3. CUTTLEFISHES (Order Sepioidea)

Cuttlefishes are characterized by the following features: shell calcarious (Sepia, Spirula) or chitinous (sepiolids); 10 circumoral appendages; tentacles retractile into pockets; suckers with chitinous rings; posterior fin lobes free, not connected at midline; eye covered with a transparent membrane, false eyelids present (except Spirula); 1 pair of gills, without branchial canal between afferent and efferent branchial blood vessels; liver divided or bilobed; each tooth of radula with a single projection; buccal membrane present; olfactory organ a ciliated pit.

This order comprises five families, two of which (the Idiosepiidae and Spirulidae) are considered inedible and hence are not included in this catalogue. Of the remaining three families,the Sepiidae are of significant commercial value to artisanal and industrial fisheries, and the Sepiolidae are exploited by many artisanal and subsistance fisheries; while the Sepiadariidae are not fished at present, one species might be of potential interest. The combined catch of cuttlefishes made up about 12 to 16% of total cephalopod catches in recent years, roughly fluctuating between 150 000 and 210 000 metric tons (FAO, 1983).

3.1 FAMILY SEPIIDAE Keferstein, 1866

SEP

Sepiidae Keferstein, 1866, Bronn's Klass.Ordn.Thierreichs, 1862-66:1441.

FAO Names : En - Cuttlefishes; Fr - Seiches; Sp - Sepias, Cloquitos

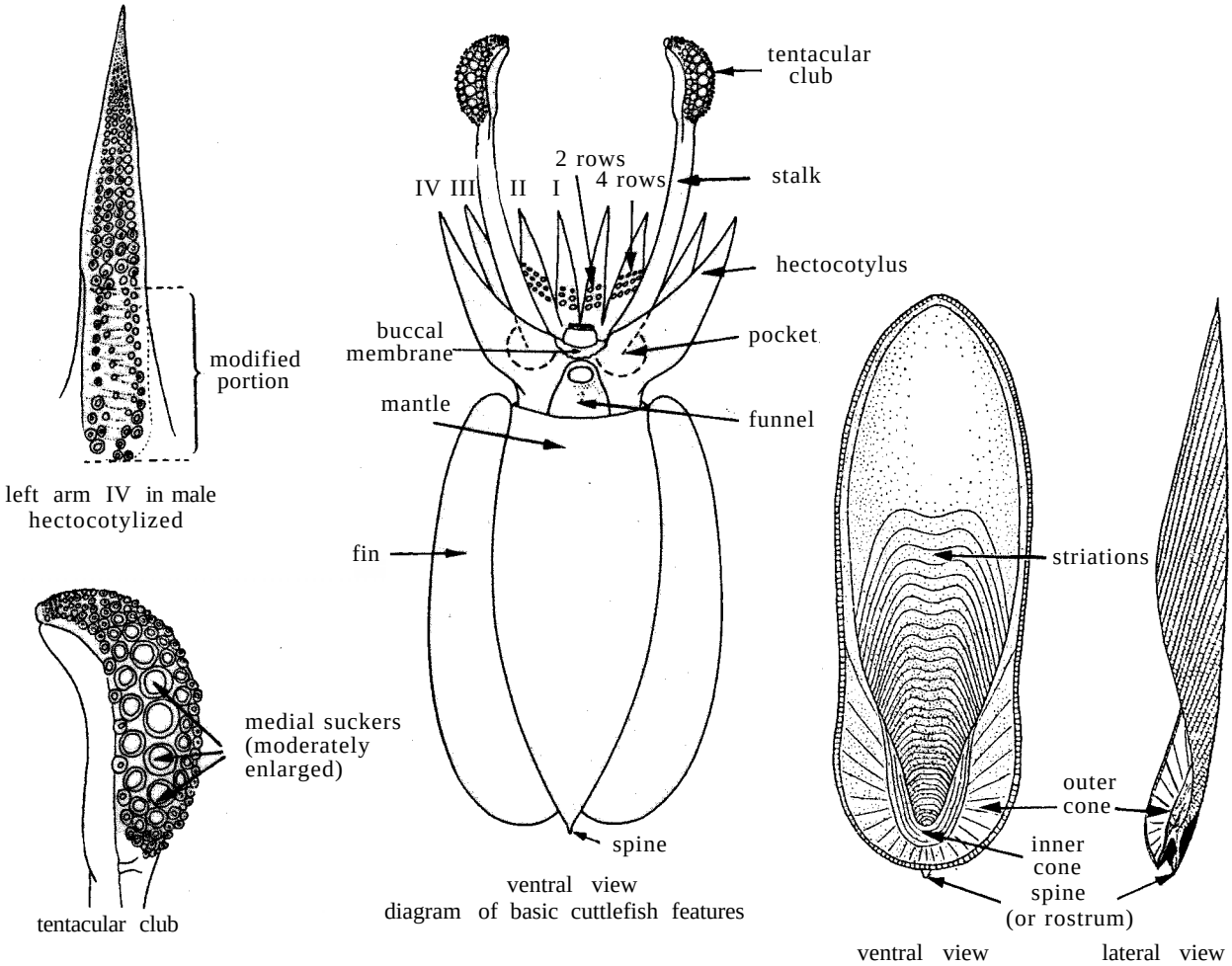


diagram of basic cuttlefish features

Diagnostic Features : Cuttlebone (shell or sepion) internal chalky (calcareous), porous, finely laminate. Mantle broad, robust, sac-like, slightly flattened dorsoventrally; fins narrow, long (more or less equal to mantle length; posterior fin lobes free, not connected at midline; 10 circumoral appendages; arms with 2 to 4, and tentacles with 4 to 8 or more longitudinal rows of suckers; tentacles retractile into pockets on ventrolateral sides of head. Eyes covered with a corneal membrane. Colour: variable due to the great complex of chromatophores (pigment cells); browns, blacks, yellows, and reds are the dominating colours.

