

Two rare and bizarre species of *Sassia* Bellardi, 1872 (Gastropoda: Ranellidae) in southern Australia, with a new species and notes on the development of *Sassia* (*Austrotriton*)

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ABSTRACT

A new species, *Sassia* (*Cymatiella*) *ansonae*, from southern Western Australia is the most elaborately sculptured species in the family. The four known specimens of *Sassia* (*Austrotriton*) *epitrema* (T. Woods, 1877) are illustrated, and the most diagnostic character of *S. (Austrotriton)* pointed out: modern species completely lack a protoconch, or have an irregularly calcified apex; they have direct development.

INTRODUCTION

Records are listed here of two of the rarest species of the gastropod family Ranellidae (= Cymatiidae), both of which occur only along the southern coast of Australia. Both taxa are referred to the very diverse, long-ranging, cosmopolitan genus *Sassia* Bellardi, 1872. The synonymy and subgenera of *Sassia* have been revised by Beu (1987; and in press). This report provides an opportunity to publicise more widely the late Florence Murray's (Burn, 1972) little-known evidence for direct development in a living species of *Sassia* (*Austrotriton*), revealing the developmental cause of the most distinctive character of the subgenus, its lack of a protoconch or presence of only a partially calcified protoconch remnant.

TAXONOMY

Family Ranellidae Gray, 1854
Subfamily Cymatiinae Iredale, 1913 (1891)
Genus *Sassia* Bellardi, 1872

Sassia Bellardi, 1872: 219. Type species (by subsequent designation, Cossmann, 1903: 93): *Triton apenninicum* Sassi, 1823, Miocene and Pliocene, Europe.

Subgenus *Austrotriton* Cossmann, 1903

Austrotriton Cossmann, 1903: 98. Type species (by original designation): *Triton radiale* Tate, 1888, early Miocene, South Australia.

Negyrina Iredale, 1929: 177. Type species (by original designation): *Triton subdistortus* Lamarck, 1822, Pliocene-Recent, southern Australia [September 1929].

Charoniella Thiele, 1929: 283. Type species (by original designation): *Triton subdistortus* Lamarck, 1822 [October 1929]. (Not *Charoniella* Powell and Bartrum, November 1929, = *Proxicharonia* Powell, 1938).

Development

Florence Murray (in Watson, 1971: 47) recorded her observations on the early development of "... *Negyrina subdistorta* (Lamarck, 1822), which sits on her eggs laid on the underside of a half bivalve — often *Neotrigonia margaritacea*, during the period April to June. The wine-glass shaped capsules are packed with nurse eggs, and only one embryo emerges. On hatching, the shell consists of one and a half whorls with the yolk sac fitting into a shallow cup-shaped depression in the first whorl. As the embryo grows the yolk material is drawn into the visceral mass and is finally absorbed leaving the sac like an empty balloon. This gradually diminishes, hardens and seals over the opening in the depression area of the first whorl. Thus there is no actual nucleus and the shell always has the appearance of a broken protoconch". This direct development of a crawling juvenile teleoconch and lack of a larval stage shows the relationship of the incompletely calcified apices of Cenozoic fossil *S. (Austrotriton)* species to the broken-looking apices of modern species such as "*Negyrina*" *subdistorta* and *Austrotriton garrardi* Beu (1970: 88, pl. 6), and makes it clear that modern species with cup-shaped teleoconch apices, lacking a protoconch, or with irregularly rugose apices, all belong in *S. (Austrotriton)*: *S. subdistorta*, *S. garrardi*, *S. bassi* (Angas, 1869), and *S. mimetica* (Tate, 1893). It can now be recorded that "*Ranella*" *epitrema* T. Woods, 1877 also has a flattened, rugose apex with a central hollow, lacking a differentiated protoconch (Fig. 1), and clearly also belongs in *Sassia (Austrotriton)*. The Pliocene to living *S. subdistorta* appears to have evolved from the Miocene *S. (Austrotriton) tumulosa* (Tate, 1888: pl. 5, fig. 2), so phylogeny supports the evidence of development. The irregularly calcified, spike-like apex or complete lack of a protoconch on the cup-shaped teleoconch apex provides the most distinctive character of the subgenus *Sassia (Austrotriton)*.

