New species of *Granulina* and *Gibberula* (Gastropoda: Cystiscidae) from offshore subtidal habitats in the western Fijiian Islands

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ABSTRACT. Four new cystiscid species (two *Granulina* and two *Gibberula*) are described from samples dredged from offshore subtidal habitats off the Western Fijiian Islands. *Granulina globosa* sp. nov. is compared with similar species, and the surface microsculpture of the shell is presented to add to the body of evidence supporting this as an important characteristic of the genus. The generic placement of *Granulina mamanucensis* sp. nov. is discussed in depth. *Gibberula marinae* sp. nov. is considered to be a member of the group 'philippi', a widespread group of small white shelled *Gibberula* with variable animal chromatism. *Gibberula vomoensis* sp. nov., an extremely small species with an unusual morphology, is described. The bathymetric distribution of marginellid and cystiscid genera in Fijiian waters is commented upon.

INTRODUCTION

Recent biodiversity exploration by Institut de Recherche pour le Développement (IRD, Nouméa) and Muséum National d'Histoire Naturelle (MNHN, Paris) has brought to light many hundreds of new or little known species of molluscs and other benthic invertebrates. Many of these explorations have been focused in the South-West Pacific, especially New Caledonia, with more scattered results from South-East Asian seas and the South-West Indian Ocean. Two cruises on board R/V 'Alis' have taken place in Fiji and we refer to Richer de Forges *et al.* (2000a and b) for background information on these expeditions, cruise narratives, station lists, maps etc. The majority of the marginelliform gastropods discovered during these campaigns were ascribed to species groups of the marginellid genus *Hydroginella* which was found to dominate the marginelliform fauna at mid-bathyal depths (Boyer, Wakefield & McCleery, 2003).

In 2001, in a privately organized campaign to Fiji (MARINA EM 1), the second author performed dredging operations in offshore subtidal habitats from S.Y. 'Marina Em'. As in the MNHN campaign MUSORSTOM 10 (15-19 August 1998), the stations were all on the Western side of the archipelago (Fig. 1), but were made in relatively shallow water (42-80 m) compared to those that brought up marginelliforms in the museum campaign (100-450m). Dredging operations at 8 stations were performed on a substrate which varied from mud to muddy gravel with coral being encountered at one station (see Table 1). A total of four cystiscid species were found in the samples (two *Granulina* and two *Gibberula*), and as in the MNHN campaigns all were collected as empty shells (except one specimen of *Gibberula marinae* which died shortly after collection, before it could be examined). Since no species from these genera have previously been described as coming from these levels in this area of the South Pacific, and because they all present original morphologic features, we consider them to be new to science and describe them herein as;

Granulina globosa sp. nov.
Granulina mamanucensis sp. nov.
Gibberula vomoensis sp. nov.
Gibberula marinae sp. nov.

The familial assignment of *Granulina* is currently debated amongst those workers who consider the genus to be in the Marginellidae (Boyer & Rolàn,1999; Gofas,1992; La Perna, 1998) and those who regard an assignation to the Cystiscidae to be correct (Coovert & Coovert, 1995; Smiriglio & Mariottini 1996). Since *Granulina* have a type 2 animal (Coovert, 1987) with a simple, unmodified head of a form typically found in the Marginellidae, it would appear that the genus should be placed in this family. However, a type 2 animal is also found in the genus *Plesiocystiscus* (Coovert & Coovert, 1995). The shells of species within this genus are clearly cystiscid, with resorbed cystiscid internal whorls, a multiplicate columella and overall cystiscid morphology. Since a type 2 animal is found in both the Cystiscidae and the Marginellidae, its usefulness as a diagnostic tool at family level could be said to be

unreliable and other characters are therefore needed in order to make a correct familial assignment.
The internal structure of the shell has been used (Coovert & Coovert, 1995) as a primary determinant of familial placement on the basis of the fact that the Cystiscidae modify (almost fully or partially resorb) their internal whorls whereas the Marginellidae do not. *Granulina* has partially resorbed internal whorls (termed 'modified cystiscid' internal whorls) and has therefore been placed in the Cystiscidae in the most recently published and thorough taxonomic classification of marginelliform gastropods (Coovert & Coovert, 1995).
The long narrow radulae of *Plesiocystiscus* and *Granulina*, although structurally very different from each other and from other cystiscid groups, do have more in common with other cystiscid radulae than they do with the wider and shorter comb-like radulae of marginellid groups, and thus they were considered to be Cystiscid radulae by Coovert & Coovert (1995).
The anatomy of the foregut of *Granulina* may reveal further clues as to the familial origin of the genus, but to our knowledge this has not yet been performed or published. For the time being we are of the opinion that the balance of evidence points in favour of assignation of *Granulina* to the Cystiscidae rather than to the Marginellidae.

Materials and methods.

Two rectangular dredges (openings measuring 380 x 100mm) were used during the campaign. One had 6mm galvanised steel mesh, the other 4mm perforated stainless steel sheet. A dredging line of 6mm dia. high tensile yacht rope with 2 tonnes breaking strain was used. Very few specimens were brought up in the 6mm mesh dredge as both the substrate and shells washed out of the dredge on retrieval to the surface. Conversely with the 4mm perforated sheet dredge, mud rapidly clogged up the dredge, so probably only a few metres of seabed were actually sampled before its retrieval.
The sediment obtained was washed through graded sieves with the cystiscids being retained by the final sieve (0.8mm mesh).

