Carnivorous Plants in Micronesia

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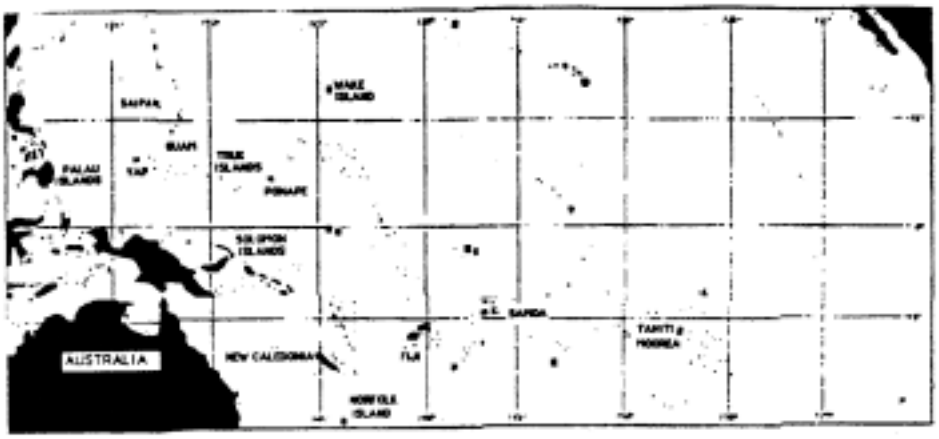
Micronesia encompasses about 2,100 islands scattered over some 12 million sq km of the central Pacific between Hawaii and the Philippines. Only about 125 of these small islands are inhabited. The total land area of Micronesia is less than 3,200 sq km, about the size of the state of Rhode Island. The largest island is Guam, with an area of about 540 sq km. There are four primary island groups, or archipelagos: Gilberts, Marshalls, Carolines, and Marianas.

In December I worked on six of these islands, from west to east: Koror and Babeldaop in the Republic of Palau (or Belau), Yap in the Federated States of Micronesia (FSM), Saipan in the Commonwealth of the Northern Marianas, U.S. Territory of Guam, and Pohnpei in the FSM. *Nepenthes* have been reported only on the western-most islands-Palau (1,200 km north of Biak, Indonesia and 700 km east of Mindanao, Philippines) and Yap (400 km east of Palau and 870 km southwest of Guam).

Micronesia was colonized by people from southeast Asia over 3,000 years ago, first through the Marianas, then the western Carolines. There was much trade among the islands. Yap was the trading center. Stone moneg, quarried on Babeldaop, was transported the 400 km to Yap by canoe. In 1929, there were over 13,000 of these circular stone "coins" on Yap-some over 4 meters in diameter. Today about half survive and are still used for important purchases. The value of each piece is based not so much on its size, but on its age and history.

Micronesia was "discovered" by Europeans about 450 years ago. Much of the area was first claimed and occupied by the Spanish. Germany entered the area in the mid-1800's and, following the Spanish-American War, Spain sold all of her possessions to Germany in 1899. The Germans began to conduct several botanical inventories of the islands. Serious "botanizing" of the islands began after Japan took possession from Germany in 1914. From 1929 through 1935, a Japanese botanist, Ryozo Kanehira, collected and inventoried the plants in Micronesia. Since the 1950's, Francis Fosberg, Sidney Glassman, and Lani Stemmermann have been the principal botanists in Micronesia, and their publications are mentioned below.

