

FURTHER NOTES ON THE WEEDS AND INTRODUCED PLANTS OF FIJI

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THE NOTES HERE PRESENTED terminate those I have accumulated during 35 years of residence in Fiji, during which much of my spare time was devoted to collecting and studying plants. Other papers in this series have appeared in Proc. Linn. Soc. **154**: 92–106. 1943, and in Jour. Arnold Arb. **25**: 397–405. 1944, and **30**: 75–84. 1949.

In his paper on "The Vegetation and Flora of Fiji" (in Sci. Monthly **73**(1): 3–15. 1951), A. C. Smith gives the number of adventive species (weeds, escapes, etc.) in Fiji as 529, and of indigenous species as 1266. This number of adventive species, however, is drawn from all the published records. I feel sure that when the synonymy has been completely checked, and when the species that did not persist have been excluded, this number will be greatly reduced. From my own records I should put the number of adventive species at about 380, or approximately 18 per cent of the total phanerogam flora.

As in my previous papers, families are discussed in the order of Bentham & Hooker's *Genera Plantarum*. Collection numbers found in the text italicized in parentheses refer to the writer's specimens; these are inserted only when the species has not previously been reported from Fiji.

I was impressed in Fiji by the manner in which a new introduction will increase rapidly for a few years until it covers acres of waste land, to the exclusion of most other plants, subsequent to which it will gradually die down and become no more abundant than dozens of other introductions. This was particularly noticeable among the grasses, which came in, increased rapidly, and then decreased in significance, to be replaced by another grass. Many of the weeds recorded from Fiji on the basis of one or two collections are probably no longer to be found there, and the place of these in lists of the flora is questionable.

NYMPHAEACEAE

Nymphaea capensis Thunb. (probably)

Waimaleka Creek, near Sambeto, Lautoka District, Mba, Viti Levu (1306). This blue-flowered water-lily has been growing in parts of the Lautoka and Nandi Districts for the past 20 years and is quite naturalized. It was probably introduced years ago, since which it has escaped and spread. It is periodically removed from Waimaleka Creek, as its growth hinders the flow of water and tends to cause flooding in nearby sugar-cane lands.

Nymphaea capensis Thunb. var. *rosea* Hort. (probably)

Swamps near Nandi, Nandi District, Mba, Viti Levu (1307). This pink-flowered variety is not as common as the preceding, but it has been quite naturalized in the cited locality for at least ten years.

MALVACEAE

Gossypium spp.

In *Flora Vitiensis* (pp. 21, 22. 1865), Seemann discussed *G. peruvianum* Cav., *G. barbadense* L., and *G. arboreum* L. (with *G. herbaceum* L. as a synonym) as being naturalized in Fiji. They do not appear to have survived, as I have never seen them or heard reports of them in recent years. I believe they should be removed from modern lists of the flora of Fiji.

Sida acuta Burm. f.

In attempting to establish the date of this introduction (in *Jour. Arnold Arb.* 30: 76. 1949), I remarked that *Greenwood 99* appeared to be the earliest collection, but I neglected to mention the date of this as 1919.

ZYGOPHYLLACEAE

Tribulus terrestris L.

This species is mentioned as occurring in Fiji in *Agr. Jour. Dept. Agr. Fiji* 11(2): 51. 1940. However, I have never found it nor heard of its collection by recent field workers. The occurrence of *T. cistoides* L. is more to be anticipated in Fiji.

LEGUMINOSAE

Cassia leschenaultiana DC.

This plant is becoming common in the Mba and Tavua Districts of Viti Levu, and it has also recently been noted in the Nandi and Singatoka Districts.

MELASTOMATACEAE

Clidemia hirta (L.) D. Don

This weed has become fairly common around the edges of clearings in parts of the Mt. Evans Range region, Mba, Viti Levu, at elevations between 2000 and 2500 feet.

CUCURBITACEAE

Coccinea cordifolia (L.) Cogn.

The bright red fruits of this creeper are used by the Indians in Fiji in making curries.

COMPOSITAE

Eleutheranthera ruderalis (Sw.) Sch.-Bip.

Noticed in waste places around Suva, Viti Levu, in March, 1951.

***Erigeron sumatrensis* Retz.**

This is the species which in earlier papers I discussed as *E. floribundus* (H. B. K.) Sch.-Bip. Some of the specimens referred to *E. albidus* A. Gray may prove to represent *E. sumatrensis*.

