

# AUSTRALIAN MUSEUM SCIENTIFIC PUBLICATIONS

Waterhouse, J. B., 1967. A new species of *Attenuatella* (Brachiopoda) from Permian beds near Drake, New South Wales. *Records of the Australian Museum* 27(7): 167–173, plate 24. [14 July 1967].

doi:10.3853/j.0067-1975.27.1967.442

ISSN 0067-1975

Published by the Australian Museum, Sydney

nature culture **discover**

Australian Museum science is freely accessible online at  
[www.australianmuseum.net.au/publications/](http://www.australianmuseum.net.au/publications/)  
6 College Street, Sydney NSW 2010, Australia



# A NEW SPECIES OF *ATTENUATELLA* (BRACHIOPODA) FROM PERMIAN BEDS NEAR DRAKE, NEW SOUTH WALES

By J. B. WATERHOUSE

New Zealand Geological Survey, Department of Scientific and Industrial Research,  
Lower Hutt, New Zealand

Plate 24. Text Figs 1-3

Manuscript received, 10th August, 1965

## Abstract

A new species *Attenuatella multispinosa* is described from the mid-Permian Gilgurry Mudstone at the top of the Boorook Group, near Drake, northern New South Wales.

## Introduction

*Attenuatella* is a small spinose Permian brachiopod genus allied to *Crurithyris*. Proposed for American species by Stehli (1954), it has also been described from Russia by Chernjak (1963), New Zealand by Waterhouse (1964) and recently found in New Caledonia by Messrs Noesmoen and Espirat, and the writer. This paper describes the first species to be identified in Australia: it was noticed early in 1965 by the writer in a collection at the Australian Museum and the specimens have been borrowed and described with the kind permission of Mr H. O. Fletcher, Deputy Director of the Australian Museum.

## SYSTEMATIC DESCRIPTION

Genus ***Attenuatella*** Stehli 1954

*Type species: Attenuatella texana* Stehli (1954).

*Diagnosis:* Small brachythyrid species with inflated elongated ventral valve and almost flat dorsal valve, ventral umbo incurved, ventral interarea high, delthyrium open, dorsal interarea low, vertical to commissure. Shallow ventral sulcus, dorsal fold in some forms. Some species costate and all ornamented by fine erect hollow spines in concentric rows. Interior of ventral valve has stubby teeth, short umbonal callosity, long median elevation on which muscle scars are sited. Dorsal valve with large cardinal process, sessile socket and crural plates, large crura, spire, tiny median septum in some species, two narrow elongated impressions or ridges close to mid-line, and two larger rounded impressions laterally. Shell impunctate.

*Discussion:* Internal features of the dorsal valve in the diagnosis are based on a New Zealand species *A. incurvata* Waterhouse (1964) and a Russian species *A. stringocephaloides* Chernychev and Liharev in Liharev and Einor (1938). The ventral valve of the Australian form is unusual in that a low ridge lies each side of the muscle field, probably because the muscle field is deeply impressed.

***Attenuatella multispinosa* sp. nov.**

Pl. 24. Text figs. 1-3.

*Material:* An internal and external mould of two dorsal valves and about a dozen ventral valves, several distorted, and all preserved as natural internal and external moulds.

*Locality:* Gilgurry Mudstone, Boorook Group, between Sandy Hill and Drake, near Crooked Creek, northern New South Wales.

*Diagnosis:* Elongated moderately inflated *Attenuatella* with shallow ventral sulcus, faint dorsal costae, and fine spines (14-18 per millimetre). Well developed ridges enclose the ventral muscle field laterally. Crural plates low.

*Holotype:* F 42104, pl. 24 (figs 5, 6) Australian Museum.

*Paratypes:* F 42100-3, 42105, 51522-26. Australian Museum.

