

An unrecognized species of the genus *Amoria* Gray, 1855 (Gastropoda: Volutidae) from East Australia

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ABSTRACT. *Amoria lineola* sp. nov. is described. It is separated from the allopatric *Amoria guttata* McMichael, 1964 with which it has been confused for a long time.

INTRODUCTION

As trawling technology improved during the 1960s, so trawling operations expanded, first in the waters off southeast Queensland in the vicinity of Cape Moreton. Then the operations moved further north to the central Queensland coast, at first working the shallower waters offshore until the 1970s, when the trawlers ventured into deeper waters outside the Great Barrier Reef. It was in these untouched waters that an untold wealth of new mollusk species were discovered, covering a broad spectrum of shell life.

Many new and exciting species were discovered and described from the 1970s to the 1990s, and still today there are new species and subspecies being found which keep researchers wondering what else lies within the deeper waters off the Great Barrier Reef.

McMichael (1964) described the newly discovered *Amoria guttata*, based upon some rare specimens dredged by Tom Nielsen in the waters south of Cairns. Comparing the previous material with two related shells brought up earlier from Keppel Bay, McMichael noted: "It may prove that these two shells are members of a species distinct from *A. guttata*, or they may represent a geographic subspecies. A decision must await the acquisition of a range of specimens."

The relative abundance of material now available leads us to separate at specific rank the southern population living outside the Reef, which is constantly different from the true *A. guttata* McMichael, 1964, from the shallower water population living inside the northern G.B.R., confirming McMichael's intuition.

Abbreviations:

A.: *Amoria*.

AMS: The Australian Museum, Sydney, Australia.

G.B.R.: Great Barrier Reef.

E, N, S: east, north, south.

Qld: Queensland.

SYSTEMATICS

Family **VOLUTIDAE** Rafinesque, 1815

Subfamily **AMORIINAE** Gray, 1857

Tribe **Amoriini** Gray, 1857

Genus ***Amoria*** Gray, 1855

Subgenus ***Amoria*** s. s.

Amoria (Amoria) lineola sp. nov.

Figs 1-5, 8-45, Map 1

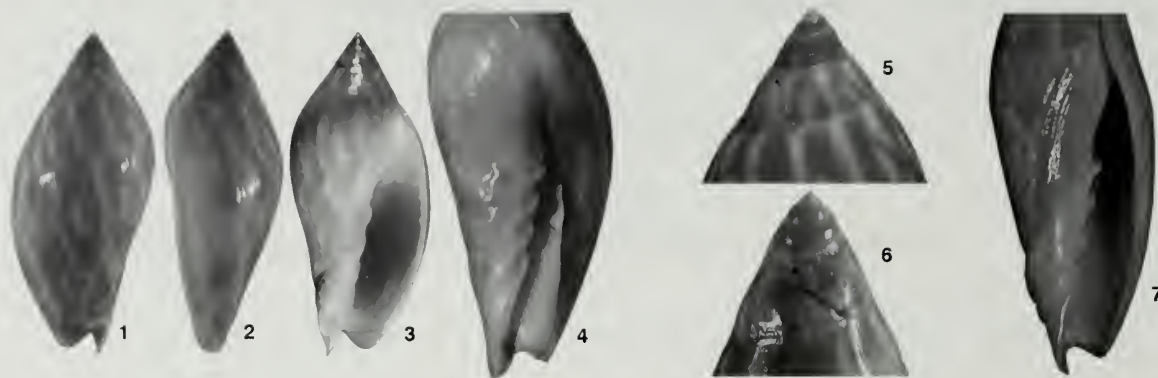
Type Material. Holotype: AMS n° 215890. Length: 44.0 mm; width: 18.4 mm (Figs 1-3).