Geographical Distribution : Restricted to the Old World (i.e., absent from the Americas).

Habitat and Biology : Cuttlefishes are primarily demersal inhabitants of nearshore and continental shelf zones in warm and temperate waters. Although excellent swimmers,they generally are bottom dwellers. Habitats range from rocky, sandy and muddy bottoms to grassflats, seaweed beds, coral reefs, etc. Many (but not all) species are known to migrate seasonally in response to temperate changes. Spawning usually takes place with an increase in water temperature, sometimes twice a year in areas where the hydrographical regime is strongly seasonal. During mating, males use their modified arm(s) (hectocotylus) to transfer spermatophores to the females. Cuttlefishes spawn relatively few and large eggs which the female attaches in grape like clusters to plants, debris, gravel and other substrates. Sexual maturity often is attained as early as a few months after hatching and it is not uncommon to find juveniles from the spring brood participating in autumn spawning. Post-spawning mortality is usually high, particularly in females.Longevity ranges between 1 and 3 years.

Cuttlefishes prey on crabs, shrimps and small fishes. Cannibalism seems to be rather common and has been interpreted as an efficient "strategy" to overcome temporary shortage of suitable sized food items (Caddy, 1979). They are opportunistic, subdominant predators thriving upon the depletion of their major finfish predators. This has been shown, for example in the West African demersal trawl fishery where a shift from sparids to cuttlefishes and octopuses was noticed in coincidence with heavy fishing pressure on the sparid stocks.

Interest to Fisheries : Together with the two minor families, Sepiadariidae and Sepiolidae, the Sepiidae accounted for 178 000 metric tons or 13.6% of the cephalopod world catch in 1981, the most important genus being Sepia.

Cuttlefish - catches by major fishing areas and countries

(Source: FAO, 1983)

Fishing Area	Country or region	% of catch in Fishing Area in 1981	catches ('000 metric tons) 1980	1981
E. Central Atlantic (34)			30 700	29 100
	Spain	54.6	18 700	15 900
	Morocco	27.5	4 200	8 000
Mediterranean (37)			18 400	17 500
	Italy	70.9	13 600	12 400
Western Indian Ocean (51)			15 800	11 700
	Yemen, DPR	82.1	9 600	9 600
	Japan	8.5	3 700	1 000
Northwestern Pacific (61)			70 100	65 700
	Korea, Rep.	58.0	38 900	38 100
	Taiwan Island	28.8	19 000	18 900
	Japan	10.8	10 400	7 100
Western Central Pacific (71)			45 500	44 600
	Thailand	48.4	23 500	21 300
	Viet Nam	28.9	12 900	12 900
	Malaysia	10.3	3 700	4 600

The above table summarizes the catch data available for the most important world fishing areas and identifies the major cuttlefish exploiting countries, which also are the prime consumers.These are mainly the southeast Asian countries and nations bordering the Mediterranean Sea. Many of the above figures should be considered as highly conservative because of the general tendency to underestimate the artisanal component of landings, which usually are not properly recorded in national statistics. In this connection, the General Fisheries Council for the Mediterranean (GFCM) suggests, for example, that the Yugoslavian artisanal demersal catch in the early seventies was at the same order of magnitude as the bottom trawl landings.

In the industrial-type fisheries,cuttlefishes usually are taken only as bycatch to other target species in bottom trawls, even in cases where they make up a sizeable portion of the catch.They are, on the other hand, actively sought by the artisanal fisheries which utilize highly selective gear and fishing techniques based on knowledge of the biology and behaviour of the species. Such techniques include the use of aggregation devices (light, substrates for egg deposition), live or artificial lures (for example, live females are used to attract males), and a variety of fishing gear, such as harpoons,spears, trammel nets, pound nets, hoop nets, lines, jigs, baited pots, etc.

The flesh of most cuttiefishes is rather tender and excellent for human consumption. It is marketed fresh, frozen, canned and dried ("surume").

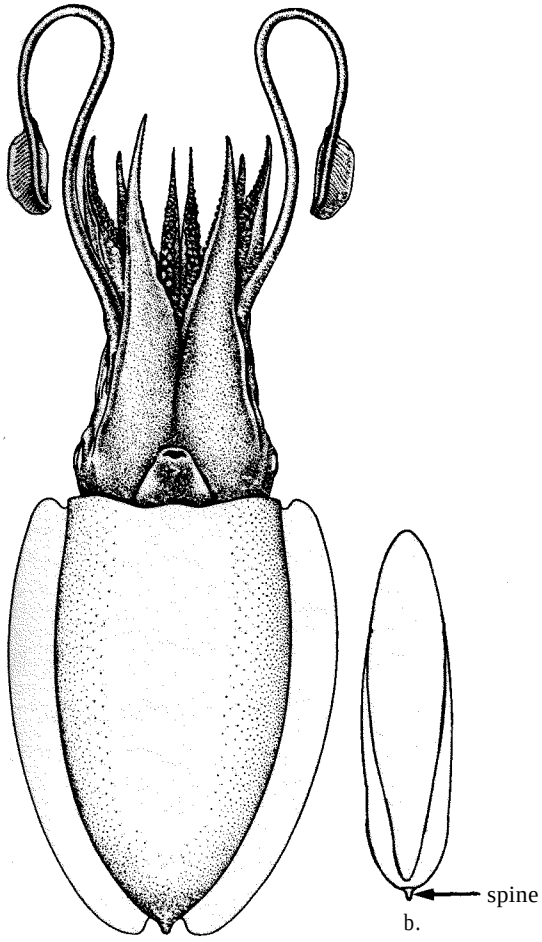
Key to Genera of Sepiidae :