Although almost all specimens of *S. bassi* (Angas) have a low, irregular apex and no clearly differentiated protoconch, a single specimen examined (NZGS, WM15099, Kingston, S. Australia) has a protoconch of about 1 well calcified whorl, the first quarter-whorl low and flattened, the remainder subspherical but excentric, not clearly marked off from the teleoconch. Evidently the membranous or conchiolin embryonic stage is calcified in a very few individuals.

Other characters of the subgenus are its finely gemmate sculpture, its subcircular to muriciform aperture with almost smooth lips and a strongly excavated columella and, in most species, its wide sutural ramp and prominent peripheral nodules. In the enormous genus *Sassia* (more than 120 species have been named from Cenozoic rocks of Europe alone) it is valuable to segregate this remarkably consistent southern Australian group as a subgenus.

Sassia (Austrotriton) epitrema (Tenison Woods, 1877). Fig. 1-11.

Ranella epitrema T. Woods, 1877: 133; T. Woods, 1878: 28; Tyron, 1881: 45; May, 1903: 108; May, 1921: 109.

Apollo epitremus Tate and May, 1901: 356, Pl. 23, Fig. 12; Hardy, 1916: 65.

Description

The most unusual character of *Sassia epitrema* is its deeply channeled suture. Its slightly dorso-ventrally compressed form is also unusual, although the same compression characterises *S. mimetica* (Tate). Another unusual character is that its varices are not as far apart as in other *Sassia*

species (and, indeed, in all other Cymatiinae), in which varices are consistently situated at each 0.66 whorls (240° apart around the spiral as the shell grows). The varices of *S. epitrema* are not as nearly aligned as in the subfamily Ranellinae, in which varices are within 20° of being aligned, or are completely united up the spire sides to form two prominent ridges (180° to no more than about 200° apart around the spiral). In *S. epitrema*, varices are almost opposite each other on the first varicate whorl (the third teleoconch whorl; only six varices are present on F53168), 15° behind the previous ones on the next whorl (the penultimate one), and the terminal varix is 35° behind the one on the whorl above. This unusually close variceal placement presumably influenced Tenison Woods in placing the species in *Ranella*. The two recently collected specimens clearly show that the apex of the shell lacks a normal turbiniform *Sassia* protoconch; the calcified shell begins as an irregularly rugose, flattened apex with a central hollow, not segregated from the teleoconch (Fig. 1), and so lacking a protoconch. This demonstrates clearly that *S. epitrema* has direct development, as was recorded by Florence Murray for *S. subdistorta*. Therefore, although *S. epitrema* is the most bizarre of *S. (Austrotriton)* species, this appears to be its correct taxonomic position. The dominant sculpture is of many low, wide, closely spaced spiral cords, crossed by faint growth ridges; there are also four to six low axial ridges below the sutural channel in each intervariceal interval.

Dimensions

Height 20.2 mm, maximum diameter 12.6 mm, minimum diameter 8.8 mm (F53168).

Material recorded

Holotype (TM5269a, Tasmanian Museum, Hobart), from "Tasmania"; "Circular Head", presumably collected on the tip of the peninsula north of Stanley, north coast of Tasmania, by Mrs Eddie, pres. to Australian Museum by C. Hedley in 1904 (C18661, Australian Museum, Sydney); scallop dredgings from off northwestern Tasmania, other data and dimensions unrecorded, in a private collection (specimen illustrated by Phillips, 1985); HMAS "Kimbla" sta. K7/73-2, eastern Bass Strait cruise, 37° 30.8' S, 150° 15' E, off Cape Howe, Victoria — New South Wales border, 274 m, on a shell bottom, 20 Nov. 1973 (F53168, Museum of Victoria).

