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Title page photo: Papuan house surrounded by primary rainforest, Star Mountains, New Guinea (image by Dmitry Telnov).





New *Taheitia* H. et A. Adams, 1863, with revisional notes on the Papuan Truncatellidae (Caenogastropoda: Truncatelloidea)

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Abstract: Surveys of snails from New Guinea and surrounding islands provide new distributional and ecological data for Truncatellidae from the Papuan Region. We present an annotated checklist of all Papuan Truncatellidae and the first identification key for the terrestrial genus *Taheitia* H. and A. Adams, 1863. Unlike widespread marine and estuarine species of *Truncatella*, the Papuan *Taheitia* usually have single island ranges and are restricted to forested limestone habitats. New anatomical data suggests that many earlier reports of *Taheitia* with multi-island distributions appear to be the result of confusion between superficially similar species. Eight new *Taheitia* species are described: *T. biaka* sp. nov. from Biak, *T. bifurca* sp. nov. from Manus, *T. gebeensis* sp. nov. from Gebe, *T. gigantea* sp. nov. from Waigeo, *T. jodiae* sp. nov. from New Britain, *T. longpela* sp. nov. from New Britain, *T. malagan* sp. nov. from New Ireland, and *T. telnovi* sp. nov. from Misool.

Key words: Taxonomy, new species, key, Taheitia, Truncatella, Papuan Region, ecology, endemism.

Introduction

Truncatellidae Gray, 1840 is a family of marine, estuarine and terrestrial caenogastropod snails distributed throughout the tropics and subtropics (Clench & Turner 1948; Egorov 2018). The family is currently divided into two subfamilies: 1) Truncatellinae Gray, 1840, comprised of the genera Truncatella Risso, 1826 and Taheitia H. et A. Adams, 1863; 2) Geomelaniinae Kobelt et Möllendorff, 1897 with the single genus Geomelania. Truncatella, is cosmopolitan in the tropics and subtropics in marine and estuarine habitats, with a few notable exceptions in terrestrial habitats (Rosenberg 1996). The other two genera are terrestrial with Taheitia restricted to the Pacific Basin, and Geomelania, the Atlantic Basin. Taheitia is morphologically more similar to Truncatella (Clench & Turner 1948) than Geomelania and the two terrestrial genera appear to have independently colonized terrestrial habitats in the Pacific and Atlantic Basins respectively (Rosenberg 1996). However, Egorov (2018) places Taheitia in the Geomelaniinae implying a common origin of the terrestrial species in both the Pacific and Atlantic Basins. Unfortunately, independent molecular data is currently available for only a few taxa from the Atlantic Basin (Wilke *et al.* 2013) and it remains unclear how many times terrestrial habitats have been colonized by truncatellids.

The last comprehensive treatment of the family (Clench & Turner 1948) includes anatomical and morphological notes, an annotated checklist, and bibliography of all truncatellids known up to that time. Two truncatellid genera, Taheitia and Truncatella, occur in the Papuan Region, defined as the area from the Maluku to the Solomon Islands (Gressit 1982; Beehler et al. 1986; Riedel 2002; Telnov 2011), Papuan truncatellids and in particular the fully terrestrial genus Taheitia remain incompletely sampled and even incidental collections uncover undescribed species (Turner 1959; van Benthem Jutting 1963; Gittenberger 1989). Our surveys allow us to provide an updated annotated checklist of Truncatellidae from the Papuan Region with new distributional and ecological records. New morphological data, particularly radular and opercular characters allow us to redescribe Taheitia clathrata (H. Adams et Angas, 1865), T. foliosocostata van Benthem







Jutting, 1963, *T. galactodes* van Benthem Jutting, 1963, *T. schneideri* (I. Rensch, 1937), *T. tesselata* Möllendorff, 1897, *T. ultima* (I. Rensch, 1937), and *T. wallacei* (H. Adams, 1865). Our surveys also uncovered eight new species: *Taheitia biaka* sp. nov. from Biak, *T. bifurca* sp. nov. from Manus, *T. gebeensis* sp. nov. from Gebe, *T. gigantea* sp. nov. from Waigeo, *T. jodiae* sp. nov. and *T. longpela* sp. nov. from New Britain, *T. malagan* sp. nov. from New Ireland, and *T. telnovi* sp. nov. from Misool. The first key to Papuan species of *Taheitia* H. et A. Adams, 1863 is presented. Peculiarities of the exclusively terrestrial Papuan representatives compared to the typical *Taheitia* sensu Adams and Adams (1863) are briefly discussed.

Material and methods

Newly collected specimens were preserved as dry shells or whole animals in 75% or 99% ethanol and were identified by the authors. A Leica S6D stereomicroscope or Wild M7 were used for dissection and study. Shell images were taken using a Canon EOS 77D or Nikon D90 SLR cameras attached to stereomicroscopes. CombineZP software was used for image stacking (Hadley 2010). Further image manipulations were done in GNU Image Manipulation program (GIMP) or Adobe Photoshop. Micrographs were imaged using a Hitachi SU5000 Schottky field emission scanning electron microscope.

A phylogenetic arrangement is currently impossible and all taxa are listed alphabetically. All label text for museum specimens is reproduced without additions. Author's comments are placed in square brackets. Text from multiple labels is separated by a slash. Type specimens of new species are provided with an additional blackframed printed label "Holotypus" or "Paratypus" on red paper.

Museum acronyms used in the text:

BMNH – Natural History Museum (formerly British Museum, Natural History), London, United Kingdom;

KGC - Collection Kristine Greķe, Dzidriņas, Latvia;

- MBBJ Museum Zoologicum Bogoriense, Indonesian Institute of Sciences, Cibinong, Indonesia;
- MFNB Museum für Naturkunde der Humboldt-Universität zu Berlin, Germany;
- NME Naturkundemuseum Erfurt, Germany;
- NMNL Naturalis Biodiversity Center, Leiden, the Netherlands;

- NMS National Museums Scotland, Natural Sciences, Edinburgh, United Kingdom;
- PNG Papua New Guinea National Museum and Art Gallery, Port Moresby, Papua New Guinea
- UF Florida Museum of Natural History, Gainesville, Florida, USA.

Measurement abbreviations:

- AH height of aperture;
- AW width of aperture;
- EW width of embryonic whorls;
- PW width of penultimate whorl;
- SH decollate adult shell height including the peristome;
- SW shell width including the peristome;
- UH height of ultimate whorl;
- UW width of ultimate whorl.

Other abbreviations:

- env. environs;
- juv. juvenile (not adult or subadult) specimen;
- vill. village or little settlement.

Terminology critical for Truncatellidae species recognition follows Clench and Turner (1948) and Turner (1959). The following measures were taken for all taxa: shell height measured parallel to the shell axis, height of the ultimate whorl, maximum shell width, and maximum height of the aperture. For the widespread species only those bibliography records are given related to the study area.

Holotypes of the newly described species are deposited at the NME and UF. Additional specimens are deposited at MBBJ and PNG.

Results

Gastropoda Cuvier, 1795 Caenogastropoda Cox, 1960 Littorinimorpha Golikov et Starobogatov, 1975 Truncatelloidea Gray, 1840 Truncatellidae Gray, 1840

Truncatella Risso, 1826

Type species: *Truncatella costulata* Risso, 1826 subsequent designation by Lowe (1855).

Truncatella is a genus of caenogastropods, mostly marine and estuarine but some are also adapted to living in near shore terrestrial environments. Five species and one subspecies are found in the Papuan Region.



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Truncatella (s. s.) granum Garrett, 1872

Bibliography: van Benthem Jutting (1963: 440), record (New Guinea, Doberai Peninsula, "Pasirputih near Manokwari, on fallen tree trunk").

Ecology: Salt-tolerant species of drift line. Distribution: Pacific islands from Fiji (locus typicus) to W New Guinea.

Truncatella (s. s.) guerinii A. Villa et J. B. Villa, 1841 (Fig. 1)

Truncatella aurantia Gould, 1847 Truncatella cristata Crosse, 1868 Truncatella fasciata Tapparone Canefri, 1886 Truncatella ferruginea Cox, 1868 Truncatella pacifica Pease, 1867 Truncatella semperi Kobelt, 1884 Truncatella valida L. Pfeiffer, 1846 Truncatella vitiana Gould, 1847 Truncatella yorkensis Cox, 1868

Bibliography: Tapparone Canefri (1874: 563), as T. valida, record (Aru Islands: "Wokan"); Tapparone Canefri (1877: 290), as T. valida, record (New Guinea, Doberai Peninsula: "Sorong"); Tapparone Canefri (1883: 280), as T. valida, record (Aru Islands: "Wokan"); Tapparone Canefri (1886: 192-193), as T. pacifica, record (New Guinea, Doberai Peninsula: "Tangion Bair, costa occidentale della Nuova Guinea"), as T. fasciata, record Aru Islands: "Wokam"); Hedley (1891: 100), as T. valida, records (New Guinea, Papuan Peninsula: "Port Moresby"; Milne Bay Province: "Milne Bay, Samarai" (islet offshore extreme SE New Guinea)); Soós (1911: 349), as T. valida, records (North New Guinea: "Berlinhafen" (now Berlin Harbour), "Tamara Island" (now Tumleo); Leschke (1912: 144), as T. valida, records (North New Guinea: "Berlinhafen" (now Berlin Harbour), "Tamara Island" (now Tumleo); East New Guinea, Huon Gulf: "Simbang"); Boettger (1922: 392, pl. 22 fig. 27), as T. valida, record ("Aru Inseln"); Adam & Leloup (1938: 82, pl. 5 fig. 3), as T. valida, records (Banda Islands: "Ile Pisang"; New Guinea, Doberai Peninsula: "Ile Mansinam, Manokwari"); Rensch I. (1937: 626, 633 & 634), as T. valida, additional description, genera distribution, records (Bismarck Archipelago, Duke of York (Neulauenburg); New Britain: "Karlei (Weite Bucht)", "Nordküste (Ulamona)"; New Ireland: "Ugana"; Vuatom), as Truncatella (Taheitia) semperi, redescription, records (Bismarck Archipelago, New Britain (Neupommern), New Ireland (Neumecklenburg); Solomon Islands, New Georgia: "Batuma, Morawa Lagune"); Rensch I. (1940: 39), as T. semperi, record (Bismarck Archipelago: New Britain (Neupommern)); Clench & Turner (1948: 167 & 199), synonymy, checklist, records (Aru Islands: Wokam (Wokan); North Moluccas: Bacan (Batjan); Shortland Islands (Papua New Guinea): Shortland: "Harapa"; Solomon Islands: Guadalcanal (Guadalcanar); van Benthem Jutting (1963: 439), as T. guerini [sic], bibliography, records

(New Guinea, northern part: "Hollandia" and "near Base "G" near Hollandia" (now Jayapura area); Doberai Peninsula: "Manokwari, "Pasirputih near Manokwari, on fallen tree trunks"; Cenderawasih Bay Islands, Biak Island: "Ariodbi (Division of Marines)", "Biak", "Jodbi"; "Kombai", "Warsa", "mangrove between Parai and Idbi, W of Bosnik, S coast", "beach near kampong Mokmer, E of airport hotel"; "kampong Saba, E part of Biak, under drift material"; Numfoor Island: "Numfoor"; Raja Ampat Islands, Waigeo: "Waigeu"); Vermeulen (1996: 108 & 113), as T. guerini [sic!], record (Aru Islands), ecology ("entirely restricted to areas under immediate influence of the sea (shores, mangrove vegetation, etc."); Greke (2012: 229), general distribution, record (North Moluccas, Gebe: "on the way from Kacepi to Umera vill., secondary rainforest on limestone").

New material: strand bij kolensteiger (Ambon) 10-6-1939 [2 adults, NMNL]; INDONESIA E, Prov. Raja Ampat, Misool S, distr. Misool Utara, Aduwey (Adua) vill. ~1 km E, Seram Sea shore, in a small stream near the sea, 01°58'41"S, 129°55'18"E, 28.III.2009 [1 adult, KGC]; INDONESIA E, West Papua, S Bird's Neck, Kaimana E env., between Triton Bay & Bitsyaru Bay, 3°49'24"S, 133°59'02"E, 6-20 m, 18.IX.2010, primary coastal rainforest on limestone. First records from southern New Guinea and Misool Island [1 adult, KGC].

Ecology: Salt-tolerant species of drift line. This underrecorded species may occur throughout the Papuan Region.

Distribution: Indo-Pacific islands from Mozambique, Reunion (locus typicus) through coastal SE Asia to Japan, the Philippines, Micronesia, Polynesia, and N Australia. Whole of Wallacea and Papuan Region (recorded from W, E, N, S New Guinea, Bismarck Archipelago (New Britain, New Ireland), Aru Islands, Banda Islands (Pisang), Bismarck Archipelago (Duke of York, New Britain, New Ireland, Vuatom), Cenderawasih Bay Islands (Biak, Numfoor), Milne Bay Islands, North (Gebe) and Central (Ambon) Moluccas, Raja Ampat Islands (Misool, Waigeo), and Solomon Islands (New Georgia)).

Truncatella (s. s.) marginata Küster, 1855 (Fig. 2)

Truncatella cerea Gassies, 1878 Truncatella ceylanica Pfeiffer, 1856 Truncatella japonica Pilsbry et Hirase, 1905 Truncatella pfeijferi Martens, 1861 Truncatella quadrasi Möllendorff, 1893 Truncatella semicostata Montrouzier, 1862 Truncatella semicostulata Jickeli, 1874 Truncatella teres Pfeiffer, 1856

Bibliography: Hedley (1891 : 100), as *T. ceylanica*, records (New Guinea, Papuan Peninsula: "Port







Moresby"); Rensch I. (1937: 627, 633 & 634), as *T. quadrasi*, additional description, records (Bismarck Archipelago, New Britain: "Weite Bucht, Karlei"; Vuatom); van Benthem Jutting (1963: 440), as *T. marginata teres*, record (Raja Ampat Islands, Yefman (also Efman, Jefman) Island: "Jefman I.: beach of Jefman").

