The Land Mollusca of Nissan Island, Solomon Islands

R. K. Dell

IN THE COURSE OF WAR SERVICE in the Solomon Islands the writer spent several months in 1944 on Nissan Island (Green, or Mons Island). A large collection of Mollusca was made and the present work is based on the land Mollusca obtained. The geographical position of Nissan on the island arc between Leptopoma vitreum and the fauna of some interest in a consideration of the origin of the Solomon Island fauna.

LIST OF THE SPECIES

Leptopoma vitreum (Draparnaud, 1801)

Pupina keraudreni Vignard, 1829

Sturanya modesta (Pfeiffer, 1853)

Pseudocyclotus levis levis (Pfeiffer, 1853)

Omphalotropis nebulosa Pease, 1872

Paludinella solomonensis n. sp.

Syncera nitida guamensis Abbott, 1949

Orphiella (Ovaraha) nissani n. sp.

Eustomopsis periwonensis (type locality), and Samoa.

Gyropena nissani n. sp.

Partula c.f. carteriensis (Q. and G., 1832).

Opea gracile (Hutton, 1834).

Leptopoma vitreum (Draparnaud, 1801)

Jutting (1948: 566) cites vitreum as of Draparnaud, 1801, (Tabl. Moll. France). Iredale (1941) cites vitreum as of Lesson, 1830, and considers that Lesson's name was preoccupied by that of Draparnaud. He therefore uses nitidum of Sowerby for this series. Jutting has apparently considered that the two names apply to the same species and that there is therefore no need to alter the name. The writer has been unable to see Draparnaud's figured specimen. This species occurs also in New Guinea (type locality), New Britain, and throughout the Solomons to Santa Anna in the southeast. Clench (1949: 33) notes that P. solomonensis Smith is very close to P. keraudreni. The differences given by Clench, larger size and dark coloration, do not appear very valid differences and probably only one form is represented.

Sturanya modesta (Pfeiffer, 1853)

This was the only member of the Helicinae collected on Nissan. It was common throughout the island on low vegetation. Rensch and Rensch (1936: 683) record it from Shortland Island, New Georgia, Guadalcanal in the Solomons, the New Hebrides (type locality), and Samoa.

Pseudocyclotus levis levis (Pfeiffer, 1853)

This species occurred not uncommonly on Nissan Island, living on the leaves of low shrubs. The shell dimensions of three specimens are:

<table>
<thead>
<tr>
<th>Height (mm.)</th>
<th>Diameter (mm.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.3</td>
<td>12.1</td>
</tr>
<tr>
<td>10.6</td>
<td>10.0</td>
</tr>
<tr>
<td>10.0</td>
<td>10.4</td>
</tr>
</tbody>
</table>

Pupina keraudreni Vignard, 1829

A series from rotten logs near the shore at Tangalan Plantation, Nissan Island, agrees very well with P. keraudreni Vignard, the type species of the genus. This species occurs also in New Guinea (type locality), New Britain, and throughout the Solomons to Santa Anna in the southeast. Clench (1949: 33) notes that P. solomonensis Smith is very close to P. keraudreni. The differences given by Clench, larger size and dark coloration, do not appear very valid differences and probably only one form is represented.

Omphalotropis nebulosa Pease, 1872

This species occurred rather commonly on Nissan Island, living on the leaves of low shrubs. The shell dimensions of three specimens are:

<table>
<thead>
<tr>
<th>Height of Body Whorl (mm.)</th>
<th>Diameter (mm.)</th>
<th>Height of Aperture (mm.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.91</td>
<td>1.91</td>
<td>2.08</td>
</tr>
</tbody>
</table>

Shell small, 2.3 to 2.7 mm. long, globbose, light brown in colour, smooth and semi-translucent. Protoconch of one and a half smooth shining whors. Post nuclear whors with very fine microscopic spirals on early whors, becoming obsolete over adult whorl surfaces. Number of whors five and a half. Outline of whors rather broadly rounded. Body whorl slightly subangled below the middle. Sculpture consisting of irregular axial growth lines with traces of fine spirals on the base. Suture slightly impressed. Aperture obliquely ovate, constricted above. Outer lip thin, sharp. Parietal wall gently concave. Columella short, rounded. There is a well-marked constriction of the aperture edge at junction of parietal wall and columella. Umbilicus completely obscured by thickened columella. Shell measurements are given in Table 1.

