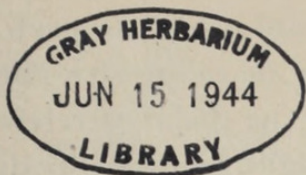


ARNOLDIA



A continuation of the BULLETIN OF POPULAR INFORMATION of the Arnold Arboretum, Harvard University

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EMERGENCY FOOD MANUALS

AS everybody at all familiar with world events realizes the present global war is in many respects very different from the first world war. Not only are many operations prosecuted along lines totally different from those which characterized the period between 1914 and 1918, but sources of special information have been developed in a wide variety of fields. Relatively speaking, the last great war was a world war in name, but in the present conflict actual combat involves not only the oceans of the world, but also the continents of Europe, Asia, Africa and the islands of the Pacific. In this second conflict botanists trained and experienced in widely diversified fields are contributing materially to the solution of various complex problems. The emergency food manuals are a small but distinctly important contribution from the fields of systematic and economic botany.

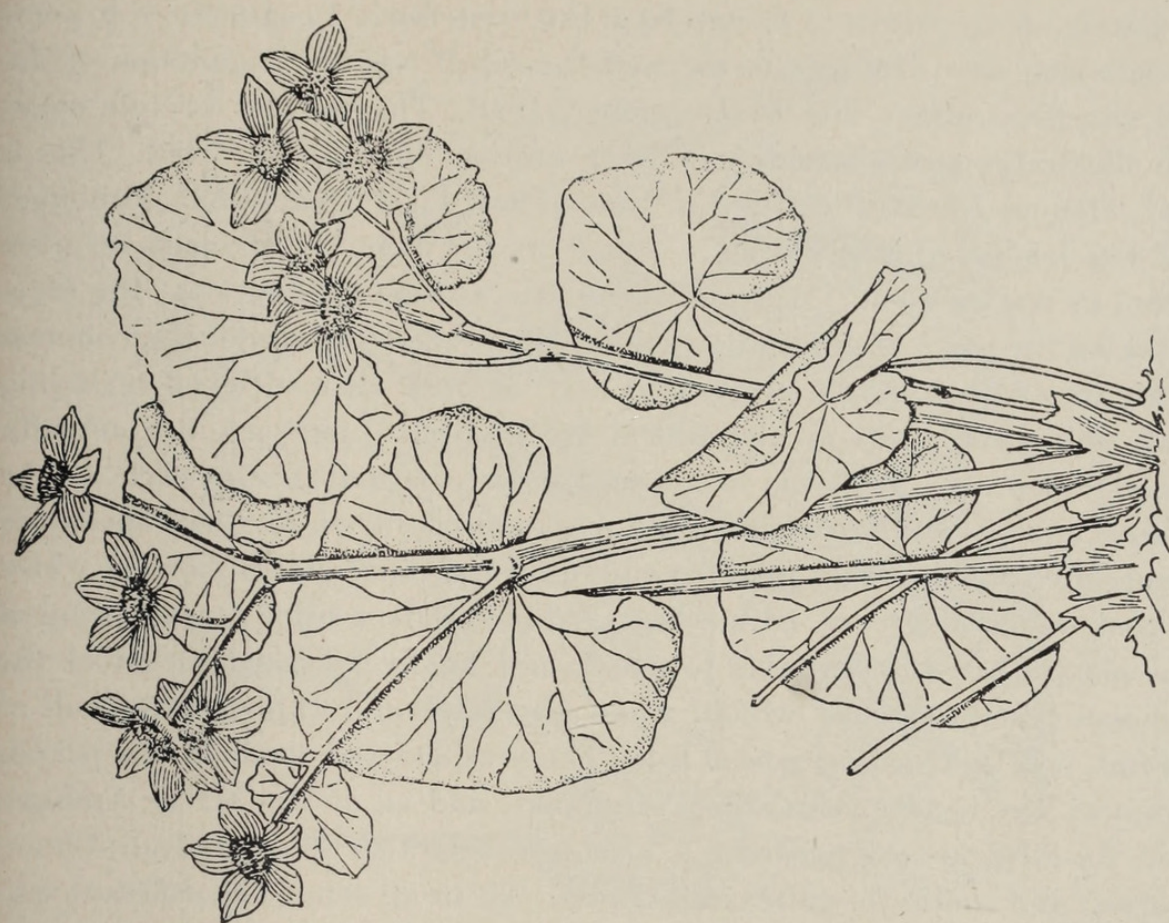
In the early part of the century when I commenced botanical work in the Philippines I soon realized, from field experience, that it was incumbent upon me to accumulate as much knowledge as possible regarding the edible qualities of various jungle plants. In my first year I had the experience of having been marooned for more than a week with no other available food than rice; and boiled rice three times a day with nothing to diversify it, is not only monotonous but is also distinctly not a satisfying diet from any angle. At that time I knew practically nothing about what one could find to eat in the vast tropical forests of the Philippines. Little did I realize that forty years later my services would be drafted to compile the data regarding jungle foods for the benefit of the men in our various services who were called upon to operate in the islands of the Pacific. Several years after the boiled rice experience when three of us were marooned by heavy rains in central Mindoro, entirely out of food and no avenue of escape open to us as long as the rain continued, one of my companions observed, when on Thanksgiving Day 1906 we dined on two broiled wood rats each, supplemented by boiled fern tips, "Cheer up, you couldn't buy a meal like this at Delmonico's." This