New material: INDONESIA E, Prov. Raja Ampat, Misool S, distr. Misool Utara, Aduwey (Adua) vill. ~1 km E, Seram Sea shore, in a small stream near the sea, 01°58'41"S, 129°55'18"E, 28.III.2009 [1 adult, KGC]. First record for Misool.

Ecology: Salt-tolerant species of drift line.

Distribution: Indo-Pacific islands from E Africa to Japan, Greater Sunda Islands (locus typicus -Borneo), W New Guinea, coastal Australia, and New Caledonia. In the Papuan Region known from Bismarck Archipelago (New Britain, Vuatom) and Raja Ampat (Misool, Yefman offshore Salawati).

Truncatella (s. s.) thaanumi insularis Clench et Turner, 1948 (Fig. 3)

New material: INDONESIA E, Papua Prov., Cenderawasih Bay, Biak Is. W, Biak ~16 km W, Urfu vill., 01°09'12"S, 135°55'53"E, 3-15 m, 21.III.2018, coastal limestone cliff, in cavities with vegetation and debris [1 adult, KGC]. First record from the Papuan Region and the Island of Biak.

Notes: Considering the high variability of conchological features in *Truncatella* (as of Clench & Turner 1948) and the relatively minor morphological differences that separate these two taxa we question the subspecific status of *T. thaanumi insularis* but do not propose a new synonymy, since type material was not available for the present study. Both subspecific taxa occur in the Papuan Region (see below).

Distribution: Tonga (locus typicus) to W New Guinea. In the Papuan Region only known from Cenderawasih Bay Islands (Biak).

Truncatella (s. s.) *thaanumi thaanumi* Clench et Turner. **1948**

Bibliography: van Benthem Jutting (1963: 440), record (New Guinea, Doberai Peninsula: "Pasirputih near Manokwari, on fallen tree trunk"); Egorov (2018: 31, fig. 50l), record (New Guinea, Doberai Peninsula: "Manokwari, near Uriami River").

Distribution: Caroline Islands (locus typicus) to W New Guinea. Only two records are known from the Papuan Region, one from New Guinea's Doberai Peninsula and the other from Atoll Fragment near Manus Island, Admiralty Islands (USNM ID 835181; GUID <u>http://n2t.net/ark:/65665/3b22ad929-0b8f-4921-92b6-3d94b07b555d</u>), the Manus specimens were not available for this study.

Taheitia H. et A. Adams, 1863

Type species: *Truncatella porrecta* Gould, 1847 original designation.

Taheitia is a genus of terrestrial Truncatellidae (Turner 1959) with twenty one species in the Papuan Region. Taheitia was originally erected by Adams & Adams (1863) to include a single Pacific islands species, T. porrecta (Gould, 1847), the small species (height of adult decollated shell distinctly under 10 mm). Adams (1865) was the first to include a new species of large and exclusively terrestrial Papuan species in Taheitia, when describing T. wallacei. No justification for the generic placement was indeed provided. This was soon followed by various authors placing their new species from the Papuan Region in the genus Taheitia (Adams & Angas 1865; Möllendorff 1897; Rensch 1937). Clench and Turner (1948) on their catalogue of the Truncatellidae made some new combinations and generally agreed with generic placement of previously described Papuan Taheitia. Later, van Benthem Jutting (1958; 1963), Turner (1959), and Gittenberger (1989) continued placing new terrestrial species in the genus Taheitia with only short discussion of Taheitia morphology by Turner (1959).

In fact, exclusively terrestrial, large Papuan species hitherto and in the present paper arranged to *Taheitia* appear strongly differentiated conchologically from the *T. porrecta* (Fig. 4), the type of the genus. In the present sense, *Taheitia* is a strongly dimorphic group. The authors currently refrain from erecting a new genus for terrestrial Papuan *Taheitia* as well as from proposing new combinations, since comparative material of *T. porrecta* required to study its anatomy, radular features, and operculum are currently unavailable.

Taheitia biaka sp. nov. (Fig. 5)

http://zoobank.org/A8C76309-BBB9-4BC0-9E60-39B21700A704

Holotype NME: INDONESIA E, Papua Prov., Cenderawasih Bay, Biak Is. N, Biak ~53 km NNW, 0°44'19"S, 135°52'56"E, 70-80 m, 22.III.2018, primary lowland rainforest.

Derivatio nominis: Toponymic from the locus typicus, Biak Island.

Measurements: Holotype H = 11.3 mm, W = 2.8



mm, HW = 4 mm, AH = 2.2 mm.

Shell is Description: decollate, whitish transparent, dextral, very narrow, almost parallelsided, slightly and gradually narrowing apicad. Decollate adult shell with 6¹/₂ moderately strongly convex whorls, number of embryonic whorls is unknown. Suture is deeply impressed, oblique to the coiling axis (angle at $\sim 70^{\circ}$). Ultimate whorl is nearly as wide as penultimate whorl in apertural view (maximum width 2.6 mm vs 2.5 mm), 6 whorls, the first non-decollate whorl is 1.7 mm wide. Umbilicus is closed in adult. Teleoconch is sculptured with moderately dense, nearly straight (in apertural view), and more or less regular axial ribs. Ribs slightly curved and wider below the suture (Fig. 5). Ribs do not always run from suture to suture. There are no abrupt changes in axial ribbing pattern, but ribs on the last half whorl widen to nearly twice the width of ribs on penultimate whorl. Ribs are not synchronous with those of previous whorls and are parallel to coiling axis. There are 5 ribs per 0.5 mm on penultimate whorl in abapertural view and 50-51 ribs on ultimate whorl. Axial ribs of ultimate whorl evenly rounded basally, basal ridge is therefore absent (ultimate whorl rounded, not angled, basally and laterally). Spiral striae or ribs not observed at 80x magnification. Last part of ultimate whorl protruding slightly anteriad from shell outline in apertural and apical view. Parietal gap present, moderately wide and comparatively shallow. Aperture is obliquely ovoid (narrowed in parietal-palatal angle), not tilted to coiling axis, positioned vertically, apertural rim entire, and with shortly reflected, not flattened apertural lip. Aperture is shifted right to the coiling axis in apertural view. Peristome is simple in lateral view. Parietal margin of peristome is detached from ultimate whorl, peristome is therefore continuous. Margins of peristome not sinuous. Operculum (Fig. 5D-F) irregularly ovoid, height 1.9 mm, maximum width 1.2 mm, strongly concave on outer surface (therefore convex internally). Its chitinous, paucispiral base bears a calcareous plate with a high erect thin ridge along peripheral margin, and at the opposite margin with 9 strong, apically pointed and slightly curved lamellar ridges radiate from apophysis.

Differential diagnosis: *Taheitia biaka* sp. nov. is readily differentiated from congeners by the combination of the following features: the shell high and slender, slowly narrowing apicad, ~50-51 axial ribs on the ultimate whorl, the base of the ultimate whorl not angled, the aperture not produced into the spur, the broadly rounded at the basal-columellar angle, the axial ribs only slightly increasing in the shape towards the suture, the operculum with the conspicuous, radial, raised and pointed lamellae.

Ecology: Specimen sampled from wet leaf litter in primary lowland (elevation 70–80 m) rainforest on a limestone ridge.

Distribution: The Papuan Region. Cenderawasih Bay Islands, Biak (Map 2).

Taheitia bifurca sp. nov. (Figs 6, 27 & 30)

http://zoobank.org/EDD40E87-80D9-4688-9C10-FE9F5BCF49D1

Holotype UF 563275: PAPUA NEW GUINEA, Manus Province, Manus Island, 0.4 km W of Loniu, -2.0749°, 147.3328°, John Slapcinsky, Cindy Bick, 1 December 2012.

Paratypes: UF 475732 (4 whole in 75% ethanol), 476354 (1 whole in 75% ethanol) as holotype; UF 475765 (3 whole in 75% ethanol), UF 475766 (2 shells): Papua New Guinea, Manus Province, Los Negros Island, 3.8 km E of Bubi, -2.0732°, 147.3719°, John Slapcinsky, Cindy Bick, 2 December 2012.

Derivatio nominis: From the Latin "bifurcus" meaning two forked or bifurcate for the pattern of v-shaped ridges on the shell surface.

Measurements: Holotype H = 14.09 mm, W = 5.25, AH = 4.66, AW = 3.22.

Description: Shell is dextral, conical, gradually expanding, and not umbilicate. The total number of whorls is unknown because only decollate adults were found and collected. Suture is slightly shouldered and not deeply impressed, oblique to the coiling axis at an angle of ~70°. Embryonic shell unknown. Adult shell is decollate, with 5-51/2 broadly rounded whorls, moderate sized, SH=12.17±1.01, SW=4.60±0.33, AH=4.21±0.25, AW=2.90±0.23, N=7. Width of first non-decollate whorl is 2.10±0.20 mm, penultimate whorl is 3.57±0.24 mm, and ultimate whorl is 3.85±0.27 mm. Aperture not deflected downward or peripherally and remains attached to penultimate whorl at sutural margin. Aperture is almost rectangular, somewhat flattened at periphery, and base. Junction of basal and flat columellar margin of peristome is angled. Peristome is pale tan, entire, only slightly reflected near columellar margin, and not flattened. Teleoconch whorls are light brown, contrasting with tan ribs and surface sculpture. There is no other colour pattern. Non-decollate teleoconch whorls are sculptured with regular slightly arched axial ribs, each about 1/2 the width of the rib-interspaces. Some ribs do not extend to the sutures and other ribs widen at apical suture forming weak nodules. There are also chevron-shaped ridges that point in the direction of









growth. These are most prominent on penultimate and ultimate whorls. Ribs are often thicker and nodulate where ridges cross them. Ribs are angled basally forming basal ridge. Spiral sculpture not observed at 80x magnification. Operculum (Fig. 6E) irregularly ovoid, height 3.28, maximum width 1.91 mm, slightly concave on outer surface. Its chitinous, paucispiral base bears a calcareous plate with large semicircular apophysis with radiating lamellar ridges that extend to the peripheral margin. Radula (Fig. 30) formula 2-1-1-2. Rachidian with large central cusp flanked on each side by three small near-basal ectocones. Lateral teeth wide, asymmetric, with poorly defined ectocones. Inner marginal with 4-5 finger like cusps. Outer marginal with 3 short broad, rounded cusps.

Differential diagnosis: Taheitia bifurca sp. nov. is unique in posessing shell sculpture of chevron shaped ridges and thin axial ribs that are thickened and nodulose where the chevrons cross them. The flattened shell whorls and irregularly oval aperture with flattened base and nearly parallel edges are superficially similar to the smaller T. foliosocostata van Benthem Jutting, 1963 from Biak which differs in having stronger and more regular ribbing and T. tessellata from New Britain which has sinuous ribs on the ultimate and penultimate whorls and a thicker lip. The operculum is similar to Fijian species T. arcasiana abbotti Clench et Turner, 1948 and T. soluta Clench et Turner, 1948 as well as Papuan Region species T. biaka from Biak and T. wallacei from Waigeo Island in having several long lamellae that radiate from a single point but unlike these species the origin of the lamellae in *T. bifurca* sp. nov. is from a semicircular apophysis.

Ecology: On limestone rocks and in leaf litter among rocks in tropical rainforest

Distribution: The Papuan Region. Manus Island (Map 4).

Taheitia bismarckiana (I. Rensch, 1937) (Fig. 7)

Bibliography: Rensch I. (1937: 627, 633 & 634), original description as *Truncatella avenacea bismarckiana*, records (Bismarck Archipelago, Duke of York (Neulauenburg), New Ireland (Neumecklenburg); Clench & Turner (1948: 191 & 196), new combination, checklist.

Syntypes 4 specimens MFNB, stored in two capsules. 2 specimens: Lauen [upper side of the label] burg [underside of the label] [both sides handwritten]; 2 specimens: Neu Mecklen [upper side of the label] burg [underside of the label] [both sides handwritten]. Both capsules stored in same box with two additional labels: Truncatella avenacea bismarckiana [upper side of the label] leg. P. Schneider [underside of the label] [both sides handwritten] / Zoolog. Museum Berlin [printed] 97961 Truncatella avenacea - bismarckiana I. Rensch Neu - Lauenb. P. Schneider [handwritten] [upper side of the label] Neu-Lauenbg. [handwritten] [underside of the label].

Notes: Lectotype is not designated at this time. This small species appears to be a typical *Taheitia* sensu Adams and Adams (1863), with strongly double peristome, or *Truncatella*. We provide images of this species for the first time.

Distribution: The Papuan Region. Known only from Bismarck Archipelago (Duke of York (locus typicus), New Ireland).

Taheitia calcarata van Benthem Jutting, 1963 (Fig. 8)

Bibliography: van Benthem Jutting (1963: 442, fig. 8), original description, records (Cenderawasih Bay Islands, Biak: "subdistrict South-Biak, base of the Marines"; "base of the Marines").

New material: INDONESIA E, Papua Prov., Cenderawasih Bay, Biak Is. N, Biak ~56 km NNW, 0°42'40"S, 135°51'59"E, 95-120 m, 22.III.2018, primary lowland rainforest on limestone cliffs [2 adults, NME & KGC]. First record since the original description, first record from northern part of Biak.