1a. Cuttlebone calcified only in posterior half, anterior half chitinous. . . . . **Hemisepius**

1b. Cuttlebone entirely calcified

2a. Cuttlebone with spine (rostrum) present on posterior end (Fig.1b) (occasionally damaged or absent); no glandular pore on ventral surface at posterior end of mantle (Fig. 1a) . . . . . **Sepia**

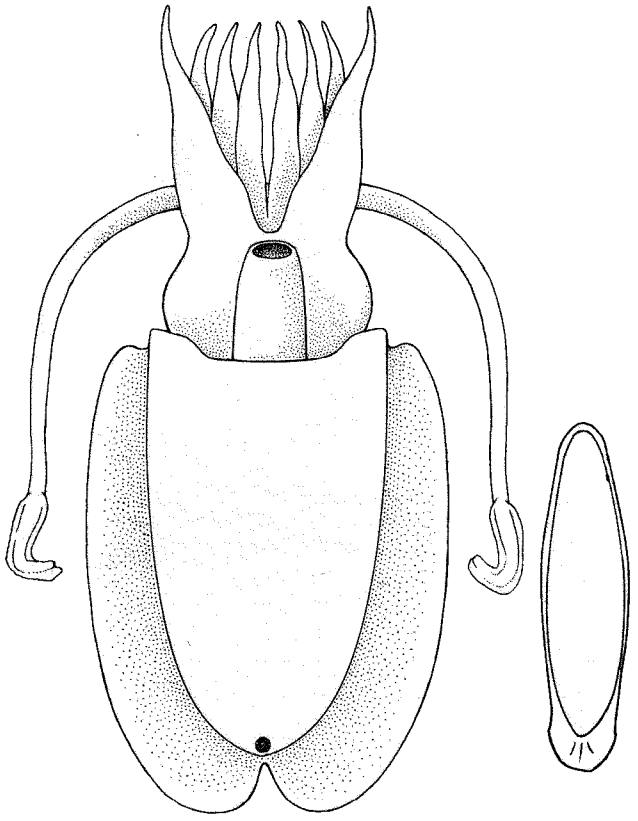
2b. Cuttlebone without spine at posterior end (Fig. 2b); glandular pore present on ventral surface of posterior end of mantle between ends of fins (Fig.2b) . . . . . **Sepiella**



a. ventral view

cuttlebone

Sepia



a. ventral view

cuttlebone

Sepiella

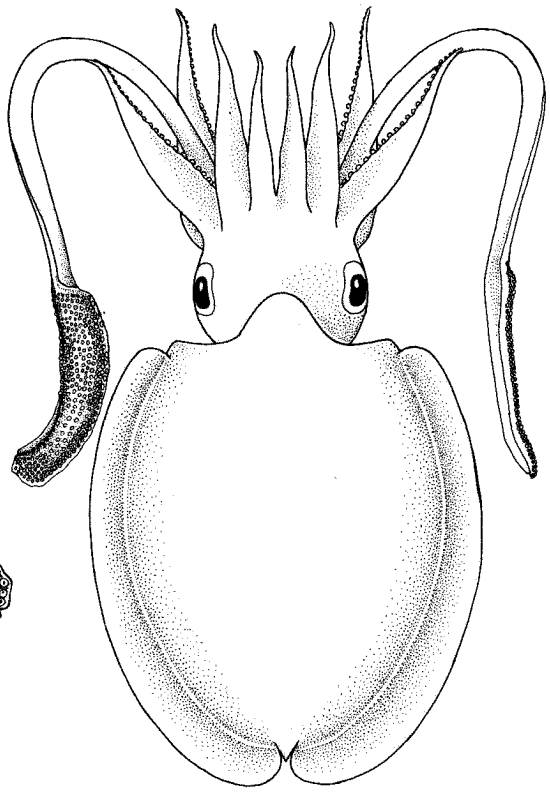
Sepia aculeata Orbigny, 1848

SEP Sep 5

Sepia aculeata Orbigny, 1848 (in 1834-1848), Hist.nat.Ceph.acetab., 287.

Synonymy : Sepia indica Orbigny, 1848 (in 1834-1848).

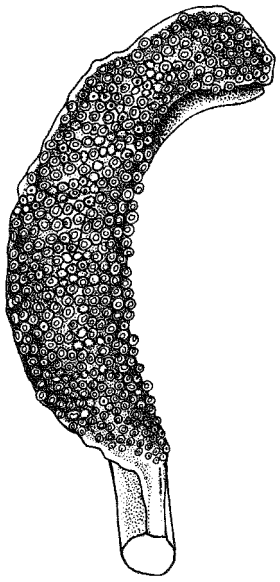
FAO Names : En - Needle cuttlefish
Fr - Seiche aiguille
SP - Sepia con punta



dorsal view

Diagnostic Features : Mantle about half as broad as long. Tentacular club long, slender with 10 to 12 minute, subequal suckers in each row across the club in males, 13 or 14 suckers across in females; club protective membranes not united, extending proximally along oral face of stalk as low ridges. Left arm IV hectocotylized: about 12 normal suckers (3 series) proximally, followed by about 5 or 6 series of very small suckers in ventral longitudinal rows; corresponding suckers of dorsal longitudinal rows extremely minute (or absent) in a deep, smooth groove; suckers normal distally. Colour: dorsal mantle with a fine, dark-pigmented, transverse, reticulate colour pattern; a pale, reflective line along bases of fins.

Geographical Distribution : Indo-Pacific: southern India to South China Sea, East China Sea north to central Japan.

