A NEW SPECIES OF SNAIL
FROM LAKE PEDDER, TASMANIA,
POSSIBLY BELONGING TO THE FAMILY VALVATIDAE

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ABSTRACT
A new species of freshwater snail, Valvata (?) pedderi sp. nov. is described from Lake Pedder, Tasmania. It is tentatively referred to the Family Valvatidae and constitutes the second record of this family for Australia. The structure of the radula and the anatomy are described.

INTRODUCTION
During a survey of the Lake Pedder area of Southern Tasmania, several specimens of a minute gastropod were collected from weed in shallow water by Mr. A. J. Dartnall of the Tasmanian Museum. These were recognised as new to the fauna of Tasmania by Mr. R. C. Kershaw of the Queen Victoria Museum, Launceston, and passed on to me for description and further study. Subsequently, further specimens were obtained by Dr. P. Tyler of the University of Tasmania, which allowed anatomical studies to be carried out.

Notwithstanding the availability of about 10 specimens, these studies are still inconclusive with regard to family and generic placement of the species. This is due to the small size of the animal which makes anatomical study extremely difficult, and the lack of comparative material from the group concerned. However, it was decided that the species should be described and that such findings as have been made, should be recorded.

Abbreviations: TM — Tasmanian Museum; NMV — National Museum of Victoria.

FAMILY AND GENERIC PLACEMENT
The species has a thin, horny, almost colourless operculum with a central nucleus, and a very small, thin, planispiral shell with pronounced spiral ridges on the dorsal and ventral surfaces. The radula consists of a few large units with many denticles. All these characters suggest the Family Valvatidae. However this family is reported as confined to the northern hemisphere (Wenz, 1939; Fretter & Graham, 1962) with only one questionable record in South America (Wenz, 1939); also the radula differs from any other valvatids for which such information is known, possessing only a single large, multicuspid central tooth of a highly modified nature. Nevertheless, I am provisionally referring this species to the Family Valvatidae as it most closely approaches this family in many of its characters. I am also including it in the genus Valvata sensu lato because of the paucity of anatomical knowledge. The external characters of the living animal have not been recorded and the few animals which
have been dissected or sectioned all proved to be immature so that im-
portant features of the reproductive system could not be fully elucidated.
Although the structure of the radula was readily seen and proved to be
different from any other valvatid, it was thought that, because this could
be a function of the animal's small size and because comparative radula
information was not available for many of the existing valvatid genera,
the erection of a new higher taxon on such evidence would be premature.
It is proposed to continue this study in the near future.

Valvata (?) pedderi sp. nov.

Text figures 1-9.

Diagnosis: Shell (Figs. 1-5) dextral, minute, planispiral with sunken
spire, whorls strongly keeled dorsally and ventrally, periphery rounded,
3 whorls, with faint growth lines visible, surface of shell composed of
irregular lattice of crystal elements. Aperture oval, pointed dorsally and
ventrally. Umbilicus wide and deep. Operculum very thin, horny, pale
yellow, paucispiral with 1½ turns and central nucleus. Radula of a large
curved spoon-shaped central tooth bearing two rows of 7 denticles, lateral
and marginal teeth absent. Eyes at outer base of tentacles, little or no
modified ctenidial structure, reproductive aperture on right anterior side
of head posterior to tentacles.

Type Material: Holotype in Tasmanian Museum, E8543, complete spec-
imen with animal preserved in 70% alcohol.

Seven paratypes: Paratypes 1 and 2 in Tasmanian Museum, E6443
with animals preserved in 70% alcohol. Paratype 3 in National Museum
of Victoria, F27937, complete serial sections on three slides. Paratype 4
in Tasmanian Museum, E8544, shell only. Paratype 5 in National Museum
of Victoria, F27938, shell only. Paratypes 6 and 7 in National Museum
of Victoria, F27939, shells only mounted on SEM stud and coated with gold.

Dimensions:

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<th>Holotype E8543</th>
<th>Paratype 1 E6443</th>
<th>Paratype 2 E6443</th>
<th>Paratype 3 F27937</th>
<th>Paratype 4 E8544</th>
<th>Paratype 5 F27938</th>
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<tr>
<td>Max.</td>
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Type Locality: Lake Pedder, Lake Maria and Lake Edgar, Southern Tas-
mania, now all part of the new Lake Pedder, enlarged artificially. The
holotype was collected by J. L. Hickman in a small hole in the plain just
south of Lake Edgar on 17 May, 1972. The remainder of the type series
was collected by Mr. A. J. Dartnall in shallow water on weed and rushes
with a net on 12 February, 1967.

