

マリアナ背弧海盆の熱水噴出孔付近から
採集された *Provanna* 属の2新種

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Two New Species of *Provanna* (Gastropoda: Cerithiacea)
from "Snail Pit" in the Hydrothermal Vent Site
at the Mariana Back-Arc Basin

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Abstract: Two new species of the genus *Provanna*, which is now known to be a hydrothermal vent associated gastropod genus, were collected from the "snail pit" in Mariana Back-Arc Basin by the DSRV *Alvin* in 1987. They are named *P. nassariaeformis* n. sp. and *P. marianaensis* n. sp., and both are associated with a mass aggregation of the hairy snail *Alviniconcha hessleri* Okutani & Ohta, 1987.

Introduction

Since *Alviniconcha hessleri* Okutani & Ohta, 1987, was described as a remarkable discovery from the hydrothermal vents in the Mariana Back-Arc Basin by the DSRV *Alvin* in April 1987, two lots of gastropod specimens (Gastropod B and S) were kindly sent by Dr. Robert Hessler, Scripps Institution of Oceanography, for identification. The result of close examination on these specimens revealed that they belong to two unnamed species of the genus *Provanna* Dall, 1918, which is now known to be associated with hydrothermal environment (Warén and Bouchet 1986). This paper gives the preliminary description of these two new species in order to reward Dr. R. Hessler for his kind permission of study on such a hardly obtainable materials.

I owe many thanks to Dr. R. Hessler for specimens and opportunity of the present study, and Dr. S. Ohta, Ocean Research Institution, for his enlightenment on hydrothermal biocommunity in the Marian Back-Arc Basin. I also owe Messrs. H. Saito and H. Numanami, postgraduate students of my laboratory, for their help in preparing illustrative materials on anatomy of new species.

Materials

Gastropod B and S collected by the *Alvin* Dive 1836 on April 26, 1987, from the "snail pit" site (18°10.95'N, 144°43.20'E: 3670–3680 m deep). Specimens were preserved in an 80% ETOH.

Provanna nassariaeformis n. sp.

(Figs. 1, 2, 5, 6 and 9)

Material examined:

Four specimens labelled "Gastropod B"

Holotype specimen (NSMT-Mo 66239):	Height	11.1 mm,	breadth	8.6 mm;
Paratype specimen No. 1 (SIO)	:	11.3 mm		8.9 mm;
Paratype specimen No. 2 (USNM)	:	11.0 mm		8.6 mm;
Paratype specimen No. 3 (dissected)	:	11.3 mm		8.4 mm.

Description:

The shell is globose and low (Figs. 1 and 2). The apical portions are entirely eroded, so that protoconch and early teleoconch whorls were lost remaining only body and penultimate whorls plus less than one whorl of the third spire. The surface is covered by metallic, golden periostracum which underlies a heavy encrustment of black, rust- or tar-like substance.

