

**The First Occurrence of the Paedomorphic Derivative Hydrozoan
Eugymnanthea (Leptomedusae, Eirenidae) from Taiwan,
with a Report of a New Host**

SHIN KUBOTA¹⁾, CHANG-FENG DAI²⁾, CHING-LONG LIN³⁾ and JU-SHEY HO⁴⁾

¹⁾Seto Marine Biological Laboratory, Kyoto University,
Shirahama, Wakayama 649–2211, Japan

²⁾Institute of Oceanography, National Taiwan University, Taipei, Taiwan

³⁾Department of Aquaculture, National Chiayi Institute of Technology,
Chiayi 60083, Taiwan

⁴⁾Department of Biological Sciences, California State University,
Long Beach, California 90840–3702, U.S.A.

Abstract A bivalve-inhabiting hydrozoan *Eugymnanthea japonica* was found for the first time in Taiwan as the southernmost population of this species in the world. In Taiwan *E. japonica* is associated with *Crassostrea gigas* and *Perna viridis*. The association with *P. viridis* is the first report, though the association rate is very low. The morphology of *E. japonica*, particularly the mature medusae of the present material is described and illustrated.

Key words: bivalve-inhabiting hydrozoan, *Eugymnanthea japonica*, Taiwan, new host, distribution

Introduction

During recent faunal surveys on the bivalve-inhabiting hydrozoans in the Southeast Asia, one of the most derivative members was found out in Taiwan (see Lin and Ho, 1999). After examination of many specimens, particularly of the mature medusae, the taxonomic status of this hydrozoan is determined and described and illustrated in this paper as a new member of the fauna of Taiwan.

Materials and Methods

Cultured oysters were purchased at Putai, Chiayi, located in the middle part of the western coast of Taiwan (Fig. 1) on July 28, 1998. Many, small green mussels were attached to these oysters. These two bivalve species, *Crassostrea gigas* (Thunberg) and *Perna viridis* (Linnaeus) were carried back to the laboratory and examined within 4 hours after purchase in the former species and within 4–8 hours in the latter species. Hydroids bearing large medusa buds were picked up from each host and kept in a petri dish filled with fresh seawater taken from Putai port in the air-conditioned laboratory (ca 28°C). The seawater was changed more than 10 times to keep the culture clean and wait for release of the medusae. Most of the mature medusae were obtained on the next day, but some on the following day. Their morphology was examined with a microscope. Spawning was suppressed by wrapping the petri dishes with aluminum foils to detect sexes.

Description of *Eugymnanthea japonica* Kubota from Taiwan

Synonymy

See Kubota (1991).

