

Mitridae and Terebridae
(Mollusca : Gastropoda)
of Malaita, Fiji, and Bileau Island, New Guinea

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(1 Map)

RECENTLY THE SENIOR AUTHOR was sent large samplings of Mitridae for identification, almost simultaneously from three different Melanesian localities. These places are all situated within approximately 13 degrees of latitude and 33 degrees of longitude — a considerable distance, to be sure, but with no apparent barriers to hinder the free movement of mollusks, such as uncommonly great ocean depths completely separating the areas, or a wide thermal range. A striking recurrence of species in the different localities prompted the investigation of other studies concerning the same general area, as it seemed an unusual opportunity to make, for this group, an up-to-date survey of a comparatively limited geographical region.

During the early stages of this project, it was discovered that the junior author, studying Terebridae, had been paralleling the work on the mitrids from the same localities; coincidentally, with one exception he had been concerned with specimens from the same collectors. In order to avoid duplication of accounts and to conserve space, the two studies have been combined here.

Two major checklists were used for comparison, both compiled by Dr. Alan Solem of the Chicago Natural History Museum. One of these (SOLEM, 1953) not only concerns species from one of the islands where our collections were made (Malaita, British Solomon Islands), but also amounts to a revision of several earlier works on Solomon Islands mollusks — namely those by E. A. SMITH (1876, 1885), H. B. GUPPY (1887), DALL (1910), DAUTZENBERG (1910), and EYERDAM (1951). Therefore this paper (and its sequel: SOLEM, 1958) seemed a logical starting point on which to base a more modern list. An

other faunal list from the Solomon Islands (ABBOTT, 1958) was examined, but as it includes only a few common, widely-dispersed species in the groups with which we are concerned and since it added nothing new, this work has not been incorporated into our study.

Subsequent correspondence with Dr. Solem resulted in his generous offer to lend the specimens of Mitridae and Terebridae on which he had based his studies. Through careful comparison with that part of Solem's original material which is now in the Chicago Natural History Museum, we are reasonably well assured of the correct identities for those species appearing on all the lists. The more recently collected specimens are now in the possession of the original collectors, or in the collections of the authors of the present study.

The first of the three groups of shells studied was an assemblage of over 150 lots of Mitridae, comprising more than 70 species; the Burch material in *Terebra* contained 23 species. These were collected in 1930 by Mr. Walter J. Eyerdam from drift along a small beach at Suu, Malaita. Another series was sent by Mrs. Isobel Pert, who collected her shells on the shore of Bileau Island, Madang Harbor, New Guinea; her collection numbered about 60 species of *Mitra* and 30 of *Terebra* (see BURCH, 1963). The third group was from Mr. A. Jennings of Nadi, Fiji, who has been dredging and shore collecting in that area for several years. Approximately 75 mitrid species and 40 of *Terebra* have been identified from his material. Since the *Mitra* collection of Mr. Ditlev Thaanum is also temporarily on loan to the senior author for study, the 43 species he collected in

1940 with T. T. Dranga have been included also, in a separate column which does not appear in the *Terebra* list.

All of our identifications, whether among those on the published lists or not, have been carefully checked with the type figures and original descriptions. Since many of these figures are poorly delineated, certain of the species are difficult to identify positively by this method alone. Only a study of the holotypes would enable a worker to differentiate among some of the species as depicted in the monographs — if, indeed, some are not synonymous. However, due to Dr. Solem's cooperation in sending his material for comparison, the final outcome should present a minimal number of misidentifications.

The results of our work have been tabulated for easy comparison among the different localities, and the species cited on the earlier lists have been included. It will be noted that many species have been added to the published records through material used in this study; there are 46 species of *Mitra* and 15 of *Terebra* not previously recorded from the Solomon Islands. This does not necessarily mean that ranges have been extended, but only that certain species had not formerly been recorded from some of the localities.

