

6. Preliminary Report on some *Nautilus* Drifts and the Epifauna on *Nautilus* Shells in a Living State from the Tañon Strait, the Philippines

by

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Introduction

It was in 1964 the first to describe the stranded *Nautilus* shells from the Malacca Straits regarding the epifauna and the shell breakage. In that occasion the present writer estimated that these drifts had been brought from the Philippine seas to the east by the dominant current through the strait on the basis of gregarious occurrence of some sedentary animals such as acorn barnacles, oysters and serpulid worms on the inner surface of the living chamber of the shells. At the same time it was clarified that the living chamber was much easier to be broken by shock during the floating than the cameral portion of the inner whorl.

Similar examples of drift *Nautilus* shells in the Kuroshio current were also revealed from the Japanese coasts by him and some other workers.

During the field study on the habitat of *Nautilus* in the Tanon Strait, the Philippines in 1981, conducted by Professor S. HAYASAKA of Kagoshima University, it was fortune to obtain some living specimens with an attached fauna on the external shells.

This is a preliminary report on the occurrence of these epifaunas on the *Nautilus pompilius* shells in a living state. The writer also intends to introduce some broken shells stranded on the shore very close to the habitat in the Tañon Strait.

Epifauna

It is well known that the external shell of *Nautilus* species in a living state is usually smooth and lustrous without any attached organisms. The outer surface of the shell is composed of a thick nacreous layer which is hard and smooth enough to prevent attachment of adhesive or boring organisms except for the narrow area near umbilicus where the shell surface is somewhat rough if compared with the main part.

Some live specimens of *Nautilus macromphalus* from New Caledonia were found to be attached by the sedentary animals such as small stalked barnacles and slender serpulid tubes around the umbilical region during the long term rearing experiments in Japan (1976–1980).

The same observation was made in several cases of the rearing and trapping ex-

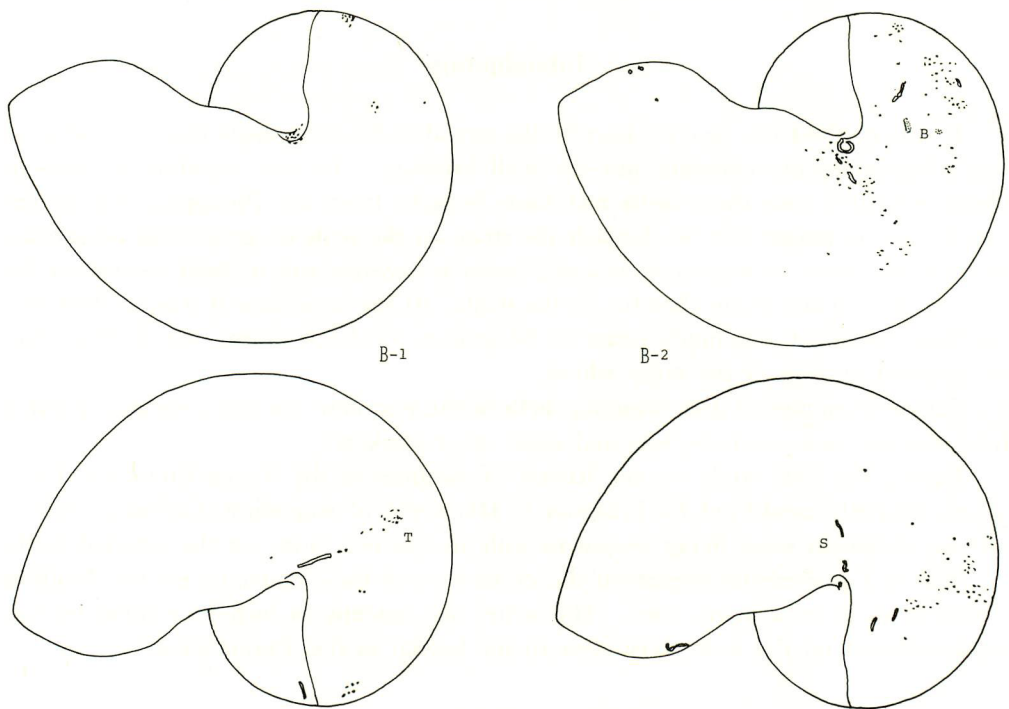
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periments in the Fijian and the Philippine seas.

Therefore our new material obtained from the Tañon Strait is unique to show an extraordinarily rich epifauna on the main portion of the shell. The specimen no. B-1, B-2 and B-8 were all adult females. It is worthy to note that no. B-8 is a full-grown individual that shows gerontic rugae on the shell surface of the living chamber where dense colonies of bryozoans are found.