There are a number of reasons for the limited amount of botanical work that has been done in Micronesia. The islands are numerous, remote, and cover a vast oceanic region. The tropical climate makes field work in the dense jungle difficult, although many of the more



noxious diseases and insects found in other parts of the tropics are missing. The most important reason, however, probably has been the strategic military importance of Micronesia. By 1920, Japan had begun a vigorous program of economic development and colonization of the islands of the Japanese Mandate. In 1940, two-thirds of the population of Micronesia was Japanese. Following World War II, all remaining Japanese were removed to Japan. Travel to and within Micronesia has been, until recently, severely restricted. Until the 1960's, all travel to Micronesia required a U.S. military security clearance. In the late 1960's, a flood of Peace Corps volunteers were sent to some parts of Micronesia. Even today, some of the islands remain off-limits to non-military personnel, including about one-third of the U.S. Territory of Guam. Despite this, however, tourism is rapidly becoming a mainstay of much of the Micronesian economy. Continental Airlines has regular service on the Honolulu-Majuro-Pohnpei-Truk-Guam-Yap-Koror route. Additional areas are served by other carriers. But, most of the outer islands remain very isolated.

The variety of species encountered in the Pacific islands declines as you move from the Asian mainland. Hawaii, for example, has only 1/2 to 1/3 as many species as is found in Palau. Fosberg, et al. (1979) listed the presence of *Nepenthes mirabilis* in the Palau group on Babeldaop, Koror, Ngarakabesang, Malakal, Aulupse'el, Urukthapel, and Orokuiza; and in the Yap group on Yap. *Drosera burmannii* and *D. spathulata* were found only on Babaldaop. *Utricularia bifida* was reported on Babeldaop and Koror, Yap, and Guam; *U. caerulea* on Babeldaop and Guam; *U. racemosa* on Koror; and *U. ulginosa* on Babeldaop. Stemmermann and Proby (1978) have published detailed location maps of their vegetation sites. Their paper also contains photographs of *U. bifida* and *U. nivea* on Palau, and N. *mirabilis* on Yap. It would be interesting if someone were to take a detailed look at the

***N. mirabilis* on Yap Island, December, 1987. Photo by author.**

distribution of carnivorous plants in Micronesia, and study the genetic diversity within those species found. The gene pool of the CP which colonized each island may well have been represented by only a few individuals, that is, the genetic variants that dispersed to these islands were limited.

The *Nepenthes mirabilis* that I observed was very common in open fields and waste areas in Palau and Yap. In some cases, the plants were growing in barren, heavily eroded "badlands." The origin of the grasslands is the subject of some debate. One view is that they are natural features. The prevailing view is that they were formed and are maintained by the fires that are set annually. Burning the grasslands is a cultural phenomenon that predates European influence. Many people hold the view that the area of grassland is enlarging, and, as erosion reduces soil depth and fertility, the barran areas are also enlarging. In one large and particularly gullied badland area that I observed on Yap, the only vegetation present was scattered *Nepenthes mirabilis* and the fern *Gleichenia linearis.* [A similar phenomenon involving *Nepenthes* has been observed in Malaysia, in Sabah. -Ed (TLM)]

The plants that I observed were healthy-looking and green in color, with occasional pitchers having some subdued red coloration, despite growing in the full, unshaded, tropical sunlight. They were 15 to 20 cm in height, many in various stages of flowering.

On Palau, *N. mirabilis* is called "Meliik"; on Yap, it is called "Youaad", or more commonly, "tafene fii ko borro", literally "the place that rats pee." It is thought that the pitchers contain rat urine, perhaps because of the odor of decaying insects. One of the local village employees of the Yap Institute of Natural Sciences who accompanied me in the field was surprised that there was water in the new, unopened pitchers, and wondered how it got

Close up of female *N. mirabilis* on Yap Island. Photo by author.

there. He was also amazed at the collection of dead insects that we found when the open pitchers were sliced. I was also told that the local people occasionally chew the *Nepenthes* seed pods, which reportedly taste like tobacco.

I found Micronesia to be a delightful place. A visit to Yap is like a step 50 years back in time, except for the color TV (tapes of programs are shipped from Los Angeles, complete with LA ads-the news is 1 to 2 weeks old when broadcast in Yap). On the outer islands, the modern world continues to have little effect, and the culture is basically intact. Micronesia was a pleasant reprieve from my home for the past four months-Waikiki Beach, Honolulu. Life is tough all over!!

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