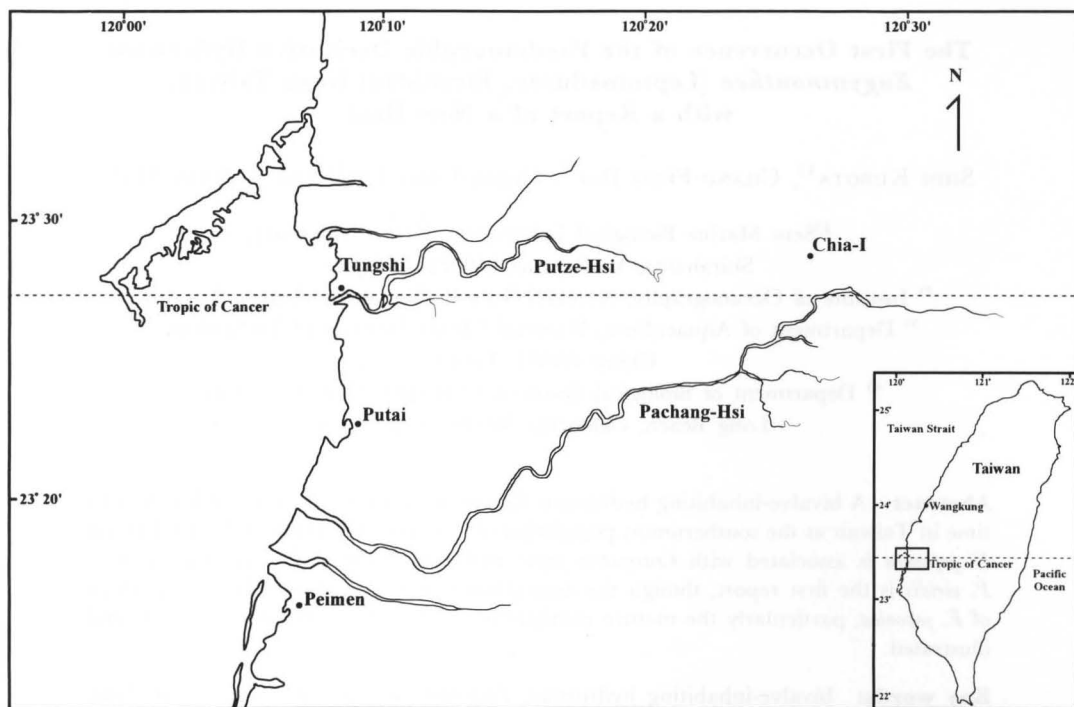


Fig. 1. Map showing the collecting site.

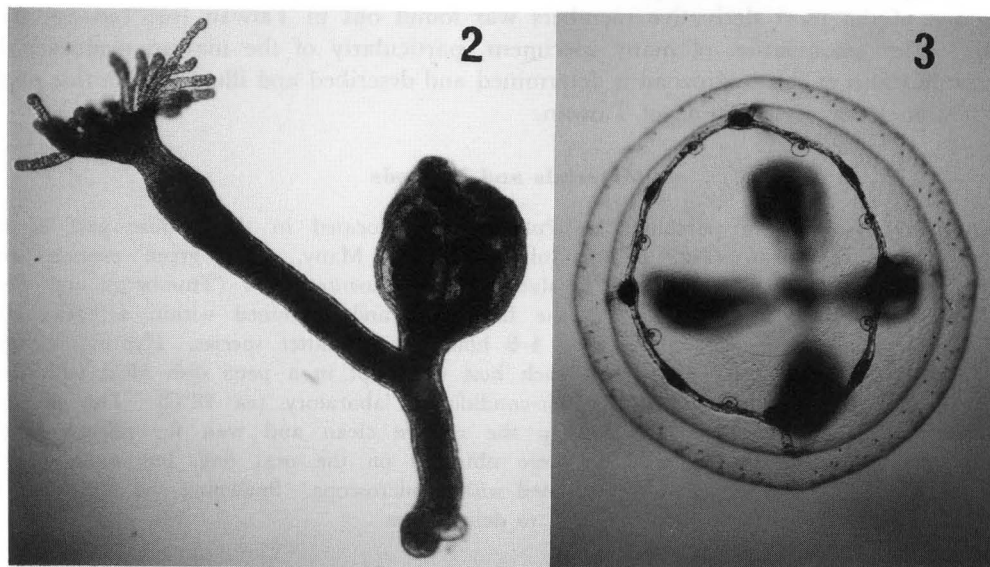


Fig. 2. The hydroid with a well-developed medusa bud of *Eugymnanthea japonica* from Taiwan.

Fig. 3. The oral view of the mature medusa (1-day-old after release from the hydroid) of *Eugymnanthea japonica* from Taiwan. Note eight statocysts, eight statoliths, and eight marginal warts.

Hydroid

The morphology of the present hydroids (Fig. 2) is similar to that described on the specimens from Japan (see Kubota, 1979, 1985, 1987). The largest specimen picked up from *Perna viridis* was measured and its length from the hypostome to the pedal disk was 1.4 mm and the tentacles were 24 in number.

Table 1. Taxonomic characters of the mature medusae of *Eugymnanthea japonica* from Taiwan.

Sex	Host spp. ¹⁾	No. of hosts exam.	No. of medusae with manubrium among medusae exam.	No of statoliths per statocyst	No. of statoliths per medusa	No. of marginal warts per medusa	Max. diameter (mm)
Male	Cg	11	35 (38)	0-2	5-10	4- 8	1.2
Female	Cg	11	26 (28)	0-2	7-13	6-10	0.94
?	Cg	10	37 (37)	-	-	-	-
Female	Pv	1	2 (2)	1-2	9-11	7- 8	0.97

¹⁾Cg: *Crassostrea gigas*, Pv: *Perna viridis*.

