

DISTRIBUTION AND ECOLOGY OF MARINE PEBBLE AND COBBLE
COMMUNITIES ON SAN SALVADOR ISLAND, BAHAMAS

Lynn A. Neal
Department of Geology
The College of Wooster
Wooster, Ohio 44691

Intertidal and subtidal pebbles and cobbles on San Salvador Island, Bahamas, consist of eroded fragments of beachrock, coral rubble or dislodged carbonate hardground. These clasts are bored and encrusted by a variety of organisms; comparison of these modern communities to similar fossil assemblages reveals some interesting changes in faunal and floral distributions.

Carbonate clasts were collected from five sites located on San Salvador Island. The sites are listed as follows in order from north to south along the west coast of the island: (1) North Point; (2) Dump Reef; (3) Bonefish Bay; (4) Fernandez Bay; and (5) French Bay (Table 1). Hardground cobbles and carbonate hard substrates are represented in abundance at each of these sites. Each location also has distinct ecological zones which have been recorded on profiles along transect lines. Clasts have been collected from these various zones along the transect lines at each of the five sites.

Marine cobbles and pebbles on San Salvador are encrusted mainly by algae. Green algal species (especially *Cymopolia barbata* and *Neomeris annulata*) are abundant from the highest intertidal through the shallow subtidal, but are confined almost entirely to the top side of cobbles and pebbles (Table 2 and Figure 1). Brown algae (notably *Styopodium zonale*) and red algae (particularly *Amphiroa fragilissima*) are most common on the sides and unobstructed bottoms of these clasts (Table 2). The most abundant encrusting animals include the foraminiferan *Homotrema rubrum* (which occurs most commonly on the sides and bottoms of clasts and is abundant from the highest intertidal to the lowest subtidal point of this study), demosponges, serpulid annelids and faviid corals (Table 2 and Figure 1).

A separate species abundance/zonation graph was done for Fernandez Bay (Figure 2) since this site was studied in greater detail than the other four locations. The various distinctive zones at Fernandez initially were used to define the zonation boundaries at the other sites.

The cobbles and pebbles, especially those collected from Fernandez Bay, are moderately bored by polychaete worms. These holes are occupied by a variety of nestling organisms, including crustaceans, echinoids, holothurians and tunicates.

These modern pebble and cobble-dwelling communities can be compared with fossil counterparts in the Paleozoic, Mesozoic and early Cenozoic. The Bahamian clasts observed in this study contain a surprisingly high number of polychaete borings, a very low abundance of cementing and boring bivalves, and no evidence of bryozoans. These observations have important implications regarding the rise of infaunalization on marine inorganic hard substrates since the early Mesozoic.

I. NORTH POINT

Green Algae:

Neomeris annulata

II. DUMP REEF

Green Algae:

Acetabularia crenulata

Avrainvillea nigricans

Caulerpa sertularioides

Chaetomorpha linum

Chaetomorpha media

Cladophora fuliginosa

Cladophoropsis membranacea

Cymopolia barbata

Monostroma oxyspermum

Neomeris annulata

Valonia macrophysa

Red Algae:

Ceramium byssoideum

Faviid Corals:

Montastrea annularis

Foraminiferans:

Homotrema rubrum

Sponges:

Cinachyra alloclada

III. BONEFISH BAY

Brown Algae:

Padina vickersiae

Green Algae:

Chaetomorpha media

Cladophora prolifera

Neomeris annulata

Valonia macrophysa

Red Algae:

Lithophyllum intermedium

Neogoniolithon spectabile

Faviid Corals:

Favia fragum

Foraminiferans:

Homotrema rubrum

IV. FERNANDEZ BAY

Brown Algae:

Padina vickersiae

Styopodium zonale

Green Algae:

Acetabularia crenulata

Caulerpa sertularioides

Cymopolia barbata

Valonia macrophysa

Red Algae:

Amphiroa fragilissima

Foraminiferans:

Homotrema rubrum

Serpulids:

Spirorbis formosus

V. FRENCH BAY

Green Algae:

Chaetomorpha media

Cymopolia barbata

Neomeris annulata

Red Algae:

Lithophyllum

intermedium

Foraminiferans:

Homotrema rubrum

Serpulids:

Spirorbis formosus

Table 1. General taxonomic list of species occurrence at the individual sites studied on San Salvador Island.

SPECIES	TOP SIDE	BOTTOM SIDE
<i>Actebularia crenulata</i> (GA)	X	
<i>Avrainvillea nigricans</i> (GA)	X	
<i>Caulerpa sertularioides</i> (GA)	X	
<i>Ceramium byssoideum</i> (RA)	X	
<i>Chaetomorpha linum</i> (GA)	X	
<i>Chaetomorpha media</i> (GA)	X	
<i>Cladophora fuliginosa</i> (GA)	X	
<i>Cladophora prolifera</i> (GA)	X	
<i>Cladophoropsis membranacea</i> (GA)	X	
<i>Favia fragum</i> (FC)	X	
<i>Monostroma oxyspermum</i> (GA)	X	
<i>Padina vickersiae</i> (BA)	X	
<i>Amphiroa fragilissima</i> (RA)	X	X
<i>Cymopolia barbata</i> (GA)	X	X
<i>Homotrema rubrum</i> (F)	X	X
<i>Lithophylum intermedium</i> (RA)	X	X
<i>Neomeris annulata</i> (GA)	X	X
<i>Spirorbis formosus</i> (SW)	X	X
<i>Styopodium zonale</i> (BA)	X	X
<i>Valonia macrophysa</i> (GA)	X	X
<i>Cinachyra alloclada</i> (SP)		X
<i>Montastrea annularis</i> (FC)		X
<i>Neogoniolithon spectabile</i> (RA)		X

