

SEDIMENT PRODUCTION AND POPULATION BIOLOGY

OF AMPHISTEGINA MADAGASCARIENSIS

(FORAMINIFER), OAHU, HAWAII

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## ABSTRACT

A tidepool population of Amphistegina madagascariensis d'Orbigny from Makapuu Point, Oahu, Hawaii, was sampled biweekly from October 1970 to October 1971. Size frequency distribution and standing crop analysis revealed a one-year reproductive cycle. A low population density in the winter months was followed by a 6 1/2 month period of reproduction beginning in mid-February which increased population density tenfold. Population density began to decline in August and by October had returned to approximately the same level as the previous October. Mean diameter size of the population declined during the early months of intense reproductive activity, then increased from June to October at a rate of approximately 2  $\mu$  per day.

Culture experiments disclosed rates of mean diameter increase and fecundity. Amphistegina grew at approximately 7  $\mu$  per day at 23-27° C and 5  $\mu$  per day at 21-22° C. Fecundity varied directly with parent size, with a mean of  $1.1 \times 10^3$  young produced per adult. The estimated minimum size at which an individual may reproductively mature was approximately 700  $\mu$ .

Apparent size-specific mortality rates, calculated using culture growth rates and field size frequency data, were inversely related to size in immature Amphistegina, but were directly related to size in mature individuals in which reproduction was a major cause of death.

Sediment production by A. madagascariensis was estimated, using the standing crop and mortality data, at approximately  $5.0 \times 10^2$  g  $\text{CaCO}_3 \text{ m}^{-2} \text{ yr}^{-1}$ .

Preliminary observations were made of an algal symbiont, tentatively identified as a Chrysophyte, that was found in all living Amphistegina madagascariensis.