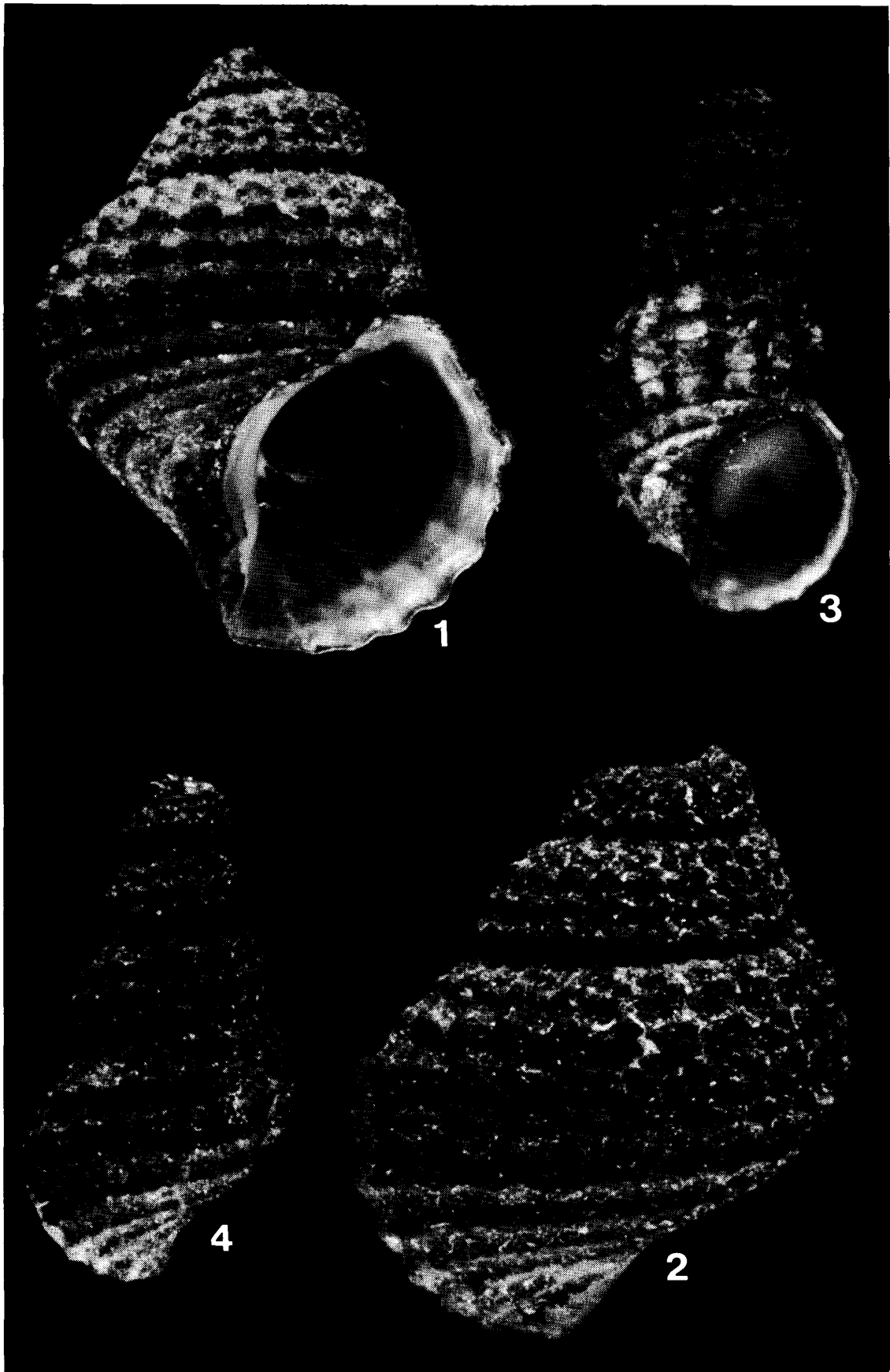
The surface has a cancellated appearance due to both spiral and axial sculptures. The penultimate and body whorls have 4 to 5 spiral ribs with occasional secondary ones that are crossed by 20–25 axial ribs presenting granules at intersections. These granules are particularly prominent on 3 spiral ribs. The base of the body whorl is only weakly inflated and has 5–6 strong spiral ribs that diminish prominence and become smooth towards abapical end. No umbilicus is present.

The aperture is pyriform in outline. The internal wall is grayish white with no lustre. The outer lip is thin and crenulated in corresponding to extremities of spiral ribs and grooves between ribs. The inner lip is gently curved and continues to the weakly twisted columellar lip which forms a shallow sinus in front.

The operculum is about the size of the aperture. It is transparent, paucispiral and semi-oval in outline (Fig. 9).

The radula is taenioglossate type with the formula, 2.1.1.1.2 (Figs. 5 and 6). The central tooth is low trapezoid with elongated and acutely pointed basal edges. The incurved top forms a triangular blunt cusp. The lateral tooth is elongate triangle in shape with incurved inner edge on which there is a large

Figs. 1-4. Two new species of genus *Provanna*
 1 and 2. *P. nassariaeformis* n. sp. (Holotype specimen)
 3 and 4. *P. marianaensis* n. sp. (Paratype No. 1 specimen)



but round central cusp and smaller blunt cusps on both sides of it. The inner and outer marginal teeth are similar in shape and size to each other, mushroom-shaped with broadened top and elongated stalk-like portion. The incurved top has comb-like cusps, about 15–20 in number.