Abbreviations

MNHN Muséum national d'Histoire naturelle, Paris.
TMC Tony McCleery collection
AWC Andrew Wakefield collection
dd dead dredged shell
ad adult
juv. juvenile

SYSTEMATICS

Family **CYSTISCIDAE** Stimpson, 1865
Subfamily **GRANULININAE** Coovert & Coovert, 1995
Genus ***Granulina*** Jousseaume, 1888
Type species *Marginella pygmaea* Issel, 1869 (non-*Marginella pygmaea* Sowerby, 1846) = *Marginella isseli* G. & H. Nevill, 1875 (nom. nov.), original designation by monotypy.

Granulina globosa sp. nov.
Figs 2-6, 8, 12-15

Type material. MARINA EM 1, stn 6, holotype (1.75 x 1.34 mm), dd. ad. in MNHN, (Figs. 12-15). 3 paratypes (also from stn 6); (1.41 x 1.09 mm) dd. ad. in MNHN : (1.50 x 1.20 mm) dd. ad. in AWC: (1.44 x 1.14 mm) dd. ad. in TMC.

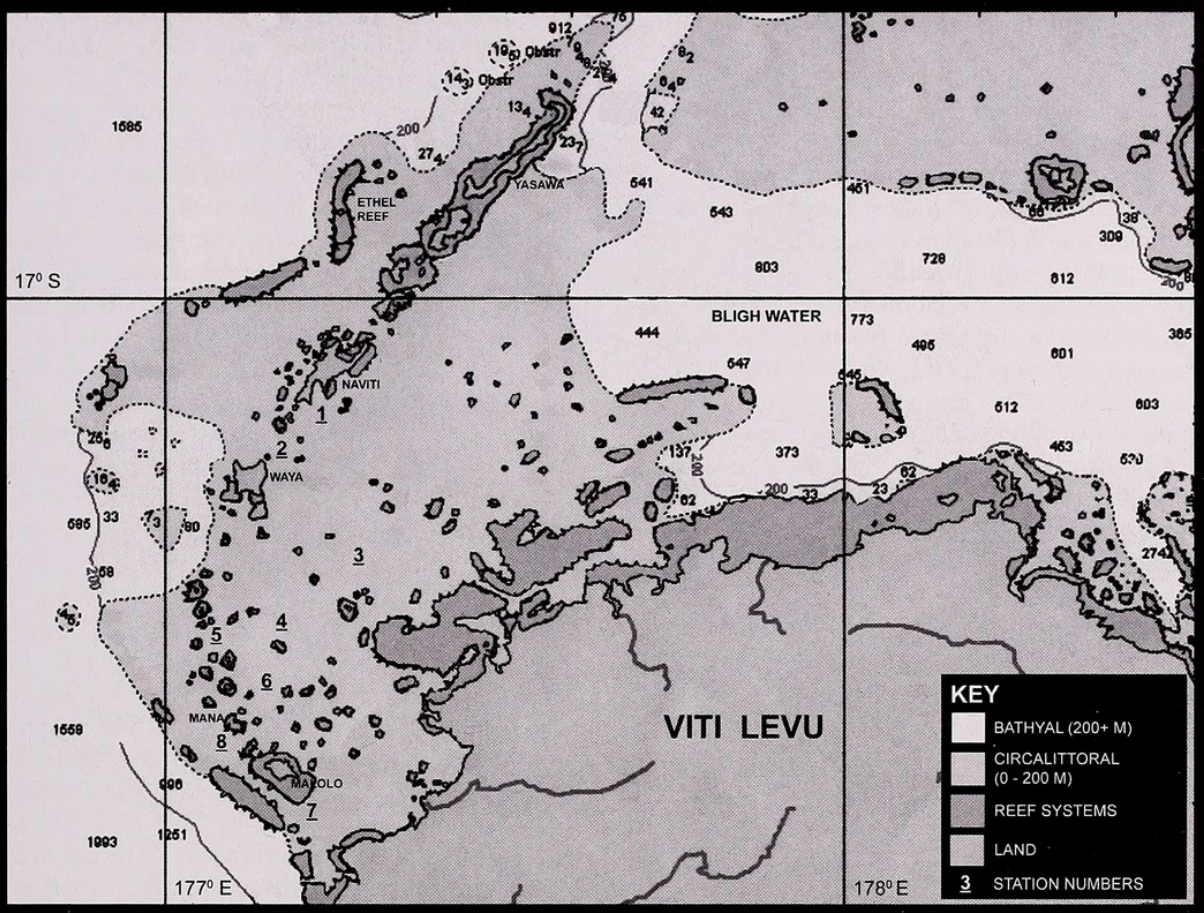
Type locality. West of Mamanuca Islands, Western Fiji, 17°37'S 177°09'E (MARINA EM 1, stn 6), on mud/gravel in 80m.

Other material examined. MUSORSTOM 10 (1.75 x 1.34 mm, 1.41 x 1.09 mm) dd. ad., in MNHN, stn DW 1329, 17° 19.3' S 177° 47.4' E, Bligh Water, Fiji, 102 – 106 m.; **MARINA EM 1**, stns 1-8, 10 dd. ad. in AWC ; 52 dd. ad. in TMC.

