

Hawaiian Ethnobotanical Studies I. Native Food and Beverage Plants

ALVIN K. CHOCK¹

Cultivated food plant stocks were brought to Hawaii by the immigrating Polynesians and composed most of their basic diet. Extensive use, however, was made of the highly endemic (95% for flowering plants and 67% for ferns) flora. The Hawaiian was both a proficient agriculturist and naturalist. Nearly all of the vascular plant genera were given vernacular names, as well as many species and varieties.

Twenty-five genera and over 85 species of vascular plants were used as food sources. These included fern auricles, pith, young fronds, and rhizomes; flowering plant roots (both aerial and underground), tubers, stems, young plants, young shoots, leaves, male flower bracts, fruits, and seeds. Six genera and 55 species of vascular plants were prepared for beverage purposes. These plants are listed in a table, with the following information provided: family, scientific name, common names, species distribution (island, altitude, occurrence, and habit), and plant part utilized. Lists of vernacular names and plant part sources are also included.

Succeeding papers will cover other aspects (introduced food and beverage plants, and native and introduced plants used for ceremonies, cultural artifacts, decorations, dye, fiber, etc.).

Introduction

Portions of this paper were first presented in 1961 in abbreviated form as part of the course material for Botany 105, "Economic Plants of Hawaii," at the University of Hawaii. The information on Hawaiian economic plants has been expanded with each succeeding class (the course is now known as "Hawaiian and Pacific Ethnobotany") to include not only those plants used for food and beverage, but also those for ceremonies, cultural artifacts, decorations, dye, fiber, medicine, plaiting, and thatching. This paper covers only those native vascular plants used for food and beverage by the Hawaiians prior to European contact in 1778. Succeeding papers in this series will cover other aspects of the ancient Hawaiian culture relating to plants.

Discussion

When the voyaging Polynesians discovered Hawaii probably over 1,500 years ago,

¹ Present Address: Plant Quarantine Division, Agricultural Research Service, United States Department of Agriculture, Room 506, 103 South Gay St., Baltimore, Maryland 21202.

they found an extremely isolated island archipelago. The Hawaiian Islands are over 2,000 miles from the nearest high island group or continental mass, and 600 miles from the nearest atoll. Some of the plants which the discoverers of this land found native to Hawaii had related species in their homeland, since 40% of the flowering plants have Indo-Pacific affinities; 16.5% are Austral; and 12.5%, Pantropic and Cosmopolitan (13). Other species and genera were, however, new, distinct, and different.

The Hawaiian flora is unique, with many rare species and unusual types of plants. There are about 2,000 species and varieties of native flowering plants, derived from about 272 original immigrants. According to Fosberg (13), 94.4% are endemic, or found nowhere else in the world but the Hawaiian Islands. Wagner (37) states that as many as two-thirds of the more than 180 fern species are restricted in distribution to Hawaii. A preliminary compilation which I have made indicates that 62.5% of the 226 species and varieties of mosses are endemic to Hawaii. Dr. Maxwell S. Doty, Professor of Botany, University of Hawaii, has made a provisional compilation of the endemism of the

Hawaiian algae. Approximately 13% of the 420 species of marine algae are endemic (21% of the 90 species of *Chlorophyta*, 35% of the 35 species of *Phaeophyta*, and 14% of the 237 species of *Rhodophyta*). None of the 58 species of marine and fresh water *Cyanophyta* are endemic. To date, there appears to be no evidence for endemic fungi in the Hawaiian Islands, as most species (500+) represent those of cosmopolitan distribution (1, 2, 36). Of the 678 species of lichens, 38% are endemic (21).

Some of these endemic species of vascular plants are confined to individual gulches, valleys, ridges, or mountains, while others are found on several islands or are widespread throughout the archipelago. Many native taxa have become very distinct or may possibly be relics and have no apparent relatives known elsewhere.