is, however, no place to enlarge upon the subject of what I have eaten and why, for the list would indeed be a strange one.

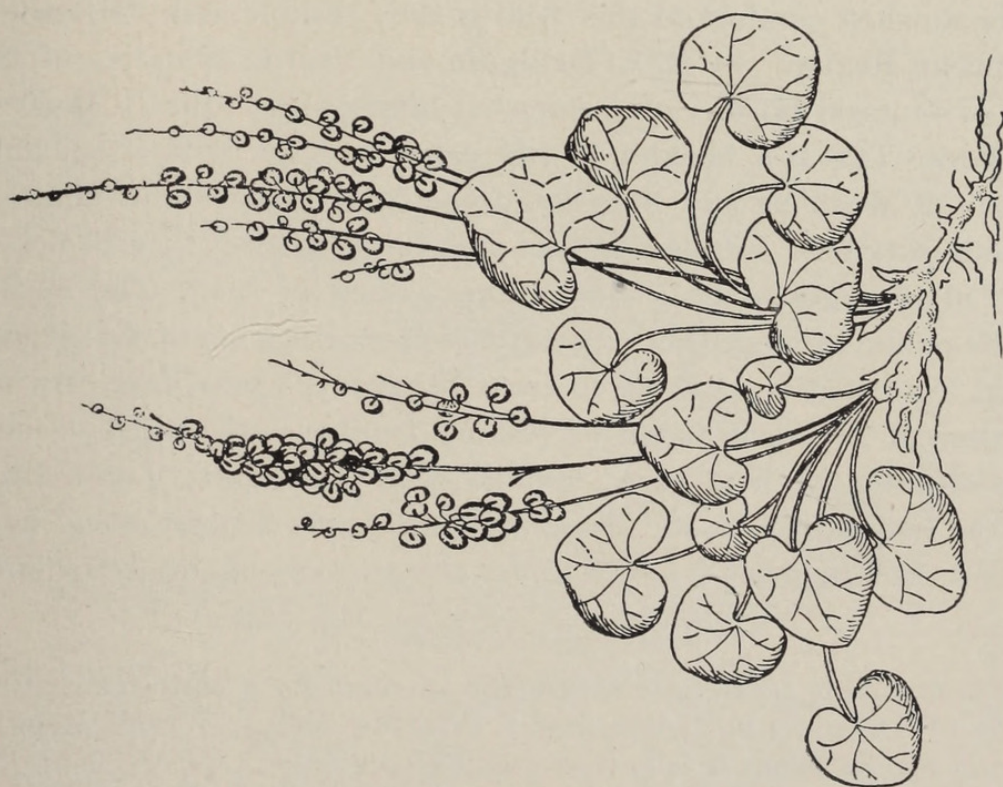
It is clear to anyone familiar with the tropics, and who has even a limited knowledge of the plants, parts of some of which may be eaten with entire safety, that there is no need of anyone starving to death in the midst of relative plenty. True, an army could not possibly subsist on what might be found in the jungles, but individuals and small groups of men can find much that may be eaten provided they know what to select. Dr. H. Lam mentions in his most interesting account of his trip up the Mamberamo River to the summit of the Central Snow Range (Mount Wilhelmina) in 1920 that his party met at the Meervlakte two Chinese bird hunters accompanied by nineteen native Papuans, who had travelled inland from the coast to the Idenburg River and thence down the Mamberamo. For a period of seventy days they had subsisted wholly on such plant and animal food as they could secure in the New Guinea forests, proof, if proof be needed, that it is possible to live on the country even in uninhabited areas such as this one in New Guinea.

