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A Contribution to the Life History and Biology of the  
Brachiopod *Pumilus antiquatus* Atkins

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The symbol  $\mu\text{m}$  has been used throughout this manuscript to signify "micron" in accordance with the ruling of the International Committee of Weights and Measures. (*Nature*, 1963, 197: 1055; and *J. roy. Inst. Chem.*, 1966, 88: 27.)

*Abstract*

*Pumilus antiquatus* Atkins has been found in the lower mid littoral zone of the shores of Lyttelton and Otago Harbours, New Zealand, where it is attached to the underside of rocks and is often associated with *Waltonia inconspicua* (Sowerby). It is a simultaneous hermaphrodite, fertilisation taking place in the mantle cavity of the parent. In Otago Harbour the breeding season is from September to November inclusive, when the sea temperature is increasing from the winter low to between 8° and 9° C. Breeding takes place twice in the life span of three years. Fully developed gonads do not consistently occur until *Pumilus* has a shell length of more than 2.5mm. The ova at maturity are large, being between 150 and 200 $\mu\text{m}$ , and 50–100 are produced each year. Atkins' (1958) hypothesis on the storage of ova in the visceral cavity is discussed in the light of recent observations. Larvae remain in the parent mantle cavity for 9–17 days, until they reach a form when the mantle lobe bears setae, the apical lobe bears cilia and eyespots, the gut rudiment is elongated and the pedicle adjustor muscles are well developed. Settlement and mantle reversal may take from 2–5 days, or up to 10 days if larvae are released prematurely.

INTRODUCTION

*Pumilus antiquatus* is a small inconspicuous brachiopod, ranging in size from the newly settled animal with a shell length of about 225 $\mu\text{m}$  up to an adult with a shell length of 5.66mm. The shell is strongly sulcate, dark brown to white in colour; the lophophore is schizolophous and the animal is hermaphrodite.

*Pumilus antiquatus* was first discovered by Dr D. Atkins in January, 1956, and was described as a new genus and species of the family Kraussinidae (Atkins, 1958). Atkins' work was based on specimens sent to her at Plymouth, England, from Lyttelton Harbour, New Zealand.

In May, 1964, whilst working at Portobello Marine Biological Station, the author discovered *Pumilus antiquatus* in Otago Harbour.

In this paper, the ecology of *Pumilus antiquatus* will be described together with observations on the breeding, embryology and larval development. To date, the genus *Pumilus* is monotypic, therefore all reference herein is to *Pumilus antiquatus*.

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