Remarks

For more than 100 years this strange little shell has been known only by the holotype, and by one other specimen in the Australian Museum. It is not surprising that May (1921: 109) rejected it as a Tasmanian species. Two fresh specimens dredged recently in Bass Strait allow clarification of the taxonomic position of this previously enigmatic species.

All four recorded specimens are illustrated here. The species is recorded only from the Bass Strait area, although the Cape Howe specimen (F53168) is from the north-eastern limits of the strait, on the Victoria-New South Wales border, suggesting that the species could well occur rarely around much of south-eastern Australia. It is highly desirable for collectors to preserve any animals of *S. epitrema* they discover, and submit them to a museum.

Subgenus *Cymatiella* Iredale, 1924

Cymatiella Iredale, 1924: 253. Type species (by original designation): *Triton quoyi* Reeve, 1844 (= *Triton verrucosus* Reeve, 1844), Pleistocene and Recent, southern Australia.

Vernotriton Iredale, 1936: 308. Type species (by monotypy): *Lotorium pumilio* Hedley, 1903, Recent, northern New South Wales.

Remarks

Most species included in *Sassia* (*Cymatiella*) have subdued sculpture. Such common south-eastern Australian species as *S. verrucosa* (Reeve) and *S. sexcostata* (Tate, 1888) (= *S. gaimardi* Iredale, 1929) have moderately prominent axial costae but evenly rounded whorls; the common south-eastern Australian *S. eburnea* (Reeve, 1844) (= *S. lesueuri* Iredale, 1929) has fine, evenly cancellate, axial and spiral sculpture, and the rare northern New South Wales — southern Queensland *S. pumilio* (Hedley) has only low, narrow, closely spaced spiral cords on an evenly rounded shell, with no axial sculpture other than growth lines. The one great exception to the usual subdued

sculpture is the following bizarre new species. The small size, the shape (with a moderately tall, straight-sided spire, and a short anterior canal), and the general protoconch size and proportions of *S. ansonae* agree with those of other *Sassia* (*Cymatiella*) species, and the elaborate sculpture is taken to be merely a species character. The protoconch is a little lower and of slightly fewer whorls than the usual turbiniform protoconch of 2.0-2.2 whorls of other living south-eastern Australian species previously assigned to *Sassia* (*Cymatiella*), but this type of protoconch difference (essentially between one of one whorl and those with two whorls) reflects a minor developmental difference that seems unlikely to have any taxonomic significance. The distinctive protoconch demonstrates that *S. ansonae* is not some sort of distorted form of a previously named species. The new species is assigned to *Sassia* (*Cymatiella*), but its inclusion reduces the diagnostic criteria of the subgenus to the small size, the tall spire, and the short anterior canal.

***Sassia* (*Cymatiella*) *ansonae*
n. sp. Fig. 12-21.**

Description

Shell very small, spire tall, stepped, anterior canal short, widely open, sculpture exceedingly prominent. Varices low, narrow, at each 0.66 whorls. Sculpture of a low subsutural fold, a wide, shallowly concave sutural ramp lacking prominent spiral cords, and two very prominent spiral cords on spire whorls and on periphery of last whorl, upper forming an exceedingly prominent, wavy, narrow peripheral carina; six low, narrow spiral cords on base and canal; many fine, close, wavy spiral threads over entire teleoconch; crossed by narrowly rounded, widely spaced axial costae; costae form a row of prominent nodules on subsutural fold, are very low over sutural ramp (particularly on last whorl), but extremely prominent over and between the two peripheral cords, fading out below third cord on base; 11 costae on last and nine on penultimate intervariceal intervals. Resulting sculpture is a row of prominent, rectangular hollows below peripheral carina. Coiling markedly asymmetrical, forming prominent bulge in outline in each intervariceal interval, opposite aperture. Aperture relatively large, sub-circular; interior of outer lip indented in conformity with exterior sculpture, but relatively weakly thickened, with only very low nodules on lip edge, three nodules inside sutural ramp and three along basal limb of lip; inner lip weakly callused, without parietal callus or ridge, with low, thin, narrow collar over neck. Anterior siphonal canal short, straight, open, deflected to left, without fasciole (probably incomplete); no constriction at top of aperture to form posterior canal or sinus. Teleoconch translucent; uniform pale fawn-cream except for narrow red-brown spiral lines in centre of peripheral and next lower spiral interspaces where they cross varices; inner lip collar pale pink. Protoconch solid opaque white, very small, low, wide, of 1.3 almost smooth, loosely coiled whorls, bearing very fine axial costellae and very fine spiral threads over last quarter-whorl (probably abraded from remainder of protoconch).

