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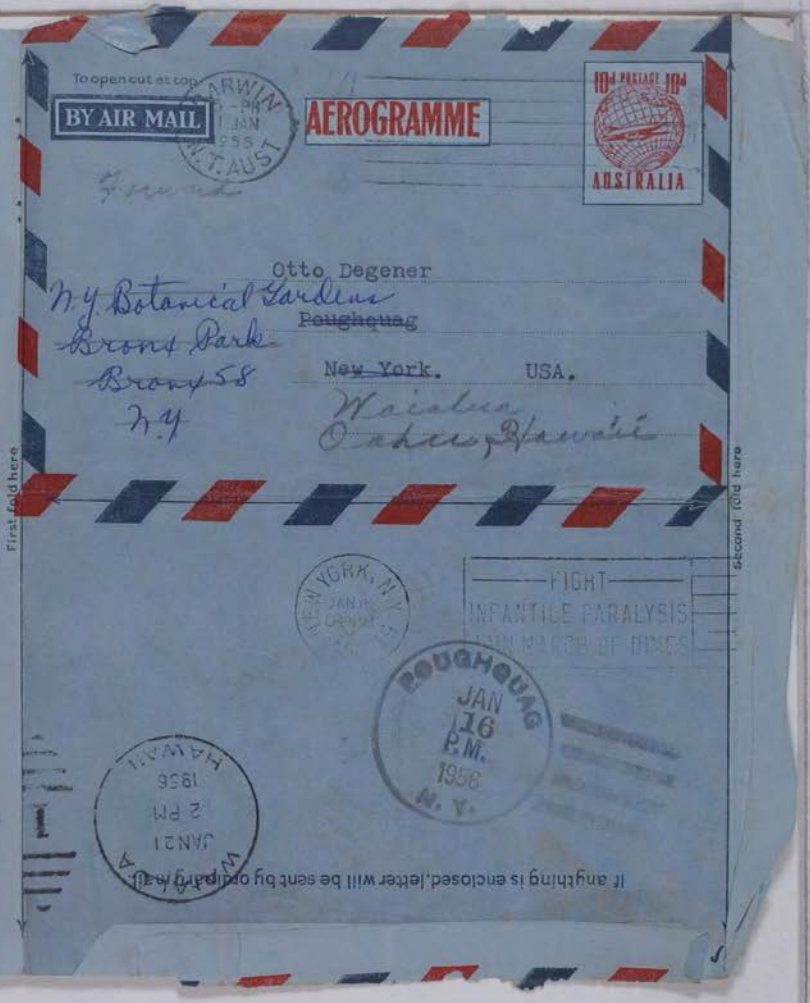
About the Institute
The Hunt Institute for Botanical Documentation, a research division of Carnegie Mellon University, specializes in the history of botany and all aspects of plant science and serves the international scientific community through research and documentation. To this end, the Institute acquires and maintains authoritative collections of books, plant images, manuscripts, portraits and data files, and provides publications and other modes of information service. The Institute meets the reference needs of botanists, biologists, historians, conservationists, librarians, bibliographers and the public at large, especially those concerned with any aspect of the North American flora.

Hunt Institute was dedicated in 1961 as the Rachel McMasters Miller Hunt Botanical Library, an international center for bibliographical research and service in the interests of botany and horticulture, as well as a center for the study of all aspects of the history of the plant sciences. By 1971 the Library's activities had so diversified that the name was changed to Hunt Institute for Botanical Documentation. Growth in collections and research projects led to the establishment of four programmatic departments: Archives, Art, Bibliography and the Library.

FISH AND FIBER — A string of fish woven into plant fibers to hang out to dry in the sun make a dramatic pattern. It is a part of an exhibit of the practical uses which Pacific peoples have for their plant life and is on display through tomorrow at Flora Pacifica. The annual show is open from 1 to 10 p.m. today and tomorrow at the Walker Estate, 2616 Pali Hwy.—Photo by Bob Young. Hon. Star-Bull. 4/8/72



Mrs M.Moss
Box 277
Darwin N.T.
Australia.
Jan. 11th. 1956.

Otto Degener
Poughquay
New York. USA.

Dear Sir,

I have read with great interest the first two numbers of Tropical Plants the World Around, and I would like to know if further numbers were published.

I have inquired at one or two booksellers in Australia but to date with no result. I have been living in Darwin for nine years and have found it very hard to get information on tropical plants. Your two small booklets were most helpfull.

If they are available in other numbers I will arange to get a bank draft. Darwin climate is rather a difficult one and from what I have read I gather that it is different to many tropical places. However many trees and shrubs grow well and we are not short of things to grow.

A great number of plants are still in the experimental stage as far as I can ascertain, very few records have been kept and some were lost during the bombing raids.

Thanking you in anticipation
Yours faithfully M. Moss

Mailed Crawford + 3 cuts
1 Fl. Haw. (1+4) ed. 2
1 9 PH
1 P01 I
damaged in exchange for ~~something of native manufacture~~
received June 1956
Offered Fiji + Crawford @ ~~$5.00~~
Book 5
~~7/3/58~~, 3/15/59

Sept. 20, 1962.

M. R.K. Won,
I. Corp.,
140 Ala Moana Blvd.,
Honolulu.

Dear Mr. Won:

This is to verify our recent 'phone conversation that IBM has my permission to use reproductions until further notice of my drawings in "Plants of Hawaii National Park" and "Flora Hawaiiensis" Books 1 - 5 to ornament building walls only on condition, however, that "After Degener" be appended to some part of each reproduction so that the general public will know the source of the material. By this I do not mean that the legend should be so large as to violate good taste.

Aloha,

FLORA HAWAIIENSIS

Family : 10

HYMENOPHYLLACEAE

FILMY-FERN FAMILY

Crowd on 1 page

Bold

12.6 FEB 13

KEY TO LOCAL SPECIES OF HYMENOPHYLLACEAE:

1. Involucre valvate; receptacle included; rhizome creeping:

 2. Frond glabrous throughout - - Mecodium recurvum (Gaud.) Copel. (a)

 2. Frond hairy:

  3. Frond lanceolate, acute at apex, with simple hair on margin and veins - - - - Sphaerocionium lanceolatum (H. & A.) Copel. (b)

  3. Frond rhomboid to ovate, obtuse at apex, with stellate hair throughout - - - Sphaerocionium obtusum (H. & A.) Copel. (c) Bold

1. Involucre tubular or obconic and never valvate; receptacle exserted or nearly so; rhizome creeping or not:

 2. Rhizome short, suberect; fronds tufted; receptacle long-exserted - - - - - - - - - Macroglena toppingii Deg. & Deg. (d) Bold

 2. Rhizome long, creeping; fronds scattered; receptacle exserted or nearly so:

  3. Vein more or less flabellate; frond less than 2 cm. long, orbicular; receptacle exserted - - - Gonocormus minutus (Bl.) v.d. Bosch (e)

  3. Vein more or less pinnate; frond more than 5 cm. long, lanceolate or nearly so; receptacle exserted or nearly so:

   4. Frond 5 - 8 cm. long; receptacle exserted or nearly so - - - - - - - - - - - Crepidopteris draytonianum (Brack.) Deg. & Deg. (f)

   4. Frond 10 - 30 cm. long:

    5 Frond broad below, usually dark green; receptacle exserted or nearly so - - - - - Vandenboschia cyrtotheca (Hillebr.) Copel. (g) Bold

    5 Frond narrow below, usually pale green; receptacle long-exserted - Vandenboschia davallioides (Gaud.) Copel. (h)

EXPERIMENT STATION OF THE HAWAIIAN SUGAR PLANTERS' ASSOCIATION
1527 KEEAUMOKU STREET
HONOLULU, HAWAII 96822

March 10, 1965

Dr. Otto Degener
68-617 Crozier Drive
Waialua, Oahu, Hawaii

Dear Dr. Degener:

Thank you for your memoranda about our former purchases of volumes of FLORA HAWAIIENSIS.

On 2 May 1963 we purchased five copies of volume 6 of this work.

We will be very glad to know when future issues are available.

Very truly yours,

EXPERIMENT STATION, H.S.P.A.,

By Charlotte Hoskins

Charlotta Hoskins,
Librarian.

hi

FROM

Henri Bos
c/o General Delivery, Kamuela, Waimea
Hawai'i 96743

4.50
cod
18.00

KAPAAU, HI
JUL 20 1970
P.M.

Post Tax
4.50
10
18
4.78

[redacted]

[redacted]

[redacted]

DRS. DEGENER
68-617 CROZIER DR.
WAIALUA, O'AHU
96791

Drs. Otto & Isa Degener
P.O. Box 154 Volcano
Hawaii 96785 U.S.A.

7/28/70

TO DRS. DEGENER:

1ST HAPPINESS - FLORA HAWAIIENSIS HELPS.

IIND BLAIR CO. IS CUTTING KOA IN A VERY VALUABLE FOREST SECTION ANY THING TO BE DONE?

IIIRD AXIS DEER - SAW WINSTON BANKO NON COMMITAL AT BEST.

PLEASE SEND PLANTS OF HAWAII NATIONAL PARK ILLUSTRATIVE OF PLANTS & CUSTOMS OF THE SOUTH SEAS.

SINCERELY
J HENRI BOS

PLEASE NOTE THAT I HAVE
SEEN YOUR RECENT ARTICLE
IN HONOLULU – PLEASE IF POSSIBLE
INCLUDE A DRAFT FOR ME.

HAVE COVERED MANY MILES - SEEN 'IO & NO 'ALALA –

DR. O. DEGENER IF TIME PERMITS
WRITE A SHORT NOTE ON YOUR
EXPERIENCE WITH THE 'IO.

AWAITING YOUR
REPLY.
WB

February 11, 1972

Dear Dr. Degener,

My husband and I wish to thank you for sending us the copy of your informative letter of February 5, 1972 – with which we are in 100% agreement. We hope it will bring the results you are working for.

– – –

Whenever we go to the volcano area we take along my 1930 ed. of Fernsand Flowering Plants of Hawaii National Parks.

Sincerely yours,
Lucinda King

6/13/73

THE NEW YORK BOTANICAL GARDEN
BRONX • NEW YORK 10458 212/933-9400

June 13, 1973

Dr. Otto Degener
P. O. Box 154
Volcano, Hawaii 96785

Dear Dr. Degener,

Thank you for the photographs, newspaper clipping and Flora Hawaiian leaflets.

We look forward to serving as an archive for other materials you may wish to send.

The Library here is now involved in an oral history program which aims to "catch" the unrecorded memories, opinions and facts concerning the early history of the Garden. Would you be willing to participate? The tapes and transcripts are used only at the wish of the person interviewed. We have a cooperative arrangement with Columbia University for storage and legalities. Since you have had a long connection with the Garden, we hope you may be interested. All of this is looking towards a written history of the Garden. We have interviewed H.A. Gleason, Elizabeth Hall, Ralph Stewart, and Lilian Weber. A modest start but we're going!

Sincerely yours,

Charles R. Long

Charles R. Long

June 17, 1973.

Dear Mr. Long:

I have your June 13/ letter.

I was a bit confused regarding our April 1973 Newsletter. Unless some personal tragedy has befallen them recently. are there not quite a few individuals still alive who had professional dealings with Dr Britton? What about Earl Dugan who started at the Garden as a school boy, Harold Moldenke, Alexander who liked botanizing so much in Mexico that it was difficult to get him to stop and return to the Garden, Mr. de la Montagne, and myself? Somewhat later colleagues were Croizat now of Caracas and Miss Woodward. Enclosed is a postal from the plant illustrator Wilhelmina Greene mentioning C.W.

Of course I would be glad to participate in an oral history of the Garden, but I doubt I ever experienced much of general interest. I botanized in Bermuda with Dr. H.H. Whetzel & Alan McAllan (of Bermuda & Yonkers) in the summer of 1921, and worked up my collections at the Garden shortly after. Some of my better Bermuda specimens should be scattered here and there in the cases. Of course , as a child living at 316 West 89 Street, I visited the Garden with my parents twice or so every year; also the Zoo.

Some of the present correspondence is of no interest to us as it mentions no Haw., plants. Keep whatever you wish, and discard the rest.

Aloha,

ОТДЕЛ ВЫСШИХ РАСТЕНИЙ
БОТАНИЧЕСКИЙ ИНСТИТУТ им. В. Л. КОМАРОВА
АКАДЕМИЯ НАУК СССР
197022. Ленинград, П-22, ул. проф. Попова, 2

DEPARTMENT OF HIGHER PLANTS,
V. L. KOMAROV BOTANICAL INSTITUTE,
ACADEMY OF SCIENCES OF THE U. S. S. R
197022. Prof. Popov Street 2, Leningrad, P-22

D-r Otto Isa Degener

Waialua, Oahu, Hawaii

U.S.A.

Dear D-r O.I. Degener!

Thank you very much for sendling me your interesting articles: 1) Prodromus of Galeatelia and Neowimmeria; 2) Some separata of "Flora Hanaiiensis".

Yours sincerely Vassilczenko

I. Vassilczenko.

Head Curator Herbarium.

Leningrad

6/III-1975.

1-я ТИН. Зак. 4907—1000. 16/XI-71 г.

Degeners' Leaflet No. 3

Concerning A Magazine Article

Otto & Isa Degener

The following letter was submitted by the undersigned March 29, 1975:

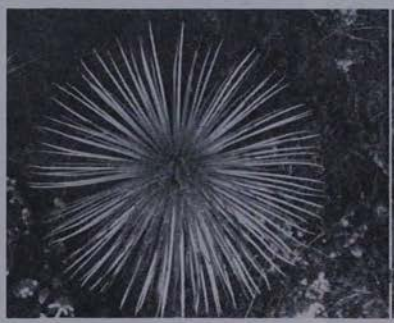
The Editor, Smithsonian,
900 Jefferson Drive,
Washington, D.C. 20560.

Dear Sir:

The beautifully illustrated warning appearing in the January issue of the "Smithsonian" by Jenkins & Ayensu entitled "One-Tenth of our Plant Species May Not Survive," is causing some wonder and criticism among its readers in the Hawaiian Islands. That our archipelago harbors a flora consisting "approximately of 2,200 kinds of plants" is absurd, and that the photograph of a silversword on page 96 is that of Argyroxiphium kauense is a misidentification.

As mentioned elsewhere (Phytologia 29:240-246. 1974.), the Hawaiian flora probably consisted of about 50,000 well recognizable species and varieties before the original Polynesians arrived a few thousand years ago with pigs, rats and chickens, and their cultigens. From that time on native farming wiped out many of the lowland endemics particularly on the lee side of the islands safe from torrential rainfall; while their introduced pigs and gnawing rats, spreading from sea level to all but the highest mountain peaks, undoubtedly ravaged the endemic vegetation particularly of the rainforest into which native hunters with their primitive weapons seldom penetrated.

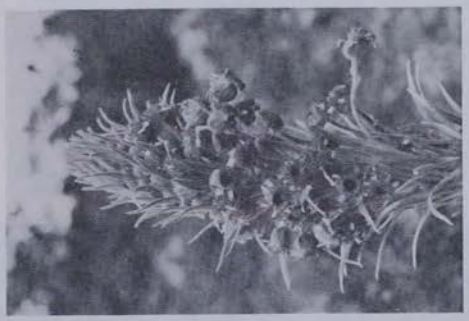
With the rediscovery of the Islands by Captain Cook in 1778, the remaining Hawaiian flora consisted of close to 30,000 species and obvious varieties. Due to resulting Caucasian and Oriental introductions of food plants, farm and range animals, weeds and timber trees, insect and fungus diseases, animals prized by hunters, and the bulldozing of vast areas for golf courses and human housing, today only about 20,000



Argyroxiphium kauense (Rock & Neal) Deg. & Deg.
(From Hawaii)

Argyroxiphium macrocephalum A. Gray
(From E. Maui)

Cart in the mail Friday
June 13, 1975



Argyroxiphium kauense (Rock & Neal) Deg. & Deg.
Photographed August 9, 1974 mauka of Kahuku Ranch, Kau, Island of Hawaii, by Denis Cabral, Degeners & Sunadas under leadership of of Kaoru Sunada, Director in charge of Mauna Kea Silversword Restoration Committee, Waiakea Soil & Water Conservation District.

Argyroxiphium macrocephalum A. Gray From Haleakala, East Maui; three distinct plants, the central one dying after flowering. This species typically bears a terminal stem devoid of lateral branches.

Argyroxiphium sandwicense DC. From Mauna Kea, Hawaii; single plant, even when immature, typically bears lateral branches from near base of terminal stem.

of such taxa remain. Of this impressive number barely 3,000 have been adequately described.

An inkling of our present vast ignorance of the botanical riches about us is shown by a modern listing of cyrtandras native to the Hawaiian Islands:

ISLAND	NUMBER OF KINDS KNOWN TO DATE	SQUARE MILES
Oahu	128	604
Maui	29	728
Hawaii	23	4,030
Kauai	22	555
Molokai	13	260
Lanai	6	141

Does it not seem strange that Oahu with 604 square miles has 128 cyrtandras when Maui with 728 square miles has only 29 known cyrtandras, and Kauai with 555 has only 22? Figuring differently, is it not suspicious that Oahu with only 604 square miles has 128 cyrtandras, when the remaining five islands with 5,814 square miles should have only 91? The explanation for such a discrepancy of distribution in the genus Cyrtandra is not botanical. IT IS HUMAN!

"Oahu has been the center of human botanical activity for nigh unto two hundred years. It is the seat of the Capital, Honolulu, where the Bishop Museum and the University are located. Most visiting botanists and collectors resided there, and collected within easy walking, riding or driving distance of the city. Teachers - - - scoured Oahu with their students week-ends and holidays for its botanical riches. The 'outside islands,' in contrast, always have been neglected." If Oahu with about 600 miles averaged one cyrtandra for every four or five miles, could not the entire archipelago with a combined total of 6,418 miles theoretically harbor 1,283? Even were we to reduce the "mileage" by half because of some inhospitable lava flows and alpine heights on Maui and Hawaii, our population of discovered and still undiscovered cyrtandra

taxa would exceed 500. What applies to the genus Cyrtandra, relatively unknown in the Archipelago excepting of Oahu, applies more or less to the remaining Hawaiian genera.

To propose a list of endangered, threatened and recently extinct species of higher plants is wise for the Continental United States. There the flora is well known. But to attempt one for the incompletely known Hawaiian Islands would be disastrous as it would lull us into dangerous complacency. Such a list would describe a few gaudy endangered and threatened species known to us, and condemn the many thousands of more modest undiscovered ones to the risk of extermination. The nonbotanist would assume that any plant not listed could be destroyed with impunity. "As it is not listed, chop or bulldoze it." What is actually needed is a blanket statement, like an "umbrella policy" in insurance terms, that ALL native Hawaiian plants are endangered and threatened with extinction EXCEPT FOR A "BLUEBOOK" LIST INCLUDING SPECIFIED PLANTS such as the beach morningglory, certain taxa of ohia-lehua, of koa, etc.

Regarding the Island of Maui silversword, the writer camped within Haleakala for three weeks in 1927, studying causes for its decline. He noted this was due chiefly to the depredation of feral goats, and to an unusual but otherwise not too dangerous infestation of maggots of an endemic fly which were eating the flower heads. At that time barely a hundred plants remained visible on the barren cindercones and cliffs. Today thanks to the wise administration of the National Park Service this species, known as Argyroxiphium sandwicense DC., s.l., has increased upward of 25,000 plants! This is the species, so well known to residents and tourists alike, and shown incorrectly labeled in the January article of the "Smithsonian."