Several Hawaiian genera are monotypic, as *Dissochondrus* (family Gramineae), *Touchardia* (Urticaceae), *Heimerliodendron* and *Rockia* (Nyctaginaceae), *Hillebrandia* (Begoniaceae), and *Brighamia* (Lobeliaceae). A number of widespread genera are represented in Hawaii by only one species.

Speciation is pronounced in some genera, while in others, the differentiation is not sufficiently distinct. The genus *Cyrtandra* (family Gesneriaceae), for example, has 159 known species in the Hawaiian Islands, of which 118 are found only on the island of Oahu (32). Study of this genus on the other islands will undoubtedly increase this total. Speciation is also notable in most of the lobelioid genera and several of the composite genera. On the other hand, speciation in *Sophora chrysophylla* has not progressed appreciably, so there is only one recognized species with many subspecific taxa (5).

This unusual and different flora did not offer large amounts of wild foodstuffs. However, because of their versatility as agriculturists and naturalists, the Polynesians did find many uses for these plants. Many authors, such as Buck (4), have summarized the uses of native wild plants as follows: "Indigenous plants which supplied any form of food were utilized . . . anything edible, in the form of pith, root tuber, corm, fruit, or leaf became part of the scanty diet. However, except in times of scarcity, these were

abandoned after the introduction of cultivated plants. . . . The pith in tree fern trunks is below the leaf bases . . . The thick, starchy leaf bases of the *pala* fern were eaten cooked or raw, and the young, uncoiled (sic) fronds of ferns were eaten, some raw, some cooked. Of the other wild foods, the various fruits were unimportant, the leaves were cooked to provide a green vegetable, and various kinds of seaweed were used as a relish with other foods." Handy (15) states that "the forest supplied a variety of wild foods in famine time."

Although the use of native edible plants was probably in many cases restricted to periods when cultivated foods were scarce, or during travels across the mountains, a large number of such plants were utilized for food. Twenty-five genera and more than 85 species were sources of food from the following plant parts (see Table III): fern auricles, 1 species; tree fern pith, 2 genera, 7 species; young fern fronds, 4 genera, 12 species; fern rhizomes, 2 genera, 3 species; roots and stems of flowering plants, 4 genera, 5 species; aerial roots, 1 species; leaves (young shoots and young plants), 4 genera, 9 species; bracts, 2 genera, 2 species; fruits or seeds, 13 genera, over 54 species. Six genera and 55 species were used for beverage purposes. Beverages were usually prepared as hot teas from dried leaves. Many of these preparations also had medicinal properties. The most commonly used plants for tea were *Bidens* spp. (ko'oko'olau) (8), and the second most important source was *Heliotropium anomalum* var. *argenteum* (hinahina).

Cultivated food plant stocks were brought to Hawaii by the first groups of immigrating Polynesians. As they later journeyed back to their homeland and returned, more economic plants, as well as weeds, were introduced. From many of these, single or multiple clones were developed into many different cultigens, for the Hawaiian was a proficient horticulturist. There were, for example, probably more taro (*Colocasia esculenta* var. *antiquorum*) varieties found in Hawaii in pre-European times than anywhere else in the world, yet introductions of clones from elsewhere must have been relatively few in number. It has been estimated that about

150-250 distinct taro varieties were known to the ancient Hawaiian (38). Many of these varieties are unfortunately lost forever: for today, fewer than 70 have survived.

The native plants which were similar in appearance to the plants the immigrating Polynesians knew in their homeland were given the same names. Many of the names chosen indicate significant botanical relationships. Sometimes the names were derived from superficial plant resemblances, with no genetic relationship. For example 'ape is the Hawaiian name for the pre-European introduced monocot *Alocasia macrorrhiza* of the Araceae, while 'ape'ape is the name of the native *Gunnera*, a member of the dicot family Haloragaceae. Both of these plants have large leaves. Other names were chosen because of their suggestion to non-plant objects or because of their economic use.

