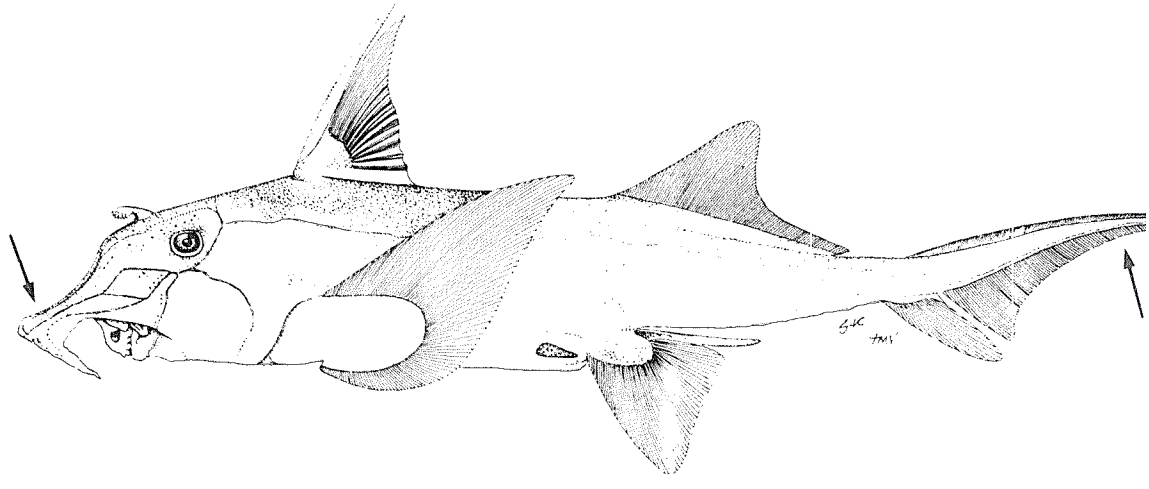
The Western Indian Ocean has a relatively undiverse chimaera fauna, with all 3 families but only 3 of the 6 genera and 3 of the approximately 29 to 34 species occurring ire the area. This is probably a result of poor sampling in the area, and it is likely that new discoveries of chimaeras will be made in Fishing Area 51 with further trawling on the continental slopes below 200 m depth. Basic knowledge of the biology of most chimaeras is extremely limited, arid can be added to by fisheries workers ire the area working abroad offshore trawlers.

In the Western Indian Ocean, chimaeras are apparently little utilized, although occasionally taken in trawls. They are suitable for human consumption, can be processed for oil and fishmeal, and yield a fine quality from their livers of use for lubricating machinery.

KEY TO FAMILIES, GENERA AND SPECIES REPORTED FROM THE AREA

1a. Snout with a hoe-shaped terminal lobe; caudal fin with axis bent upward (heterocercal) and with a strong ventral lobe (Fig.1) ..... Family Callorhinchidae (Callorhinchus) Callorhinchus capensis

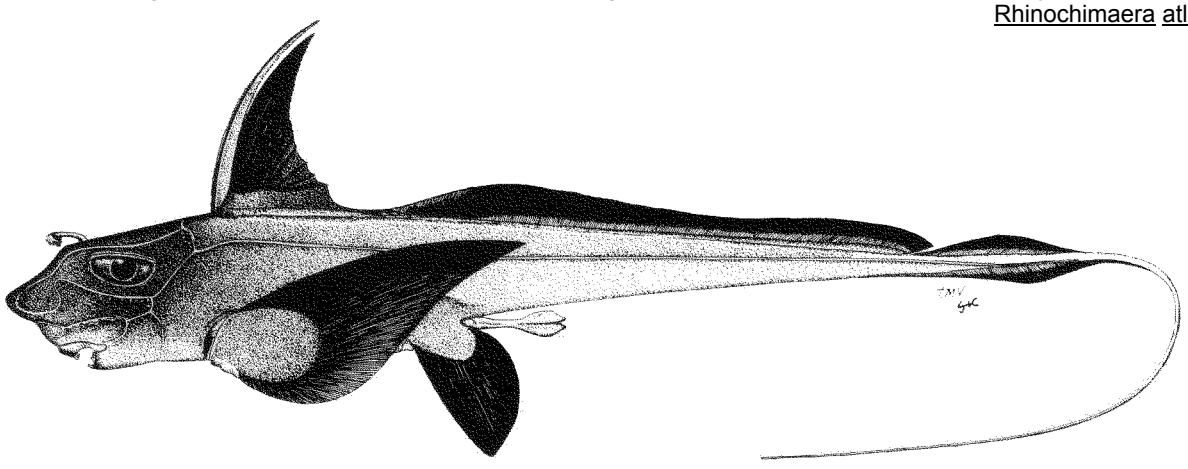
1b. Snout rounded, conical, flattened or pointed. not hoe-shaped; caudal fin with a horizontal axis (diphycercal) and no ventral lobe



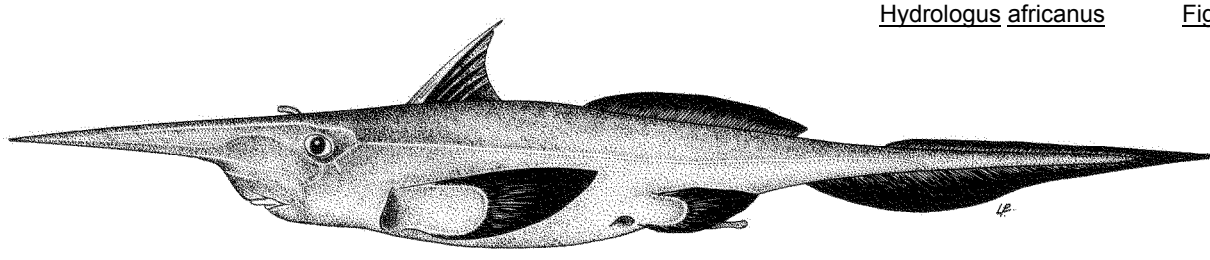
Callorhinchus capensis Fig.1

2a. Snout short. rounded or conical (Fig.2) ..... Family Chimaeridae
Hydrolagus africanus

2b. Snout elongate, pointed and more or less flattened (Fig.3) ..... Family Rhinochimaeridae
Rhinochimaera atlantica



Hydrologus africanus Fig.2



Rhinochimaera atlantica Fig.3

LIST OF FAMILIES AND SPECIES OF CHIMAERAS OCCURRING IN THE AREA

CALLORHINCHIDAE - Elephant fishes CALL

Callorhinchus capensis Dumeril, 1865

RHINUCHIMAERIDAE - Longriose chimaeras RHIN

Rhinochimaera atlantica Halt & Byrne, 1909

CHIMAERIDAE - Shortnose chimaeras CHIM

*Hydrolagus africanus (Gilchrist, 1922)

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* In addition, there are one or two additional representatives of Hydrolagus in the area, apparently representing new species

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