REPRODUCTIVE BIOLOGY OF ANCHOVIES (*Encrasicholina heterolobus* AND *Encrasicholina devisi*) FROM BACAN, MALUKU

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ABSTRACT

The reproductive biology of the anchovies, *Encrasicholina heterolobus* and *E. devisi* at Bacan were compared with published data from other parts of their geographic range. Sampling was carried out in April, September and November 1996 and April and July 1997. The length-weight relationship for both species has a *b* value greater than 3 suggesting that the environment is favourable for these species. Both species are multiple spawners and the batch fecundity ranged between 1573 and 7090 for *E. heterolobus* and up to 6959 for *E. devisi*. This is much higher than recorded elsewhere for these species, but is partly due to larger fish size. Age at first spawning varied from 111 to 180 days for *E. heterolobus*, which is later than that estimated for fish from sites in the Solomon Islands. The age of *E. devisi* at first spawning varied between 81 and 106 days and was less than that found in the Solomon Islands. Both species live longer at Bacan than in the Solomon Islands and so the reproductive life span is also longer than found elsewhere. This means that the lifetime egg production of *E. heterolobus* and *E. devisi* at Bacan is higher than in the Solomon Islands. It suggests that populations of *E. heterolobus* and *E. devisi* in Bacan should be able to sustain higher long-term exploitation and be able to recover more rapidly from short periods of overexploitation.

KEYWORDS: tropical anchovies, length-weight, fecundity, age at first spawning, sustainability

INTRODUCTION

The anchovies, *Encrasicholina* and *Stolephorus* species, play an important role as live-bait fish for the skipjack tuna *Katsuwonus pelamis* fisheries in Maluku. In Bacan and elsewhere in Maluku Province, these anchovies are caught using "bagan" (light-fishing), "redi" (beach seine) and "bouke-ami" (the stick-held dipnet) at night. An understanding of the reproduction of these anchovies is important for determining the sustainability of the baitfish supply to the fishery. Previous research has been conducted elsewhere on the reproductive biology of the stolephorid anchovies (Sumadhiharga, 1995; Milton *et al.* 1990; Milton *et al.*1995).

The present study was carried out in Bacan, north Maluku and the objectives were: (1) to determine length-weight relationships, batch fecundity, age at first spawning, and egg production of *Encrasicholina heterolobus* and *Encrasicholina devisi* at Bacan; and (2) to compare the results with other studies from the tropical Pacific in order to assess the relative sustainability of the Bacan anchovy populations.

MATERIALS AND METHODS

Sampling

Random sub-samples of *E. heterolobus* and *E. devisi* were collected from bagans in the main baitgrounds at Bacan in September and November 1996 and April and July 1997. During each sampling trip, 200 fish were collected from at least two bagans each night for at least three consecutive nights. All samples were preserved in 10% formalin and taken back to the laboratory in Ambon for analysis.

Laboratory Analyses

Fish were measured (standard length mm), weighed (± 0.001 g) and then dissected. Gonads were removed and sex and gonad weights were recorded for all of the samples. Gonads were ex-

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