STUDIES ON ATYIDAE (DECAPODA, CARIDEA) OF SRI LANKA
III. ASPECTS OF THE POPULATION ECOLOGY
OF CARIDINA SIMONI BOUVIER, 1904

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INTRODUCTION

Atyid shrimps play an important role in the ecology of freshwater habitats in the tropics. However, there are few detailed studies on their population ecology and their role in tropical freshwater communities. Hart (1981) has discussed the population dynamics of Caridina nilotica (P. Roux, 1833) in South Africa and De Silva (in press) has described seasonal changes of a population of C. pristis J. Roux, 1931, a species inhabiting slow flowing streams of Sri Lanka. Aspects of the population ecology of temperate species of atyids have been studied by Kamita (1956, 1957a, 1957b, 1958, 1959) and Shokita (1979) in Japan, and by Williams (1977) in Australia.

The aim of the present work is to describe the structure and seasonal changes in a population of C. simoni in a small reservoir in Sri Lanka. The taxonomic status of C. simoni remains controversial. Bouvier (1904) described C. simoni from Sri Lanka but later included it as a subspecies under C. nilotica (vid. Bouvier, 1925). Johnson (1963), who considers C. nilotica as a purely African species, included the Sri Lankan form as well as closely related Indo-West
Pacific forms in a single species, *C. simoni*. According to him, the Sri Lankan population is a subspecies, *C. simoni simoni*, confined to the island. In a recent paper, Benzie & De Silva (1984) take the earlier view that *C. simoni* is really a subspecies of *C. nilotica*. Whatever the true taxonomic status of the shrimp, it is not of great importance to the present work, and the shrimp is treated here as *C. simoni* following Johnson (1963).

**MATERIALS AND METHODS**

*C. simoni* is the most widely distributed of the ten atyid species found in Sri Lanka and it inhabits the littoral regions of both lentic and lotic habitats from sea level up to an elevation of about 600 m (De Silva, 1983).

Shrimps were collected from Lake Kandy (80°38'-80°39'E, 7°17'-7°18'N), a small reservoir situated 510 m above sea level. The reservoir is situated within the small, residential city of Kandy and extends over an area of about 18 ha and has a maximum depth of 14 m. The littoral zone extends from a few metres to about 15 m from the embankment. The substratum is mainly muddy, and the edge of the lake is rich in decaying leaves fallen from the trees on the embankment. Littoral macrophytes are scarce except for grasses growing in some regions. Shrimps were found resting and feeding on the decaying leaves and also among the grasses.

Monthly samples were taken from the lake littoral at five stations representing different habitats (fig. 1). Details of the sampling stations are given in De Silva & De Silva, 1984. Samples were obtained by sweeping a pond net (diameter 30 cm, mesh size 1 mm²) through the vegetation and along the bottom among the decaying leaves of an area 5 x 10 m for 5 minutes. (Tests indicated that almost all the shrimps in an area 5 x 10 m in the lake littoral were collected in 5 minutes sampling). The same person sampled all 5 stations between 0830 and 1130 hours throughout the study.

If less than 50 individuals were obtained over all 5 stations, sampling was repeated in an adjacent 5 m x 10 m area at each station. The additional samples were used only to provide a more accurate estimate of population parameters such as sex ratio and the percentage of ovigerous females in the population.

Shrimps were transported live (in polythene bags with water) to the laboratory where they were picked from the debris and preserved in 70% ethyl alcohol. The body length of each shrimp, taken as the distance from the posterior margin of the orbit to the end of the telson excluding setae, was measured to the nearest 0.1 mm under a dissecting microscope. Carapace length, from the posterior margin of the orbit to the posterior margin of the carapace, was measured to the nearest 0.1 mm in a subsample of shrimps from each monthly collection.

Length-weight relationships were calculated from a sample of shrimps...