In some cases, a binominal system of nomenclature was used. 'Ōhi'a is the word used in pre-European times to indicate members of the Myrtaceae. 'Ōhi'a'ai (literally, edible 'ōhi'a) is *Eugenia malaccensis*; 'ōhi'a-hā, *E. sandwicensis*; and 'ōhi'a-lehua, *Metrosideros collina* ssp. *polymorpha*. This system was also used to define groups of varieties of introduced economic plants as taro and banana. Most of these varieties had two names: the first word indicating the varietal group name; and the second word, that particular varietal name.

Eventually, most of the Hawaiian vascular plant genera were named, as well as many species. Nearly all of these names have been included in a comprehensive Hawaiian-English Dictionary (24). They are also listed in many of the earlier botanical works, such as Hillebrand (16), and Rock (29, 30).

The manner in which plants of post-European introduction were quickly adapted to various economic uses by the Hawaiians indicates their knowledge and resourcefulness with plants and plant products in general. These will not be included in this series, since they form a later, post-historical culture. In many cases, their role from the 1800's to the present time has been of such significance and so widespread that some Hawaiians will insist that the origin of these plants is prehistoric—even when the actual introduction date can be pinpointed.

Hawaiian Cooking Methods

Buck (4) lists three methods of cooking: broiling, boiling, and a combination of steaming and roasting in the earth oven.

Broiling was done on hot coals (*kō'ala*) or on hot ashes (*pūlehu*). This method was used away from the home or at home when the quantity of food was small. Some fruits were broiled in their skins, as bananas and breadfruit, while other foods were wrapped in *ki* leaves (*Cordyline terminalis*).

Boiling (*hāku'i*, *pūhōlo*) consisted of heat from the inside rather than the outside, since the Hawaiians had only gourd and wooden bowls, which were not fireproof. Wooden bowls were filled with food and water, and heated stones were added. This was the most commonly used method of cooking greens.

Roasting and steaming (*kālua*) was done in an earth oven (*imu*). Either a permanent kitchen, with a shallow hole in the ground under a shelter, or an oven in the open for special occasions was used. Rocks were heated in the bottom of the pit by kindling wood. Grass or leaves were placed on top of the stones, then the food to be cooked was placed in the oven. Layers of leaves, old mats, and tapas were used to cover the food and retain the heat. This method involved several hours and was used to cook both meat and vegetables.

Explanation of Table I.

The information about the food and beverage plants utilized by the Hawaiians prior to European contact (1778) is listed in Table I. These data have been assembled from many literature sources, none of which provides complete information about these plants. The data are arranged as follows:

(1) *Family*. They are listed in botanical sequence.

(2) *Scientific Name*. Synonyms are listed in parenthesis, since many different scientific names are found in the literature. The synonymy listed are only those which have been frequently used in reference sources, both botanical and anthropological.

(3) *Common Names*. Except for three vernacular names, all of those listed are found in Pukui and Elbert (24). The first

(Text continued on page 236)