Additional description: The studied decollate adult specimen has ~5 whorls, shell height is 10 mm, maximum width is 3.8 mm. There are 35 axial ribs on the ultimate whorl.

Distribution: The Papuan Region. Known only from Biak, Cenderawasih Bay Islands (Map 2).

Taheitia clathrata (H. Adams et Angas, 1865) (Fig. 9)

Bibliography: Adams H. & Angas (1865: 54, pl. 2 fig. 2), original description as *Truncatella (Taheitia)*, record (Solomon Islands); Clench & Turner (1948: 191 & 197), checklist.

Syntypes 3 specimens NMS: TRUNCATELLA (TAHEITIA) CLATHRATA AD. + ANG. [underlined] SOLOMON IS. [label handwritten].

Notes: The syntypes have accession No NMS.Z.1961.61.163. Lectotype is not being designated at this time. This small species seems to be true *Taheitia* in sense of Adams & Adams (1863). We provide images of this species for the first time.

Additional description based on the syntypes: Shell is decollate, creamy-yellowish. Shell high









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conical. Adult (decollate) shell of 5¹/₂-6 rather flat whorls. Suture deep. Axial ribs strong and high, ridge-like, straight to nearly straight, widely spaced, rib interspaces twice as wide as ribs. Ribs are not synchronous with those of previous whorls and are generally parallel to the coiling axis. Ribs becoming significantly less high and denser on last quarter whorl. Spiral striae or ribs not observed. Parietal gap distinct. Aperture is half-moon shape, nearly flat along the parietal and columellar margin and broadly rounded along palatal margin. Aperture not tilted to coiling axis, positioned subvertically, apertural rim entire, with flattened apertural lip, which is reflected slightly basally. Aperture is shifted right to coiling axis in apertural view. Peristome is simple in lateral view. Parietal margin of peristome is detached from ultimate whorl, peristome is therefore continuous. Margins of peristome not or barely sinuous. Operculum unknown.

Distribution: The Papuan Region. Known only from type series of syntypes from the Solomon Islands (locus typicus) in National Museum Scotland (Edinburgh, United Kingdom), without exact locality.

Taheitia foliosocostata van Benthem Jutting, **1963** (Fig. 10)

Bibliography: van Benthem Jutting (1963: 443, fig. 9), original description, records (Cenderawasih Bay Islands, Biak: "Biak", "Bosnik, coral reef near sago swamp", "subdistrict South-Biak, base of Marines").

New material: INDONESIA E, Papua Prov., Cenderawasih Bay, Biak Is. W, Biak ~16 km W, Urfu vill., 01°09'12"S, 135°55'53"E, 3-15 m, 21.III.2018, coastal limestone cliff, in cavities with vegetation and debris [20 adults, 2 subadult & 2 juv., NME, MBBJ & KGC]; INDONESIA E, Papua Prov., Cenderawasih Bay, Biak Is. E, Biak ~34 km ENE, 01°04'50"S, 136°22'08"E, 10-15 m, 22.III.2018, primary lowland rainforest [1 adult & 1 juv., KGC]. First record since the original description, first record from eastern tip of Biak.

Additional description: Total number of whorls is no less than 12, the number of embryonic whorls is two. The studied decollate adult specimens have $4\frac{1}{2}-5\frac{1}{2}$ whorls, shell height varies from 5.6 mm (smallest adult shell from Urfu vill. env.) to 12 mm (adult shell form E Biak), minimum width (on first non-decollate whorl) is 1.6 mm, maximum width (on ultimate whorl) to 3.8 mm. The subadult specimen from E Biak has 8 whorls, is 7.6 mm high. Except on microscopically pitted embryonic whorls, axial ribs are strong, with acute blades. Basal outline of the peristome is subtruncate to slightly angular in this species. Distribution: The Papuan Region. Known only from Biak, Cenderawasih Bay Islands (Map 2).

Taheitia galactodes van Benthem Jutting, 1963 (Fig. 11)

Bibliography: van Benthem Jutting (1963: 442, fig. 7), original description, record (Cenderawasih Bay Islands, Biak: "Bosnik, coral reef near sago swamp").

New material: INDONESIA E, Papua Prov., Cenderawasih Bay, Biak Is. W, Biak ~16 km W, Urfu vill., 01°09'12"S, 135°55'53"E, 3-15 m, 21.III.2018, coastal limestone cliff, in cavities with vegetation and debris [18 adult, 2 subadult & 4 juv., MBBJ, NME & KGC].

Additional description: The largest adult decollate shell from W Biak (NME) is 9.5 mm high and 3.4 mm wide. Total number of whorls is 12, number of embryonic whorls is two.

Distribution: The Papuan Region. Known only from Biak, Cenderawasih Bay Islands (Map 2).

Taheitia gebeensis sp. nov. (Fig. 12)

http://zoobank.org/A379A407-837C-4F34-8A5C-CA6F6985D962

Holotype NME: INDONESIA E, Maluku Utara Prov., Gebe Island, on the way from Kacepi to Umera vill., 29.X-03.XI.2011, secondary lowland rainforest on limestone, leg. L.Wagner.

Paratype: 1 adult KGC: same as holotype.

Same specimens were previously reported as *T. gracilenta* (Greke 2012).

Derivatio nominis: Toponymic from the locus typicus, Gebe Island.

Measurements: Holotype H = 10.4 mm, W = 3 mm, HW = 4.1 mm, AH = 2.1 mm. Paratype shell is slightly shorter.

Description: Shell is decollate, creamy-pink with whitish axial ribs, dextral, very narrow, almost parallel-sided, slightly and gradually narrowing apicad. Decollate adult shell with 6 slightly convex whorls, number of embryonic whorls is unknown. Suture is moderately deeply impressed, oblique to coiling axis (angle ~80°). Ultimate whorl is as wide as penultimate whorl in apertural view (maximum width 2.6 mm vs 2.55 mm), decollate shell is 6 whorls, first non-decollate whorl is 1.9 mm wide. Umbilicus is closed in adult. Teleoconch is sculptured with widely spaced nearly straight (in frontal view) to slightly irregularly sinuous and more or less regular axial ribs. Ribs are slightly curved, higher and wider near upper suture (Fig. 12D-E). Some ribs do not run from suture to suture. There are no abrupt changes in axial ribbing pattern, ribs



on last half whorl more widely spaced than ribs on penultimate whorl. Ribs are not synchronous with those of previous whorls and are generally parallel to coiling axis. There are 3 ribs per 0.5 mm on penultimate whorl in abapertural view and 33-35 ribs on ultimate whorl. Axial ribs on ultimate whorl obtuse angulate basally; basal ridge not prominent (ultimate whorl angled basally and laterally). Spiral striae or ribs not observed at 80x magnification. Last part of ultimate whorl projects slightly anteriad from shell outline in apertural view. Parietal gap not present. Aperture is obliquely ovoid (narrowed in parietal-palatal angle), not tilted to coiling axis, positioned subvertically, apertural rim entire, and with flattened apertural lip, which is reflected slightly basally. Aperture is shifted right to coiling axis in apertural view. Peristome is simple in lateral view. Parietal margin of peristome is detached from ultimate whorl, peristome is therefore continuous. Margins of peristome slightly sinuous palatalobasally. Operculum unknown.

Differential diagnosis: Taheitia gebeensis sp. nov. is conchologically similar to T. biaka sp. nov. (Biak; described above), T. gracilenta (E.A. Smith, 1897) and T. mansueta van Benthem Jutting, 1963 (both last - Doberai Peninsula of New Guinea) but is readily differentiated by the combination of the following features: the shell almost parallel-sided, slowly narrowing apicad, ~33-35 axial ribs on the ultimate whorl (50-51 in T. biaka sp. nov., 35-36 in T. gracilenta, 28-30 in T. mansueta), the base of the ultimate whorl slightly angled (not angled in T. biaka sp. nov. and T. mansueta, slightly angled in T. gracilenta), the axial ribs significantly less dense on all whorls (except the ultimate) than in T. biaka sp. nov. and T. gracilenta, there are no abrupt changes in the ribbing pattern on the ultimate whorl (axial ribs on ultimate whorl twice as widely spaced as rest of teleoconch in T. gracilenta), the decollated spire of 6 whorls (6¹/₂ in *T. biaka* sp. nov., 7 in *T.* gracilenta, 7-8 in T. mansueta), the parietal gap not present (short gap present in T. mansueta), the shell generally less high and less slender than in T. biaka sp. nov. and T. gracilenta, the penultimate and the ultimate whorl of same wide (the penultimate whorl slightly narrower than the ultimate in T. biaka sp. nov. and T. mansueta).

Ecology: Specimen sampled from wet leaf litter in disturbed lowland rainforest on limestone.

Distribution: The Papuan Region. North Moluccas, Gebe (Map 1).

Taheitia gigantea sp. nov. (Fig. 13)

http://zoobank.org/8A0183A9-C86A-42F4-8B5B-313465F3D5F2

Holotype NME: INDONESIA E, Raja Ampat, Waigeo Island, Majalibit Bay, Waisai 19 km NE, River Werabiai valley, 00°18'02"S, 130°56'00"E, 40-60 m, 20.II.2012, primary lowland rainforest on limestone.

Derivatio nominis: Hitherto the largest truncatellid, this species named from Latin "giganteus" (giant) for its extraordinarily large shell. Measurements: Holotype H = 31 mm, W = 8.1 mm, HW = 13.2 mm, AH = 6.2 mm.

Description: The holotype is in poor condition, white, dextral, conical, decollate, gradually narrowing apicad. Decollate adult shell with $6\frac{3}{4}$ rather flat whorls, number of embryonic whorls is unknown. Suture is slightly impressed, oblique to coiling axis (angle at ~80°). Ultimate whorl in apertural view is 6.9 mm wide, penultimate whorl - 6.3 mm, topmost remaining (first non-decollate of almost 7 remaining whorls) whorl is 3.7 mm wide. Umbilicus is closed in adult. Teleoconch is sculptured with very dense sinuous (in frontal view), rather delicate and in part irregular axial ribs. Some ribs increase in width at suture. Ribs do not always run from suture to suture. There are no abrupt changes in axial ribbing pattern, ribs on the last half whorl nearly as dense as those on the penultimate whorl. Ribs are not synchronous with those on previous whorls and are slightly oblique to coiling axis. There are 5-6 ribs per 0.5 mm on penultimate whorl in abapertural view and about 110-115 ribs on ultimate whorl. Axial ribs of ultimate whorl evenly rounded basally, basal ridge is therefore absent (ultimate whorl rounded, not angled, basally and laterally). Spiral striae or ribs not observed at 80x magnification (possibly, because of poor condition of shell); considering how dense axial ribbing pattern is, there is literally no space left for spiral sculpture). Last part of ultimate whorl protruding slightly anteriad from shell outline in apertural view. Parietal gap present, broad and very deep. Aperture is obliquely ovoid (narrowed in angular corner), not tilted to coiling axis, positioned vertically, apertural rim entire, and with broadly reflected, flattened apertural lip. Aperture is shifted right to coiling axis in apertural view. Peristome is simple in lateral view. Parietal margin of peristome is detached from ultimate whorl, peristome is therefore continuous. Angular corner of peristome broadly detached from penultimate whorl (Fig. 13). Palatal margin of peristome sinuous. Operculum unknown.







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Differential diagnosis: Taheitia gigantea sp. nov. is undoubtedly closely related to T. heinrichi Gittenberger, 1898 (Doberai Peninsula, Salawati & Warir islands), T. telnovi sp. nov. (Misool), and T. wallacei (H. Adams, 1865) (Waigeo). The only available shell of the new species is in poor condition, however, differs from aforementioned species in the more delicate, denser and sinuous axial ribbing pattern, the stronger reflexed apertural lip and in the significantly larger shell (it seems unlikely that the same Taheitia species, even in disparate natural conditions, develops a shell 1/3 higher than average for the species). Discovering more specimens and studying the operculum should provide additional differential features of T. gigantea sp. nov.

Ecology: Primary lowland rainforests on limestone, wet leaf litter.

Distribution: The Papuan Region. Raja Ampat Islands, Waigeo, eastern peninsula (Map 6).

Taheitia gracilenta (E. A. Smith, 1897) (Fig. 14)

Bibliography: Smith E.A. (1897: 289, pl. 17 figs 16–17), original description as *Truncatella*, record (New Guinea, Doberai Peninsula: "Andai"); Clench & Turner (1948: 191 & 200) new combination, checklist; Turner (1959: 182, pl. 31 fig. 4), lectotype designation, redescription, records (New Guinea, Doberai Peninsula: "Andai"; Bismarck Archipelago: New Britain, New Ireland); van Benthem Jutting (1963: 440), records (New Guinea, Doberai Peninsula: "Teminabuan"; Cenderawasih Bay Islands, Biak: "Bosnik, coral reef near sago swamp", "vicinity of Nica camp, in deserted garden overgrown with grass", "S Biak, hospital cave above kampong Parai").

Type material: lectotype [here designated] & 5 paralectotypes BMNH, Truncatella gracilenta Smith Type Andai, New Guinea (W.D.) 1897. 98.10.25.16-21. [handwritten] / Type. gracilenta, Smith. New Guinea. [handwritten]. The first label supplemented with additional text in different colour and different handwritting: [Type] "?" "(See Turner 1959, Occ. Papers on Malacology, 2,pp.182-5)".

Ecology: This species may be salt-tolerant.

