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Short Communication

Striking behavior of *Rapana rapiformis* in egg capsule deposition in Pondicherry coastal region

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Abstract

During the monthly field survey along the sandy beaches of Pondicherry in the southeast coast of India, fresh but empty capsules of *Rapana rapiformis* were collected and capsules with strange features were photographed. The gastropod exhibited three striking features in depositing its egg capsules (i) *R. rapiformis* selected the egg capsules of *Chicoreus virgineus* for depositing its capsules (ii) *R. rapiformis* produced layered and branched capsules, (iii) 4-5 capsules are laid on the apex of single capsule of *C. virgineus*. The probable reasons/factors for such egg capsule deposition were discussed.

Keywords: Egg capsule, gastropod, lateral branching, *R. rapiformis*, Pondicherry

Introduction

Prosobranchs are the most conspicuous egg capsule producing gastropods and their egg capsules or ootheca inculcates more taxonomic importance, fingerprints and genetic keys showing interspecies and intra species variations (Rawlings, 2009). Preference of substratum and the nature selected by the gastropods for egg capsule deposition differ from species to species. Previous studies on the substratum selection showed that prosobranchs deposit their capsules on a variety of living and non living hard substrata like shells and rocks by *Murex pormum*, small stones and blades of seaweeds by *Fasciolaria tubifera* (Barnette *et al*., 1980), sandy and mud flats by *Prunum apicinum* (D'Asaro, 1970) leathery fronds of *Gigartina* by *Nassarium reticulata* (Bony, 1966) in carbonate sands by *Thias and Strombus gallus* (D'Asaro, 1970) and rocks and shells by many prosobranchs (Fretter and Graham, 1962). Michal *et al*. (2009) reported on egg capsules preserved on cardiniid bivalves from Lower Jurassic (Hettangian) deltaic deposits of the Holy Cross Mountains area, central Poland. In the present communication, striking features observed in the fresh but empty egg capsules of *Rapana rapiformis* were reported.

Material and Methods

During the monthly coastal survey and collection of the capsules for the work relating to scanning electron microscope studies on the walls of the capsules and evaluation of its pharmacological properties, totally 520 bunches of egg capsules of *Rapana rapiformis* were collected during six month period from Pondicherry coast; of which 44 bunches were found attached on the capsules of *Chicoreus virgineus.* Among these, 18 bunches of capsules showed lateral branching/lateral attachment. The capsules with strange and striking features were photographed. The preserved egg capsules were examined in the laboratory using hand lens and binocular microscope and the strange features were recorded. The egg capsules were identified at Marine Biological Station at Porto Novo by comparing with the specimen kept at the museum in consultation with experts.

Results and Discussion

Totally 125 individual capsules separated from 18 bunches that were attached on *C. virgineus* and exhibited branched nature and the length, width and diameter of apical opening of each capsule were measured using Vernier caliper. The average length

of the capsule is 17 mm, width 5 mm and diameter of apical opening 3 mm. Each bunch contained an average of 200-250 capsules.

On close examination of the capsules, three interesting features were noticed. The egg capsule of the *R. rapiformis* was attached on the apex part of the leafy and broad capsules of another gastropod *C. virgineus* (Fig. 1). The deposition was in two layers *i.e.,* one bunch is deposited on the other. Dan Richtt *et al*. (2007) reported that the egg capsule deposition and movement of the mud snail *Nassarius obtusus* is induced to aggregate and spawn by the living odour of the substrate. (Bony, 1966) also emphasised that preference is more oriented towards living things due to their characteristic odour. Similarly, the field as well as experimental studies (Barnette *et al*., 1980) revealed that *N. reticulate* preferred leathery fronds of the seaweed, *Gigartina* rather than rocks.

In the present study, selection of capsules of its own species and / or other species as substrate for depositing the egg capsules might be due to the biological nature of the substratum (biomaterial) and its characteristic bio-odour. Moreover, it could also be attributed that the bio-odour in terms of chemostatic response would be the intriguing factor in such a substrate selection. Such a chemostatic response is mostly prevalent in community structures of capsules as reported by Kohn (1961) and D' Asaro (1970) where a given substrate is selected by one species and latter it would attract other species or its own kind to aggregate and deposit their egg mass substratum creating huge mass of eggs.

Deposition of egg masses in layers are common only in egg mass producing prosobranchs rather than egg capsule producing gastropods. However, the phenomenon of capsule deposition in layers has been reported in prosobranchs like *Conus spurious and M. pormum* where egg capsules are laid continuously to build up on the first layer of capsule (D' Asaro, 1970). Similar behavior is exhibited by *R. rapiformis* producing egg capsules in two layers and the probable reason might be due to two factors *viz*. non availability of better substratum in its nearest vicinity and chemostatic attraction by its own capsule odour and /or of other species.

Further, the base of *R. rapiformis* is freely merged with the apex of the *C. virgineus* as if it has grown from the capsule itself because the attachment point is smooth and plain, void of any ridge or distinct marks of mechanical attachment (Fig. 1). Thirdly, it is noticed that there were 4-5 capsules of *R. rapiformis* attached on a single capsules of the *C. virgineus* and probably it would be the first incident to report/ observe with regard to *R. rapiformis.*

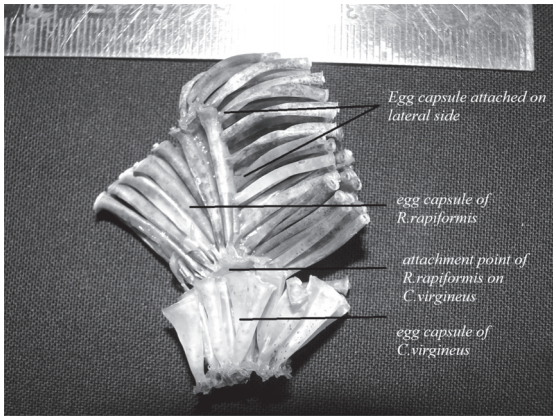

Fig. 1. Two layered egg capsules with lateral branching/ attachment

One more strange observation made is the branched nature of the capsules on the lateral side (Fig. 1) and such arrangement/attachment of capsules on the lateral side is looking like drepanium inflorescence where the flowers are aligned only on one plane. This report on the observation of attachment of additional capsules to the capsules or branched nature of the capsules probably be the first time reporting in *R. rapiformis.* Thus, in the present study, it is observed that *R. rapiformis* laid egg capsules in layers on the egg capsules of *C. virgineus*. There were more than 4-5 individual capsules attached on a single capsule of *C. virgineus*. The egg capsules were also laid on the lateral axis of the capsules in *R. rapiformis*. All these observations with regard to *R. rapiformis* are probably be useful to malacologist particularly those who are working on molluscan embryology and genetics.

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