Table 1

<table>
<thead>
<tr>
<th>Species Name</th>
<th>Measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paludinella solomonensis n. sp.</td>
<td>2.77</td>
</tr>
</tbody>
</table>

This appears to be the first record of the genus from the Solomons. The outline characterizes the species.

Syncera nitida guamensis Abbott, 1949

A series of shells from near the lagoon shore, Tangalan Plantation, Nissan Island, is very well washed. The umbilicus is totally closed in all the specimens seen. Half-grown specimens have a low spiral carina on the base. Abbott's figure (1949, fig. 8) of...
guamensis shows a wider shell than the Nissan specimens but his measurements indicate that both forms have almost identical proportions. Since later work may show that the Solomon Island form is separable, a specimen from Nissan is figured and the dimensions of five specimens are given below.

<table>
<thead>
<tr>
<th>Height (mm.)</th>
<th>Diameter (mm.)</th>
<th>Height of Body Whorl (mm.)</th>
<th>Height of Aperture (mm.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.18</td>
<td>1.86</td>
<td>2.0</td>
<td>1.27</td>
</tr>
<tr>
<td>2.75</td>
<td>1.59</td>
<td>1.77</td>
<td>1.13</td>
</tr>
<tr>
<td>2.59</td>
<td>1.73</td>
<td>1.73</td>
<td>1.13</td>
</tr>
<tr>
<td>2.95</td>
<td>1.68</td>
<td>1.77</td>
<td>1.13</td>
</tr>
<tr>
<td>2.95</td>
<td>1.73</td>
<td>1.86</td>
<td>1.13</td>
</tr>
</tbody>
</table>

Genus ORPIELLA Gray, 1855


Baker (1941: 239) gives a full synonymy for this genus. He also proposes (p. 240) a new section, Owaraba for Helix solidiuscula Smith from the Solomon Islands, and this name probably is available for all the Solomon Island species, previously assigned to Fretilum, Kalendyma, and Nannina. Rensch and Rensch (1936) have used Orpiella for compluviatia (Cox), concava (Clapp), malaitaensis (Clapp), treasuryensis (Tryon), tamuauensis (Clapp), kappelli (Pfeiffer) and solidiuscula (Smith).

A small species was obtained on Nissan which does not agree with any other species recorded from the Solomons. It is here described as new. In the absence of the animal it may be tentatively assigned to Orpiella (Owaraba).

Orpiella (Owaraba) nissani n. sp.

Fig. 1 a-c

Shell small globose-turbinate, perforate, translucid, shiny brown. Whorls five and a half, narrowly increasing, periphery evenly rounded. Embryonic whorls sculptured with microscopic spirals crossed by axials of weaker strength. This sculpture persists across the spire whorls, with irregular axial growth wrinkles becoming more apparent. On the base the fine spirals become somewhat irregular, but are stronger, and the microscopic axials become obsolete. Spire somewhat elevated. Suture rather impressed. Aperture sublunate, slightly oblique. Outer lip simple. Columella obliquely descending, slightly thickened and reflexed, almost covering the umbilicus. Umbilicus very narrow, deep, almost covered by the reflected columella.

Maximum diameter, 3.04 mm.; height, 2.32 mm.; height of spire 1.0 mm. (Holotype). Dimensions of three paratypes, maximum diameter 2.64, 3.0, 2.64 mm.; height, 1.91, 2.36, 1.86 mm.; height of spire 0.73, 1.19, 0.82 mm., respectively.


Eustomopsis eustoma Pfeiffer 1856

A single shell was obtained from Nissan. It has the raised spire of erinaceus Pfr. but the whole question of the subspecific status of the Solomon Island forms needs review. Present indications are that Eustomopsis eustoma erinaceus Pfr. may be a northern form extending to New Ireland with Eustomopsis eustoma eustoma Pfr. replacing it in the southern Solomons. Only extensive series from numerous localities can decide the matter. It may well be a case of variability with no geographical basis.

Papuina (Pinnadena) perivonensis n. sp.

Fig. 2b–d

Shell trochiform, periphery sharply angled, imperforate. Whorls four and a half. Protoconch not clearly marked off from subsequent whorls. Apex domed, smooth at first apart from fine growth wrinkles. Upper whorls with fine irregular incised spirals which are retained on lower whorls on a narrow band below the suture. Penultimate and body whorl above the peripheral keel sculptured with irregular closely spaced oblique wrinkles. Base of body whorl with raised wrinkles, with irregular raised spirals running through them. Body whorl divided about the middle with a strong raised keel. Aperture oblique, expanded, thickened. Outer lip angled slightly by the keel, bearing up to three low broad teeth above the angulation. Outer lip advanced, columella retracted. No sign of perforation. Colour yellowish cream with broad irregular, brown, axially disposed, zigzag markings on the spire whorls, becoming rather oblique on the body whorl. Outer lip, columella and edge of kel white. See Table 2 for shell measurements. Locality: On vegetation near Periwon Village, Nissan Island, northern Solomons, R. K. Dell, May, 1944; generally distributed in the area near Tangalan Plantation.