Animal is opaque white in preserved condition. It has no eye on the head.
Remarks: The shell morphology of this new species somewhat resembles that of *P. macleani* Warén & Bouchet, 1989, from off Oregon, but the morphology of radula shows that they are far distantly different from each other. *P. goniata* Warén & Bouchet, 1986, may be the lowest species among East Pacific *Provanna*, but shape of central and lateral teeth of radula indicate that it is never close to this species.

Distribution: "Snail pit" site in the Mariana Back-Arc Basin, 3670–3680 m deep.

***Provanna marianaensis* n. sp.**

(Figs. 3, 4, 7, 8 and 10)

Material examined:

Nineteen specimens labelled "Gastropod S"

Holotype specimen (NSMT-Mo 66240):	Height 9.1 mm,	breadth 4.3 mm;
Paratype specimen No. 1 (NSMT-Mo 66241):	5.4 mm,	2.7 mm;
Praatype specimen No. 2 (USNM) :	5.1 mm,	2.9 mm;
Paratype specimen No. 3 (USNM) :	4.9 mm,	2.9 mm;
Other paratypes (SIO) smaller than 3.2 mm in shell height.		

Description:

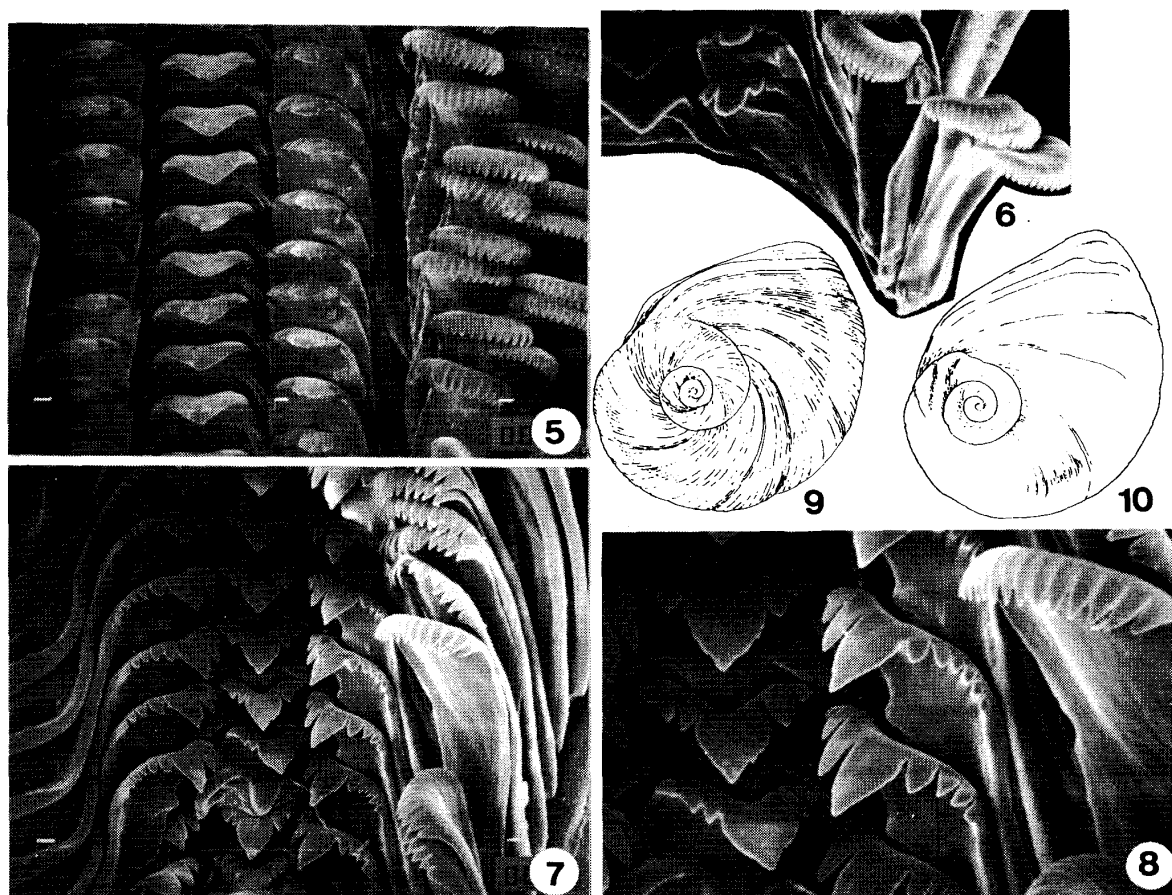
The shell is turrated, but usually body and penultimate whorls plus at least two upper whorls remained as protoconch and early teleoconch whorls are always eroded and lost. The surface is covered by olivaceous periostracum which undelies a thick encrustment of tar-like substance.

