New Association of Eugymnanthea japonica (Hydrozoa, Leptomedusae, Eirenidae) with an Oyster, Dendrostrea sandvichensis (Bivalvia, Ostreoida, Ostreidae), in Okinawa Island, Japan

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New Association of *Eugymnanthea japonica* (Hydrozoa, Leptomedusae, Eirenidae) with an Oyster, *Dendrostrea sandvichensis* (Bivalvia, Ostreoida, Ostreidae), in Okinawa Island, Japan

Shin Kubota¹, Setsuko Iwana⁴, Naomasa Oshiro² and Kenji Torigoe³

Abstract An association is reported for the first time between *Dendrostrea japonica* (Bivalvia, Ostreidae) and *Eugymnanthea japonica* (Hydrozoa, Leptomedusae), based on specimens collected in Okinawa in 2002. A brief description of the mature medusa of the latter species, obtained by laboratory-culture, is also given.

Key words New association, bivalve-associated hydroid, *Eugymnanthea japonica*, *Dendrostrea sandvichensis*, mature medusa, Okinawa

INTRODUCTION

In the Nansei Islands the bivalve-inhabiting hydroid *Eugymnanthea japonica* Kubota, 1979 has been reported in association with *Crassostrea vitrefacta* (Sowerby) from Yagaji, Nago City, Okinawa Island, and its medusa was obtained by laboratory-culture (Yamada and Kubota, 1979; Kubota, 1979). The medusa of this species was also collected in plankton samples taken in the harbor at Akajima Island, Kerama Islands (Kubota, 1998). One of us (SK) has been carrying out a faunal survey of bivalve-inhabiting hydrozoans in the Nansei Islands and has found hydrooids and medusae of *E. japonica* at some other localities in this region as well, associated with two bivalve species, *Barbatia virescens* (Reeve) and *Crassostrea gigas* (Thunberg), which were previously known as its hosts in Kyushu, Honshu, and Shikoku (Kubota unpublished data; Kubota, 1991, 1999).

Recently two of us (SI and NO) found hydrooids within the mantle cavity of oysters. One of the bivalve species involved (identified by KT) proved to be

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a hitherto unreported host for hydroids, *Dendrostrea sandvichensis* (Sowerby, 1871). The host specimens were collected from Ginowan Port Marina in Okinawa Island on February 21, 2002, by SI.

In order to decide the taxonomic position of these associated hydrozoans, we cultured the materials as much as possible, and observed their mature medusae, the stage at which identification is possible (see Kubota, 1991). After the hydroids had been removed from the host in the laboratory (in Okinawa by SI and NO and in Shirahama, Wakayama Prefecture, by SK), they were cultured in filtered natural seawater taken from around the respective two laboratories at room temperature (about 20° - 24°C or more). In Okinawa, medusae were liberated on and after March 4, 2002, and in Shirahama release took place on and after March 6, 2002.

As a result, the diagnostic characters of *Eugynnanthea* species, including the presence or absence of the manubrium and the number of statoliths per statocyst in the mature medusa, could be observed under the microscope. The observed states of these two features (Table 1) allow the present hydroid to be assigned to *Eugynnanthea japonica* (see Kubota, 1979, 1987, 1991), which is one of the most advanced bivalve-inhabiting hydrozoans in the Eirenidae, differing from the congeneric species *E. inquilina* Palombi, which occurs in the Mediterranean Sea (Kubota, 2000).

In the present paper, the first finding of the association between *Dendrostrea sandvichensis* and *Eugynnanthea japonica* is reported, with a brief morphological description of the mature medusa of *E. japonica*.

**Results and Discussion**

(1) **New host and attachment of the hydroids**

Three out of 25 bivalve specimens harbored the present hydroids. The hydroids were usually attached to the mantle of the host (Fig. 1), and some zooids produced medusa buds. Among the specimens of the new host *Dendrostrea sandvichensis* (Sowerby, 1871), the largest individual was 28 mm in shell length and 43 mm in shell height, and all were attached to a rope reaching to 2.5 m depth. The water temperature at the collecting site was around 20°C.