Description. Shell minute (holotype 1.75 mm in length, paratypes 1.41 – 1.75mm). Description of holotype; translucent white, glossy, very rounded. Spire completely submerged, callused, suture obscured. Labrum strongly curved, inner aspect bearing 15 strong, evenly spaced labial denticles, weakening slightly towards posterior and anterior ends. Labial varix very strong, grooved externally, extending posteriorly beyond length of last whorl to insert onto top of spire, and anteriorly around base of columella to join with first plication. Aperture evenly narrow with weak anterior flare. Parietal wall

Figures 1-11

1. Map of the Western Fijiian Islands; **2-4.** *Granulina globosa* sp. nov. MUSORSTOM 10, stn DW 1329, Bligh Water, Fiji, 102-106m (1.75 x 1.34 mm), MNHN; **5.** *G. globosa* sp. nov., weakly callused adult shell, MARINA EM 1, stn 3, NW of Vomo, Fiji, (length 1.60 mm), TMC; **6.** *G. globosa* sp. nov., strongly callused adult shell, MARINA EM 1, stn 3, NW of Vomo, Fiji, (length 1.65 mm), TMC; **7.** *G. mamanucensis* sp. nov., detail of base of columella and labrum; **8.** *G. globosa* sp. nov., detail of base of columella and labrum; **9.** *G. oodes* (Melvill, 1898), original figure from Melvill, 1898; **10.** *Gibberula marinae* sp. nov., MARINA EM 1, stn 6, Mamanuca Islands, Fiji, (length 2.3 mm), TMC, angled view of parietal callus protrusion; **11.** *G. vomoensis* sp. nov., MARINA EM 1, stn 3, NW of Vomo, Fiji, (length 1.59 mm), TMC, angled view of parietal callus.



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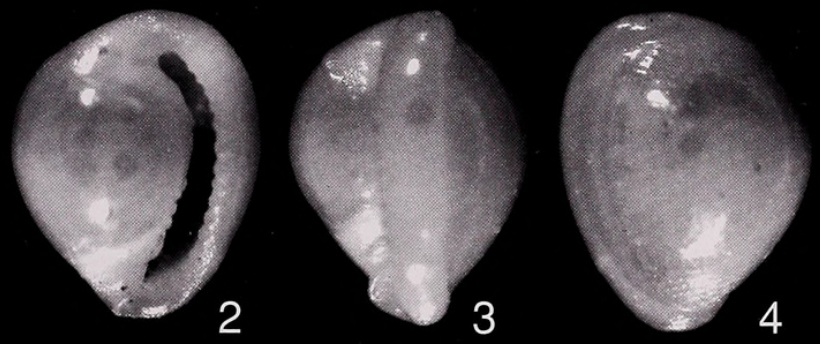

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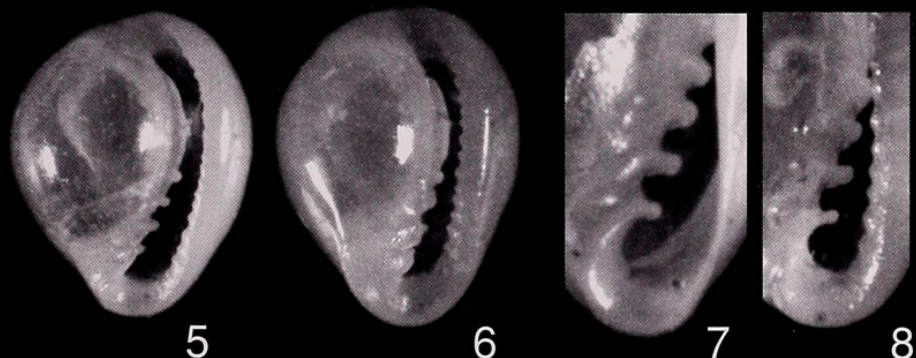