Naturally, widely scattered and very rare or local species should not be considered in any popular booklet on edible plants, hence a prime necessity, if anything really useful is to be prepared, is a wide field experience on the part of the compiler. He must in the first place know the tropics from personal experience, and in the second place he must know what plants and plant parts may be eaten, either crude or processed—and some plant parts must be processed before they can be eaten in order to eliminate certain poisonous principles. But what is of even greater importance than this is a knowledge of what are the common and widely distributed species. It would be utterly valueless were a species to be included that is so rare or so local that no one could possibly expect to find enough to satisfy, in part, the hunger of even one man.

The first emergency booklet prepared was a small one compiled by Captain A. B. Godshall and published in Panama in 1942, entitled “Edible, Poisonous and Medicinal Fruits of Central America,” illustrated by 42 excellent line drawings. Immediately the idea appealed to others and within a very short time after this booklet appeared no less than twenty-one different individuals or agencies, representing various branches of the service, commenced to play with the idea of preparing something for the benefit of our service men who might become separated from their commands and who might have to live for a time on what they could find in the tropical jungles. There was no coordination of these endeavors, and too frequently individuals with no knowledge of the subject and with no tropical experience were assigned to the task of compiling data. Because of this confusion a meeting of representatives of the various services was arranged under the auspices of the National Research Council in Washington in September, 1942. The result of this conference was to enlist my services to prepare the copy for a booklet appertaining to the Pacific islands, while to Mr. Paul C. Standley and



Cowslip (*Caltha palustris*)



Mountain Sorrel (*Oxyria digyna*)

PLATE III

Reproduced from Standley, Paul C. "Edible Plants of the Arctic Regions" 1944,
by courtesy of the author and the Bureau of Medicine and Surgery, Navy Department

Dr. B. E. Dahlgren of the Field Museum of Natural History, Chicago, were assigned the arctic and subarctic regions (including Alaska) and tropical America.

