

NEW RECORD OF A LOLIGINID SQUID, *DORYTEUTHIS SIBOGAE*
ADAM 1954, (CEPHALOPODA; LOLIGINIDAE), FROM INDIAN WATERS

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ABSTRACT

Doryteuthis sibogae Adam 1954 is described for the first time from the Indian seas. The species occurs in commercial quantities along the southwest coast of India. A brief description on the status of this species in relation to its congeners is given.

INTRODUCTION

In the course of our studies on Indian cephalopods and their fisheries, we have found that the loliginid squid *Doryteuthis sibogae*, described by Adam in 1954, occurs in commercial quantities along the southwest coast. In an earlier review on the cephalopod resources of India, this species had been referred to as *Doryteuthis* sp. (Silas et al 1982). Though this occurs as a commercially important species, no description of it from our waters is available. The species is therefore described and illustrated here.

DORYTEUTHIS SIBOGAE ADAM, 1954

Doryteuthis sibogae Adam, 1954, pp. 146-149, fig. 16-18, pi. I fig. 4; Natsukari, 1976, pp. 15-23, fig. 1-4.

Doryteuthis sp., Silas, et al., 1982, pp. 4-5, pi. II.

Material examined: Four males, 126-153 mm dorsal mantle length, and three females 120-123 mm, 31-5-1977; two males 116 mm and 121 mm, and three females 90-117 mm, 4-7-1977; one male 238 mm, 28-2-1980; two males 170 mm and 213 mm, 6-3-1980; three males 158-163 mm, four females 125-157 mm, 2-11-1981. All the squids were obtained from the commercial fish landings of boat seines at Vizhinjam, Trivandrum, India. They were captured at a depth of 10-30 metres. One small female of 90 mm dorsal mantle length was also obtained from the trawl catches off Kasimode, Madras, India, on 20-6-1978.

Description: Mantle is slender and cylindrical, the greatest width being 16-23% in length (Fig. 1a). Widest about the middle, the mantle tapers from the

point of insertion of fins and ends in a blunt point posteriorly. On the dorsal side the anterior margin of the mantle is produced in the middle to a pointed lobe; the ventral margin is emarginated beneath the funnel. No ridge is present

