

SIGNIFICANT RANGE EXTENSION FOR THE FRESHWATER MUSSEL *HYRIDELLA (HYRIDELLA) NARRACANENSIS* IN TASMANIA.

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ABSTRACT

Specimens of the freshwater mussel, *Hyridella (Hyridella) narracanensis* (Cotton & Gabriel, 1932), were recently found in the Boobyalla River in North East Tasmania. This is a significant range extension as, until this discovery, the species was only known from the South Esk catchment in Tasmania. Some possible implications of this record are discussed.

INTRODUCTION

A prominent component of the invertebrate fauna of many of the major rivers in Australia are large, black or brown freshwater mussels belonging to the family Hyriidae. Eighteen species are recognised for Australia as a whole with two of these being known from Tasmania (Smith, 1992). Until now, both the Tasmanian species were thought to be confined to the South Esk catchment (Smith & Kershaw, 1979). The larger of the two species, *Velesunio moretonicus* (Sowerby, 1865), is known from many parts of the catchment and is endemic to Tasmania. It has a heavy, black shell and can reach over 120 mm in length. The smaller one is *Hyridella (Hyridella) narracanensis* (Cotton & Gabriel, 1932) which has a thin brown shell and reaches about 60 mm in length. *Hyridella narracanensis* was originally described from the Narracan River, South Gippsland, Victoria and was recognised as the species found in the northern part of the South Esk in the major revision of the family published by McMichael & Hiscock (1958).

Hyriids have a complex life-cycle (Walker, 1981). After fertilisation, the developing larvae are held in a modified gill pouch (or marsupium) of the female until they form into shelled larvae called glochidia.. These are liberated and become parasitic on the gills of freshwater fish (or more rarely tadpoles or invertebrates), where they can stay for several weeks. They then detach and fall to the bottom and develop into juvenile mussels. This parasitic stage appears to be necessary to further the development of the larva, which can be transported great distances by the fish in that time. A defini-

tive list of the possible host species for the two Tasmanian species of mussels is not available, but it is known that several species of galaxiids are used, together with other native fish species (Walker, 1981; Playford, 2004).

The adult mussels are filter-feeders, living in shallow, fairly swiftly flowing streams, usually in a sandy gravel substrate. They burrow using their strong muscular foot and then lie buried with only the posterior shell margins exposed, through which their short siphons extend into the stream flow. Water is drawn over the gills by ciliary action and food particles strained from the water. The species favours flowing water with little silt load.

Before the present study, Tasmanian records of *H. narracanensis* were from the Liffey River at Bishopsbourne, the South Esk River below Ben Lomond and the Cataract Gorge, Launceston (McMichael & Hiscock, 1958).

OBSERVATIONS

In May 2004, a dead valve of a small freshwater mussel was found by Sean Blake on the banks of the Boobyalla River, close to the junction with the Little Boobyalla River (Grid Ref. 572100 5468600). About a year later, on 17th May 2005, I went back to that site with Sean to look in the same area for further signs of the species. After a search of the area, a second single valve of the same species was found. Several stretches of the river were examined, but there was severe degradation of the riverine habitat with high silt loads in the water and disturbance of the banks and bed of the stream due to cattle trampling.

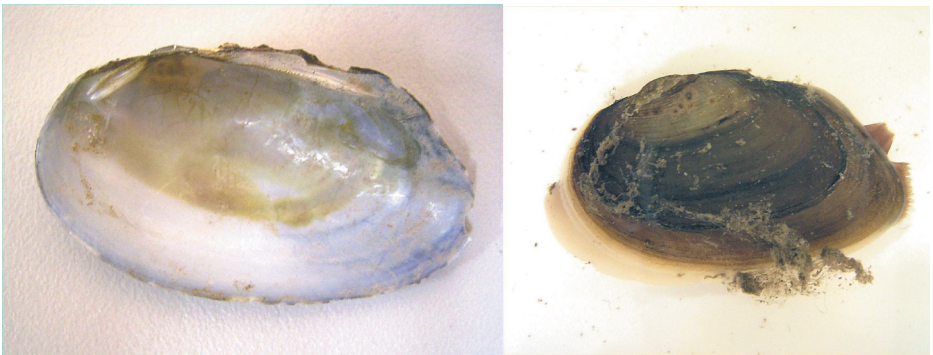


Figure 1. *Hyridella (Hyridella) narracanensis*. Left: Inside the valve of specimen no. QVM:9:22333, showing the arrangement of hinge teeth. Right: a live specimen (QVM:9:22335) showing the large muscular foot and the two mantle siphons protruding from the posterior end of the animal (on the right). Photos: Tammy Gordon.