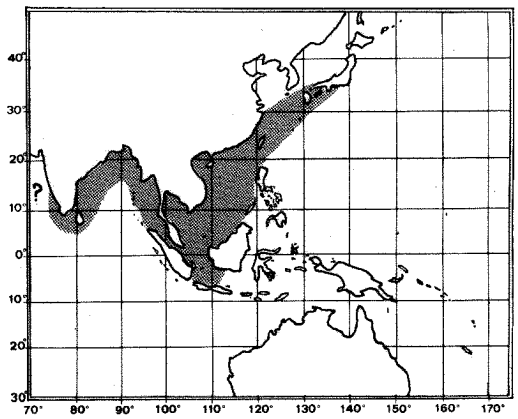


tentacular club

Habitat and Biology : Sepia aculeata is a demersal, neritic species ranging in depth from the shore down to about 60 m. In the Hong Kong area an inshore spawning migration occurs from March to May with concentrations at 5 and 20 m depth.

Size : Maximum mantle length 23 cm and weight 1.3 kg.

Interest to Fisheries : The third most important commercial cuttlefish in Hong Kong, caught with setnets and seines during the spawning season. The most important commercial cuttlefish in south-west India, caught by trawl with peak landings in October and November.



Local Names : CHINA: Jam mak yue; JAPAN: Ami-monkouika.

Literature : Voss & Williamson (1971, Hong Kong); Tomiyama & Hibiya (1978); Okutani (1980).

Sepia andreana Steenstrup, 1875

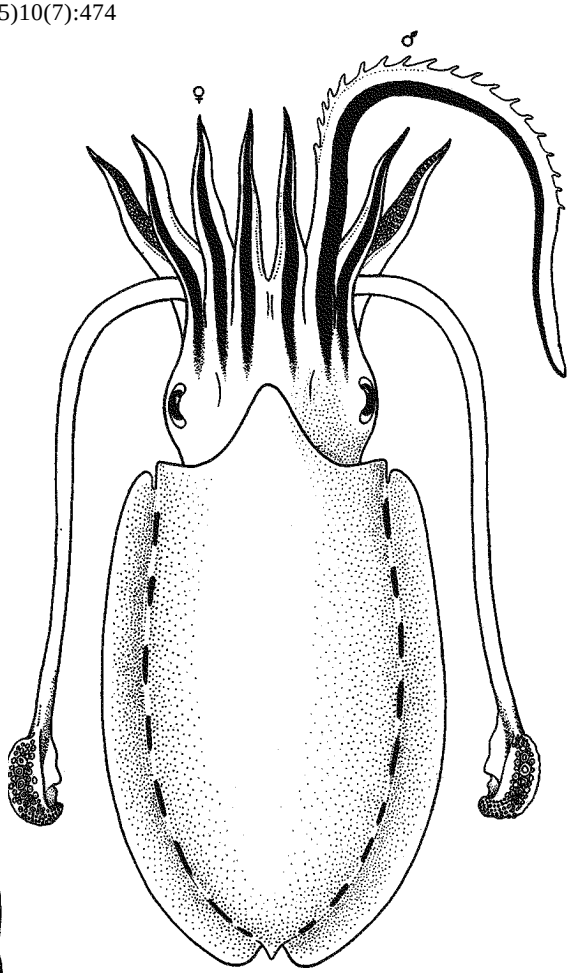
SEP Sep 7

Sepia andreana Steenstrup, 1875, K.danske Vidensk Nat., (5)10(7):474

Synonymy : None

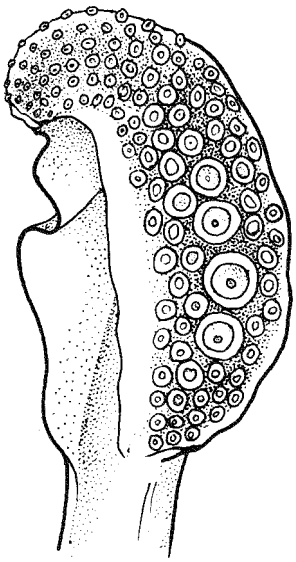
FAO Names : En - Andrea cuttlefish
Fr - Seiche andreana
Sp - Sepia andreana

Diagnostic Features : Mantle length 2½ times width; fins arising posterior to mantle margin. Tentacular club with 8 suckers in transverse rows, the median 4 about 3 times the diameter of suckers on the marginal rows. Arms II in males greatly elongated, 3 times longer than the others, bluntly rounded distally, not tapered, cylindrical in cross-section; left arm IV hectocotylized, with the proximal 10 quadriserial rows of suckers normal, while the dista1 half bears only rudimentary suckers on swollen peduncular bases; arms II of males with quadriserial suckers in proximal third, then biserial, becoming rudimentary and sparse distally; arms I of both sexes and arms III of males with quadriserial suckers proximally, biserial distally. Shell 6 times longer than wide. Colour: the 3 dorsal pairs of arms with an orange-pigmented reflective stripe along aboral surface.



dorsal view

Geographical Distribution : Western Pacific: from northern Philippines, along the South China coast to central Japan; S. andreana is the northernmost species of cuttlefish in the northwestern Pacific.


tentacular club

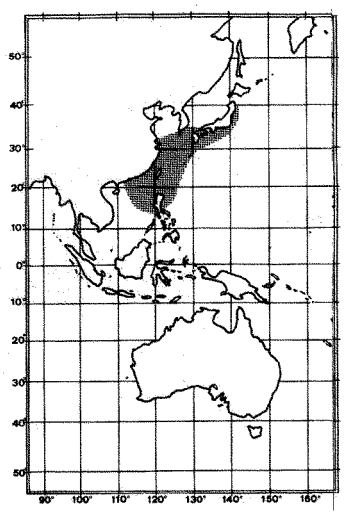
Habitat and Biology : A demersal species occurring in coastal waters to 50 m depth.