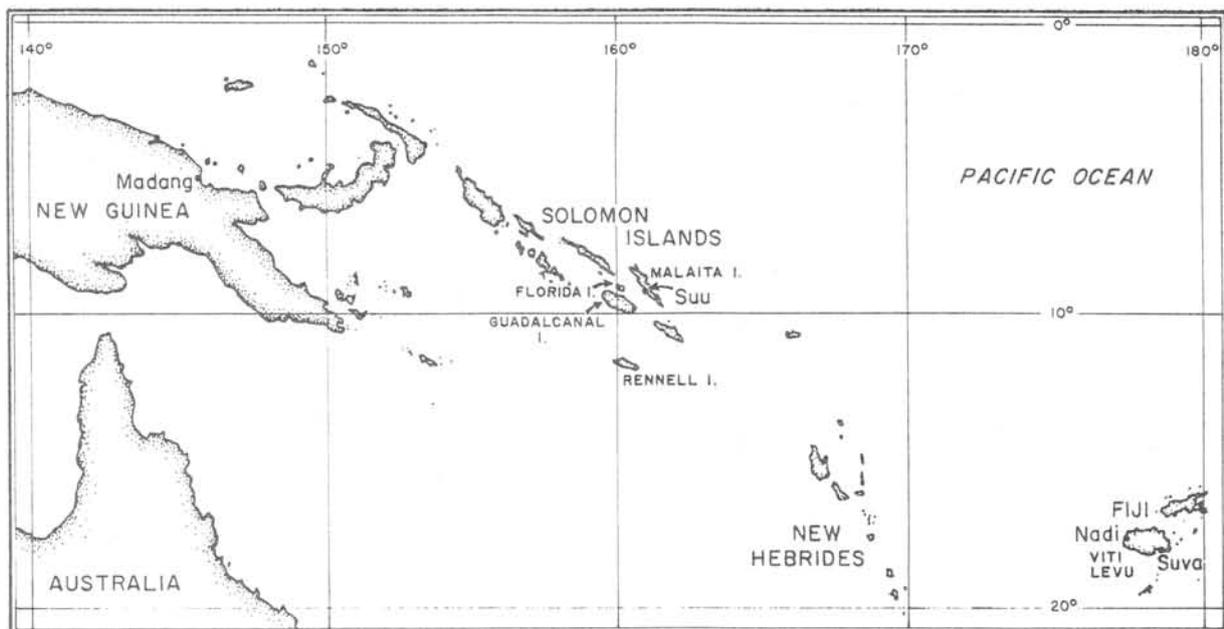
We wish to point out that none of the lists in this paper is intended as a complete checklist for its respective area; each group represents only a typical sampling by an individual within a comparatively limited time.

In order to simplify the alphabetical listing of species, they have been assigned to as few generic groups as

possible; most collectors, with relatively small collections of *Mitra* and *Terebra*, find a more specialized classification confusing. Since no systematic work is intended in this paper, we have therefore adopted approximately the same minimal taxa mentioned by KURODA and HABE (1952), using for the Mitridae only the broad groups *Pusia*, *Vexillum*, *Mitra*, *Strigatella*, *Imbricaria* and *Cylindromitra*; for the Terebridae we have used only *Terebra*, *Duplicaria* and *Hastula*. This is roughly the same classification used by GARRETT (1880) in his similar study of the Polynesian Mitridae, and it facilitates the locating of species-names on an alphabetical list.

We have followed Dr. Solem's example in listing in parentheses only the more obvious synonyms, to assist collectors in correlating their specimens with our tables. In some instances, nomenclatural changes have taken place since the SOLEM papers were published; all species appear here under what we believe to be the presently valid names, with the invalid names cited as synonyms. A few species misidentified in the SOLEM material are listed here under the correct names, with the incorrect names added in brackets. The catalog number of the Chicago Natural History Museum is given for each lot examined from that source. Unidentified species have been omitted, as they serve no useful purpose in a faunal study.

Even if it were not premature to do so, it would be unwise to attempt to make satisfactory conclusions from a checklist of this sort. The conditions under which the separate collections were made are certain to have



differed widely; for example, Mr. Jennings has been dredging intensively for a number of years in Fiji, in both shallow and relatively deep water. Mr. Thaanum also dredged there, but only for a comparatively short time, and probably not more than once at each station. Mrs. Pert's shells were collected along the shore, as were Mr. Eyerdam's — but even these two apparently similar circumstances differ, because the former collection was made throughout an entire year, while the latter was probably completed within a few days. Some of the earlier collections tabulated by Solem could have been made within a few hours time — perhaps during one tide, though one of these (Fox collection) was made over a period of thirty years while Dr. Fox was doing medical missionary work in the Solomon Islands. Conditions of weather, season, ecology, length of time spent in making the collection, and many other important factors must be considered in evaluating any faunal study. Since the circumstances necessarily vary so widely in these instances, it would be inappropriate to consider the present tabulation as anything more than a checklist of authenticated species that have been collected at each of the localities. Only a few broad trends may be noted, such as the occurrence of some species at all stations, or the relative scarcity of certain others that are reported at only one or two localities.