Paratype 1: 48.5 mm, off Half Moon Reef, 140-150 m, Limpus collection (Figs 8-9). Paratype 2: 55.7 mm, off Sweet Lip Reef, 140-150 m, Limpus collection (Figs 10-11). Paratype 3: 59.0 mm, off North Reef, Capricorn Channel, 80-100 m, Bail collection (Figs 12-13). Paratype 4: 62.3 mm, Keppel Bay, 36 m, Limpus collection (Figs 14-15). Off Sweet Lip Reef, southeastern Swain Reefs at 140-150 m deep. Paratype 5: 48.5 mm, off Sweet Lip Reef, southern Swain Reefs at 140-150 m, Limpus collection (Figs 42-43).

Type locality. Trawled at 180 m off South-East Swain Reef.

Other material examined. 1) 52.6 mm, off Leopard Reef, subfossil specimen. 2-3) 51.2 mm, 49.2 mm off Pith Reef. 4) 43 mm, off Frog Reef, N.E. Swain Reefs, 170m. 5) 36.0 mm, off S.E. Swain Reefs, albino specimen. 6) 48.7 mm, off Hixson Cay, 190 m. 7-8-9) 61.0 mm, 57.5 mm and 48.3 mm, off E. Swain Reefs, 190m. 10-11) 50.4 mm and 46.6 mm, Keppel Bay. 12) 56.5 mm, off Lady Musgrave Island, 180 m. 13) 54.8 mm, off One Tree Reef, Capricorn Channel. 14-15-16) 57.5 mm, 43.6 mm (albino specimen) and 42.0 mm, off North Reef, 225 m. 17) 49.1 mm, off North-West Reef, 150m. All specimens in A. Limpus and P. Bail collections.

Habitat. Between 140 to 200 m on mud and shell grit.



Figures 1-7

Figs 1-3. *Amoria lineola* sp. nov., holotype, 44 mm, 180m off S.E Swain Reef; **4.** Columellar plaits of *A. lineola*; **5.** Spire of *A. lineola*; **6.** Spire of *A. guttata* McMichael, 1964; **7.** Columellar plaits of *A. guttata*.

Range. Along the Capricorn Channel from north of Lady Musgrave to North Reef. From there the range forks with one fork going up to Keppel Bay and the other going up along the east side of the Swain Reefs. Two isolated colonies are settled along the outer edge of the Great Barrier Reef, the one off Leopard Reef at 148° 35' East, 19°05' South, the other off Pith Reef at 147° East, 18°12' South where it possibly becomes parapatric with its related *A. guttata* MacMichael, 1964 (see Map 1).

Description. Shell medium sized (average length: 45-55 mm), solid, highly glossy, broad ovate with anterior part tapered. Protoconch cone-shaped of 3.5 smooth convex whorls, immersed in the first teleoconch whorl (fig. 5). Transition protoconch - teleoconch marked by faint axial ribs, sometimes persisting on the first post-nuclear whorl. Spire short, triangular with concave sides. Suture slightly impressed. Teleoconch of 2-2.5 adult whorls, the last one very expanded, bearing convex shoulder. Aperture white, semi-lunar, forming an average of 83% of the

total shell length. Outer lip thickened and simple. Columella straight with 4 solid, thin columellar plaits. A 5th additional adapical plait is frequently present or, if absent, replaced by slightly raised callus (fig. 4). Siphonal notch narrow and shallow. Fasciole strong, its upper edge reaching the first posterior plait. Parietal callus weak. Background light brown, overlaid by thick axial cream lines, regularly spaced under the suture, delimiting a subsutural band of rectangular blotches, then becoming elongate or broken into small dashes on the body whorl, shifted or interrupted on the shoulders and on the mid body whorl forming two visible spiral rows of coarsely quadrangular blotches. Aperture and columella light bluish when fresh.

Animal. Head and foot beige, finely mottled with reticulated red dots.

Discussion. *Amoria lineola* must be compared only with its close relative *A. guttata*, with which it has been confused. Typically, distinction is easy, and main character differences are summarized below:

Figures 8-53

Figs 8-45. *Amoria (Amoria) lineola* n.sp.