The Kau silversword, growing in a very restricted, open, shrubby rainforest on the southwest slope of Mauna Loa, Island of Hawaii, is an entirely different plant. This does not hug the ground as does the xerophytic A. sandwicense; nor are its leaves stiff and densely covered with silvery, sunlight-repelling hair. When intensively studied and photographed last year within its concentrated range of twenty to thirty acres it numbered a scant 1,000 plants of all sizes. This Kau silversword, the true Argyroxiphium kauense (Rock & MacNeal) Deg. & Deg., is truly an endangered and threatened species, particularly because hunter pressure induced officials in 1974 to liberate two mouflon ewes and a ram to breed and multiply in the general area. If goats almost exterminated the Maui silversword in and about Haleakala in 1927, what will these wild sheep, originally native to Sardinia and Corsica, do to the defenseless Kau silversword? Jeremia 2:7 in Biblical times described such folly:

"And I brought you into a plentiful country,
To eat the fruit thereof and the goodness thereof;
But when ye entered, ye defiled my land,
And made mine heritage an abomination."

(Signed) Dr. Otto Degener
Naturalist, Haw. National Park, 1929
Author, Flora Hawaiiensis, 1932-

* *

Uniquely bound loose-leaf volumes profusely illustrated and describing the wild and cultivated ferns and flowering plants of our gardens, roadsides and mountains. Here are the authoritative books giving you the plant's correct English and scientific names, native home, distribution, present and former uses and facts of interest. Moreover, as many of these plants are found elsewhere in the South Seas, this work is useful in the study of other Pacific regions. Read about the Spanish moss & auto cushions, tacca and calico frocks, a runaway orchid, pickleweed to lay the dust, Mexican tea, 4 o'clock face powder, cherimoya, avocado & rats, klu & perfume, poinciana & pavement, peanut & chocolate, clitoria & blue rice, wiliwili & surfboard, indigo, tephrosia fish poison, pride-of-India, mahogany & Kalakaua, poinsettia, castor oil, California peppertree, christmasberry, soapberry, kokio the missing link, milo & calabash, passionflower, dayblooming cereus, cochineal cactus, pricklypear, pomegranate & Pliny, Indian almond & Indian summer, roseapple & Byron, mountainapple, fuchsia, Chinese violet, scarletpimpernel, Natalplum, periwinkle, dodder, Cape gooseberry & poha jam, popolo, African tulip, Liberian coffee, gardenia, hedgehog gourd, Star-of-Bethlehem & blindness, trematolobelia the native saltshaker, maidenhair, Bermuda grass & hayfever, waterhyacinth & navigation, yam & whaling, wauke, macadamia, Diamond Head sandalwood, seagrape jelly, caper sauce, Chile algaroba & bees, cotton & Marin. Volume 7 in press.

NATURALIST'S SOUTH PACIFIC EXPEDITION: FIJI

Otto Degener

A narrative based on the writer's stay of eight months in the Fiji Islands as member of the Anne Arnold "Cheng Ho" Expedition. Read about the fabulous junk-yacht built of camphor and mahogany woods, collecting orchids and shells, Thakombau & Queen Victoria, Fijians & Tongans, trial by ordeal, cobbler Carey & Christianity, hot Spring of Savu Savu, mistaken for Japanese spy, schooling, blackbird labor, elephantiasis, giant kauri, Hydnophytum the ant plant, Degeneriaceae a missing link rediscovered, tattooing, hair does, funerals before deaths, fine points of cannibalism, the tambua, races of man, some missionaries, mbeautiful Mbelo, time-table for drinking yangona or (k)awa, flying foxes, Aloisio adopts a father, Aloisio woos "I Dunno," and scientific list of 2,000 plants collected. Illustrated with 42 plates and 73 figures.

For the above books or for information write Drs. Otto & Isa Degener, Volcano, Hawaii 96785, U.S.A.

Mr. & Mrs. Kaoru Sunada at 400 feet elevation and Park Ranger Don Reeser at 4,000 feet elevation are growing different taxa of Argyroxiphium from seed under controlled conditions for proper understanding of their relationships and naming.

HAWAIIAN PLANT NAMES AND THEIR BOTANICAL EQUIVALENTS

We publish the following list realizing it contains shortcomings. The vernacular names have been gleaned by the writers, early haole travelers, residents throughout the islands and the publications of other authors. Early botanists noted likenesses between plants rather than differences, and thus were usually less critical in their determinations than we are today. The Hawaiians, likewise, often failed to note the more obscure features distinguishing the different taxa. As a result, a vernacular name in the list below applied to one species may very well apply to one or more other species superficially resembling it. Language difficulties between early haole collectors and their native informants added undoubtedly another element of confusion. With the native population gradually marrying out of existence as a race and the old culture and language disappearing, for us to correct all ancient errors-if one in this age would call such usage during that time an error-at this date would be impossible.

I have worked on your introduction and submit it for your review - I feel that we should credit the other authors in a bibliography at the end of the list.

Also here is the list I promised please check it and let me know - I suspect I have a lot of mistakes in the Scientific names Aloha - Nordh

The present list of Hawaiian names and their botanical and English equivalents is a provisional one begun by the senior writer almost fifty years ago. He had been stimulated by the superb compilation made by 1.) Brigham in 1893. This was obviously copied, somewhat enlarged, by 13.) Rock in 1913. To this list the Degeners in their manuscript added names used in the publications of 2.) Bryan & Walker, 4.) Doty, 5.) Emerson, 6.) Handy & Handy, 7.) Hillebrand, 8.) Merril, 9.) Munro, 10.) Neal, 11.) Pekelo, 12.) Porter, 14.) Stimson & Marshall and, especially used in the fabulous dictionary authored by 15.) Pukui & Elbert. The vernacular plant names in the latter had been gleaned from innumerable sources, apparently excluding Brigham's pioneer work but including the *Flora Hawaiiensis*. Here the two linguists discovered the writer's pseudo-Hawaiian name "*kamapuaa*" which he had dubbed his newly discovered coffee relative *Kadua (Hedyotis) kamapuaa* on August 10, 1932. Luther Earl Bishop's "Honolulu Botanic Gardens Inventory 1972" and Harold St. John's "List and Summary of the Flowering Plants in the Hawaiian Islands," both published in 1973, unfortunately came to the attention of the writers too late for consultation.

Besides the library sources mentioned, the Degeners collected vernacular plant names for miscellaneous publications; and from personal communications with Hawaiian acquaintances and friends such as Mr. Oliu [Oliver] Kiekie Pohina (1906-1973) of the once-isolated fishing village of Milolii, Kona, Hawaii. Realizing that many younger Hawaiians, especially of rural areas, know the names of native plants not from books but rather from daily conversation with their elders, the Degeners prevailed on Forester Noah Pekelo, Jr., of Molokai to join them in the present project as collaborator.

1. Brigham, W. T. A List of Hawaiian Names of Plants with Botanical Equivalents. Preliminary Cat. B. P. Bishop Museum 4:46-57. 1893. (Listed in library as Bot. Pamphlet 1351.)
2. Bryan, L. W., & Walker, C. M. Prov. Checklist Forest Plants Haw. 1-34. 1966.
3. Degeners' publications and field notes. 1922 to date.
4. Doty, M. S. Key to Frequently Found Genera Haw. Seaweeds. Ed. 8. 1957. (Mimeographed.)
5. Emerson, N. B. Unwritten Literature of Haw. Bur. Amer. Ethnology Bull. 38:1-288. 1909.
6. Handy, E. S. C., & E. G. Native Planters Old Haw. 1-641. 1972.
7. Hillebrand, W. Flora Haw. Isl. 1-673. 1888.
8. Merrill, E. D. Index Cards to Species of Plants Credited to Polynesia (unofficially named "the pink slips," and deposited at the New York Botanical Garden, Bishop Museum and elsewhere. The wealth of vernacular names cited has not yet been thoroughly studied because of the bulk of the Index and its inaccessibility).
9. Munro, G. C. Typewritten copy of his plant notes in Degeners' possession.
10. Neal, M. C. In Gard. Haw. 1-805. 1948; ed. 2:1-924. 1965.
11. Pekelo, N. Jr. Personal notes to date.
12. Porter, J. R. Haw. Names Vasc. Plants. Coll. Trop. Agri., Univ. Haw. Dept. Pap. 1:1-63. 1972.
13. Rock, J. F. List Haw. Names Plants. Terr. Haw. Bd. Agr. & For. Bot. 2:1-21. 1913.
14. Stimson, J. F., & Marshall, D. S. Dictionary of some Tuamotuan Dialects of the Polynesian Language. 1-623. 1964.
15. Pukui, M. K., & Elbert, S. H. Hawaiian-English Dictionary. Ed. 3. 1-370. 1965.

Waialua, Oahu, Hawaii 96791.
Aug. 20, 1975.

Dear Mr. Burkhalter:

Mrs. Degener & I just returned from the most interesting XII International Botanical Congress held in Leningrad. We also took in a week's tour of the Caucasus. So much rot is believed in the U.S., about Russia that we can refute. For example, on the flig between Zurich & Leningrad on a Russian plane, an American tourist took movies; every one snaps pictures in Russia. We could wander all over without supervision. There are no hippies nor welfare cases; all loafers are obliged to choose one of five proferred jobs. Then I guess it becomes a choice of either working or starving. Any one can practice the religion of his choice, but now churches are separated from the Government. Thus without govt., funds, they are gradually dying as churches and becoming museums. The streets in Leningrad & Moscow are washed nightly, and swept by street cleaning women. We noticed one of them picking up a discarded match because it did not belong on the street! The people on the street we saw casually look happy and cleanly dressed, but what we might consider a bit hsabbilly as though they had bought their cothing at the Salvation Army. But we botanists were royally treatted. We lived in a 6,000 room hotel that resembled a Hilton.

We have not forgotten you as we have your letters of July 2, 1970 Sept. 11 abd Sept. 17 on file. On that of Sept. 11 is the notation that you still owe us for oneset of the Flora Ha Vols. 1-6. Do you want to pay me $30 for it at this time? Vol. 7 is just about completed. In fact, lots of fascicles have already been distributed, I retaining only 1,400 copies of each for final binding in a cover. Of course, if you want what we have published thus far, you can have the lot for an additional $10. I, however, would not recommend such a purchase. Why not wait until the book is properly bound?

What is your Master's thesis? Will it be concerned with some genus represented in Hawaii?

Aloha,

Dr. Otto Degener

THE UNIVERSITY OF WEST FLORIDA
PENSACOLA, FLORIDA 32504
(904) 476-9500

GAMMA COLLEGE
FACULTY OF BIOLOGY

June 28, 1975.

Dear Dr. Degener,

It is my hope that this letter finds you and Mrs. Degener in a state of good health and prosperity. It is also my hope that you have not forgotten this botanist from Pensacola, Florida, who has not written to you for a number of years and must apologize for the same. Since I last wrote to you, I have been busily working on my master's degree at the University of West Florida here in Pensacola.

Recently I was showing the first volume of your superb Flora Hawaiiensis to a pteridologist who is a member of UWF's faculty, Dr. Michael Cousens. Needless to say, he was highly impressed. It was then that I remembered you were working on a seventh volume of this magnum opus when I last corresponded with you. I became excited: is volume seven completed at this time? If it is I am anxious to have a copy of it. Please send one copy of volume seven to me here at the University as soon as you can, if it is available, and bill me for it. At least let me know of its progress in the event that it has not been finished.

I look forward to hearing from you soon--can, in fact, scarcely wait until I receive your reply. Please give my regards to Mrs. Degener.

Yours sincerely,

James R. Burkhalter

James R. Burkhalter,
Bldg. 58, Rm. 108.

UNIVERSITY OF CALIFORNIA, SANTA BARBARA

BERKELEY • DAVIS • IRVINE • LOS ANGELES • RIVERSIDE • SAN DIEGO • SAN FRANCISCO — SANTA BARBARA • SANTA CRUZ

DEPARTMENT OF BIOLOGICAL SCIENCES
W. Jürgen Schrenk

SANTA BARBARA, CALIFORNIA 93106

12/6/75

Dear Drs. Degener,

Please send me 1 copy of your "Flora Hawaiiensis" (all that is published so far), since these volumes have been proven indispensable during my recent visit to the islands.

Sincerely,

Dr. W. Schrenk

40,45

Hl. 1-7 (Hawaii Dict.) POT v.2, pamphlets, ~~Fiji~~, PHNPolds.

UNIVERSITY OF CALIFORNIA, SANTA BARBARA

BERKELEY • DAVIS • IRVINE • LOS ANGELES • RIVERSIDE • SAN DIEGO • SAN FRANCISCO — SANTA BARBARA • SANTA CRUZ

DEPARTMENT OF BIOLOGICAL SCIENCES
W. Jürgen Schrenk

SANTA BARBARA, CALIFORNIA 93106

January 20, 1976

Dear Dr. Degener,

Thank you for your reply to my inquiry about the price of your Hawaii Flora, as well as for your good wishes for 1976 (which I gladly return).

I recall to have seen your books in a bookstore in Honolulu for a total of about $ 20.-, and I think I remember a similar price tag on the volumes here in our library. If you now write that you charge $ 40.- for these same volumes, I'm afraid I cannot buy them at this price. Although I like your books very much, and although I found them to be very helpful, $ 40.- for an incomplete flora are in my eyes simply far too much. Please let me know what this 100% increase in price is due to, and whether this maybe was a misunderstanding. If it wasn't, I'll return your (still unopened) parcel right upon the arrival of your reply.

Sincerely, J. Schrenk

P.o. Box 154, Volcano, Hi.96785.
Aug. 25, 1976.

Dear Mr. Arrigoni:

Your Kaena Point letter of Aug. 18 was forwarded to Mrs. Degener & me to our mountain cottage at Volcano.

I guess you are referring to an art icle we wrote about Kaena Point in the Haw. Bot Soc. Newsletter 1(8):9. 1962. Not being home where our library is located, we really don't know what we printed any more. Did we cite our source of information? We must have gotten it from some publication. At any rate, please start at the Point and walk along the coast, preferably at low tide, toward Mokuleia. After 10 to at most 20 minutes you can't miss the "scar interpreted - - - as an eroded dike." It is terrificallly prominent striking at an angle out to sea. Unfortunately, we know nothing more regarding the geology of the area.

Are you going to mention the old Pringle Road leading up to near the flats from which pineapple were to be hauled to the RR? Along that road grows, or at least grew, the endemic nightblooming morningglory (Calonyction).

Regarding the lowland plants. Do you plan to publish your paper, perhaps as a thesis for an advanced degree? Do you know our FLORA HAWAIIENSIS? It is available to you at some public libraries (or from us unfortunately for $40).

Illustrations are worth thousands of words. Years ago I merely erased the magnifications from my printed illustrations in the Flora, and then had a rather nice pamphlet printed about weeds of the tropics. There I printed the plates one-fourth the size. They came out perfectly. If you will print under such plate, whether I had copyrighted it or not, "After Degener," we herewith give you permission to do so for that one project. That would be our contribution to Conservation and, incidentally would advertise our Flora and perhaps help with sales. You would have illustrations for Sesbania tomentosa (almost extinct), Waltheria, sandalwood, naio, caper, Chamaesyce degeneri, Sapindus oahuensis, nehe, morningglories, kokoolau, wiliwili, hau, milo, etc., etc. Of course, there are additoonal il lustrations you can use from our paperback "Plants Haw. Nat. Parks" if you give similar credit where due.

Will you deal with those fascinating limu like the coenocytic Codium and Bryo., and Sargassum that mimics a flowering plants VERY superficially?

You picked out a fascinating
project for which we envy you,

Drs. O. & I. Degener

Edward Arrigoni
712 Kamuela Avenue
Apartment 404B
Honolulu, Hawaii 96816
August 18, 1976

Dr. Otto Degener
68-617 Crozier Drive
Waialua, Hawaii 96791

Dear Dr. Degener:

Please find enclosed four photographic slides which involve an area of study at Kaena Point. I teach marine science topics as a high school teacher for the Hawaii Department of Education and a part-time instructor at the University of Hawaii College of Continuing Education, and the information I am trying to obtain on points of interest at Kaena Point I intend to use in this capacity and as a resource person for a project of the Sea Grant College at the University of Hawaii. Mr. Ray Tabata of Sea Grant is in charge of this project, which in conjunction with a humanities program is attempting to determine what kind of use Kaena Point can best serve the people of Hawaii.

In the publication describing some of the plants and other points of interest at Kaena Point you mentioned a rock called Pohaku-Kauai, "shaped like the island of that name." I have not been able to locate this rock matching your description with "a scar interpreted ... as an eroded dike." I would greatly appreciate any directions you can provide to help us locate this particular rock. May I assure you that the usual resources, such as "Sites of Oahu," have not provided specific directions to the rock.

Another point of interest which we often locate is the area known as "soul's leap." I am assuming from the vague directions of these sources that the "soul's leap" rock is the large reef rock shown in the slide. If we can obtain any sort of confirmation on this similarly questionable point of interest, I would appreciate your help. All this information which is being obtained we hope to have published in some form for the education of students and others who would like to share the pleasure of exploring this last, remaining semi-wilderness seashore of our island.

I have already done an extensive write-up of the plants and geology of the area. If you would like to look over this write-up, which now consists of about 50 typewritten pages, I will be happy to send you a copy. I may be reached at telephone number 737-0818, or in an informal note to me you may want to indicate a convenient time and place to call you.

Incidentally, I have enjoyed your many published articles, including the recent one on pineapples in the newspaper. Thank you again for your help.

Respectfully,

Edward Arrigoni

Edward Arrigoni

9-19-77

Hello,

You are due three thank yous: for the Fiji book, which I am fascinated by; for the advance look at *Flora Hawaiiensis*; and for the pineapple tips. Such happy surprises your books & letter were.

Now that your back no longer pains you and my illness has passed, it seems we have only your poor dog's malady to cure. I hope that when we next hear from you, he is as well as Otto & I are now.

Here is the check for *Flora*. I hope the amount is accurate. And thank you very specially for your thoughts on Fiji.

Sincerely yours, Harriet Kane

THE UNIVERSITY OF WEST FLORIDA
PENSACOLA, FLORIDA 32504
(904) 476-9500

JOHN C. PACE LIBRARY
ACQUISITIONS DEPARTMENT

August 16, 1978

Dr. Otto Degener
Waialua
Oahu, Hawii 96791

Dear Sir:

One of our faculty members has asked us to obtain the following publications from you for the University Library.

Flora Hawiiensis; Degener, Otto; 1946/1975

sent set through 8/-/78 $ 40.00
1.52
41.52

(Fl. Haw. defective; ad. 1st $7.00 gratis)

Please let us know if they are available, and the cost.

We would also like to have our name placed on your mailing list to receive any lists or catalogs you may publish in the future.

Thank you for your cooperation .

Acquisitions Department

DRS. OTTO & ISA DEGENER
68-617 Crozier Drive
Waialua, Oahu, Hawaii
96791 U. S. A.

March 17, 1979

Dear Sirs:

In going through my records in preparation of tax returns, I am confused re-g,rding the enclosed:

To save time I mailed you my FLORA HAWAIIENSIS, Books fascicles complete through Aug. 1978 ON APPROVAL for $40.00 plus $1.52 postage. Kindly advise me:

1. Do you wish to keep the work and will pay the $41.52 without undue delay?

2. Are you returning the work?

3. Does your University plan to ignore the entire matter?

If you choose the last, I wish to enclose the original of this xerox to the tax office with a request for a tax credit either as a $40 gift to an eleemosynary institution or as a bad debt. One of these methods should fit the situation.