A) Foraminifers

Small spots of the sedentary foraminifer *Homotrema rubrum* (LAMARCK) and *Miniacina miniacea* (PALLAS) were scattered on the adaxial portion of the external whorl especially near and on the chitinous covering of the specimen B-8 as illustrated on Plate 3.



Text-fig. 1. Distribution of the epifaunal animals on the *Nautilus pompilius* specimen nos. B-1 and B-2.

S: serpulid tubes (uncoiled); B: bryozoan colonies; F: foraminifera;
T: scars imprinted by serpulid tubes (coiled) and foraminifera

B) Bryozoans

As mentioned above the dendroid creeping colonies of *Stomatopora* species are found around the external part of the shell aperture (Plate 4). Although most of the colonies are dead it is clear that they initiated from the irregularly fractured surface of the whorl that could be suitable for attachment of the larvae.

C) Serpulids

Small serpulids with a coiled tube *Spirorbis foraminosus* MOORE et BUSH are common on the three *Nautilus pompilius* specimens now in question. Slender dead tubes of *Protula tubularia* (MONTAGA) are also found often in association with *Spirorbis*.

The larger tubes with a few keels on the dorsal portion may closely ally to *Spir-branchus giganteus* (RALLAS). It is whitish in color with pink tints in a living condition instead red.

Distribution of these serpulids is somewhat irregular and is not restricted to the umbilical region as in the case of *Nautilus macromphalus* mentioned above.

D) Acorn barnacles

Two kinds of acorn barnacles were found attached.

As shown in figs. 1 and 2 on Plate 3 the first one bears rather small aperture with smooth latera. The whole tests are pinkish in color, and faintly marked by concentric lamellae. This could be a species of the genus *Balanus* that adapted to the deeper waters. A scar of the base of another individual is seen close to the living one (Plate 3, fig. 3).

Another barnacle is thought to be a juvenile form of *Balanus amphitrite* group which is characterized by non-branched radial striae on the lateral plates (Plate 4).

E) Stalked barnacle

Only one specimen attached next to the striated acorn barnacle near the apertural margin of the specimen no. 8 is available. It is dark brownish in color and not well calcified, and supposed to be a young form of a species of genus *Conchoderma*.

It is set on the rugae of the ventral portion which obviously marks the recovering trace of the *Nautilus* shell (Plate 4).

Drift Shells

Three specimens of severely broken shells were obtained from Bindoy shore. Two of them were especially damaged not only in the shell shape but also in the coloration. The external nacreous layer of these specimens were lost by exfoliation. The other one is also remarkably broken around the aperture and some cameral portions as illustrated on Plate 5.

Noteworthy is that all drifts from this locality were picked up on the sea shore along the high strand line and found burried almost completely in the sand or other drifts.

It is not clear whether they represent true natural drift shells or not. There should be a possibility that they were the broken shells thrown out by someone in the village. No post-mortem epifaunal organisms is found on these shell surface in this status.

A great number of living *Nautilus pompilius* specimens has been supplied by the fishermen in the Bindoy village to the world researchers since the Alpha Helix expedition. They were caught by the traditional bamboo trap from the depth off Bindoy as reported elsewhere (HAYASAKA *et al.*, 1982).

References

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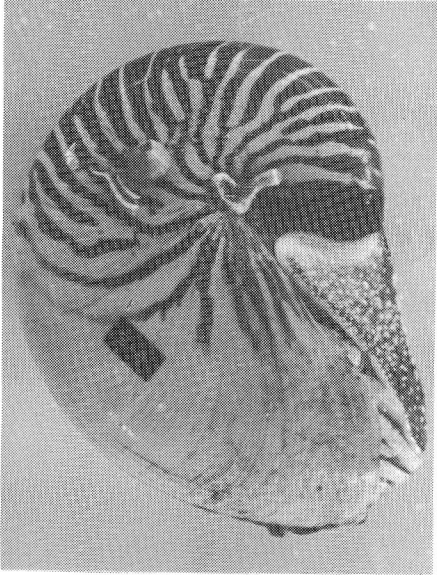
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Plates 3–5