The tabulations are interesting, though again it should be stressed that no conclusions as to the relative rarity of species, or to their general distribution, should be drawn at this time. The arrangement of plus (+) and minus (—) signs in the various columns, indicating the presence or absence, respectively, of species at different localities, offers 64 possibilities for different combinations of the symbols for the six columns of Mitridae, while the number of possible combinations for the five-column list of Terebridae is 32 (based on the binomial theorem). The appearance of only one or two plus signs for any species might be interpreted as indicating its relatively restricted distribution in the total area considered, whereas a plus sign in each of five or six columns could be interpreted as indicating a more widely distributed species. If we consider only the broader aspects of this survey, disregarding at the present time the possibilities implicit in the many different combinations of symbols seen in the checklist, the results of the survey can perhaps best be summarized briefly in another table, as follows:

	Mitridae (6 columns)	Terebridae (5 columns)
Number of species noted in:		
any one column	.....48	.....15
any 2 columns	.....41	.....21
any 3 columns	.....15	.....6
any 4 columns	.....17	.....8
any 5 columns	.....6	.....1
all 6 columns	.....2	

It is hoped that further similar tabulations may be made for these and other adjacent localities, so that at some future date the relative population density and the distributional pattern may be more clearly evident for these as well as other species.

ACKNOWLEDGMENT

We are extremely grateful to Dr. Alan Solem for his ready cooperation and prompt response to our inquiries. For their generosity and helpfulness, we also wish to express our deep appreciation to the various collectors of the material cited in this paper. It is understood that both Mr. Eyerdam and Mr. Jennings expect to publish more complete faunal lists for their particular localities, and we have no desire to intrude upon their plans in this regard. There are unquestionably many species not mentioned in the present list, from each of the regions cited; our contribution has a different purpose, namely that of comparing species from more or less adjacent areas. Future work may extend the study in other directions.

Our sincere thanks go also to Emily Reid for her excellent adaptation of the maps of the area considered in this paper.

EXPLANATION OF TABLES 1 AND 2

Specimens of the species listed are contained in various collections, as designated by the following code:

B	R. D. Burch (Houston)
C	J. M. Cate (Los Angeles)
E	W. J. Eyerdam (Seattle)
J	A. Jennings (Nadi, Fiji)
P	I. Pert (Madang, New Guinea)
T	D. Thaanum (Honolulu)
CNHM	Chicago Natural History Museum

The columns have been arranged to indicate an east-to-west direction, following the same general pattern as the prevailing winds and ocean currents in the areas covered.

Data for columns 1 to 6, Table 1 (Mitridae)

- Column 1: Thaanum, 1940 - Viti Levu, Fiji (and nearby islets)
 Column 2: Jennings, 1962 - Viti Levu, Fiji (and nearby islets)
 Column 3: Eyerdam, 1930 - Suu, Malaita Island, British Solomons
 Column 4: Solem, 1953 - Malaita and Guadalcanal Islands
 Column 5: Solem, 1958 - Florida and Bougainville Islands
 Column 6: Pert, 1962 - Bileau Island, Madang Harbor, New Guinea

Table 2 (Terebridae)

The arrangement of columns is exactly the same as in Table 1 except that Column 1 (Thaanum, Fiji) has been omitted.