TABLE I
LIST OF HAWAIIAN NATIVE FOOD AND BEVERAGE PLANTS

(1) Family	(2) Scientific Name	(3) Common Name	(4) Distribution	(5) Plant Part Used
Psilotaceae	(PSILOTUM) 1a. <i>Psilotum complanatum</i> Swartz f. <i>fosbergii</i> Degener & Degener	moa, moa-nahele, pipi, Psi- lotum, whisk ferns.	All islands (this form, ac- cording to Degener, 1966, is endemic; the species is found in Polynesia, Malaya, and Tropical America); lower and middle rain for- ests, usually epiphytic; oc- casional, not so common as <i>P. nudum</i> ; herb.	Plant: beverage (m) (7, 12, 23).
	1b. * <i>P. nudum</i> (L.) Beauv. (<i>P. triquetrum</i> Swartz)		All islands; sea level to 4,500 ft elev.; moist to dry habitats, terrestrial or epi- phytic; locally common to occasional; also Pan-tropic; herb.	
Marattiaceae	(FERNS) 2. <i>Marattia douglasii</i> (Presl) Baker in Hook. & Baker	pala, Douglas' mulesfoot fern.	All islands; 1,000-4,500 ft elev.; usually in fog-belt or dense rain forests; (now no longer common) occasional to rare; herb.	Auricle: raw (m) (8), broiled (8, 9, 12, 16, 20, 23) or roasted and steamed (20); beverage (m), slices soaked in cold water (8, 9, 12, 16, 20, 22, 23).
Dicksoniaceae	3a. <i>Cibotium glaucum</i> (J. E. Sm.) H. & A. (<i>C. lauii</i> Dege- ner & Greenwell, p.p.; <i>C. nealae</i> Degener, p.p.; <i>C. st. johnii</i> Krajina, p.p.)	hāpu'u, hāpu'u-pulu; Ha- waiian tree fern.	All islands; (500) 1,500- 4,800 (6,600) ft elev.; mod- erately wet forests to bogs; occasional to rare (certain varieties); tree.	Pith: (ff) broiled or roasted and steamed (4, 7, 12, 15, 22, 23, 26). Young frond (pepe'e): (ff) boiled or roasted and steamed (16, 18, 22).

TABLE I—(Continued)

(1) Family	(2) Scientific Name	(3) Common Name	(4) Distribution	(5) Plant Part Used
Aspidiaceae	3b. <i>C. splendens</i> (Gaud.) Krajina (<i>C. chamissoi</i> Kaulf., auct. non. Hbd., Rock, et al.; <i>C. hawaiiense</i> Nakai & Ogura, p.p.)	mei ^a (sp. <i>hawaiiense</i> (Nakai & Ogura) Krajina); Hawai- ian tree fern.	All islands; (near sea level) 1,000-4,300 (6,700) ft elev.; dry and wet forests; abun- dant to rare (certain varie- ties); tree.	
	4. <i>C. chamissoi</i> Kaulf. (<i>C.</i> <i>menziesii</i> Hook.)	hāpu'u-ʻi'i, ʻi'i; heiiʻb, Ha- waiian tree fern.	All islands; 1,000-6,000 ft elev.; common in rain for- ests with best development and abundant on island of Hawaii; tree.	
	5. <i>Athyrium meyenianum</i> (Presl) Milde (<i>A. arnotii</i> (Brack.) Milde, <i>Diplazium</i> <i>arnotii</i> Brack., <i>D. meyenia-</i> <i>num</i> Presl)	hōʻiʻo; pohole (Maui).	All islands; 800-4,300 ft elev.; damp habitats; com- mon; herb.	Young frond (pepeʻe): raw. (4, 12, 15, 23, 24).
	6. <i>A. microphyllum</i> (Sm.) Alston (<i>A. baldwinii</i> (Hbd.) C. Chr., <i>A. poiretianum</i> (Gaud.) Presl)	ʻākōlea.	All islands; 1,500-6,500 ft elev.; damp habitats; com- mon to occasional; herb.	Rhizome: cooked (18).
	7. "Dryopteris" <i>keraudre-</i> <i>niana</i> (Gaud.) C. Chr.	waimaka-nui, ala'alai.	All islands; 600-4,000 ft elev.; moist habitats; oc- casional; herb.	Rhizome: cooked (18).
	8. * <i>Thelypteris cyatheoides</i> (Kaulf.) Fosberg (<i>Cyclosorus</i> <i>cyatheoides</i> (Kaulf.) Farw., <i>Dryopteris cyatheoides</i> (Kaulf.) O. Ktze.)	kikawaiō, pakikawaiō; ku- pukupu-makali'i (var. <i>de-</i> <i>paupeperatum</i>).	All islands; 750-4,600 ft elev.; rain forests; common; recorded also from New Guinea, Samoa, and Sit- matra; herb.	Rhizome: raw (grated and salted) (4, 12, 15, 23, 24), or cooked (18). Young frond (pepeʻe): raw (4, 12, 15, 23, 24) or cooked (16.).