Holotype (M. F. 2507) and four paratypes (M. F. 2508) in the Dominion Museum.

There is some variation in regard to height-width ratios and the brown colour markings are less obvious in some examples. Pilsbry

TABLE 2

<table>
<thead>
<tr>
<th>Diameter (mm.)</th>
<th>Height of Spire (mm.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Holotype</td>
<td>28.0</td>
</tr>
<tr>
<td>Paratype 1</td>
<td>27.8</td>
</tr>
<tr>
<td>Paratype 2</td>
<td>26.3</td>
</tr>
<tr>
<td>Paratype 3</td>
<td>27.4</td>
</tr>
<tr>
<td>Paratype 4</td>
<td>25.2</td>
</tr>
</tbody>
</table>

(1891) gave Marten's genus Papuina subgeneric rank and used some 15 groups, for each of which he gave a short diagnosis. Later workers have restored Papuina to full generic rank. Iredale (1941: 84) has proposed new generic names for 14 of these groups and has...
used Pilsbry’s group diagnoses as generic diagnoses without any very critical re-examination of specimens. Evaluation of these names must await a complete revision of the species of Papuina. In the meantime, they may be used subgenerically. P. periwonensis seems best included in Pinnadena (Type Helix lombei Pfeiffer). From the lombei series it may be distinguished by the very sharp keel on the periphery.

Gyropena nissani n. sp.

Fig. 1c-g

Shell small, discoidal, umbilicate. Whorls three and a half including a spirally striate protoconch of one and a half whorls. Sculpture on postembryonic whorls consisting of fine raised radial riblets, about 85 on body whorl. Interstices with fine growth lines and fine spirals. Spire very slightly elevated. Periphery rounded. Suture impressed. Aperture rather wide, sub-lunate, unarmed. Umbilicus deep, perspective, about one third the greatest diameter.

Major diameter 2.04 mm.; height .92 mm.; diameter of umbilicus 0.6 mm.

Holotype (M. F. 2513) in Dominion Museum, New Zealand.


The only two members of the family Charopidae hitherto recorded from the Solomons are Endodontia (Charopa) solomonensis Clapp from Ugi, and Foxidonta stevensoni Clench from Malaita. Foxidonta is a peculiarly turrited shell, large for the family, and doubtfully belonging to it. Charopa solomonensis Clapp seems very similar to the New Zealand species around C. anguliculii (Reeve). It has a smooth protoconch. Jutting (1951: 28) has described Charopa ( Discachoropa) microdiscus from Java and South Celebes, with fine radial riblets on the protoconch. The type of Discocharopa (D. exquisita Iredale) from the Kermadeces, has a smooth protoconch. It is not unusual for the fine radials on the protoconch to be worn off leaving an apparently smooth protoconch and solomonensis and microdiscus may both for the present be classed under Discocharopa. The former is somewhat larger than the other species ascribed to this genus and close examination of actual specimens may well show other points of difference. Gyropena nissani n. sp. has a protoconch with well-marked spirals, a very flattened spire, and an impressed suture. In some respects it recalls the New Zealand charopid genus Mocella. However, the general facies and the impressed suture agree with the description and figure of Iredale’s Gyropena from Lord Howe Island.

The importance of these scattered charopids from the Solomons and the Greater Sunda Islands is that they probably represent relics on the migration route through which the charopid faunas of southern Australia, New Caledonia, Lord Howe, Norfolk, the Kermadeces, and New Zealand were derived.

