

**FALSE POLYEMBRYONY IN VIVIPAROUS RHIZOPHORA MUCRONATA LAM.**

*Rhizophora mucronata* Lam., is a mangrove plant which bears fruits with viviparous seeds. Before the fruit becomes detached from the parent tree, the single seed inside germinates and by growth of the cotyledons and later enlargement of the hypocotyl, which pushes out through the micropyle, the lower part of the embryo is formed into a club-shaped structure 10" to 20" long. When the fruit drops down into the swamp surrounding the plant, the root-end penetrates the mud and gets established by development of the main and lateral roots. If the fruit drops down during high tide, when the swamp is usually flooded, the seedling may be carried away by the tide and gets established later.

In *Rhizophora mucronata*, the most common occurrence is that of fruits each bearing a

single well developed hypocotyl indicating the presence of one normal embryo. The specimen illustrated on the right in the photograph (Fig. 1) was collected from the saline swamps of Bandra Creek near Bombay. The unusual feature of this specimen is the presence of twin hypocotyls emerging from a single fruit. As normally only one seed is formed in a fruit in *Rhizophora*, from an external examination of this specimen, it seemed that two embryos had developed from the same ovule. When the pericarp enveloping the plumular part was carefully dissected it was observed that each of the twin hypocotyls was connected with its own separate plumule and also enclosed by separate nucellar tissue, tegmen and other tissues of two distinct ovules which, however, were more or less adhering to each other. So this is a case of false poly-embryony of the type recently reported by Howard in *Brassica*. A large number of fruits were dissected out and only in another case we found the presence of a second ovule with its young embryo.

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<sup>1</sup> Howard, H. W., *J. Genet.*, 1939, 38, 325.

**BALANOGLOSSUS AS FOOD OF FISHES\***

SRI. S. VARADARAJAN recorded for the first time on 6th July 1940 and 1st August 1940 that the Whiting *Sillago sihama* and the Squeaking Perch *Therapon jarbua* had a specimen of *Balanoglossus* in their stomach contents. This led to the present investigation.†

A systematic collection of fishes from both the 'Balanoglossus area' and the Watchman's Bay was arranged. The fishes were caught by

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† As Sri. S. Varadarajan, M.A., was transferred to West Hill Biological Station, Malabar, on 11-9-1940 he could not pursue this item of research.