Aloha,

Dr. Otto Degener

UNIVERSITY OF GLASGOW

Regius Professor of Botany
M. B. WILKINS
Hooker Professor of Botany
G. BOND, F.R.S.
Professor of Botany
A. D. BONEY

DEPARTMENT OF BOTANY
THE UNIVERSITY
GLASGOW, G12 8QQ
TELEPHONE 041-339 8855

8th September, 1976

Dr. Otto Degener,
Waialua,
Oahu,
Hawaii 96791,
U. S. A.

Dear Dr. Degener,

Your letter of 18th July has been handed to me as curator of our herbarium. The specimens and the two volumes of your Hawaiian Flora arrived at about the same time. I must say how very grateful I am to you for sending them to us, and they are most certainly very valuable additions to our collections.

I have read with considerable interest the article in the Honolulu Advertiser in connection with the controversy over the conservation of your flora. Of course, I wish you every success in your efforts to oppose the destruction of even more species, and hope that those that remain can be successfully conserved. I am sure that you must be right in your view that there are still many undescribed species and probably many more that have perished without ever having been seen by a botanist.

Nevertheless, I do not really feel, in spite of our having some of the Beechey plants, that I am in any position to contribute directly myself. I have no first hand knowledge of the matter. I have only heard one side of the story, and the newspaper cutting that you sent me is now six months old. I thus cannot really see that anyone here is in any position to express an opinion on the details of the controversy, though we all most certainly wish that your flora be saved from further destruction.

Yours sincerely,

Alan Crundwell

A. C. Crundwell.

THE UNIVERSITY OF WEST FLORIDA
PENSACOLA, FLORIDA 32504
(904) 476-9500

JOHN C. PACE LIBRARY
ACQUISITIONS DEPARTMENT

September 15, 1978

Drs. Otto and Isa Degener
P.O. Box 154
Volcano, Hawaii 96785

Dear Drs. Degener:

Your thoughtfulness in sending Flora Hawaiiensis, vol. 1-7 is appreciated very much.

Imagine our chagrin when we started to order cards to learn that we already own volumes 1-6. This was a slip-up on our part and we are very sorry.

We are returning volumes 1-6 and the extra pages which we do not need. Please issue a new invoice for volume 7. It will be processed immediately.

Best wishes for freedom from lava flows, termites and tsunamis. Pensacolas bugaboos are humidity, termites, and hurricanes, of which there have been no major ones since 1916.

Sincerely,

Jeanette Light

Mrs. Jeanette Light
Acquisitions Department

THE UNIVERSITY OF WEST FLORIDA
PENSACOLA, FLORIDA 32504
(904) 476-9500

JOHN C. PACE LIBRARY
ACQUISITIONS DEPARTMENT

September 23, 1976

Dr. Otto Degener
Waialua
Oahu, Hawaii 96791

Dear Sir:

One of our faculty members has asked us to obtain the following publications from you for the University Library.

Degener, Otto: Flora Hawaiiensis

$30.
1,85 post.
$31,85

gratis
Fiji +
pamphlets

Please let us know if they are available, and the cost.

We would also like to have our name placed on your mailing list to receive any lists or catalogs you may publish in the future.

Thank you for your cooperation .

Acquisitions Department

Jeanette Light

pd. 11/19/76

BY AIR MAIL
PAR AVION

Aerogramme

DR. OTTO DEGENER,
BOTANIST,

UNIVERSITY OF HAWAII,

WAIALUA, OAHU, HAWAII,

U. S. A.

From:-

A. H. MUNSHI
Department of Botany,
University of Kashmir,
Srinagar — 190006,
KASHMIR — INDIA.

A. H. Munshi

Department of Botany
University of Kashmir
Srinagar—190006,
KASHMIR — INDIA.

Phone: 2231—30

Dated: 10-4-1976.

Dr. Otto Degener,
Botanist, University of Hawaii,
Waialua, Oahu, Hawaii,
U. S. A.

Dear Dr. Degener,

I have no words to thank you for sending me ypur interesting publication along with two books. It is further requested that you have written me about flora of Hawaii whose prise is 10 dollars which I can not effort because as I am simply a researcher, nextly there is great difficulty for us to get exchange from the banks,. I hope your goodself will send me other publication in future which will be published . If you will require any plant material from our country then pleasse write me I will difinetly send it to you.

Thanking you.

Sincerely Yours,

(A. H. Munshi)

Hibiscadelphus x Kahila

Edward Arrigoni
712 Kamuela Avenue
Apartment 404B
Honolulu, Hawaii 96816
October 15, 1976

Dear Dr. Degener:

Please find enclosed a check for $40 which I hope will cover the cost of your latest copy of FLORA HAWAIIENCIS. Mr. Steven Montgomery of the State of Hawaii Natural Area Reserve Commission and I made a survey of the drawings we plan to use, as you generously offered us. We have not been able to find pictures of several plants in your book. Perhaps we do not have your latest drawings. They include:

Boerhavia repens (diffusa?)
Batis maritima
Cuscuta sandwichiana
Sida fallax
Heliotropium anomalum var. Argentium
Acacia farnesiana
Lantana camara

If they are not yet available, we have the offer of Mrs. Maria Tseu (wife of medical doctor Theodore Tseu) to draw them. She has done botanical illustrations for graduate students working on various projects at the University of Hawaii and will be doing other illustrations of the legends associated with Ka'ena Point for the guidebook.

I am enclosing drafts of Mrs. Tseu's work and a partial draft of the guidebook. I hope to have it ready for the review of proper authorities within a month.

I will keep you informed of this project. Thank you again for your help and encouragement.

Sincerely,

Ed Arrigoni

Oct. 20, 1976

Dear Mr. Arrigoni:

Mrs. Degener & I are delighted Mt. Gomery & you are getting the general public to appreciate our Mokuleia-Kaena Pt., area. It will so help educate everyone in favor of Conservation. We do so hope no road will destroy this narrow strip.

We have listed about 100 species we know, limited to the "flats" of the region. Somehow we forgot to add Canthium odoratum, a member of the Coffee Family.

Mrs. Degener was a staff member of the Bot. Garden in Berlin until our marriage, and I have been a staff member of the New York Bot. Garden for many years. We try to maintain Mainland standards of nomenclature, being precise in identifications and spelling. Hence the Fl. Haw., is pretty well scattered throughout the bot. gardens and institutions of thr World, and won the Linné medal from Stockholm, Sweden. So, if our scientific names do not coincide with those of other local workers, I would be very critical in my choice of name. Of course, Botany is a Science that is advancing, so don't be surprised if quite a few scientific names will be changed in the future after chromosomes, pollen, etc., have been better studied.

Regarding the pictures you failed to notice in our books:

Boerhavia is omitted because the present identification is questionable. A von Poelnitz (my spelling may be wrong) was monographing the Haw., plants, started publishing but was prevented completing it by being killed in a bombing raid in Germany during World War II.

We printed both Batis & Cuscuta in the Fl. Haw.

Haw. Sida taxa we did not publish, after we started working with Dr. Skovsted of Europe, when dissatisfied with the determinations. Similarly, we omitted Heliotropium, being confused regarding the status of the same or related taxa on more distant islands.

Lantana camara is in our Nat. Park paperback.

"Acacia" farnesiana we call Vachellia f. Any one can see that a plant with klu pods cannot belong in the same genus as the koa. Similarly, the "Cassia" group actually consists of many different genera. Just look at the pods!

Did you ever think of adding a list, similar to our Poamoho Trail one, regarding the species available along your area? You really should keep a herbarium of voucher specimens as proof of your having found the plants there. The herb., should be kept in some institution free of destruction by insects, etc., and added to as you discover additional species. In time it will be eminently valuable as a history of the change of flora in an area sensitive to man's influence with his introduced animals and plants.

We wish you and Steve Mt. Gomery the best of luck with your worth while project.

Regarding Fl. Haw. Books 1-4, the work was printed during WW II on poor emergency paper & bound in poor cover. That it why I sell the 1192 pages for only $10.

Aloha,

BIOLOGICAL LABORATORY
DEPARTMENT OF GENERAL EDUCATION
NAGOYA UNIVERSITY
Chikusa-ku, Nagoya 464, JAPAN

Drs. Otto & Isa Degener
P.O.Box 154
Volcano, Hawaii 96785
U.S.A.

Nov. 11, 1976

Dear Drs. Otto & Isa Degener:

Pardon me for my long silence since this summer. Thank you for your kind letter and we are hoping to get the next chance to visit your Hawaii Islands again. Thank you also for your successive sending of your reprints and epiphyllous specimen of hepatics collected by you.

The parcel of moss specimens I collected with you at Volcanoes National Park arrived here safely and I have finished to put them in order. Now I am examining them carefully and Bartram's "Manual of Hawaiian mosses" which you presented me long years ago is very useful for the present work.

I am asked to give a lecture on Hawaiian flora at the meeting of Nagoya Branch of the Botanical Society of Japan which will be held on next Sat. (Nov. 20) at our University. I am planning to exhibit your important publications "Flora Hawaiiensis" and dry Hawaiian specimens you sent me for many years.

My wife is also very well and we are enjoying always many pictures and color slides we took at Hawaii.

We do hope you all are in good health.

Sincerely yours,

Noriwo Takaki

Noriwo Takaki

City of Birmingham

CITY MUSEUMS AND ART GALLERY
Birmingham
B3 3DH. Telephone 021-235 9944
Dennis Farr, M.A., F.R.S.A., F.M.A. Director

your ref. NHD/DRGW/PT/ our ref. 11 date 28th Jan. 1977

Dr. Otto Degener
68/617 Crozier Drive
Walalea
Oahu
Hawaii
96791
U.S.A.

Dear Dr. Degener,

Many thanks for your gift of the New Illustrated Flora of the Hawaiian Islands. This will make a most useful addition to our botany library.

I am most envious of people like you working in such an attractive part of the world. In Birmingham during the next few years we will have the opportunity of growing examples of the British flora at a 6 acre site called the Birmingham Nature Centre.

If you are ever in these parts please contact me and I will be happy to show you this work, which you will probably agree is quite unique for a Natural History Department in a large city like Birmingham.

Many thanks again.

Yours sincerely,

D.R.G. Walker
Acting Keeper
Natural History Dept.

Telephone calls to Mr. Walker

Direct line 021-235 2838

Drs. DEGENER
Waialua, Oahu,
Hawaii, 96791 ,
U.S.A.

Dear Dr. Otto and Isa DEGENER,

I want to express my sincere gratitude to you for the kindness in sending me such interesting and thrilling books on your travel to Fiji Isles and "Flora Hawaiensis". They are a pride of my library. Thank you very much for the copy of Garden Journal. Is is of great interest for me.

Flowers of african violets propagated from seeds you've kindly sent me now are in blossom. I am waiting for another seeds parcel from New Jersey you mentioned.

I am waiting for my book printing in summer and I'll send my "Manual of the genus Ascochyta Sacc." (Fungi imperfecti - Deuteromycetes) to you.

With very best wishes

yours sincerely

V.Mel'nik
Bot. Inst. Acad. Sci. U.S.S.R.
Prof. Popov street 2,
197022 LENINGRAD 22, U.S.S.R.

February 7,
Leningrad

Familie
Otto & Asa Degener
Waialua
O a h u HI 94791
U.S.A.

Absender:

Institut für Forstpolitik
u. forstl. Betriebswirtschaftslehre
Abt. Forstpolitik u. Forstgeschichte
8 München 40 · Schellingstraße 12/II
Telefon 2180/3551

Mit vielem Dank empfing ich Ihre freundlichst übersandten Arbeiten:

I thank you very much for sending me your publication:

Je vous remercie vivement pour votre envoi de:

Flora Hawaiiensis und andere Arbeiten

Mit vielem Dank
In herzlicher Verbundenheit
Ihr

München, 26.4.77.
Amalienstraße 52

Dr. E. Gundermann

MUSÉUM NATIONAL D'HISTOIRE NATURELLE

BIBLIOTHÈQUE CENTRALE
38, Rue Geoffroy-Saint-Hilaire
75005 PARIS
TÉLÉPHONE : 331 71.24

Paris, le 10 février 1977

Drs. Degener
Waialua
Oahu
Hawaï
U.S.A.

Monsieur,

Nous avons bien reçu vos graines :
RAGENARIA SICERARIA (Molina) Standley
et nous vous en remercions. Nous les transmettons au service des cultures du Museum.

Par ailleurs , nous prenons note que rien de nouveau n'est paru pour FLORA HAWAIENSIS.

Veuillez agréer, Monsieur, l'expression de nos sentiments distingués.

Pour le Conservateur en Chef

E. Dourron

Madame Dourron - Service acquisitions

LYMAN HOUSE MEMORIAL MUSEUM
276 HAILI STREET • HILO, • HAWAII 96720

March 17, 1977

Dr & Mrs. Otto Degener
68627 Crozier Drive
Waialua, Oahu, HI, 96781

Dear Dr. & Mrs. Degener:

I am so very sorry for all the confusion I caused you by my forgetfulness. It was indeed very careless of me to mail the invoice without any address on it. I hope you will forgive me for all your trouble.

Thank you very much for sending us the books so promptly. I hope to have occasion to order many more and will be more careful with the addresses on future orders. I am instructing our bookkeepper to mail you a check for the items listed below. I would rather not have the Plants of Hawaii National Parks on a consignment basis if you do not mind. I recently sold one copy of Flora Hawaiiensis (Vol. I-IV) and am including your consignment price in the check.

The check is for:

Six (6) copies..... Plants of Haw. Nat. Parks	$18.00
Flora Hawaiiensis.....	10.00
Postage (for invoice 6143)...	2.33
TOTAL	$30.33

Mr. Lyman sends his regards and hopes we can accomodate Mrs. Degener's membership very soon and that we can keep on decreasing your abundance of books.

Thanking you again for your time and trouble and hoping you will forgive me for all the inconvenience I caused you both, I am

Very sincerely,
Marni Herkes

May 1, 1977

Dear Mrs. Yerkes:

I have the $30.33 cheque for the books. Many thanks. Should you need any more, all you need half the time is to 'phone us 967-7409 to Volcano. We alternate our living between beach and mountain about every two or three months.

I assume the $10 from book sales has been turned over to the Association so that Mrs. Degener can be a Charter Member. If her name is used on a membership card, I guess she should be "Dr. Isa Irmgard Degener."

We are such good friends of our distant neighbor, Mrs. Frank Lyman, at Volcano. It will be nice for my wife to be a fellow Charter Member with her, and drive down together to Hilo for preview receptions.

The Hawaiian gourd (ipu) vine is getting increasingly rare. We were advised that should give some of the seeds to Miss Sparko for her garden.

Aloha to Miss Spargo, and to you,

Dr. Otto Degener

96791 March 10, 1977

Dear Miss Herkes:

Mrs. Degener & I were so confused receiving Order 6143 from HONOLULU from you WITHOUT information as to where to ship the package that we 'phoned to two Honolulu parties to solve the puzzle.

Yesterday I mailed:

6 copies Degener, Plants Haw. Nat. Park, paperback @ $3.00	$18.00
1 set Fl. Haw. (Vols. 1-6) net	20.00
Postage	2.33
	$40.33

I am mailing you everything on consignment to simplify matters.

There is a slight complication. Mrs. Degener & I are enormously wealthy in unsold books and enormously poor in cash * we are our own publishers, and that is where the cash is tied up. Mr. Lyman kindly gave us the opportunity to become Charter Members in his letter last December. Upon selling our Flora Haw., for $30, could you turn over $10 of the sale price to the Association for Mrs. (Dr.) Isa Degener's membership?

I remember meeting Mr. Lyman in the Botany Building of the University of Mass., in Amherst in the '20s. We were both diffident students there at the time. He was thin and dark-haired.

Aloha,

MENSURATION

		inches		feet
Length of	pace	27		2.25
"	" span	9		.75
Height "	eye	68		5.6
"	" reach	92	(tiptoe 8 feet)	7.6
Width "	hand	3½		

April 11, 1977.

Dear Mr. Long:

Just as all of you in New York have been working for Conservation World wide; so Isa & I for the last ten or twenty years have been working for conservation in and about the Hawaiian Islands. We have been moderately successful. Most biologists in the Islands are Conservationists. Being employees of Government institutions, they cannot risk being too outs spoken for fear of reprisal. So we and Audubon Society Mac Mull are picking most of the chestnuts out of the fire.

We need our holographs returned soon, as we copy & recopy our articles to send to key individuals involved in the biological fiasco prevalent here. The arguments are usually the same, often merely requiring rewording. We just leaved through the enclosed pile of letters to mail our "palila" xerox copies to people who had written us in the past.

As before, please return any originals that you consider worthless for the Archives; and, if our carbon answers do not reproduce, please return the originals.

You have the fascicles of our Flora Haw., Book 7. Here, under my "ottobiography," we have listed our Bibliography. Now that both of us have survived longer than expected, we should update our bibliography with another sheet in our next fascicle. Please do mail us, or ask Dr. Rogerson to do so, the lists of publications he had published in the past Garden Annual Reports. We want the Garden publication & our new sheet to coincide as much as possible.

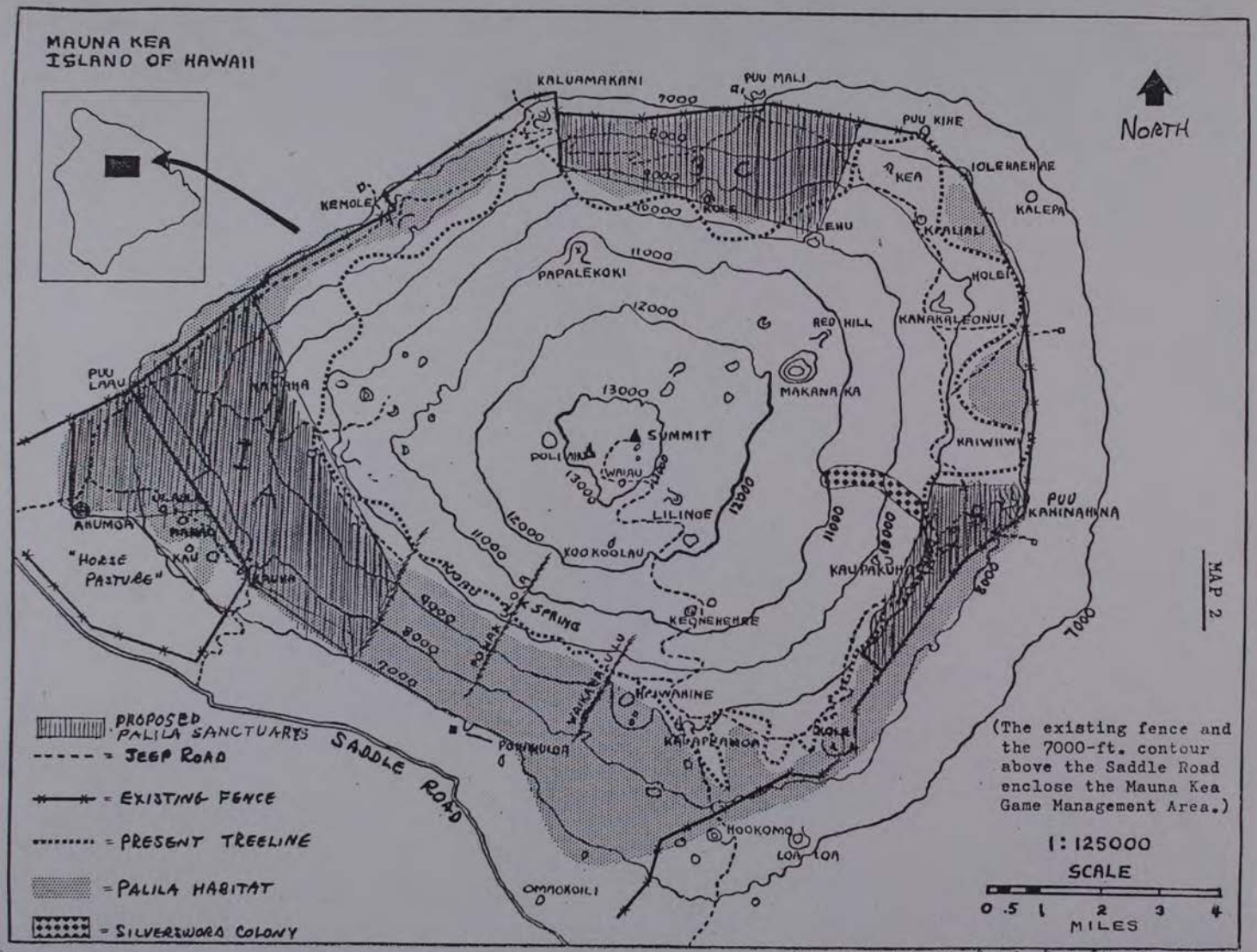
We need your professional advice regarding newspaper articles: Are these not publications, like the "palila" clipping? Now what do we do when we have 200 copies xeroxed to mail to local politicians abd bot.institutions of the world? Are we supposed to append a notice such as "xerox copies widely distributed."? We try to insure retention of such xeroxes by pasting them into covers of Phytologia, etc.