Size : Maximum mantle length 12 cm.

Interest to Fisheries : Separate statistics are not reported for this species which is taken as by-catch in trawl and set net fisheries in northern China.

Local Names :

Literature : Okutani (1980).



Sepia apama Gray, 1849

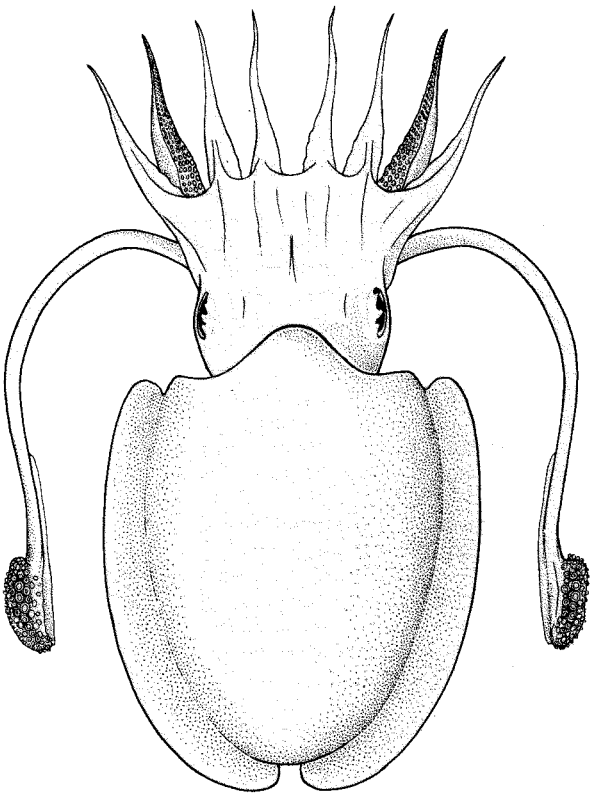
SEP Sep 8

Sepia apama Gray, 1849, Cat.Moll.Brit.Mus., 103.

Synonymy : ? Sepia palmata Owen, 1881; ? Amplisepia verreauni Iredale, 1926; ? Amplisepia parysatis Iredale, 1954.

FAO Names : En - Australian giant cuttlefish
Fr - Seiche géante
SP - Sepia gigante

Díagnostic Features : Adults very large. Sucker-bearing surface of tentacular club raised off the stalk, attached only by a thin membrane; 5 suckers in rows across the manus, median suckers enlarged; swimming keel of club extending along stalk a distance equal to the club length. Web between arms deep: equal to half of arm length between dorsal arms, two thirds of arm length between lateral arms, absent between ventral arms. Three flat, semicircular, flap-like papillae posterior to each eye. Fins broad. Colour: deep maroon.



dorsal view

Geographical Distribution : So far only known from Australia (except the far north) and Tasmania.

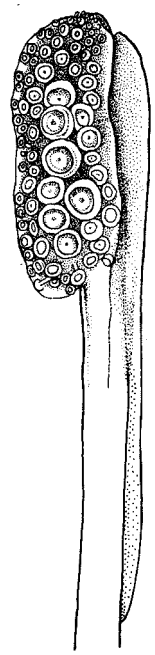
Habitat and Biology : A neritic demersal species with cryptic habits occurring in coral areas, seagrass beds and on open trawl grounds down to at least 35 m depth. Spawning extends from October to December.

Size : Maximum size up to 50 cm mantle length, and weight in excess to 5 kg; one of the largest cuttlefishes.

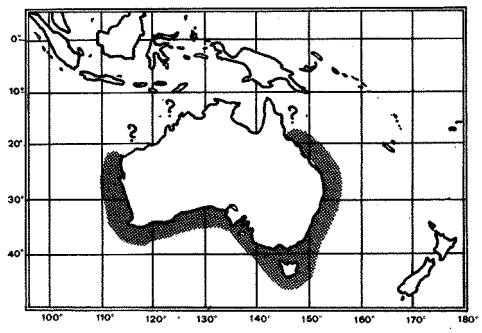
Interest to Fisheries : Presently no large-scale commercial fisheries exist for the species, but it is commonly seen in fish markets along the southern coast of Australia, where it is caught by hook and line or speared by divers. It is sold for human consumption and also used as bait.

Local Names :

Literature : Okutani (1980).



distal part of tentacle



Sepia arabica Massy, 1916

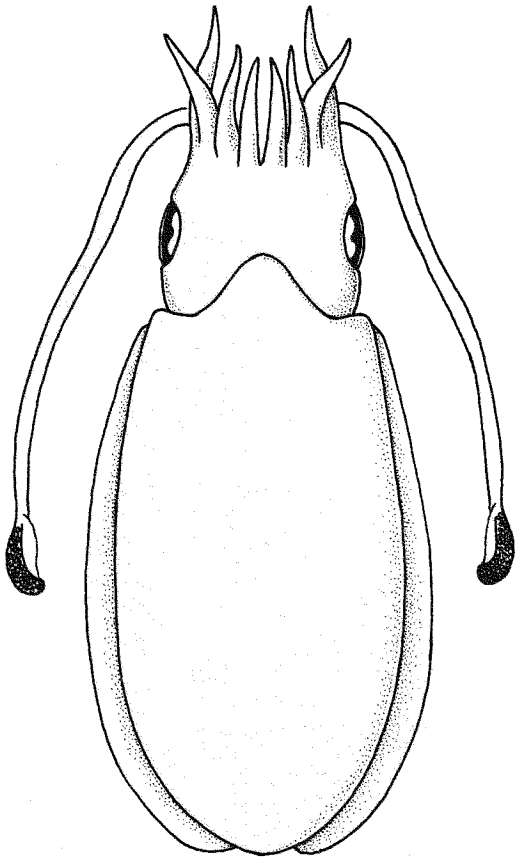
SEP Sep 9

Sepia arabica Massy, 1916, Rec.Indian Mus, 12(5):228.