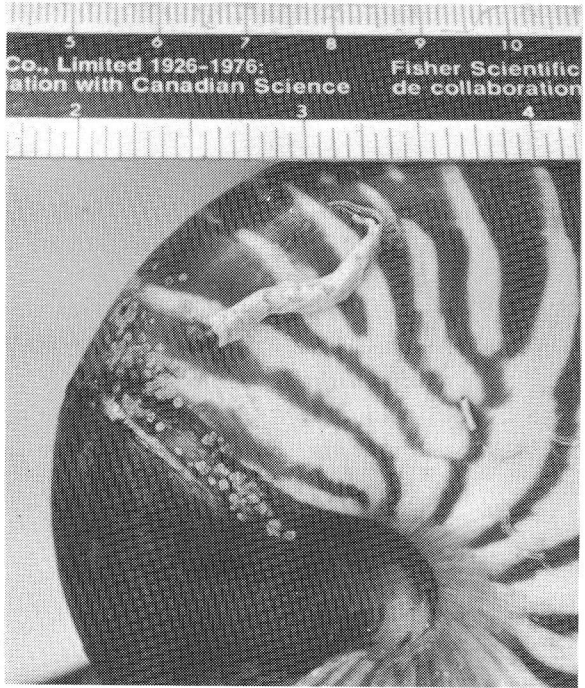
Explanation of Plate 3

- Fig. 1. Specimen no. B-8 just after trapped.
- Fig. 2. Close up of the margin of the black chitinous membrane to show the distribution of foraminifers and a living *Spirobranchus* tube.
- Fig. 3. Acorn barnacles and serpulid tubes on the right lateral surface of the shell.

