IDENTIFICATION GUIDE FOR THE

Ammonite Pinwheel Snail

Ammoniropa vigens

NRM SOUTH

Acknowledgements

This guide was a collaboration between NRM South, Dr Kevin Bonham and Dr Isabel Hyman (The Australian Museum). Species descriptions by Dr Kevin Bonham

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This guide is Appendix 1 to NRM South's 'Management Guidelines for the Ammonite Pinwheel Snail (*Ammoniropa vigens*)'

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Contents

A guide for identifying the **Critically Endangered Ammonite Pinwheel Snail, *Ammoniropa vigens.***

- ***Ammoniropa vigens*** is just one of a range of micro-snails present in the greater Hobart region
- Some long-described species from the families Charopidae, Punctidae, Cystopeltidae and Rhytidae are easily distinguishable from ammonite snails
- Species of the genus ***Bonhamaropa*** are less well-known but share some common features with ***A. vigens.***
- This guide identifies the features of habitat, shell anatomy and sculpture that distinguish these other groups from the Ammonite Pinwheel Snail, ***A. vigens.***

The Snail Shell

Snails and their shells are described by their colour, shape of the parts of the shell, and the sculpture.

Glossary of terms

Whorls are the spiral structures of the shell. A full whorl is 360 degrees.

The **spire** is formed by the inner whorls of the shell except the body whorl (the last whorl).

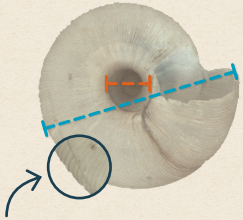
The **umbilicus** is the hollow central part of the shell seen on the ventral side.

The **protoconch** is the embryonic part of the shell, the inner whorls that form before hatching.

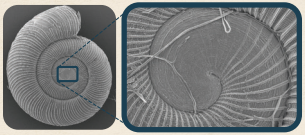
The **teleoconch** is the rest of the shell that grows after hatching.

Glossary of terms - pictorials

The **shell width (blue)** to **umbilicus width (orange)** ratio can be a feature that helps distinguish snail species.



Radial riblets are ridges in the shell of some micro-snails and visible with a field microscope

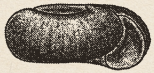


Under the high magnification of a scanning electron microscope fine sculpture such as **spiral lirae** perpendicular to the radial riblets are visible.

Shell Features

Shell Shape

CONICAL



DISCOIDAL

EAR-SHAPED

TROCHOIDAL

TURBINATE

GLOBOSE

PUPIFORM

PLATE-LIKE

Whorl Profile

ROUNDED ABOVE AND BELOW

FLATTENED ABOVE AND BELOW

SHOULDERED

SULCATE

Spire

SUNKEN

FLAT

LOW

HIGH

Aperture

CIRCULAR

OVATE

LUNATE

TEAR-SHAPED

Umbilicus

CLOSED

NARROW

MODERATE

WIDE

Based on figures in Hyman & Köhler (2020), *A Field Guide to the Land Snails of Lord Howe Island*, Australian Museum Scientific Publishing.

Ammonite Pinwheel Snail
Ammoniropa vigens

Species Description: Dr Kevin Bonham

SHELL

Size
H = 0.9 – 1.2mm
D = 2.5 – 3.5mm

Whorls
3.5 – 4.3

Colour
Uniform off-white to yellow-grey or brownish yellow in colour, in rare cases orange.

Shape
Discoidal with a flattened spire and rounded whorls.

Sculpture
Protoconch has ~ 25-40 radial ribs on the last half whorl, and sometimes, irregular spiral lirae. Teleoconch also with radial ribs of variable strength and density, but typically 80 – 130 on the final whorl. Under magnification the protoconch and teleoconch are distinguished by a visible break in the sculpture.

Aperture
Ovately lunate.

Umbilicus
Widely open and slightly wider than one third of the shell diameter.

Ammoniropa vigens
Credit: Bruno Bell

COMMENTS

Ammoniropa will have a shell width to umbilicus width ratio (see pictorials) between 2.5 and 3. Juvenile shells are smaller, with fewer whorls but with the same protoconch sculpture as adults.