Table 1

	Fiji		Solomon Islands		New Guin.	
	Thaanum, 1940	Jennings, 1962	Eyerdam, 1930	Solem, 1953	Solem, 1958	Pert, 1962
<i>Pusia</i> SWAINSON, 1840						
<i>adamsoni</i> (REEVE, 1844) (J)	—	+	—	—	—	—
<i>affinis</i> (REEVE, 1844) (E)	—	—	+	—	—	—
<i>alveolus</i> (REEVE, 1845) (E)	—	—	+	—	—	—
<i>amabilis</i> (REEVE, 1845) (J, E)	—	+	+	—	—	—
<i>aureolata</i> (REEVE, 1844) (J, E, C, CNHM 44863)	—	+	+	+	+	—
<i>consanguinea</i> (REEVE, 1845) (T, E, C)	+	—	+	—	—	+
<i>crocata</i> (LAMARCK, 1811) (C)	—	—	—	—	—	+
<i>discoloria</i> (REEVE, 1845) (J, E, P, C)	—	+	+	+	—	+
<i>ficulina</i> (LAMARCK, 1811) (E)	—	—	+	+	—	—
<i>leucodesma</i> (REEVE, 1845) (J, E)	—	+	+	—	—	—
<i>luculenta</i> (REEVE, 1845) (T, C)	+	—	—	+	—	—
<i>microzonias</i> (LAMARCK, 1811) (E, C)	—	—	+	—	—	+
<i>muriculata</i> (LAMARCK, 1811) (E)	—	—	+	—	—	—
<i>pardalis</i> (KÜSTER, 1841) (E)	—	—	+	—	+	—
<i>patriarchalis</i> (LAMARCK, 1811) (E, C)	—	—	+	—	—	+
<i>porphyretica</i> (REEVE, 1844) (E, C)	—	—	+	—	—	+
<i>rosea</i> (SWAINSON, 1835) (E)	—	—	+	—	—	—
<i>tuberosa</i> (REEVE, 1845) (J, C)	—	+	—	—	—	+
Totals (18 species)	2	6	14	4	2	7
<i>Vexillum</i> RÖDING, 1798						
<i>acupicta</i> (REEVE, 1844) (T, J, C)	+	+	—	—	—	—
<i>amanda</i> (REEVE, 1845) (J, E)	—	+	+	—	—	—
<i>arracanensis</i> (SOWERBY, 1874) (E, C)	—	—	+	—	—	+
<i>cadaverosum</i> (REEVE, 1844) (J, E, C)	—	+	+	—	—	+
<i>caffrum</i> (LINNAEUS, 1758) (J)	—	+	—	—	—	—
<i>comptum</i> (A. ADAMS, 1853) (J, C)	—	+	—	—	—	+
<i>coronatum</i> (HELBLING, 1779) (J, C)	—	+	—	—	—	—
<i>costellaris</i> (LAMARCK, 1811) (E)	—	—	+	—	—	—
<i>crebriliratum</i> (REEVE, 1844) (J, E, C)	—	+	+	—	—	+
<i>cruentatum</i> (REEVE, 1844) (T, J, E, C)	+	+	+	+	+	—
<i>cumingii</i> (REEVE, 1844)	—	—	—	+	—	—
<i>deshayesii</i> (REEVE, 1844)	—	—	—	+	—	—
<i>exasperatum</i> (GMELIN, 1791) (<i>arenosum</i> LAMARCK, 1811) (J, E, C)	—	+	+	—	—	+
<i>exquisitum</i> (GARRETT, 1873) (C)	—	—	—	—	—	+
<i>filistriatum</i> (SOWERBY, 1874) (J, C)	—	+	—	—	—	+
<i>formosense</i> (SOWERBY, 1890) (J, C)	—	+	+	—	—	—
<i>granosum</i> (GMELIN, 1791) (C)	—	—	—	—	—	+
<i>gruneri</i> (REEVE, 1844) (E)	—	—	+	—	+	—
<i>intertaeniatum</i> (SOWERBY, 1874) (T, J, C)	+	+	—	—	—	+
<i>ligatum</i> (A. ADAMS, 1853) (C)	—	—	—	+	—	+