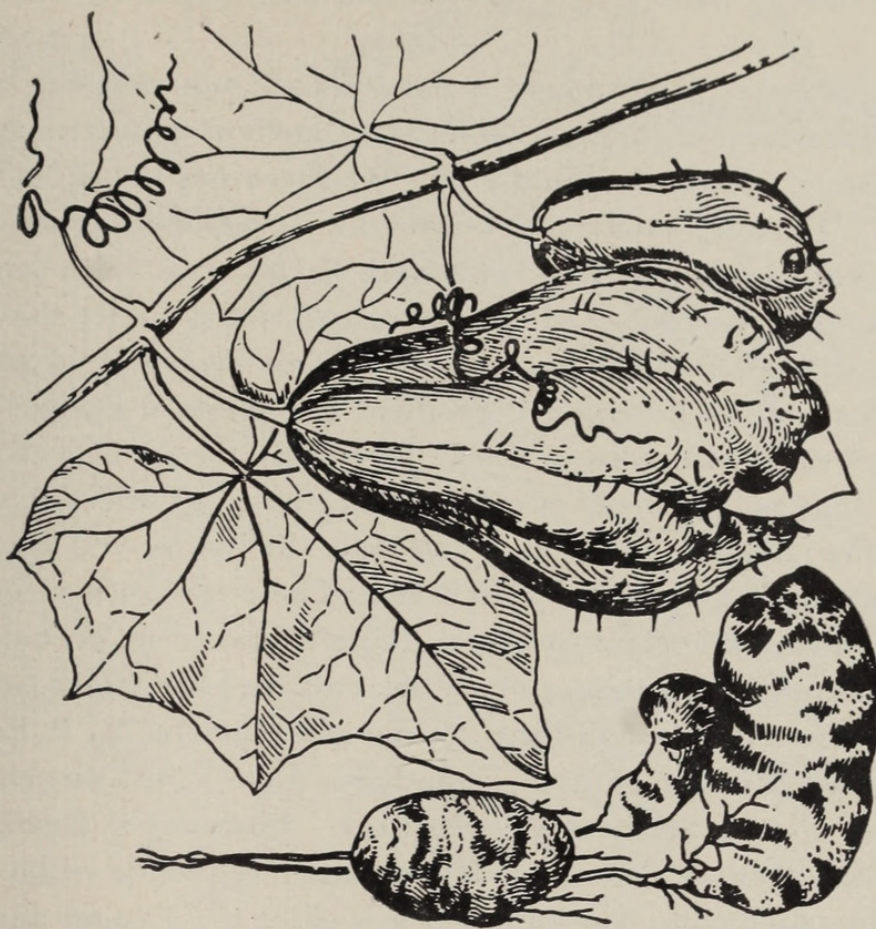
Immediately on my return to Boston from this conference I commenced to compile the data that were available to me, and the result was the completion of the copy and the illustrations late in December, 1942. The booklet of 149 pages with 113 illustrations was issued in a large edition on April 15, 1943. This is Technical Manual 10-420, entitled "Emergency Food Plants and Poisonous Plants of the Islands of the Pacific," issued by the War Department for wide distribution to service men.* It is non-technical, without descriptions, the illustrations taking the place of descriptions, and includes the majority of the common and widely distributed jungle plants that may be used as food, even including some that, unless the seeds or the tubers are properly processed, are actually poisonous if eaten raw. It covers in general certain natural groups such as the palms, ferns, grasses and aroids, followed by a consideration of those species in various unrelated families that produce edible tubers, those plants parts of which may be freely eaten as greens, edible fruits, edible seeds, a brief consideration of poisonous plants that it is desirable to avoid, and finally a consideration of the more common species parts of which, when macerated and thrown into pools or slow streams, will suffocate or poison fish. The area covered is all of the islands of the tropical Pacific, Papuasias, the Philippines, and all of the Malay Archipelago; and for all practical purposes it also covers British Malaya, Indo-China, Siam, Burma, and southern and eastern India. All in all some 128 different edible plants or plant parts are illustrated and others are discussed or mentioned. Some of these species will be found on every island of the entire tropical Pacific region that is high enough to support any vegetation.

A more finished product in this field is the "Edible and Poisonous Plants of the Caribbean Region" by B. E. Dahlgren and Paul C. Standley of the Chicago Museum of Natural History, in somewhat larger format than TM 10-420, mentioned above. This is a booklet of 102 pages with 72 illustrations, published by the Bureau of Medicine and Surgery of the Navy Department in 1944, and the equally authoritative "Edible Plants of the Arctic Region" by Paul C. Standley, a booklet of 49 pages with 27 illustrations, issued in 1943. The former is available to the public through the Superintendent of Documents, Government Printing Office, Washington, D.C. at 20 cents per copy. These, then, are some of the contributions of American botanists who are familiar with their fields and also, on the basis of extensive field work, familiar with the tropics. Little can be said in favor of the botanical parts of "Jungle Desert Arctic Emergencies" and "Jungle and Desert Emergencies" issued under the auspices of the Army Air Forces in

* This is available to anyone interested in securing a copy through the Superintendent of Documents, Government Printing Office, Washington, D. C., the price being fifteen cents *in coin* (not stamps) per copy.



