

Composition, abundance and temporal variation of the macro-zooplankton from the inshore waters of Christmas Island, Indian Ocean

Claire Davies

Abstract

The red land crab, *Gecarcoidea natalis*, is endemic to Christmas Island in the Indian Ocean. Although the adult life of this crab, including the migration and spawning cycles, has been well studied the marine larval phase is poorly understood. Surface plankton tows using a 500 micron net were conducted monthly over the period of one year, at three sites on the north coast of the Island, to investigate the composition, abundance and seasonal variation of the plankton at Christmas Island and to ascertain the presence of red crab zoea in the plankton.

The highest plankton concentrations were found at the end of the SE monsoon periods of 2005 and 2006. The highest concentration recorded was in September 2006, 1.9 ml settled volume of plankton /m³ water sampled. For the remainder of the year plankton settled volumes were very low, typically <0.1 ml/m³ of water sampled at all sites. The South Equatorial Current is strongest at the end of the SE monsoon and would appear to be the main transport mechanism for plankton in the waters around Christmas Island.

Copepods and fish eggs were the most abundant taxa recorded in the plankton at Christmas Island. Brachyuran crab zoea were found in the plankton samples throughout the year, the highest concentration recorded in November 2005 (up to 18 zoea /m³ water sampled) and December 2005 (up to 6 zoea /m³ water sampled). Although the December sampling corresponded to a spawning period of the red crab, positive identification of the zoea as those of red crabs was not possible.

The planktonic larvae of the red land crab will be reliant on favourable wind and current conditions for retention in the waters around the island and subsequent successful recruitment of juveniles back to the island. Focus for the conservation of the red crab should therefore be on the adult populations to ensure that there is an adequate spawning population to provide larvae that can recruit when conditions are favourable.