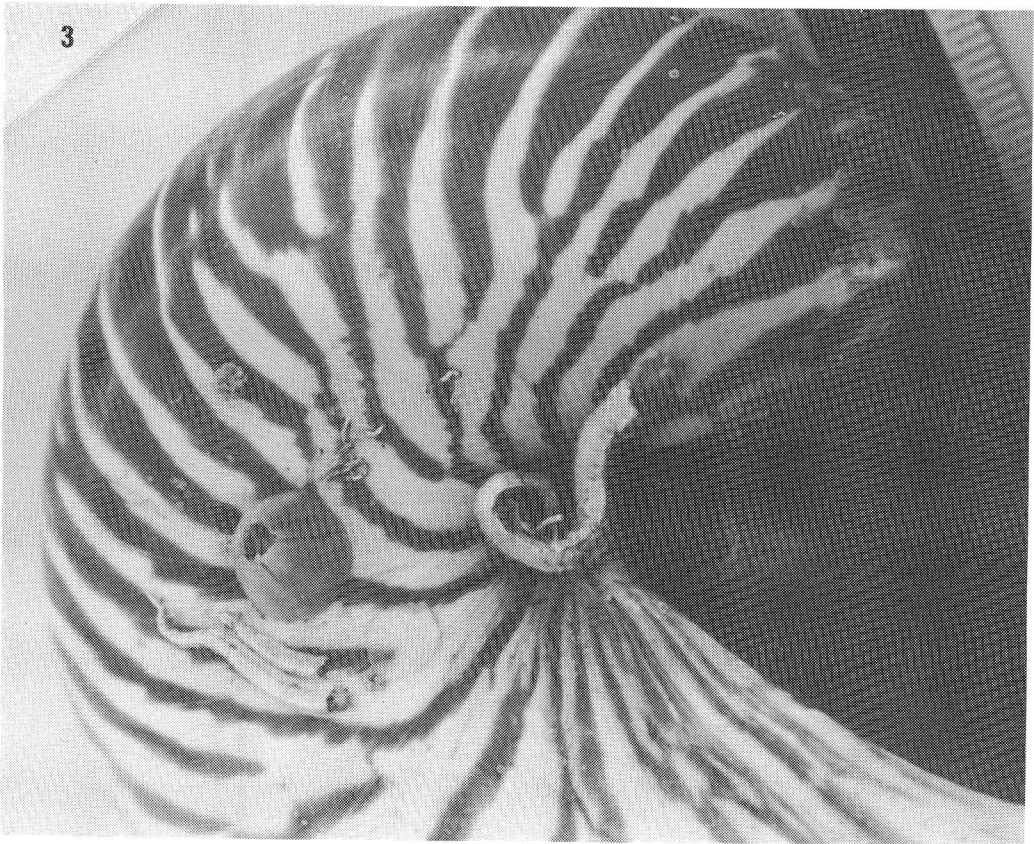
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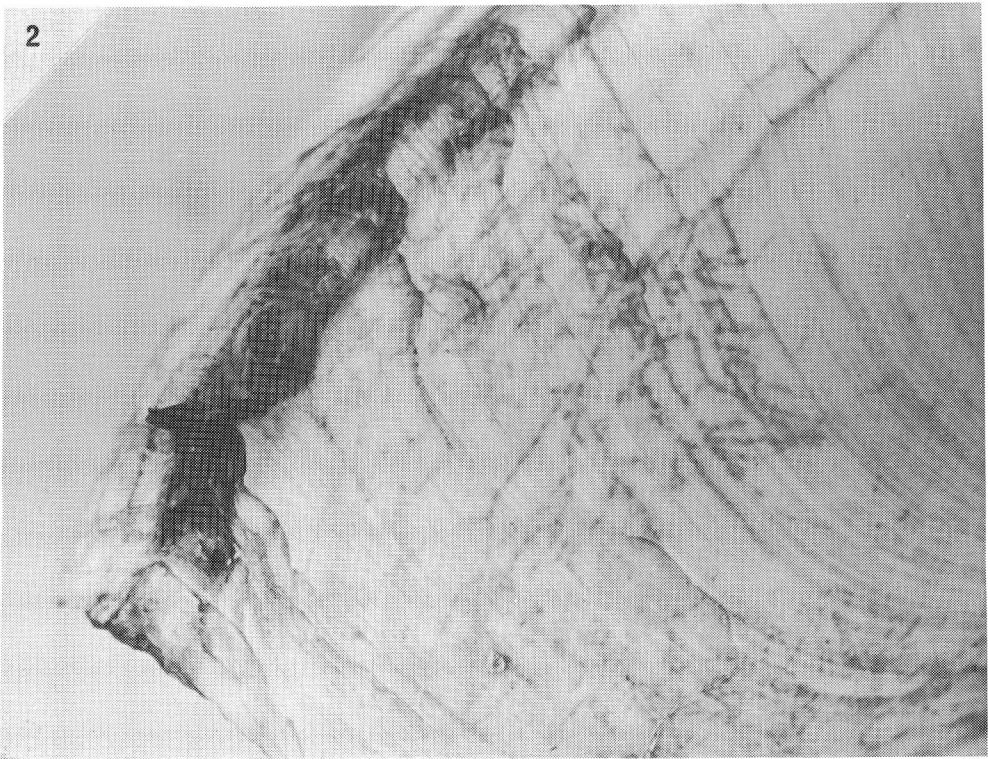
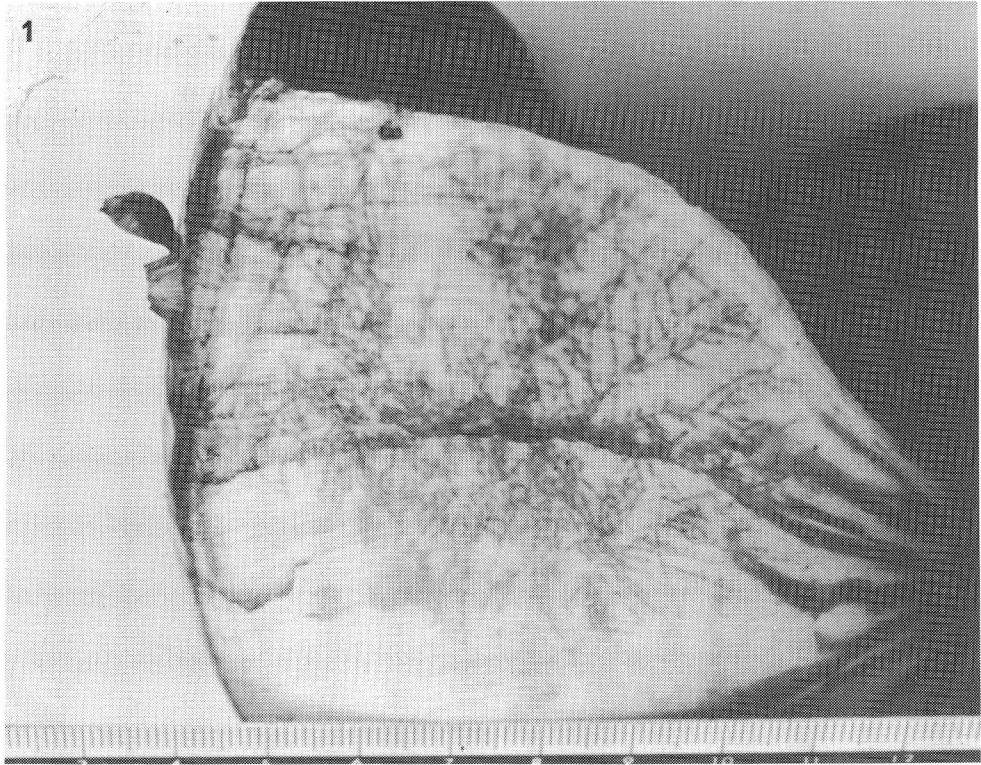


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Explanation of Plate 4

- Fig. 1. A lateral view of the apertural margin of the specimen no. B-8 to show the distributed bryozoan colonies and the lateral shape of a acorn barnacle and a stalked barnacle at the ventral edge.
- Fig. 2. An oblique view of the same showing the rugose shell surface owing restoration of the shell after a certain breakage during living period.



Explanation of Plate 5

Figs. 1-3. Three *Nautilus pompilius* drifts from the Bindoy shore to show the breakage from two lateral sides respectively.