Distribution: The Papuan Region. Known from Doberai Peninsula (locus typicus – Andai) (Map 7) and Cenderawasih Bay Islands (Biak). Record from North Moluccas (Gebe) by Greķe (2012: 29) refer to a new species, *Taheitia gebeensis* sp. nov. Here we agree with Turner (1959) who already questioned the Bismarck Archipelago records of this species by Rensch I. (1937: 629, 633 & 634, fig. 54), as *Truncatella (Taheitia)*, New Britain (Neupommern): "Cormoranhuk (Luwelon)", "Karlei", "Malkongbach", "Wattokgebiet"; New Ireland (Neumecklenburg): "Mittel-Neu-Mecklenburg"). The record from Biak needs confirmation and may refer to *T. biaka* sp. nov. (this locality is not mapped) (Map 7).

Taheitia heinrichi Gittenberger, 1989

Bibliography: Gittenberger (1989: 24, figs 1–2, 4), original description, records (New Guinea, Doberai Peninsula: "5.5 km ENE of Klamono at the drilling site Klamoekoek, 131°33'E 1°06.5'S; 6 km ENE of Klamono at the drilling site Klawilis, 131°34'E 1°07'S; 16 km NNW of Klamono at the drilling site Klamesin, 131°26'E 0°59'S"; Raja Ampat Islands, Salawati; Warir: "island Warir off the east coast of the island Salawati, 7 km SE of Samate, 131°07'E 1°01'S").

Distribution: The Papuan Region. Known from southern lowlands of New Guinea's Doberai Peninsula and Raja Ampat Islands (Salawati (locus typicus), Warir (locus typicus)). It is likely the record of *Taheitia wallacei* from Salawati by van Benthem Jutting (1963: 441 "Waileh district") is this species (Map 7).

Taheitia jodiae sp. nov. (Figs 15, 28 & 31)

http://zoobank.org/4670CD4A-E5F8-4833-9188-BD6B8CC884D4

Holotype UF 549960: PAPUA NEW GUINEA, East New Britain Province, large cave 11 km N of Marmar Village on E side of trail to Pakia Village, -5.444°, 151.465° John Slapcinsky, 24 February 2005.

Paratypes: UF 366599 (45 adults), UF 366600 (13 whole in 75% ethanol) as holotype.

Derivatio nominis: Matronymic. Named for Jodi Slapcinsky, wife of the second author. Without her support long field excursions in remote areas would not have been possible.

Measurements: Holotype SH = 15.25 mm, SW = 5.06 mm, AH=4.91, AW=3.65.

Description: Shell is dextral, conical, gradually expanding, not umbilicate, with approximately $11^{1}/_{2}$ -12¹/₂ total whorls, half of which are lost in adults. Suture is not deeply impressed, oblique to the coiling axis at an angle at ~70°. Embryonic shell of approximately 2 ³/₄ smooth, cylindric whorls, EW=1.10±0.03 mm, N=10; first whorl descends slowly and has a moderately deep suture. Adult shell is decollate, with $5^{1}/_{2}-6^{1}/_{2}$ broadly rounded whorls, large, SH=14.88±1.00, SW=5.09±0.38, AH=4.81±0.33, AW=3.47±0.32, N=21. Width of first non-decollate whorl is 2.28±0.20 mm, the penultimate whorl is 3.94±0.31 mm, and the ultimate whorl is 4.32±0.27 mm. Aperture is deflected slightly downward and peripherally and detaches from the penultimate whorl. Aperture is







half-moon shape, flat along parietal and columellar margin and broadly rounded along palatal margin. Peristome dirty white and entire, reflected slightly palatally, and broadly basally and along columellar margin and then narrowing parietally. Teleoconch whorls dirty white, after third whorl shell marked with alternating irregular dark brown axial stripes. Stripes strongest near sutures and usually broken into zig-zag lines between sutures. First four teleoconch whorls sculptured with regular slightly arched axial ribs, about same width as rib-interspaces. After fifth whorl ribs become progressively more sinuous, pustulose and weaker. After peripenultimate whorl ribs are only clearly defined near suture where some are also thicker and whiter. Rest of middle of penultimate and ultimate whorls are sculptured with elongate pustules that are oriented axially or diagonally (Fig. 15D). Ribs thicken and then weaken abruptly creating a well-defined basal ridge. Spiral sculpture not observed at 80x magnification. Operculum (Fig. 15E) irregularly ovoid, height 3.14 mm, maximum width 1.64 mm. Chitinous, paucispiral base bears calcareous plate with strong, unicuspid, hookshaped apophysis. Outer margin slightly upturned. Between periphery and apophysis there is irregular and often interrupted lamellar ridge terminating in triangular projection with narrow base almost in centre of operculum. Radula (Fig. 31) formula 2-1-1–1–2. Rachidian with large central cusp flanked on each side by three small near-basal ectocones. Lateral teeth wide, asymmetric, with poorly defined ectocones. Inner marginal with 6 finger like cusps. Outer marginal with 3 bluntly pointed cusps.

Differential diagnosis: *Taheitia jodiae* sp. nov. has a colour pattern of alternating dark and light rectangular markings below the suture and irregular dark markings on the rest of the whorls similar only to *T. schneideri* (I. Rensch, 1937) from New Britain and *T. orrae* Turner, 1959, from Biak and unlike most Papuan *Taheitia* which are either unicoloured or marked with axial bars. *Taheitia jodiae* has a peristome that is free of the penultimate whorl, expanded but not recurved abaperturally unlike the peristome of *T. orrae* which is appressed to the penultimate whorl, or *T. schneideri* the free margin of which is abaperturally recurved.

Ecology: Found in only one location, but locally abundant in tropical rainforest in a ravine under piles of mossy limestone rocks outside the entrance of a large deep cave that emitted cool moist air.

Distribution: The Papuan Region. New Britain Island, Jacquinot Bay area (Map 3).

Taheitia longpela sp. nov. (Fig. 16)

http://zoobank.org/ACF86BB4-567A-44CC-8791-1B9C2FA6B5DB

Holotype UF 366528: PAPUA NEW GUINEA, East New Britain Province, large cave 11 km N of Marmar Village on E side of trail to Pakia Village, -5.444°, 151.465° John Slapcinsky, 24 February 2005.

Derivatio nominis: Longpela means tall in Tok Pisin, the most widely spoken language in Papua New Guinea.

Measurements: Holotype SH = 10.54 mm, SW = 2.69, AH=2.46, AW=1.68 mm.

Description: Shell is dextral, conical, gradually expanding, not umbilicate. Total number of whorls is unknown because only a single decollate adult is known. Suture is moderately impressed, oblique to coiling axis at angle at ~70°. Embryonic shell is unknown. Adult shell is decollate, with 8 broadly rounded whorls. Width of first non-decollate whorl is 1.15 mm, penultimate whorl is 2.15 mm, and ultimate whorl is 2.29 mm. Aperture is not deflected downward and peripherally. Palatal margin of peristome is attached to penultimate whorl. Aperture is almost rectangular, flat along palatal and basal margins. Parietal and columellar margins are sinuous recessed. Parietal margin curves into aperture. Shell worn and no colour description is possible. Sculptured with regular, slightly arched axial ribs, that are slightly narrower than rib-interspaces. Ribs maintain their strength and consistency throughout teleoconch whorls (Fig. 16). Ribs are not thickened at sutures. No basal ridge is present. Spiral sculpture was not observed at 80x magnification although shell is chalky and fine shell sculpture is not visible. Operculum unknown.

Differential diagnosis: *Taheitia longpela* sp. nov. has a tall narrow decollate shell of more than seven very gradually expanding whorls like the shell of *T. gracilenta* (E. A. Smith, 1897) from Doberai Peninsula of New Guinea. The two species differ in the shape of their whorls which are flattened in *T. gracilenta* and rounded in *T. longpela* sp. nov. The apertures of both species also differ. The parietal edge of the peristome in *T. gracilenta* meets the outer lip at the opening of the aperture whereas the parietal edge of the peristome of *T. longpela* meets the outer lip well inside the aperture.

Ecology: Single long dead shell found in leaf litter among moss covered limestone rocks outside the entrance of a large deep cave that emitted cool moist air.

Distribution: The Papuan Region. New Britain



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Island, Jacquinot Bay area (Map 3).

Taheitia malagan sp. nov. (Fig. 17)

http://zoobank.org/31D101FE-0F1D-414E-8648-94279398893B

Holotype UF 475675: PAPUA NEW GUINEA, New Ireland Province, Nusa Island off Kavieng -2.5822°, 150.7772°, overgrown coconut plantation, John Slapcinsky and Cindy Bick, 27 November 2012.

Paratype: UF 563274 (1 whole in 75% ethanol) as holotype.

Derivatio nominis: Malagan is from the Nalik language of northwestern New Ireland and refers both to funerary carvings and the ceremony where they are displayed. Named for this species operculum, which resembles an intricately carved malagan shield.

Measurements: Holotype SH = 8.03 mm, SW = 3.11 mm, AH=2.66 mm, AW=1.93 mm.

Description: Shell is dextral, conical, gradually expanding, not umbilicate, with approximately 9 total whorls, half of which are lost in adults. Suture moderately impressed, oblique to coiling axis at an angle at ~70°. Embryonic shell of approximately 2¹/₂ smooth, cylindric whorls, EW=0.93 mm; first whorl descends slowly and has a moderately shallow suture. Adult shell is decollate, with $4^{1/2}$ broadly rounded whorls, large, SH=8.31±0.40, SW=3.22±0.15, AH=2.75±0.13, AW=2.00±0.10, N=2. Width of first non-decollate whorl is 1.74±0.08 mm, penultimate whorl is 2.64±0.06 mm, and ultimate whorl is 2.87±0.04 mm. Aperture is deflected peripherally and detaches from penultimate whorl. Aperture is teardrop shaped, angled and narrow at detached sutural margin and broadening and slightly flattened basally. Peristome white and entire, reflected slightly palatally and basally but not along columellar and parietal margin. Teleoconch whorls dirty white, final three whorls also marked with irregular narrow axial bands of grey. Stripes extend from suture to midpoint of whorl and less commonly to lower suture. Teleoconch whorls are sculptured with regular slightly arched axial ribs, about same width as rib-interspaces which extend from suture to suture. On final three whorls some ribs are thickened and white at suture making whorl shoulders nodulate (Fig. 17D). Base somewhat angled but not clearly ridged. Spiral sculpture not observed at 80x magnification. Operculum (Fig. 17E) irregularly ovoid, height 1.56 mm, maximum width 1.04 mm. Chitinous, paucispiral base bears calcareous plate with strong, unicuspid, hook shaped apophysis. Outer (palatal-peripheral) margin is slightly upturned.

Between periphery and apophysis there is single row of triangular projections, which extend from base nearly to parietal margin. Each projection has two wing shaped tips and row of projections resembling a line of birds in flight.

Differential diagnosis: Taheitia malagan sp. nov. with a height of approximately 8 mm is one of the smallest Taheitia species in the Papuan Region, larger only than T. bismarkiana (I. Rensch, 1937) (approximately 5 mm) from Duke of York Island which differs in having the parietal edge of the peristome appressed, and similar in size to T. galactodes van Benthem Jutting, 1963 from Biak which differs from T. malagan sp. nov. in having the basal-columellar edge of the peristome expanded forming a wing-like projection. The operculum of T. malagan sp. nov. has a row of raised projections the tops of which are bifurcated, each tip acutely pointed and flattened parallel to the operculum surface, forming gull wing like structures. While several species have rows of projections on the outer surface of the operculum these usually consist of columns with oval crossections as seen in T. ultima (I. Rensch, 1937), and T. jodiae sp. nov. or form lamellar ridges as seen in P. heinrichi Gittenberger, 1989 from Salawati and Warir islands and Doberai Peninsula of New Guinea.

Ecology: Under limestone rocks and coconut leaf litter in abandoned coconut plantation.

Distribution: The Papuan Region. Nusa Island off New Ireland Island (Map 3).

Taheitia mansueta van Benthem Jutting, 1963 (Fig. 18)

Bibliography: van Benthem Jutting (1963: 445, fig. 10), original description, records (New Guinea, Doberai Peninsula: "Manokwari, along the beach near Uriami River", "Pasirputih near Manokwari, on fallen tree trunks"); Egorov (2018: 34, fig. 57E), as *T. mansuata* [sic!], record (New Guinea, Doberai Peninsula: "Manokwari, Pasirputih").

Distribution: The Papuan Region. Known from northern part of New Guinea's Doberai Peninsula (locus typicus) (Map 7).

Taheitia orrae Turner, 1959

Bibliography: Turner (1959: 186, pl. 31 figs 1–2), original description, record (Cenderawasih Bay Islands, Biak: "under fern roots in a large sink-hole cave behind the air strip, Biak"); van Benthem Jutting (1963: 441), records (New Guinea, Doberai Peninsula: "Sorong, Cape Nuijew", "region of the Klawilu canyon", "along road from Ajamaru to Teminabuan"; "New Guinea"; Cenderawasih Bay Islands, Biak: "under fern roots in a









large sink-hole cave behind the air strip"; Raja Ampat Islands, Salawati: "Waileh district"); Gittenberger (1989: 24, fig. 3), holotype image.

Note: The type specimens are 12.4–12.8 mm high and 4 mm wide (Turner 1959; Gittenberger 1989). Van Benthem Jutting (1963) gives a wide variety of heights for her presumably decollate specimens from Klawili env. (14.5–21.5 mm), Sorong (18–20 mm) and Salawati (17.6–22 mm). We had no opportunity to study these specimens but, considering the large shell height, it is not impossible that aforementioned specimens are aberrant *Taheitia heinrichi*, which seems not uncommon in the same area.