WE are lucky! We had planned to present a paper at the Island Symposium in the Canaries this month. When, however, Thomas Cooke & Sons could not get us on an inexpensive Charter Flight, we reluctantly gave up the idea.

Isa Joins me in aloha,

O. H. Degener

P.S. In the Garden periodical Isa is listed presumably as just a housewife. Her doctorate should be listed - she earned it.



THE UNIVERSITY OF THE ORANGE FREE STATE

TELEPHONE 70711 - P.O. BOX 339 - BLOEMFONTEIN 9300

DEPARTMENT: BOTANY REPUBLIC OF S.A.

Refer: HJTV/JdL

24 June 1977

Dr Otto Degener
68-617 Crozier Drive
Waialua, Oahu
HAWAII
USA

Dear dr Degener

Please receive our sincere thanks for the "Flora Hawaiiensis" we recently received from you. We appreciate your consideration. We shall have it bound and placed in our Departmental Library. We consider it as a valuable reference work, especially as we have very little on the flora of the islands of the Pacific Ocean.

With best regards

Yours sincerely

(DR H J T VENTER)

ALICE FROST DOUGLAS
R. R. 1, Box 176
Captain Cook, Hawaii 96704

November 13, 1977

Dear Drs. Degener,

I have now completed the task of filing books one through seven of the "New Illustrated Hawaiian Flora" in proper order and find that what I want most is a compete index of all the families, Genus, Species, Variety or Cultivar, common and Hawaiian names so that your excellent work can be really useful.

Is there yet such a thing available?

I also will want to know whenever you put out further listings as I will want to add them to what has already been done.

I am finding your descriptions of the Hawaiian flora very useful but certainly, as stated above, crave an index complete with cross references.

Sincerely yours,

Alice Douglas

Alice Frost Douglas
address above

Nov. 1

Douglas:

Mrs. Degener & I have your Nov. 13 letter.

is no Index such as you have described for the Flora Hawaiiensis.
ora, considering Flowering Plants alone, comprises today probably over
ustrated descriptions. Moreover, considering exotic weeds and ornament
thousand. The Fl. Haw., thus far deals with just a fraction of the pl
chipelago. We formerly published indices for individual books of the
rth the money expended.
we publish one illustrated species, perhaps 100 new ones are introduce
fact, The Soil Conservation group on Haw., has ordered 100 different
from the Mainland to scatter over pasture land! As our Flora can never
se-leaf to enable the insertion of sheets of new discoveries and intro
continued indefinitely, we having provided for a Trust for doing so a
ora Haw., is not written to be a vademecum for the average reader: Mis
xcellent for that purpose. It is more for the serious amateur and prof
ey would know the Family to which a plant belongs, and then go to the
er in our Flora. Then they would be obliged to hunt through the alphal
nera to see whether their plant has yet been described. The chances a
find it, as mentioned above, the Fl. Haw., is still VERY fragmentary.
ng.
true Mrs. D., & I have a list alphabetically arranged of all genera g
re titles on Sheet X_0. But to do so was a waste of time. There are too
not yet listed. It is up to the Trustees to decide evetually if they
index after every tenth or twentieth book.
way, our haole koa is NOT Leucaena glauca. A controversy has raged w
cocephala or the more recently chosen L latisiliqua. We judge it to b
mint a replacement of the old sheet. As OUR Fl. Haw., is a "Family e

MUSÉUM NATIONAL D'HISTOIRE NATURELLE

BIBLIOTHÈQUE CENTRALE

38, Rue Geoffroy-Saint-Hilaire
75005 PARIS
TÉLÉPHONE : 331 71.24

Paris, le 21 Juin 1978

Drs DEGENER
Waialua
Oahu
HawaÏ
U.S.A

Monsieur,

Nous vous serions très obligés de bien vouloir nous faire savoir si quelque chose de nouveau est paru depuis le volume 7 pour FLORA HAWAIENSIS.

Avec nos remerciements, nous vous prions d'agréer, Monsieur, l'expression de nos sentiments distingués.

Pour le Conservateur
chargé du service des Acquisitions

Brindel

Madame BRINDEL

RIJKSHERBARIUM

SCHELPENKADE 6 - P. O. BOX 9514
2300 RA LEIDEN - The Netherlands
Telephone: 071 - 130541

No.: 1164.

Ref. :

Subject:

Drs. Otto and Isa Degener
68-617 Crozler Drive
Walalua, Oahu, Hawaii
96791, U.S.A.

Leiden, 27th October 1978.

Dear colleagues,

Thank you very much for sending me the bundle of sheets from your Hawaiian Flora. I also did not yet thank you for the reprints which were handed to me during the symposium at Aarhus last August. You may have heard reports about the symposium, although there was no one from Hawaii. I thought it a very good symposium; it is a pity that you could not attend.

With kindest regards,

Yours sincerely,

(Prof. Dr. C. Kalkman)
director

JHL.

DRS. OTTO & ISA DEGENER
P.O. Box 154
Volcano, Hawaii
96785 U.S.A.

Sept. 23, 1978.

Dear Mrs. Right;

I received your Sept. 15 package of my Flora of Haw., Books 1-6, and was truly amazed that the post office charged you over #10 for it! The original package, which had contained Book 7 ± in addition, cost me only #1,52 in postage. I may often enclose a letter or bill in such a package, noting on outside next to a 15 cent stamp merely "letter enclosed." When I get orders for books from the University of Hawaii the stamped notice "Mail Library Rate" has always been added. Can it be that Florida post office officials interpret regulations differently than do those in Hawaii? It might be well to investigate, without risking any change here by mentioning Hawaii.

Incidentally, since Mrs. Degener & I are both staff members of the New York Bot. Garden, all packages of herbarium specimens sent within the U.S., go via "Library Rate." I guess your Botany Dept., knows about this.

After waiting your time, please accept Book 7, such as it is, as a complementary copy.

Aloha,
Dr. Otto Degener

Esidrix
(hydrochlorothiazide USP)
DO LIST

First things first

Dear Dr. Degner:

Please send me Flora Hawaiiensis Books I-IV

Enclosed find a check for $10.00.

Sincerely yours,

Paul Degner, M.D.

1

FIRST to publish on circulation of the blood—William Shakespeare in *Coriolanus* (19 years before Harvey)—"I send it through the rivers of your blood,/Even to the court, the heart, to the seat o' the brain;/And, through the cranks and offices of man,/The strongest nerves and small inferior veins...."

Botanische Staatssammlung
D-8000 München 19
Menzinger Straße 67

München
Stadt weltberühmter Biere

30

POSTKARTE

Drucksache

Drs. Otto & Isa Degener,

P. O. Box 154,

Volcano, Hawaii 96785 / USA

435

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LABORATOIRE DE PHANÉROGAMIE
16, RUE BUFFON - PARIS (V°)
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Dr Otto DEGENER
68-617 Crozier Drive
Waialua, Oahu
HAWAI 96791

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20 20

भारत INDIA
100

TO
DR. DEGENER, OTTO,
CROZIER DR., WARIALUS,
OAHU, HAWAII, U.S.A.
U.S.A.

München. 4.12.1978.

Sehr geehrter Herr

Wir haben mit bestem Dank die nachstehenden Sonderdrucke erhalten.

Dear **Drs. Degener,**

We have received with many thanks the following reprints.
Flora Hawaiiensis, 4 parts.

With kind regards
Yours sincerely
Prof. Dr. H. Merxmüller

Dr J.E. VIDAL
LABORATOIRE DE PHANÉROGAMIE
16, RUE BUFFON - ~~PARIS 5e~~ 75005 PARIS

Dear Dr Degener

I beg to acknowledge with many thanks the receipt of

papers concerning Flora Haiwaiensis

My best regards

Vidal

Dr. A. B. Vyas
DEPARTMENT OF ZOOLOGY
UNIVERSITY SCHOOL OF SCIENCES
GUJARAT UNIVERSITY, AHMEDABAD-380009 (India)

Date : 2/3/79.....

Dear Doctor

I would greatly appreciate receiving your following reprint(s) "Help save the dwindling endemic flora of the Hawaiian Islands at least as herbarium specimens for museums of the world." PHYTOLOGIA. 37(4). 281-284 1977.

and others on allied topics.

Thanks.

Yours Sincerely

A. B. Vyas

Dr. A. B. Vyas
DEPARTMENT OF ZOOLOGY
UNIVERSITY SCHOOL OF SCIENCES
GUJARAT UNIVERSITY
AHMEDABAD-380009 (INDIA)

NEW ILLUSTRATED FLORA OF THE HAWAIIAN ISLANDS

Family: 308
Genus : Grammica

CUSCUTACEAE
DODDER FAMILY

GRAMMICA Lour. Fl. Cochinch. 170. 1790.

Whitish to reddish glabrous lax herbaceous plants with mostly thin stems. Leaves very reduced. Flowers perfect, regular, small, whitish to reddish, in compact or loose globular inflorescence or in loose racemose or paniculate inflorescence. Pedicels shorter or longer than flowers. Calyx 5- or 4-lobed with lobes upright or deflexed. Corolla 5- or 4-lobed with lobes upright or deflexed, persistent at maturity, surrounding the capsule or rarely corolla detached from its base at maturity to form a cap to the capsule. Stamens as many as corolla lobes. Styles 2, one style usually shorter than the other; stigmas capitate. Seeds usually 0.8 - 2.8 mm. long; embryo with 2 - 4 windings of the spiral.

Name supposed to have been derived from the Greek gramma, i.e., "line", in reference to the appearance of the plant.

Type Species: Grammica aphylla Lour., i.e., Grammica chinensis (Lam.) Hadač & Chrtek

About 70 species known throughout the World, but most abundant in America. Many species are of considerable economic importance because of their parasitism of tobacco, flax, clover, etc.

We had planned to attend the botanical symposium last year at the Viero 7 Clavijo botanic garden in the Canary Islands, and hence ~~xxixxd~~ cleared our shelves of much good legible but shopworn literature pertaining to Hawaii to Director Bramwell in good time for distribution to the assembling delegates. ~~Due to overbooking we never reached La Palma nor were exposed to a ghastly airplane holocaust.~~ Due to awkward plane schedules, we abandoned our flight to La Palma at length reluctantly.

Because of our interest in this fascinating archipelago beside the Hawaiian and our gift, Dr. David Bramwell and Zoë I. Bramwell mailed us a complimentary copy of their "Wild Flowers of the Canary Islands." The book we prize was published in 1974 and is extremely rare in the New World and in many countries elsewhere. The intriguing reason is hardly explained by the statement that "The edition was published by Excmo. Cabildo Insular de Tenerife (Aula de Cultura) in association with Stanley Thornes (Publishers) Ltd, London. For copyright reasons this edition not for sale in U.K. or in North or South America." !!!!

The book, in board cover, comprises X + 261 pages that include 118 carefully drawn illustrations essentially of spermatophytes. In addition, the middle holds 64 full-page color plates depicting beautiful, instructive general views and species habitats.

The Canary Archipelago resembles the Hawaiian in many respects such as volcanic origin, a wet windward and a dry leeward side, subtropical lowlands and subartic highlands, and long geologic isolation. The former archipelago differs in having had a closer contact to Africa than the latter ever had to the Americas or Asia. The Canary Phanerogams "flora appears to be an ancient survivor of a bygone age."

The first 43 pages are of general interest, such as History of Botanical Exploration, Climate, Vegetation Zones, Origin of the Flora, Folklore, and Conservation. Regarding the latter, the wholesale extermination of endemics is about as serious as that occurring in the Hawaiian Islands in this Age of the Bulldozer. The authors conclude that conservation "can only succeed by means of a policy of education," a duty presently somewhat neglected in both archipelagos.

It will interest Hawaiian readers especially that the physician William Hillebrand (1821-1886), author of the "Flora of the Hawaiian Islands," an excellent work for its time published posthumously in 1888, *"had resided in different parts of Germany and Switzerland after leaving the Hawaiian Kingdom in 1871, and was for some years in Madeira and Teneriffe, where he also collected extensively." This fact, ignored by the Bramwells in their History, induced the Swiss botanist Hermann Christ to name Lotus hillebrandii in the collector's honor.

FLORA HAWAIIENSIS
Family : 332
Genus : Coprosama
Species : Waimeae

RUBIACEAE
MADDER FAMILY

COPROSMA WAIMEAE Wawra (yellow color of it's wood)
OLENA (in reference to ye ; WAIMEA CANYON COPROSMA

Coprosma waimeae Wawra in Flora 57:327. 1874.
Coprosma foliosa sensu Hillebr. Fl. Haw. Isl. 186. 1888. (In part.)
Coprosma waimeae sensu Heller in Minn. Bot. Stud. Bull. 1:895. 1897.
Coprosma waimeae sensu Rock, Indig. Trees Haw. Isl. 465. 1913.
Coprosma waimeae sensu W.R.B. Oliver in B.P. Bish. Mus. Bull. 132:163.1935.

Small tree with glabrous to very rarely sparsely pilose branches. Leaves e elliptic to obovate, coriaceous, acute to rarely obtuse at apex, acuminate to somewhat abruptly narrowed at bse, reticulate beneath and smooth above, glabr rous or rarely a few hairs on midrib above andor beneath; blade 25-85 mm. long, 15-40 mm. wide; petiole 5-15 mm. long; stipules broadly triangular, prominently cuspidate, glabrous or very rarely sparsely ciliolate. Staminate flowers 3, on glabrous to rarely sparsely pubescent 7-12 mm. long peduncles o of which usually only 1 arises from leaf axil; bracts paired, narrow-o -vate; calyx cup-shaped, dentate; corolla funnelform. with usually 8 linear lobes; stamens about 8, lobed at base, apicylate. Pistillate flowers 1-4 but usually 3, on 12-20 mm. long peduncle , bearing pair of broadly to narrowly spatul ate up to 5-8 mm. long bracts; calyx cup-shapedm dentate; corolla with short tube and about 8 narrow acuminate lobes. Drupe globose to obovoid, orange, 8-12 mm. long, crowned by calyx teeth.

Type Locality:"Kauai; Gebiet von Halemanu; 2100."

Local Range: This species inhabits the rainforest above about 2,000 feet elevation about Waimea Canyon, Kauai. It is not found about Waimea , or Kamuela, on the Island of Hawaii, as the name might denote. Coprosma or nodioides has black fruit, which are the largest for the genus in the Islands; C. waimeae has orange fruit, the second largest.

Extra Range:

FLORA HAWAIIENSIS

Family 308

67,163

CUSCUTACEAE
DODDER FAMILY

Whitish or yellowish to reddish filiform dextrorsely twining glabrous lax XXXXXXXXX herbs practically always devoid of chlorophyll, parasitic by numerous haustoria on herbs or shrubs and very rarely on trees. Leaves reduced to minute alternate functionless scales. Flowers perfect, regular, small, usually more or less cymosely clustered, whitish to pink or reddish. Calyx inferior, 5-lobed or 5-parted or of 5 distinct sepals (rarely 4- or 5-lobed or 4-/// or 3-parted or of 4 or 3 distinct sepals or very rarely doubled). Corolla 5-lobed (rarely 4- or 3-lobed or very rarely doubled), the tube bearing as many fimbriate or crenulate scales as there are lobes and these alternate with the lobes or very rarely wanting; lobes imbricate in the bud. Stamens as many as the corolla lobes and inserted in the throat or sinuses above the scales, often shortly exserted; anthers short, ovate to oval, obtuse, introrse, 2-celled, longitudinally dehiscent. Ovary 2-celled; ovules 2 in each cell anatropous; styles 1 or 2, terminal, distinct or rarely united below; stigmas linear to capitate. Fruit a globose or ovoid capsule, circumscissile near base or irregularly bursting or indehiscent, 3- or 4-seeded. Seeds glabrous; embryo linear, terete, curved or spiral, with apex bearing 1-4 minute alternate scales; endosperm fleshy; cotyledons none or very rarely present but then rudimentary. Seeds germinate in the soil but soon the root and lower part of stem of seedling dies while the upper part attaches itself to the host. Because the dodder lacks chlorophyll completely (except in a very few exotic species that exhibit a slight greenish tinge in their stems), it must henceforth derive all its nutrition from its host.

A family, comparatively recently evolved from the Convolvulaceae through parasitism, and consisting of at least four genera of which only Grammica is native to the Islands. Because many readers of the Flora are unfamiliar with this strange family, we here give a synoptic key:

1. Style 1; stem mostly robust; inflorescence racemose or paniculate:
   2. Corolla persistent; stigmas capitate to ovate; 2n = 28 (Old World)- Monogynella Des Moul., Études Org. Cusc. 65. 1853. Type: M. vahliana Des Moul., i.e., M. monogyna (Vahl) Hadač & Chrtek
   2. Corolla deciduous; stigmas conic to subulate; as far as known 2n = 28, 32 or 42 (Small, mostly Old World) - - - - - - - Kadurias Raf., Fl. Tellur. 4:91. 1836. Type: K. reflexa (Roxb.) Raf.
1. Style 2; stems mostly thin; inflorescence usually capitate or racemose and only rarely paniculate:
   2. Styles of equal length; stigmas cylindric to subulate; inflorescence globose heads; as far as known 2n =14, 28, 42. (Mostly Old World) - Cuscuta L., s. str., Sp. Pl. 1:124. 1753. Type: Cuscuta europaea L.
   2. Styles of unequal length; stigmas capitate, inflorescence various, from globose heads to racemose or paniculate; as far as known two groups (perhaps genera) occur with 2n = 32 or 56 and with 2n = 30 or 60. (Mostly New World) - Grammica Lour., Fl. Cochinch., 170. 1790. Type: Grammica aphylla Lour., i.e., G. chinensis (Lam.) Hadač & Chrtek

(Degeners, Hadač & Chrtek / /77, to displace Cuscuta 6/14/

(date to come later

Copy of old application for NSF grant gives information in summary:

Flora Hawaiiensis or New Illustrated Flora of the Hawaiian Islands. Books 1-5 (Book 6 in collaboration with Dr. Isa Degener over 75% completed.) Over 2,000 pp. 1938-61.