<i>Strigatella</i> SWAINSON, 1840						
<i>auriculoides</i> (REEVE, 1845) (T, E, C)		+	-	+	-	-
<i>decurtata</i> (REEVE, 1845) (E)		-	-	+	-	-
<i>litterata</i> (LAMARCK, 1811) (T, J, E, C)		+	+	+	-	-
<i>lutea</i> (QUOY & GAIMARD, 1833) (<i>acuminata</i> SWAINSON) (T, E, C)		+	-	+	-	-
<i>paupercula</i> (LINNAEUS, 1758) (J, E, C, CNHM 44860)		-	+	+	+	-
<i>pellisserpentis</i> (REEVE, 1844) (J, E, C)		-	+	+	-	-
<i>retusa</i> (LAMARCK, 1811) (T, J, E, C)		+	+	+	-	-
<i>scutulata</i> (GMELIN, 1791) (T, J, E)		+	+	+	-	-
<i>tigrina</i> (A. ADAMS, 1853) (C)		-	-	-	-	-
<i>virgata</i> (REEVE, 1844) (E, CNHM 44879)		-	-	+	+	-
Totals (10 species)		5	5	9	2	0
<i>Imbricaria</i> SCHUMACHER, 1817						
<i>conica</i> SCHUMACHER, 1817 (T, J, C, CNHM 44876)		+	+	-	+	+
<i>punctata</i> (SWAINSON, 1821) (C)		-	-	-	-	-
<i>vanikorensis</i> (QUOY & GAIMARD, 1833) (E)		-	-	+	-	-
Totals (3 species)		1	1	1	1	1
<i>Cylindromitra</i> P. FISCHER, 1884						
<i>crenulata</i> (GMELIN, 1791) (T, J) [<i>Conus mitratus</i> BRUGUIÈRE; CNHM 44875]		+	+	-	-	-
<i>dactylus</i> (LINNAEUS, 1758) (T, J, C) [<i>fenestrata</i> LAMARCK; CNHM 44874]		+	+	-	+	-
<i>fenestrata</i> (LAMARCK, 1811) (J, E, C)		-	+	+	-	-
<i>nucea</i> (GMELIN, 1791) (T, J, E)		+	+	+	-	-
Totals (4 species)		3	4	2	1	0
Totals, all species:						
<i>Pusia</i>	18 species	2	6	44	4	2
<i>Vexillum</i>	45 species	13	31	22	12	6
<i>Mitra</i>	49 species	17	30	22	12	6
<i>Strigatella</i>	10 species	5	5	9	2	0
<i>Imbricaria</i>	3 species	1	1	1	1	1
<i>Cylindromitra</i>	4 species	3	4	2	1	0
	128 species, all localities	41	77	70	32	15

Table 2

	Fiji	Solomon Islands		New Guin.
		Jennings, 1962	Eyerdam, 1930	
<i>Duplicaria</i> DALL, 1908 (<i>Diplomeriza</i> DALL, 1919)				
<i>australis</i> (E. A. SMITH, 1873) [<i>dussumieri</i> KIENER] (J, B, CNHM 11273; excluded from SOLEM, 1953, as collected at New Ireland)	+	-	-	-
<i>raphanula</i> (LAMARCK, 1822) (P, B)	-	-	-	+
Totals (2 species)	1	0	0	1