The radial riblet sculpture of the *Ammoniropa* protoconch is more widely spaced than similar species from the genus *Bonhamaropa*, in which the riblets become denser towards the end of the protoconch with typically 50 ribs on the last half whorl.

ANIMAL

Pale (white) body, with no visible pigment on the end of the eyestalks.

HABITAT

Found in the hollows and cracks in soil under medium to large dolerite rocks, usually in damp to wet forested gullies, but only very rarely in drier sites.

Bonhamaropa sp "Romilly"
Credit: Bruno Bell

OTHER MICRO-SNAILS

Family Charopidae

The Ammonite Pinwheel Snail, ***Ammoniropa vigens,*** belongs to the family Charopidae. Small charopids generally have regular radial ribbing. They also have fine sculpture in the spaces between the primary ribs (called the interstices) or running across the primary ribs.

In some species, the sculpture of the protoconch differs markedly to that of the teleoconch. The protoconch sculpture can consist of spiral ridges, radial ridges or a mix of both, which differ between genera.

Genus: Bonhamaropa

Bonhamaropa is a diverse genus endemic to Tasmania and Victoria, with two described and 40 undescribed species in Tasmania.

Bonhamaropa usually live in surface leaf litter and bark below eucalypts and under loose rocks and logs. However, some species are found in the same cryptic embedded rock habitats as ***A. vigens***. ***Bonhamaropa*** usually have black pigmented dots at the end of the eyestalks, but some do not, especially the white-bodied species that share the ***A. vigens*** microhabitat.

Bonhamaropa are typically smaller than the adult ***A. vigens,*** at less than 2.5mm, and are less flat with a narrower umbilicus.

The protoconch ribbing is the most reliable feature to distinguish ***Bonhamaropa*** spp. from ***Ammoniropa.***

Spacing of the ribbing on the ***Bonhamaropa*** protoconch is irregular, becoming denser towards the protoconch–teleoconch boundary, with typically 50 ribs in the last half whorl compared to 25–40 ribs in ***Ammoniropa.***

At very high magnification, the protoconch sculpture of the two genera differ also in the regularity of the spiral lines but this is not visible with a field microscope.

***"Bonhamaropa" sp* "Romilly"**

The known range of *B.* sp "Romilly" extends from Knocklofty to Tinderbox. It can be locally abundant, occupying a high percentage of rocks in a small area and with multiple individuals detected under a single rock.

It is the other charopid most frequently encountered when searching for *A. vigens.* It can be very common at sites where *A. vigens* is present, co-occurring even under the same rock, however, it is also absent from several known *A. vigens* sites.

B. sp "Romilly" is a pale bodied (white) animal with depigmented eyestalks. It has a flattened discoidal shell with 3.8 – 4.2 rounded whorls. However, with an adult shell diameter of 1.6 – 2.1mm, it is smaller than the adult *A. vigens.*

The genus name *Bonhamaropa* has been used for this species based on its shell features, but genetic evidence at the time of writing this guide suggests it may belong in a different genus.

***Bonhamaropa sp* "Poimena"**

Bonhamaropa sp "Poimena" was common at Poimena Reserve, Austins Ferry but now appear locally extinct there. It remains common around Mt Direction, the drier eastern shore habitat of *A. vigens.* Its appearance is similar to *B.* sp "Christ College" but with wider spaced ribbing and a deeper, narrower umbilicus. The spire is also more dome-shaped and less flat, which is a point of difference with *A. vigens.*

***Bonhamaropa sp* "Christ College"**

Bonhamaropa sp "Christ College" is an uncommon species found mainly on the Hobart western shore but with a few sites on the eastern shore. The species is present in both dry and wet forest but generally in somewhat drier areas than *A. vigens.* The adult shell is flat with closely packed ribbing, but is smaller than *A. vigens,* at just 1.7 – 2.2mm diameter at 4.4 – 4.5 whorls. The umbilicus is fairly wide but slightly less than one third of the shell diameter. The shell is pale yellow, tan or pale brown often with a darker brown lining on the ribs.