Naturalist's South Pacific Expedition: Fiji. 1-303 pp. 1949.

Dr. I. Hansen Degener
(Research Associate)
(Actually Co-Author)

Education: Student in the Natural Sciences, Albert-Ludwig University. Freiburg, Baden, West Germany, 1944; Dr. rer. nat. (Dr. Natural Sciences) magna cum laude, Friedrich-Wilhelm University, Berlin, 1949. Botanical assistant at the Botanisches Museum, Berlin-Dahlem, 1945-46; lecture and laboratory assistant to Drs. R. Pilger and H. Sleumer, Berlin-Dahlem, 1948-49; botanist, ditto, 1949-53; assistant in Pharmacognosy at the Freie Universitaet, Berlin-Dahlem, 1949-53. Publications: (as I. Hansen) Europaeische Arten der Gattung Erica L. Bot. Jahrb. 75:1-81. 1950. Beitraege zur Kenntnisse einiger Volvocales. Berl. Deutsch. Bot. Gesell. 65(4):87-93. 1952. (As I. Degener with O. Degener), Nutzpflanzen der Eingeborenen von Fidschi. Mitt. Bot. Gart. u. Mus. Berl.-Dahl. 1:1-20. 1953. (I. Degener with E. Potztal), Beitraege zur Anatomie und Systematik der Lepturae. Bot. Jahrb. 76:251-270. 1954. Co-author and collaborator in most articles with her husband since her marriage in 1953.

Shorter Articles in Scientific Journals: To date my (since our marriage Dr. Isa Degener is mostly included) collections, my observations, my illustrations or descriptions of interesting finds or of novelties by myself and most collaborators are scattered in over 200 papers by about 90 authors, principally systematic botanists. The list, comprising 12 pages, was submitted May 15, 1961 to the National Science Foundation in my appeal for a grant to continue field work in

Degeners' Leaflet No. 4

CONCERNING MYRSINE, RAPANEA AND SUTTONIA

Otto & Isa Degener

"Phytologia" is a technical magazine published at irregular intervals in an edition of 250 copies, which are mailed to about that many institutions. Frequently, however, reprints of articles are distributed privately by individual authors to select correspondents. Thus about 350 copies were scattered throughout the world of Degener, O., & I. "Numata & Asano, 'Biological Flora of Japan and Remarks about Paederia, Phryma, Rabdosia, Rapanea, Sigesbeckia & Vitex.' Phytologia 22(3):210-214. 1971." Because of the cryptic title few local workers realize that we Degeners have altered the scientific names of over a dozen koleas. We shall not repeat ourselves as copies of "Phytologia" are available for study at local museums and colleges. At least we wish here to add a few pertinent remarks chiefly for local readers.

During the present century various writers have relegated the Hawaiian koleas to either Myrsine, Rapanea or Suttonia. We have long championed the second, one of us giving some reasons in the illustrated Flora Hawaiiensis as early as April 21, 1939. In fact, Rapanea Aubl., (1775) we consider a genus synonymous with Suttonia A. Rich., (1832) and quite different from the predominently African Myrsine L. (1735, 1737). To quote Dr. A.C. Smith briefly (Journ. Arn. Arb. 54:278. 1973.): "Actually, in Myrsine (sens. str.) the filaments are connate into a tube that is only proximally adnate to the corolla-tube, being dorsally free from the corolla and distally produced into obvious filaments. In Rapanea the filament-tube has lost its identity by a complete fusion with the corolla-tube, there is no 'flange' (i.e. free filament-tube), and the anthers appear essentially sessile on the corolla-throat." Our koleas fit the latter description.

We have named a kolea endemic to Kauai Rapanea helleri Deg. & Deg. (Phytologia 22(3):213. 1971.). In the introduction of his "List of Flowering Plants in Hawaii" (1973), Dr. St John states that "The acceptance of the species in this summary has been based, either upon herbarium specimens, or upon acceptable published records. The botanical judgement on these has been that of the author." Thereupon the author on page 268 upholds Myrsine hosakae Wilbur, R.C. (Nomenclatural Notes on the Hawaiian Myrsinaceae. Pac. Sci. 19(4):522. 1965.), and relegates Rapanea helleri Deg. & Deg., to synonymy. This must be an oversight as Dr. Wilbur's binomial for the Kauai plant has no standing whatsoever because of the rules of priority. This very same name, Myrsine hosakae St. John (St. John, H., & Philipson, W.R., in Trans Royal Soc. New Zealand. Botany. 1(14):188-190. 1962.) belongs rightfully to a valid taxon of Henderson Island, an island about 1,300 miles southeast of Tahiti. As the Henderson Island tree and the Kauai tree cannot bear identical names, we here add a few remarks concerning our:

RAPANEA HELLERI Deg. & Deg.

Myrsine lanceolata Heller (1897) is a tree with large, slender, entire leaves. Heller's name is untenable as M. lanceolata Wallich (1829) preempts it. This last is an Indian tree to which the name properly belongs. It is likewise not M. sandwicensis var. lanceolata Wawra, an entirely different tree, though also growing on Kauai.

Suttonia angustifolia Mez (1902) bears a specific name untenable in Rapanea because of the Philippine tree R. angustifolia Merr. (1922).

Myrsine angustifolia Hosaka (1940) is an untenable binomial because of the previous publication of M. angustifolia D. Dietr. (1839-52) for a plant from Reunion, an Island east of Madagascar.

Myrsine hosakae R.W. Wilbur (1965) is an untenable binomial, as mentioned above, because of the previous publication of M. hosakae St. John (1962) for a Henderson Island tree. Nor could it be called Rapanea hosakana Deg. & Deg. (1971) as this binomial already belongs to a Kauai tree with small, denticulate leaves.

Myrsine hosakae R.W. Wilbur (1965) is an untenable binomial, as mentioned above, because of the previous publication of M. hosakae Deg. & Deg. (1971) as this binomial already belongs to a Kauai tree with small, denticulate leaves.

It is indeed unfortunate that Recommendation 35A of the International Code of Botanical Nomenclature has not been changed into a mandate. Its weak admonition that "It will be well, in the future, to avoid the use of the genetive and the adjectival form of the same word to designate two different species of the same genus - - -," still might allow such mnemonic nuisances to exist side by side as Rapanea hosakae versus Rapanea hosakana and Rapanea mezii versus Rapanea meziana! We at least try valiantly to maintain only the first published binomial of such unwelcome twins and to ignore the second. As to maintain both is confusing, we take refuge in Article 69. This states that "A name must be rejected if it is used in different senses and so has become a long-persistent source of error." The names in these cases are those of Hosaka and of Mez.

Incidentally E.Y. Hosaka published jointly with O. Degener a number of kolea names April 21, 1939 in the genus Rapanea before the former became an apostate in favor of Myrsine. This fact is acknowledged in "Kew," but not in the "List."

* *

NATURALIST'S SOUTH PACIFIC EXPEDITION: FIJI

Otto Degener

An account of human interest dealing with social conditions, cannibalism, kawa ceremony with time table, fire-walking, religion, native treatment for leprosy, Fiji drums, tattooing, doodlebugs, filariasis, flying foxes, burial alive of chiefs, strangling of widows, peonage, Missionary foibles and successes in Hawaii and elsewhere, the discovery of the missing link DEGENERIACEAE, and a numbered list of plants collected during the Anne Archbold Cheng-Ho Expedition in Fiji in 1940-41 (One taxon of Morinda described as new.). 312 pages with 188 photos - $5.00.

- -

PLANTS OF HAWAII NATIONAL PARKS ILLUSTRATIVE OF PLANTS AND CUSTOMS OF THE SOUTH SEAS

Otto Degener

A book of human interest emphasizing the culture of the ancient Hawaiians. As many of the plants growing in Hawaii grow likewise in other islands of the Pacific and as many of the ancient Hawaiian customs are like the customs of the present inhabitants of other Pacific islands, this book is actually illustrative of plants and customs of the South Seas. Read about treeferns and the pulu industry, hala and mat making, ieie and hula dansing, idols, sugarcane and pineapple industries, coconut and the giant crab, taro and edible poi, ti leaves for dresses, banana and the taboo, shampoo ginger and earth oven, beefwood tree, breadfruit and surfing, making of bark cloth, sandalwood and the disastrous New Hebrides expedition, mistletoe and other parasites, koa and its two kinds of leaves, outrigger canoe, grass house, candlenut-lighting, human sacrifices, passionflower, guava and coffee, the poisonous Star-of-Bethlehem, besides other plants and native customs. 333 pages profusely illustrated with 101 full-page plates and 39 figures - $5.00.

For the above books or for information write Drs. Degener, Volcano, Hawaii.

DEGENERS' FLORA HAWAIIENSIS Leaflet No. 2

MYRSINE, RAPANEA AND SUTTONIA

Otto & Isa Degener

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Otto & Isa Degener, "PRODROMUS OF GALEATELLA AND NEOWIMMERIA" constituted Degeners' Flora Hawaiiensis, Leaflet No. 1. Due to postal delays, it was not published August 1974 as intended; but October 3, 1974. The manuscript for Leaflet No. 2 is being mailed to the printer April 12, 1975. Precise date of publication shall be written into the copies in India ink. 5/20/75

Hunt Newsletter 4/7/75

MYRSINE, RAPANEA AND SUTTONIA

Otto & Isa Degener

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Otto & Isa Degener

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68-617 Crozier Drive
Waialua, Hawaii 96791

MS. NO. 75-016
APR 10 1975 accepted

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O.D. Please note! ⇒ What is the usual abbreviation for him

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Dr. Degener: Please supply missing article titles and page numbers.

Degener, O., & I. Degener. 1971. _____.
Phytologia 22: 210-214.

Smith, A.C. 1973. _____.
& J. Arnold Arbor. 54: 278-___.

St. John, H. 1973. List of flowering plants in Hawaii.
Lawai, Kauai: Pac. Trop. Bot. Garden Mem. 1: 519 p

___, & W.R. Philipson. 1962. _____.
Trans. Roy. Soc. New Zealand, Bot. 1: 188-190.

Wilbur, R.C. 1965. Nomenclatural Notes on the Hawaiian
Myrsinaceae. Pacific Sci. 19: 522-___.

No proof to author. No draft page left n.h. Returned by Brown-Brumfield 4/19/73 1 tap of first page on n.h.

DEGENERS' FLORA HAWAIIENSIS Leaflet No. 2

MYRSINE, RAPANEA AND SUTTONIA

Otto & Isa Degener

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BRAUN-BRUMFIELD INC.
BOX 1203 • ANN ARBOR, MICHIGAN 48106 • PHONE 313-662-3291

MESSAGE

TO: Dr. Otto Degener
68617 Crozier Drive, Waiahua until May 5
Oahu, Hawaii 96791
thereafter —

DATE: 4/17/75

Dear Dr. Degener: Was going to send this one sheet through without you seeing proof but decided against that. We note that you want 250 copies on a similar stock but that this sheet does not need to be punched.

You will receive an estimate of the cost of this in the mail - one of our Estimaters had a fire in his home and his absence has put us somewhat behind on pricing.

Received your note regarding the Dictionary running heads. We assume there are to be no actual page numbers on the Dictionary pages - or is this a false assumption?

Very truly yours
Frieda Carlson
Frieda Carlson
Composition

BY

REPLY

DATE: 4/19/75

Mrs. Degener & I are amazed! at the speed of BB's work! I mailed the extra proof to the editor of the University publication who (foolishly) had shown our ms., with our ideas to the man who has criticized us. Now that the University group notes what we are printing, the danger of plagiarism is over, & the extreme hurry.

Should you add to "Plants Hawaii Nat. Parks" that present printing is "1975"?

Better to have sheet (not page) numbers as the sheets will be in loose leaf binder, and reader may otherwise get them out of order when collating.

SIGNED: O.D.

RECIPIENT KEEP THIS COPY, RETURN WHITE COPY TO SENDER

Waialua, Oahu 96791.
April 15, 1975.

Dear Dr. How:

We have been getting favorable postals and letters from Mainland and Foreign institutions regarding our Leaflet No. 1 (Caleatella & Neowimmeria) plus Newsletters we had enclosed. So please return the mss., we mailed you prematurely. These are now being set up as Leaflets Nos 2 & 3, and will be mailed (with an advertisement) to the larger institutions listed in Ed. 6 of the Index Herbariorum.

Hope we did not bother you too much.

Aloha,

Otto Degener

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Family : 169c
Genus : Vicia
Species : Menziesii

LEGUMINOSAE
LEGUME FAMILY

VICIA MENZIESII Spreng.
HAWAII VETCH

Vicia grandiflora Smith in Rees, Cyclop. 37, No. 7. 1819.
Not *Vicia grandiflora* Scop. Fl. Carn. ed. 2, 2:65. 1772
Vicia Menziesii Spreng. in Linn. Syst. Veg. ed. 16, 3:267. 1826.
Vicia Menziesii sensu A. Gray in U.S. Expl. Exped. 1:420-421. 1854.
Vicia Menziesii sensu H. Mann in Proc. Am. Acad. 7:163. 1866
Vicia Menziesii sensu H. Mann in Proc. Essex Inst. 5:184, 1867.
Vicia Menziesii sensu Hillebr. Fl. Haw. Isl. 97. 1888.
Vicia Menziesii sensu MacCaughey in Bot. Gaz. 64:413,415. 1917.
Vicia Menziesii sensu Rock, Leg. Pl. Haw. 173. 1920.
Vicia Menziesii sensu Skottsb. in Acta Horti Gotob. 6:57. 1931.
Vicia Menziesii sensu Selling in B. P. Bishop Mus. Spec. Publ. 38:149. 1947.

Coarse strongly climbing perennial glabrate leafy herb of unknown height with angular stems and darkening with age or drying. Stipules foliaceous, 2–3 cm. long, 1–2 cm. wide, suborbicular, lacerate-dentate with long subulate teeth; leaves 10–13 cm. long ending in a ramose tendril; leaflets 8–12, entire, ovate-oblong, 3.5–7 cm. long by 1.5–3 cm. wide, acuminate, mucronulate, prominently veined, often alternate, occasionally subopposite. Racemes 6- to 9-flowered, shorter than subtending leaves by 3–5 cm.; pedicels slender. Flowers large, 2.5–3 cm. long, pale purple, drying yellow. Calyx teeth subequal, narrow, subulate, as long as tube, the upper two well-developed. Corolla strongly curved upward. Androecial sheath of 9 united and 1 free stamen quite oblique at apex; pollen is the largest thus far known from the genus. (Quoting from Selling: "Tricolporate, prolate, 56 x 36 (54-60 x 33-39) micra; occasional specimens smaller, *e. g.* 47 x 30 micra. Poles (in normal cases) rounded, lobes fairly straight in their central parts. Each colpa marked by a narrow, light line of jagged margins, about 36 micra long, on both sides surrounded by prominent endexinous thickenings. Pores with distinct margins, circular and about 8 micra in diameter, or slightly ellipsoidal, transverse, about 7.5 x 9 micra, occasionally smaller. Pore membrane transversed by the said light line and often protruding. Exine comparatively thin, about 1.2 to 1.5 micra at the poles (the polar parts light-coloured and often irregular), considerably thickened, about 3 micra and dark-coloured in a somewhat diffuse equatorial zone about 24 micra broad. This zone provided with a reticulate sculpture of irregular lumina (aver. diam. about 1 micron), gradually disappearing towards the poles, where only an indistinctly granular texture occurs. This pollen type is unique in the Hawaiian flora.") It is not unique, however, for the genus. Style ribbon-like with hairs all around from apex to midway to base; stigma capitate, small. Legume 10 cm. long by 1.5–2 cm. wide, flattened; stipe 1 cm. long. Seed spherical, large (15 mm. in circumference), with hilum occupying 75% of seed circumference, brownish, smooth, dull.

Type Locality: "Gathered by Mr. Menzies, at the upper edge of the forest, on the mountain called Mowna-rooa, in Owhyhee, which is 6000 feet high." The common name given by Smith is "Large-flowered Vetch;" we find no record of any native name.

Local Range: An apparently extinct endemic collected by Menzies, Macrae, Remy and last by Forbes. It grew at an elevation of 7,000 to 8,000 feet "at the upper edge of the forests on *Mauna Kea* and *Mauna Loa*" according to Hillebrand, "climbing among shrubs" according to Mann. Forbes' plant No. 997-H, here illustrated, was discovered June 29, 1915, along the Palakea fence line. Rock states in 1920 that he "camped several weeks on the high mountains of Hawaii, collecting, but he has never seen it. There is the possibility that the plant has become extinct, as the high elevations on that island are entirely given over to grazing animals, which naturally would make quick work with such a fine leguminous plant." Recently the Degeners, thanks to their jeep and to roads never built in Rock's time, explored the triangle made by Mauna Loa, Mauna Kea and Hualalai in search of this vetch without success.

Extra Range: Endemic to the Island of Hawaii. This species appears to be closely related to *V. gigantea* Hooker of western North America; *V. nigricans* Hook & Arn., of western South America; and *V. pisiformis* L., of Europe and European Russia. A detailed study of the relationship of these four species is being prepared by the monographer of the genus Dr. Charles B. Gunn, Botanist, Crops Research Division, Agricultural Research Service, U.S.D.A., Beltsville, Md.

(Illustrated on following page)

(Deg., Deg., & Gunn, June 10, 1970)

Footnote under: FLORA HAWAIIENSIS (R) D (2)

DEGENER

12

INSERTAE SEDIS: While continuing our work we discover that we have published numerous good, bad, and indifferent papers at various times that have missed inclusion in the present bibliography. With apology we insert them here.

Degener, O. C. [sphalm]. The Hermit Crabs of the Hawaiian Islands. Proc. Haw. Acad. Sci. First Annual Meeting May 19-21. 1926. Bishop Mus. Spec. Publ. 11:27. 1926.

Degener, O., & Sherff, E.E. Lipochaeta lobata leptophylla Degener & Sherff, L. lobata grossedentata Deg. & Sherff (p. 92), L. lobata hastulatoides Deg. & Sherff (p. 93), X L. procumbens Deg. & Sherff (p. 94), L. profusa robustior Deg. & Sherff (p. 96), L. heterophylla malvacea Deg. & Sherff, L. intermedia Deg. & Sherff (p. 102), L. tenuis Deg. & Sherff (p. 102-103). Sherff, E.E. New or Otherwise Noteworthy Compositae IX. Bot. Gaz. 95(1): -. [illegible] 9/-/33.

Degener, O. Haw. Plant Studies Series Launched Here. Hon. Star-Bull. 1941?

- Cruise of the "Cheng Ho." Amer. Eagle 40(29):1, 3, 4. ~~11/8/45.~~ 11/8/45.

- "Advocate of True Religious Freedom." Hon. Adv. 7/25/47.

- Our Forest and our Water Supply. What We Can Do To Increase Them. Haw. Farm & Home. Pp. 36, 37. -/-/51.

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- Flora Hawaiiensis, Book 6: 530 unnumbered pages. 1957-1963. 1/18/63.

Degener, O., & I., and Walker, M.H. Henry Brougham Guppy, 1854-1926. Flora Hawaiiensis, Book 6: 3 unnumbered pages. 3/15/63.

Degener O., & I. Flora Hawaiiensis, Book 6: 530 unnumbered pages. 1957-1963. (31 unnumbered pages, 1/18/63; 17 unnumbered pages, 3/15/63; 3 unnumbered pages, 3/29.63.)

Degener, O. Threat to Wildlife. Hon. Star-Bull. (or Hon. Adv.?) 1/25/68.

[illegible] - A Landlord's - - -. Hon. Star-Bull. 10/15/69.