A little further upstream a small section of the stream surrounded by dense scrub was found where cattle had been fenced out (Grid Ref. 571500 5468200). Here the water was clear and running over a bed of clean sandy gravel. The stream was flowing fairly rapidly and the water was only about 25 – 30 cm deep. Sieving through the surface of the gravel with a coarse net eventually yielded 2 live specimens of the small mussel. These were transferred to a container of clean water where they were observed to open the gap and extend their siphons. They also extended their white, muscular foot and attempted to move over the bottom of the container.

The 4 specimens (2 dead valves and 2 live collected animals) have been registered into the reference collections of the Queen Victoria Museum & Art Gallery. The measurements of these specimens are given in Table 1. The specimens (see Figure 1) were identified as *Hyridella narracanensis* as they were consistent with the description given in McMichael & Hiscock (1958) and with other Tasmanian and Victoria reference specimens held in the Museum's collections. The ratio of shell height (H) to length (L) for this species is 55 - 65%

Table 1. Measurement of the shells of the specimens found

Specimen	State	Height (H) mm	Length (L) mm	Ratio H/L %
QVM:9:22333	dead	29	50	58
QVM:9:22334	dead	28	52	54
QVM:9:22335	live	20	31	64
QVM:9:22336	live	24	40	60

DISCUSSION

Before this study the two species of hyriid mussels were only known in Tasmania from the South Esk catchment. This is still true of *Velesunio moretonicus*, but the finding of a population of *Hyridella narracanensis* living outside that catchment is significant and throws into doubt several of the assumptions about the species. The identification of populations of the same species of freshwater mussel on both sides of Bass Strait has always been a matter of some speculation. Have they been isolated since the last time a land bridge occurred between Tasmania and Victoria and if this is true are they tending towards becoming separate

species? Work on a sister species, *Hyridella glenelgensis*, with reference to this species, was recently reported on by Playford (2004). He compared the biology and conservation status of these two small mussels in southern Victoria and some of his conclusions may be applicable to *Hyridella narracanensis* in Tasmania.

Another question that arises is – have these mussels always lived in other coastal rivers outside the South Esk system, or is this somehow a new occurrence? These two questions could be related when one remembers that these mussels go through a parasitic stage on the gills of fish. Some of the fish species that are known to carry mussels also occur in coastal streams on both sides of Bass Strait and they are also known to have a marine stage as part of their life history. Could it be that some fish migrate from a freshwater environment in Victoria, cross Bass Strait, and enter the fresh water of a coastal river in northern Tasmania? If this were to happen, then it might be that some of these fish could be carrying the glochidia larvae of a freshwater mussel on this migration. If this could happen, then are there populations of these mussels established in any other coastal rivers along the north coast of Tasmania? Why haven't such populations been found before? Is this another indicator of global warming and a changing climate?

Consequently, this find stimulates a whole series of questions to be asked. Are there any other populations of this mussel to be found in other north-flowing rivers along the Bass Strait coast of Tasmania? Which fish carry the glochidia larvae and is there any evidence that they can carry the larvae while at sea? Do we know if fish from a freshwater habitat in Victoria migrate to a freshwater habitat in Tasmania (or *vice versa*)? It might even be that this population, in a coastal river of North East Tasmania, has been established via a fish host from the known populations in the South Esk system. This may have occurred naturally through a short marine migration along the coast from the Tamar, or artificially by direct human agency. I feel that this latter possibility is the least likely as these are not fish species of interest to anglers and the locality is not near any angling locality. The river is small and shallow and mainly runs through agricultural land. Of even smaller possibility is the direct human translocation of the mussels themselves. It is hard to envisage any reason for such an act. To further this study, I would be very interested in seeing any other specimens of freshwater mussels from anywhere in the State.

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