

A new subspecies of *Asperitas bimaensis* (Mousson, 1849) from western Sumbawa, West Nusa Tenggara, Indonesia

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ABSTRACT This paper describes a new subspecies of *Asperitas bimaensis* (Mousson, 1849) from Alas District, western Sumbawa in West Nusa Tenggara, Indonesia. Shell coloration, pattern, sculpture, shape and periostracum separate it from the other subspecies of *A. bimaensis*, and a similar looking relative from western Sumbawa.

KEY WORDS Dyakiidae, *Asperitas bimaensis abbasianus*, Alas District, Sumbawa, Indonesia

INTRODUCTION

During a 2006 trip to western Sumbawa, John Abbas and locals collected colourful specimens of *Asperitas* Gude, 1911 on various crop trees and plants on the lower volcanic slopes of the north western-part of Olet Sangenges, Alas District. On several later trips, John Abbas and locals found them at several neighbouring sites, c. 3 km east of Alas. Initially identified as *Asperitas* (*cf.*) *trochus* (Müller, 1774), and later circulated by others as *Asperitas trochus polymorpha* (E.A. Smith, 1897) and *Asperitas trochus tjendanae* Rensch, 1932. After a review of type specimens of *Asperitas* known to occur on Sumbawa, I consider these snails as relatives of *Asperitas bimaensis* (Mousson, 1849), and described herein as a new subspecies.

Materials and Methods

Eight shells make up the type series, the holotype and seven paratypes (1 NHMUK, 2 MNHN and 4 JP or JA), plus four additional specimens (JP). Photography credits are as indicated below each image. The species description was determined from the shell

morphology of dry empty shells obtained by John Abbas. Comparative material comprised of shells from the author's private collection and images found on the Internet. Relative shell sizes (width) for the genus *Asperitas* mentioned are as follows: small < 25 mm, medium 25-40 mm and large > 40 mm.

Shells were measured using digital Vernier callipers (0.01 mm resolution). Shell sculpture was examined under low magnification (10x) using a jeweler's loupe. Whorl count includes the apex and counted precise to 0.125 ($\frac{1}{8}$) whorl. Shell weight was measured in grams (g) using a pocket-sized electronic scale (capacity 300 g x 0.01 g). 'Paries' (adj. parietal) refers to the 'inner apertural wall' and 'palatum' (adj. palatal) refers to the 'outer apertural wall'.

Taxonomic remarks

The full genus status and family group placement of *Asperitas* follows that of Rensch (1931 & 1932) and Hausdorf (1995), and the accepted species follows that of Dharma (2005 & 2012).

Abbreviations used for museums and private collections:

MNHN:	Muséum national d'Histoire naturelle, Paris, France
NHMUK:	Natural History Museum, London, England, United Kingdom
ZMB:	specimen label code at Museum für Naturkunde, Berlin, Germany; previously known as Zoologisches Museum Berlin
JA:	John Abbas collection
JP:	Jeff Parsons collection

Abbreviations for shell morphometry, shell coiling and other:

D:	shell width (abbreviation for 'diameter' as per literature usage)
H:	shell height
H/D:	shell height/shell width ratio
N:	whorl count
W:	shell weight
JP	data, observations, comments or other by Jeff Parsons

SYSTEMATICS

Family: Dyakiidae Gude and Woodward, 1921

Genus: *Asperitas* Gude, 1911

Types: *Xestina rugosissima* Möllendorff, 1903

Asperitas bimaensis abbasianus Parsons,
new subspecies (Figure 1 and Plate 1)

Description. (Holotype) High-spired globose shell of medium-size, fairly solid and translucent. Apex obtuse, very slightly exserted and suture impressed. Surface shiny; first half whorl subplicatulate, rest of protoconch smooth with an infrasutural row of very short threadlets; teleoconch with faint spiral microstriations overlain by crowded microthreads and intermixed with close-set pliculae on the last whorl, weaker on base and distant behind lip. Whorls $5\frac{3}{4}$, not descending in front, top and base convex; ultimate's periphery rounded, faintly angular near lip terminus. Shell albus with four hazel bands on the last whorl: infrasutural, superior, peripheral and inferior, first and third slightly darker. Bands emerge faintly on antepenult and intensify toward lip; width ratio c. 1:4:4:8. Periostracum dichroic: viridian green on lower spire, worn away

apically and faint buff on last whorl. Aperture roundly lunate, oblique. A colourless film coats viridian green periostracum on the paries. Glaze on palatum slightly thicker, faintly whitened and translucent, showing external pattern. Outer lip simple, thickened and sub-labiate basally; albus, edged with pale buff. Columella albus, cuneate, thick and slightly abaxial. Columellar margin briefly dilated and reflexed at its insertion, almost occluding a very narrow umbilicus.

