

***Sepia bandensis* Adam, 1939**

Fig. 122; Plate IV, 21–22

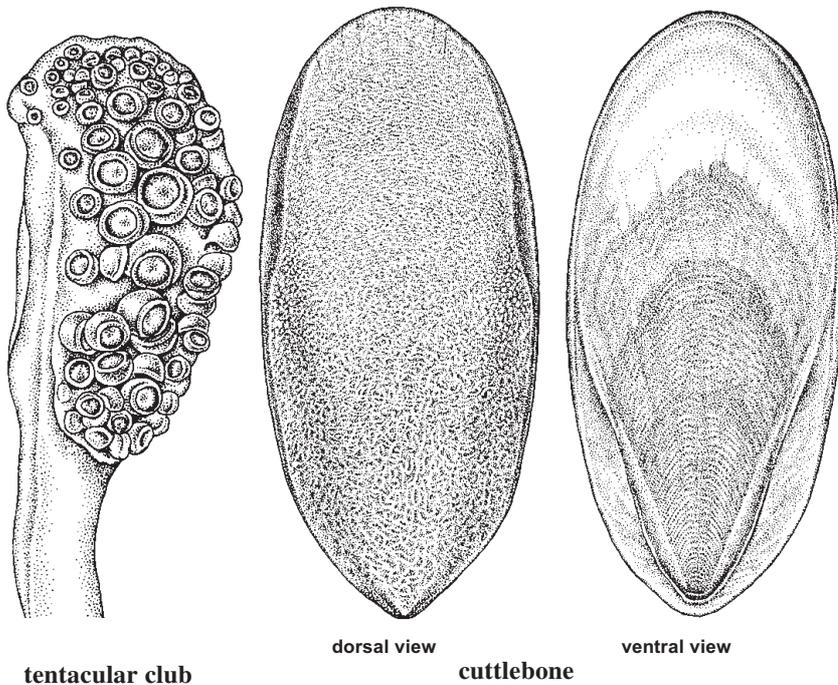
Sepia bandensis Adam, 1939b. *Bulletin du Musée royal d'Histoire naturelle de Belgique*, 15(18): 1 [type locality: Indonesia: Banda Sea, Banda Neira].

Frequent Synonyms: *Sepia baxteri* (Iredale, 1940) and *Sepia bartletti* (Iredale, 1954) are possible synonyms.

Misidentifications: None.

FAO Names: **En** – Stumpy cuttlefish; **Fr** – Seiche trapue; **Sp** – *Sepia achaparrada*.

Diagnostic Features: Club with **5 suckers in transverse rows**, central 3 suckers enlarged. Swimming keel extends beyond base of club. Dorsal and ventral protective membranes **joined at base of club**, separated from stalk by a membrane. Cuttlebone outline broad, oval; bone bluntly rounded anteriorly and posteriorly; dorsal surface evenly convex; calcified with reticulate sculpture; dorsal median and lateral ribs absent. Spine **reduced to tiny, blunt tubercle**. Sulcus shallow, narrow, extends along striated zone only. Anterior striae are **inverted U-shape**. Inner cone limbs are narrow anteriorly, broaden posteriorly, slightly convex; outer cone narrow anteriorly, broadens posteriorly. Dorsal mantle has longitudinal row of ridge-like papillae along each side, adjacent to base of each fin and scattered short ridges dorsal to cuttlebone (corresponding to whitish bars). Head and arms with short, scattered, bar-like papillae positioned dorsally and laterally. **Colour:** Light brown, or greenish yellow-brown when fresh, and with whitish mottle. Head with scattered white spots. Dorsal mantle has white blotches concentrated into short, longitudinal bars. It often shows a pair of brown patches on the posterior end of the mantle, often accompanied by white patches over the eye orbits. Fins pale with **row of small luminescent blue spots** at base.



(illustrations: K. Hollis)

Fig. 122 *Sepia bandensis*

Size: Up to 70 mm mantle length. Animals from the Alas Strait, Indonesia reported at about 40 g (males) and 45 g (females).

Geographical Distribution: Tropical Indo-Pacific: Philippines, Malaysian Borneo, Java, Sulawesi, Alas Strait, eastern Indonesia, New Guinea. Possibly northern Australia and Marshall Islands (Fig. 123).

Habitat and Biology: Coastal shallow waters. Found over coral reefs and sand. Night active. This species has been observed 'walking', rather than swimming, using arms III [or IV] and a pair of raised flaps on the ventral mantle. It is often found in association with sea cucumbers and sea stars.

Literature: Adam and Rees (1966), Gofnar (1989).