Distribution: The Papuan Region. Known from lowlands of New Guinea's Doberai Peninsula, Cenderawasih Bay Islands (Biak (locus typicus)) and Raja Ampat Islands (Salawati). However, all records by van Benthem Jutting (1963) from outside Biak considered dubious and need further confirmation (Map 2).

Taheitia scalariformis (Reeve, 1842)

Note: Solem (1960) mentioned this species from Nggela (Florida) Island, Solomon Islands, commenting that identification is uncertain and studied available specimen is dissimilar to those of typical *T. scalariformis* (originally described from the Tuamotu Archipelago). We therefore ignore this otherwise highly interesting record.

Taheitia schneideri (I. Rensch, 1937) (Figs 19–20 & 32)

Bibliography: Rensch I. (1937: 628 & 633, figs 51–52), original description as *Truncatella*, records (Bismarck Archipelago, New Britain (Neupommern): "Jacquinotbucht (Malekur, Mailmail)"); Clench & Turner (1948: 191 & 196), new combination, checklist.

Holotype MFNB by original designation: Mailmail [handwritten] / Mailmail Jacquinotbucht [handwritten] [upperside of the label] leg. P. Schneider Truncatella schneideri I. R. [handwritten] [underside of the label] / Zoolog. Museum Berlin [printed] Truncatella schneideri I. Rensch Mailmail 97962 P.Schneider [handwritten]. Supposed holotype shell is broken, kept in a separate capsule without any specific marking. On the fig. 51 in the original description (Rensch 1937: 628) the holotype shell is figured unbroken.

Paratypes 17 specimens MFNB: same labels as holotype. Rensch (1937) mentions two series of type specimens, from Malekur and Mailmail. Malekur specimens were not available for the present study. However, Rensch (1937: 629) selected the specimen

from mailmail as the "type" (here considered holotype). New material: UF 366522 (24 adult shells), UF 546812 (8 juvenile shells) UF 366527 (18 whole in 75% ethanol): Papua New Guinea, East New Britain Province, 4 km NW of Marmar Village along trail to Pakia Village, -5.49651, 151.49027, John Slapcinsky, 4 March 2005.

Measurements: Holotype (decollated shell) H = 15.7 mm, W = 6.9 mm, from original description. Adult decollated paratypes H = 14-18.3 mm.

Redescription: Shell is dextral, conical, gradually expanding, not umbilicate, with approximately 11-12 total whorls, half of which are lost in adults. Suture is not deeply impressed, oblique to coiling axis at angle at ~70°. Embryonic shell is approximately 2³/₄ smooth, cylindric whorls, EW=1.28±0.08 mm, N=3; first whorl is planar or even sunken with very deep sutures. Adult shell is decollate, with 5-6 broadly rounded whorls, large, SH=22.18±1.09, SW=8.72±0.37, AH=8.31±0.44, AW=6.91±0.46, N=23. Width of first non-decollate whorl is 3.38±0.32 mm, penultimate whorl is 6.29±0.30 mm, and ultimate whorl is 6.87±0.34 mm. Aperture is deflected downward and peripherally and detaches from penultimate whorl. Aperture is half-moon shape angled at sutural margin and flattened along columellar margin. Peristome is entire, broadly reflected, flattened and dark grey from periphery towards base where it is slightly curved abaperturally. Peristome is only slightly reflected along columellar margin. Teleoconch whorls light brown, after third whorl shell marked with alternating irregular dark brown axial stripes. Stripes strongest near sutures and usually broken into zig-zag lines between sutures. First four teleoconch whorls are sculptured with regular slightly arched axial ribs, each about one-third width of rib-interspaces. After fifth whorl ribs become progressively more sinuous, pustulose and weaker. After peripenultimate whorl ribs are only clearly defined near suture. Ultimate and penultimate whorls sculptured with elongate pustules, that are oriented axially but also less commonly diagonally (Fig. 20D). In many individuals the surface sculpture is weak or worn on the last two whorls and surface is nearly smooth. Basal ridge is absent and spiral sculpture not observed at 80x magnification. Operculum (Fig. 20E) irregularly ovoid, height 5.14 mm, maximum width 2.82 mm. Chitinous, paucispiral base bears calcareous plate with strong, unicuspid, triangular apophysis at base. Outer margin rimmed with thin raised lamellar ridge. Between peripheral ridge and apophysis there is strong irregular lamellar ridge







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with several poorly defined peaks. Radula (Fig. 32) formula 2–1–1–1–2. Rachidian with large central cusp flanked on each side by 4 small near-basal ectocones. Lateral teeth wide, asymmetric, with poorly defined ectocones. Inner marginal with 4–5 finger like cusps. Outer marginal with 3 short bluntly pointed cusps.

Differential diagnosis: *Taheitia* schneideri has a colour pattern of alternating dark and light rectangular markings below the suture and irregular dark markings on the rest of the whorls similar only to *T. jodiae* sp. nov. from New Britain and *T. orrae* from Biak, and unlike most Papuan Taheitia which are either unicoloured or marked with axial bars. *Taheitia schneideri* has a peristome that is free of the penultimate whorl, darkly pigmented and broadly expanded and recurved abaperturally unlike the peristome of *T. orrae* which is white, not expanded, and attached to the penultimate whorl or *T. jodiae* sp. nov. which is white, not as expanded, and not abaperturally recurved.

Ecology: Rainforest under limestone rocks and in leaf litter among limestone rocks.

Distribution: The Papuan Region. New Britain Island, Jacquinot Bay area.

Taheitia telnovi sp. nov. (Figs 21 & 33)

http://zoobank.org/0BD742EF-03B6-45AF-BC9F-9128050CDB9E

Holotype NME: INDONESIA E, Raja Ampat, Misool Island (central), River Gam upstream, Gamta vill. 12-14 km NW, 01°57'20"S, 130°11'04"E, 105-325 m, 04-06.II.2012, primary lowland rainforest on limestone ridge. Paratypes 20 specimens. Two adults MBBJ, 8 adults & 1 subadult NME, 7 adults & 1 juv., KGC: same as holotype; 1 adult NME & 2 adults, 1 juv., 1 adult shell fragment KGC: INDONESIA E, Raja Ampat, Misool Island (central), River Gam upstream, Gamta vill. 12-14 km NW, 01°57'45"S, 130°10'59"E, 80-85 m, 03.IV.2009, primary lowland rainforest on limestone, leaf litter; 1 adult KGC: INDONESIA E, Raja Ampat, Misool Island S, Biga vill. ~7,5 km W, River Biga valley, 02°01'23"S, 130°12'38"E, 45-78 m, 03.II.2012, primary lowland rainforest on limestone.

Derivatio nominis: Patronymic. Named in honour of Dr. Dmitry Telnov (The Entomological Society of Latvia, Rīga), famous coleopterist, taxonomist, biogeographer and experienced specialist on the Papuan Region and Wallacea, the chief editor of this book series.

Measurements: Holotype H = 18 mm, W = 5.2 mm, HW = 7.5 mm, AH = 4.5 mm. Selected paratypes $15.2 \times 4.9 \text{ mm}$ (River Biga valley), $17.4 \times 5.1 \text{ mm}$, $18.5 \times 5.1 \text{ mm}$, $19 \times 5.1 \text{ mm}$ (data same

as holotype).

Description: Shell is decollate, cream coloured, dextral, conical, gradually narrowing apicad. Decollate adult shell with $5\frac{1}{2}-7$ rather flat whorls, number of embryonic whorls is about two. Total number of whorls is about 121/2. Suture is moderately deeply impressed, oblique to coiling axis (angle at ~70-80°). Ultimate whorl in apertural view is 4.6 mm wide, penultimate whorl - 4.2 mm wide. Of seven remaining whorls the topmost remaining whorl is 2.4 mm wide. Umbilicus is closed in adult. Teleoconch is sculptured with dense nearly straight to slightly arched or sinuous (in frontal view) and in part irregular axial ribs. Some ribs increase in width at the sutures, especially the upper suture (Fig. 21D). Ribs do not always run from suture to suture. There are no abrupt changes in axial ribbing pattern, ribs on last half whorl slightly less dense than those on penultimate whorl. Ribs are not synchronous with those of previous whorls and are slightly oblique to coiling axis. There are 4–5 ribs per 0.5 mm on penultimate whorl in abapertural view and about 90-95 ribs on ultimate whorl. Axial ribs on ultimate whorl evenly rounded basally, basal ridge is therefore absent (ultimate whorl rounded, not angled, basally and laterally). Spiral striae or ribs not observed at 80x magnification. Last part of ultimate whorl protruding slightly anteriad from shell outline in apertural view. Parietal gap present, variable wide and deep. Aperture is obliquely ovoid (narrowed in angular corner), not tilted to the coiling axis, positioned vertically, apertural rim entire, and with moderately broadly reflected, flattened apertural lip. Aperture is shifted right to coiling axis in apertural view. Peristome is simple in lateral view. Parietal margin of peristome is detached from ultimate whorl, peristome is therefore continuous. Angular corner of peristome broadly detached from penultimate whorl (Fig. 21A). Margins of peristome not or slightly sinuous; parietal margin is slightly obtusely angulate. Operculum (Fig. 21E-G) irregularly ovoid, height 3 mm, maximum width 1.9 mm, slightly concave on outer surface. Its chitinous, paucispiral base bears small calcareous plate with unicuspidate apophysis provided with strong cow-horn-shaped-curved projection, which is longitudinally grooved on inner margin (one directed inside the shell), without lamellar ridges. Radula (Fig. 33) formula 2-1-1-2. Rachidian with large central cusp flanked on each side by three small near-basal ectocones. Lateral teeth wide, asymmetric, with relatively well defined short pointed ectocones. Inner marginal with 3 short finger like cusps. Outer marginal with 3 short broad,







rounded cusps.

Differential diagnosis: *Taheitia telnovi* sp. nov. is undoubtedly closely related to *T. gracilenta* (E.A. Smith, 1897) (Doberai Peninsula, Biak, Gebe), *T. heinrichi* Gittenberger, 1898 (Doberai Peninsula, Salawati & Warir islands) and *T. wallacei* (H. Adams, 1865) (Waigeo) but readily differentiated primarily by operculum morphology, which has the large horn-like apophysis and has no raised ridges (not like in *T. heinrichi* and *T. wallacei*), being generally larger than *T. gracilenta* (15–18 vs 11.5–14 mm), having rounded, non-angulate shell base (the shell base slightly angulate in *T. gracilenta*) and the axial ribs not or slightly sparser on the last half whorl (the axial ribs sparser on the last half whorl than on the rest of teleoconch in *T. gracilenta*).

Ecology: Lowland rainforests on limestone and vegetated limestone cliffs. On Misool, this species is recorded far inland. Some specimens were found at foot of the limestone ridge, but most – at the elevation 300–350 m directly on the watershed on a dry limestone cliff with small patches of soil and leaf litter (Fig. 29).

Distribution: The Papuan Region. Raja Ampat Islands, Misool (Map 5). We consider records of *T. wallacei* from Misool ("Fakal", "between Waigama and Waima", "Waima") by van Benthem Jutting (1958: 322; 1963: 441) as referring to the new species as well.

Taheitia tesselata Möllendorff, 1897 (Fig. 22)

Bibliography: Möllendorff (1897: 32), original description, record (Bismarck Archipelago); Rensch I. (1937: 630, 633 & 634), additional description as *Truncatella (Taheitia)*, records (Bismarck Archipelago, Massait (Masahet); New Britain (Neupommern): "Ghóghuwuloù", "Jacquinotbucht (Pomeo, Mailmail)", "Kap Dampier", "Matong", "Nangurup"; New Ireland (Neumecklenburg): "Ugana", "Ulaputur"); Clench & Turner (1948: 192 & 208), checklist, in part (p. 192) as *T. tessellata* [sic!] Quadras [sic!] and v. Mollendorff.

Holotype: Not studied.

Studied material: Truncatella aheitia [corrected by hand] tesselata (Bltg. Ms) Mollendorff [sic!] Nachricht. 1897 New Pommern Bismark [sic!] Archipelago near New Guinea 94.11.23.13-16 B. Strubell Esq. [handwritten] / tesselata, Bltg. Bismark [sic!] Arch. B.Strubell Esq [handwritten].

Notes: The studied specimen is possible syntype exchanged from Möllendorff's collection. We provide images of this species for the first time. Additional description based on the specimen

from "New Pommern" (now New Britain): Shell is

decollate, high conical. Adult decollate shell of 5 rather flat whorls. Suture deep. Axial ribs strong and dense, generally sinuous on penultimate and ultimate whorl, more regularly straight on older whorls, dense, generally separated by own width. Ribs are not synchronous with those of previous whorls and are generally parallel to coiling axis. No changes in ribbing pattern on ultimate whorl. Spiral striae or ribs not observed. Parietal gap not present. Aperture is drop-shaped, rounded along parietal and palatal margin. Aperture not tilted to coiling axis, positioned subvertically, apertural rim entire, and with flattened apertural lip, which is reflected slightly basally. Aperture is shifted right to the coiling axis in apertural view. Peristome is simple in lateral view. Parietal margin of peristome is attached to ultimate whorl, peristome is continuous. Palatal margins of peristome slightly sinuous. Operculum unknown.

Distribution: The Papuan Region. Known from Bismarck Archipelago (Massait, New Britain, New Ireland). Locus typicus is not specified exactly ("in archipelago Bismarckiano").

Taheitia ultima (I. Rensch, 1937) (Figs 23-24 & 34)

Bibliography: Rensch I. (1937: 629 & 633, fig. 53), original description as *Truncatella*, records (Bismarck Archipelago, New Britain (Neupommern): "Cormoranhuk", "Jacquinotbucht"); Clench & Turner (1948: 191 & 209), new combination, checklist.