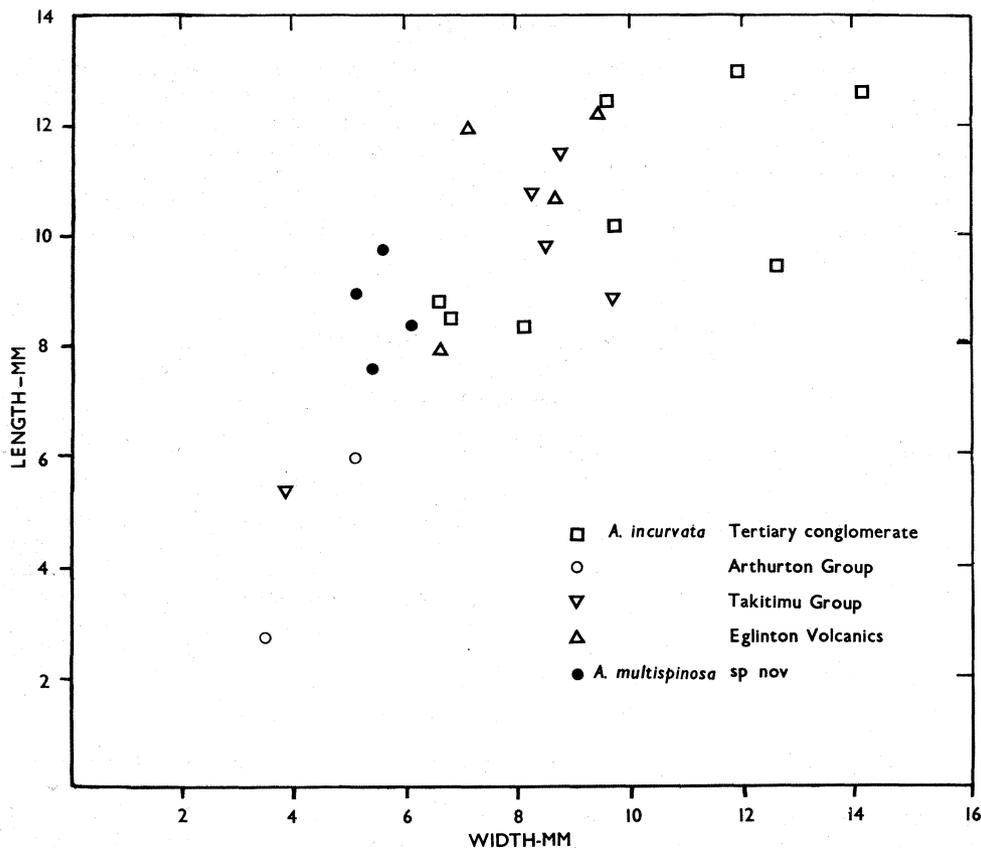


Fig. 1—Graph of length and width of ventral valves (in millimetres) for Australian and New Zealand *Attenuatella*.

*Measurements (in mm) Ventral Valve.*

Specimen	Width	Length	Height	Hinge Width	Umbonal Angle	Width Ventral Muscle Field	M <sup>1</sup>
F42100*	..	?5	9	3	..	0.8	5.5
F42102*	..	5.5	9.9	2.8	?4.5	70°	5.5
F42105*	..	5.3	7.6	2.3	?4.6	75°	4.6
F42104	..	6.3	8.1	3.6	?4.7	60°	5.2
Dorsal Valve							
F51524	..	3.4	3	2.5			
F51522	..	3.0	3.0	2			

\* Ventral valves preserved as internal moulds but the true length is measured from the external mould. M<sup>1</sup> = distance from ventral umbo to position of maximum width of shell.