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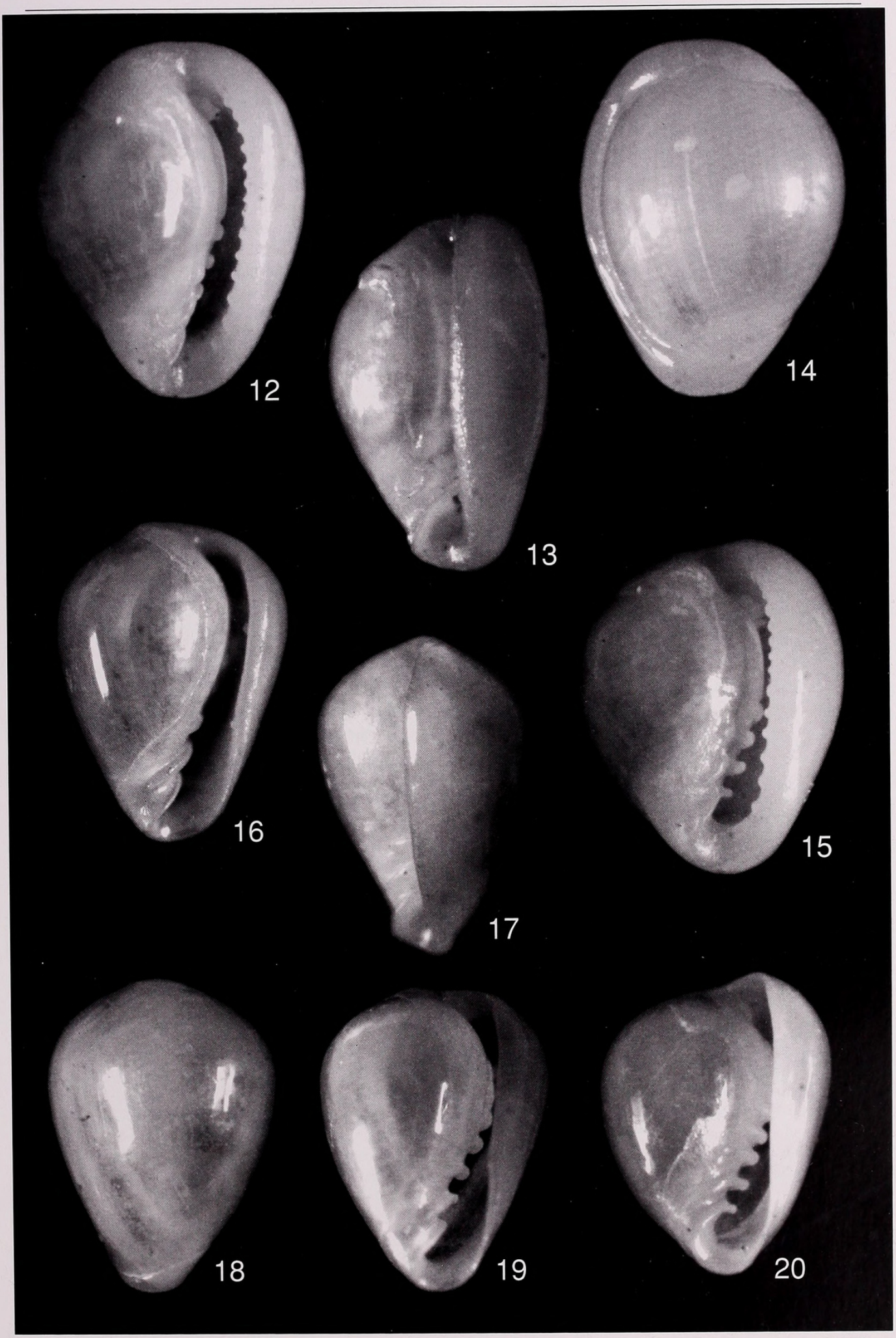
convex. Columella with four plications occupying anterior half of aperture; first plication strongly emergent, narrow, with beaded crest, its end kinked downwards as it meets the parietal callus ridge; second plication shorter and wider, end also kinked downwards ; third plication shorter and wider still, with a raised bead at its end where it joins parietal callus ridge; fourth plication short, wide, only visible within aperture, insufficiently emergent to meet parietal callus ridge. Collabral parietal callus ridge strong, intersecting first three plications resulting in their excavated appearance. Parietal callus wash thick, smooth, edge distinct and slightly raised posteriorly, extending well out of aperture anteriorly and posteriorly but not medially. All callused areas microscopically pitted. Last adult whorl bearing 5 spiral rows of raised micro-nodules at both anterior and posterior ends, visible from dorsal aspect only.

Remarks. The majority of described species of *Granulina* have a 'heart' shaped or ovoid shell profile. The distinctive globular profile, very strong callus deposits and extremely thick external labial varix of *G. globosa* thus serve to distinguish this species from most other locally occurring and worldwide *Granulina*. *Granulina isseli* (G. & H. Nevill, 1875), the type species of the genus, is slightly less rounded than *G. globosa*, its labial denticles are also not as strong and it is a shallow water species (see Bouchet & Danrigal, 1982). *G. oodes* (Melvill, 1898) (Fig. 9) from the Arabian Gulf considered by Tomlin (1917) to be a synonym of *G. isseli*) was originally described as having a 'globose, *Cypraea*-like shell with a very thickened lip'. Its original figure (Fig. 9) does indeed show a very round shell but the labrum lacks denticles and therefore it too cannot be confused with *G. globosa*.
G. globosa is very similar morphologically to the benthic Western Mediterranean species *G. gubbiolii* (Smriglio & Mariottini, 1999) which exhibits a similar degree of callus formation, and *G. minusculina* (Locard, 1897) from the Ibero-Morroccan Gulf which exhibits a similar globular profile. Both of these species are 0.5-1.0mm longer than *G. globosa*, and lack microsculpture. Nevertheless, it is evident that *G. globosa* belongs to a group comprising *G. minusculina*, *G. gubbiolii*, and the slightly more pyriform *G. melitensis* (Smriglio, Mariottini & Rufini, 1998).
Surface macro and microsculpture is a recognized feature of *Granulina* (Gofas, 1992 ; Boyer & Rolàn, 1999). *G. globosa* has several surface features; minutely pitted callus deposits and five or six concentric rows of raised micro-nodules crowded at both anterior and posterior ends. (Figs. 4, 14). These features are described by Smriglio & Mariottini (2001) as being a characteristic feature of their new genus *Paolaura*, with its type species *P. semistriata* (Smriglio & Mariottini, 2001) bearing a spiral microsculpture similar in distribution to *G. globosa*.
The genus *Granulina* clearly comprises an extremely large and sculpturally diverse number of species, which can be expressed as a spectrum of morphs varying from hyaline, non-denticulate and completely smooth shelled species at one end, to heavily callused, denticulate and deeply sculpted species at the other. Whilst some morphologic trends or groups do seem to be emerging as more and more of these granulinids are described, we consider that it is premature to be considering the description of new genera within the subfamily Granulininae. Furthermore, it is not yet known whether subdivision of the genus is going to be appropriate given the ongoing nature of description of different forms occurring within it.
The material dredged by MUSORSTOM 10 in 102-106m (Figs. 2-4) closely matches the morphologic characters of the shells of *G. globosa* taken in shallower water (42 - 80m) by MARINA EM 1 and also exhibits the same surface microsculpture. We thus consider the two to be conspecific.
The currently known bathymetric range for *G. globosa* (42 - 106m) appears to be wider than that of the other species described in this paper, which were lacking in the upper bathyal MNHN samples. This wide range is, however, based upon the occurrence of empty shells rather than living animals, and the possibility of translocation of many shells downslope must be borne in mind when considering these figures. Having said that, the ability of some species of *Granulina* to have a large bathymetric range is well documented. For example, *G. minusculina* is found living on sediments from 112-1285m (Gofas, 1992). *G. globosa* was the most commonly occurring species found during the campaign, being present at all of the stations, in greater numbers than the other species.
The deposition of callus in this species seems to be a sign of gradual maturity since some adult shells are found which are relatively weakly callused (Fig. 5) when compared with other, presumably older specimens (Fig. 6).

