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funnel on either side, into which fits the inner cal-
carius ridges of the mantle present at the anterior
end. Head is flat on dorsal as well as on ventral side.

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ON THE OCCURRENCE OF
SEPIETTA OWENIANA (CEPHALOPODA)
FROM VISAKHAPATNAM

DURING the course of our investigations on the Cephalopod fauna off Visakhapatnam, some interesting specimens belonging to the genus *Sepietta* Naef, of the family Sepiolidae were collected. From a cursory examination of these specimens it was concluded that they belonged to the species *Sepietta oweniana* which has not been recorded so far from tropical waters by any of the earlier workers. These specimens were collected by the mechanised fishing boats. Six specimens were collected belonging to both sexes (two males and four females) and they have been collected from a distance of about 50 Kms away from Visakhapatnam towards South.

They are dark bluish grey on the dorsal side with spots and pale grey on the ventral side. Among the six specimens collected the ventral mantle length varied from 35 mm to 45 mm. The body is saccular and the anterior end of the mantle is slightly wider than the posterior end which is rounded. Dorsally the mantle edge is fringed with the head which is a diagnostic feature of the sub-family. The fins are dorso-lateral in position, well separated at their anterior ends from the body, more or less circular and very thin. The mantle septum which is vertical and obliquely placed and connects the inner dorsal region of the funnel at its base, with the inner ventral region of the mantle at its half length towards posterior end. There are calcarious streak like depressions on the knobs situated at the base of the



(a)



(b)

PLATE 1 (a) male, dorsal view, left dorsal arm hectocotylized; (b) female, dorsal and ventral views.

All the arms are proximally connected by a thin membrane which is characteristic of the genus and the cleft between the dorsal arms being less deep than that between the other arms. Stalked suckers are present in two longitudinal rows on ventral aspect of

each arm. Each sucker is globular and is attached to the arms through a conical stalk which is flat and broad based and pointed at the tip where it bears the sucker. Each sucker is with a circular horny chitinous ring. Tentacles are slender and muscular. Each tentacle has a terminal distinguished club which bears small microscopic suckers arranged in about 16-32 longitudinal rows. The left dorsal arm in the males is hectocotylized and is much shorter than the remaining arms. Small stalked suckers are arranged in 4-6 longitudinal rows on the expanded spon-like part of this arm. The shell is rudimentary and membranous.

The genus *Sepietta* was first described by Naef⁵. The species *Sepietta oweniana* was described by Muus (1963⁴), but the description was quite inadequate. The occurrence of this species was reported from Kattegat, Skagerak, Northern North Sea, South and West Ireland and Atlantic Faroe-Iceland area, English Channel (Western), Bristol Channel and Irish Sea, and Norwegian Sea (Muus⁴).

The distribution of the species was quite interesting as it is restricted to northern latitudes only. The occurrence of the species from the tropical waters is reported for

the first time from Visakhapatnam and its colonizing factors throw light on our understanding of the ecological factors responsible for such interesting adaptations exhibited by the species.

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REVIEWS

Energy Methods in Time Varying System Stability and Instability Analyses. By Y. V. Venkatesh. (Springer-Verlag, Berlin), 1977.

We realise that stability analysis of time varying systems is more difficult than that of nonlinear systems since the later sometimes leads to the first. This monograph is written by an expert on the specialised subject of stability of time varying systems. Though theoretical in nature, the author explains in the beginning the practical importance of these techniques to a variety of real life problems and also highlights at several places that the methods are not adequate to explain the phenomena described by Hill's or Mathieu equations. The book starts with an excellent introduction to the subject in Chapter 1 with emphasis on the special behaviour of such systems. In Chapter 2 a formulation of the problems and methods of stability and instability for a certain class of equations with a familiar feedback structure is given along with the definitions for stability. Chapter 3 deals with the exponential stability of feedback system governed by different equations using the method of Lyapunov-corduneau,

while Chapter 4 considers the integral form of the equation using Popov method. By this, more general exponential stability conditions are derived. The method of Zames-Sandberg for the L_2 stability analysis of time varying system is given in Chapter 5 and the stability results so derived constitute some generalization of the results of Chapter 4. Chapters 6 and 7 deal with the instability counterpart of the method of Lyapunov-corduneau and of Zames-Sandberg respectively and the instability conditions are derived.

The presentation of the material is very lucid. Each Chapter contains a list of exercises and the author also mentions, wherever possible, problems for further research.

The references are quite exhaustive. The book can be used for teaching as an elective at a Master's degree program in Engineering/Mathematics or in a Pre-Ph.D. course program. On the whole this is an excellent monograph.

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