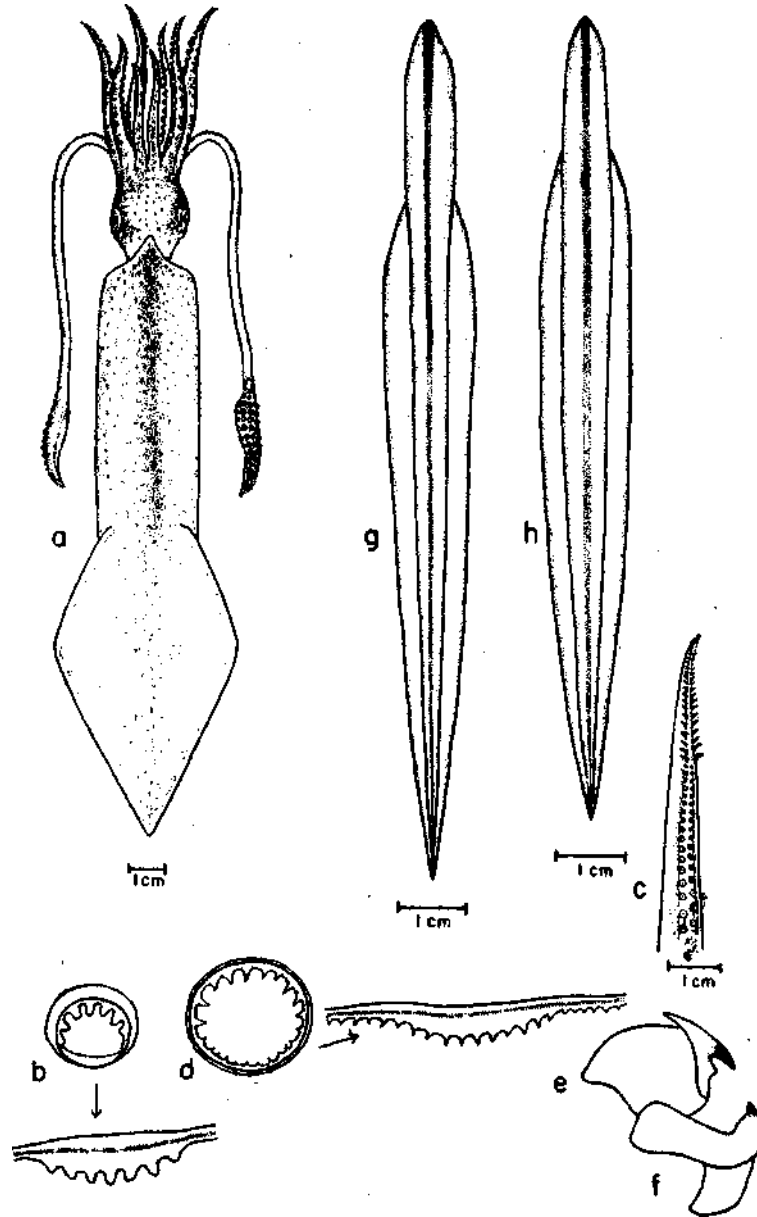


FIG. 1. *Doryteuthis sibogae*. a - male 170 mm dorsal mantle length, dorsal view; b - largest sucker ring of arm III; c - hectocotylied arm; d - tentacular club sucker ring; e - upper beak; f - lower beak; g - gladius of male; l - gladius of female.

along the midventral line; however, the concentration of chromatophores forming a definite longitudinal midventral line is seen in all the specimens, conspicuous in males, but very faint in females. A pair of light organs are present, one on either side of the ink sac.

Fins are rhombic in shape; the anterior margins are slightly convex and the posterior margins almost straight in larger specimens; the posterior margins have slight concave contour in smaller specimens. Length of fins is between 44% and 54% of the dorsal mantle length; width not more than 36%.

Head is small, slightly longer than wide both in male and female. Eyes are large and of the loliginid type, with the membrane covering the eye. The funnel is short and thick, and the anterior free end reaches up to the anterior margin of the eye.

The oral arms are short. The arms in most of the specimens are in the order 3.4.2.1, but in a few specimens the order is 3.2.4.1. All the arms are compressed and keeled. The arm III is the largest, and its aboral keel is well-developed in the form of a swimming membrane. All the arms are with protective membrane, which is more pronounced on the arm III. Suckers are biserially arranged on the oral arms and they are small in size, the largest sucker on arm III being 0.8-1.3% in mantle length. The horny ring of the largest sucker has 5 to 9 blunt, squarish teeth on the distal half; the proximal half is smooth or sometimes wavy (Fig. 1 b). The lateral teeth are slightly broader, but shorter than the distal teeth.

In males, the left ventral arm is distinctly hectocotylized. This arm is slightly longer than the corresponding right-arm and possesses 15-19 pairs of normal suckers basally, and distal to them are 20-22 pairs of fleshy, conical, pedicels, or papillae, arranged in two rows along the margins of the arm, gradually decreasing in size towards the distal tip (Fig. 1 c). The hectocotylized length index ranges from 35 to 40.

The tentacles are very slender with short and moderately expanded clubs. The club has feebly developed swimming membrane on either side. The suckers are arranged quadriserially, with the lateral rows having suckers smaller than those on the median rows in the manus portion. The horny rings of the large club suckers bear 22-26 inwardly curved sharp conical teeth on the entire margin; they are the largest on the distal margin, becoming smaller and progressively blunt towards the proximal margin (Fig. 1 d). However, one large male (238 mm DML) has about 31-35 such teeth on the club sucker ring. The arm suckers and the tentacular club suckers are moderate in size. The largest suckers of arm III and the largest tentacular club suckers are subequal in size; the ratio of club sucker/arm sucker (Sc|Sa) is 0.86 to 1.20.

There are seven buccal lappets around the mouth and each one possesses 5-11 minute suckers at the tip on the oral side.

The rostrum of the upper beak is narrow, sharp and deeply curved; the insertion wing is very broad (Fig. 1 e). In the lower beak the rostrum, rostral wing and the insertion wing are narrow (Fig. 1 f).

The gladius is narrow, with almost straight margins. The vane of the gladius is broader at the anterior region, tapering sharply to the posterior end. The gladius of female is slightly wider than that of the male (gladius width index 10.7 in males and 11.5 in females; Fig. 1 g, h). There are five distinct ribs on the vane, one thick median, two lateral and two marginal, of which the median and the two lateral ribs extend on to the rachis which is triangularly pointed at the anterior end.