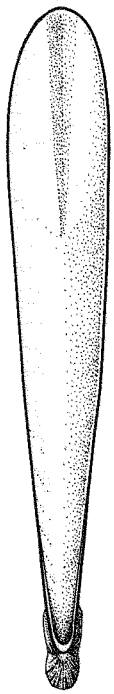
Synonymy : None.

FAO Names : En - Arabian cuttlefish
Fr - Seiche d'Arabie
SP - Sepia arábiga

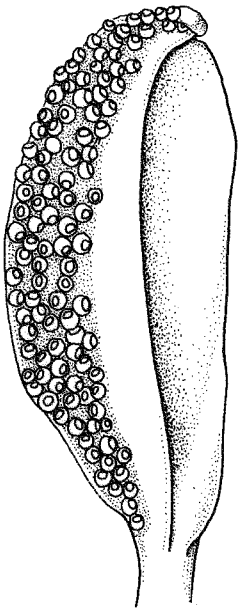
Diagnostic Features : Body elongate, narrow, bluntly pointed posteriorly, the mantle extending dorsally to level with the eyes. Tentacles very slender; clubs crescent-shaped with 5 or 6 suckers in transverse rows across the club, subequal in size; their dorsal protective membrane as broad as sucker-bearing surface, their swimming keel well developed, slightly longer than club. Cuttlebone long, narrow; tapered, very narrow posteriorly; spine lacking.



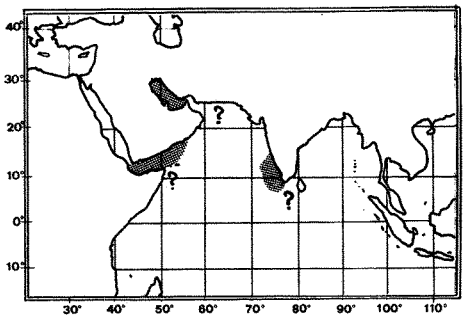
dorsal view



cuttlebone



tentacular club



Geographical Distribution : Northwestern Indian Ocean and southwest India.

Habitat and Biology : Unknown.

Size : Maximum mantle length 7 cm.

Interest to Fisheries : Presently undetermined. The species has been reported from a bottom trawl resource survey in the Gulf of Aden.

Local Names:

Sepia australis Quoy & Gaimard, 1832

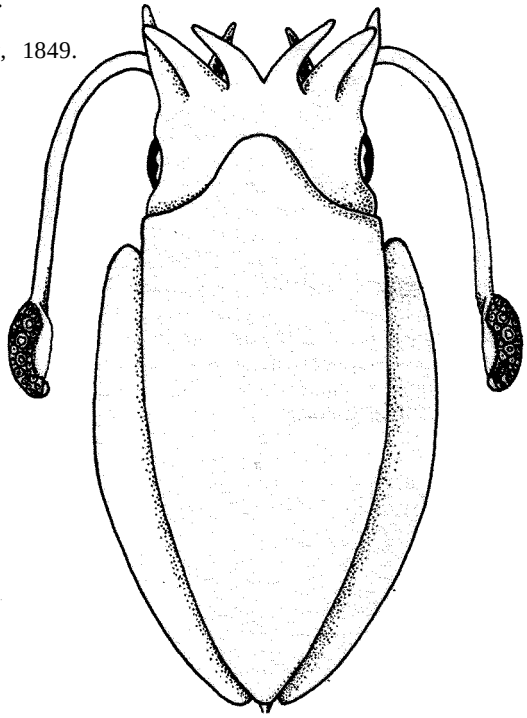
SEP Sep 10

Sepia australis Quoy & Gaimard, 1832, Zool.Astrolabe, 2(1):70.

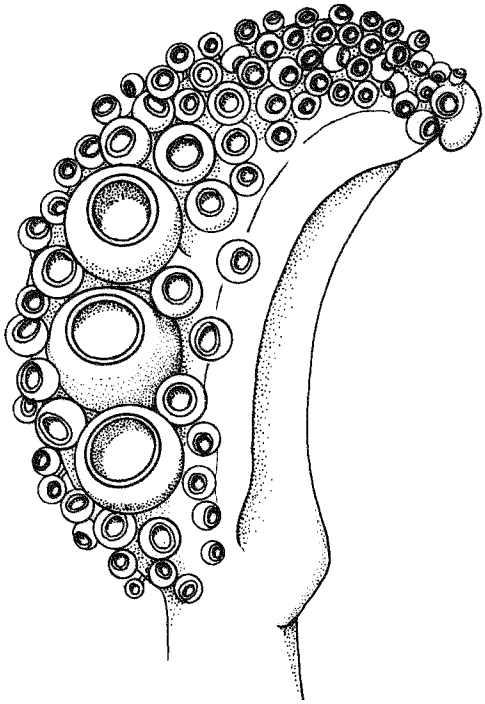
Synonymy : Sepia capensis Orbigny, 1845; Sepia sinope Gray, 1849.

FAO Names : En - Southern cuttlefish
Fr - Seiche australe
Sp - Sepia austral

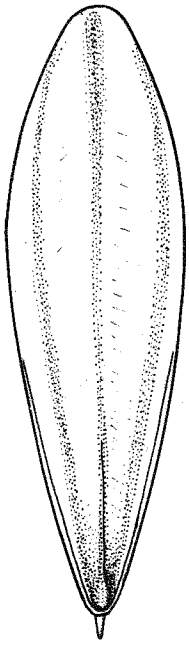
Diagnostic Features : Body elongate, oval, narrow and tapering anteriorly and posteriorly. Fins arising several mm posterior to anterior mantle margin. Tentacular club short, slightly recurved, with 5 suckers in transverse rows, 4 proximally; median 3 suckers greatly enlarged, 1 or 2 others less so. Colour: a narrow reddish-brown to orange band along bases of fins; body ventrally as heavily pigmented as dorsally (purple).