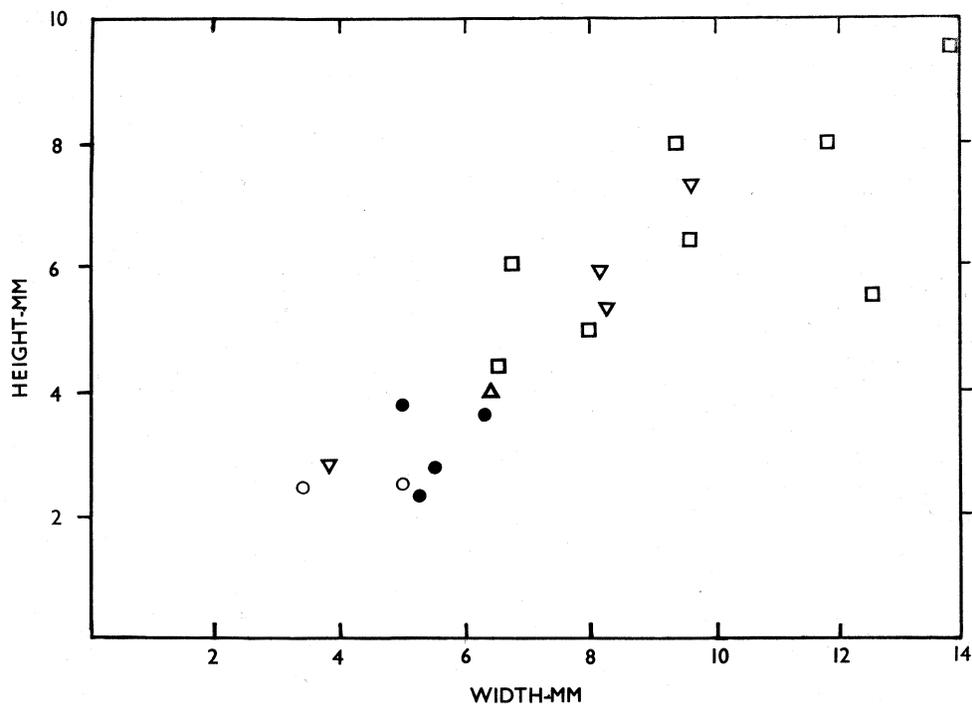


Fig. 2—Graph of height and width of ventral valves (in millimetres) for Australian and New Zealand *Attenuatella*. For legend see fig. 1

*Description*

*External:* The specimens are of medium size for the genus, with an elongate moderately arched ventral valve and an almost flat dorsal valve. The ventral umbo is extended and incurved, with posterior walls diverging anteriorly at 40 degrees to 50 degrees and the maximum width lying a little in front of mid-length. The dorsal valve is convex over the nepionic region for a width of nearly 1.5 mm and is gently concave in front. Cardinal extremities are obtuse, measuring 120 degrees to 130 degrees. The ventral interarea is high and incurved, and the dorsal interarea low and almost perpendicular to the commissure, but neither are well exposed. A narrow sulcus extends for the full length of the ventral valve and there is possibly a low fold anteriorly on the dorsal valve F42103 and a sulcus in F51522. Faint costae with wide interspaces are present anteriorly on the dorsal valves, about 14 occurring in F51522, about 7 per millimetre. Erect spines with hollow cores arise along somewhat irregular concentric rows, spaced about 12 per millimetre anteriorly in F42104 and 14 to 15 per millimetre in F42103. The spacing of spines along the row is not entirely regular, and also varies over the shell—in F51523 15 spines occur per millimetre just over 2 mm from the umbo, and spines then become very dense, over 20 per millimetre, the density gradually decreasing anteriorly. Near the anterior margin the density again increases to 18 to 19 per millimetre. In another ventral valve F51526 15 to 19 spines occur per millimetre. In the dorsal valve F51524 14 occur in 1 mm near the anterior margin, and at the anterior margin a rather irregular row has only 10 per millimetre. Growth lamellae appear at intervals of 1 to 2 mm and finer growth lines are seen only as faint traces.