Etymology. From the Latin *glŏbōsus* : round as a ball, spherical, globose.

Figures 12-20

12-15. *Granulina globosa* sp. nov., MARINA EM 1, stn 6, holotype (1.75 x 1.34 mm), MNHN.
16-18. *Granulina mamanucensis* sp. nov., MARINA EM 1, stn 6, holotype (1.25 x 0.96 mm), MNHN.
19-20. *G. mamanucensis* sp. nov., view of columellar plications (1.19 x 0.90 mm, 1.29 x 0.94 mm), TMC.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Granulina mamanucensis sp. nov.
Figs 7, 16-20

Type material. MARINA EM 1, stn 6, holotype (1.25 x 0.96 mm) dd. ad, in MNHN, (Figs 16-18), 80 m.
3 paratypes MARINA EM 1: (1.25 x 0.92 mm) dd. ad., stn 7, in MNHN, 42 m ; (1.26 x 0.95 mm, 1.29 x 0.98 mm) dd. ad., stn 6, in AWC, 80 m ; (1.26 x 0.95) dd. ad., stn 5, 65 m, in TMC.

Type locality. West of Mamanuca Islands, Western Fiji, 17°37'S 177°09'E (MARINA EM 1, stn 6), on mud/gravel in 80m.

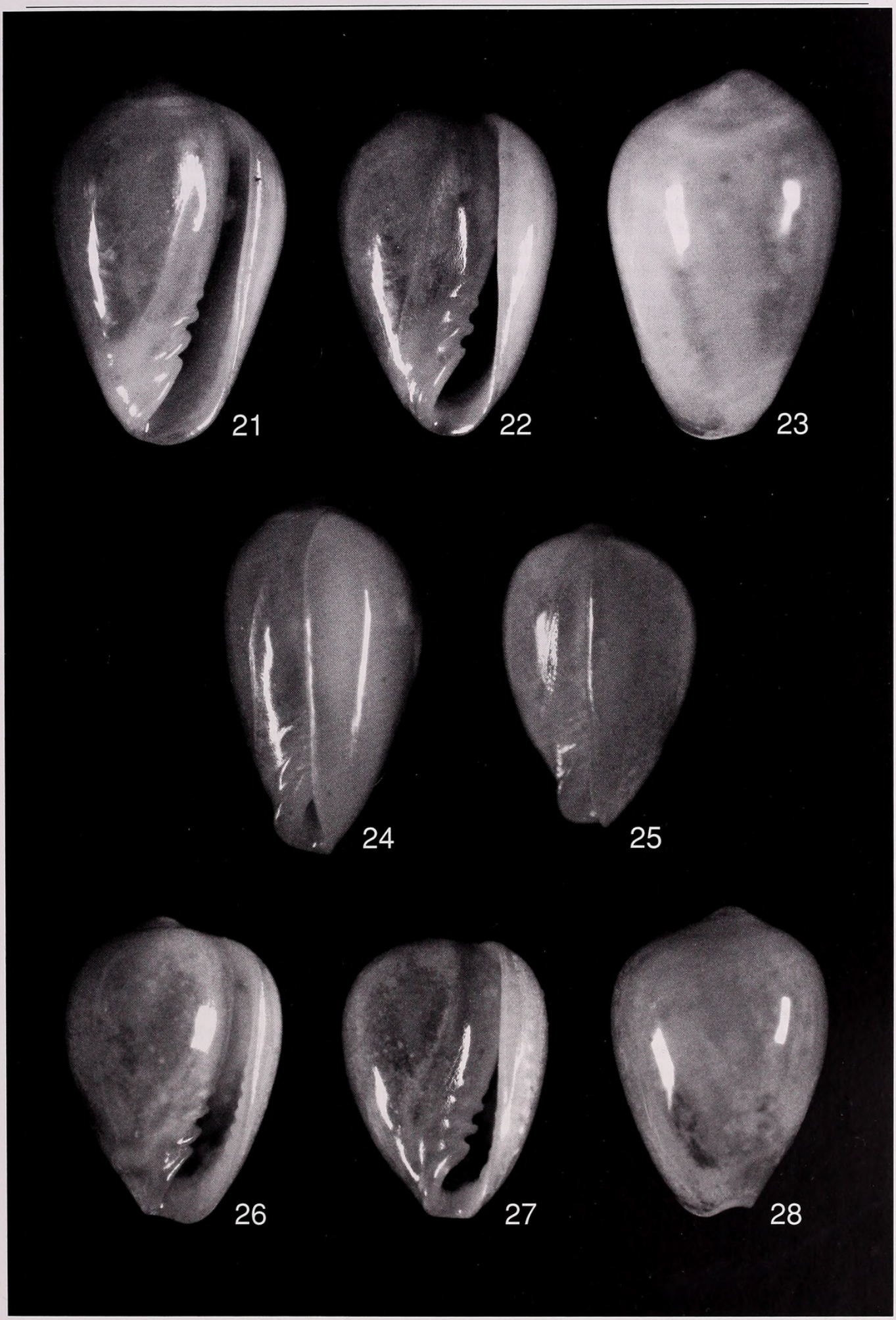
Other material examined. MARINA EM 1, stns 1,2,4-7, 15 dd. ad., in TMC.