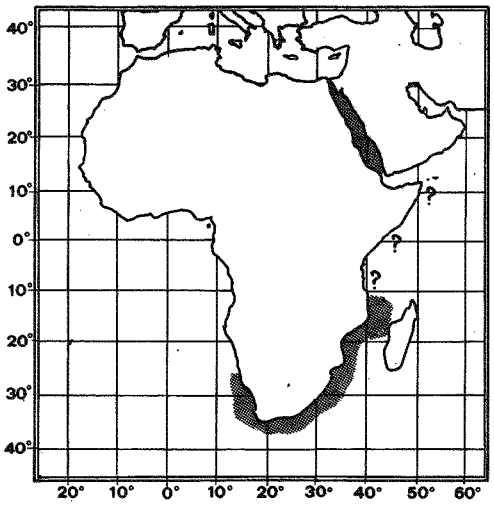
dorsal view



tentacular club



cuttlebone



Geographical Distribution : Southeastern Atlantic (Namibia, South Africa) and western Indian Ocean (South Africa to northern Mozambique); Red Sea.

Habitat and Biology : A demersal species, abundant on the upper shelf from 50 to 100 m depth. 1ts biology is unknown.

Size : Maximum mantle length 5.5 cm.

Interest to Fisheries : At present undetermined.

Local Names :

Literature : Okutani (1980).

Sepia bertheloti Orbigny, 1839

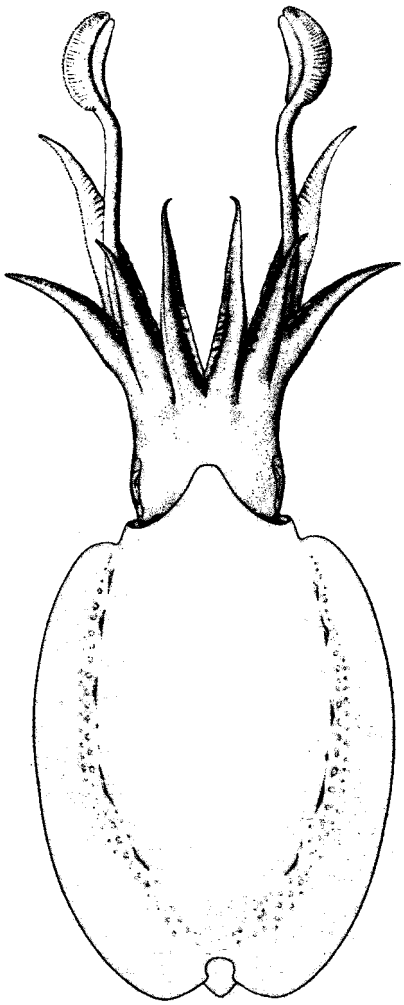
SEP Sep 2

Sepia bertheloti Orbigny, 1839, Hist.Nat.Iles Canar., 2(2):21.

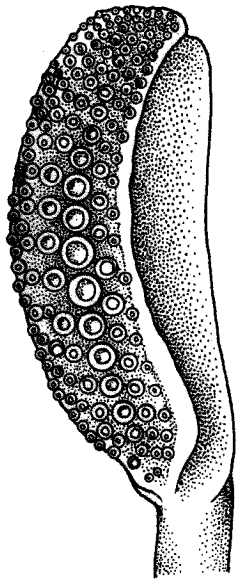
Synonymy : Sepia mercatoris Adam, 1937.

FAO Names : En - African cuttlefish
Fr - Seiche africaine
Sp - Jibia africana

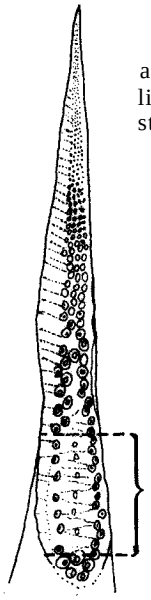
Diagnostic Features : Mantle more than 2 times longer than wide, its dorsal margin projecting strongly as a long, sharp angle. Tentacular club slender, the swimming keel not extending beyond base; protective membranes not united proximally and not extending proximally onto stalk; suckers small, not much larger than arm suckers, 8 suckers arranged in oblique, transverse rows, 3rd in series slightly enlarged. Left ventral arm (IV) (hectocotylus) with 2 to 5 normal suckers at its base and 9 to 13 rows of minute spaced suckers on its proximal third; dorsal protective membrane very broad, almost completely covering suckers. Colour: elongate tubercles along bases of fins with small, light-coloured patches laterally, males with a reddish stripe near lateral border of fins.