^a Ripperton, 1924:3; vernacular name not listed in Pukui & Elbert, 1965.
^b Hillebrand, 1888:546; vernacular name not listed in Pukui & Elbert, 1965. This may be the indefinite article, *he* + ʻiʻi.

TABLE I—(Continued)

(1) Family	(2) Scientific Name	(3) Common Name	(4) Distribution	(5) Plant Part Used
	9. * <i>T. stegogrammoides</i> (Baker) Fosberg (<i>C. sandwicensis</i> (Brack.) Copel., <i>D. sandwicensis</i> Brack., <i>D. stegogrammoides</i> (Baker) C. Chr.)	hō'i'o-kula.	All islands; (near sea level) 1,000–4,300 ft elev.; usually moist habitats; common; also Fiji, Pitcairn; herb.	Young frond (pepe'e): raw (23, 24).
Blechnaceae	10a. <i>Sadleria cyathoides</i> Kaulf.	'ama'u; 'āma'uma'u and ma'uma'u (plural); tree fern, Sadleria.	All islands; (300) 1,200–4,000 (6,600) ft elev.; dry to very wet forests; abundant to common; tree.	Pith: (ff) broiled or roasted and steamed (7, 12, 23, 24). Young frond (pepe'e): boiled or roasted and steamed (7, 22).
	10b. <i>S. fauriei</i> Copel.		Oahu; 1,500–1,800 ft elev.; leeward lower forest; rare; tree.	
	10c. <i>S. rigida</i> Copel.		Kauai, Lanai; 2,500–4,800 ft elev.; wet forest to bog; rare; tree.	
	10d. <i>S. souleyetiana</i> (Gaud.) Moore	'ama'u-ke'oke'o ^o (<i>f. brevissora</i> H. Christ).	All islands; 1,300–4,000 ft elev.; moderately wet forest to bog; occasional to rare; tree.	
	11. <i>S. pallida</i> H. & A. (<i>S. hillebrandii</i> Rob.)	'ama'u-'i'i, 'i'i, tree fern, Sadleria.	All islands; 1,100–6,000 ft elev.; moderately wet to bog; occasional; tree.	
	12. <i>S. squarrosa</i> (Gaud.) Mann (<i>S. polystichoides</i> (Brack.) Heller, <i>S. unisora</i> (Baker) Rob., p.p)	'apu'u, 'ama'u, Sadleria.	All islands; 1,800–4,800 ft elev.; moderately wet to bog habitats; occasional; herbaceous to suffruticose.	Young frond (pepe'e): boiled or roasted and steamed (22).

^o Hochreutiner, 1912: 204. Listed as "amahu keu-keu (keu-keu signifie blanc)." *Amahu* probably is Hochreutiner's way of spelling 'ama'u, since a glottal stop is often designated in speech with a pause. Since he stated that *keu-keu* means white, the correct spelling would be *ke'oke'o*. Vernacular name not listed in Pukui & Elbert, 1965.

TABLE I—(Continued)