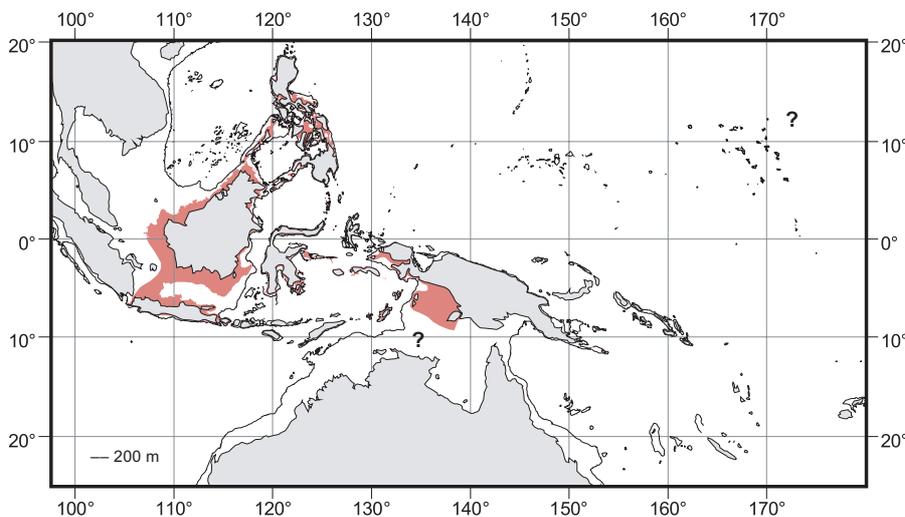


Fig. 123 *Sepia bandensis*
■ Known distribution

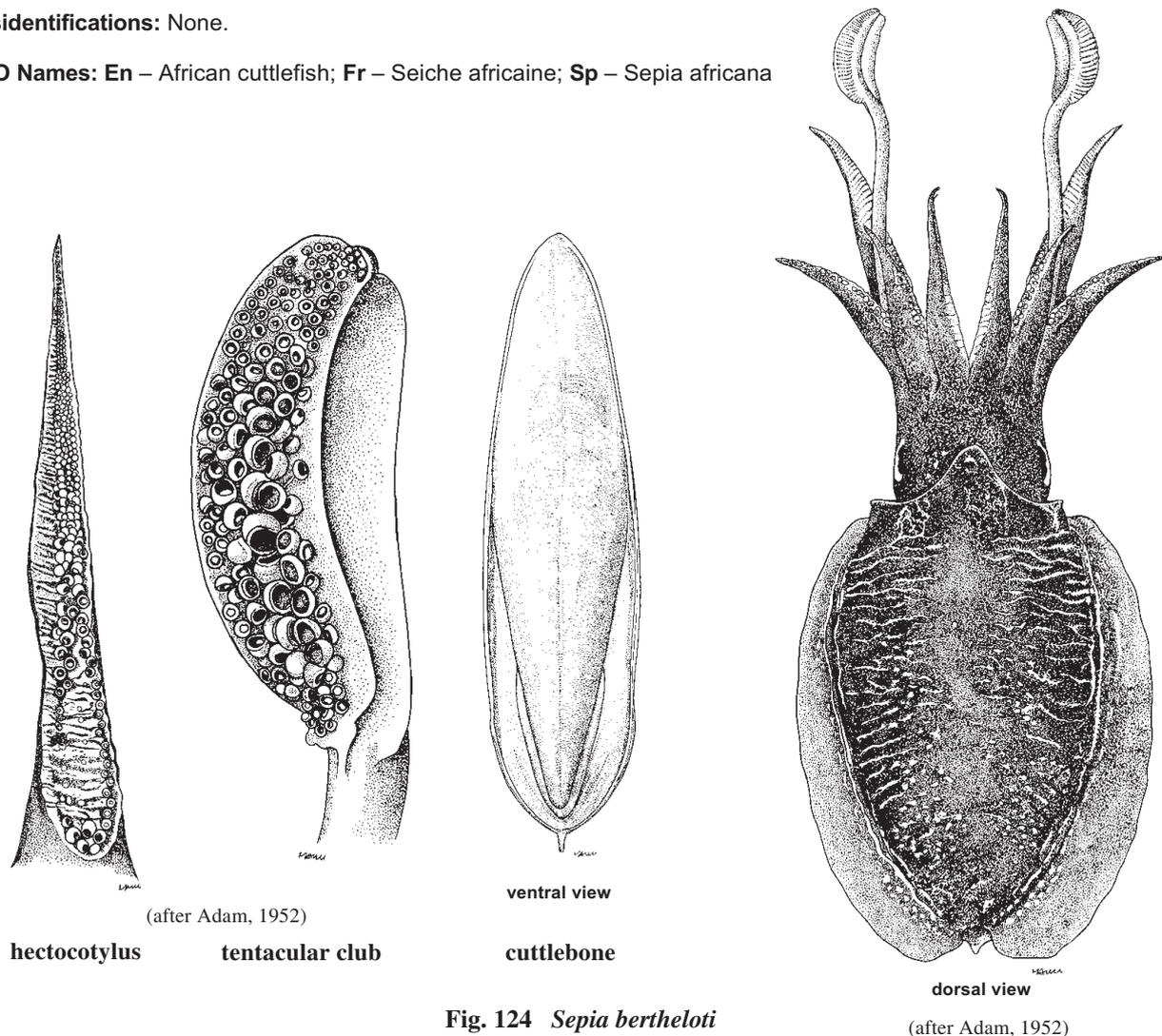
Sepia bertheloti* d'Orbigny, 1835 (in Férussac and d'Orbigny 1834–1848)*Fig. 124**

Sepia bertheloti d'Orbigny, 1835. *Histoire naturelle générale et particulière des Céphalopodes Acétabulifères vivants et fossiles*, pl. 11 [type locality: Canary Islands: Tenerife].