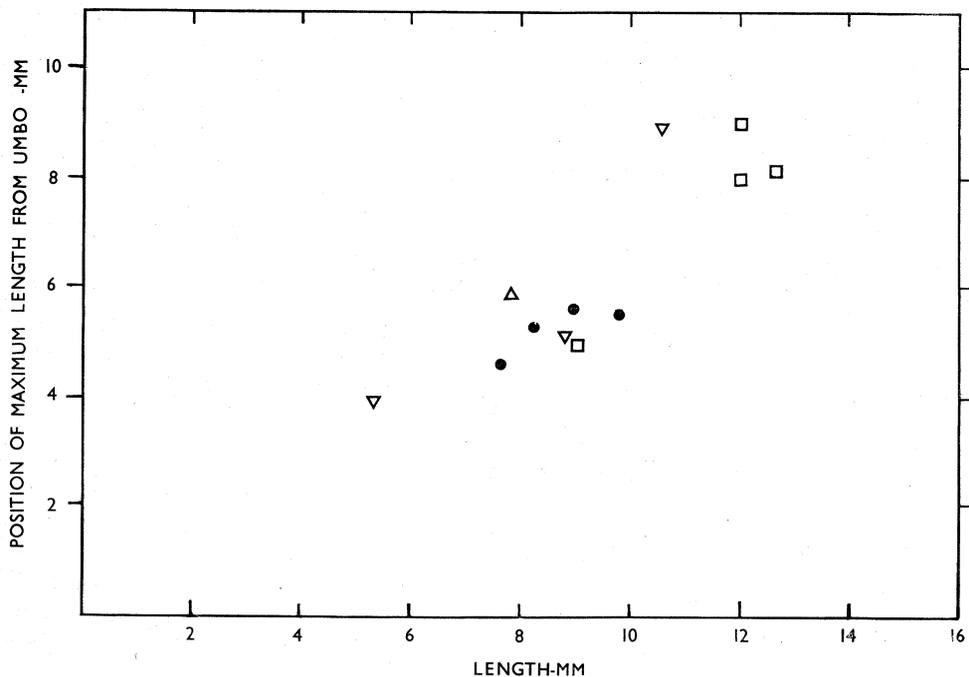


Fig. 3—Graph of dimensions (length and the position of maximum width from the ventral umbo, in millimetres) for ventral valves of Australian and New Zealand *Attenuatella*. For legend, see fig. 1

*Internal: Ventral Valve.* The teeth are massive and not supported by dental plates. A narrow high umbonal callosity is developed at the posterior end of a wide high median elevation which extends for two thirds to three quarters of the length of the valve. Dividing the ridge is a narrow median groove, and to each side lie a number of fine longitudinal striations which usually do not extend beyond mid-length. In F42105 the muscle ridge is concave in transverse profile with a groove each side, suggestive of adductors; in F51523 and the others the entire muscle field is convex. The muscle field is sharply depressed below the crest of the median elevation, leaving a ridge which extends for half to full length of the muscle scars, suggestive of adminicula. The remainder of the valve has fine dimples and pits.

*Dorsal Valve.* The dental sockets are finely denticulate in F51524 and are enclosed anteriorly by low sessile crural plates which diverge anteriorly at 115 degrees. Two blades of matrix cross the crura. Little is seen of the cardinal process: it is represented in the mould by a deep depression between the sockets; with a median posterior groove and a lobe each side. Nor are the crural supports apparent in this specimen, but they are visible in F51522 as very low plates, with erect crural bases. In front of the cardinal process lies a very short septum, less than a millimetre long, with a shallow elongated depression each side, and a larger subrounded depression lies in front to each side. The remainder of the valve is marked by fine pustules and pits.

#### *Resemblances*

*Attenuatella incurvata* Waterhouse (1964, pl. 20, figs 1-12; pl. 21, figs 1-9; Figs 47-52) is a slightly larger and more transverse species with a similar incurved ventral umbo and sulcus and concavo-convex dorsal valve. The spines are coarser, 10-14 occurring per millimetre. Internally the median ventral elevation is usually longer, lacks adminicular-like ridges, and has a less well-defined median groove. In the dorsal valve the dental sockets are not denticulate and the crural plates are more prominent. The holotype of *A. incurvata* and topotypes from a limestone boulder in Tertiary conglomerate have a different arrangement of muscle scars, the inner pair lying in a more anterior position. But small specimens from the Kazanian Arthurton Group, BR 929 (Waterhouse, 1964, pl. 21, fig. 8) and BR 930 (Waterhouse, 1964, pl. 21, figs 4, 7) have scars in a posterior position, similar to the arrangement in the Australian form. The position of the muscle scars in *A. incurvata* has been assumed to change with ontogeny, but this has not been confirmed because small topotypes are not known, and Arthurton specimens are sparse, small and generally poorly preserved. In the Arthurton dorsal valves the cardinal process lies in a more posterior position than in the Australian species, the socket plates are not crenulate and the crural plates are clearly visible.

Specimens recently discovered from Lower Artinskian beds of the Takitimu Group and Eglinton Volcanics of New Zealand usually have a dorsal fold and costae and a slightly lower density of spines than in *A. incurvata*. The two Takitimu specimens have no dorsal septum and a very long pair of dorsal median ridges.

*Attenuatella texana* Stehli (1954, pl. 25, figs 31-33) from the Lower Leonardian of Texas is known from a single ventral valve and thus cannot be compared adequately. It is similar in shape and inflation, shallow sulcus and the failure of the inner ventral ridge to reach the anterior margin. No spine density is given in the description and features of the dorsal valve are not known. Another American species *A. attenuata* (Cloud, 1944, pl. 17, figs 22-25) from the Waagenoceras zone of Las Delicias, Mexico, is more inflated with a more incurved ventral umbo. Internal details are not shown.