Description. Shell minute (holotype 1.25 mm in length, paratypes 1.25 – 1.29mm). Description of holotype; translucent white, glossy, subtriangular, widest part at junction of posterior and middle thirds, tapering to base. Spire immersed, covered by strong callus forming a rostration. Suture indistinct. Labrum thickened and beveled posteriorly, convex externally, very weakly concave internally, smooth, external varix absent. Labial shoulder extending posteriorly due to insert onto spire. Siphonal notch absent, posterior notch weak. Aperture narrowest at posterior third, gradually widening anteriorly. Parietal wall convex. Parietal callus ridge weak. Parietal callus wash moderately strong extending well out of aperture, over spire and around base. Columella with seven plications; first plication strongly emergent, narrow, crest rounded, kinked downwards where it meets parietal callus ridge; second plication slightly wider, crest less rounded, also kinked downwards as it emerges from aperture; third plication shorter, crestally flatter presenting slightly square profile. Remaining four plications only visible deep within aperture, gradually decreasing in strength; Posterior ¼ of parietal wall smooth. Plications all equidistant from each other.
Animal not seen.

Remarks. The correct generic assignment of this species proved to be difficult to ascertain and according to the currently accepted characteristic features of *Granulina* (Gofas 1992, Coovert & Coovert, 1995) not entirely satisfactory. These features are of a small white ovoid shell with the last adult whorl completely enveloping the preceeding ones. The labrum inserts posteriorly either close to or directly on top of the spire forming a rostration. The labrum is often bevelled posteriorly, bears denticles interiorly, and is varixed externally. There is a strong parietal callus and the columella bears four plications confined to the anterior half of the apertural length. These plications take the form of an inner and outer series running parallel to each other, separated by an 'excavated' region. Finally, there is often a surface microsculpture present on the last whorl.
Our new species is small and white but is more subtriangular than ovoid, and it lacks microsculpture. It bears the apical rostration and the well demarcated parietal callus deposits. The posterior labial bevel is strong but the labrum lacks denticles and an external varix, being only weakly thickened externally. Perhaps the biggest difference is that whilst the first four plications are excavated and of a form comparable to other *Granulina* species (compare Fig. 7 with Fig. 8, noting particularly that the second plication is kinked anteriorly in both) a further 3 plications/lirae are present as an extension of the internal series deep within the aperture, to finally occupy up to ¾ of its length (Figs. 19, 20). The shell features of our new species therefore express considerable deviation from those which are diagnostic for *Granulina*. With this information alone it is not possible to make a definitive generic assignation, since the species also bears characters which resemble *Cystiscus* (subtriangular profile, multiple columellar plications, smooth weakly thickened labrum, surface gloss) and *Crithe* (subtriangular profile, smooth weakly thickened labrum and multiple, excavated plications). Since the internal whorl structure of *Granulina* has been shown to differ from that of *Cystiscus* and *Crithe* (Coovert & Coovert, 1995), a paratype in AWC was sectioned in order to determine the structure of the internal whorls. It was found to have modified cystiscid internal whorls and thus indicative of *Granulina*.
The assignation of this new species to the genus *Granulina* was confirmed by reference to indirect evidence obtained from live animal observations of two similar shallow water *Granulina* species which occur in surrounding island locations (Vanuatu and Fiji). These as yet undescribed species whilst being more rounded at the labial shoulder, have a smooth glossy shell, a non-denticulate weakly thickened but non-varixed labrum, and a columella which bears 6 plications/lirae occupying up to ¾ of the apertural length. They therefore bear a close morphological resemblance to *G. mamanucensis*. The animals of these two species have been observed to have type 2 (Coovert, 1995) *Granulina*-like animals rather than the type 4 *Cystiscus/Crithe*-like animals which are anatomically very different. As a result we propose to assign our new species to the genus *Granulina* (considered as an undifferentiated whole) whilst

