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MOLINA FROM THE CONTINENTAL SLOPE OFF
THE WEST COAST OF INDIA

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ON THE OCCURRENCE OF THE DEEP-WATER SQUALOID SHARK
SQUALUS FERNANDINUS MOLINA FROM THE CONTINENTAL SLOPE OFF
THE WEST COAST OF INDIA *

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ABSTRACT

During exploratory trawling from the upper continental slope in depths between 290 and 325 metres off the south-west coast of India, a specimen of the Squaloid shark *Squalus fernandinus* Molina was obtained. This species is a new distributional record for Indian Seas and it is described and illustrated.

ON 7-8-1969 the Indo-Norwegian Project Fishing Vessel M.V. *Velameen* while trawling on the upper continental slope off Quilon between 290 and 325 metres obtained one specimen of a species of squaloid shark which is identified here as *Squalus fernandinus* Molina. Up to now no representative of the genus *Squalus* Linnaeus popularly known as the 'Spiny dogfish' has been reported from the Indian Seas. In view of the fact that species of *Squalus* are of considerable economic importance in some areas constituting sizable fishery, the present record is of special interest. A description of this new record along with a taxonomic discussion is given below:

Squalus fernandinus Molina, 1782

(Fig. 1, a-k)

Material.—One male, 495 mm. in total length, weighing 480 gm., trawled between 290 and 325 metres off Quilon by M. V. *Velameen* on 7-8-1969.

Synonyms.—For a detailed list of synonyms reference is invited to Bigelow and Schroeder (1948, 1957).

Description.—Proportional dimensions in per cent of total length of the specimen is as follows:

Trunk at origin of pectoral: breadth 12.9, height 9.5; *Snout length in front of*: outer nostrils 4.0, mouth 9.1; *Inter-orbital distance*: 8.3; *Eye*: horizontal diameter 4.9; *Mouth*: breadth 7.9, height 1.2; *Nostrils*: distance between inner ends 4.6; *Labial furrow length from angle of mouth*: upper 2.8, lower 2.4; *Gill opening lengths*: 1st 2.8, 2nd 3.2, 3rd 3.4, 4th 3.4, 5th 3.2; *First dorsal fin*: vertical height 7.1, length of base 7.3; *Second dorsal*

fin: vertical height 3.8, length of base 5.5; *Caudal fin*: upper margin 21.8, lower anterior margin 11.7; *Pectoral fin*: outer margin 13.1, inner margin 7.1, distal margin 9.3; *Distance from snout to*: 1st dorsal 30.9, 2nd dorsal 64.6, upper caudal 80.2, pectoral 24.8, pelvics 49.1; *Interspace between*: 1st and 2nd dorsals 24.4, 2nd dorsal and caudal 10.1; *Distance from origin to origin of*: pectoral and pelvics 24.2, 1st dorsal and pelvics 18.8, pelvics and 2nd dorsal 16.0, pelvics and caudal 'pit' 31.3; *Dorsal fins from origin (ahead of spine) to posterior free tip*: 1st dorsal 13.3, 2nd dorsal 10.3; *Exposed length of dorsal spines*: spine of 1st dorsal 2.5, spine of 2nd dorsal 3.0; *Clasper*: from origin of pelvic to tip of clasper 12.7, anterior end of vent to tip of clasper 11.1, inner angle of pelvic to tip of clasper 5.9.

Trunk slender, its height at origin of pectoral about 1/7 its length to origin of caudal and 1/9 of total length; dorsal profile sloping gently to snout from base of dorsal; pre-vent distance almost equal to length of post-vent part of body including tail; caudal peduncle flattened below with a low longitudinal dermal ridge laterally below mid-level extending from behind base of second dorsal to behind crigin of caudal; upper precaudal pit not well developed; lower caudal pit absent.

Dermal denticles on sides of body (below 1st dorsal) lying in close contact, but not overlapping; each denticle expanded laterally and presenting a tridentate shape with a median ridge and median process more elongate (Fig. 1, h-k); head about 1/4 of total length and moderately flattened above with snout broadly ovate anteriorly; snout length in front of mouth much less than half length of head (about 36%); eye longer than high, its horizontal diameter equalling distance between nares and anterior margin of mouth; spiracle just

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behind eye being about 1/3 horizontal diameter of eye with its lower margin in level with middle of eye; gill openings almost evenly spaced, the first opening being slightly smaller; nostrils more or less horizontal, its inner end distinctly nearer tip of snout than to anterior margin of mouth; anterior margin of nostril bilobed, the inner secondary lobe being small (Fig. 1, c); disposition of larger mucous pores and sensory canals on head as shown in Fig. 1, b and c.

Teeth triserial in both jaws and are essentially similar in shape, though teeth on lower jaw are slightly larger; each tooth with a single sharp pointed cusp which is deflected laterally (Fig. 1, g). The number of teeth in each row (outermost row mentioned first) of upper and lower jaw is as follows:

fold is present a laterally directed almost straight strong spine which projects postero-laterally outside the clasper (Fig. 1, d-f).

