

FORAMINIFERAL POPULATIONS AND FAUNAS IN THE BARRIER REEF AND LAGOON OF BRITISH HONDURAS

DONALD E. CEBULSKI¹
HOUSTON, TEXAS

ABSTRACT

Eighty-nine sediment and 41 bottom water samples were collected from the barrier reef and lagoon of British Honduras. The sediment samples were obtained with a gravity coring tube and a Van Veen grab sampler. The top 1 cm. or 10 ml. of wet sediment of each core or grab sample was used to study the contained Foraminifera. The temperature and salinity of each bottom water sample was measured.

Living and total (living and dead) foraminiferal populations were determined in each of the sediment samples. The living populations on the barrier reef range from 151 to 3,653 specimens per 10 ml. of sediment; while the total populations in the same area range from 501 to 37,966 specimens. The largest living and total populations on the barrier reef were found to occur on the leeward side of mangrove and coral sand cays. The cays are excellent source areas for nutrients because of decaying vegetation, profuse sea grass growth, and the multitude of microscopic organisms associated with them. The lowest living and total populations on the barrier reef were found in areas remote from mangrove or coral sand cays, where coral growth was active and floral growth absent.

The living and total populations in the lagoon range from 20 to 1,967 specimens and from 182 to 24,677 specimens, respectively. The largest living and total populations in the Belize Harbor area of the barrier reef lagoon were found near the effluents of rivers that drain into the lagoon. These rivers cross a coastal mangrove swamp and transport an abundance of organic material into the lagoon. South of Belize Harbor the distribution patterns for living and total populations did not coincide because the magnitude of living populations increased while the total populations decreased from the reef side of the lagoon toward the mainland.

The living Foraminifera were divided into the barrier reef and lagoon faunas, reflecting the two major environments of the area. Each fauna was further divided into assemblages.

The fauna of the barrier reef was typified by (1) the restricted occurrence of some species of the families Alveolinellidae, Amphisteginidae, Cymbaloporidae, Peneroplidae, and Rotaliidae, (2) the abundant occurrence and diversification of the family Miliolidae, and (3) the overall diversification of the fauna as compared with the lagoon fauna.

Main Reef Assemblage

Archaias angulatus (Fichtel and Moll)
Asterigerina carinata d'Orbigny
Borelis pulchra (d'Orbigny)
Cymboloporetta squamosa (d'Orbigny)
Discorbis orbicularis (Terquem)
Hauerina ornatissima (Karrer)
Quinqueloculina subpolygona Parr
Triloculina carinata d'Orbigny
T. linneiana d'Orbigny
Valvulina oviedoia d'Orbigny
Vertebralina cassis d'Orbigny var. *mucronata* d'Orbigny

Marginal Reef Assemblage

Amphisorus hemprichii Ehrenberg
Amphistegina lessonii d'Orbigny
Articulina sagra d'Orbigny
A. sulcata Reuss
Discorbis candeiana (d'Orbigny)
Hauerina bradyi Cushman

¹Monsanto Chemical Co.

Peneroplis carinatus d'Orbigny
P. pertusus (Forskal)
P. proteus d'Orbigny
Planorbulina mediterraneensis d'Orbigny

Reef Channel Assemblage

Bigenenerina irregularis Phleger and Parker
Hanzawaia strattoni (Applin)
Textularia agglutinans d'Orbigny
T. candeiana d'Orbigny

Lagoon Fauna

The lagoon fauna was characterized by the abundant occurrence of species of the genera *Elphidium* and *Nonion* and the relatively common occurrence of variants of *Streblus beccarii*.

Main Lagoon Assemblage

Elphidium discoideale (d'Orbigny). Cushman
E. poeyanum (d'Orbigny). Cushman
Nonion grateloupi (d'Orbigny). Cushman
Streblus beccarii (Linne). variants

Open Lagoon Assemblage

The open lagoon assemblage was characterized by the frequent occurrence of the species *Virgulina punctata* d'Orbigny.

The bottom water temperature range throughout the barrier reef and lagoon was 3.17° C; the highest recorded was 30.83° C, and the lowest 27.66° C. Within the lagoon the temperatures recorded from stations near the mainland were slightly higher (less than 1° C) than those at stations near the reef.

The range in salinity was also small, being slightly more than 3 ‰. The highest salinity recorded was 36.41 ‰, and the lowest 33.08 ‰. There appeared to be a definite graduation in salinity within the lagoon, increasing from the mainland toward the barrier reef.

A sediment size analysis was made on 42 samples from the lagoon and on 16 samples from the barrier reef. The sediments of the barrier reef were composed of the fragmental remains of corals, algae, pelecypods, Foraminifera, and other marine organisms that inhabited the reef. These sediments were classified as either calcarenites or calcilitites, depending upon the grain size of the constituents that composed the sample. The sediments of the lagoon were silts and/or clays, often with admixtures of sand or shell material.