Holotype MFNB: Not studied.

Paratype 1 specimen MFNB: Zoolog. Museum Berlin [printed] Truncatella ultima I. Rensch Jacquinot Bucht Neu Pommern 97959 Pater Schneider [handwritten]. According to Rensch (1937: 629), this species was originally described from nine specimens from two localities.

New material: Papua New Guinea, East New Britain Province: UF 366523 (10 whole in 75% ethanol), UF 366525 (15 adult shells) UF 539697 (18 juvenile shells), Renis Peninsula, E of Galowe Village, 5.5207° S, 151.4833° E, 1 meter, John Slapcinsky, 6.III.2005, primary coastal forest; UF 366524 (3 shells), Marmar Village, 1 km W of Pomio, 5.5183° E, 151.5067° E., 20 meters, John Slapcinsky, 21-II-2005, hill forest and gardens; UF 366526 (5 shells), W bank of Pomio River, 1 km E of Marmar Village, 5.5153° S, 151.5111° E, 0-65 meters, primary and secondary hill forest.

Measurements: Holotype H = 17 mm, W = 6.1 mm, from the original description. Studied paratype H = 16.5 mm.

Redescription: Shell is dextral, conical, gradually expanding, not umbilicate, with approximately



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11-12 total whorls, half of which are lost in adults. Suture is not deeply impressed, oblique to coiling axis at angle of ~70°. Embryonic shell is approximately 2³/₄ smooth, cylindric whorls, EW=1.01±0.05 mm, N=8; first whorl is planar with deep sutures. Adult shell is decollate, with 5-6 broadly rounded whorls, large, SH=14.53±1.00, SW=5.70±0.37, AH=5.08±0.34, AW=3.84±0.28, N=14. Width of first non-decollate whorl is 2.52±0.26 mm, penultimate whorl is 4.19±0.26 mm, and ultimate whorl is 4.59±0.30 mm. Aperture is deflected peripherally and detaches from penultimate whorl. Aperture is half-moon shape, nearly flat but sinuous along parietal and columellar margin and broadly rounded along palatal margin. Peristome dirty white and entire, reflected slightly palatally, and broadly basally and along columellar margin and then narrowing parietally. Teleoconch whorls light brown, some individuals show very occasional grey lateral stripes or blotches after third whorl. Teleoconch whorls sculptured with slightly arched axial ribs, each about same width as rib-interspaces. After fifth whorl ribs become progressively more sinuous, sometimes merging with neighbouring ribs especially on penultimate and ultimate whorls. Ribs usually extend from suture to suture (Fig. 24D). Ribs weaken basally especially on ultimate whorl but a basal ridge is not clearly defined. Spiral sculpture not observed at 80x magnification. Operculum (Fig. 24E) irregularly ovoid, height 3.28 mm, maximum width 1.87 mm. Chitinous, paucispiral base bears calcareous plate with strong, hook-shaped apophysis with basal projection. Outer margin rimmed with thin raised lamellar ridge. Between peripheral ridge and apophysis there is row of several strong usually triangular projections with hollowed tips. Radula (Fig. 34) formula 2-1-1-2. Rachidian with large central cusp flanked on each side by three small near-basal ectocones. Lateral teeth wide, asymmetric, with relatively well defined ectocones. Inner marginal with 4-5 finger like cusps. Outer marginal with 3 bluntly pointed cusps.

Differential diagnosis: The basal-columellar edge of the peristome of *Taheitia ultima* sp. nov. is expanded into a wing-like projection and the parietal edge is free of the penultimate whorl like *T. jodiae and T. schneideri* from New Britain as well as *T. calcarata* and *T. galactodes* from Biak. However, *Taheitia jodiae* and *T. schneideri* differ in having complex colour patterns and *T. calcarata* and *T. galactodes* differ in being smaller and having regular ribbing that does not become sinuous in the ultimate and penultimate whorls.

Ecology: Under limestone rocks and leaf litter among rocks in primary and secondary coastal and hill forest at low elevation.

Distribution: The Papuan Region. New Britain Island, Jacquinot Bay area. The record from Cenderawasih Bay Islands (Yapen) by van Benthem Jutting (1963: 441: "Serui, in gardens of agricultural school" and "near brackish water lake of Sarawandori, W of Serui") is considered highly doubtful given the very spotty distribution of most *Taheitia* and their specialized habitat.

Taheitia wallacei (H. Adams, 1865) (Figs 25–26) Bibliography: Adams H. (1865: 416, pl. 21 figs 13– 14), original description as *Truncatella (Taheitia)*, record (Raja Ampat Islands, Waigeo (Waigiou)); Wallace (1865: 414), record (Raja Ampat Islands, Waigeo: "Waigiou, on limestone rocks") [this record is not considered a *nomen nudum* since the original description is published in the very same paper a few pages later, see Adams H. 1865]; Tapparone Canefri (1883: 281), as *Truncatella*, record (Raja Ampat Islands, Waigeo: "Waigheu, trovata sugli scogli calcai"); Clench & Turner (1948: 192 & 209), checklist; Turner (1959: 184, pl. 31 fig. 3), redescription, general distribution; van Benthem Jutting (1963: 441), bibliography.

Type material: Type material was probably never properly designated, therefore only topotypes were studied, 1 specimen BMNH - "Waigiou Island" / 1903.7.11.38 [purchased off MR E. Gerrard]; 1 specimen BMNH - "Waigiou, Molucca Is" / 1904.12.15.56-57 [collected by Mr Waterhast, purchased off Gerrard]. New material: INDONESIA E, Raja Ampat, Waigeo Island, Waisai 3 km W, 00°26'04"S, 130°47'41"E, 40-50 m, 17.II.2012, secondary lowland rainforest on limestone [3 adults (one is broken), NME & KGC]; INDONESIA E, Raja Ampat, Waigeo Island, Waisai 4-6 km W (around Waisai airport), 00°24'46"S, 130°44'11"E, 10-100 m, 17.II.2012, primary lowland rainforest on limestone & karst [2 adults, NME & KGC]; INDONESIA E, Raja Ampat, Waigeo Island, Waisai 10 km NWW, 00°24'46"S, 130°44'11"E, 70-200 m, 19.II.2012, primary lowland rainforest on limestone [3 adults, NME & KGC].

Turner (1959) based her redescription of *T. wallacei* on topotypic subadult specimens from BMNH (Fig. 25), since the types were not allocated (the types are not in BMNH – J. Ablett, personal communication, 18.viii.2020). However, these specimens are atypical or belong to a different species, because they are significantly smaller than mentioned in the original description (9.5–10.5 mm vs 18 mm) and have denser axial ribbing pattern on the ultimate whorl (not mentioned by Adams H. 1865). Recent specimens from Waigeo in the NME









collection perfectly match the original description of this species. A neotype is not being designated since the syntype(s) may still be present in BMNH. Redescription based on specimen from Waisai env., S Waigeo, Raja Ampat Islands (see Annotated checklist below for details). H = 17.9 mm, W = 5.5mm, HW = 8.3 mm, AH = 5.3 mm; selected specimen from Waisai airport area H = 12.4 mm, W = 4.1 mm,HW = 5.9 mm, AH = 3.1 mm. Shell is decollate, cream coloured, dextral, conical, gradually narrowing apicad. Decollate adult shell with 6-6¹/₂ rather flat whorls, number of embryonic whorls is unknown. Suture is moderately deeply impressed, oblique to coiling axis (angle at ~70-75°). Ultimate whorl in apertural view is 3.9 mm wide, penultimate whorl - 3.5 mm, topmost remaining (first non-decollate of totally 6 whorls) is 1.65 mm wide. Umbilicus is closed in adult. Teleoconch is sculptured with dense nearly straight to slightly arched (in frontal view) and in part irregular axial ribs. On ultimate whorl ribs become slightly sinuous basally. Some ribs are distinctly wider in their upper part at suture (Fig. 26C). Ribs do not always run from suture to suture. There are no abrupt changes in axial ribbing pattern, ribs on the last half whorl are as dense as those on penultimate whorl. Ribs are not synchronous with those of previous whorls and are oblique to coiling axis. There are about 5 ribs per 0.5 mm on penultimate whorl in abapertural view and about 80-93 ribs on ultimate whorl. Axial ribs of ultimate whorl evenly rounded basally, basal ridge is therefore absent (ultimate whorl rounded, not angled, basally and laterally). Spiral striae or ribs not observed at 80x magnification. Last part of ultimate whorl protruding slightly anteriad from shell outline in apertural view. Parietal gap present, rather wide and comparatively deep. Aperture is obliquely ovoid (narrowed in angular corner), not tilted to coiling axis, positioned vertically, apertural rim entire, and with moderately broadly reflected, flattened apertural lip. Aperture is shifted right to coiling axis in apertural view. Peristome is simple in lateral view. Parietal margin of the peristome is detached from ultimate whorl, peristome is therefore continuous. Angular corner of peristome attached to or broadly detached from penultimate whorl (Fig. 26A). Margins of peristome not or barely sinuous; parietal margin is slightly obtusely angulate. Operculum (Fig. 26D-F) irregularly ovoid, height 2.4 mm, maximum width 1.7 mm, flattened on outer surface. Its chitinous, paucispiral base bears calcareous plate with slightly raised ridge along one margin and on opposite margin with strong, unicuspid apophysis and 5 strong lamellar

elevations of variable size raising radially from apophysis.

Distribution: The Papuan Region. Only known from Waigeo, Raja Ampat Islands (Map 6).

Key to Papuan Taheitia H. et A. Adams, 1863

The present key is an attempt to summarize critical features of the Papuan Region species presently arranged to Taheitia in broad sense (see short discussion above). Considering our generally poor present knowledge on the Papuan fauna, it is likely further species will be recorded from the area in the future and, therefore, this key is only valid for the Papuan taxa mentioned in the present paper. This key is generally based on conchological features. Shape and structure of operculum is a very useful feature, but opercula are known only for limited number of Papuan Taheitia, therefore we generally avoided usage of opercula for treating groups of species in the key except if opercula known in all closely related species and proper comparison was possible. Taking into account high variability in shell height among some Papuan Taheitia, some features used in this key may not work sufficiently for extreme sized (smallest and largest) specimens of same species. Taheitia is a difficult group thanks to high variability of shell size (as above), shape and ribbing pattern and usage of comparative specimens are mandatory for certain identification.

- Shell less slender; decollate adult shell conical to strongly subcylindrical (Figs 6, 8–11, 13, 15, 17, 19–26); for five last whorls the ratio of shell height to width is 3 or less; teleoconch whorls widen more rapidly; ratio









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of maximum width of ultimate whorl (measured above aperture) to maximum width of fourth preceding whorl is 1.5 or more 7 3 In adult shell axial ribbing pattern is nearly same dense or slightly sparser on the last half whorl as on the rest of teleoconch 4 - In adult shell axial ribbing is significantly sparser on the last half whorl than on the rest of teleoconch (Fig. 14B-C); shell slenderer T. gracilenta 4 Less than 40 axial ribs on ultimate whorl, counting both complete and incomplete ribs; operculum is unknown .. Fifty or more axial ribs on ultimate whorl counting both complete and incomplete ribs (Fig. 5A-C); operculum on inner side with 9 lamellar elevations (Fig. 5D & E) *T. biaka* sp. nov. 5 Aperture more or less regularly ovoid, rounded along the palatal and basal margins; the parietal margin not curves into the aperture 6 Aperture nearly rectangular, flat along palatal and basal margins (Fig. 16A & D); parietal margin bent into the aperture *T. longpela* sp. nov. 6 Axial ribs on ultimate whorl rounded basally (Fig. 18); ridge at shell base not present (ultimate whorl rounded basally and laterally); 28-30 axial ribs on the ultimate whorl T. mansueta - Axial ribs on ultimate whorl obtuse angulate basally; weak ridge is present at shell base (ultimate whorl angled basally and laterally) (Fig. 12); 30-35 axial ribs on the ultimate whorl *T. gebeensis* sp. nov. 7 Shell height ~30 mm; axial ribbing pattern very dense; axial ribs slightly sinuous, comparatively delicate; about 110–120 axial ribs on the ultimate whorl T. gigantea sp. nov. Shell height under 25 mm; axial ribbing pattern moderately dense; ribs straight to slightly arched (only become slightly sinuous at shell base); up to 95 ribs on the ultimate whorl 8 8 Teleoconch with axial ribs longitudinally grooved (with one or more delicate groves) along their crests, as if they have been composed on two merged lamellae (Fig. 8D); columellar-basal corner of peristome obtusely protruding in a spur in adult shell (Figs 8A & 11A) 9 - Axial ribs of teleoconch not grooved longitudinally along their crests; columellar-basal corner of peristome not protruding 10 9 About 22–25 axial ribs on ultimate whorl; teleoconch whorls comparatively stronger convex (Fig. 11) T. galactodes - About 32-34 axial ribs on ultimate whorl; teleoconch whorls comparatively less convex (Fig. 8) ... T. calcarata 10 After peripenultimate whorl axial ribs are only clearly defined near the suture, the rest of penultimate and ultimate whorls is sculptured with axially or diagonally directed elongate pustules (Figs 15 & 19-20); operculum on inner side with a strong unicuspid hookshaped apophysis at the base (Figs 15E & 20E) 11 Axial ribs clearly defined; operculum (where known) not as in figs 15E & 20E 12