This host species has been recorded from the Boso Peninsula of Honshu to southern Japan and is not a rare species (Torigoe, 1981). Since *E. japonica* is common along the coasts washed by the warm Kuroshio Current (Kubota, 1999), the present association will, very likely, be found in other regions in the future.

(2) **Morphology of the medusa of *Eugynnanthea japonica***

Mature medusae of about 1 mm in diameter possess a vestigial manubrium, 8
Fig. 2. One-day-old mature female medusa of *Eugymnanthea japonica* from Ginowan, Okinawa Island, Japan (still attached to the hydroid by its apex), oblique view, arrow indicating the vestigial manubrium.

Fig. 3. Oral view of another mature medusa of *Eugymnanthea japonica*, showing inclusion of a small number of statoliths per statocyst, usually 1 (arrow).

**Table 1.** Measurements of mature medusae of *Eugymnanthea japonica* associated with a new host bivalve, *Dendostrea sandvichensis*, from Ginowan Port Marina, Okinawa Island, Japan.

<table>
<thead>
<tr>
<th>Age (in days)</th>
<th>Sex</th>
<th>Manubrium</th>
<th>Diameter (mm)</th>
<th>No. of statocysts</th>
<th>No. of marginal swellings</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>present</td>
<td>0.92</td>
<td>8 (2x1+1x7)</td>
<td>not examined</td>
</tr>
<tr>
<td>1</td>
<td>female</td>
<td>present</td>
<td>0.90</td>
<td>8 (1x8)</td>
<td>not examined</td>
</tr>
<tr>
<td>2</td>
<td>spent</td>
<td>present</td>
<td>1.18</td>
<td>8 (1x8)</td>
<td>4+4</td>
</tr>
<tr>
<td>2</td>
<td>spent</td>
<td>present</td>
<td>1.10</td>
<td>8 (2x1+1x7)</td>
<td>4+4</td>
</tr>
<tr>
<td>2</td>
<td>spent</td>
<td>present</td>
<td>1.08</td>
<td>8 (2x1+1x7)</td>
<td>4+4</td>
</tr>
<tr>
<td>1</td>
<td>female</td>
<td>present</td>
<td>1.08</td>
<td>8 (2x1+1x7)</td>
<td>4+4</td>
</tr>
<tr>
<td>1</td>
<td>female</td>
<td>present</td>
<td>1.00</td>
<td>8 (1x8)</td>
<td>4+4</td>
</tr>
<tr>
<td>1</td>
<td>female</td>
<td>present</td>
<td>1.03</td>
<td>8 (1x8)</td>
<td>4+4</td>
</tr>
</tbody>
</table>
statocysts, and 8-9 statoliths (a statocyst contains 1, sometimes 2 statoliths) (Figs. 2, 3; Table 1). The morphology of the present mature medusae associated with the present new host accords well with that of medusae associated with other known hosts such as *Mytilus galloprovincialis*, *Crassostrea gigas*, *Chlamys farrelli*, *Septifer virgatus*, and *Barbatia virescens* (Kubota, 1979, 1987, 1991, 1993, 1998, 2000). No distinct differentiation is detected among the hydrozoans symbiotic with any host.

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**References**


요 と 約

2002년 2월에 총수주에는 야생 분리의 노코리가키 (水深2.5m以浅의 ロープ付着) 3개体에共生する

サイドリヒドドラクラゲを世界で初めて記録した。

飼育により得たサイドリヒドラクラゲの成熟

クラゲの形態学的特徴（口柄を有し、各平衡胞が

通常1個の平衡石を含有）を観察し、近縁種のチ

チョウサイドリヒドラクラゲの標識（口柄を欠如し、各平衡胞に通常2-3個の平衡石を含有）

とは明瞭に異なることを確認した。

（2003년 4月12日受理）