Frequent Synonyms: *Sepia verrucosa* Lönnberg, 1896; *Sepia mercatoris* Adam, 1937.

Misidentifications: None.

FAO Names: **En** – African cuttlefish; **Fr** – Seiche africaine; **Sp** – Sepia africana

**Fig. 124** *Sepia bertheloti*

Diagnostic Features: Dorsal anterior mantle margin triangular, acute; ventral mantle margin emarginate. Fins wide, with wide gap between them posteriorly. Arms IV **elongate**, particularly in males. Arm suckers tetraserial. Male median arm suckers with greater diameter than marginal ones. Hectocotylus present on left ventral arm: **1 or 2 rows of normal size suckers proximally, 9 to 13 rows of greatly reduced suckers medially**; suckers in 2 dorsal and 2 ventral series displaced laterally, with gap between them. Dorsal protective membranes **well developed on hectocotylied arm, covering suckers**. Club straight, slender, with **5 or 6 suckers in transverse rows**; suckers differ in size: **several suckers of inner 2 or 3 rows larger than rest**. Swimming keel of club **terminates at posterior end of carpus**. Dorsal and ventral protective membranes **not joined at base of club** but fused to tentacular stalk. Dorsal and ventral membranes **same length**, terminate at posterior end of carpus. Buccal membrane in females extends ventrally with 2 spermathecae. Cuttlebone outline oblong; acuminate, acute, anteriorly; bluntly rounded posteriorly; dorsal surface evenly convex; entire surface calcified with reticulate granulate sculpture concentrated medially and on lateral margins in irregular longitudinal ridges; calcification thickest posteriorly; dorsal median rib indistinct; broadens slightly anteriorly; lateral ribs absent. Chitin borders lateral and anterior margins of cuttlebone. Spine moderate length, keel(s) absent. Striated zone and last loculus convex; sulcus shallow, narrow, extends entire length of cuttlebone. Anterior striae shallow m-shape, or inverted U-shape. Inner cone limbs are narrow, strap-like anteriorly, broaden slightly posteriorly; outer cone **chitinous, spatulate, expanded**. Dorsal mantle with series of elongate papillae along each side, medial to base of each fin. **Colour:** Purplish brown. Arms have a transverse zebra-stripe pattern and a **longitudinal orange-red pigmented stripe along their aboral surfaces**. Dorsal mantle has small spots (predominantly posteriorly) and narrow, cream-coloured, broken transverse lines. Fins pale with **narrow lustrous orange-pink band along base in males bordered by purplish band and 1 or 2 longitudinal rows of numerous short bars**.

Size: Males up to 175 mm mantle length; females to 134 mm mantle length.

Geographical Distribution: Eastern Atlantic: off northwestern Africa, from Canary Islands and off Western Sahara, to Angola (southwestern Africa), 14°S. Endeavour Bank (Fig. 125).

Habitat and Biology: Depth range from 20 to 156 m. On the Endeavour Bank, *Sepia bertheloti* migrates to shallow waters to spawn during summer and autumn. The size distribution observed in the captures shows a larger range for this species than for the co-occurring *S. officinalis* Linnaeus, 1758 in summer.

Interest to Fisheries: *Sepia bertheloti* is trawled off the Canary Islands, where greatest concentrations are encountered between 70 and 140 m depth. It is commonly captured off the western Endeavour Bank, where it shares the same depth distribution with the co-occurring species *S. hierredda* Rang, 1835. Separate statistics are difficult to obtain because the two species are often marketed together, but information from the Spanish fishery in Saharan waters indicate that it represented 11% of cuttlefishes captured over the last decade, with *S. hierredda* comprising the remaining 89%. It is also a sizeable component of cephalopod catches in Mauritania waters, where it represented about 35% of the cuttlefishes captured in recent years (the remaining 65% again made up by *S. hierredda*). Off Senegal, it is reported to represent a minor portion of the total cuttlefish catch taken by trawls. It is marketed fresh or deep-frozen for export.

Remarks: Sexual dimorphism is pronounced: the mantle is relatively wider in females and the arms are much longer in males, especially the ventral pair. The soft parts are very similar to those of *S. officinalis*, although the ventral arms of the males are much longer and the largest tentacular suckers relatively smaller. However, the cuttlebone differs markedly between the two species. Recent genetic studies show the distinctiveness of this species in relation to *S. officinalis* and *S. hierredda*.

Literature: Adam and Rees (1966), Delgado de Molina *et al.* (1993), Hernandez-Garcia and Castro (1994).