Type Material. Eight shells from the type locality. Holotype (NHMUK 20160362/1, Figure 1) H 28.60 mm, D 30.77 mm, H/D 0.93, N 5.75 & W 2.19 g. Paratypes 1-7, 3 adults + 2 sub-adults (paratypes 3 & 4) [1 NHMUK 20160362/2; 2 MNHN IM-2012-2799a; 3 MNHN IM-2012-2799a; 4-7 JA] (paratype 7 Plate 1, Figure 3 and paratype 4 Plate 1, Figure 4). H 22.60-34.70 (av. 28.42) mm, D 25.55-37.59 (av. 30.41) mm, H/D 0.88-1.03 (av. 0.93), N 5.0-6.0 (av. 5.61) & W 0.65-2.85 (av. 1.65) g.

Other Material Examined. Four shells from type locality, three adults (Plate 1, Figure 5) + one sub-adult (JP) and digital images of shells from the first colony discovered (Plate 1,

Figures 6-13). H 22.38-31.84 (av. 27.88) mm, D 26.37-31.71 (av. 29.32) mm, H/D 0.85-1.00 (av. 0.95), N 5.125-6.0 (av. 5.50) & W 0.61-2.10 (av. 1.54) g (4 shells, JP).

Type Locality. Lower volcanic peaks (below 600 m asl.) on the north western-part of Olet Sangenges c. 3 km east of Alas, Alas District, NW Sumbawa in West Nusa Tenggara, Indonesia; c. 8°30'S 117°E.

Distribution. NW part of Olet Sangenges, NW Sumbawa.

Ecology/Habitat. Collected by John Abbas and locals on the leaves and stems of various short herbaceous or woody plants in cultivated areas and nearby Monsoon forest. Locally common and considered pests by locals.

External Features of Animal. Not known.

Soft parts. Not available for study.

Etymology. Named in honour of John Abbas and his family for supplying the type material.



Figure 1. Holotype of *Asperitas bimaensis abbasianus* n. ssp. NHMUK 20160362/1 [photos: JP]

Shell Variation.

Simply described as a polychromatic subspecies. Mature shells have thickened lips, sublunate or not, and may have a pale buff edge to only the lip, or that extends onto the columella and parietal callus margin. Variation in band width is minor. The basal band may be a little wider and almost reaches the umbilicus. The infrasutural (ISB) and peripheral bands (PB) are sometimes composed of two narrower bands, the primary band brown and the other forming a grey border. Sometimes the superior (SB) band is wider than the peripheral (PB) band. Light shells strongly translucent, almost transparent and other shells moderately translucent. Exterior colour of the last whorl shows through to the interior (Plate 1, Figures 6-8). A white sutural

thread is very rarely present, typically on the last whorl (Plate 1, Figures 6, 9 & 10). Sculpture as per holotype or finer, no pliculae on last whorl.

Shells from the type locality rarely show a change in ground colour, such as pink spire whorls changing to white on last whorl. The periostracum is dichroic, being green (viridian, dark sulphate or bright guinea) on spire whorls changing generally to faint buff, rarely antimony yellow on the last whorl (Plate 1, Figures 1, 4 & 5), or sometimes to pale pinkish buff on penult or last whorl. Ground colour change commonly occurs in shells from the first colony discovered (Plate 1, Figures 6-13, except 11). Although all images studied show bleached specimens, one shell I own has a green stained

paries. This suggests they too have green periostracum on the spire, but it does not stain the shell surface as it does in shells from the type locality.

Band colour is variable with the ISB & PB slightly darker than the other bands, of a different tone or hue. The type locality shells are often white and tend to have orange - or reddish-brown ISB & PB with the other two bands paler (Plate 1, Figure 2) or flesh-pink, or all four bands same-coloured (Plate 1, Figure 3), or rarely pattern less (Plate 1, Figure 5). The ISB & PB bands on the other shells are orange-, reddish- or blackish-brown or black, and the other two bands of the same tone (Plate 1, Figure 11), paler (Plate 1, Figures 8 & 12) or dark vinaceous (Plate 1, Figure 13). Their shells commonly have white or pink spire whorls staying the same or changing on last or last half whorl, and commonly lack bands (Plate 1, Figures 6, 7, 9 & 10). A white spire changes to carnelian red, purplish vinaceous or blackish. A pink (old rose, eosine or jasper) spire changes to white, pompeian red or blackish. Rarely the shell is coral red with or without white early whorls.

DISCUSSION

All the species discussed here tend to have similar sized shells. *A. bimaensis bimaensis* (Mousson, 1849) (Plate 2, Figure 14) differs in having an obtusely conoid shell with a somewhat flat base and rounded-trapezoid aperture. Either plain white or with faint grey spiral bands (SB and PB) with pale buff periostracum. Sculpture slightly coarser, especially at the suture of the last whorl.

