

WHERE HAVE ALL THE ALGAE GONE?

By: Gary Kendrick

The shores of Academy Bay are relatively bleak. The coastline consists of black blocks of lava devoid of life except for the equally dark marine iguanas barely visible against their background or the occasional yellow warbler feeding on insects attracted to the moisture of the sea spray at the edge of the ocean. Below the water, however, most rocky surfaces are pink with encrusting corallines, a group of red algae (Rhodophyta) which precipitates calcium carbonate (CaCO_3) from sea water and incorporates it into their thalli giving them a "coral-like" appearance. The pink pavement is broken by multicolored miniscule lawns, or turfs of filamentous red (Rhodophyta) and green (Chlorophyta) algae. Many of these lawns are guarded by fearless black fish with a touch of yellow on their pectoral fins--the damselfish. Beware of the damselfish for they go white-faced with anger at your trespassing and may bite the unwary visitor.

Gerald Wellington described the same shore in 1975 and noted the predominance of a skirt of brown seaweeds, mainly *Blossevillea*, draping the lower tide level to a depth of 5-6 m into the subtidal. This olive band was intermixed with slashes of purple, red, brown, and pink (the red algae, *Grateloupia howeii*, *Prionitis hancocki*, and *Gracilaria subsecunda*, and the brown alga, *Padina durvilleai*). Apparently, in the period from 1975 to 1987, this characteristic band of macroscopic algae has disappeared. Wellington observed that the northernmost islands of the Archipelago (Islas Darwin, Wolf, and Genovesa) were depauperate in macroscopic algae over large areas, but these areas were characterized by encrusting corallines and algal turfs. Macroscopic algal communities were found to be restricted to southern shores of southern islands, the western shores of Isabela, and all of Fernandina. These are areas usually associated with upwelling of the Equatorial Undercurrent (Cromwell Current) during the "garúa" season. Could it be that the loss of the macroscopic algal community in Academy Bay is related to a shift in the oceanographic setting?

I noted several differences when I compared the marine flora of Academy Bay, Isla Santa Cruz, observed by Gerald Wellington during 1973 and 1974 (Wellington 1975) with my observations made in 1987 (Table 1). The number of species of bladed and macroscopically branched algae found by Gerald Wellington in 1973-74 (25 bladed and 17 branched) was double the number found in 1987 (10 bladed and 9 branched). But, three times as many species of

filamentous algae were observed in 1987 as in Wellington's 1973-74 study (18 species versus 6 species, respectively). In 1987, the dominant fucoid (*Blossevillea*) had disappeared, bladed brown (*Padina* spp. and *Spatoglossum* spp.) and red algae (Cryptonemiales, Gigartinales, and Rhodonemiales) were rare; but filamentous green (*Cladophora* spp. and *Chaetomorpha* spp.), brown (*Giffordia* sp.), and red (e.g., *Ceramium* spp., *Polysiphonia* spp., *Audouinella* spp.) algae predominated the marine flora.

The marine benthic flora of Academy Bay in 1987 is more representative of floras found in the more tropically influenced northern islands of the Archipelago. Why is this so? Possibilities could range from human impact, long-term changes in the oceanographic setting, a result of the El Niño event of 1982-83, a reflection of the exceptionally wet and warm weather conditions of 1987, or a combination of all of the above. Where has the fucoid *Blossevillea* gone? Will it come back? In travels to Española, Floreana, and southern Isabela in 1987, no *Blossevillea* have been observed. This particular genus suffered greatly in the 1982-83 El Niño completely disappearing from many shores of the islands. That it has not recolonized infers either that Academy Bay was a transitional environment for this species before El Niño or that a change has occurred in the oceanographic conditions of Academy Bay in the extent and frequency of upwelling. Do not worry for the algae though. Such changes to the benthic flora occur seasonally in the higher temperate latitudes. As long as the more temperately-influenced benthic flora occurs somewhere on the islands (western Isabela and Fernandina), recolonization of Academy Bay will occur when the oceanographic setting shifts toward more temperate conditions.

LITERATURE CITED

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Table 1. Differences in the components of the marine flora of Academy Bay between 1973-74 and 1987. The predominant habit of the groups is given although there will be some overlap between bladed and branched. All orders and families are those used by Silva (1966).

Group	Habit	Number of species 1973-74	Number of species 1987
Chlorophyta			
Ulvales	bladed	2	4
Cladophorales	filament	1	3
Others	branched	3	2
Phaeophyta			
Sphacelariales	bladed	6	1
Fucales	branched	3	0
Ectocarpales	crusts and filament	0	2
Rhodophyta			
Nemaliales	branched	1	0
Gelidiales	branched	5	3
Cryptonemiales	branched and	5	3
Corallinaceae	crusts		
Cryptonemiales	bladed	9	2
other families			
Gigartinales	bladed	6	3
Rhodomeniales	bladed	3	0
Cerariales			
Dasyaceae	filament	0	1
Ceramiaceae	filament	2	9
Rhodomelaceae	filament	3	3