Pedunculate Barnacles of the Symbiotic Genus *Octolasmis*  
(Cirripedia: Thoracica: Poecilasmatidae)  
from the Northern Gulf of Thailand

**WILLIAM B. JEFFRIES**1,2*, **HAROLD K. VORIS**2, **PHAIBUL NAIYANETR**3  
AND **SOMSAK PANHA**3

1Department of Biology, Dickinson College, Carlisle, Pennsylvania 17013, USA  
2Department of Zoology, Field Museum of Natural History, Chicago, Illinois 60605, USA  
3Department of Biology, Faculty of Science, Chulalongkorn University, Bangkok, 10330, THAILAND

**ABSTRACT.**—Edible crabs and lobsters (Crustacea), obtained from fishermen  
and in village markets of a few northern provinces adjoining the Gulf of  
Thailand, revealed upon examination and dissection the presence of six  
barnacle species of the genus *Octolasmis*. Four of these symbiotic barnacle  
species occupied protective niches, cemented to structures within the gill  
chambers of the host. Whereas two more exposed species, cemented to the  
exoskeleton and external mouthparts of the hosts, were protected by robust  
calcareous plates.

**KEY WORDS:** *Octolasmis*, Crustacea, Barnacle, Symbiosis, Gulf of Thailand

In the warmer oceans of the world, marine  
Crustacea of the Order Decapoda are frequently  
infested with epizoic pedunculate barnacles of  
the genus *Octolasmis* (Jeffries and Voris, 1996). In the seas adjacent to Singapore, for  
example, decapods representing 18 families, 38  
genera, and 55 species were surveyed as  
potential hosts of octolasmids. Of these, 27  
species representing 9 families were infested  
with up to 7 *Octolasmis* species each (Jeffries et  
al., 1982). More recently, decapods from the  
Gulf of Mexico representing 40 families, 75  
genera, and 114 species, were surveyed. Of  
these, 26 species representing 11 families were  
infested with up to 4 *Octolasmis* species each  
(Jeffries and Voris, 2005).

A number of *Octolasmis* species live in the  
gill chambers of their hosts cemented to the gill  
lamellae (Fig. 1) and are often present in large  
numbers (Voris et al., 2000). Thus they occupy  
space on the gills normally available for  
respiration with the result that the host is  
debilitated and may die (Gannon and Wheatly,  
1992). The economic impact of such large  
infestations on the shellfish industry seems  
obvious but remains undocumented.

During November and December 2004,  
some edible species of crabs and lobsters were  
purchased at village markets along the northern  
perimeter of the Gulf of Thailand. Upon  
examination, it was discovered that most  
species were infested with one or more species  
of *Octolasmis*.

Body shape and size, the presence or  
absence of calcareous plates, as well as  
variations in plate size, shape and disposition,  
are useful elements in barnacle species

*Corresponding author:  
Tel: 1-717245-1339  
Fax: 1-717245-1130  
E-mail: jeffries@dickinson.edu
identification. The most cosmopolitan species of the genus *Octolasmis* is *O. lowei* (Darwin, 1851). It has a muscular peduncle without plates, a fleshy capitulum with 5 calcareous plates embedded in the surface, which support it and protect vital organs such as the feeding apparatus enclosed by it. The calcareous plates include 2 scuta, 2 terga, and 1 carina, which are visible to the unaided eye but are more easily recognized with magnification, using either a hand lens or a dissecting microscope.

In this study the following species of *Octolasmis* were observed on hosts collected from the northern portion of the Gulf of Thailand: *Octolasmis angulata* (Aurivillius, 1894); *Octolasmis cor* (Aurivillius, 1892); *Octolasmis lowei* (Darwin, 1851); *Octolasmis neptuni* (MacDonald, 1869); *Octolasmis tridens* (Aurivillius, 1894); and *Octolasmis warwickii* Gray, 1825 (Fig. 2).

The above mentioned *Octolasmis* species were found on 5 species of crustacean hosts belonging to 3 families. The host families and species were as follows: Menippidae Ortmann, 1893, *Myomenippe granulosa* (A. Milne Edwards, 1867); Portunidae Raffinesque, 1815, *Portunus pelagicus* (Linnaeus, 1758), *Scylla serrata* (Forskål, 1755), and *Thalamita danae* Stimpson, 1858); and Scyllaridae Latreille, 1825, *Thenus orientalis* (Lund, 1793).

*Octolasmis angulata*, with a mean capitular length of $2.40 \pm 0.34$ mm and 3 reduced capitular plates, 2 scuta and a carina, has the second lowest capitular plate coverage (10.5 per cent) among 28 *Octolasmis* species compared
It was described by Aurivillius, 1894 as *Dichelaspis angulata* and observed in the gill chamber of a palinurid from the Java Sea. Daniel (1955) reported *O. angulata* in the gill chambers of species of the families Calappidae, Palinuridae, and Portunidae from the Bay of Bengal, Arabian Sea, Malay Archipelago, and off Madras. In Singapore it was observed in the gill chambers of 15 host species representing 4 families (numbers following family names indicate number of host species infested), Majidae (1), Menippidae (2), Portunidae (8), and Xanthidae (4) (Jeffries et al., 1982). In the current study, *O. angulata* was observed in the gill chambers of 3 host crabs of the families Menippidae (1) and Portunidae (2).