The new subspecies is most similar to *A. bimaensis halata* (Mousson, 1849) (Plate 2, Figures 15-17), which differs in often having a flatter shell with a more open, slightly wider

umbilicus and transverse sculpture not weakened on base. Shell white with a green or bluish-green periostracum throughout or changing to light buff on the last whorl, or light buff throughout. It may have a similar four-banded pattern, except all the bands are pinkish brown, or the ISB and PB are brown and the other two pinkish brown. Differs in having two other banding patterns, two-banded (ISB and PB) or three-banded (ISB, SB and PB), or lacks bands. Also the ISB is more variable, brown or green and distinct or faint on dark-banded shells; and faint or absent (*e.g.* 2-banded syntype) on pale-banded shells *vs.* present and green or absent on patternless shells

A. bimaensis subpolita (E.A. Smith, 1897) (Plate 2, Figure 18) has a different shaped shell, turbinate or conoid-globose, sub-polished with a depressed-convex last whorl. Spiral sculpture on spire coarser and suture white or luteous margined. Spire purplish, last whorl pale chestnut and interior white or livid-fuscous toward lip. Periostracum differs by showing two or three colour changes: whole spire viridescent or green on penult green-cerulean and green above, changing to pale buff on the last whorl. Similar in mature shells having a limbate aperture, except the external and internal margins of aperture, and columella are fuscous-tinted.

A. bimaensis cochlostyloides (Schepman, 1892) (Plate 2, Figure 19) differs by having a dull, globosely conical and often heavy shell with flatter whorls, the last descending a little in front. Aperture rounded-rhomboid and suture deep on lower whorls, white margined. Differs from all other subspecies in the “biangular character” of the last whorl, a rounded angle near the suture and one towards the base. Similar in typically having a dichroic periostracum, changing colour on the last whorl (*e.g.* green to straw), but it is hydrophanous,

commonly deciduous and sometimes of one colour (green or blue green). It has different ground colour changes on last whorl (see Schepman, 1892 for details), orange, yellow or green vs. white on upper whorls. Palatum bright orange, citron yellow or white and not always the same as the exterior.

A. bimaensis soembaensis (Schepman, 1892) (Plate 2, Figure 20) differs in having a more depressed shell, typically purplish or brown, but also white, pinkish-white or yellow. Periostracum is deciduous, yellowish or olive and almost complete or patchy on the last whorl. Suture margined with opaque white and periphery of last whorl is subangular, often marked by a very narrow white band. Both white bands are usually faint and only visible if wetted. No other bands present and interior shows external colour, or is livid in dark shells.

A. bimaensis liei Thach, 2018 (Plate 2, Figure 21) differs in having a larger, thicker brown depressed globose shell with a stepped spire, inflated last whorl and wider, more open umbilicus. It has a similar staining on the external margin of its lip, and possibly the columella and parietal margin, except it tends to thicken the latter margins in a gerontic fashion. Periostracum is green on early whorls changing to olive-green.

A. everetti notabilis (Rensch, 1930) (Plate 2, Figures 22–25) differs in having a deciduous periostracum, which is green on spire whorls of adult shells and yellow-brown on the last whorl. Sculpture consists of coarser close-set pliculae crossed by spiral striae, coarser on the last whorl creating a subgranulose appearance, and transverse sculpture not weakened on base. Three patternless shells: holotype is pink changing to white behind lip, small shell is flesh-coloured and large shell is pink changing to white on last whorl. A third paratype is a

three-banded shell with a ratio of c. 2:2:9 mm; shell is pale pink with purplish bands. All four lack an infrasutural band.

Final Comments and Conclusions.

Current data suggests the three subspecies of *Asperitas bimaensis* occur separately on Sumbawa. The new subspecies occurs in the western part of Sumbawa, *Asperitas bimaensis halata* in central Dompu Regency, and the nominate subspecies near Kota Bima in Bima Regency, with no overlap in their territories.

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Plate 1: *Asperitas bimaensis abbasianus* n. ssp., with figure numbers listed below.

First row, Figure 2. paratype 1 NHMUK 20160362/2, **Figure 3.** paratype 4 (JA), **Figure 4.** paratype 7 (JA), **Figure 5.** non-type shell (JP) [Figures 2-3 bleached, Figure 4 sub-adult].

Second & third rows, Figures 6-13 non-type shells from the first colony discovered [all bleached].

[Photographic credits: Figures. 2-5 JP; Figures 6-8 Gallego, 2019; Figure 9 John Abbas; Figures 10-13 J & M Coltro, 2017]



Plate 2: Relatives of *Asperitas bimaensis abbasianus* n. ssp., with figure numbers listed below.

First row, Figure 14. *A. bimaensis bimaensis* Bima, E Sumbawa ZMB.Mol.47475; **Figures 15-17.** *A. bim. halata* Dompu, Cen. Sumbawa ZMB.Mol.75127.

Second row, Figure 18. *A. bim. subpolita* south Flores ZMB.Mol.49814; **Figure 19.** *A. bim. cochlostyloides* E Sumba (JP); **Figure 20.** *A. bim. soembaensis* Kehutanan, W Sumba (JP); **Figure 21.** *A. bim. liei* Cen. Sumba (JP).

Third row, *A. everetti notabilis* Batu Dulang, W Sumbawa (800-1200 m asl.), **Figure 22.** holotype ZMB.Mol.75124, **Figures 23-25.** paratypes ZMB.Mol.75125a.

[Photographic credits: Figures 14-18 Museum für Naturkunde, 2019a-c; Figures 19-21 JP; Figures 22-25 Museum für Naturkunde, 2019d].