- Urges Giving Island Police Pay Hike. Hon. Adv. 11/7/69.

Family: 332
Genus: Coprosma
Species: Waimeae

RUBIACEAE

MADDER FAMILY

COPROSMA WAIMEAE Wawra
WAIMEA (CANYON) COPROSMA; OLENA

Coprosma waimeae Wawra in Flora 57:327. 1874.
Coprosma foliosa sensu Hillebr. Fl. Haw. Isl. 186. 1888. (As to Kauai plant only.)
Coprosma waimeae sensu Heller in Minn. Bot. Stud. Bull. 1:895. 1897.
Comprosma waimeae sensu Rock, Indig. Trees Haw. Isl. 465. 1913.
Comprosma waimeae sensu W. R. B. Oliver in B. P. Bish. Mus. Bull. 132:163. 1935.

Small rather variable tree wtih glabrous to very rarely sparsely pilose branches. Leaves elliptic to obovate, coriaceous, acute to rarely obtuse at apex, acuminate to somewhat abruptly narrowed at base, reticulate beneath and smooth above, glabrous or rarely a few hairs on midrib above andor beneath; blade 25-85 mm. long, 15-40 mm. wide; petiole 5-15 mm. long; stipules broadly triangular, prominently cuspidate, glabrous or very rarely sparsely ciliolate. Staminate flowers 3, on glabrous to rarely sparsely pubescent 7-12 mm. long peduncles of which usually only 1 arises from leaf axil; bracts paired, narrow-ovate; calyx cup-shaped, dentate; corolla funnelform, with usually 8 linear lobes; stamens about 8, lobed at base, apiculate. Pistillate flowers 1-4 but usually 3, on 12-20 mm. long peduncle, bearing pair of broadly to narrowly spatulate up to 5-8 mm. long bracts; calyx cup-shaped, dentate; corolla with short tube and about 8 narrow acuminate lobes. Drupe globose to obovoid, orange, 8-12 mm. long, crowned by calyx teeth.

Type Locality: "Kauai; Gebiet von Halemanu; 2100."

Local Range: This species inhabits the rainforest above about 2,000 feet elevation about Waimea Canyon, Kauai. It is not found about Waimea, or *Kamuela, on the Island of Hawaii as the name might denote. The vernacular name *olena* alludes to the yellow color of the wood. The fruit of this species is probably the largest in the Islands for the genus.

Extra Range: Not known elsewhere. By presently considering this a "rather variable" species, we really confess our present ignorance regarding the different varieties and forms that probably exist, or at least existed before exotic weeds like the blackberry competed with them.

*As Waimea, or "reddish water," was the name of communities on Kauai, Oahu and Hawaii, letters often went astray. To be sure that their letters would reach Waimea on the Island of Hawaii, individuals addressed them to "Kamuela," the Hawaiian name of Samuel Parker, the postmaster there.

(Illustrated on following page)

Degener & Degener, / 17

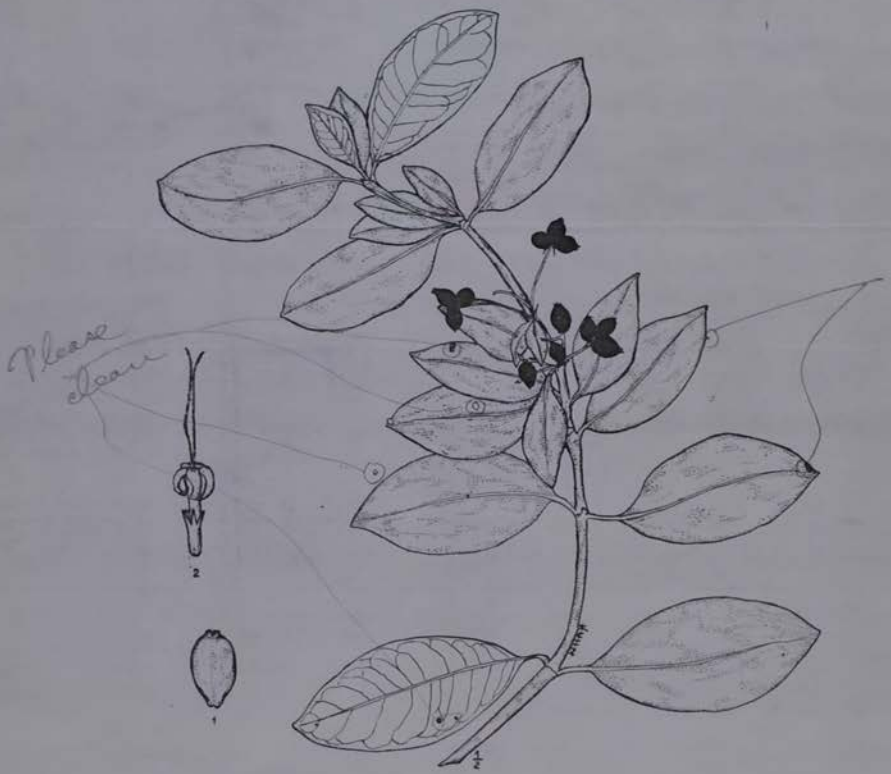
Update to come

67-763-

Family: 332
Genus: Coprosma
Species: Waimeae

RUBIACEAE

MADDER FAMILY



COPROSMA WAIMEAE Wawra

(Original)

(Deg. & Deg., 30,786, Kokee, 11/19/60)

CUSCUTACEAE

DODDER FAMILY

Whitish or yellowish to reddish filiform dextrorsely twining glabrous lax herbs practically always devoid of chlorophyll, parasitic by numerous haustoria on herbs or shrubs and very rarely on trees. Leaves reduced to minute alternate functionless scales. Flowers perfect, regular, small, usually more or less cymosely clustered, whitish to pink or reddish. Calyx inferior, 5-lobed or 5-parted or of 5 distinct sepals (rarely 4- or 3-lobed or 4- or 3-parted or of 4 or 3 distinct sepals or very rarely doubled). Corolla 5-lobed (rarely 4- or 3-lobed or very rarely doubled), the tube bearing as many fimbriate or crenulate scales as there are lobes and these alternate with the lobes or very rarely wanting; lobes imbricate in the bud. Stamens as many as the corolla lobes and inserted in the throat or sinuses above the scales, often shortly exserted; anthers short, ovate to oval, obtuse, introrse; 2-celled, longitudinally dehiscent. Ovary 2-celled; ovules 2 in each cell, anatropous; styles 1 or 2; terminal, distinct or rarely united below; stigmas linear to capitate. Fruit a globose or ovoid capsule, circumscissile near base or irregularly bursting or indehiscent, 3- or 4-seeded. Seeds glabrous: embryo linear, terete, curved or spiral, with apex bearing 1-4 minute alternate; endosperm fleshy; cotyledons none or very rarely present but then rudimentary scales. Seeds germinate in the soil but soon the root and lower part of stem of seedling dies while the upper part attaches itself to the host. Because the dodder lacks chlorophyll completely (except in a very few exotic species that exhibit a slight greenish tinge in their stems), it must henceforth derive all its nutrition from its host.

A family, comparatively recently evolved from the *Convolvulaceae* through parasitism, and consisting of at least four genera of which only *Grammica* is native to the Islands. Because many readers of the Flora are unfamiliar with this strange family, we here give a synoptic key:

1. Style 1; stem mostly robust; inflorescence racemose or paniculate:
   2. Corolla persistent; stigmas ~~capitate~~ to ovate; 2n = 28 (Old World) . . . . . *Monogynella* Des Moul., Études. Org. Cusc. 65. 1853. Type: *M. vahliana* Des Moul., *i.e.*, *M. monogyna* (Vahl) Hadač & Chrtek
   2. Corolla deciduous; stigmas conic to subulate; as far as known 2n = 28, 32 or 42 (Small, mostly Old World) . . . . . *Kadurias* Raf., Fl. Tellur. 4:91. 1836. Type: *K. reflexa* (Roxb.) Raf.

1. Style 2; stamens mostly thin; inflorescence usually capitate or racemose and only rarely paniculate:
   2. Styles of equal length; stigmas cylindric to subulate; inflorescence globose heads; as far as known 2n = 14, 28, 42. (Mostly Old World) . . . . . *Cuscuta* L., *s. str.*, Sp. Pl. 1:124. 1753. Type: *Cuscuta europaea* L.
   2. Styles of unequal length; stigmas capitate; inflorescence various, from globose heads to racemose or paniculate; as far as known two groups (perhaps genera) occur with 2n = 32 or 56 and with 2n = 30 or 60. (Mostly New World) . . . . . *Grammica* Lour., Fl. Cochinch., 170. 1790. Type: *Grammica aphylla* Lour., *i.e.*, *G. chinensis* (Lam.) Hadač & Chrtek

(Degeners, Hadač & Chrtek / 77. to displace Cuscuta 6/14/33 & 9/15/46)

date to come

Family: 308
Genus: Grammica

CUSCUTACEAE

DODDER FAMILY

GRAMMICA Lour. Fl. Cochinch. 170. 1790.

Whitish to reddish glabrous lax herbaceous plants with mostly thin stems. Leaves very reduced. Flowers perfect, regular, small, whitish to reddish, in compact or loose globular inflorescence or in loose racemose or paniculate inflorescence. Pedicles shorter or longer than flowers. Calyx 5- or 4-lobed with lobes upright or deflexed. Corolla 5- or 4-lobed with lobes upright or deflexed, persistent at maturity, surrounding the capsule or rarely corolla detached from its base at maturity to form a cap to the capsule. Stamens as many as corolla lobes. Styles 2 with one style usually shorter than the other; stigmas capitate. Seeds usually 0.8-2.8 mm. long; embryo with 2-4 windings of the spiral.

Name supposed to have been derived from the Greek *gramma, i.e.*, "line," in reference to the appearance of the plant.

Type Species: *Grammica aphylla* Lour., i.e., *Grammica chinensis* (Lam.) Hadač & Chrtek

About 70 species known throughout the World, but most abundant in America. Many species are of considerable economic importance because of their parasitism of tobacco, flax, clover, etc.

67-70

All must be crowded on single page as cut copies on back!

FLORA HAWAIIENSIS®

Family: 308
Genus : Grammica
Species: Sandwichiana

CUSCUTACEAE
FAMILY
DODDER

accents

GRAMMICA SANDWICHIANA (Choisy) Degeners, Hadač & Chrtek
HAWAIIAN DODDER: KAUNOA, POLOLO

Cuscuta sandwichiana Choisy in Mém.Soc. Phys. Hist. Nat. Genève 9: 289. 1841.
Not Cuscuta sandvicensis var. mimosae Hooker f. in Trans. Linn. Soc. 20:205. 1847.
Not Cuscuta sandwichiana var. mimosae Anderss. Om. Galap. Veg. 214. 1854.
Not Cuscuta sandwicensis Anderss. Om. Galap. Veg. 89. 1847 [1860?] .
Cuscuta sandwichiana sensu Degener, Fl. Haw., Fam. 308: Cuscuta. 6/14/33, 9/15/46.
Grammica sandwichiana (Choisy) Degeners, Hadač &Chrtek comb. nov.

Stem slender, orange-yellow. Leaves reduced to 2 mm. long lanceolate scales. Flowers often glandular, 3-4 or rarely up to 5 mm. long, on bracteate pedicels usually less than 5 mm. long to form compound open cymes on peduncles 1 cm. long or less. Calyx campanulate, scarious, shiny, deeply 5-cleft with triangular- ovate somewhat acute to almost obtuse lobes about 1.5 mm. long which are sometimes mdeianly thickened to form a slight ridge, marcescent. Corolla urn-shaped, thin, about 4 mm. high, the tube bearing no scales but with 1.5 mm. long ovate to triangular somewhat acute persistent libes which are inflexed at the top and erect or reflexed but finally appressed to the ripening capsule. Stamens inserted in the sinuses between the lobes and shorter than the lobes; filaments thickish, often subulate; anthers subsessile. oblon , about as long as filaments. Ovary depressed-obovoid, about 2 mm. high; style distinct, exserted, almost as long as ovary; stigma capitate. Fruit a depressed-globose to rarely globose indehiscent capsule about 3 mm. high with apical 2-branched cavity projecting into placenta from which divergent marcescent styles arise when these sometimes persist. Seeds light brown, dull, much depressed-globose and almost 2 mm. wide and 1 mm. thick or somewhat angular from pressure, with oblong perpendicular hilum.

Type Locality: Hawaiian Islands.

Local Range: Growing of probably all the larger Islands at lower elevations often along coastal dunes and in arid regions. It is found commonly on Convolvulaceae, Heliotropium, Scaevola and Pluchea. At Hilo, Island of Hawaii, a form with fasciated flowers was collected in 1922. In the "Song of the Lei of the Hawaiian Islands," the dodder is mentioned as being emblematic of the Island of Lanai. This plant is sometimes confused with Cassytha filiformis L., of the Cassythaceae (Family 138). The latter, because of its greenish yellow, firm stems and its habit of growing mostly on shrubs and trees, can be distinguished easily from the dodder even when both plants are devoid of flowers and fruits.

Extra Range: Endemic to the Hawaiian Islands. It belongs to the Subsection Californicae, , to which five species chiefly native to western North America also belong.

GRAMMICA SANDWICHIANA var. KAILUANA (Yuncker) Degeners, Hadač & Chrtek

Cuscuta sandwichiana var. kailuana Yuncker in Mem. Torr. Bot. Club 18:158. 1932.
Grammica sandwichiana var. kailuana (Yuncker) Degeners, Hadač & Chrtek comb. nov.

Differing from the species itself in having pedicels often longer than the flower and in bearing short insignificant yet definite bifid or truncate ot triangular scales at base of of corolla and alternating with its lobes.

Type Locality: "Hawaii, Kailua along beach."
Local Range: Thus far recorded from Kailua, Hawaii; Moomomi, Molokai; and Kaena Point, Oahu. At Kailua, where Otto Degener found the type material, Hawaiians were sacking the plant to carry away to their swine as food.

Extra Range: Endemic to the Hawaiian Islands. This taxon is anomalous in being the only member if the Subsection Californicae possessing infrastaminal scales. As the presence of these scales is a primitive feature and their absence is due to reduction or simplification, the relationship of the Hawaiian dodders to one another is quite opposite to the nomenclatural status. The variety kailuana seems to be the original stock from which Grammica sandwichiana s. str., or, according to more modern orthology, var. sandwichiana, was derived. (Variety illustrated on following page)

(Degeners, Hadač & Chrtek -1-178, to displace Cuscuta sandwichiana 6/14/33 & 9/15/46).

- (Necrology) Paul Aellen-Meisel. Haw. Bot. Soc. Newsletter 12( ):31. 1973.

Degener, O. Dr. Otto Degener on Silverswords. Haw. Bot. Soc. Newsletter 13( ):1-2. 1974.

(2)

Degener, O., & I. Hawaiian Plants found in Capt. Nicholson's Appendix. Haw. Bot Soc. Newsletter 13( ):2. 1974.

Degener, O. Notes from Dr. Otto Degener. (Pseudocyphellaria hawaiiensis & Usnea rockii and Zepernick, Arsneipflanzen.) Haw. Bot. Soc. Newsletter 13( ): 3. 1974.

- July 9, 1895. A.A. Heller - - - Leptotrema hawaiiense [sic] - - -. Haw. Bot. Soc. Newsletter 13(4):17-18. 1974.

- An Explanation and an Appeal. Haw. Bot. Soc. Newsletter 13( ):6-7. 1974.

- "Flora - - - Conocarpus erecta - - -. Haw. Bot. Soc. Newsletter 13(4):17-18. 1974.

- Prodromus of Galeatella and Neowimmeria. Degeners' Leaflet No. 1:1-4. 10/3/74.

- To Save a Rare Naupaka. Haw. Bot. Soc. Newsletter 13( ):16. 1974.

- Notes from Drs. Otto & Isa Degener (Chytrids, Leptotrema hawaiiense [sic] - - -). Haw. Bot. Soc. Newsletter 13(4)18. 1974.

- Medicinal Plants of the Polynesians. Haw. Bot. Soc. Newsletter 13( ):18. 1974.

- Sadleria About Kilauea, Hawaii. Haw. Bot. Soc. Newsletter 13(5):21-23. 1974.

- Coix lacryma-jobi. Haw. Bot. Soc. Newsletter 13(5):23. 1974

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- [Necrology] Felix J. Widder. Haw. Bot. Soc. Newsletter 13( ):23. 1974.

- Flotsam & Jetsam of Canton Atoll, South Pacific. Phytologia 28(4):405-418. 1974.

- Spathodea. Phytologia 28(4):419-420. 1974.

- Bishop's "Inventory." Phytologia 28(4):420-421. 1974.

- Appraisal of Hawaiian Taxonomy. Phytologia 29(3):240-246. 1974.

- Rapanea, Myrsinaceae, in the Pacific. Phytologia 31(1):21. 1975.

Degener, O., & I., and Pekelo, N. Haw. Plant Names, Their Bot. and Engl. Equivalents. Flora Hawaiiensis Book &: sheets X_0-X_{28}. 6/1/75.

List of Flowering Plants in Hawaii, Harold St. John. Sida 6(2):120-122. 1975.

- Concerning a Magazine Article [Argyroxiphium] Article. Degeners' Leaflet No. 3: 1-6. 6/13/75.

- Review: Samoan Versus Hawaiian Mosses (Musci). Haw. Bot. Soc. Newsletter. 14(4): 78-80. 1975.

- Myrsine, Rapanea and Suttonia. Degeners' Flora Hawaiiensis Leaflet No. 2:1-2. 6/3/75.

- Silverswords & The Blue Data Book. Notes Waiʻea Arboretum 2(1):3-6. 1975.

Degener, O., & I. Unrecognized Asset. Hon. Adv. 2/20/76.

- An Unrecognized Lucrative Asset. Pp. 2. 4/11/76. (Privately printed.)

- Sheep on Mauna Kea. Hon. Adv. 4/14/76.

- Feral Sheep Ruining Forests. Trib.-Herald 4/15/76.

Degener, O. Camels ve. Deer. Haw. Trib.-Herald 8/1/76.

- Foreign Owners. Hon. Star-Bull. 9/11/76.

Degener O., & I. Hawaiian Specimens in Leningrad and Geneva. Haw. Bot. Soc. Newsletter 15(3):34- 1976.

~~Degener, O., & I.~~ The Pink-and-White Shower. Newsl. Haw. Bot. Soc. 15(3):48. 1976.

- "World Guide to Tropical Drift Seeds and Fruits" by C.R. Gunn & J.V. Dennis. Phytologia 15(3):57-58. 1976.

- "Trees of Puerto Rico and the Virgin Islands" Volume 2 by XXXX Elbert L. Little, Roy O. Woodbury & Frank H. Wadsworth. Phytologia 15(3):58-59. 1976.

- Concerning Plants of the Caucasus. Phytologia 33(2):128-129. 1976.

Degeners & Sunadas. Argyroxiphium kauense, the Kau Silversword. Phytologia 33(3): 173-177. 1976.

Degener, O., & I. McBride's "Practical Folk Medicine of Hawaii," and Opinions about Tacca hawaiiensis versus Tacca leontopetaloides and other taxa. Phytologia 34(1): 1-4. 1976.

- Wikstroemia perdita Deg. & Deg., an Extinct (?) Endemic of a Paradise Lost by Exotic Primates. Phytologia 34(1):28-32. 1976.

- Weeds (?) of Japan. Phytologia 34(1):69. 1976.

- Flotsam & Jetsam of the World. Phytologia 35(2):108-109. 1976.