Dimensions

Height 13.5 mm, diameter 9.4 mm.

Material

Ellensbrook Beach, north of Margaret River and south of Cowaramup Bay, southern Western Australia, cast up on beach, 21 October 1985, Mrs W. Anson; holotype only (WAM 285-87, Western Australian Museum, Perth).

Remarks

Sassia ansonae is the most elaborately and beautifully sculptured of all Ranellidae, and its exceedingly prominent sculpture easily distinguishes it from all previously named species. The holotype had small bryozoans (now removed) attached in most hollows of both exterior and interior, but is otherwise in a very fresh condition. The few-whorled protoconch indicates that *Sassia ansonae* is likely to have lecithotrophic development, and so to have a limited geographic range in southern Western Australia. *S. ansonae* is apparently among the rarest of all Ranellidae, as Mrs Anson has found only the one specimen during many years of diligent collecting.

Etymology

I have great pleasure in naming this species in honour of its collector, Mrs Wendy Anson, whose patient collecting of small Western Australian molluscs over many years has greatly increased our knowledge of the fauna, as well as enriching museum collections.

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I thank Mrs Wendy Anson for donating her specimen to the Western Australian Museum, Dr C.C. Lu (Museum of Victoria), Joan Phillips (formerly of the Museum of Victoria), and Dr W.F. Ponder (Australian Museum) for information on and photographs of *Sassia epitrema*, and Dr Phillip Maxwell (NZGS) and Dr T.A. Darragh (Museum of Victoria) for manuscript criticism. Fig. 1 is by R.C. Brazier, NZGS; Fig. 2-5 are by Wendy St George, NZGS; Fig. 6, 8 are by W.F. Ponder; Fig. 7, 10 by A.G. Beu; Fig. 9, 11 by Joan Phillips; and Fig. 12-21 are SEM micrographs by J.E. Simes, NZGS. The manuscript was typed by Sue Nepe.