*A. stringocephaloides* (Chernyshev and Liharev in Liharev and Einor, 1938, pl. 13, fig. 5; Chernjak, 1963, pl. 42, figs 3, 4) is a more transverse shell with a wider ventral sulcus and short posterior adductor impressions (Chernjak, 1963, pl. 42, fig. 3a). *A. taimyrica* Chernjak (1963, pl. 42, figs. 5-9) is even more transverse and has a shallow ventral sulcus and inner ventral elevation that fails to reach the anterior margin.

#### *Age*

*A. multispinosa* comes from the Gilgurry Mudstone (Voisey, 1936, 1939, 1957), likely to be late Kungurian or early Kazanian age. The species closest to the Gilgurry form are the poorly known *A. texana* Stehli from the Lower Leonardian of Texas and Kazanian specimens assigned to *A. incurvata* from the Arthurton Group of New Zealand, but the new form is too distinctive to give any firm indication of age.

## REFERENCES

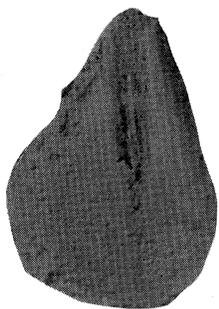
- Chernjak, G. E. (1963) in Utritskiia, V. I., Chernjak, G. E., Biostratigraphy and Brachiopods of the upper Permian of Taimyra. *Trud. Arkt. Geol. Inst. Lening.* 134: 1-139, 47 pl.
- Cloud, P. E. (1944). in King, R. E.; Dunbar, C. O.; Cloud, P. E.; Miller, A. K.; Geology and Paleontology of the Permian Area northwest of Las Delicias; Southwestern Coahuila, Mexico. *Geol. Soc. Amer. Spec. Pap.* 52: 1-172.
- Liharev, B., Einor, O. L. (1938). Paleontology of the Soviet Arctic Part 4. Contributions to the Knowledge of the Upper Paleozoic fauna of Novaya Zemla, Brachiopoda. *Trud. Arkt. Inst. Akad. Nauk. S.S.S.R.* 127: 1-247.
- Stehli, F. G. (1954). Lower Leonardian Brachiopoda of the Sierra Diablo. *Bull. Amer. Mus. Natur. Hist.* 105 (3): 257-358.
- Voisey, A. H. (1936). The Upper Palaeozoic Rocks in the neighbourhood of Boorook and Drake, N.S.W. *Proc. Linn. Soc. N.S.W.* 61: 155-68.
- (1939). The Geology of the County of Buller, N.S.W. *Proc. Linn. Soc. N.S.W.* 64: 385-94.
- (1957). Further remarks on the Sedimentary Formations of New South Wales. *J. roy. Soc. N.S.W.* 91: 164-88.
- Waterhouse, J. B. (1964). Permian brachiopods of New Zealand. *N.Z. geol. Surv. Palaeont. Bull.* 35: 1-287, 37 pl.

## EXPLANATION OF PLATE 24

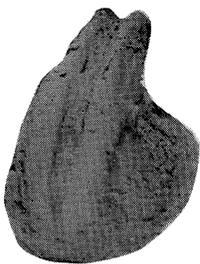
***Attenuatella multispinosa* sp. nov.**

x 4 approx.

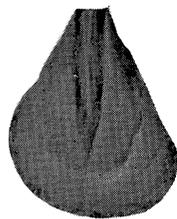
- Fig. 1—Internal mould of ventral valve, F42102.
- Fig. 2—Internal mould of ventral valve, F42100, obliquely crushed.
- Fig. 3—Internal mould of ventral valve, F42105.
- Fig. 4—Obliquely crushed internal mould of ventral valve, F51523.
- Fig. 5—Lateral view of internal mould of ventral valve, F42104, holotype.
- Fig. 6—Rubber latex mould of exterior of ventral valve, F42104, holotype.
- Fig. 7—Internal mould of dorsal valve, F51524. This specimen seems to have been lost at the Geological Survey, only the external mould remaining.



1



2



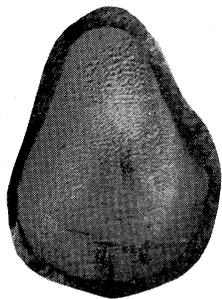
3



4



5



6



7