* "Following letter of 1 April 1976 from Drs. Otto & Isa Degener on Sheep on Mauna Kea was also published in the Honolulu Advertiser, 14 April 1976, page A-15." 'Elepaio 36(12):151-152. 6/-/76.

- Whence the Pineapple? Hon. Adv. 7/30/76.

- Weeds (?) of Japan. Notes Waimea Arb. 3(1):4-5. 1976.

- A Correction of a "Correction". Notes Waimea Arb. 3(2):4. 1976

- The Hala-Kahiki or Pineapple. Notes Waimea Arb. 3(2):2-7. 1976.

- Hibiscadelphus Number KK-HX-1 an International Treasure in Hawaii. Phytologia 35(1):385-396. 1977.

- "Hawaiian Forest Plants" by M.D. Merlin. Phytologia 35(3):220. 1977.

Degener, O. Native Plants Should Be Preserved. Hon. Star-Bull. 1/29/77

- Cruel Death for Pets. Hon. Adv. 4/30/77.

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Degener, O. "Living at Mokuleia, Oahu - - -." Coastal Zone News. 1977.

- Free Mauna Kea of Sheep. Haw. Trib.-Herald 3/31/77.

- Save the Palila. Hon. Adv. 4/5/77.

Degener, O., & I. Time to Enlarge the Park. Haw. Trib.-Herald 9/22/77.

- Enlarge Park. Hon. Star-Bull. 9/22/77.

- Expand Volcano Park. Hon. Adv. 9/23/77.

Degener,). HELP Save Dwindling Flora Haw. Islands at least as Herbarium Specimens for Museums of the World. Phytologia 37(4):281-284. 1977. [illegible] (Also privately printed by Degeners. Additional 300 copies with note by H.H. Iltis published privately by him in 1977.)

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- Regarding Expansion Commercial Hapu'u Harvesting Operations - - -. Haw. Privately printed.

- The Endangered Palila Bird. Haw. Trib.-Herald 12/8/77. (Also privately printed.)

- Flora of the North Caucasus. Phytologia 37(4):409-411. 1977.

Degener, O. Rainbow Falls Hospital for Hilo? Hon. Star-Bull. 4/5/78. Ed. 2 revised & privately [illegible] printed 4/20/78.

Degener, O., & I. Fire's Destruction. Hon. Star-Bull. 1/7/78.

- The Endangered Palila Bird. 'Elepaio 18(7):77-78. 1978.

- (Review) Bramwell, D., & Z. Wild Flowers of the Canary Islands. A Review. Phytologia 38(4):321-322. 1978.

Degener, O., & I., and Hummel, K. Aleurites erratica Deg., Deg. & Hummel sp. nov., (Euphorbiaceae) des Stillen Ozeans. Phytologia 38(5):361-364. 1978.

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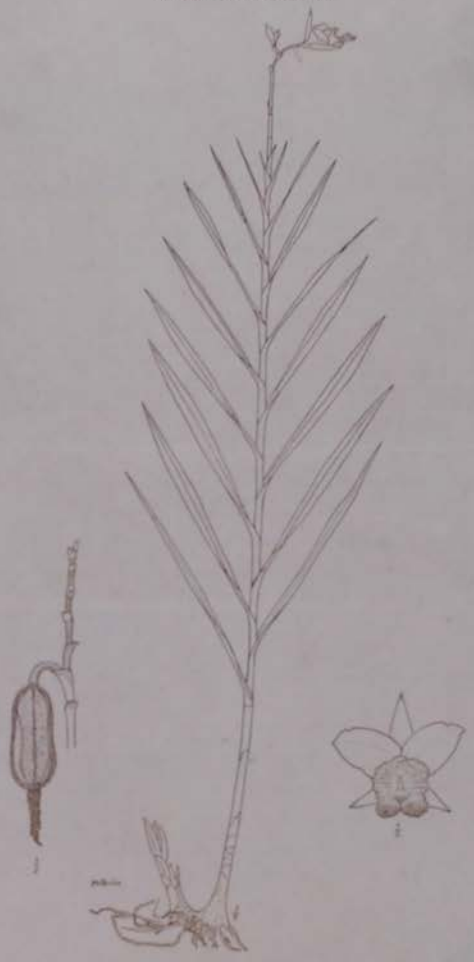
- the missing sesbania paper Phytologia 39(3): 1978.

- Regarding the Expansion of Commercial Hapu'u Harvesting - - -. 'Elepaio 38(7): 82. 1978.

Degener, O. For Hanawi EIS. The Maui News 7/7/78.

Family : 80
Genus : Arundina
Species : Bambusifolia

ORCHIDACEAE
ORCHID FAMILY



ARUNDINA BAMBUSIFOLIA (Roxb.) Lindl.
[Original]
[Described on preceding page]

(Deg. & Deg. 32.439, 27 Miles, Feb. 1967)

Family : 80
Genus : Arundina
Species : Bambusifolia

ORCHIDACEAE
ORCHID FAMILY

ARUNDINA BAMBUSIFOLIA (Roxb.) Lindl.
BAMBOO ORCHID

Cymbidium bambusifolia Roxb. Hort. Beng. 63. 1814. One might quibble that William Roxburgh's binomial is a *nom. nud.*, because his description denotes merely by a single sign and a single letter of the alphabet that the species is an erect perennial.
Arundina bambusifolia Lindl., in Wall. Cat. No. 3751. 1828. Without giving a description, John Lindley cites as synonym "Cymbid. bambusifol. Roxb. Hort. Ben."
Cymbidium bambusifolium sensu Roxb. in Fl. Ind. 3:460. 1832.
Arundina bambusifolia sensu Neal, In Gard. Haw. 277. 1965.
Arundina sp., sensu Deg. & Deg., in Bull. Pac. Orch. Soc. 23:12. 1965.
Arundina bambusifolia sensu Deg. & Deg., in Phyt. 17:343. 1968.
Arundina bambusaefolia sic sensu Fosb., in Doty & Mueller-Dombois, Haw. Bot. Sci. Pap. 2:183. 1966. (This orthography fails to follow Recommendation 73G (d) of the Code.)

Slender erect 5–20 dm. tall reed-like shrubby terrestrial with leafy stems about 1 cm. thick; leaves sheathing; free part linear-lanceolate, commonly 20 cm. long and 1.5 cm. wide, pale green, smooth, with 4–8 veins of greater thickness, the central one beneath being the most prominent, long-acuminate to sharp apex. Flowers several in simple raceme to (in robust specimens) many in large panicle of many racemes; bractlet pale green, broadly deltoid, 6 mm. long, acuminate at apex, enlarging in fruit; pedicel pale green like ovary and with it arcuate, 10–15 mm. long and 2–3 mm. wide. Ovary 20–25 mm. long, 3–4 mm. wide, longitudinally 6-sulcate. Outer perianth lobes subequal, 30 mm. long, 10 mm. wide, elliptic to obovate, white faintly diffused with purplish red, with thickish greenish acuminate apex. Inner perianth lobes white or nearly so, 35 mm. long, 18 mm. wide, broadly elliptic with straightish sides, acute at apex. Labellum with straight upper margins 25 mm. long while lower side including wrinkled emarginate lip is 35 mm. long; labellum white but anterior half progressively more purplish red except for yellowish throat. Stamens and style and stigma all about 18 mm. long, white. Capsule with body prominently longitudinally 6-sulcate and 5 cm. long, with rest of flower marcescent and about 3 cm. long. Seeds pale grayish.

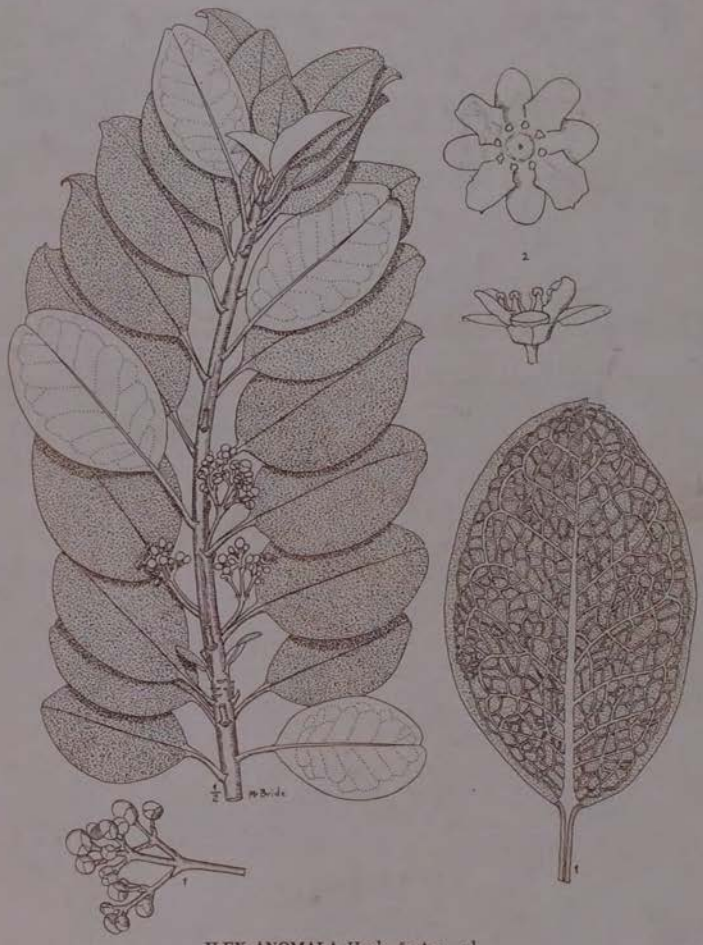
Type Locality: Roxburgh (1814) gives it as Chittagong. Mr. J. R. 1810 [India]. Then later (1832) he mentions that the species is "found indigenous to the forests of Chittagong, growing in well shaded places on the face of moist rocks. Flowering time the hot season, March and April chiefly."

Local Range: The above description applies to the bamboo orchid occurring as a common, naturalized weed since about 1950 along grassy roadsides and open, dryish, tree scattered plains from sea level to 4,000 feet elevation in the Puna District of Hawaii. Plants with more colorful and larger flowers are cultivated here and there in gardens (including the writers'), and evidently escaped to revert more or less to the original form in the wild. Degener 21,765 was collected in 1952 in the Keauohana Forest Reserve, near Pahoa, Hawaii. Sparingly naturalized with the very much more common *Spathoglottis plicata* among grasses and bushes. Deg. Deg. & Ruhle 23,722 two years later represents plants growing "along fumeroles of Chain-of-Craters Road, Kilauea region, Hawaii. Recently naturalized among grass and bushes." Deg. & Deg. 27,758 of July 1961 represents a voucher specimen to prove that it had spread "Makai of Kulani Prison, Hawaii. Ubiquitous and naturalized in grassy lava fields." This orchid, with flowers wilting soon after being picked, is seldom cultivated; various *Vanda* cultigens, with long-lasting flowers, monopolize the lei industry.

(Illustrated on following page)

Family : 200
Genus : Ilex
Species : Anomala

AQUIFOLIACEAE
HOLLY FAMILY



ILEX ANOMALA Hook. & Arn., s.l.
(Original)
(Described on preceding page)
(Deg. & Deg. 31,193)

no dwg

O.K.
O.D.

Family : 200
Genus : Ilex
Species : Anomala

AQUIFOLIACEAE
HOLLY FAMILY

ILEX ANOMALA Hook. & Arn., s.l.
HAWAIIAN HOLLY; KAWAU (AIEA)

Ilex anomala Hook. & Arn. Bot. Beech. 111. 1832. (Type from Oahu.) (Hu, 1967: "The dichasium has less flowers and it becomes more compact.")
**Byronia sandwicensis* Endl. in Ann. Wien. Mus. 1:184. 1836.
**Byronia anomala* Heller in Minn. Bot. Stud. 1:847. 1897.
**Ilex sandwicensis* Loes. in Engl. & Prantl, Natürl. Pflzfam. Nachtr. 1:218. 1897.
**Ilex anomala var. sandwicensis* Loes. in Nova. Acta Acad. Caesar. Leop.-Carol. 78:68. 1901.
**Byronia helleri* Levl. in Fedde, Repert. 10:155. 1911. (Type from Hanapepe, Kauai.)
**Ilex hawaiensis* Hu in Journ. Jap. Bot. 42:14. 1967. (Type from Maui.) (Hu, 1967: "has the largest inflorescence. It is loosely arranged, 3- to 5-times trichotomously branched dichasium with rather large bracts.)

Completely glabrous quick-growing shrubby 2 - 7 meter tall tree with whitish somewhat soft wood and erect smooth dark trunk and prominently lenticeled branches and angular green twigs. Leaves coriaceous and brittle, persisting about 3 - 4 years, above glossy and dark green and with prominently impressed ribs and nerves and veins, below dull and pale green and with prominently thick midrib and with dark nerves and veins even with leaf surface; oval or elliptic-oblong to oval-obovate, entire or rarely some leaves with a few serrulations particularly toward apex, rounded to abruptly acute at base, obtuse at somewhat conduplicate apex; blade 3.5 - 9 cm. long, 2 - 5 cm. wide; petiole sulcate above, rounded beneath, 1 - 2 cm. long. Flowers numerous, crowded, in cymose panicle 5 - 10 cm. long in axils of early leaves of current year's twigs. Pedoncle 2 - 5 cm. long, naked, pale green, somewhat alate, with pair of green 2 mm. long subulate bracts at top, ultimate pedicels commonly 2 mm. long, alate, bibracteolate at base. Calyx pale green to somewhat purplish, with four subequal broadly semi-circular obtuse entire lobes 2 - 3 mm. wide and half as long. Corolla rotate, coriaceous, pure white or with lower surface often minutely irregularly pink-purplish-dotted, commonly 10 - 12 mm. wide, almost regular, 6- to 10-cleft often in same inflorescence; lobes 3 mm. long, 2 - 2.5 mm. wide in same flower, oblong-ovate, rounded to truncate at apex, subentire ones alternating with those having on one side or both sides a single obscure to prominent tooth below middle. Stamens as many as corolla lobes, stiff, erect, almost 2 mm. long; filaments white, flattened-subulate; anthers short, with sacks separated by wide connective, whitish but after liberation of pollen gradually darkening; staminodia often in pistillate flowers resembling corolla lobes. Pollen pale yellow, according to Selling's Palebua, Oahu specimen "Tricolporate, prolate spheroidal, sometimes spheroidal or subprolate, 30 x 29 (28-33 x 28-30) micra (incl. sculpture). Colpae broad and long but not reaching the poles, their membranes granulate, pore sometimes hard to see. Exine dark purplish brown, thick, and thickly beset, also at the poles, with rounded rods of about 3 micra length giving the grains a most characteristic appearance." Ovary shiny, yellowish green, closely sessile, depressed ovate-orbicular, 12- to 20-celled; stigmas sessile, greenish yellow, 12 - 20 crowded into 2 - 3 mm. long almost 1 mm. high wart-like mass. Fruit somewhat shiny and smooth when ripe and fresh (never grooved except when dried as in herbarium specimen), purplish-black throughout, moist-mealy, slightly bitter, seldom depressed spherical but usually depressed-oblong-globose to obscurely depressed-quadrangular, 5 - 7 mm. high, 7 - 10 mm. wide, 10 - 15 mm. long, with grooved 2 - 9 mm. long scar of dried stigmas, with 10 - 20 separate woody endocarps which are 3 - 4 mm. long and 2 mm. wide and at back thickening to 1 mm.

Type Locality: Oahu.

Local Range: This melange grows in the more open rainforest on all the larger islands, including Lanai as a small erect tree or more rarely, particularly on Kauai, as a floriferous shrub. On the latter island, about Halii Valley, a form with rose-tinged flowers may be seen. About Kilauea, Hawaii, it is usually overtopped by some *Metrosideros* and their epiphytic *Cheirodendron* trees, alternately sun- and fog-drenched. In the Kulani area and about Hualalai, Hawaii, we have collected a taxon with large, conspicuously narrow leaves. Seeds germinate well on decaying treefern logs, the seedlings bearing serrulate leaves for several years. The white wood was prized by the early Hawaiians for canoe trimmings; and for the *kua kuku*, or anvil, on which bark was beaten into tapa. Emory (1925) in a Lanai cave discovered an *auamo*, or carrying stick, of this wood 2 inches thick and 5 feet 9 inches long. The common Hawaiian name *kawau* is not limited to *Ilex*, but in some island dialects is that of *Fagara*, *Mezoneuron* and *Styphelia*. The name *kawaii* (Fosberg, 1966) is just one of many errors deserving oblivion.

Extra Range: Endemic to the Hawaiian Islands, and closely related to a few Polynesian species to the South. These are the most primitive for the genus, belonging in *Byronia* Endlicher, a generic name now generally equated with *Ilex*. *I. anomala* is archaic in not having separate vegetative and floriferous shoots; in having loose, compound dichasia rather than reduced cymes; in having floral parts numerous and variable in number rather than reduced to 4 or rarely 2; in having filaments short with wide connective rather than long with narrow connective; in having endocarps numerous and fibrous rather than few, trigonous and hard; and in certain features of wood anatomy too complicated for discussion here.

*So many ask about the Hawaiian holly that we here furnish, provisionally, an illustrated description even though our understanding of its various taxa is still in a state of flux. Our former intent to publish jointly with the monographer of the genus, Dr. Shiu-ying Hu, proved impracticable because of a difference of opinion. The present illustrated description is based on our No. 31,193 and a few neighboring plants growing at 28 Miles, Puna, Hawaii, in 1967.