CODE: PLANTS: BA = Brown Algae; GA = Green Algae; RA = Red Algae
ANIMALS: FC = Faviid Corals; F = Foraminiferans; SW = Serpulid Worms; SP = Sponges

Table 2. Species occurrence on clasts from all five sites studied on San Salvador Island. "Bottom Side" and "Top Side" refer to occurrence of the species on the clasts.

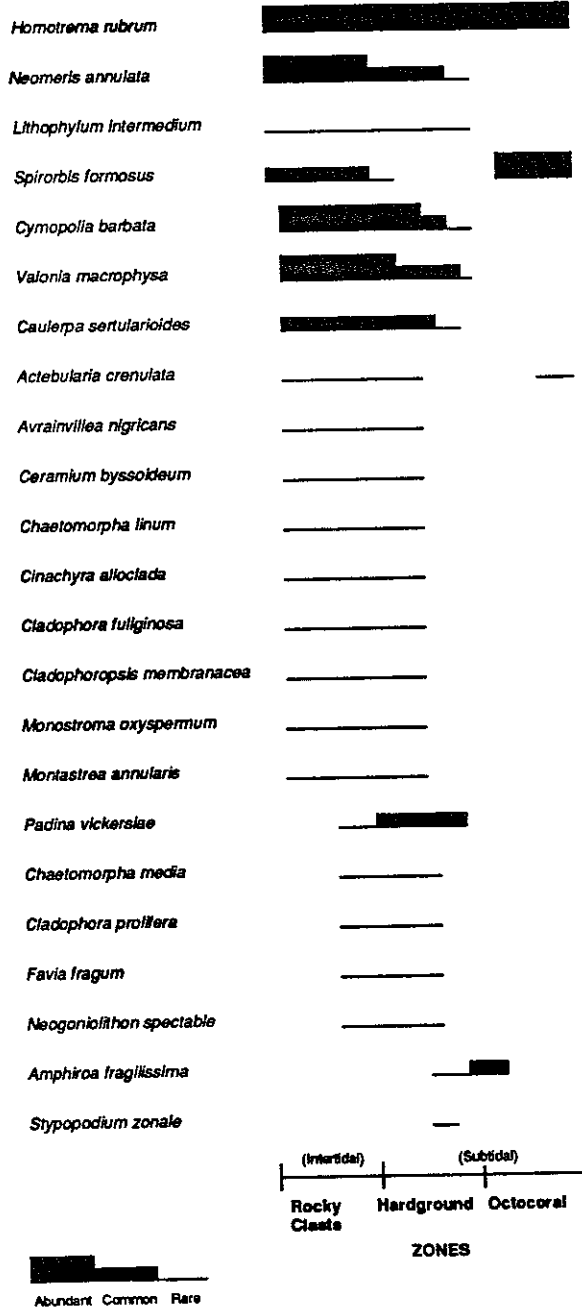


Figure 1. Abundance/zonation graph of species present at the five sites on San Salvador Island.

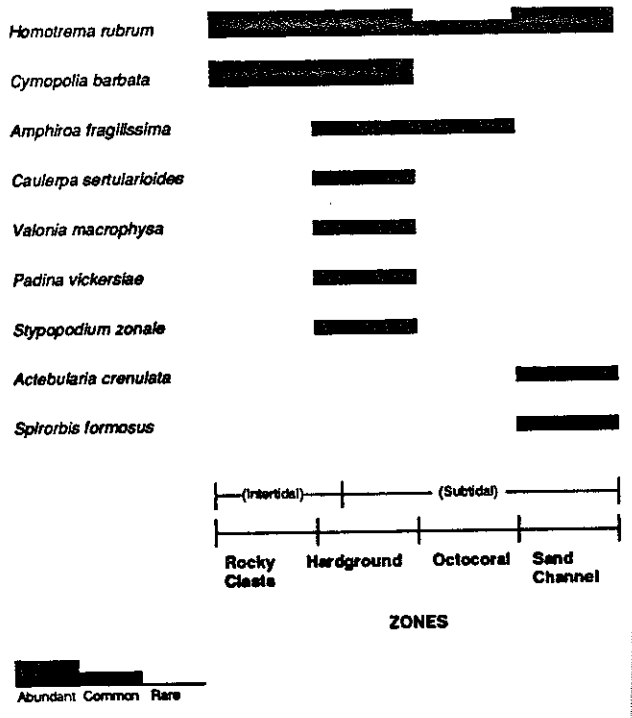


Figure 2. Abundance/zonation graph of species present at Fernandez Bay on San Salvador Island.