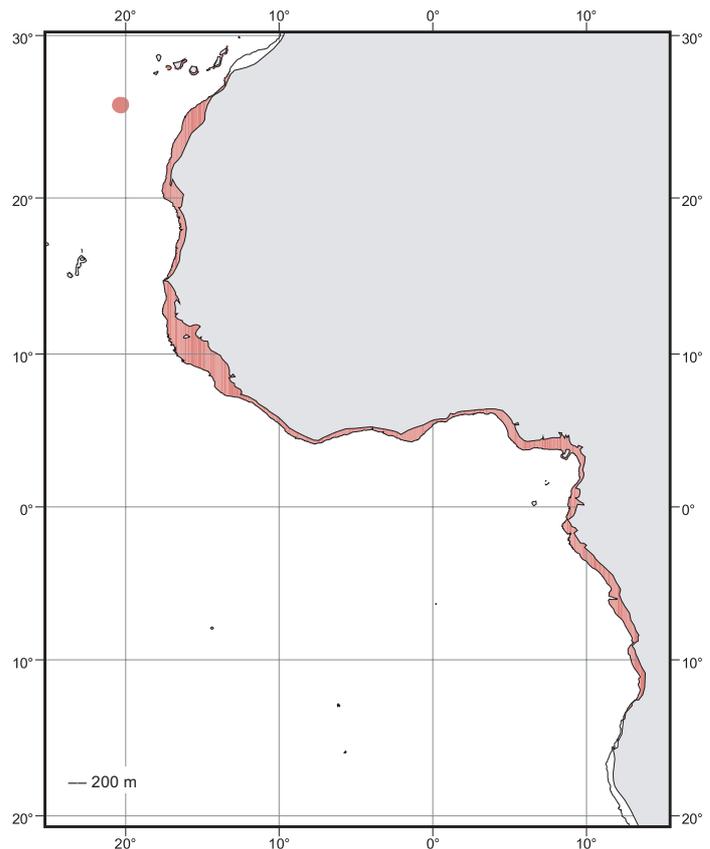


Fig. 125 *Sepia bertheloti*

■ Known distribution

Sepia braggi* Verco, 1907*Fig. 126**

Sepia braggi Verco, 1907, *Transactions of the Royal Society of South Australia*, 31: 213 [type locality: South Australia, Glenelg, 34°58'S 138°32'E].

Frequent Synonyms: None.

Misidentifications: *Sepia bidhaia* Reid, 2000; *Sepia cottoni* Adam, 1979; *Sepia limata* (Iredale, 1926); *Sepia rhoda* (Iredale, 1954); *Sepia vercoi* Adam, 1979.

FAO Names: En – Slender cuttlefish; Fr – Seiche gracile; Sp – Sepia grácil.

