

## New record of Umbraculoidea (Gastropoda: Opisthobranchia) from Taiwan

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**ABSTRACT :** We found the umbraculid snail, *Umbraculum umbraculum* (Lightfoot, 1786), alive at Taiwan. This species belongs to the family Umbraculidae in the order Umbraculoidea and apparently individuals are exceptionally rare in the tropical zone. It is the new record of umbraculoid (Gastropoda: Opisthobranchia) in Taiwan. Ecological information and photographs of the specimen are also provided in this report.

**KEYWORDS :** new record, Opisthobranchia, Umbraculidae, *Umbraculum umbraculum*, Taiwan

### Introduction

The Umbraculoidea is a small, specialized order of opisthobranchs (Willan 1987, 1998; Wagele & Willan 2000). Members are commonly known as umbrella slugs. The family Tylodinidae is the most primitive of the Umbraculoideans. Members have an external, limpet-like shell beneath which the animal can withdraw fully. The second family Umbraculidae, is characterized by a small, external heavily, calcified, flattened shell which the animal cannot withdraw beneath. All Umbraculoideans are sponge-feeders and only to eat the sponges of the class Demospongiae (Willan, 1984).

The species belonging to the order Umbraculoidea are widespread in the tropical to warm temperate Indo-West Pacific Ocean (Willan, 1998), however, they apparently individuals are exceptionally rare in the tropical zone (R.C. Willan personal communication). Not a single member was recorded in any of the previous studies of the fauna of Taiwan (Kuroda, 1941; Tan, 1987; Chao & Lee, 2002). Here, *Umbraculum umbraculum* (Lightfoot, 1768), which belong the family Umbraculidae, is reported in Taiwan for the first time and this record is supplemental with photograph of living specimen and informative on its habitat.

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### Materials and methods

One specimen was collected on 22<sup>nd</sup> Sep.2003 at the high-tide zone of Hengchun Peninsula, southern Taiwan by Y. W. Chiu (Fig. 1.). This specimen was preserved and deposited at the National Museum of Marine Biology and Aquarium (NMMB-M000753). This species was also photographed at Lanyu (Orchid Island), an island located off southeastern Taiwan in 1998.

