PJ-6

Eggs and Egg Capsules of Three Stenoglossan Gastropod Species, *Ceratostoma rorifluum, Ocinebrellus inornatum* & *Neptunea constricta*, (Mollusca: Neogatropoda) in the Korean Waters

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Introduction

The morphology of molluscan egg capsule is generally regarded as being species specific (Turner, 1992), and form and structure of the egg capsule reflect the degree of anatomical complexity of the reproductive organs (Fretter & Hian, 1984). *Ceratostoma rorifluum* and *Ocinebrellus inornatum* are common and widespread muricid species found throughout the Korean rocky and boulder shores, and *Neptunea constricta* is found frequently from continental shelf of the eastern sea of Korea. In spite of their predominance along the Korean coasts, morphology of their eggs and egg capsules is unknown so far. The purpose of the present study, therefore, is to provide descriptions and illustrations for identifying egg capsules of the foregoing 3 stenoglossan gastropod species.

Materials and Methods

- Sampling sites: *C. rorifluum* & *O. inornatum* - subtidal sites of rocky shores of Pusan and Yangpo, Korea, respectively on May 1999 with skin diving; *N. constricta* - offshore of Kampo (*ca.* 60 m in depth), Korea on December 1999 with whelk trap
- Rearing: *C. rorifluum* & *O. inornatum* - sea water aquariums (*ca.* 4 L in volume) separately with aeration and held at 12-15°C in the laboratory for spawning
- Field capture: *N. constricta* with egg capsules on its shell surface
- Measurement: approximately 10 centrally positioned capsules with an ocular micrometer attached to a dissecting microscope (Leica MZ12)
- Drawing: drawing tube attached to a dissecting microscope
- Morphological terminology: D'Asaro (1970) and Fretter & Graham (1994)

Results

- Morphology of the capsules: see 'Poster'

• Capsular dimension and enumerations of eggs and egg capsules (value = mean)

Character	Sepcies	*C. rorifluum*	*O. inornatum*	*N. constricta*
Size of adult shell (mm)		38.74	29.70	123.18
Number of egg capsules/female		30	21	32
Number of eggs/capsule	Viable E	43	-	404
	Nurse E		-	836
	Sum	417	635	1,240
Size of egg capsule (mm)	Length	7.75	6.43	26.90
	Width	3.95	3.00	15.09
Size of egg (mm)		0.26	0.16	.37

-: no morphological difference between viable and nurse eggs

• Laminal structure of the capsule wall

Character	Species	*C. rorifluum*	*O. inornatum*	*N. constricta*
Number of laminae	Concave side (CCS)	4	4	3
	Convex side (CVS)	4	5	3
Remarks		thicker in CVS	CVS > CCS	hanging 3rd layer

Discussion

C. rorifluum and *O. inornatum* spawned the typical form of egg capsules shown in most muricid species. According to Amio's (1963) scheme, the egg capsules of the foregoing 2 species could be classified as 'adhesively aggregative type' having outer and inner capsule layers, and to Soliman's (1987) scheme they could be assigned into 'type 2.4'. Egg capsule of *C. rorifluum* is composed of 4 laminae in the all side. Among the 4 layers, the innermost layer in the CVS is considerably thicker than that in the CCS. The innermost layer in the CVS, therefore, might give the impression that the layer functioned as a mechanical cushion for the eggs within the layer when harsh waves hit the CVS of the capsule. Although the hypothesis, that an important role of the CVS of the capsules in *C. rorifluum* is presumably a mechanical cushion and/or protection for the eggs, may be also supported by the fact that 5 laminal structure is found only in the CVS in *O. inornatum*, yet the functional significance of many aspects of the benthic egg coverings remains unexplored, especially the specific role of each of these laminae has not been determined (Rawlings, 1999).

Selected References

Amio, M. 1963. A comparative embryology of marine gastropods, with ecological considerations. J. Shimonoseki Univ. Fish., 12: 229-358 (in Japanese).

Soliman, G.N. 1987. A scheme for classifying gastropod egg masses with special reference to those from the northwestern Red Sea. J. Moll. Stud., 53: 1-12.