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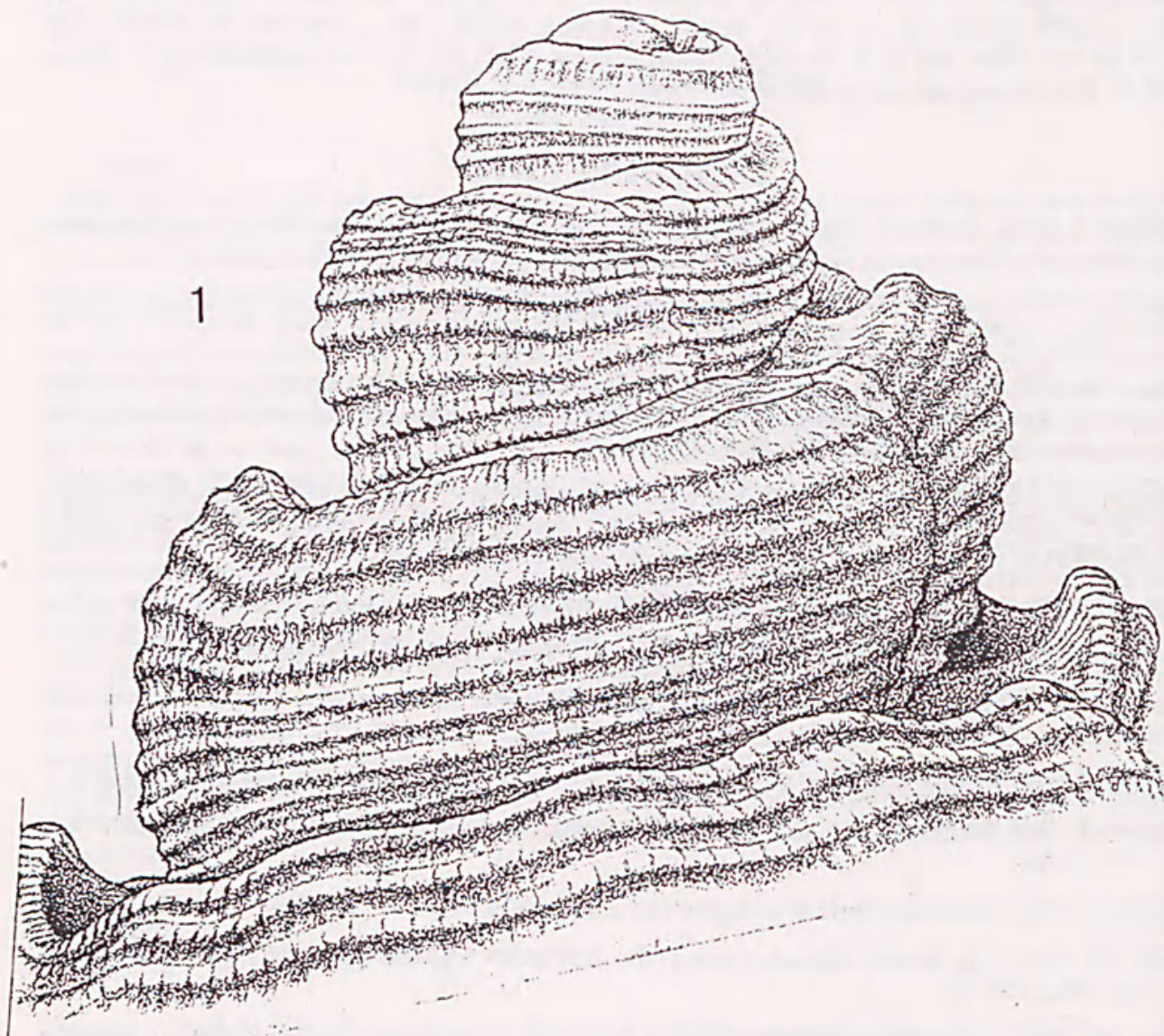
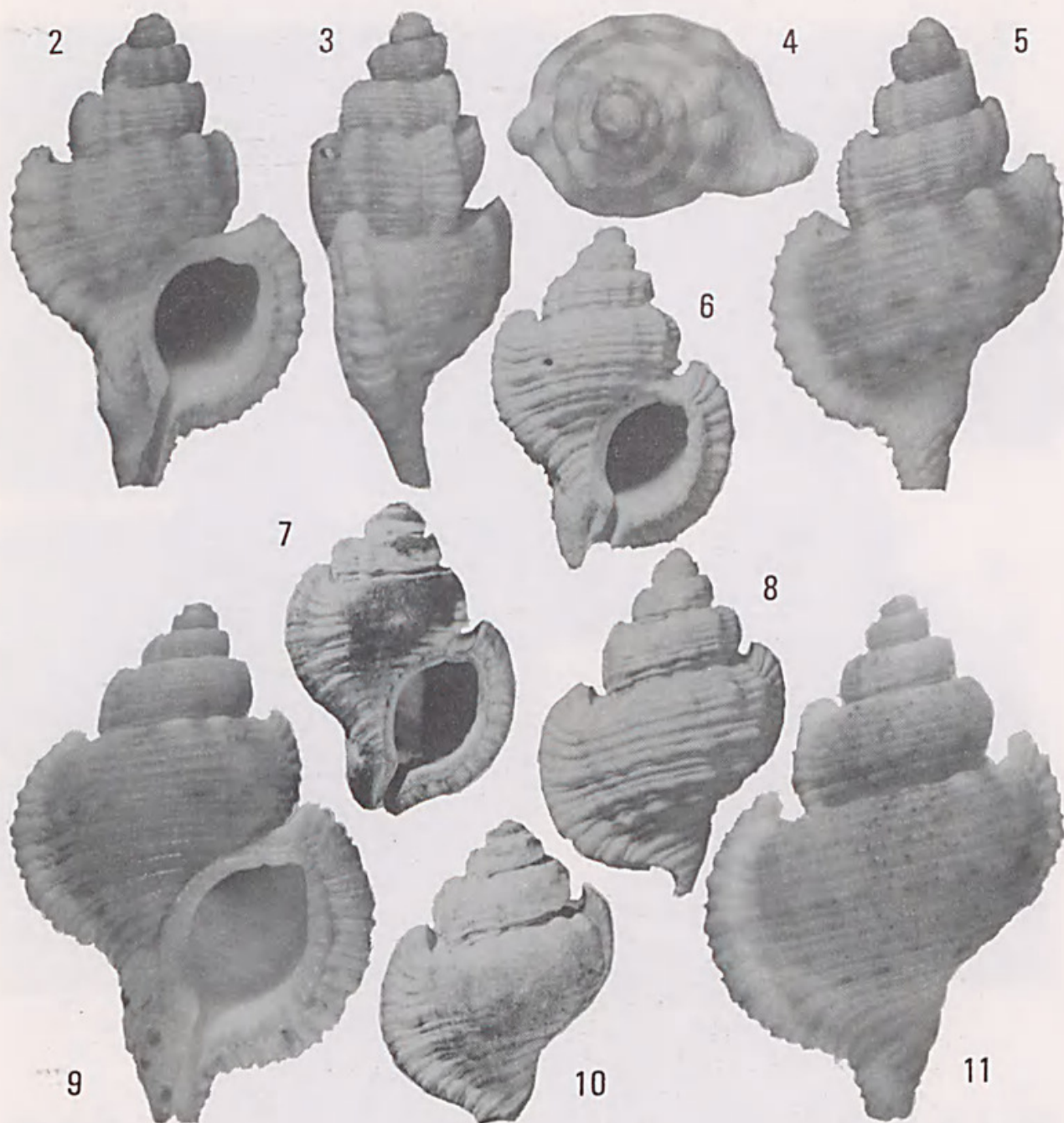