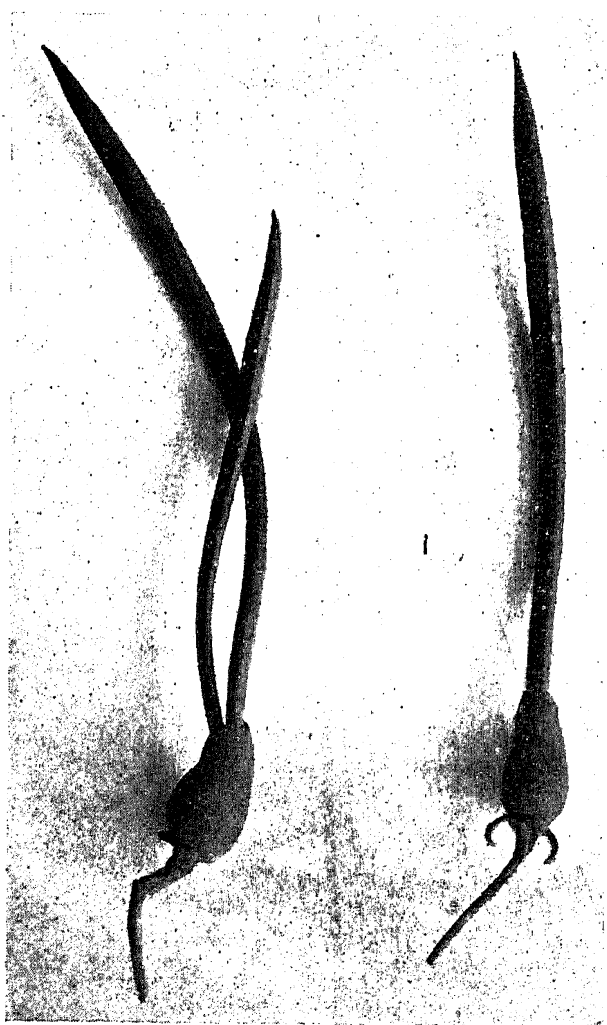


FIG. 1

Photographs of normal (on left) and abnormal fruits of *Rhizophora mucronata*

stake-nets 1½' high, planted within the shore during the low tide, especially during the New Moon and Full Moon days. During the high tide, water with its finny inhabitants flows above and over the net; but when the tide recedes most of the fishes are trapped in the net. The following four species of fish are generally represented in the catches made by this method:—(1) the Whiting, *Sillago sihama*, (2) the Mullett, *Mugil waigiensis*, (3) the Mullett, *Mugil troschelii*, and (4) the Squeaking Perch, *Therapon jarbua*.

The stomach-contents of the above fishes were studied in detail; and the following observations were recorded:—

- (1) *Sillago sihama* (125 specimens).—Polychæte worms, crabs, prawns, stomatopods, 14 specimens of *Zonogobius* sp.,<sup>‡</sup> *Balanoglossus*, amphipods, sea-weeds and sand-grains.
- (2) *Mugil* spp. (200 specimens).—Moults of polychæte worms, copepods, amphipods, *Thalassiothrix*, *Bacteriastrum*, *Rhizosolenia*, *Trichodesmium*, *Nitzschia*, *Pleurosigma*, *Fragilaria*, Algal filaments and sand-grains.
- (3) *Therapon jarbua* (25 specimens).—Polychæte worms, crabs, 14 specimens of *Zonogobius* sp., prawns, stomatopods, amphipods, *Balanoglossus*, sepia, fish-scales and sea-weeds.

Of the 125 specimens of *Sillago sihama*, 12 specimens showed *Balanoglossus* in their stomach, that is, nearly 10 per cent. feed on this worm; similarly, of the 25 specimens of *Therapon jarbua* examined, 3 specimens had *Balanoglossus* in their stomach, that is, 12 per cent. favour this diet. *Balanoglossus* is therefore not a general item of food of these fishes. In spite of these enemies, no reduction in the population of *Balanoglossus* has been noticed. Thanks to the comparative freedom the bed of *Balanoglossus*—being in the tidal zone—enjoys, sea-water can cover it only during the high-tides, twice during 24 hours. The two fishes

in question are, therefore, deprived of access to the bed at low tides; their ravages can only be intermittent and in a pell-mell fashion as they have to retire with the ebbing tide. It is also likely that the fecundity of these worms copes with the destruction caused by these fishes and that the balance of nature is in favour of the *Balanoglossid* worms.

From the detailed study of the stomach-contents, it is seen that *Balanoglossus* is not an item of food of the mullets though they are caught in the area along with the Whiting and the Squeaking Perch. The snout of the specimens which had fed on *Balanoglossids* smells of iodoform. *Balanoglossids* swallow sand, and their intestine is almost always filled with sand. The above fishes when they feed on *Balanoglossids*, naturally swallow sand-grains also. Further, to get *Balanoglossids* and polychæte worms, the fishes probably have to dig into the sand with their snout.

During the investigation, we were confronted by the following problems:—What originates the iodoform smell? If *Balanoglossus* is responsible for it, can it be a protective device as iodoform has a disagreeable smell or is it a disinfectant employed by *Balanoglossus* for coating its burrows with, or can it be a product of the gut of *Balanoglossus* which, like the earthworm, swallows earth (sand) and throws it out as fæces? The substratum in the *Balanoglossus* area is subject to the gut-action of these worms all over there.

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#### FOOD AND FEEDING HABITS OF THE OIL SARDINE AND MACKEREL

DEVANESEN in an article in this *Journal*<sup>1</sup> has made some valuable observations regarding the food of certain commercially important fishes of the west coast.

A study of the food and feeding habits of

<sup>‡</sup> It was not possible to determine the species as the specimens had been partly digested,