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**TABLE 3**

**SHELL MEASUREMENTS OF PARTULA (MELANESICA) CARTEIENSIS (Q. AND G.)**

(Measurements in Millimeters)

<table>
<thead>
<tr>
<th>SPECIMEN</th>
<th>NUMBER OF WHORLS</th>
<th>HEIGHT</th>
<th>DIAMETER</th>
<th>HEIGHT OF APERTURE</th>
<th>WIDTH OF APERTURE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nissan</td>
<td>4½</td>
<td>17.8</td>
<td>9.8</td>
<td>9.0</td>
<td>5.6</td>
</tr>
<tr>
<td>Nissan</td>
<td>4½</td>
<td>17.5</td>
<td>8.9</td>
<td>9.0</td>
<td>6.2</td>
</tr>
<tr>
<td>Nissan</td>
<td>4½</td>
<td>17.3</td>
<td>9.3</td>
<td>9.2</td>
<td>6.2</td>
</tr>
<tr>
<td>P. carteriensis (<em>fide</em> Pilsbry)</td>
<td>5</td>
<td>17.5</td>
<td>8.5</td>
<td>9.0</td>
<td>6.0</td>
</tr>
<tr>
<td>P. carteriensis (<em>fide</em> Pilsbry)</td>
<td>4½</td>
<td>16.0</td>
<td>8.7</td>
<td>8.7</td>
<td>6.0</td>
</tr>
</tbody>
</table>

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**Partula (Melanesica) cf. carteriensis**

(Q. and G., 1832)

A species of Partula was comparatively common on the island living on vegetation. The collection contains three specimens. They are close to *P. carteriensis* (Q. and G.) as described and figured by Pilsbry (1909: 298, pl. 36, figs. 15, 16) and the geographical position of *Partula* in relation to New Ireland makes it very probable that they are closely related if not identical. The spiral sculpture is very fine as described for *P. carteriensis* (Q. and G.). Table 3 gives shell measurements of Pilsbry’s specimens and three from Nissan. The systematics of the group in the Solomon Islands is so uncertain that a figure is given of a Nissan Island specimen. The tooth on the per.eral lip is absent in the other specimens.

**Opeas gracilis**

Hutton, 1854

A number of specimens were collected under rotten wood near the lagoon at Tan-galan Plantation. This species is a tropical cosmopolite and has been recorded from many of the islands of the Solomon group.

**DISCUSSION**

Thirteen species of land snails are herein recorded from this small island and it is highly probable that other forms will be collected in the future. It is, however, unlikely that any large species were missed. The relationships of this fauna are, as might be expected, with both the Bismarck Archipelago and with the other Solomon Islands. Four of the species appear to be endemic to the island but for three of these (*Orpilla nissani, Gyropena nissani* and *Paludinella solomonensis*) this is probably an apparent, rather than a true endemism. So little is known of the molluscus fauna of the northern Solomons, especially the smaller forms, that little value can as yet come from such comparisons. It is more likely that *Papuina periwonensis* is truly endemic although again it could quite easily
The waifs and strays of the Nissan fauna are such as one would expect in an oceanic island, and three of these, *Paludinella, Syneca* and *Opeas*, are forms that appear to be confined to coastal areas.

Nissan is an elevated and probably tilted coral atoll, some 15 miles in diameter. Most of the surface of the island is covered by dense forest apart from two quite considerable patches of coconut plantations. Situated between Buka in the northern Solomons and New Ireland, it is about 30 miles from Buka and 70 miles from New Ireland. However, it is more closely connected with New Ireland by the small island group of Feni, which is about halfway between. Ocean depths between Nissan and New Ireland are at least over 2,000 fathoms, and it is most unlikely that the two areas have been joined in the recent past by a fall in sea level. The land Mollusca of Nissan (apart from the endemic species which may be older in origin) must, therefore, have been derived by transoceanic migration. Very little is known of the methods used for such transoceanic dispersal by land snails although there has been a great deal of conjecture, especially in the literature of the latter part of the nineteenth century. What does seem very apparent is that some land snails do cross ocean barriers. At least it is logical to assume that they do, as to postulate a land bridge in the face of strong biological and geological evidence to the contrary. In an attempt to derive some elements of the Solomon Island land snail fauna from the Bismarck Archipelago, the strait between New Ireland and Nissan presents the first and probably the widest oceanic barrier. The land snails present on Nissan show that some species have crossed this gap comparatively recently and that presumably they could also spread further south.

These remarks would apply to the *Eustomatopsis, Omphalotropis, Leptopoma, Pseudocyclotus* and *Pupina*. *Partula cartersiensis* has apparently crossed the strait but has not, so far as is known, extended its range further south. Three of these forms, *Leptopoma, Pseudocyclotus* and *Partula* are arboreal in habitat while the other three are terrestrial, so there is apparently no advantage in motility as regards type of habitat.

REFERENCES


--- 1951. On a new Charopa from Celebes (Charopa (Discocharopa) microdiscus nov. spec.). *Basteria* 15: 28–29.