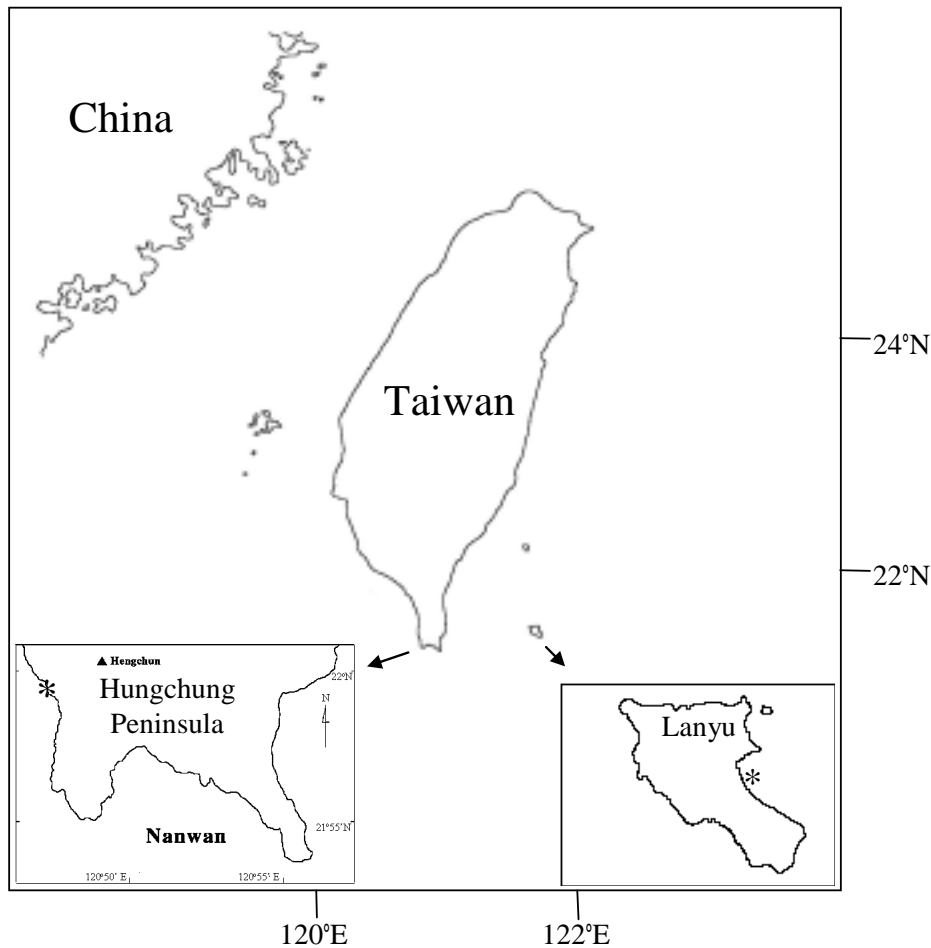


Fig. 1. Map showing the localities mentioned in the text. The asterisks indicated the collection sites.

## Systematics

Order: Umbraculoidea Dall, 1889

Family: Umbraculidae Dall, 1889

Genus: *Umbraculum* Schumacher, 1817

*Umbraculum umbraculum* (Lightfoot, 1786)

**Material examined :** The specimen (NMMB-M000753) used in this study was collected by the Y. W. Chiu at the high-tide zone of Hengchun Peninsula, southern Taiwan, on September 22, 2003. This specimen was found on top of rocks on a coral reef of the high-tide zone in an area with no protection.

**Diagnosis :** Specimen with large external shell covering the body (Fig. 2). Shell: external, white; length 33 mm, diameter 22 mm; strongly calcified; apex blunt and central. Patelliform shell covered with a beard-like periostracum. Animal: body circular and much larger than shell, mantle obvious, lying beneath shell in mantle with serrated margins; two pairs of cephalic tentacles above mouth. With a pair of enrolled rhinophores. Eyes located at rhinophoral bases. Foot larger tuberculate dorsally; lateral surfaces with large, soft non-retractile tubercles decreasing in size toward periphery. Sole broad and flat. Color: color of fresh specimen bright orange; pale white when alcohol-preserved.

**Distribution:** This species distribute throughout tropical and warm-temperate Indo-Pacific Ocean (Willan and Burn 2003).

**Remarks:** This specimen is easily distinguished by the umbrella-like shell and the large tuberculate foot. The beard-like periostracum on the shell is a conspicuous character. *Umbraculum umbraculum* externally resembles *Tylodina corticalis* (Tate, 1889). There are some similarities in the shape of their shells, and the large heavily calcified and patelliform external shells. They differ in the soft body shape. *T. corticalis* is characterized by a large head and retractile penis. When *T. corticalis* crawls, the bright yellow body is elongated and extends in front of and behind the shell. *Umbraculum umbraculum* appears to be much more circular in shape.