Figures 21-28

21-24. *Gibberula marinae* sp. nov., MARINA EM 1, stn 6, holotype (2.48 x 1.62 mm), MNHN.
25-28. *Gibberula vomoensis* sp. nov., MARINA EM 1, stn 3, holotype (1.64 x 1.17 mm), MNHN.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acknowledging that all of the new species mentioned above belong to a distinct group within the genus *Granulina*. Comparisons of *Granulina mamanucensis* with other worldwide *Granulina* have been made, with the Cape Verde species *G. fernandesi* (Boyer & Rolan, 1999) showing some affiliation due to its lack of an external varix and labial denticles. We consider however, that despite these similarities *G. fernandesi* is not closely related to *G. mamanucensis* as the former has a surface microsculpture, and also only has four columellar plications occupying less than half of the apertural length. Therefore the group of multiplicate, smooth shelled, non-denticulate and non-varixed *Granulina*, of which *G. mamanucensis* is a member, currently appears to be confined to South Central Pacific localities.
G. mamanucensis was found in 6 out of the 8 stations, on a mud and gravel substrate in 42 –80m.

Etymology. Named after the Mamanuca Islands (pronounced 'Mamanutha'), the nearest island group to the type locality.

Subfamily **PERSICULINAE** Coovert & Coovert, 1995
Genus ***Gibberula*** Swainson, 1840
Type species *Gibberula zonata* Swainson, 1840, = *Volvaria oryza* Lamarck, 1822, original designation by monotypy.

Gibberula marinae sp. nov.
Figs 10, 21-24

Type material. MARINA EM 1, stn 6, holotype (2.48 x 1.62 mm)dd. ad, in MNHN, (Figs 21-24) , 80 m.
5 paratypes, MARINA EM 1: (2.57 x 1.51 mm)dd. ad., stn 6, in MNHN ; (2.24 x 1.36 mm) dd. ad., stn 6, in TMC; (2.35 x 1.50 mm, 2.25 x 1.15 mm, 2.43 x 1.55 mm) dd. ad., stn 5, in AWC.

Type locality. West of Mamanuca Islands, Western Fiji, 17°37'S 177°09'E (MARINA EM 1, stn 6), on mud/gravel in 80m.

Other material examined. MARINA EM 1, stns. 5 – 7, 7 dd. ad., , in TMC.

Description. Shell small (holotype 2.48 mm in length, paratypes 2.24 – 2.57mm). Description of holotype; translucent white, glossy, obovate, shoulders rounded, tapering to rounded base. Spire slightly elevated, of 2.5 whorls including nucleus. Suture smooth, visible. Labrum smooth, straight, widest in its posterior third. 5 weak labial denticles and lirae only evident in anterior third, labial edge weakly thickened and rounded. Siphonal and posterior notches weak. Aperture weakly curving, narrow in its posterior half, flaring slightly along its full length to base. Parietal callus wash heavy, distinctly edged and slightly angulated at its mid point by callus protrusion. Parietal wall very weakly convex, smooth. Columella with four oblique plications, occupying anterior half of aperture ; first three plications strongest, straight, oblique, evenly spaced, decreasing in size from from first to third. First plication large, emergent from aperture. Fourth plication diminutive.
Animal not observed.

Remarks. A single live specimen (a paratype in TMC) was obtained in one dredging operation (stn.6), but by the time the contents of the dredge had been sorted, the animal was dead and could not be studied. This does however prove that at least this species actually lives at these depths and that dead shells are not necessarily translocated there from shallower levels. *G. marinae* was absent from the more muddy substrates of stations 1- 4, the inference being that it prefers the habitat of a coarser substrate.
The callus protrusion on the mid-parietal surface (Fig. 10), which from one particular viewpoint results in the aperture having a slightly angled appearance, is unusual.
This species exhibits a size and profile characteristic of the group '*philippi*' (Gofas, 1987) and is close to the *G. sandwicensis* (Pease, 1860) complex of species, a study of which is currently being undertaken by the authors.

Etymology. Named both for Marina McCleery, the daughter of the second author, who took part in the campaign, and for S.Y. 'Marina Em', the vessel from which the material was dredged.

Gibberula vomoensis sp. nov.
Figs 11, 25-28

Type material. MARINA EM 1, stn 3, holotype (1.64 x 1.17 mm)dd. ad., in MNHN, (Figs 25-28), 60 m.
5 Paratypes MARINA EM 1, stns 1,2 : (1.53 x 1.08 mm), in MNHN; (1.54 x 1.14 mm, 1.63 x 1.18 mm), in AWC; (1.54 x 1.14 mm, 1.62 x 1.14 mm), in TMC.

Type locality. Off the island of Vomo, Western Fiji, 17°25'S 177°16'E (MARINA EM 1, stn 3) on mud in 80m.

Other material examined. 20 dd. ad., MARINA EM 1, stns 1,2,7,8, TMC.