	Fiji	Solomon Islands		New Guin.
	Jennings, 1962	Eyerdam, 1930	Solem, 1953	Solem, 1958
<i>Hastula</i> H. & A. ADAMS, 1853				
<i>casta</i> (HINDS, 1844) (E, J, B)	+	+	-	-
<i>concinna</i> (DILLWYN, 1817) (<i>verreauxi</i> DESHAYES) (E, J, P, B)	+	+	-	-
<i>caerulescens</i> (LAMARCK, 1822) (<i>hectica</i> LINNAEUS) (E, J, B, CNHM 45094)	+	+	+	-
<i>lanceata</i> (LINNAEUS, 1767) (J, P, B)	+	-	-	-
<i>penicillata</i> (HINDS, 1844) (J, B)	+	-	-	-
<i>solida</i> (DESHAYES, 1857) (<i>clarkei</i> M. SMITH) (J, P, B)	+	-	-	-
Totals (6 species)	6	3	1	0
<i>Terebra</i> BRUGUIÈRE, 1789				
<i>affinis</i> GRAY, 1834 (E, J, P, B, CNHM 44649) [<i>cerithina</i> LAMARCK]	+	+	+	-
<i>albicostata</i> ADAMS & REEVE, 1850 (J, B)	+	-	-	-
<i>amanda</i> HINDS, 1844 (J, B)	+	+	-	-
<i>anilis</i> (RÖDING, 1798) (<i>straminea</i> GRAY) (E, J, P, B)	+	+	-	-
<i>archimedes</i> DESHAYES, 1859 (J, B)	+	-	-	-
<i>areolata</i> (LINK, 1806) (<i>muscaria</i> LAMARCK) (E, J, P, B, CNHM 44982 [<i>tigrina</i> LAMARCK])	+	+	+	+
<i>argus</i> HINDS, 1844 (J, P, B)	+	-	-	-
<i>babylonia</i> LAMARCK, 1822 (J, P, B)	+	-	-	-
<i>cancellata</i> QUOY & GAIMARD, 1832 (E, J, B, [? <i>columellaris</i> HINDS])	+	+	-	-
<i>cerithina</i> LAMARCK, 1822 (<i>pulchra</i> HINDS) (J, B)	+	-	-	-
<i>chlorata</i> LAMARCK, 1822 (E, J, B)	+	+	-	-
<i>cingulifera</i> LAMARCK, 1822 (E, J, B)	+	+	-	+
<i>columellaris</i> HINDS, 1844 (E, J, P, B, CNHM 83689)	+	+	+	-
<i>conspersa</i> HINDS, 1844 (J, B)	+	-	-	-
<i>crenulata</i> (LINNAEUS, 1758) (E, J, P, B, CNHM 45078)	+	+	+	-
<i>cumingi</i> DESHAYES, 1857 (J, B)	+	-	-	-
<i>dimidiata</i> (LINNAEUS, 1758) (E, J, P, B, CNHM 44985)	+	+	+	-
<i>eburnea</i> HINDS, 1844 (B)	-	-	-	-
<i>exigua</i> DESHAYES, 1859 (J, B)	+	-	-	-
<i>felina</i> (DILLWYN, 1817) (<i>tigrina</i> GMELIN) (E, J, P, B)	+	+	-	-
<i>flavescens</i> DESHAYES, 1859 (E, J, B)	+	+	-	-
<i>funiculata</i> HINDS, 1844 (J, B)	+	-	-	-
<i>guttata</i> (RÖDING, 1798) (<i>oculata</i> DILLWYN) (J, P, B)	+	-	-	-
<i>laevigata</i> GRAY, 1834 (E, J, P, B)	+	+	-	-

<i>langfordi</i> PILSBRY, 1921 (J, B)	+	-	-	-	-
<i>lauta</i> PEASE, 1869 (J, B)	+	-	-	-	+
<i>maculata</i> (LINNAEUS, 1758) (E, J, B, CNHM 45094)	+	+	+	-	+
<i>marmorata</i> DESHAYES, 1859 (P, B)	-	-	-	-	+
<i>multistriata</i> SCHEPMAN, 1913 (J)	+	-	-	-	-
<i>nebulosa</i> SOWERBY, 1825 (J, B)	+	-	-	-	+
<i>nitida</i> HINDS, 1844 (E, B)	-	+	-	-	+
<i>paucistriata</i> (E. A. SMITH, 1873) (J, B)	+	-	-	-	+
<i>pertusa</i> (BORN, 1780) (J, P, B)	+	-	-	-	+
<i>plumbea</i> QUOY & GAIMARD, 1832 (E, B)	-	+	-	-	+
<i>polygyrata</i> DESHAYES, 1859 (E, J, B)	+	+	-	-	-
<i>roseata</i> ADAMS & REEVE, 1850 (B)	-	-	-	-	+
<i>scabrella</i> LAMARCK, 1822 (E, B)	-	+	-	-	-
<i>subulata</i> (LINNAEUS, 1767) (E, J, P, B, CNHM 44981)	+	+	+	-	+
<i>textilis</i> HINDS, 1844 (E, J, B)	+	+	-	-	-
<i>tiurensis</i> SCHEPMAN, 1913 (J)	+	-	-	-	-
<i>turrita</i> (E. A. SMITH, 1873) (J, B)	+	-	-	-	-
<i>undulata</i> GRAY, 1834 (J, P, B)	+	-	-	-	+
<i>violascens</i> HINDS, 1844 (J)	+	-	-	-	-
Totals (43 species)	37	20	7	2	28

Totals, all species:

<i>Duplicaria</i>	2 species	1	0	0	0	1
<i>Hastula</i>	6 species	6	3	1	0	6
<i>Terebra</i>	43 species	37	20	7	2	28
	51 species, all localities	44	23	8	2	35

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