Colour dark grey throughout with no indications of white spots; inner side of claspers and skin around vent pale white.

Remarks.—In their monumental work on the Fishes of the Western North Atlantic, Bigelow and Schroeder (1948) stressed the need for a revision of the sharks of the suborder Squaloidea, which they subsequently studied and reported (1957). The other comprehensive accounts dealing with squaloid sharks are by Regan (1908), Garman (1913), and Fowler (1941). Bigelow and Schroeder (1957) while clarifying the systematic position of the various nominal species of the genus *Squalus* Linnaeus recognised three species complexes or divisions

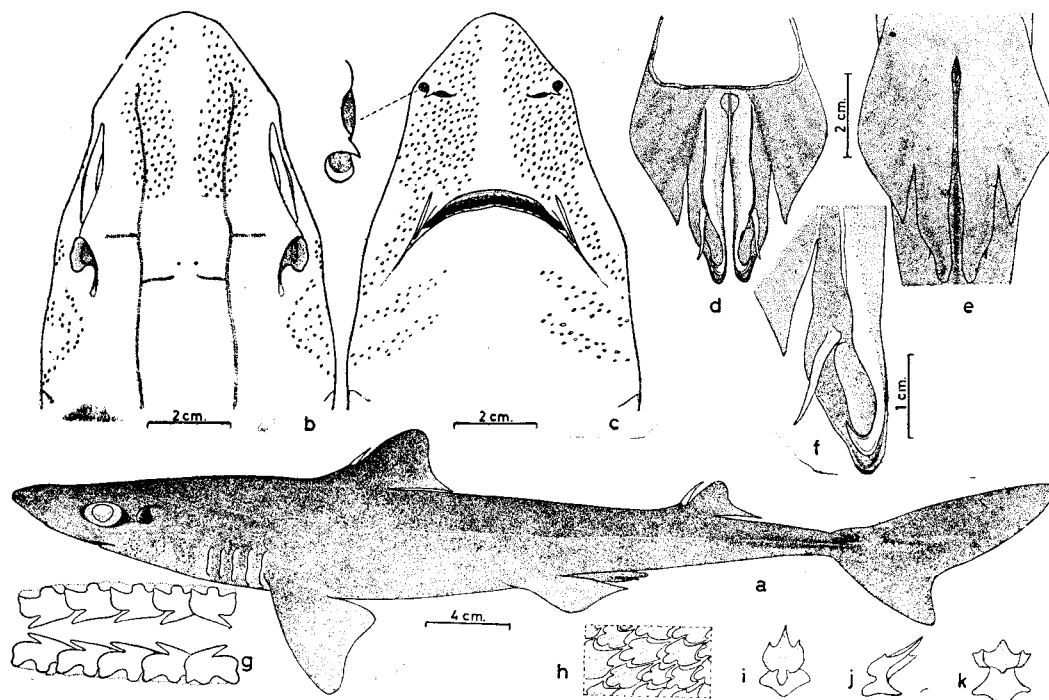


FIG. 1. *Squalus fernandinus* Molina. a, Lateral view of male 495 mm. in T.L.; b and c, Dorsal and ventral views of head of same; d, Dorsal view of clasper; e, Ventral view of clasper and pelvic fin; f, Dorsal view of clasper showing details; g, Teeth of upper and lower jaws; h to k, Dermal denticles.

Upper jaw: 8/8; 13/13; 13/13.

Lower jaw: 11/11; 12/12; 11/11.

Dorsal spines are strong, pointed, partly exposed and do not bear any lateral grooves but are flat along posterior side; Claspers well developed, each bearing along its inner posterior edge a sharp recurved hook inner to which is present a flap-like fold; anterior to this

of *Squalus* as *Acanthias* division, *Fernandinus* division, and *Megalops* division, on a combination of characters, namely, the position of the first dorsal in relation to the paired fins, the shape of the pectoral, the nature of the narial flap and the shape of the dermal denticles. In all these diagnostic characters our specimen agrees fully with the characteristics given for

the *Fernandinus* division, and particularly with the salient characters of *S. fernandinus*. At present *S. blainvilli* (Risso, 1826), *S. acutipinnis* Regan (1908), and *S. philippinus* Smith and Radcliffe (1912) (= *S. montalbani* Whitley, 1931) are considered synonyms of *S. fernandinus*. In the Indian Ocean this species has been reported by Regan (1908) from Mauritius (as *S. acutipinnis*) and from South African Waters as *S. blainvilli* (Bleeker, 1860; Günther, 1870); as *S. acutipinnis* (Regan, 1908 a; Barnard, 1925); and as *S. fernandinus* (Gilchrist, 1922; Smith, 1949). For records of *S. fernandinus* from the Pacific and Atlantic Oceans and the Mediterranean reference is invited to Bigelow and Schroeder (1948, 1957). According to these authors (1948), this species has a circumpolar distribution occurring in boreal and cool temperate latitudes of the southern hemisphere and is also "represented in the Philippines and Japan by forms so closely allied that it is a question whether they are separable from it". In this context also the present record of *S. fernandinus* from Indian Seas is of added interest.

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