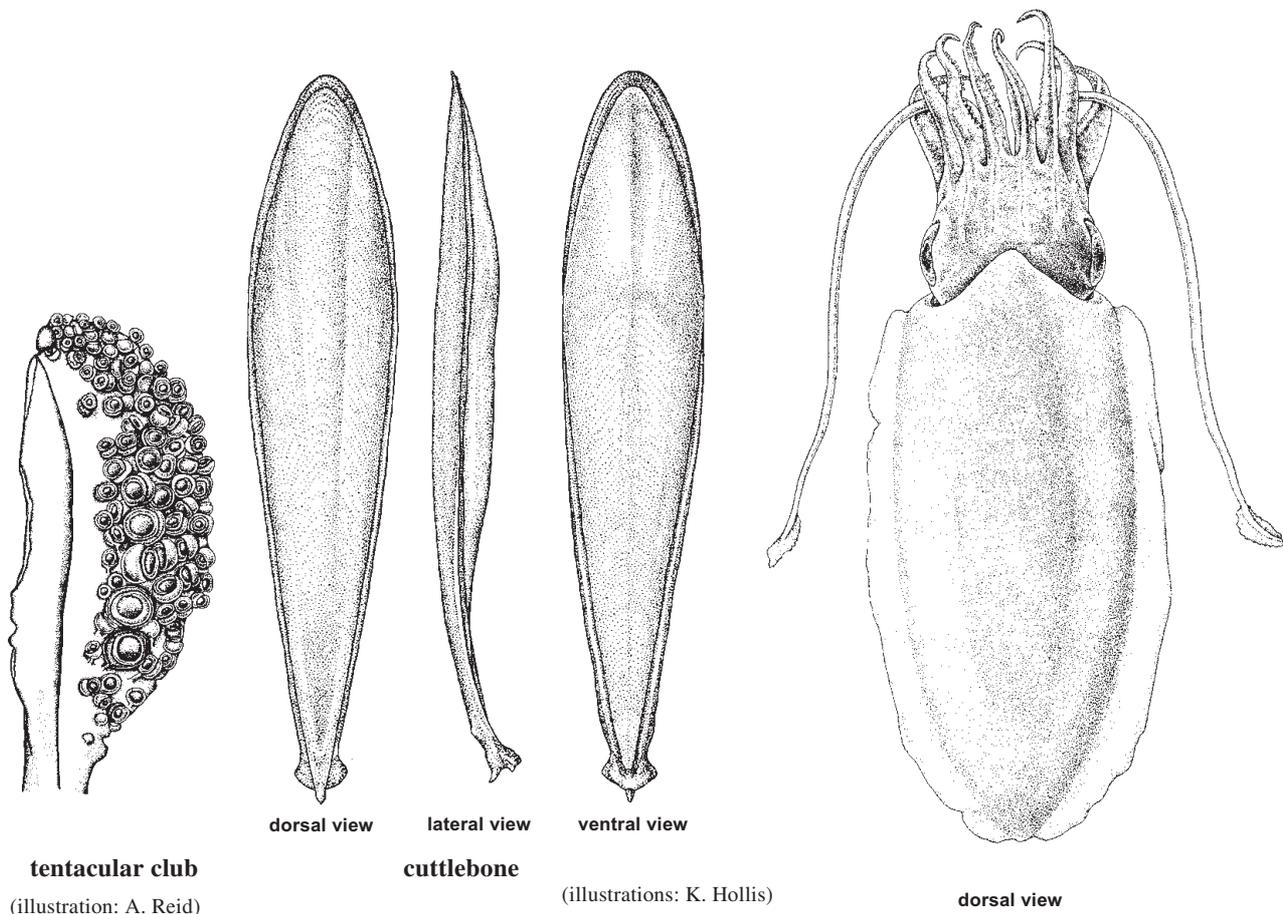


Fig. 126 *Sepia braggi*

Diagnostic Features: Dorsal anterior mantle margin triangular, acute. Fins widest in posterior third, rounded posteriorly, with wide gap between them. Head short, slender, narrower than mantle. Male and female arms differ in relative lengths; male (mature) **arms III elongate**; female **arms II and III longer than arms I and IV** (arms II usually longer than arms III). Distal arm tips **strongly attenuate** in both sexes, suckers enclosed by protective membranes. Arm suckers **tetraserial proximally, biserial at distal arm tips** (biserial region over greater proportion of arms II and III than of arms I and IV); biserial suckers reduced and displaced laterally, with gap between them on arms II of females and arms III of males. **Hectocotylus absent**. Club slightly recurved, short, sucker-bearing surface flattened, with **4 to 6 suckers in transverse rows**; suckers differ in size: 5 or 6 median suckers twice diameter of rest. Swimming keel of club extends proximally slightly beyond carpus; dorsal and ventral protective membranes not joined at base of club but fused to tentacular stalk. Dorsal and ventral membranes **same length**, extend proximal to carpus along stalk. Dorsal membrane broad, much wider than ventral membrane and forms shallow cleft at junction with stalk. Gills with 26 to 30 lamellae per demibranch. Buccal membrane without suckers. Buccal membrane in females without spermathecae. Spermatophores 2.4 to 4.4 mm long; smallest male recorded with well-developed spermatophores in spermatophoric sac was 24.1 mm mantle length. Eggs oval, up to 9.4 mm long, 5.5 mm wide. Cuttlebone outline lanceolate, broadest in anterior third at anterior end of striated zone; acuminate, acute, anteriorly and posteriorly; strongly recurved ventrally; dorsal surface pinkish; evenly convex; calcified medially, slightly granulose with irregular longitudinal ridges (particularly posteriorly). Spine and posterior end (approximately one quarter) of bone covered with ochre-coloured, smooth, glaze-like substance. Dorsal median rib distinct anteriorly, indistinct posteriorly; rib broadens anteriorly; lateral ribs absent. Chitin present as wide bands bordering lateral margins of cuttlebone (covers about half of dorsal surface of cuttlebone). Spine short, pointed, curves dorsally; keel(s) absent; fine, radiating ribs between outer cone and spine. Striated zone and last loculus convex; sulcus deep, narrow,

flanked by rounded ribs, extends entire length of cuttlebone. Anterior striae are **inverted U-shape, incurved medially, slightly V-shape following sulcus**. Inner cone limbs are strap-like anteriorly, narrower posteriorly, U-shape; slightly raised into rounded posterior ridge; thickened, shiny (yellowish), inner cone posteriorly with irregular calcareous ribs radiating into outer cone; outer cone calcified, narrow, limbs are **expanded posteriorly into 2 short 'wings'**, directed ventrally, to form a recurved cup-like structure. Dorsal mantle has scattered short ridges dorsal to cuttlebone and up to five orange-pink ridges at base of each fin. Head with short, scattered papillose bars posterior to eyes; arm papillae present; same as those on head. **Colour:** In preserved specimens pale buff to pinkish brown. Arms I have a **darkly pigmented purplish band on each side of dorsal midline**. Arms II to IV have a **median longitudinal purplish band along their aboral surfaces**. All arms have short transverse bars and blotches lateral to these longitudinal bands. Arm and club sucker rims midbrown. Fins without markings along base.

Size: Males up to 49 mm mantle length; females up to 80 mm mantle length.

Geographical distribution: Southern Indo-Pacific: southern Australia from southern New South Wales, 36°23'S 150°07'E, to Western Australia, 31°51'S 115°35'E. Australian endemic (Fig. 127).

Habitat and Biology: Depth range from 30 to 86 m. *Sepia braggi* is a demersal species. A report of many fresh bones washed up on Gunnamatta Beach (Victoria) 26–27 May 2001, is perhaps indicative of a spawning event.