BORAGINACEAE

***Cynoglossum amabile* Stapf & Drummond**

Commonly grown in European gardens in Fiji and evidently recently escaped in the vicinity of Nandarivatu, where Smith collected it in 1947 (cf. Jour. Arnold Arb. 33: 116. 1952).

ACANTHACEAE

***Thunbergia grandiflora* Roxb.**

The inclusion of this species in the Fijian flora is questionable, as I feel fairly certain that the locality of Degener's collection in Ra (cf. Sargentia 1: 117. 1942) used to be a garden attached to the District Commissioner's house. Because of its attractive flowers this creeper is commonly grown in European gardens throughout Fiji, but I have never seen or heard of it setting fruit.

***Asystasia gangetica* (L.) T. Anders.**

The seeds of this plant are sought after and eaten by domestic fowls in Fiji.

EUPHORBIACEAE

***Euphorbia* cf. *australis* Boiss.**

This species, of which the precise identity still remains uncertain (cf. Jour. Arnold Arb. 25: 402. 1944), has now spread from Singatoka to the Lautoka District.

***Euphorbia drummondii* Boiss.**

This species became established on the Colonial Sugar Refining Company's tennis courts at Lautoka, Viti Levu, in 1942. These courts are kept under couch grass (*Cynodon dactylon* Pers.) and are rested each year during the wet season, from about the end of the year until the end of April. By March, 1943, the *Euphorbia* had covered about one quarter of the courts, and in some places it had completely killed the couch grass in patches up to two feet in diameter. As it spreads close to the ground, the regular mowing had no effect on it, and it was necessary to dig up the plants by hand.

HYDROCHARITACEAE

***Hydrilla verticillata* (L. f.) Royle**

During the dry season, when the Nandi River is low, horses wade out into the river and feed on this species, which was first reported from this locality by me in Jour. Arnold Arb. 25: 403. 1944.

GRAMINEAE¹***Andropogon nodosus* (Willem.) Nash**

At sea-level, Lautoka, Mba Province, Viti Levu (1223). This species was first noticed about 1950, often at the sides of drains and in other wet places.

***Chloris inflata* Link**

At sea-level, Lautoka, Mba Province, Viti Levu (1213). The species also occurs in the vicinity of the Nandi airport, in the present Mba Province.

***Eriochloa procera* (Retz.) C. E. Hubbard**

Noticed at sides of roads and in waste places around Suva in March, 1951.

***Dactylis glomerata* L.**

This species was originally recorded, as to its Fijian occurrence, from Nandarivatu, Mba Province, Viti Levu, but during various visits there I have never seen it. If its persistence is not indicated by recent collections, it should perhaps be omitted from the lists of the Fijian flora.

***Bambusa* sp.**

The common bamboo in Fiji grows beside creeks and rivers at elevations up to 2000 feet. It is used by the Fijians for rafts, house-building, and numerous other purposes. It is included here because it can be a nuisance. In the wet season, when the Rewa and Singatoka Rivers are liable to flood, clumps of this bamboo growing on the river-banks are undermined and fall into the rivers. They are carried down and, because of the length of the culms (often 60 feet), lodge across the piers of bridges downstream. This causes debris to pile up against the bridges and holds the water back, threatening damage to the piers and superstructures. In such cases it has been necessary for workmen to cut the lodged bamboo culms. To avoid this situation, each year about September workmen are employed to work up the rivers and cut down any large bamboos growing on the banks.

During thirty years of residence on the northern coasts of Viti Levu I have never seen this bamboo in flower and so have never been able to collect material adequate for specific identification. I am told that it flowers frequently on the wet side of Viti Levu.

This species is planted beside tracks by the Fijians for shade, and often on the tops of hills as well. I believe that when so planted it is intended to show the route of a track, as I know of a number of cases where, on coming to the top of a ridge with its clump of bamboos, one can look out and see another clump on a ridge three or four miles away, which one will find to be also beside the track.

¹Two of the grasses listed here are first reported from Fiji, as indicated by my collection numbers. I am indebted to Dr. Jason R. Swallen for identifications of my recent grass collections.

The species has been in Fiji at least fifty years, and probably longer. I regard it as introduced, possibly from India, by Indians when they first came to Fiji.

I am indebted to Mr. Walter Freeman, of the Colonial Sugar Refining Company, who lived for many years along the Rewa River, for much of the above information.

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