Pinanona (*Monstera deliciosa*)



Chayote (*Sechium edule*)

PLATE IV

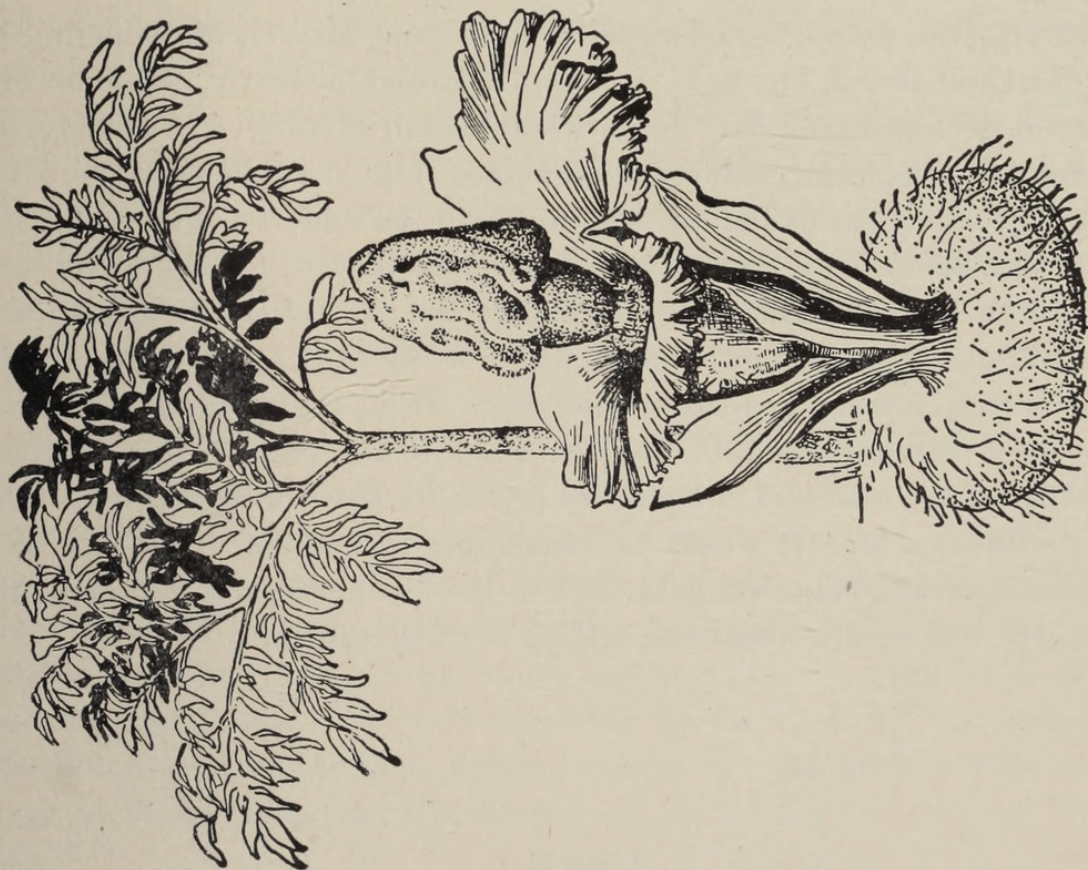
Reproduced from Dahlgren, B. E. and Standley, Paul C. "Edible and Poisonous Plants of the Caribbean Region," 1944,
by courtesy of the authors and the Bureau of Medicine and Surgery, Navy Department

1944, for the simple reason that too much of the relatively small amount of data about plants included in them verges on botanical misinformation, rather than on real facts.

But the United States Government is not the only one that has tapped this special botanical reservoir of information for the benefit of its service men operating in strange lands. About the middle of 1943 there was issued in Australia a booklet entitled "Friendly Fruits and Vegetables" compiled for the use of Australian service men operating in the Southwest Pacific area. This consists of 71 pages with 37 figures. In August, 1943, there was issued under the auspices of the Auckland Institute and Museum, Auckland, New Zealand, "Food is Where You Find It. A Guide to Emergency Foods of the Western Pacific." This is a 72 page booklet with illustrations of nearly fifty plant species as well as pictures of certain fishes that are poisonous if eaten, and others that inflict severe wounds (including also the poisonous sea snakes and cone shells), as well as other fishes and marine forms that may be eaten with safety. These two antipodean contributions include much the same plant species as those discussed in Technical Manual 10-420. To be mentioned in this category are two booklets issued in Honolulu for the needs of our service men in the Pacific area, one by K. P. Emory, published by the Bishop Museum entitled "South Sea Lore," and one compiled and published by the United States Army, entitled "Castaway's Baedeker to the South Seas." Both of these contain some information regarding edible and otherwise useful Polynesian plants. The former is a booklet of 75 pages and the latter one of 63 pages, and both are illustrated.