The surface has a cancellated sculpture consisted of spiral and axial ribs. In the penultimate whorl, there are about 15–16 spaced, axial ribs that are crossed by three spiral ribs of the similar strength creating square meshes. In the upper whorls, axial ribs tend to weaken making spiral ribs granular. The base is ornamented with five spaced spiral cords without axial ones. No umbilicus is present, but the abapical end weakly forms a siphonal fasciole.

The aperture is oval in outline with no lustre inside. The outer lip is thin and undulating in corresponding to extremities of spiral ribs. The inner and columellar lips are continuous, but the basal lip is weakly reflexed forming a very shallow frontal canal.

The operculum is about the size of the aperture. It is transparent, paucispiral and semi-oval in outline. The nucleus is situated inwardly (Fig. 10).

The radula is taenioglossate type with the formula, 2.1.1.1.2 (Figs. 7 and 8).



Figs. 5-10. Radulae and opercula of *Provanna*

5. Radula of *P. nassariaeformis* n. sp.
6. The same in different angle showing shapes of lateral and marginals to the base.
7. Radula of *P. marianaensis* n. sp.
8. The same, enlarged.
9. Operculum of *P. nassariaeformis* n. sp.
10. Operculum of *P. marianaensis* n. sp.

The central tooth is trapezoid with strongly recurved top which carries large central and 2-3 lateral cusps. The lateral tooth is elongate trapezoid in shape with incurved inner edge on which there are 8-9 sharply pointed cusps, sub-central one is the most prominent. There is a weak flexure below the incurved top. The inner and outer marginal teeth are similar in shape with widened top where there are about 15 subequal cusps arranged rather horizontally. The prop of these teeth are plate-like and rather tapering basally.

Remarks: The external morphology of this new species is somewhat close to *Provanna ios* Warén & Bouchet, 1986. But, the numbers of spiral ribs are less than those in this new species. The radula of *P. lomana* Dall, 1918 (Warén & Bouchet, 1986) is very close to that of *P. marianaensis* n. sp., but the former has a smooth central cusp on the rachidian tooth which has characteristic

lateral projections on the base.

Distribution: "Snail pit" site in the Mariana Back-Arc Basin, 3670–3680 m deep.

要 約

本誌47巻1号で記載した *Alviniconcha hessleri* Okutani & Ohta, 1988 と同一産地から潜水調査船アルビン号によって採集された *Provanna* ハイカブリニナ属 (新称) の2新種について記載する。

Provanna nassariaeformis n. sp. ムシロハイカブリニナ (新種・新称) 模式標本 (殻高 11.1 mm, 殻幅 8.6 mm) ほかに3標本。殻頂部は腐蝕欠損している。殻表は顕著な顆粒状螺肋があり、太短かい。縫合は深く掘れる。歯舌中歯は鈍い歯尖があり、側歯の歯尖も鈍い。縁歯は2本で、頂上は熊手状。

Provanna marianaensis n. sp. マリアナハイカブリニナ (新種・新称) 模式標本 (殻高 9.1 mm, 殻幅 4.3 mm) ほかに18標本。殻頂部は腐蝕欠損している。殻表は格子状であるが、上方では顆粒状。細長い。縫合は余り深く掘れ込まない。歯舌中歯は鋭い歯尖があり、側歯も同様。縁歯は2本で、頂上は熊手状。

Provanna 属は東太平洋海嶺付近で数種知られているが、西太平洋では初記録である。

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[Received: November 6, 1989]