Other Material: Lake Maria, A. J. Dartnall, 10 February, 1967, 3 spec.
(TM); Lake Edgar, P. Tyler 17 May, 1972, 2 spec. (NMV).
Figures 1-4. *Valvata (?) pedderi* sp. nov.
1. Dorsal view of Paratype 6, F27939, X 90.
2. Ventral view of Paratype 7, F27939, X 90
3-4. Aperture views — specimen lost subsequently, 3 — X 93, 4 — 240.

**Radula:** The radula (Figs. 6-9) of one specimen was extracted by macerating in 10% sodium hydroxide. It was then mounted on a stud, evaporated with gold and examined with a J.S.M. U-3 Scanning Electron Microscope.

The radula consists of a ribbon of highly modified single central teeth with enlarged basal regions so that each tooth articulates in the plane of the ribbon with the teeth on either end of it. There are no lateral or marginal teeth. Each tooth consists of a solid base plate with short anteriorly pointing protuberances which appear to form ball-and-socket-
like articulation with the tooth anterior to it. The body of the tooth is extended as an acute, triangular spoon-shaped structure, concave anteriorly. Each side of the tooth bears seven anteriorly pointing small sharply pointed denticles. The pointed tip is easily worn down.

**Anatomy:** Two specimens were serially sectioned and two were dissected. However, because of the smallness of the specimens, and the fact that none of the specimens were reproductively mature, many of the anatomical features will have to await further collections for elucidation.

The eyes are situated at the outer base of the tentacles. No ctenidia could be detected in the pallial cavity although a long flap-like structure was found attached posteriorly to the left side of the cavity. There also appears to be a structure similar to a pallial tentacle attached at the right margin of the cavity. The anterior part of the reproductive tract extends anteriorly to level with the right side of the buccal mass where it presumably opens to the exterior. A hollow penal organ appears to be present but the specimens were not mature. The oesophagus arises from the mid-dorsal surface of the large buccal mass and runs to the large simple stomach. There appears to be no oesophageal or salivary glands.

**Discussion:** There is no minute planispiral freshwater operculate remotely similar to this species recorded anywhere in the Australian fauna. The species differs from all other valvatids in its planispiral shell with the two spiral ridges and its radula consisting of a much enlarged central tooth only with no lateral or marginal teeth. A species *Valvata tasmanica* was described by Tenison Woods in 1876. However, it was described as globose turbinate and was transferred to the Hydrobidae by Iredale 1943 under the genus *Valvatasma*.

The referring of this species to the family Valvatidae constitutes the second record of the family for Australia, and only the third record from the southern hemisphere. This creates considerable zoogeographical problems but these will not be solved by erecting a new family for this species. The species will have to remain an enigma until more collecting can be carried out in Tasmania and comparative collections can be obtained from
Valvata (?)

Figures 6-9. *Valvata (?) pedderi* sp. nov.
6. X 600.
7. X 2520.
8. X 1848.
9. X 3360.
South America and South Africa, as well as from Europe and North America. Similar species could have been overlooked in remote mountain areas of other parts of the southern hemisphere due to their small size and to lack of collections. This collection was stimulated by the projected hydro-electric work in the area. All the localities where the species was collected are now inundated by a new artificial lake. It is not known what effect this flooding will have on the populations.

ACKNOWLEDGEMENTS

I would like to thank Mr. A. J. Dartnall, formerly Curator of Invertebrates, Tasmanian Museum and Mr. R. C. Kershaw, Honorary Associate, Queen Victoria Museum, Launceston, Tasmania, for making the specimens available and for their helpful suggestions and assistance; also Dr. P. Tyler for making further specimens available. I also thank Mr. C. Mallett of the Geology Department, Melbourne University for taking the Scanning Electron Microscope pictures and to Mr. C. Tilson, Science Museum of Victoria for assistance with the photography. I also thank the Zoology Department, University of Melbourne and Mr. L. Winsor, Anatomy Department, Monash University for their assistance with sectioning and Mr. K. N. Bell of the National Museum for his assistance in preparing the SEM material. Finally, I would like to thank Dr. J. B. Burch, University of Michigan, for his helpful suggestions.

REFERENCES


Post scriptum. Recent correspondence with a worker in Germany indicates a similarity of radulae between this species and an undescribed species from southern Chile. It is felt that both these species, because of the unusual radular structure, should be referred to the family Hydrobiidae, possibly to a new genus. It is hoped to publish further on this in the near future.

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