The measurements and indices of ten males and ten females are given in Table 1.

REMARKS

The present specimens are assigned to *Doryteuthis sibogae* Adam because of their very close agreement with the descriptions given by Adam (1954) and Natsukari (1976). This record of *D. sibogae* extends its distribution from Indonesian waters (Adam 1954; Silas 1968) and Formosan waters (Natsukari 1976) to the Bay of Bengal and up to the southeastern Arabian sea (Fig. 2). The species after first described by Adam (1954) was recorded only by Natsukari (1976). Though the present record is the first from Indian waters, the species is not in stray occurrence, but supports a fishery along the southwest coast of India (Silas et al 1982). Only sporadic occurrence has been observed on the east coast. In Taiwan this squid is taken as a bycatch in the fisheries for larger squids (Roper et al 1984).

Although the present specimens agree well with the earlier descriptions and measurements, they nevertheless differ in some morphometric characters, which are perhaps minor variations. The differences are: (1) Among the males so far examined, one large specimen measuring 238 mm in mantle length has 31-35 conical teeth on the horny ring of the club suckers, whereas Adam (1954) has reported 25 such teeth on the ring of the club sucker, and Natsukari's (1976) specimens have only 15-30 teeth. (2) Though there is good agreement in the shortness of tentacular clubs, the tentacles are more slender and longer in the present specimens with the tentacular length index value of 78-96. The index value of *Doryteuthis sibogae* of Indonesian waters is 27-47; the tentacles of *D. sibogae* described by Natsukari (1976) are also very short.

Doryteuthis sibogae is a distinct species. In spite of the controversy about the generic status of *Doryteuthis* and *Loligo* that these two are distinct genera (Naef, 1912) and that they are not separable (Okutani, personal communication; Okutani 1980), the present material is regarded as *Doryteuthis sibogae*

TABLE 1. *Measurements (mm) indices (% in mantle length) of ten males and ten females of Loligo sibogae.*

Type											10	Range
	Male											
Length of dorsal mantle	238	213	170	163	160	158	153	152	137	126		121-238
Mantle width	17.6	16.4	17.1	18.4	17.5	17.7	18.9	16.4	21.9	22.7		16.4-22.7
Fin length	53.4	53.5	51.2	53.4	48.8	48.1	45.8	49.9	47.4	46.1		45.8-53.5
Fin width	34.5	32.4	31.8	30.7	32.5	31.6	32.0	28.9	31.4	35.2		28.9-35.2 z
Head length	10.5	10.3	14.1	12.3	15.0	12.7	15.7	13.8	13.9	13.3		10.3-15.7 2
Head width	9.2	9.4	12.9	8.4	13.8	11.4	14.4	9.2	13.1	13.1		8.4-14.9 Z
Length of right I arm	18.5	17.4	20.6	18.4	18.8	20.9	19.6	22.4	21.9	22.7		17.4-22.7 w
Length of right II arm	26.5	24.9	25.9	25.2	24.4	27.2	27.5	28.9	31.4	32.0		24.4-32.0 o
Length of right III arm	29.4	27.2	29.4	31.3	31.9	30.2	31.4	30.3	33.6	35.2		27.2-35.2 §
Length of right IV arm	23.1	23.5	27.1	25.8	29.4	27.2	28.8	28.9	30.7	33.0		23.1-33.0 o
Length of right tentacle	—	—	69.4	—	—	—	72.5	—	92.7	—		69.4-92.7 *>
Length of right tentacular club	—	—	18.2	—	—	—	19.6	—	23.3	—		18.2-23.3 >
Length of hectocotylized arm	28.6	26.3	31.8	30.7	31.9	31.6	32.0	28.9	35.8	35.9		26.3-35.9 g
Hectocotylus length (% in hectocotylized arm length)	35.3	35.7	38.9	38.0	35.3	38.0	36.7	38.6	36.7	37.0		35.3-39.5 3 z
	Female											
Length of dorsal mantle	157	145	132	125	123	122	120	117	113	90		90-157 e
Mantle width	19.1	19.3	20.5	17.6	19.5	19.7	21.7	18.8	19.5	18.9		17.6-21.8 §
Fin length	49.7	50.3	51.5	49.6	47.2	44.3	51.7	45.3	47.8	46.7		44.3-51.7 Q
Fin width	35.7	30.3	34.1	32.8	32.5	32.0	33.3	29.9	36.3	30.0		29.9-36.3
Head length	13.4	16.6	15.9	16.8	14.6	16.4	15.8	16.3	16.8	16.7		13.4-16.8
Head width	12.7	13.1	13.6	16.0	13.0	14.8	15.8	15.4	15.0	15.6		12.7-16.0
Length of right I arm	20.4	22.1	22.7	23.2	21.9	18.0	22.5	23.1	25.7	20.0		18.0-25.7
Length of right II arm	25.5	30.3	26.5	28.8	29.3	26.2	29.2	29.1	33.6	27.8		25.5-33.6
Length of right III arm	31.8	34.5	34.1	32.8	34.1	31.1	38.3	35.0	37.2	33.3		31.1-38.3
Length of right IV arm	29.3	31.7	31.1	32.0	28.5	30.3	30.8	33.3	32.7	28.9		28.5-33.3
Length of right tentacle	76.4	82.1	—	—	—	79.5	93.3	93.2	—	—		76.4-93.3
Length of tentacular club	20.4	22.1	—	—	—	19.7	20.8	21.4	—	—		19.7-22.1 ,o