(1) Family	(2) Scientific Name	(3) Common Name	(4) Distribution	(5) Plant Part Used
Chenopodiaceae	(DICOTS) 13a. <i>Chenopodium oahuense</i> (Mey.) Aellen (<i>C. sand- wicheum</i> Moq.)	'āheahea, 'āweoweo, ahea, 'āhevaheva, alaweo, Ha- waiian goosefoot.	All islands; 10-8,250 ft elev.; dry areas; common; also several islands of Lee- ward Hawaiian Chain (i.e., Nihoa, Necker, French Frigate Shoal, Laysan); (var. <i>discosperma</i> Fosberg, found on Maui at an elev. of 6,750 ft, is herbaceous), shrub (low elevations) to small tree (high elevations).	Leaf, young shoots, and young plants: boiled (4, 14, 15, 16, 24).
Rosaceae	13b. <i>C. pekeloi</i> Degener, Degener & Aellen 14. <i>Fragaria chiloensis</i> (L.) Duchesne var. <i>sand- wicensis</i> (Decaisne) Dege- ner & Degener 15. * <i>Osteomeles anthyllidi- folia</i> (Smith) Lindl.	'ōhelo-papa, Hawaiian strawberry. 'ūlei; eluehe (Molokai).	Molokai; arid rocky slopes; rare; herb. Hawaii, Maui (this variety is endemic according to Degener, 1961; the species is American); 2,700-7,800 ft elev.; dry areas; locally common; herb. All islands; sea level to 4,000 (8,000) ft elev.; com- mon in dry areas; also Poly- nesia, Bonin, and Ryukyu Islands; creeping shrub (low elevations) to tree (high elevations).	Fruit: raw (16, 23, 24). Fruit: raw (4, 14, 15, 23) (Hillebrand, 1888: 119, con- siders the fruit "quite un- palatable").
16a. <i>Rubus</i> Gray	<i>hawaiiensis</i>	'ākala, 'ākalakala, Hawai- ian raspberry.	All islands except Oahu and Lanai; (2,000) 4,000-7,500 ft elev.; locally common; shrub to small tree.	Fruit: raw (4, 7, 15, 16, 23).

TABLE I—(Continued)

(1) Family	(2) Scientific Name	(3) Common Name	(4) Distribution	(5) Plant Part Used
	16b. <i>R. macraei</i> Gray		Hawaii, Maui; 4,000–6,000 ft elev.; not so common as <i>R. hawaiiensis</i> ; trailing shrub.	
Sapindaceae	17a. <i>Alectryon macrococcus</i> Radlk. (<i>Mahoe</i> Hbd., gen. nov.?)	māhoe, 'ala'ala-hua.	Molokai, Maui; 1,600–2,600 ft elev.; leeward side of dry regions; rare; tree.	Fruit (aril) and seed: raw (8, 14, 30).
	17b. <i>A. mahoe</i> St. John & Frederick		Kauai (?), Oahu; 1,500–2,400 ft elev.; usually in dry areas; occasional to rare; tree.	
Sterculiaceae	18. * <i>Waltheria americana</i> L. ^d	'uha-loa, 'ala'ala-pū-loa, hi'a-loa, kanaka-loa.	All islands; arid lowlands; locally common; also tropical America; creeper to shrub.	Root and leaf: beverage (m) (24.)
Myrtaceae	19. <i>Eugenia sandwicensis</i> Gray (<i>Syzygium sandwicensis</i> (Gray) Ndz., <i>S. oahuense</i> Degener & Ludwig, p.p.)	hā, 'ōhi'a-hā, kaoukahiki; pā'ihi (Maui).	All islands except Hawaii; (350) 1,000–3,600 (4,200) ft elev.; occasional; tree.	Fruit: raw (23, 24, 30). (Hillebrand (1888: 129) states "the fruit is resinous-astringent, insipid).
Ericaceae	20a. <i>Vaccinium reticulatum</i> J. E. Smith	'ōhelo, 'ōhelo'ai.	Maui, Hawaii; near sea level to 6,000 (10,000) ft elev.; abundant to common on open lava beds; shrub.	Leaf: beverage (24); Fruit: raw (4, 7, 15, 16, 23, 24).
	20b. <i>V. berberidiifolium</i> (Gray) Skotisb.		Maui Hawaii (?); 6,000–10,000 ft elev.; common to occasional; shrub.	

^d Considered by some botanists to be introduced by the Polynesians.