FIGURE 1. *Sassia* (*Austrotriton*) *epitrema* (T. Woods, 1877), apex of the specimen from Cape Howe, 274 m, HMAS "Kimbla" sta. K7/73-2; F53168, Museum of Victoria, X 16. Note lack of protoconch, and development of sutural channel as a steep but rapidly fattening, weakly concave sutural ramp on first teleoconch whorl.



FIGURES. 2-11. The four known specimens of *Sassia* (*Austrotriton*) *epitrema* (T. Woods).
 FIGURES 2-5. HMAS "Kimbla" sta. K7/73-2, off Cape Howe, Victoria-NSW border, 274 m, 20 Nov. 1973; F53168, Museum of Victoria; x 2.5.
 FIGURES 6, 8. Holotype, "Tasmania"; TM5269a, Tasmanian Museum; x 2.0 (photo. W.F. Ponder).
 FIGURES 7, 10. "Circular Head", Stanley, north coast of Tasmania, Mrs Eddie; C18661, Australian Museum; x 2.0.
 FIGURES 9, 11. Scallop dredgings off northwestern Tasmania, other data and dimensions not recorded, in a private collection (x 3?); specimen illustrated by Phillips (1985) (photo. J. Phillips).

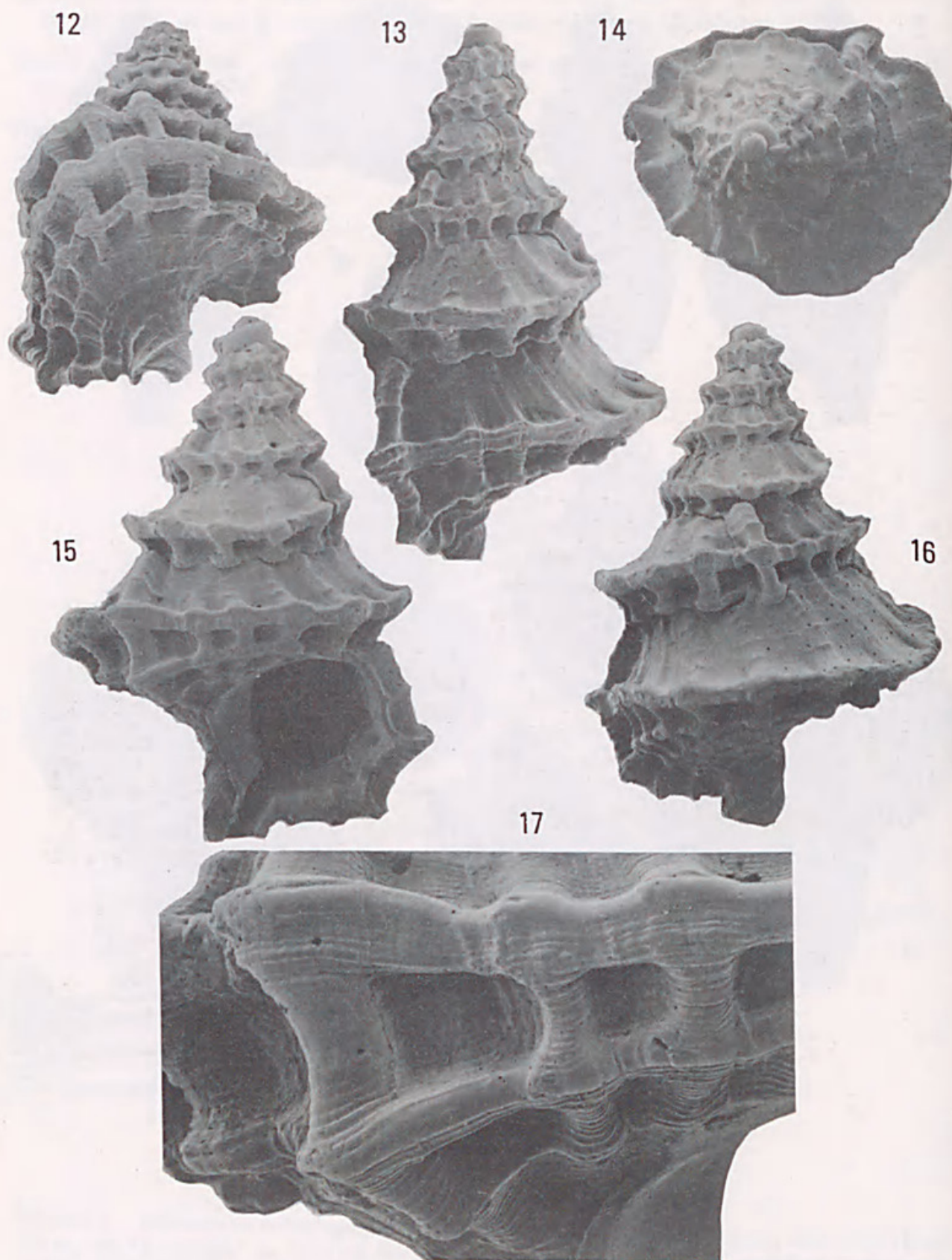


FIGURE 12-17. *Sassia (Cymatiella) ansonae* n. sp., holotype, Ellensbrook Beach, southern Western Australia, Mrs W. Anson; WAM 285-87, Western Australian Museum. Fig. 12 — oblique dorso-basal view, x 5.0. Fig. 13, 15, 16 — x approx. 5.5. Fig. 14 — apical view, x 4.9. Fig. 17 — enlargement of sculpture above and to left of aperture in Fig. 15, x 20.