*Octolasmis cor*, with a mean capitular length of $2.53 \pm 0.43$ mm and 3 robust capitular
plates, 2 scuta, and a carina, has a capitular plate coverage of 27.3 per cent (Voris and Jeffries, 1997). It was described by Aurivillius (1892) as *Dichelaspis cor* on the gills of a decapod from South Africa. Daniel (1955) reported *O. cor* in the gill chambers of a species of Portunidae from the Indian Ocean, the Malay Archipelago and Madras. In Singapore *O. cor* was observed in the gill chambers of 6 crab species, all in the family Portunidae (Jeffries et al., 1982). In the current study it was observed in the gill chambers of 2 crab species of the Portunidae.

*Octolasmis lowei*, with a mean capitular length of 3.29±0.29 mm and 5 reduced capitular plates, 2 scuta, 2 terga, and a carina, has a capitular plate coverage of 23.6 per cent (Voris and Jeffries, 1997). Darwin (1851) described *Dichelaspis lowei* attached to a brachyurous crab of undisclosed geographic origin. Daniel (1955) reported *O. lowei* from the Indian Ocean, Malay Archipelago, Australia, Japan, Formosa, Atlantic Ocean and off Madras in the gill region of decapod Crustacea of the Palinuridae (1) and Portunidae (1). In Singapore it was observed in the gill chambers of 2 species of the families Portunidae (1) and Scyllaridae (1) (Jeffries et al., 1982). In the Gulf of Mexico *O. lowei* was the most ubiquitous species, being present primarily in the gill chambers of 25 of the 27 host species representing the families: Calappidae (1); Glyphocrangonidae (1); Hepatidae (1); Leucosiidae (1); Menippidae (1); Mithracidae (3); Parthenopidae (1); Pisadae (4); Portunidae (8); Raninidae (1); Scyllaridae (2); and Xanthidae (1) (Jeffries and Voris, 2005). In the current study it was observed in the gill chambers of 2 host species of the Menippidae (1) and the Scyllaridae (1).

*Octolasmis tridens*, with a mean capitular length of 2.56±0.25 mm and 5 robust capitular plates, 2 scuta, 2 terga, and a carina, has a capitular plate coverage of 71.0 per cent (Voris and Jeffries, 1997). It was reported from the Gulf of Siam, at Kelantin and Trengannu, and the China Sea by Lanchester (1902) as *Dichelaspis occlusa*, on a species of Scyllaridae. Daniel (1955) observed it in large numbers from the mouth-parts and entrances to gill chambers of cray-fish off the coast of Madras. He listed its distribution as the Pacific Ocean, Philippines, Gulf of Siam, Kelantan and Trengannu, Malay Peninsula, Straits of Malacca, N. Sumatra, and Bay of Bengal. In Singapore it was observed on 10 decapod species of the families Portunidae (8), Scyllaridae (1), and Menippidae (1) (Jeffries et al., 1982). In the current study, it was observed on antennae, external mouthparts, at incurrent openings, and on the base segment of the chelae of 3 decapod species among the Portunidae (2) and Scyllaridae (1).

*Octolasmis warwickii*, with a mean capitular length of 6.06±0.74 mm and 5 robust capitular plates, 2 scuta, 2 terga, and a carina, has a capitular plate coverage of 43 per cent (Voris and Jeffries, 1997). It was reported from the Gulf of Siam, at Kelantin and Trengannu, and the China Sea by Lanchester (1902) as *Dichelaspis equina* on a species of Portunidae. In Singapore it was observed on the exoskeleton of 17 decapod species in seven families: Dorippidae (1), Leucosiidae (1), Majidae (1), Menippidae (2), Portunidae (10), Scyllaridae (1) and Xanthidae (1) (Jeffries et al., 1982). In the current study it was observed on 2 species described as *Dichelaspis neptuni* by MacDonald (1869) from the gills of a portunid from Sydney, Moreton Bay. In Singapore it was observed in the gill chambers of species of the families Menippidae (4) and Scyllaridae (1) (Jeffries et al., 1982). In the current study it was observed in the gill chambers of 2 host species of the Menippidae (1) and the Portunidae (1).
of the families Portunidae (1) and Scyllaridae (1) usually on the dorsal carapace, singly or in small clusters, and sometimes attached to the basal segment of an appendage.

Observations gleaned from examination of potential crustacean hosts of the symbiotic barnacle genus *Octolasmis* obtained from local fishermen in a few northern provinces adjoining the Gulf of Thailand, document that the waters of the Gulf support at least six *Octolasmis* species. This new information, coupled with published reports, suggests that the Gulf of Thailand may be one of the richest habitats on earth in terms of the species diversity within the genus *Octolasmis*.

**ACKNOWLEDGEMENTS**

We are grateful to the faculty, graduate students, and support staff of Chulalongkorn University, especially members of the Biology Department who hosted our recent visit, introduced us to key Thai scientists, helped us plan, and execute the very important reconnaissance tours to fishing villages on the west and east coasts of the Gulf. Their professional skills, encouragement and enthusiasm, were vital to the success of this international collaborative venture. We also wish to thank Jack O’Brien for his helpful comments on an earlier version of this manuscript.

**LITERATURE CITED**


Received: 17 January 2005
Accepted: 7 February 2005