TABLE I—(Continued)

(1) Family	(2) Scientific Name	(3) Common Name	(4) Distribution	(5) Plant Part Used
Ebenaceae	20c. <i>V. dentatum</i> J. E. Smith		All islands except Hawaii; 1,200–10,000 ft elev.; usually in rain forest; common to occasional; shrub.	
	20d. <i>V. palahalae</i> Skottsb.		Molokai, Hawaii; 3,000 ± ft elev.; open rain forest to bog; occasional; shrub.	
	20e. <i>V. peleanum</i> Skottsb.		Hawaii; 7,500–11,000 (12,250) ft elev.; subalpine to alpine; locally common; shrub.	
	21. <i>V. calycinum</i> J. E. Smith	'ōhelo-kau-lā'au.	All islands; 2,000–4,000 ft elev.; abundant to common on Kauai, Maui, and Hawaii in rain forest; shrub to small tree.	Fruit (pi'oi) and seed: raw (4, 11, 14, 15, 16, 30).
	22a. <i>Diospyros ferrea</i> (Willd.) Bakh. ssp. <i>sandwicensis</i> (A. DC.) Fosberg (<i>Maba sandwicensis</i> A. DC.)	lama (PPN, rama; PMP, damaR) Hawaiian persimmon.	All islands (the subspecies, according to Fosberg, 1939, is endemic; The species is distributed from India to the Pacific); 450–3,000 ft elev.; dry to wet forests; common to rather rare (certain forms); tree.	
22b. <i>D. hillebrandii</i> (Seem.) Fosberg (<i>M. hillebrandii</i> Seem.)		Kauai, Oahu; 1,300–2,400 ft elev.; rain forest; locally common to occasional on Oahu; tree.		

TABLE I—(Continued)

(1) Family	(2) Scientific Name	(3) Common Name	(4) Distribution	(5) Plant Part Used
Convolvulaceae	23. * <i>Ipomoea cairica</i> (L.) Sweet (<i>I. palmata</i> Forsk., <i>I. tuberculata</i> Roem. & Schult.).	koali-'ai, koali-lau mana- mana; koali, kowali, kū- pala, paha, 'uala-koali, Cairo morning glory.	All islands; lowlands; dry rocky places; common; also tropical Africa and Asia; creeper.	Root and stem: (ff) cooked (4, 15, 16, 22, 23, 24).
	24. * <i>I. pes-caprae</i> (L.) Sweet ssp. <i>brasiliense</i> (L.) van Ooststtt.	pōhuehue, beach morning glory.	All islands; strand (coastal sand dunes); abundant; also Pantropic; creeper.	Root and stem: (ff) cooked (23, 24).
	25. <i>Jacquemontia sand- wicensis</i> Gray	pā'ū-o-Hi'i-aka, kākua-o- Hi'i-aka.	All islands; strand and low- lands (above strand); on dry plains and rocky slopes of lowlands; common to occasional on leeward side; creeper.	Stem and leaf: beverage (m) (18); Root: (ff) cooked (8, 16).
Boraginaceae	26. <i>Heliotropium anomalum</i> H. & A. var. <i>argenteum</i> Gray	hinahina, hinahina-ku- kahakai, beach heliotrope.	All islands (the variety is endemic, while the species is distributed in the Pacific); strand and lowland (above strand); often in dry sandy soil; abundant to common; herb (sometimes suffruti- cose).	Plant: beverage (m) (23, 24), second choice when <i>Bidens</i> spp. not available.
	27. * <i>H. curassavicum</i> L.	kipūkai, nena, seaside heliotrope.	All islands; strand and low- lands; often in clay soil of drying salt marshes; oc- casional, but widespread; also American; herb (some- times suffruticose).	Leaf: boiled (14, 22); beverage (m) (7, 24).
Solanaceae	28a. <i>Nothocestrum brevi- florum</i> Gray	'aiea, hālena.	Hawaii (also one specimen each collected on Oahu and Maui; rare?); 2,400-4,000 ft elev.; dry forests; oc- casional; tree.	Fruit: (ff) raw (23, 30).