Interest to Fisheries: Taken as bycatch with other cuttlefishes along southern Australia, then used locally as bait and food.

Remarks: The pigmentation on the arms is very distinctive and clearly visible even in small specimens. While arms III are obviously elongate in adult males, they are similar in length to the remaining arms in immature males (less than approximately 30 mm mantle length). *Sepia braggi* males differ from *S. limata* Iredale, 1926 and *S. rhoda* (Iredale, 1954) males in having elongate third arms. *Sepia braggi* does not have a hectocotylus; the left ventral arms are hectocotylized in *S. limata* and *S. rhoda*. The arrangement of the arm suckers differs among these three species. Female *S. rhoda* have elongate second arms. While the second and third arms of *S. braggi* females are slightly longer than the other arms, they do not differ to the same extent as those of mature *S. rhoda* females. The anterior striae on cuttlebones are M-shape in *S. rhoda* and the posterior inner cone is very broad, while in *S. braggi* the anterior striae are an inverted U-shape and the inner cone narrow. The cuttlebone is broader in *S. limata* than the *S. braggi* cuttlebone. *Sepia braggi* of both sexes differ from all other Australian narrow-boned species in its distinctive arm pigmentation.

Literature: Adam and Rees (1966), Lu (1998a), Reid (2000).

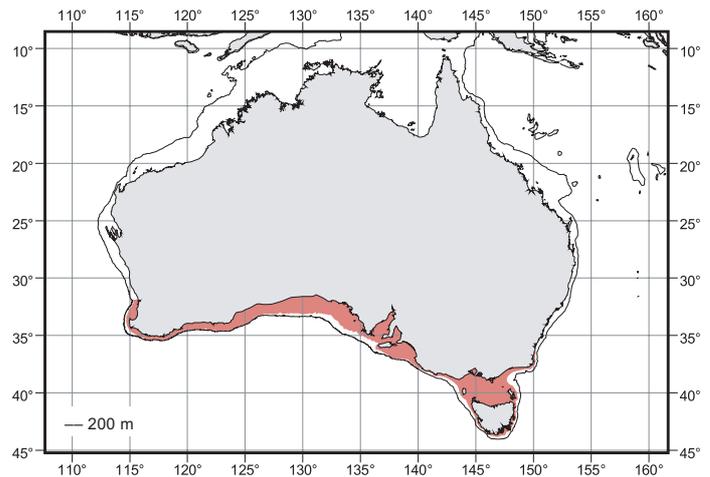


Fig. 127 *Sepia braggi*
■ Known distribution

Sepia brevimana* Steenstrup, 1875*Fig. 128**

Sepia brevimana Steenstrup, 1875, *Danske Videnskabernes Selskabs Skrifter*, 5 Række, Naturvidenskabelig og Mathematisk, 10(7): 475 [type locality: Indian Ocean].

Frequent Synonyms: *Sepia rostrata* (in part) Férussac and d'Orbigny, 1848.

Misidentifications: *Sepia esculenta* Hoyle, 1885; *Sepia stellifera* Homenko and Khromov, 1984.

FAO Names: **En** – Shortclub cuttlefish; **Fr** – Seiche petites mains; **Sp** – *Sepia mazicorta*.

Diagnostic Features: Mantle broad, oval; dorsal anterior margin triangular, acute. Arm suckers tetraserial. **Club small, with 6 to 8 suckers in transverse rows**; all club suckers of similar small size. Swimming keel of club extends well proximal to carpus; dorsal and ventral protective membranes **not joined at base of club**; **dorsal membrane much wider than ventral membrane**. Cuttlebone outline oval; bone very angular, **V-shape anteriorly**; dorsal surface flat, texture rough, with irregular calcified projections. Spine long, pointed, with dorsal and ventral keels. Sulcus shallow, narrow, extends along striated zone only, flanked by rounded ribs. Anterior striae are inverted blunt V-shape. Inner cone limbs **broaden posteriorly, thickened, rose-coloured or yellowish orange**; **outer margin of inner cone raised into a flattened ledge posteriorly**; outer cone calcified, narrow anteriorly, broadens posteriorly.

Size: Up to 110 mm mantle length.

Geographical Distribution: Indo-Pacific: northern Indian Ocean, Andaman Sea, Andaman and Maldive Islands, Singapore to the Gulf of Tonkin, South China Sea, Hong Kong, Java, Sulu and Celebes Seas. Possibly Saya-de-Malha Bank (Fig. 129).

Habitat and Biology: Depth range from 10 to 100 m. *Sepia brevimana* is a shelf species, restricted to coastal waters. Around India, spawning occurs throughout the year. Several spawning peaks have been observed between July and February in eastern Indian waters. Hatchlings grow to adult size in 11 to 13 months, depending on temperature conditions. Off Chennai (Madras), animals attain 29 to 34 mm within 6 months, 56 to 58 mm at the end of 12 months and about 75 mm after 18 months. Length at 50% maturity for males is 56 mm off Madras and 62 mm off Waltair, and for females, 59 and 63 mm, respectively. Maximum length in the Indian trawl fishery is 85 mm off Madras, and 95 mm off Waltair (northeast India), with common size ranges from about 40 to 70 mm. In the Gulf of Thailand, 40 to 60 mm mantle length animals are caught commonly, with the maximum size attained 90 mm mantle length. The sex ratio of males to females caught is 1:2.