because of the close agreement in its description with that given by Adam (1954) and Natsukari (1976). *Doryteuthis sibogae* differs from other allied species such as *D. pickfordi* Adam, 1954 (plate-like teeth on the entire margin of the horny

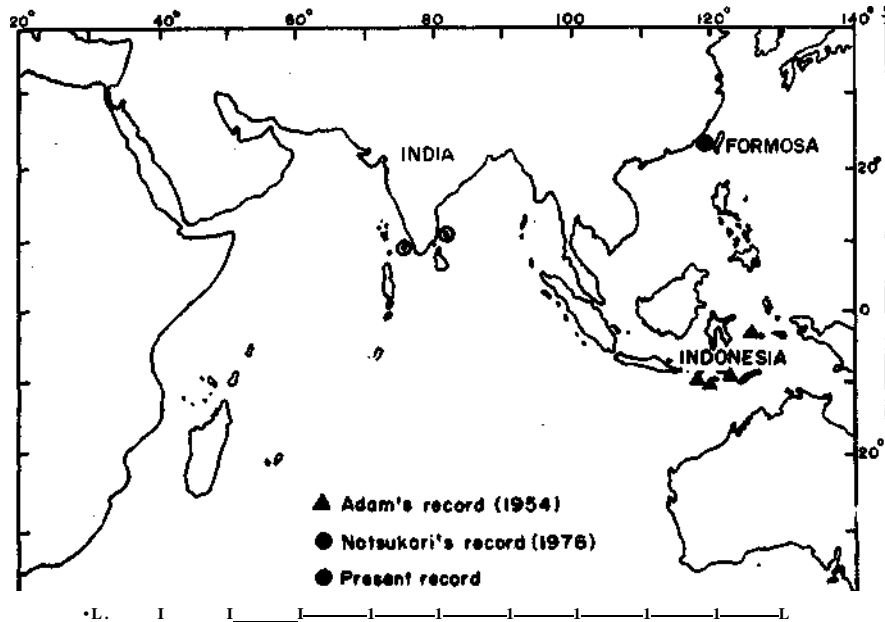


FIG. 2. Records of *Doryteuthis sibogae*.

rings of lateral arms), *D. reesi* Voss, 1962 (both the ventral arms are hectocotyhzed in males) and *D. arabica* Ehrenberg, 1831 (mantle with a midventral keel in male and hectocotyhzed arm with 13 pairs of normal suckers and 30 pairs of pedicels). However, the present material has some resemblance to *D. singhalensis* (Ortmann 1891) in its having a slender mantle, somewhat similar fins, and plate-like teeth on the distal margin of horny rings of the arm suckers. *D. sibogae* can be distinguished based on the fin-length index and hectocotylus index. In *D. sibogae* the fin-length index ranges between 44 and 54 and the modified portion of hectocotyhzed arm is less than 40. In *D. singhalensis* the fin length index is always more than 55 and increases up to 62; the fin-width index 34-51; hectocotylus index exceeds 50 (Adam 1939, 1954, Voss 1963, Voss and Williamson 1971, Okutani 1970), the posterior margin of fins are slightly concave, whereas *D. sibogae* has nearly straight margins, especially in large specimens, and the width is only 28-36 in mantle length.

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