11 Peristome darkened; peristome recurved abaperturally (Figs 19A-20A); operculum on inner side with unicuspid triangular apophysis at the base (Fig. 20E) T. schneideri Peristome whitish; peristome not recurved abaperturally (Fig. 15A); operculum on inner side with unicuspid hook-shaped apophysis at the base (Fig. 15E) *T. jodiae* sp. nov. 12 Parietal margin of peristome attached to wall of ultimate whorl (Figs 6, 10 & 22); parietal gap not present or insignificantly narrow 13 - Parietal margin of peristome broadly detached from wall of ultimate whorl (Figs 9, 21, 24-26); parietal gap distinct15 13 Axial ribbing pattern generally denser, more than 35 ribs on the ultimate whorl; operculum different (not known in T. clathrata); aperture less wide and more verticallyoriented (Figs 6 & 22); decollated shell generally shorter and less slender (Figs 6 & 22); distribution: Bismarck Archipelago 14 - There are ~25-27 ribs on ultimate whorl; operculum apophysis cow-horn-shaped, unicuspidate, not lamellate (cf. van Benthem Jutting (1963, fig. 9b)); aperture stronger expanded, comparatively wider (Fig. 10A); shell generally slenderer (Fig. 10A-C); distribution: Biak, Cenderawasih Bay Islands T. foliosocostata 14 Shell sculptured with chevron-shaped ridges as well as axial ribbing (Fig. 6); ridges and ribs separated by more than own width (Fig. 6); palatal margin of peristome nearly straight in lateral view (Fig. 6C) T. bifurca - Shell with axial ribbing but lacking raised ridges (Fig. 22); ribs denser, separated by about their own width; palatal margin of aperture sinuous in lateral view (Fig. 22B) T. tesselata 15 Some of axial ribs on teleoconch markedly increasing in shape or height towards suture, or at least on ultimate whorl axial ribs are grouping or merging together to form short stronger ridges at suture and at shell base (Figs 21D & 26C) 16 - Axial ribs on teleoconch not increasing in shape or height towards suture; axial ribs are not merging together to form "thicker" ridges 17 16 Operculum with erect ridge along one margin, with bicuspidate apophysis on opposite margin and 5–6 subparallel irregularly shaped partly strongly high transverse lamellae close to the erect ridge (cf. Gittenberger (1989, fig. 4)); on ultimate whorl some axial ribs are grouping (merging together to form short stronger blades) at suture (see Gittenberger (1989, figs 1–2); shell uniformly coloured, without darker markings T. heinrichi - Operculum with slightly erect ridge along one of margins; apophysis unicuspidate, with five strong lamellar elevations of variable size raising radially from it (Fig. 26D & F); on ultimate whorl some axial ribs are grouping (merging together to form short stronger

ridges) at suture (Fig. 26C); shell not uniformly coloured

but without darker brown marking T. wallacei



- Operculum without erect ridge; apophysis cow-hornshaped unicuspidate, not lamellate (Fig. 21E & G); axial ribs not merging together to form stronger ridges at suture or shell base, slightly increasing in shape at suture (Fig. 21D); shell uniformly coloured, without darker brown marking *T. telnovi* sp. nov. - Operculum apophysis massive, somewhat laterally curved, truncate apically (cf. Turner (1959, figs 2-5)); at least on ultimate whorl some axial ribs are grouping (merging together to form short stronger ridges) at suture and shell base; shell with irregular darker brown markings on generally paler background T. orrae 17 Axial ribs on teleoconch dense, strongly sinuous (Figs 23-24); shell stronger obese (Figs 23-24) T. ultima Axial ribs on teleoconch straight, very spaceous (Fig. 9); shell comparatively slenderer (Fig. 9) T. clathrata

Discussion

The two truncatellid genera in the Papuan Region, Truncatella and Taheitia, differ markedly in their distributions. The five Truncatella taxa: T. granum, T. guerini, T. marginatum, T. thaanumi, and T. thaanumi insularis, are saltwater tolerant species living in the extreme upper intertidal and supratidal edges of saltwater habitats under mats of cast up marine vegetation. This habitat likely facilitates long-distance transport on floating mats during storm events, and all are distributed beyond the Papuan Region (Clench & Turner 1948). In contrast, Taheitia are found in terrestrial habitats and our study suggests are generally narrowly distributed. The eight new species described here are all found on single islands: Taheitia biaka sp. nov. from Biak, T. bifurca sp. nov. from Manus, T. gebeensis sp. nov. from Gebe, T. gigantea sp. nov. from Waigeo, T. malagan sp. nov. from New Ireland, T. telnovi sp. nov. from Misool, T. jodiae sp. nov. and T. longpela sp. nov. from New Britain. Some reports of species with multi island ranges appear to be based on misidentifications. Taheitia wallacei records from Misool and Salawati (van Benthem Jutting, 1958; 1963) are likely the subsequently named T. telnovi sp. nov. and T. heinrichi Gittenberger, 1989. Records of Taheitia gracilenta (E.A. Smith, 1897) from New Britain (Rensch I. 1937) and Biak (Benthem Jutting 1963: 440) likely refer to morphologically similar Taheitia longpela sp. nov. and T. biaka sp. nov., respectively. Other records of T. gracilenta from New Ireland (Rensch I. 1937: 629 & 633-634) and of Taheitia ultima (I. Rensch 1937) from Yapen (Benthem Jutting 1963: 441) need confirmation. Remaining species with multi island ranges are not separated by deep water, for example, T. heinrichi is found in Salawati, Warir, and adjacent lowlands of New Guinea's Doberai Peninsula, which were likely contiguous during low water stands.

The Papuan Region is geologically complex (Baldwin et al. 2012), and many areas are experiencing rapid uplift of karst habitats (Lindley 2008), an extreme example of this is the Nakanai Mountains of eastern New Britain, where rapid uplift has resulted in extensive and very deep cave systems (Gabriel et al. 2018). Taheitia species appear to be calciphiles and are not generally distributed over wide areas, instead occurring in discontinuous habitats where weathered limestone is exposed at the soil surface. All eight new species of Taheitia were found in rainforest on karst, usually under or on limestone rocks within rock piles, or in leaf litter among rocks. These new species increase the Papuan Region's Taheitia fauna by more than 50% bringing the total number of species to 21. It is likely other unexplored karst areas in the Papuan Region are inhabited by additional undiscovered species.

The habitat specificity of Taheitia species makes them particularly vulnerable to both limestone extraction and deforestation. Species restricted to karst habitats are often found where limestone is exposed at the soil surface, unfortunately these are also the conditions that are optimal for commercial extraction for cement and other industrial applications. Entire limestone exposures can be mined away before endemic species are discovered (Oheimb et al. 2019; Schilthuizen et al. 2005). Even in areas where limestone is not extracted, forest loss can lead to loss of soil moisture, which is likely to negatively impact moisture dependent snails. The island of New Guinea harbours the third largest tracts of primary rainforest remaining on the planet, behind only the Amazon and Congo basins. As remaining uncut forests decline in Australasia, particularly in Kalimantan and other parts of Indonesia, logging has increased in primary forests of the provinces of Papua and West Papua (Nasendi 2000). In Papua New Guinea, rates of deforestation between 1972 and 2002 increased from 1.4 to 1.7% per year, surpassing deforestation rates in the Amazon Basin. In only 30 years, 15% of the country's tropical forests have been felled and another 8.8% degraded (Shearman 2009). Terrestrial snails are the faunal group most likely to be impacted by this forest loss, as these moisture dependent animals are among the most endangered species globally, and approximately 50 percent of all extinctions recorded since 1500 have been mollusks





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particularly land snails (Regnier *et al.* 2015). This high rate of extinction coupled with loss of habitat due to deforestation emphasizes the importance and urgency of increased sampling to identify and describe species before their extinction (Richling & Bouchet 2013) and while conservation efforts are still possible.

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References

- Adam W., Leloup E. 1938. Prosobranchia et Opisthobranchia. In: Résultats scientifiques du voyage aux Indes orientales néerlandaises de LL. AA. RR. le Prince et la Princesse Léopold de Belgique. – Mémoires du Musée Royal d'histoire naturelle de Belgique (Hors Série) 2, No 19: 1–209, pls 1–8.
- Adams H. 1865. [Descriptions of new species]. In: Wallace A. R. List of the land shells collected by Mr. Wallace in the Malay Archipelago, with descriptions of the new species by Mr. Henry Adams. – Proceedings of the Zoological Society of London 1865: 414–416, pl. 21.
- Adams H., Adams A. 1863. Descriptions of five new genera of Mollusca. Annals and Magazine of Natural History; Zoology, Botany, and Geology, Series 3, **11**: 18–20.
- Adams H., Angas G. F. 1865. Descriptions of two new species of shells in the collection of George French Angas. – *Proceedings of the Zoological Society of London* 1865: 54, pl. 2.
- Baldwin S. L., Fitzgerald P. G., Webb L. E. 2012. Tectonics of the New Guinea region. – *Annual Review of Earth and Planetary Sciences* **40**: 495–520.
- Beehler B. M., Pratt T. K., Zimmerman D. A. 1986. Birds of New Guinea. Handbook No. 9 of the Wau Ecology Institute. New Jersey, Princeton University Press: xiii + 293 pp.
- Boettger C. R. 1922. Die Landschneckenfauna der Aru- und der Kei-Inseln. Abhandlungen



- Clench W. J., Turner R. D. 1948. A catalogue of the family Truncatellidae with notes and descriptions of new species. – *Occasional Papers on Mollusks* **1**, No 13: 157–212, 445, pls 22–24.
- Egorov R. 2018. Treasure of Russian shells. Supplement 3. A review of the genera of the terrestrial pectinibranch molluscs (synopsis mainly based on published data). Part IV Rissooiformes. Assimineidae, Truncatellidae, Pomatiopsidae, Tateidae, Terrestribythinellidae. Colus Publishers, Moscow: 54 + xxiii pp.
- Gabriel J., Specht J., Leavesley M., Kelly M., Wood M., Foale S., Filer C., McIntyre-Tamwoy S., Bourke R. M., Gill D., Sounier J-P. 2018. The Nakanai Ranges of East New Britain, Papua New Guinea. James Cook University, Cairns: 35 pp.
- Gittenberger E. 1989. A new *Taheitia* species (Mollusca: Gastropoda: Prosobranchia: Truncatellidae) from Irian Jaya. – *Zoologische Mededelingen* **6**, No 1/10: 23–26.
- Greķe K. 2012. Non-marine Mollusca of Gebe Island, North Moluccas. – *Vernate* **31**: 225–240.
- Gressitt J. L. 1982. General introduction: 3–13. In: Gressitt J.L. (ed.) Monographiae biologicae 42, Biogeography and ecology of New Guinea. Dr. W. Junk / Springer Publishers, the Hague: 983 pp.
- Hadley A. 2010. CombineZP. Available from https://combinezp.software.informer.com/download [accessed 14 April 2020].
- Hedley C. 1891. The land molluscan fauna of British New Guinea. – Proceedings of the Linnean Society of New South Wales, Series 2, 6: 67–116, pls 9–12, 12bis.
- Lindley L. 1988. Early Cainozoic stratigraphy and structure of the Gazelle Peninsula, east New Britain: An example of extensional tectonics in the New Britain arc-trench complex. – *Journal of the Geological Society of Australia* **35**, No 2: 231–244.
- Leschke M. 1912. Mollusken der Hamburger Südsee-Expedition 1908/09. (Admiralitätsinsel, Bismarckarchipel, Deutsch-Neugiunea). – *Mitteilungen aus dem Naturhistorischen Museum in Hamburg* **29** [1911]: 89–172, pl. 1.
- Lowe R. T. 1855. Catalogus molluscorum pneumonatorum insularum Maderensium: or a list of all the land and freshwater shells, Recent and fossil, of the Madeiran Islands: arranged in groups, according to their natural affinities; with diagnoses of the groups, and of the new hitherto imperfectly defined species. – *Proceedings of the Zoological Society of London* 1854: 161–218.
- Möllendorff O. F. von 1897. Diagnosen neuer und kritischer Landdeckelschnecken. – Nachrichtsblatt der Deutschen Malakozoologischen Gesellschaft **29**: 31–45.
- Nasendi B. D. 2000. Deforestation and Forest Policies in Indonesia. *In*: Palo M., Vanhanen H. (eds) *World*







Forests from Deforestation to Transition? World Forests. Volume **2**. Springer, Dordrecht. <u>https://doi.org/10.1007/978-94-010-0942-3_9</u>

- Oheimb K. C. M. von, Oheimb P. V. von, Hirano T., Do T. V., Ablett J., Luong H. V., Pham S. V., Naggs F. 2019. Cryptic diversity of limestone karst inhabiting land snails (Cyclophorus spp.) in northern Vietnam, their evolutionary history and the description of four new species. – PLoS ONE 14: e0222163.
- Rensch I. 1937. Systematische und tiergeographische Untersuchungen über die Landschneckenfauna des Bismarck-Archipels. II. – Archiv für Naturgeschichte, Neue Folge, **6**: 526–644.
- Rensch I. 1940. Nachträge zur Landschneckenfauna des Bismarck-Archipels. – *Zoologischer Anzeiger* **131**, No 1/2: 29–39.
- Richling I., Bouchet P. 2013. Extinct even before scientific recognition: a remarkable radiation of helicinid snails (Helicinidae) on the Gambier Islands, French Polynesia. – *Biodiversity and Conservation* **22**: 2433–2468 <u>https://doi.org/10.1007/s10531-013-0496-2</u>
- Riedel A. 2002. Taxonomy, phylogeny, and zoogeography of the weevil genus Euops (Insecta: Coleoptera: Curculionoidea) in the Papuan Region. Dissertation zur Erlangung des Doktorgrades der Fakultät für Biologie der Ludwig-Maximilians-Universität München: 216 pp.
- Rosenberg G. 1996. Independent evolution of terrestriality in Atlantic truncatellid gastropods. *Evolution* **50**, No 2: 682–693.
- Schilthuizen M., Liew T. S., Elahan B., Lackman-Ancrenaz I. 2005. Effects of karst forest degradation on Pulmonate and Prosobranch land snail communities in Sabah, Malaysian Borneo. – *Conservation Biology* **19**: 949–954.
- Schneider J. 1954. Über den Feldbau der Sulka auf Neubritannien. Anthropos 49, No 1/2: 276–289.
- Shearman P. L., Ash J., Mackey B., Bryan J. E., Lokes B. 2009. Forest Conversion and Degradation in Papua New Guinea 1972–2002. – *Biotropica* 41: 379–390.
- Solem A. 1960. Non-marine Mollusca from the Florida Islands, Solomon Islands. – *Journal of the Malacological Society of Australia* **1**, No 4: 39–56.
- Soós L. 1911. On a collection of land shells from New Guinea and adjacent islands. Annales musei nationalis hungarici **9**: 345–356.
- Tapparone Canefri C. 1874. Contribuzione per una fauna malacologica delle Isole Papuane. I. Molluschi raccolti da Odoardo Beccari nelle Isole Aru, Kei e Sorong. – Annali del Museo Civico di Storia naturale di Genova, Serie 2, 6: 548–568.