Interest to Fisheries: This species appears as a bycatch in the eastern Indian trawl fishery off Chennai and Waltair, but separate catch data are not reported. *Sepia brevimana* is important to the commercial fishery of Thailand. Most cuttlefishes in this area are caught using otter trawl, some using pair trawl, and small catches are made using squid light-lures, traps and push nets; bottom otter and pair trawls are used offshore, while push nets and lift nets are used in inshore and coastal waters. It is also fished in the South China Sea.

Remarks: This species may be confused with *S. stellifera* Homenko and Khromov, 1984, but differs in having 6 to 8, rather than 10, oblique rows of suckers on the club. The sulcus of the cuttlebone in *S. brevimana* is shallow and narrow. In *S. stellifera*, the sulcus is deep and wide. *Sepia brevimana* is similar to *S. esculenta* Hoyle, 1885, but differs in having fewer

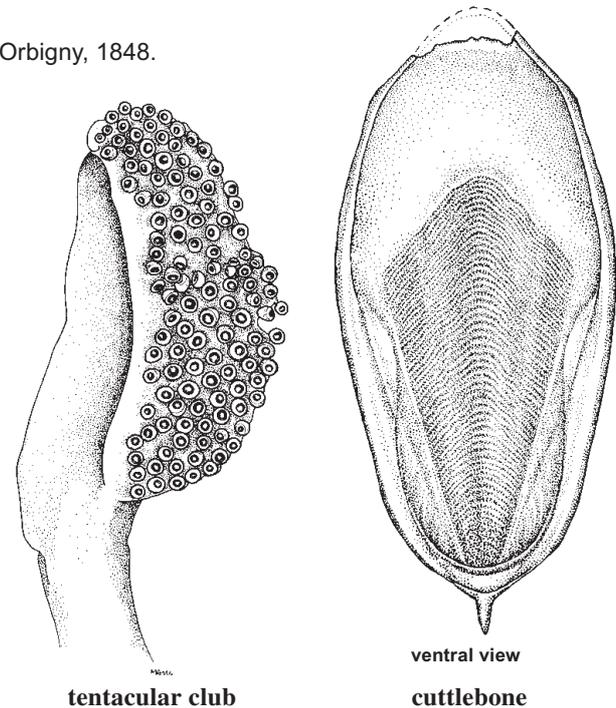


Fig. 128 *Sepia brevimana*

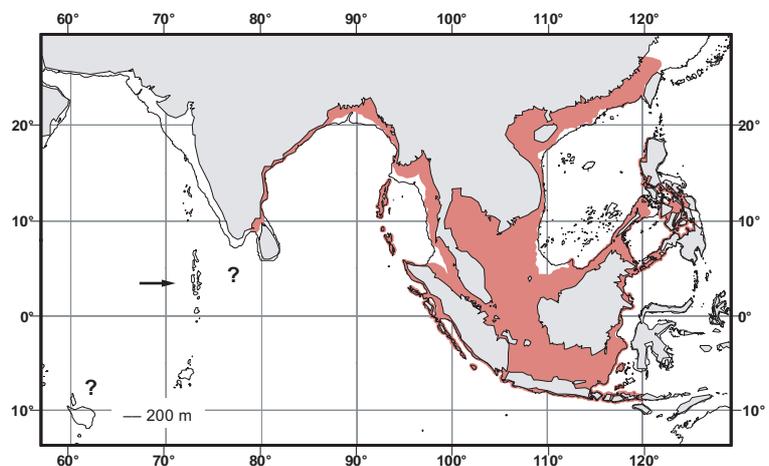


Fig. 129 *Sepia brevimana*
■ Known distribution

club suckers (there are 10 to 16 suckers in transverse rows in *S. esculenta*), no fleshy papillae along the base of the fins, and by the coloured inner cone.

Literature: Adam and Rees (1966), Voss and Williamson (1971), Silas *et al.* (1982), Silas *et al.* (1986), Chantawong and Suksawat (1997).

***Sepia cultrata* Hoyle, 1885**

Fig. 130

Sepia cultrata Hoyle, 1885, *Annals and Magazine of Natural History*, (series 5)16: 198 [type locality: Australia, Twofold Bay, 36°59'S 150°20'E].

Frequent Synonyms: None.

Misidentifications: None.

FAO Names: **En** – Knifebone cuttlefish; **Fr** – Seiche à os en couteau; **Sp** – Sepia de sepión de cuchillo.