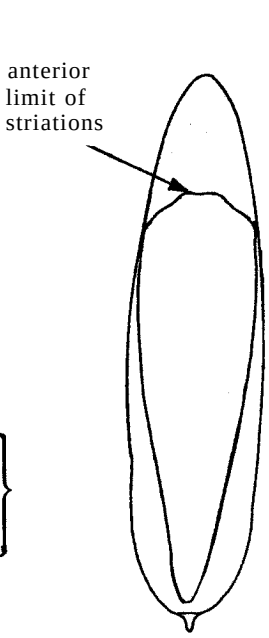
dorsal view



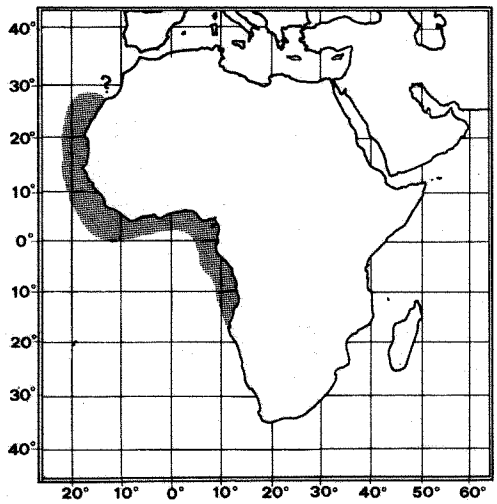
tentacular club



left arm IV of male hectocotylized



cuttlebone



Geographical Distribution : Eastern Atlantic: from 14° S to the Canary Islands.

Habitat and Biology : A neritic, demersal species occurring in open bottom habitats down to 160 m depth, but most abundant between 70 and 140 m. The spawning season extends through summer and autumn; females deposit about 50 to 100 eggs. This species preys on molluscs (including other cephalopods), crustaceans and small fishes. Its lifespan is 1 to 2 years.

Size : Maximum mantle length 17.5 cm in males and 13 cm in females.

Interest to Fisheries : Taken by otter trawls in the cuttlefish fishery off the Canary Islands where greatest concentrations are encountered between 70 and 140 m depth; females predominate in the catches. Off Senegal, it is reported to represent only a minor portion (about 1%) of the total cuttlefish catch taken by trawls and from pirogues (Bakhaukho & Drammeh,1982). Marketed fresh or deep-frozen for export. Separated statistics are not reported for this species.

Local Names :

Literature : Okutani (1980); Bakhaukho & Drammeh (1982, catches, Senegal).

Sepia braggi Verco, 1907

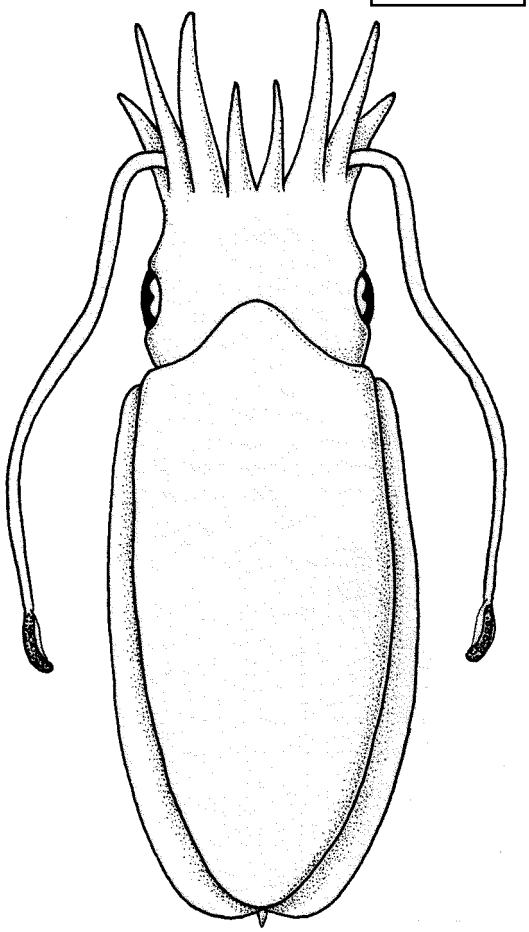
SEP Sep 11

Sepia braggi Verco, 1907, Trans.Roy.Soc.S.Austr., 31:213.

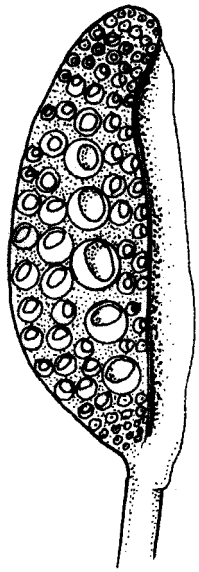
Synonymy : Arctosepia braggi is invalid generic name.

FAO Names : En - Slender cuttlefish
Fr - Seiche gracile
Sp - Sepia grácil

Diagnostic Features : Mantle elongate, 2½ to 3 times longer than wide, its dorsal margin broadly acuminate and projecting anteriorly. Fins relatively broad, united posteriorly, arising posterior to mantle magin. Tentacular club short, swimming keel well developed, extending proximally beyond base; dorsal protective membrane broad, devoid of suckers, widely separated from ventral protective membrane proximally; 5 suckers in transverse rows, finely dentate, 5 or 6 median suckers 2 times the diameter of others.

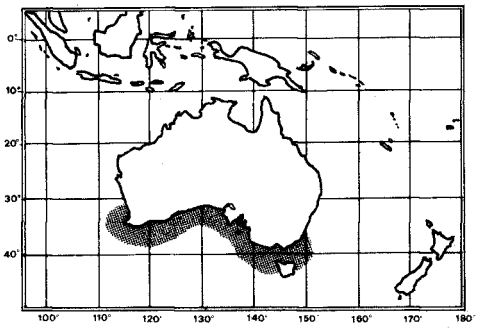


dorsal view



tentacular club

cuttlebone



Geographical Distribution : Southern Australia and Tasmania, western Australia to Cockburn Sound, 32°S.

Habitat and Biology : A demersal species, depth range unknown; so far recorded from 34 to 38 m.

Size : Maximum mantle length 6.5 cm.

Interest to Fisheries : Possibly taken with other cuttlefish in artisanal fisheries along southern Australia.

Local Names :

Remarks : Reported from a bottom-trawl resource survey in the Gulf of Aden but the species identification is doubtful because the distribution as currently understood is limited to southern Australian waters.