8-9. Half Moon Reef, Swain 150m, 48.5 mm. Paratype 1; **10-11.** Pale form Sweet Lip Reef Swain 145m, 55.7 mm. Paratype 2; **12-13.** North Reef 59.0 mm. Paratype 3. **14-15.** Keppel Bay 36m, 62.3 mm Paratype 4; **16-17.** Keppel Bay 46.6 mm; **18-19.** Capricorn Channel 80-100 m, 57.5 mm; **20-21.** Capricorn Channel 61.1 mm; **22-23.** Lady Musgrave 180m, 56.5 mm; **24-25.** Pale form North Reef 225m, 42.0 mm; **26-27.** North Reef 49.2 mm; **28-29.** albino North Reef 210m, 43.6 mm; **30-31.** One Tree Reef Capricorn Channel 54.8 mm; **32-33.** Pith Reef 49.2 mm; **34-35.** Pith Reef 51.9 mm; **36-37.** Leopard Reef N.Qld. 52.6 mm; **38-39.** Frog Reef N.E Swain 170 m, 43.0 mm; **40-41.** Swain Reef 51.0 mm; **42-43.** Sweet Lip Reef, Swain 150 m, 48.5 mm; **44-45.** Hixson Cay 190 m, 48.7 mm.

Figs 46-55. *Amoria (Amoria) guttata*.

46-47. Townsville 40m, 60.4 mm; **48-49.** Townsville 60.4 mm; **50-51.** Townsville 54.0 mm. Abnormal pattern; **52-53.** Lodestone Reef N. Qld. 70m, 59.7 mm; **54-55.** Rib Reef N. Qld. 47.7 mm. Rare squat form.



	<i>A. lineola</i>	<i>A. guttata</i>
Shape	ovate, posterior part expanded	fusiform
Protoconch	cone-shaped, immersed in the first teleoconch whorl	slightly broader and more raised
Spire	short, triangular, mostly with concave sides	more elongate, mostly with convex sides
Last whorl	swollen	rather cylindrical
Columellar plaits	4, often with an abapical 5 th or a raised callus	strictly 4
Fasciole	colored with an acute ventral ridge.	whitish with a more flattened ventral surface
Parietal callus	light	thick, the outer edge marked by a well-defined groove
Pattern	dominance of elongate dashes mingle with rare spots	dominance of small dots with small dashes mainly on the spiral bands

Occasionally, distinction is more difficult:

Some specimens of *A. lineola* bear many spots which could appear dominant but they are always broader and coarser than the ones of *A. guttata*, and the presence of other specific characters confirms the identification (Figs 32-35). The shape of *A. guttata* is not well fixed, especially in the northern portion of its range. Some shells have a very expanded last whorl, and somewhat resemble *A. lineola*. The distinction may be subtle and needs the presence of the other discriminating characters (Figs 54-55).



Map 1. Distribution of *Amoria lineola* n.sp. and *A. guttata* McMichaël, 1964

Remarks. This species is rather stable, showing few variations in shape. Some specimens from Keppel Bay and from the remote Pith Reef tend to bear a pattern richer in spots than the Capricorn Channel population, in which live-taken golden-colored specimens are brought up, having a so-called subfossil appearance. Its range seems parapatric with *A. guttata* southward of Pith Reef, where a possible genetic flow might occur through the Palm Passage. The *A. guttata* from the neighboring Rib Reef show a trend to a broad swollen last whorl similar to *A. lineola*.

The highly discontinuous distribution in three widely separated locations on the outer slope of the G.B.R. can be considered more due to the lack of exploration than the remnants of the regression of a previously prosperous species. Indeed the area of the Coral Sea adjacent to the G.B.R. remains insufficiently explored and probably conceals some still unknown populations that would fill the gap.

Etymology. From the Latin word *lineola*: dash.

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