-: no data.

Table 2. Frequency of the number of statoliths per statocyst in the mature medusae of *Eugymnanthea japonica* from Taiwan.

Sex	Host species	No. of statoliths/statocyst		
		0	1	2
Male	<i>Crassostrea gigas</i>	10	282	4
Female	<i>Crassostrea gigas</i>	4	189	13
Female	<i>Perna viridis</i>	0	10	5

Table 3. Frequency of the number of statoliths (Stl) and marginal warts (Mw) in the mature medusae of *Eugymnanthea japonica* from Taiwan.

	No. of medusae exam.	Host spp. ¹⁾	No. of meristic characters per medusa									
			4	5	6	7	8	9	10	11	12	13
Stl	38 males	Cg	0	1	1	3	32	0	1	0	0	0
	28 females	Cg	0	0	0	4	18	3	1	0	1	1
	2 females	Pv	0	0	0	0	0	1	0	1	0	0
Mw	38 males	Cg	1	2	0	12	23	0	0	0	0	0
	28 females	Cg	0	0	4	2	21	0	1	0	0	0
	2 females	Pv	0	0	0	1	1	0	0	0	0	0

¹⁾Cg: *Crassostrea gigas*, Pv: *Perna viridis*.

Mature medusa

Some important taxonomic character states of the mature medusae (Fig. 3) are shown in Tables 1–3, together with the maximum diameter of the umbrella.

The diagnostic characters of the present material accords well with those of the specimens in Japan (see Kubota, 1979, 1985, 1987, 1991).

Gametes

The diameter of unfertilized eggs spawned from four medusae (originated from three specimens of *Crassostrea gigas*) was measured within 13 minutes after spawning: 56.0 (mean) ± 4.7 (SD) μm , 48.0 – 65.6 μm in range ($N=45$). Some ovoid eggs were not included in the measurements.

The egg size of the present material is not different from that of the Japanese one (see Kubota, 1985, 1987).

Hosts and association rate

The hydroids were associated with *Crassostrea gigas* at the rate of 47.5% ($N=80$) and with *Perna viridis* at the rate of 1.6% ($N=64$). The latter association was the first finding, though very rarely occurred. The hydroids attached to everywhere on all the body portions of these two host species except for the foot. The number of hydroids found in *Perna viridis* was 236.

Multiple colonization

In at least five specimens of *Crassostrea gigas*, multiple colonization was found since the mature medusae of both sexes were released from these hosts.

Distribution

Only in the western Pacific, restricted in the central to southern Japan (see Kubota, 1991) and also in Taiwan as the southernmost distributional record (present study).

Acknowledgements

The authors wish to offer their heartfelt thanks to Ms. Yu-Fen Pai for her kind assistance in the collection of the material.

References

- Kubota, S. 1979. Occurrence of a commensal hydroid *Eugymnanthea inquilina* Palombi from Japan. J. Fac. Sci. Hokkaido Univ., Ser. VI, Zool., 21: 396–406.
- Kubota, S. 1985. Systematic study on a bivalve-inhabiting hydroid *Eugymnanthea inquilina japonica* Kubota from central Japan. J. Fac. Sci. Hokkaido Univ. Ser. 6, Zool., 24(1): 70–85.
- Kubota, S. 1987. Occurrence of a bivalve-inhabiting hydroid *Eugymnanthea inquilina japonica* Kubota from Okinawa Island, southwest of Japan, with notes on parthenogenesis. Galaxea, 6: 31–34.
- Kubota, S. 1991. The stability of diagnostic characters of the medusa of a bivalve-inhabiting hydrozoan *Eugymnanthea japonica* Kubota in Japan. Proc. Japan. Soc. Syst. Zool., (44): 1–7.
- Lin, C.-L. and J.-S. Ho. 1999. Poecilostomatoid copepods parasitic in bivalve mollusks of Taiwan. Publ. Seto Mar. Biol. Lab., 38(5/6): 201–218.