

FLORAL DIMORPHISM
IN
RACHICALLIS AMERICANA (JACQ.) HITCH.
(SALTWATER-BUSH)

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Hummingbird Cay is one of ten large oolitic limestone islands in the Jewfish Chain which runs westerly at 23.5°N from the George Town area of Great Exuma in the Bahamas. The island's ecology and flora are more fully described elsewhere (Nickerson *et al.*, in preparation). One member of the rocky-shore seaside plant communities is *Rachicallis americana* (Jacq.) Hitch. (Rubiaceae), listed by Britton and Millspaugh (1920) as a monotypic genus with 4 stamens and a half-superior, 2-celled ovary with slightly two-lobed, thick styles. Observation of many individual plants during early July of 1968 and 1969, the wet season when they are near their flowering peaks, showed that some bushes produced flowers with only bifurcate stigmas clearly visible, while others showed only 4 anthers. Since no mention was made by Britton and Millspaugh of this seeming dioecism, a careful study was made.

Many flowers on each of several different bushes were examined in the field in 1968. In 1969, branches laden with flowers in all stages of anthesis were collected from 32 randomly selected plants in five different locations. Ten flowers from each of these branches were carefully examined in the laboratory with a binocular microscope. Each flower was dissected by slitting the tube and flattening it slightly to observe the filaments, anthers, stigmas and style. The stamen-style form of each flower and each branch was noted

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and recorded. Pollen samples from flowers of each branch were compared with those of each other branch with a compound microscope. Dried specimens of representative branches were prepared and are deposited in the Herbarium of Tufts University, Medford, Mass. In 1970, 25 of these 32 plants were checked again; each exhibited the same sexual form as they had the previous year.

Foliage and branching habits of all the plants appeared to encompass the same amounts of variation. Flowers were dimorphic. Those in which the stigmas were clearly visible were perfect and had anthers on very short filaments well down the tube. Pollen was present. Those in which anthers were visible had longer filaments, occasionally with insertion higher up the tube, but not with anthers exerted. Stigmas and styles in such flowers were abortive, regardless of floral age. Ovaries were essentially equal in size in all flowers at this stage. All the flowers on any one plant were found to be identical with regard to form of stigmas, styles and filaments. The data are summarized in Table I.

Flowers of the two types occurred on separate plants. Both types of plants occurred at all but one of the sites sampled. Pollen was abundantly produced by both floral types and appeared alike in size and color under the compound microscope. Fruits were produced only on perfect-flowered individuals.

Perfect-flowered plants and male plants of *Rachicallis americana* occur in approximately equal numbers in this part of the Bahamas. There was no obvious correlation between geographic and/or ecological situation and expressed floral form, as Vuilleumier (1967) had noted might be present. Three plants of each type were known to be consistent in the sexual form of their flowers for the three seasons of 1968, 1969 and 1970. This case of floral dimorphism seems to be a further documentation of Vuilleumier's (1967) stand that many cases of floral dimorphism have been unreported by taxonomists.

The description of *Rachicallis americana* (Jacq.) Hitch. should be amended as follows: Plants of two types, bearing

TABLE I

Floral Dimorphism in *Rachicallis americana* (Jacq.) Hitch.

Location of Plant	Sexual Form of Individual Plants	
	Perfect Flowers	Male Flowers
Great Exuma, So. Dock (southeast-facing exposure)	6	3
Tommy Young Cay (west-facing exposure)	3	3
Culmer's Cay (south-facing exposure)	3	2
Hummingbird Cay		
South Coast	4	5
Northeast Coast	0	3
Total number of plants, each sexual expression:	16	16

dimorphic flowers either exclusively perfect with 4 stamens on very short filaments below the prominent bifurcate stigma, or exclusively with 4 anthers visible at the mouth of the tube and above the short aborted style and stigma. Fruits formed only on perfect-flowered plants.

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