Description. Shell minute (holotype 1.64 mm in length, paratypes 1.53 – 1.54mm). Description of holotype; translucent white, glossy, rounded, not shouldered, tapering to rounded base. Spire slightly elevated, sides weakly concave 2.5 whorls including nucleus. Suture smooth, visible. Labial shoulder not

raised above suture. Labrum bearing 10-12 evenly spaced denticles, usually strong but occasionally weak, very weak or absent altogether. When present, denticles strongest in anterior half of aperture, becoming weaker and almost completely absent at posterior end. Internal lirae present in association with denticles. Lirae not extending far into aperture. Siphonal canal moderate, posterior notch weak. Aperture narrow, gently curving. Flaring only weakly to base. Parietal wall weakly convex, smooth, with callus wash and weak collabral parietal callus ridge. Callus wash extending well out of aperture, with a well defined edge. Columella with four oblique plications, occupying half of apertural length. First plication strongest, slightly concave, emergent. Size of plications decreasing to fourth plication which is diminutive. All four plications appearing excavated due to influence of collabral parietal callus.
Animal not observed.

Remarks. The more rounded profile of this tiny shell, the strong labial denticulation, and the weaker parietal callus wash (Fig. 11), serve to distinguish this species from *G. marinae*. It appears to be unusual in that adult shells can be weakly to very strongly denticulated, and it may be that strong labial denticulation only develops in gerontic specimens.

Etymology. Named after the island of Vomo, Fiji, off which the type material was dredged.

DISCUSSION

The MNHN campaigns performed over 200 dredging operations in this general area, yet from a quantitative point of view the yield of marginelliforms was not a great as that obtained from the fewer dredging operations performed during MARINA EM 1 with a smaller sized dredge and a very short dredging distance. From this comparison, and from study of the generic composition of the material obtained, two observations can be made. First of all it can be inferred that marginelliform gastropods have a much higher relative abundance in offshore subtidal habitats in this area of Fiji than they do in the bathyal, and secondly that there is clear evidence of a transition from *Gibberula/Granulina* dominance in offshore subtidal habitats to *Hydroginella* dominance at greater depths. Whilst it is perhaps not too surprising that marginelliforms are scarce in the inhospitable environment encountered at bathyal depths, currently there is no satisfactory explanation for the phenomenon of the pattern of generic bathymetric distribution. Having said that, two undescribed *Hydroginella* species representing two different groups have been discovered in shallow water coral reef environments in Fiji by the second author, which makes the apparent absence of this genus in offshore subtidal habitats (as recorded by MARINA EM 1) unexpected. One explanation is that as the number of samples taken during MARINA EM 1 was relatively small, and the dredging distances short it is possible that other genera such as *Hydroginella* were simply missed. On the other hand it may be that the samples obtained are in fact a true reflection of the marginellid fauna at these depths.
The generic bathymetric distribution observed by us in the Western Fijiian Islands appears to be replicated to some extent in the Marquesas Islands. Deep dredging operations (300m) performed there by the second author in August 2003, using the same equipment as used in MARINA EM 1, brought up no marginelliforms. However, Cystiscidae were again encountered in offshore subtidal habitats between 40 and 90 metres. A *Granulina* and a *Gibberula*, both different to the Fijiian species described herein, were discovered in the dredge. Although both species were found on the coarser substrates, their incidence on the softer muddy substrates was far greater, the *Granulina* in particular being abundant.
The dominance of *Granulina* and *Gibberula* species from offshore subtidal habitats in Western Fiji, the Marquesas Islands, and probably in many other Pacific Island localities, is beyond doubt, but further dredging operations at these levels in Fiji will be required to establish the true pattern of the bathymetric distribution of *Hydroginella* groups occuring there.

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Station	Locality & coordinates	Depth (metres)	Substrate	Number and name of species found
1	S.W. of Nanuya Sewa, Yasawa Islands. 17°02'S 177°20'E	60	Mud	2 x *globosa* 1 x *mamanucensis* 3 x *vomoensis*
2	S.W. of Nanuya Sewa, Yasawa Islands. 17°14'S 177°13'E	45	Mud	9 x *globosa* 3 x *mamanucensis* 3 x *vomoensis*
3	N.W. of Vomo Island, 17°25'S 177°16'E	60	Mud	20 x *globosa* 1 x *vomoensis*
4	W. of Vomo Island, 17°32'S 177°10'E	65	Sand/mud	4 x *globosa* 2 x *mamanucensis*
5	Off Mamanuca Islands, 17°34'S 177°06'E	65	Gravel/mud	5 x *globosa* 3 x *mamanucensis* 5 x *vomoensis*
6	Off Mamanuca Islands, 17°37'S 177°09'E	80	Gravel/mud /coral	5 x *globosa* 2 x *mamanucensis* 4 x *marinae*
7	Off Malolo Lai, 17°42'S 177°12'E	42	Gravel/mud	10 x *globosa* 8 x *mamanucensis* 1 x *vomoensis* 4 x *marinae*
8	S.W of Mana Island, 17°48'S 177°05'E	60	Sand/gravel /mud	1 x *globosa* 3 x *vomoensis*

Table 1. Stations, coordinates, substrates and sympatric occurence of species found