- Tapparone Canefri C. 1877. Contribuzione per una fauna malacologica delle Isole Papuane. IV. Molluschi raccolti dal sig. L.M. D'Albertis nell'Isola di Sorong (Costa Nord-Ovest della Nuova Guinea) nell' anno 1872. – Annali del Museo Civico di Storia naturale di Genova, Serie 2, **9**: 278–293.
- Tapparone Canefri C. 1883. Fauna malacologica della Nuova Guinea e delle isole adiacenti. Parte I. Molluschi estramarini. – Annali del Museo Civico di Storia naturale di Genova, Serie 2, **19**: 1–313, 11 pls.
- Tapparone Canefri C. 1886. Fauna malacologica della Nuova Guinea e delle isole adiacenti. Parte I. Molluschi estramarini. Supplemento 1. – Annali del Museo Civico di Storia naturale di Genova, Serie 2, 4, No 24: 113–199, pls 1–2.
- Telnov D. 2011. Taxonomische Revision der Gattung Macratria Newman, 1838 (Coleoptera: Anthicidae: Macratriinae) aus Wallacea, Neuguinea und den Salomonen: 97–285, pls 17–37. In: Telnov D. (ed.) Biodiversity, Biogeography and Nature Conservation in Wallacea and New Guinea. Volume I. The Entomological Society of Latvia, Rīga: 434 pp + 92 pls.
- Turner R. D. 1959. Notes on the genus *Taheitia* (Truncatellidae) in New Guinea with the description of a new species. – *Occasional Papers on Mollusks* 2, No 23: 181–188, pls 21–32.
- van Benthem Jutting W. S. S. 1958. Non-marine Mollusca of the island of Misool. – Nova Guinea: A Journal of Botany, Zoology, Anthropology, Ethnography, Geology and Palaeontology of the Papuan Region **9**, No 1: 293–338.
- van Benthem-Jutting W. S. S. 1963. Non-marine Mollusca of West New Guinea. Part 1, Mollusca from fresh and brackish waters. – *Nova Guinea (Zoology)* **20**: 409–521, 2 pls.
- Vermeulen J. J. 1996. A checklist of the non-marine molluscs of the Aru Islands. – *The Papustyla* 10, No 3: 107–115.
- Wallace A. R. 1865. List of the land shells collected by Mr. Wallace in the Malay Archipelago, with descriptions of the new species by Mr. Henry Adams. – *Proceedings of the Zoological Society of London* 1865: 405–416, pl. 21.

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Figures 1–2. Papuan *Truncatella* Risso, 1826 species. 1 – *T. guerinii* A. Villa et J. B. Villa, 1841; 2 – *T. marginata* Küster, 1855. A – Apertural view; B – Abapertural view; C – Lateral view [scale bars 5 mm].





Figures 3-4. Papuan Truncatellidae species. 3 – *Truncatella thaanumi insularis* Clench et Turner, 1948; 4 – *Taheitia porrecta* (Gould, 1847), holotype (USNM 5527) from the National Museum of Natural History, Smithsonian Institution, Washington, D.C., U.S.A. (image 3 licensed under <u>http://creativecommons.org/publicdomain/zero/1.0</u>, out of copyright). A – Apertural view; B – Abapertural view; C – Lateral view; D – Apical view; E – Umbilical view [scale bars 5 mm].





Figure 5. *Taheitia biaka* sp. nov., holotype. A – Apertural view; B – Abapertural view; C – Lateral view; D-F – Operculum, inner (D) and outer surface (E), lateral view (F) [figures A–C scale bar 5 mm; figures D–F not to scale].





Figure 6. *Taheitia bifurca* sp. nov., holotype. A – Apertural view; B – Abapertural view; C – Lateral view; D – Axial ribbing pattern, close view; E – Operculum, inner surface [figures A–C scale bar 5 mm; figures D–E not to scale].



Figure 7. *Taheitia bismarckiana* (I. Rensch, 1937), two syntypes (syntype 1 – A, C, D; syntype 2 – B, E, F). A & B-Apertural view; D & E – Abapertural view; C & F – Lateral view; G – Original labels [scale bar 2 mm].





Figure 8. *Taheitia calcarata* van Benthem Jutting, 1963, specimen from ~56 km NNW Biak, Biak Island. A – Apertural view; B – Abapertural view; C – Lateral view; D – Axial ribbing pattern, close view [figures A–C scale bar 5 mm].



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Figure 9. *Taheitia clathrata* (H. Adams et Angas, 1865), three syntypes (syntype 1 – A, D–F, syntype 2 – B, syntype 3 – C). A–C – Apertural view; D – Abapertural view; E – Lateral view; F – Axial ribbing pattern, close view [figures A–E scale bars 2 mm] (images courtesy Sankurie Pye).





Figure 10. *Taheitia foliosocostata* van Benthem Jutting, 1963, specimen from Urfu village, Biak Island. A – Apertural view; B – Abapertural view; C – Lateral view; D – juvenile specimen, apertural view [figures A–C scale bar 5 mm].



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Figure 11. Taheitia galactodes van Benthem Jutting, 1963, specimen from Urfu village, Biak Island. A – Apertural view; B – Abapertural view; C – Lateral view; D – juvenile specimen, apertural view [figures A–C scale bar 5 mm].











Figure 12. *Taheitia gebeensis* sp. nov., holotype. A – Apertural view; B – Abapertural view; C – Lateral view; D–E – Axial ribbing pattern, close view [figures A–C scale bar 5 mm; figures D–E not to scale].



Figure 13. *Taheitia gigantea* sp. nov., holotype. A – Apertural view; B – Abapertural view; C – Lateral view [scale bar 5 mm].











Figure 14. *Taheitia gracilenta* (E. A. Smith, 1897), lectotype. A – Apertural view; B – Lateral view; C – Abapertural view; D – Apical view; E – Umbilical view; F–G – Original labels [figures A–E scale bar 5 mm] (images courtesy Jonathan Ablett).

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Figure 15. *Taheitia jodiae* sp. nov., holotype. A – Apertural view; B – Abapertural view; C – Lateral view; D – Axial ribbing pattern, close view; E – Operculum, inner surface [figures A–C scale bar 5 mm; figures D–E not to scale].





Figure 16. *Taheitia longpela* sp. nov., holotype. A – Apertural view; B – Abapertural view; C – Lateral view; D – Aperture, close view [figures A–C scale bar 5 mm; figure D not to scale].



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Figure 17. *Taheitia malagan* sp. nov., holotype. A – Apertural view; B – Abapertural view; C – Lateral view; D – Axial ribbing pattern, close view; E – Operculum, inner surface [figures A–C scale bar 5 mm; figures D–E not to scale].







Figure 18. *Taheitia mansueta* van Benthem Jutting, 1963, paratype (collection Zoological Museum Moscow State University) from Pasirputih near Manokwari, Doberai Peninsula, New Guinea. A – Apertural view; B – Abapertural view; C – Lateral view [scale bar 5 mm] (images courtesy Roman Egorov).



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Figure 19. *Taheitia schneideri* (I. Rensch, 1937), paratype from Mailmail village, New Britain. A – Apertural view; B – Lateral view; C – Apical view); D – Original labels [scale bar 5 mm].











Figure 20. *Taheitia schneideri* (I. Rensch, 1937), specimen UF366522 from ~ 4 km NW of Marmar village, E New Britain. A – Apertural view; B – Abapertural view; C – Lateral view; D – Axial ribbing pattern, close view; E – Operculum, inner surface [figures A–C scale bar 5 mm; figures D–E not to scale].



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Figure 21. *Taheitia telnovi* sp. nov. A–G – Holotype. A – Apertural view; B – Abapertural view; C – Lateral view; D – Axial ribbing pattern, close view; E–G – Operculum, inner (E) and outer surface (F), lateral view of the opercular apophyse (G); H – Paratype, juvenile shell [figures A–C scale bar 5 mm; figures D–H not to scale].





Figure 22. *Taheitia tesselata* Möllendorff, 1897, specimen from Bismark Archipelego (B. Strubell collection, BMNH). A – Apertural view; B – Lateral view; C – Abapertural view; D – Apical view; E – Umbilical view; F–G – Original labels [scale bar 5 mm] (images courtesy Jonathan Ablett).



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Figure 23. *Taheitia ultima* (I. Rensch, 1937), paratype from Jacquinot Bay, New Britain. A – Apertural view; B – Lateral view; C – Dorsal (top) view); D – Original label [scale bar 5 mm].











Figure 24. *Taheitia ultima* (I. Rensch, 1937), specimen UF366525 from E of Galowe village, E New Britain. A – Apertural view; B – Abapertural view; C – Lateral view; D – Axial ribbing pattern, close view; E – Operculum, inner surface [figures A–C scale bar 5 mm; figures D–E not to scale].



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Figure 25. *Taheitia wallacei* (H. Adams, 1865), topotype (possible syntype) BMNH. A – Apertural view; B – Lateral view; C – Abapertural view; D – Apical view; E – Umbilical view; F – Original labels [scale bar 5 mm] (images courtesy Jonathan Ablett).











Figure 26. *Taheitia wallacei* (H. Adams, 1865), specimen from 3 km W of Waisai, Waigeo. A – Apertural view; B – Lateral view; C – Axial ribbing pattern, close view; D–F – Operculum, inner (D) and outer (E) surface, lateral view (F) [figures A–B scale bar 5 mm; figures C–F not to scale].



Figure 27. Taheitia bifurca sp. nov., paratype, live specimen.











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Figures 28–29. Live specimen and microhabitat of Papuan Taheitia. 28 – Taheitia jodiae sp. nov., paratype, live specimen; 29A & B – Microhabitat of Taheitia telnovi sp. nov., River Gam valley.













Figures 30–34. SEM micrographs of radulae of the Papuan *Taheitia* H. et A. Adams, 1863. 30 – *T. bifurca* sp. nov., paratype UF476354; 31 – *T. jodiae* sp. nov., paratype UF366600; 32 – *T. schneideri* (I. Rensch, 1937), specimen UF366527 from 4 km NW of Marmar village, E New Britain; 33 – *T. telnovi* sp. nov., paratype UF542950; 34 – *T. ultima* (I. Rensch, 1937), specimen UF366523 from E of Galowe village, E New Britain [scale bars 0.05 mm].



Map 1. Type locality of Taheitia gebeensis sp. nov. (circle) on Gebe, North Moluccas (prepared with ArcGIS 10.3).





Map 2. Localities of *Taheitia* H. et A. Adams, 1863 on Biak, Cenderawasih Bay Islands. Four-pointed stars (filled and empty) – *T. calcarata* van Benthem Jutting, 1963; Circle – *T. biaka* sp. nov.; Diamonds (filled and empty) and an empty four-pointed star – *T. foliosocostata* van Benthem Jutting, 1963; Empty four-pointed star – *T. orrae* Turner, 1959; Empty diamonds – *T. galactodes* van Benthem Jutting, 1963 (prepared with ArcGIS 10.3).



Map 3. Localities of *Taheitia* H. et A. Adams, 1863 on Bismarck Archipelago. Four-pointed star – *T. malagan* sp. nov.; circle – *T. jodiae* and *T. longpela* spp. nov. (prepared with ArcGIS 10.3).





Map 4. Localities of Taheitia bifurca sp. nov. (circles) on Manus, Admiralty Islands (prepared with ArcGIS 10.3).



Map 5. Localities of *Taheitia* H. et A. Adams, 1863 on Misool, Raja Ampat Islands. Filled circles – Type localities of *T. telnovi* sp. nov.; empty circles – Unverified localities of *T. telnovi* sp. nov. published as those of *T. wallacei* (H. Adams, 1865) by van Benthem Jutting (1958) (prepared with ArcGIS 10.3).





Map 6. Localities of *Taheitia* H. et A. Adams, 1863 on Waigeo Island. Circles – Localities of *T. wallacei* (H. Adams, 1865); Four-pointed star – *T. gigantea* sp. nov. (prepared with ArcGIS 10.3).



Map 7. Localities of *Taheitia* H. et A. Adams, 1863 on Salawati and Warir, Raja Ampat Islands, and on Doberai Peninsula of New Guinea. Circles – Type localities of *T. heinrichi* Gittenberger, 1989; Squares – *T. gracilenta* (E. A. Smith, 1897); Four-pointed star – *T. mansueta* van Benthem Jutting, 1963 (prepared with ArcGIS 10.3).