Nearer home, and a mine of information regarding the edible qualities of our own species is the Fernald-Kinsey "Edible Wild Plants of Eastern North America," pp. i-xiv. 1-452. fig. 1-129. pl. 1-25. 1943. This was prepared at the Gray Herbarium of Harvard University, and is by far the most complete and most authoritative treatment of our native edible plants that has been issued. It covers the area from the Maritime Provinces to Minnesota southward to eastern Oklahoma and northern Florida. It is available from the Idlewild Press, Cornwall-on-Hudson, N.Y., price \$3.00. (See *ARNOLDIA*, 4: 8. 1944.)

The published information regarding potential jungle food plants is tremendously scattered in periodical literature, covering the fields of botany, horticulture and agriculture, as well as in various standard botanical treatises. Several of the particularly valuable reference works in the field of economic plants appertaining especially to the Malayan region and hence also to Polynesia, Micronesia, the entire Southwestern Pacific region and all of southern Asia are: **Ochse, J. J. & Bakhuizen van den Brink, R. C.** "Fruits and Fruticulture in the Dutch East Indies" i-x. 1-180, *pl. 1-57* (in color). 1931. (This is an English edition of their "Vruchten en vruchtenteelt in Nederlandsch-Oost-Indie"); their "Vegetables of the Dutch East Indies (Edible Tubers, Bulbs, Rhizomes, and Spices Included). Survey of the Indigenous and Foreign Plants Serving as Pot-herbs and Side



Pungapung (*Amorphophallus campanulatus*)



Cashew (*Anacardium occidentale*)

PLATE V

Reproduced from Merrill, E. D. "Emergency Food Plants and Poisonous Plants of the Islands of the Pacific" 1943,
by courtesy of the author and the Quartermaster's Office, War Department

Dishes." i-xxxvi. 1-1006, illus. 1931. (This is an English edition of their "Indische groenten"); **Heyne, K. K.** "Die nuttige planten van Nederlandsch-Indië —." **1:** 1-250. i-xxviii. 1916 (re-issue 1-570. i-lxxx. 1922), **2:** 1-349, i-xxxix. 1916, **3:** 1-402, i-xlviii. 1917, **4:** 1-254. i-xxxvi. 1917; ed. 2, 1 vol. in 3, p.p. 1-1662. i-ccxli. 1927; and Burkill, I. H. "Dictionary of the Economic Products of the Malay Peninsula," 2 vols. pp. i-xi. 1-2402. 1935.

Thus certain information, not previously available in any single volume, some of it based on actual experience and observation on the part of individual authors, some compiled from widely scattered publications, has been assembled. In the compact form of the booklets briefly discussed above, these data have now been made widely available for all who may be interested in acquiring information which, on occasion, may be vitally important. This of course applies especially to individuals lost in the jungles of the tropics, cut off from their food supply and thus those whose lives are dependent on their own efforts.

E. D. MERRILL

Notes

Dr. H. M. Raup, of the Arboretum staff, left Boston on May 31, with his party of seven, to continue the botanical survey of the Alaska Military Highway. Last year his party covered that part of the road from its southern terminus to Whitehorse. This year the group, which consists of Dr. and Mrs. H. M. Raup and their two sons, Karl and David, Dr. S. K. Harris of Boston University, Dr. John H. H. Sticht, glacial geologist, and Mr. Frederick Johnston of Andover Academy, archaeologist and anthropologist, will cover the region from Whitehorse to the Alaskan terminus of the road. The botanical field work will be done by Messrs. Raup and Harris and Mrs. Raup. This trip has been made possible by special grants received from the Milton Fund of Harvard University, the American Philosophical Society, the National Academy of Sciences, the Society of Sigma Xi, the American Geological Society and the Peabody Foundation. This year, as last, the party will operate in the field, not only with the permission of the military authorities, but transportation on the road and commissary privileges have been granted by these authorities without which it would be impossible to operate. This will be Dr. Raup's tenth season in botanical field work in the northern parts of North America. The party will return about the middle of September.



Wyman, Donald. 1944. "Emergency Food Manuals." *Arnoldia* 4(7), 29–36.

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