Diagnostic Features: Male and female arm lengths subequal. Arm suckers tetraserial. Hectocotylus present on left ventral arm: approximately **7 rows of normal size suckers proximally; 5 or 6 rows of greatly reduced suckers medially**. Suckers of hectocotylus in **2 dorsal series are smaller than those in 2 ventral series** (in some specimens, 2 dorsal rows appear merged as if in a single row); oral surface of modified region swollen; suckers in 2 dorsal and 2 ventral series displaced laterally, with gap between them. Club crescent-shaped, sucker-bearing surface flattened, with **5 or 6 small suckers** in transverse rows. Swimming keel of club extends well proximal to carpus; dorsal and ventral protective membranes **not joined at base of club; dorsal and ventral membranes differ in length**; dorsal membrane **extends proximal to carpus along stalk**, ventral membrane **terminates at proximal end of carpus**. Buccal membrane without suckers. Cuttlebone outline oval; bone triangular, obtuse anteriorly; acuminate, acute, posteriorly; **dorsal surface pinkish**; dorsal surface convex posteriorly, flat anteriorly; some granulation on lateroposterior margins bordered by a longitudinal ridge; dorsal median rib present; rib broadens anteriorly; lateral ribs indistinct. Spine straight. Striated zone **concave in extreme posterior part, slightly convex in anterior part**; last loculus slightly concave; sulcus absent. Anterior striae **slightly convex to straight**. Inner cone limbs are **uniform width, very narrow, U-shape posteriorly**; thickened. Dorsal mantle with scattered short papillae along each side close to fins and with longitudinal row of ridge-like papillae adjacent to base of each fin; ventral mantle with longitudinal row of 4 or 5 narrow ridges along each side close to fins. **Colour:** Pale buff pinkish brown.

Size: Up to 120 mm mantle length.

Geographic Distribution: Southern Indo-Pacific: southern Australia from southern Queensland, 26°35'S 153°45'E, southwestward to Western Australia, Houtman Abrolhos, 28°49'S 114°04'E, including Tasmania, 42°43'S 148°22'E (Fig. 131).

Habitat and Biology: Depth range from 132 to 803 m with the majority of catches from 300 to 500 m; outer shelf and upper bathyl.

Interest to Fisheries: Species taken as bycatch of prawn and mixed species trawl fisheries. Possibly more than one species is identified under this name. This requires further investigation.

Literature: Adam and Rees (1966), Lu (1998a).

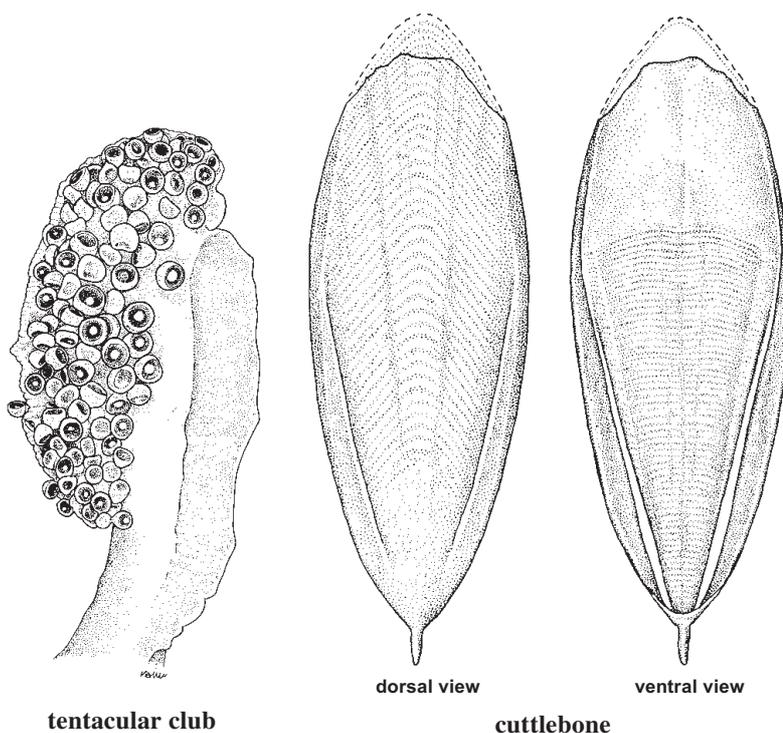


Fig. 130 *Sepia cultrata*

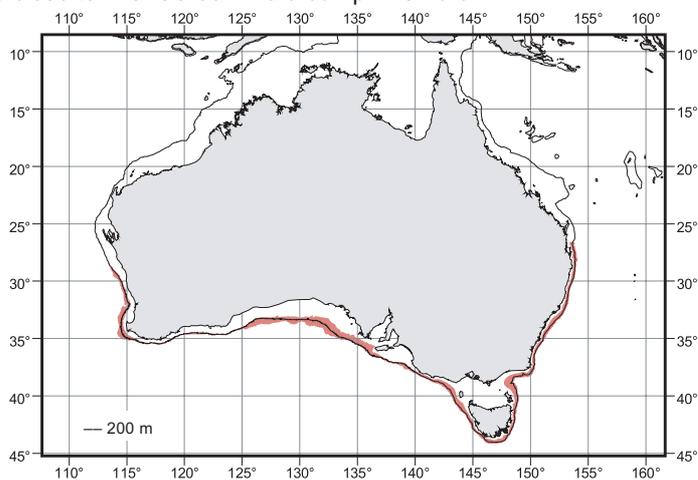


Fig. 131 *Sepia cultrata*
Known distribution