Bonhamaropa sp "Wellington"

Bonhamaropa sp "Wellington" is common in wet forests from the Wellington Range, the D'Entrecasteaux Channel mainland and parts of the southern forests. It is present in some lowland foothills where ***A. vigens*** also occurs, particularly in Truganini CA and around the Lambert Rivulet area. It is readily distinguished from ***A. vigens,*** as adult shells are only 2 – 2.5mm wide at 4 – 4.5 whorls, the ribbing bolder and more widely spaced and the umbilicus narrow.

Bonhamaropa sp "Barossa"

Endemic to south-eastern Tasmania, ***B.*** sp "Barossa" is mostly found in dry forests. It is larger than other ***Bonhamaropa*** species at 2.2 – 2.6mm at 4.5 whorls. It will rarely co-occur with ***A. vigens*** but is readily distinguished by its brownish shell with strong widely spaced ribbing.

Bonhamaropa sp "Port Huon"

This species is endemic to south-eastern Tasmania in wet forests. Though mostly found south of the range of ***A. vigens*** and at higher altitudes on Kunanyi/Mt Wellington, it does co-occur in the Ridgeway area. It is smaller than ***A. vigens***, at 1.7 – 1.8mm at 4.0 whorls and has a smaller umbilicus. The radial ribs are fine and tightly packed sometimes with a trace of dark brown.

Bonhamaropa sp "Glenorchy"

This species is known reliably only from the Glenorchy, Collinsvale and Mt Faulkner areas but may be more widespread and could co-occur with ***A. vigens.*** It has very closely packed radial ribs and a noticeably flat, even slightly biconcave spire. The ***B.*** sp "Glenorchy" shell has more height relative to width than ***A. vigens*** giving it a distinctive chubby appearance, comparatively.

Other small Charopids

Tasmanaropa tasmaniae

Tasmanaropa tasmaniae is common across south-eastern and central Tasmania, occurring under rocks, logs, bark and in leaf litter.

It is a large species at 4mm wide, with very widely spaced bold ribbing, and a colour pattern of red and white rays. Its umbilicus is similarly wide to ***A. vigens*** but deeper. On this species, the striking radial ribs only appear on the last half whorl of the protoconch.

Tasmathera legrandi

Tasmathera legrandi is common across eastern Tasmania, extending to the Derwent's western shore in the Hobart foothills but is not present in wet forests higher up Kunanyi/Mt Wellington. It is common under logs and bark but is sometimes found under rocks or litter.

The adult shell is larger than ***A. vigens*** at 4-5mm wide, with a much chunkier shape and narrower umbilicus. This species has striking shell sculpture, with very fine radial riblet throughout and a regular netted pattern of radial and spiral ribs on the protoconch.

Paralaoma mucoides
Credit: Bruno Bell

OTHER MICRO-SNAILS

Family Punctidae

Punctids are tiny snails closely related to charopids, with most Tasmanian species less than 2mm wide. The shell sculpture is more irregular, it is often difficult to clearly distinguish the primary ribs, and some have smooth glossy shells.

Punctids are generally found in leaf litter, bark and moss but are also found under rocks and logs while looking for ***Ammoniropa***. Tasmania has about 35 species of punctid with several yet to be formally described. In the wet forests around Hobart, up to eight species may be found together in leaf litter. Only a couple of the punctids are large enough to be potentially mistaken for ***A. vigens.***

Paralaoma hobarti

Paralaoma hobarti is a Tasmanian endemic common across eastern and northern Tasmania. The adult shell is around 2mm wide. The teleoconch sculpture features rough-looking riblets of variable height that are less regular looking than those on ***A. vigens*** and the ***Bonhamaropa*** species. The protoconch has spiral lines that may not be visible due to wear and tear, but there are never radial riblets like those on ***A. vigens.***

Paralaoma mucoides

Paralaoma mucoides is common across south-eastern Australia, including eastern and northern Tasmania. Though typically occuring in litter or associated with eucalypt bark, dead shells are found under rocks while looking for ***Ammoniropa.*** The shell is up to 2mm wide (rarely slightly larger) and is angled when viewed from side on; many specimens have an obvious keel on the body whorl. The sculpture is often of sharp radial ribs which can produce a saw-like appearance, but some specimens lack obvious strong ribbing.