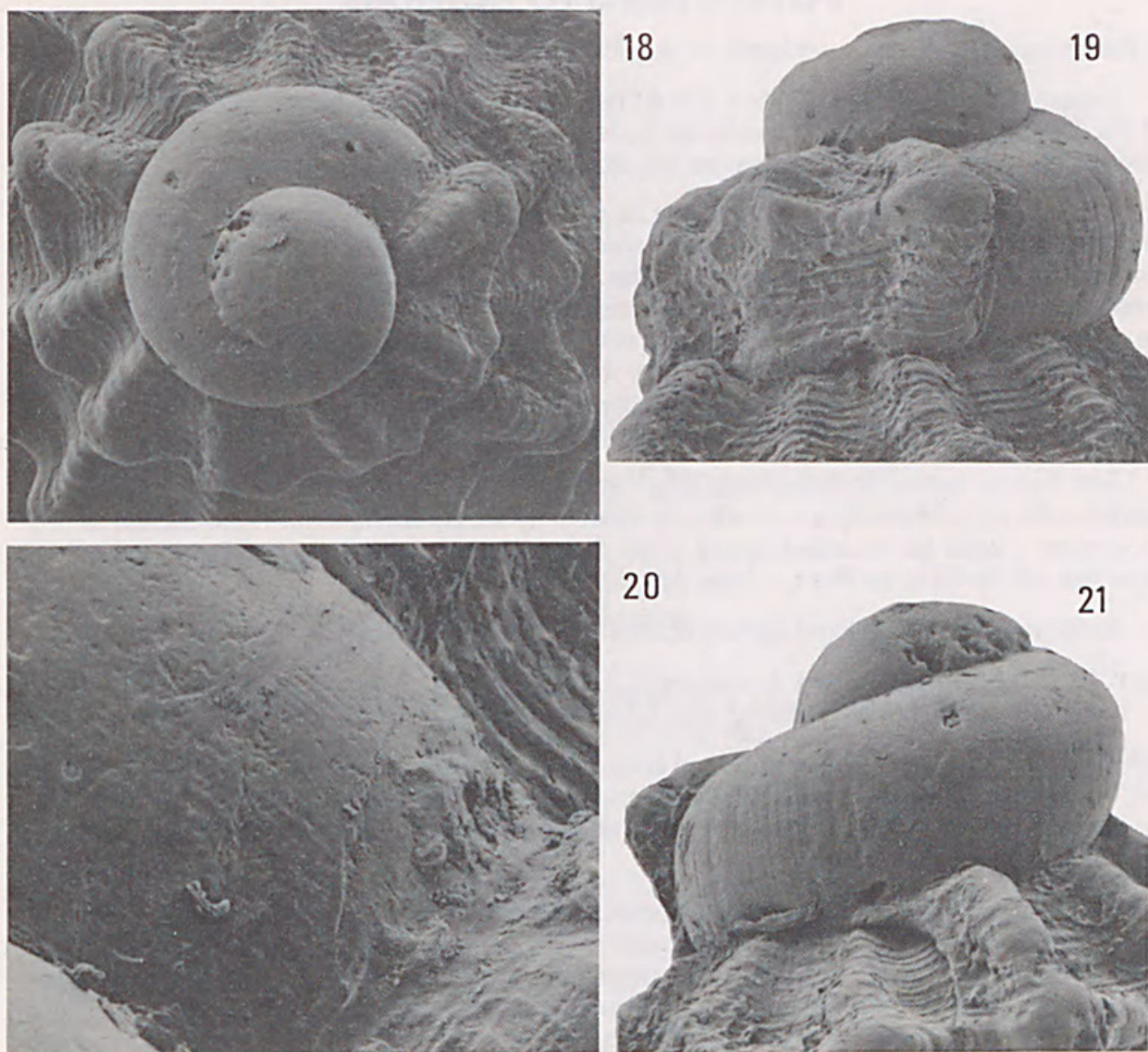


FIGURE 18-21. *Sassia (Cymatiella) ansonae* n. sp., holotype, protoconch. Fig. 18 — apical view, x 28; Fig. 19, 21, lateral views, x 37; Fig. 20 — enlargement of protoconch termination in Fig. 19, showing fine spiral sculpture, x 144.



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