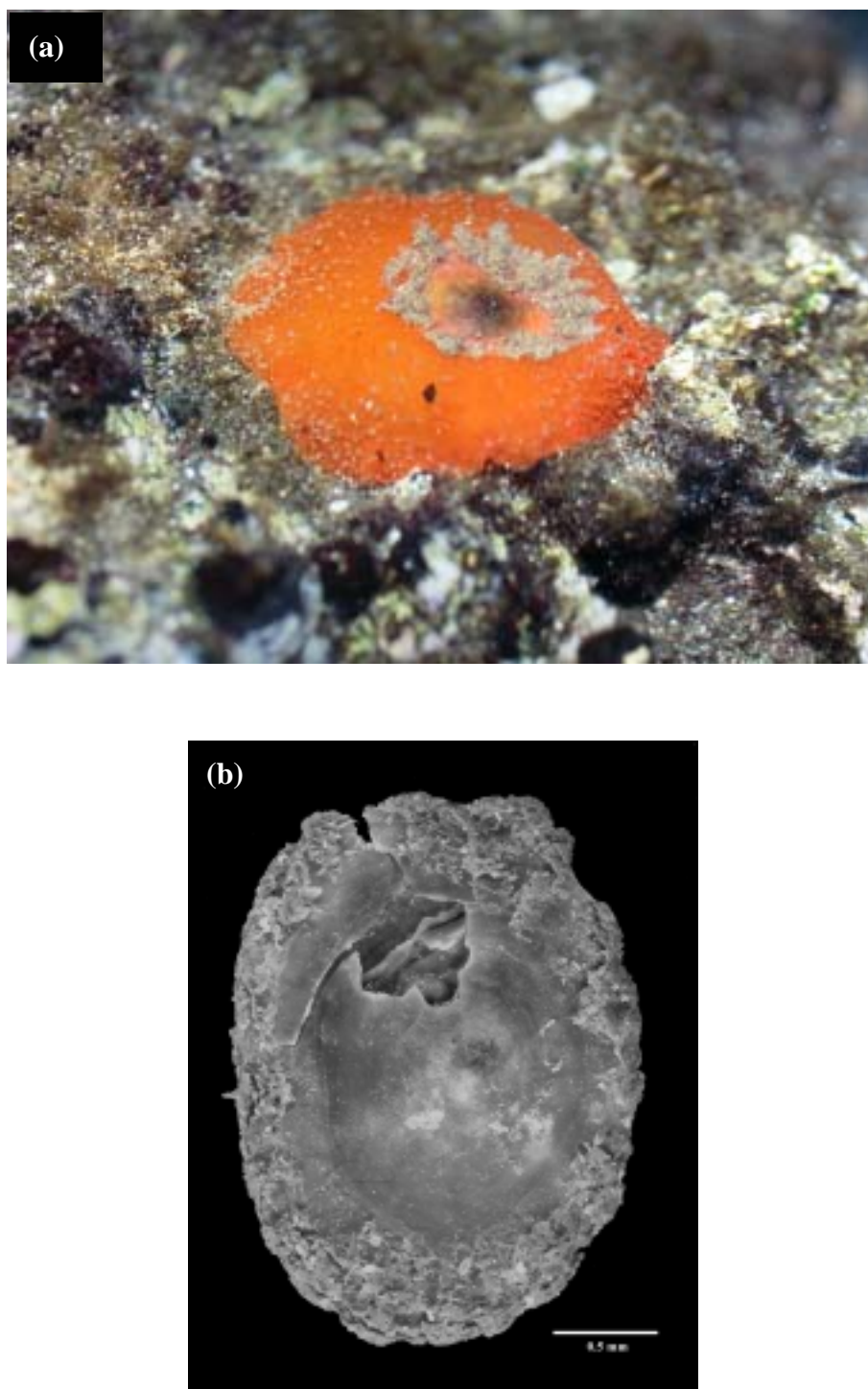


Fig. 2. Photograph of (a) the individual in its natural habitat and (b) specimen in NMMBA.

## Discussion

Burn (1959) suggested that there is only one recent, worldwide, pan-tropical/warm temperate species in the genus *Umbraculum*, however, Willan & Burn (2003) mentioned that this opinion has yet to be tested and there are twelve recent nominal species of *Umbraculum*. There are many synonyms of *Umbraculum umbraculum* (Lightfoot, 1786), such as *Umbella chinensis* Martini, 1769, *Patella umbraculum* Lightfoot, 1786, *Umbraculum umbraculum* (Lightfoot, 1786), *Patella sinica* Gmelin, 1791, *Umbraculum sinicum* (Gmelin, 1791), *Operculatum aurantium* Pease, 1868 (see reviews in Valdes, 2001 and Willan & Burn, 2003). The type species of the genus *Umbraculum* were also discussed in articles by Valdes (2001) and Willan & Burn (2003). Willan & Burn (2003) suggested that the type species is *U. chinense* and the specific name should be attributed to Lamarck, 1801.

The coloration of *Umbraculum umbraculum* is variable ranging from gray, brown, and yellow, to orange and even reddish (Willan, 1998). The color pattern of the one specimen observed in southern Taiwan and another one individual at Lanyu observed were consistently bright orange (Fig. 2).

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## 台灣傘螺目貝類之新記錄

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### 摘 要

筆者在台灣恆春半島採集到一新記錄種 - 傘螺 *Umbraculum umbraculum* (Lightfoot, 1786)。本物種歸屬於傘螺科 (Family Umbraculidae)、傘螺目 (Order Umbraculoidea)，在熱帶地區海域並不常見。本次發現的傘螺為傘螺目貝類首次在台灣海域被報導的物種，本文描述了傘螺的形態和生態習性並提供生態照以供參考。

**關鍵詞：**新記錄，傘螺，傘螺科，後鰓亞綱，台灣

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