Planilaoma luckmanii
Credit: Bruno Bell

OTHER MICRO-SNAILS

Family Cystopeltidae

The Cystopeltidae is an unusual family that includes some tiny snails and a genus of slugs called ***Cystopelta.*** The tiny snails were historically considered charopids and punctids but were placed in the Cystopeltidae following a DNA-based phylogenetic review. A few species are potentially present in habitats where ***A. vigens*** is found.

Planilaoma luckmanii

This species is found in wet forests and high-altitude woodlands mainly in eastern, northern and central Tasmania. It is uncommon at sites where ***A. vigens*** occurs but is present at some of the wetter forest sites. The adult shell is 2.5 – 3.5mm wide, usually with a colour pattern of white and pale brown rays, but some shells are purely white. The shell sculpture is very different to ***A. vigens.*** The teleoconch has very fine closely packed riblets that sweep back from the spire at an angle. The protoconch does not have strong radial sculpture and often appears smooth.

"Planilaoma" sitiens

This species is only known from south-eastern Tasmania, generally on the western shore of the River Derwent, where it is common to find on mossy rocks and the forest floor, especially following rain. The genus-level placement of this species is presently only tentative and may change. Its appearance and colour are similar to ***P. luckmanii,*** although it has a higher spire and rougher sculpture, including more prominent spiral ribbing on the protoconch.

Prolesophanta nelsonensis
Credit: Bruno Bell

OTHER MICRO-SNAILS

Family Rhytididae

The rhytidids are a group of carnivorous snails that prey on other land snails and other invertebrates. Some Tasmanian species are large (up to 3 cm wide) but the genus ***Prolesophanta*** includes several smaller species. Of the eight smaller species, ***P. nelsonensis*** is widespread in eastern Tasmania and the only one likely to be detected during searches for ***A. vigens.***

Prolesophanta nelsonensis

The ***P. nelsonensis*** shell is a similar size to ***A. vigens*** at 2.5 – 3.5mm, very rarely larger.

It has a flat shape similar to ***A. vigens*** but has a glossy, greenish yellow and often semi-translucent shell.

The shell lacks sculpture, being smooth or with only a few vaguely defined radial corrugations. The umbilicus is much narrower than ***A. vigens.***

Oxychilus cellarius
Credit: Bruno Bell

OTHER MICRO-SNAILS

Family Oxychilidae

Oxychilids (glass snails) are a mainly northern hemisphere family of which three species have become invasive in Tasmania.

Oxychilus spp

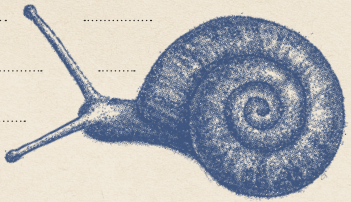
Three species of ***Oxychilus*** occur in the range of ***A. vigens.*** They have glossy, often semi-translucent, tightly coiled pale yellow-brown shells 7-14mm wide when adult, with a small to medium umbilicus and very little sculpture (sometimes some low rough indistinct ridges).

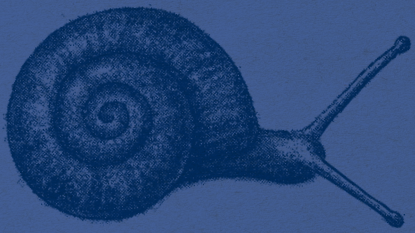
They are often difficult to tell apart in the field but ***O. draparnaudi*** is the largest and has a wide body whorl, ***O. cellarius*** is medium-sized with a tightly coiled spire, and ***O. alliarius*** is the smallest with a wider umbilicus (>1/6th of shell width) than the other two. Live specimens of ***O. alliarius*** have a garlic-like smell when disturbed.

These carnivorous snails are invasive in bushland throughout the range of ***A. vigens*** and are suspected of eating native charopids or their eggs.

Juvenile specimens may be a similar size and appearance to ***Prolesophanta nelsonensis*** but have a much less flat shell.

Notes





A field guide to the critically endangered Ammonite Pinwheel Snail, *Ammoniropa vigens*.

Found in the greater Hobart region, ***A. vigens*** is one of several micro-snail species in Tasmania's leaf litter and forest floors.

This guide highlights the key habitat, shell and sculpture traits that separate *A. vigens* from other micro-snails.

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