(Illustrated on following page)

Family : 110
Genus : ~~Polygonum~~ Rumex
Species : Skottsbergii

POLYGONACEAE
BUCKWHEAT FAMILY

RUMEX SKOTTSBERGII Deg. & Deg.
(Original)
(Described on preceding page)

(Degener, Kilauea, Hawaii)

Family : 110
Genus : ~~Polygonum.~~ Rumex
Species : Skottsbergii

POLYGONACEAE
BUCKWHEAT FAMILY

RUMEX SKOTTSBERGII Deg. & Deg.
SKOTTSBERG DOCK; PAWALE

Rumex giganteus sensu Hillebr. Fl. Haw. Isl. 377. 1888. (In part.)
Rumex giganteus sensu Skottsb. in Acta Horti Gotob. 2:223. 1926. (In part.) The novelty is named for Dr. Carl Skottsberg, who here gave some results of his study of local *Rumex* taxa.
Rumex giganteus sensu Degener, Plants Haw. Nat. Park 152. 1930; ibid. 1945.
Rumex giganteus sensu Fagerlund & Mitchell in Nat. Hist. Bull. (Haw. Nat. Park) 9:35. 1944.
Rumex giganteus sensu Hubbard & Bender, Trailside Plants Haw. Nat. Park 4:7. 1950.
Rumex giganteus sensu Fosberg in Doty & Mueller-Dombois, Atlas Bioec. Stud. 187. 1966.
Not *Rumex giganteus* Ait. Hort. Kew. ed. 2:232. 1811. (Rainforest up to about 15 meter long liane with loose, horizontal to drooping inflorescence brilliantly red but drying castaneous. This complex is also represented by an important sheet – *R. g.* var. *nelsonii* – collected by David Nelson and deposited in the British Museum (Nat. Hist.) and by one – *R. g.* var. *g.* – annotated "Rumex 40 feet high . . . C68.")
Rumex skottsbergii Deg. & Deg. in Phytologia

Erect 7 - 10 dm. tall entirely glabrous shrub with many stiffly erect slightly zigzag twiggy longitudinally grooved stems arising from compact rootstalk bearing thick yellowish taproots. Leaves pale green fading yellow: most blades 10 x 4.5 cm., oval with acute apex but toward inflorescence gradually smaller and more ovate- to obovate-elliptic with somewhat cuspidate apex, thick, entire or nearly so and never crisped, with acute to acuminate base; petioles slender, somewhat shorter than lower blades and often longer than upper blades; ocrea thin, castaneous. Flowers extremely numerous, yellowish green, imperfectly dioecious with staminate and pistillate flowers at times in same fascicle, subtended by minute persistent scarious ocreae: pedicels 3 - 5 mm. long, filiform except for thickened top, persistent in fruit; inflorescence stiffly erect, compact, enlarging in fruit to become usually broad-conical and 10 - 20 cm. wide. Pistillate flower: outer sepals concave, oval-suneate to obovate, with obtuse apex, faintly nerved, almost 1.5 mm. long, spreading at anthesis; inner sepals longitudinally recurved to facilitate lateral extrusion of the longer stigmatic branches, ovate with subtruncate base and usually retuse apex, 3 mm. long and almost 2 mm. wide, erect at anthesis, with veins and especially midrib prominent. Ovary 1 mm. long, ellipsoid-trigonous with sharp angles, short-stipitate; styles filiform, each acutely widening into white-translucent broadly fan-shaped stigma irregularly twice and thrice fringed to form about 40 ultimate flat branches. Staminate flower: sepals concave, obovate with obtuse apex, faintly nerved, grading from about 1 mm. long for outermost to 2 mm. long for innermost, suberect; filaments filiform; anthers pale yellow, exserted, obovoid, 1.5 mm. long, emarginate at base and deeply narrowly cordate at apex; aborted ovary 0.5 mm. long, with spreading flat truncate stigmas each half as long. Fruit yellowish green ripening castaneous; outer sepals reflexed, marcescent, not enlarged; inner sepals erect to closely invest nutlet, 4 - 6 mm. long, undulate to somewhat erose-dentate, obtuse to retuse at apex, broadly cordate at base, conspicuously net-veined except for open margin, with midrib prominent without but sulcate within; nutlet shiny, obovoid, deeply trigonous, 2.5 mm. long, obtuse to a minute truncate stalk at base, somewhat beaked.

Type Locality: "Degeners & Piccos 32,453. On 1907 Lava Flow, Kau, Hawaii. On lava rubble at 1,600 feet. July 26, 1968. Type at NY, cotypes widely distributed."

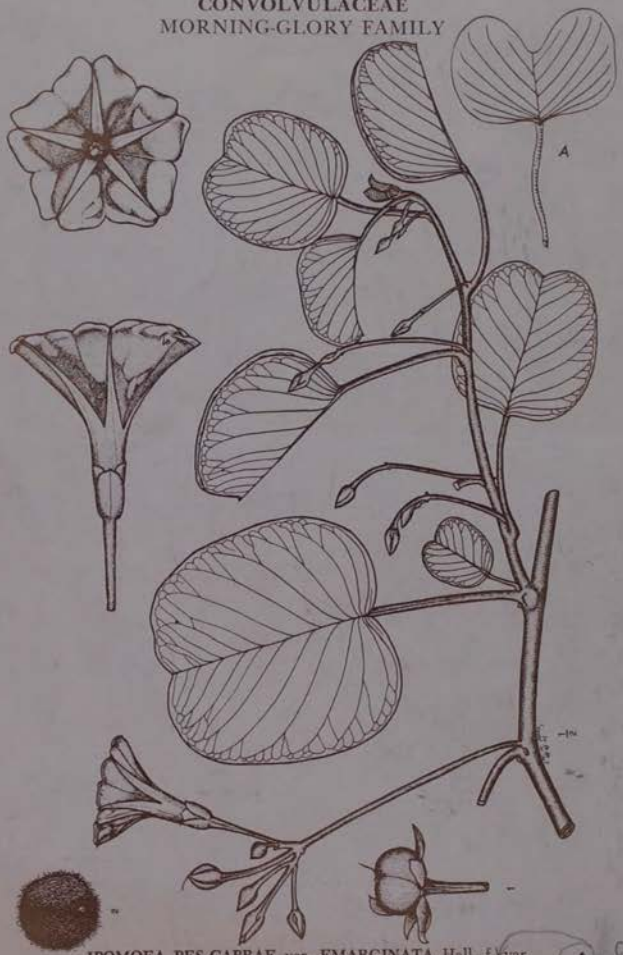
Local Range: At present we know this species complex is native to Hawaii, where it is common on the ash and aa flows from about Kilauea and Kilauea Iki Craters through the *aalii, ohia lehua* and *ukiuki* pahoehoe flows of the Kau Desert up the Southwest Rift Zone of Mauna Loa and thence northward into Kona until stopped by forests. It grows from about 1,500 to 7,000 feet elevation. It is strictly a pioneer. This erect xerophyte with yellowish green flowers in a compact erect cluster has been mistaken for the gigantic liane complex *R. giganteus* with brilliant red flowers in a loose horizontal to drooping cluster first collected by Captain Cook's botanist, David Nelson. After growing both taxa side by side in their Volcano garden, the Degeners judge them specifically distinct. The species s.s., described above, extends in imperfectly known varieties and forms to Maui where it thrives in and about Haleakala's cinders and ledges. Most curiously, it is replaced on Oahu and Kauai by *R. albescens* Hillebr. It does not reappear until dry, eroded Nihoa, where it was collected at 600 feet elevation as recently as May 1969 (D. Yen. No. 1015). The Nihoa plant, when procured in better condition for study, may prove to be a new variety. Apparently hybrids between complexes of *R. skottsbergii* and *R. giganteus* occur.

Extra Range: Endemic to a few of the Hawaiian Islands. The Nihoa plants may represent a relict flora. Many similar islets, reefs and shoals of the Hawaiian Chain in past ages were large, usually high islands. These were certainly covered with vegetation in which *Rumex* was one of the elements.

(Illustrated on following page)

Family : 307
Genus : Ipomoea
Species : Pes-caprae
Variety : Emarginata

CONVOLVULACEAE
MORNING-GLORY FAMILY



IPOMOEA PES-CAPRAE var. **EMARGINATA** Hall. f. var.

(fig. A) Pes-caprae

~~Figure A. PES-CAPRAE~~
Original & after van Ooststroom)
(Laie, Oahu)

tall bold caps.

(Described on preceding page)

Family : 307
Genus : Ipomoea
Species : Pes-caprae
Variety : Emarginata

CONVOLVULACEAE
MORNING-GLORY FAMILY

IPOMOEA PES-CAPRAE var. **EMARGINATA** Hall. f.
SEASIDE MORNING-GLORY; POHUEHUE

Convolvulus brasiliensis L. Sp. Pl. 159. 1753.
Convolvulus bilobatus Roxb. Fl. Ind. 3:73. 1824.
Convolvulus ovalifolius sensu Meyen, Reise um die Erde 2:150. 1838. (Evidently our plant growing east of "*Demant-Hügel*" on beach sand; had it grown on rocks and soil, and been less showy, we would suspect Meyen had admired our *Jacquemontia*.)
Ipomoea Pes-caprae var. *emarginata* Hall. f. in Bull. Soc. Roy. Bot. Belg. 37:98. 1898.
Impomea pes-caprae sensu Akana, Haw. Herbs Med. Value 73. 1922.
Ipomoea maritima sensu Freaf Our Familiar Isl. Trees 86. 1929.
Ipomoea pes-caprae ssp. *brasiliensis* van Ooststr. in Blumea 3:533. 1940. (Considering our plant a variety rather than a subspecies, we reject the name *brasiliensis*. See Article 60 of the Code.)
Ipomoea pes-caprae of Hawaiian authors; not of Linnaeus Sp. Pl. 159. 1753, which is cited by him as "*Habitat in India.*" This variety, *I. pes-caprae* var. *pes-caprae*, represented by a leaf in our accompanying plate, ranges from the coasts of tropical Asia sporadically to Malasia and East Africa. It is foreign to the Hawaiian Islands.

Rapidly growing watery-milky glabrous faintly viscid succulent herb with 10 - 15 cm. wide perennial crown bearing thick deep starchy roots and prostrate straight creeping smooth and never twining subterete solid stems often 10 to rarely 30 meters long with many leafy short branches and from the nodes rooting; green stems as well as inflorescences and petioles usually tinged with red-violet where exposed to intense sunlight; old stems brownish gray and with lenticels coarsely rugose. Leaves with 3 - 12 cm. petioles which are slightly flattened and sulcate on upper surface; blades about as long as petioles or shorter, leathery-fleshy, entire, mucronulate, usually suborbicular, usually more or less conduplicate and especially so nights, mostly emarginate to rarely slightly truncate to deeply obcordate at apex and rounded to cordate at base, with midrib thickened below but ribs and veins impressed on both surfaces, bearing nearly parallel 8 - 10 oblique ribs on each side of which the lowest 3 - 6 converge at base which frequently bears 1 - 2 reddish glands. Peduncles axillary, stout, erect, somewhat angular, 2.5 - 10 cm. long, bearing 1 to few slightly thinner angular and sulcate pedicels 1.5 - 4.5 cm. long; bractlets lanceolate, caducous. Sepals oval, pale green, the 3 inner 10 mm. long but the 2 outer 8 mm. long, mucronate. Corolla red-violet, about 4.5 cm. long, with broadly funnel-form tube and undulately-lobed limb 5 - 7 cm. wide. Stamens subequal; filaments coarsely glandular-pubescent for lower third and glabrous elsewhere, white; anthers 3.5 mm. long, narrow-deltoid in outline, white, pollen with yellow tinge, polyporate, globular, 125 micra, but without spines 95 micra, with exine with less numerous 9 micra wide pores separated from one another by 5 to 15 micra. Ovary 2 mm. wide and almost as high, imperfectly 4-locular, faint lavender, glabrous; style white, glabrous; stigma white, bilobed-capitate, 2 mm. high, 2 x 3 mm. wide, verruicose. Capsule ovoid, about 10 - 15 mm. high and somewhat wider, with thick valves brown without and whitish to yellowish within, dull, its 2 locules containing each about 2 seeds, with marcescent reflexed sepals. Seeds black with dark brown dense velvet pubescence, 6 - 7 mm. long, buoyant.

Type Locality: "Embouchure du Congo à Shark Point, 7 Sept. 1874 (Naumann!, Hb. Berol)."

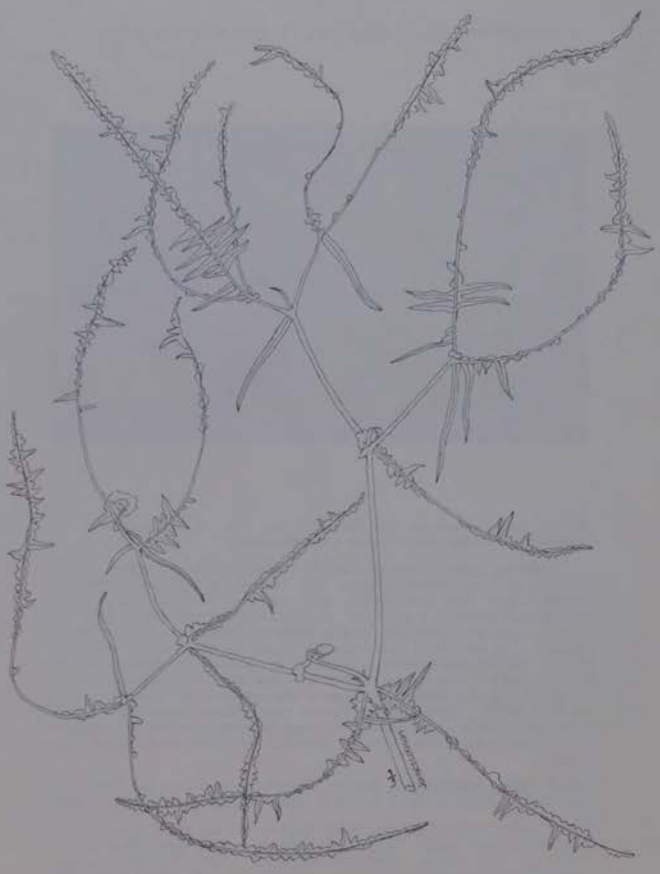
Local Range: Native to all our islands, luxuriating on coastal dunes and beaches. Its long, slender stems seemingly gallop toward the ocean to be mauled and killed by storm waves which scatter the floating capsules and liberate seeds far and wide. It does not grow on earth like the jacquemontia, nor ordinarily on coastal lava flows. Fagerlund & Mitchell (1944) observed it, however, at Halape, Hawaii Volcanoes National Park, forming "a thick mat on the virtually soilless lava. It probably has its roots in brackish water beneath the rocks." It is a beautiful plant with its large, bright flowers through early spring and summer, seeding thereafter. Its criss-crossing straight, leafy stems are efficient sand binders. The specific name was obviously chosen because the leaf shape suggests the footprint of a goat. During times of famine, roots and stems were cooked and used as food, although if eaten exclusively for any length of time they caused dizziness. Stock, browsing on the leaves, is similarly affected. Roots and stems were formerly used for medicine, though poisonous in large amounts. They seem to lack anti-bacterial qualities. The seeds had much repute as a cathartic. According to a pathetic manuscript written in Hawaiian by Kaaiakamanu & Akina, and published in an English translation by Akana in 1922, "This vine . . . is good for the expectant mother." Fornander (p. 204) describes how the Hawaiian surfers, frustrated by a calm, would invoke seaward as follows: "Arise, arise ye great surfs from Kahiki, the powerful curling waves. Arise with the pohuehue; well up, long raging surf." More energetic swimming parties would take "several strands of the sea-convolvulus vine, and swinging it around the head, lashed it down unitedly upon the water until the desired undulating waves were obtained . . ." An appropriate chant accompanied this violence. For *hukilau* fishing, the tough, wiry vines were twisted into long coils, leaves dangling here and there, and used to drive the frightened reef fish toward the net. From Handy & Pukui we learn that when the Hawaiians practiced circumcision, the kahuna slit the foreskin of 7- to 8-year-old youngsters with a sharp knife made by splitting a piece of bamboo. The skin contracted of its own accord or he pulled it gently back. He next slipped a morning-glory blossom over the wound to promote healing.

Extra Range: A common littoral creeper of the tropics and subtropics and its most isolated islets. One of its most southern localities is Ninety-Mile Beach on the North Island of New Zealand. H. C. Cooper in Rec. Auck. Inst. Mus. 6:177. 1967, in error considered it naturalized rather than native. Presumably the plant had similar uses throughout its range as those described above. In Fiji the scorched leaves were used for caulking canoes.

(Illustrated on following page)
(Deg. & Deg., _____ to replace Deg. 6-30-32 and 9-15-46)

Family : 5
Genus : Dicranopteris
Species : Emarginata
Variety : Inaequalis

GLEICHENIACEAE
GLEICHENIA FAMILY



DICRANOPTERIS EMARGINATA var. **INAEQUALIS** Deg. & Deg.
(Original)
(Described on preceding page)

(Deg. & Deg. 31,277a)

Family : 5
Genus : Dicranopteris
Species : Emarginata
Variety : Inaequalis

GLEICHENIACEAE
GLEICHENIA FAMILY

DICRANOPTERIS EMARGINATA var. **INAEQUALIS** Deg. & Deg.

Dicranopteris emarginata var. *inaequalis* var. nov., *a D. emarginata var. emarginata in pinnis abortivis plus minusque differt.*

Differing from the species itself in having the fronds greatly reduced in blade surface. Ultimate pinnae very variable in different fronds and variable along their own length; part may be devoid of blade tissue entirely and consist for some cm. of only rachis, it may be divided into rounded segments a few mm. long or segments that are coarsely antrorsely pointed, or it may have such segments joined by wings of the midrib to lend to the ultimate pinnule a more or less sinuate appearance; all the foregoing shapes may be interrupted here and there by single pinnules or groups of pinnules resembling those of the species itself; rarely are some pinnules forked. Lateral pinnae shorter than ultimate ones, linear and 4 mm. wide or variously modified to be sinuate or coarsely antrorsely pointed or occasionally beset with 1 or a few pinnules. Sori often present, apparently normal.

Type Locality: Pahoa, Puna, Hawaii. Covering several acres in open, grassy Metrosideros forest at about 800 feet. Deg. & Deg. 31,277, July 7, 1967.

Local Range: Evidently a successful mutant that not only covers several acres in the type locality, it grows likewise in a small area about 8 miles distant, as the crow or spore flies, at upper Kaimu Homesteads. This latter colony (Deg. & Deg. 31,508), collected Feb. 12, 1968, bears fronds with a little less blade tissue.

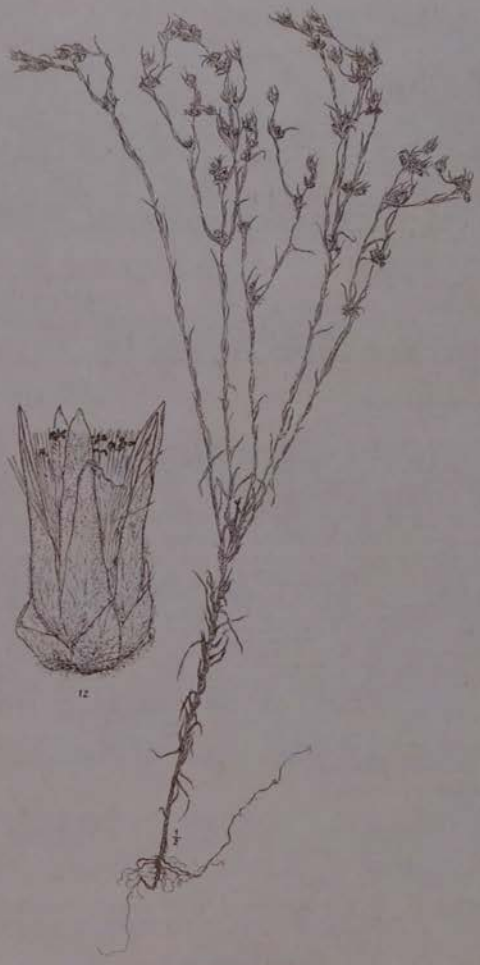
Extra Range: Not known elsewhere. A similar mutant seems to be the variety *duffii* of *Nephrolepis cordifolia*.

(Illustrated on following page)

(Degener & Degener, June 20, 1969 and, with drawing corrected, Jan. 20, 1970)

Family : 344
Genus : Filago
Species : Gallica

COMPOSITAE
COMPOSITE FAMILY



FILAGO GALLICA L.
(Original)
(Described on preceding page)

(Deg. & Deg. 31,907)

Family : 344
Genus : Filago

COMPOSITAE
COMPOSITE FAMILY

FILAGO L. Sp. Pl. 2:927, 1199. 1753.
(Including **Evax** Gaertn.)

More or less arachnoid to tomentose small to minute annual or very rarely perennial herbs with non-alate stems. Leaves alternate, entire. Heads discoid, small, mostly sessile, numerous and crowded or very seldom single, with many florets, white or nearly so, usually of three series of florets: outer florets pistillate, fertile, filiform-tubular, in several series of which peripheral ones lack pappus but are partly to almost completely enclosed by concave to boat-shaped bracts; while the inner usually perfect florets lack bracts but are furnished usually with capillary pappus bristles; the mostly 2 - 5 innermost florets are perfect or pistillate or sterile, are bractless, bear capillary pappus bristles or are rarely wanting. The European *F. minima* (Sm.) Pers., is noteworthy for smallness and bearing heads with but 2 - 3 florets. Receptacle flat to obconic or cylindric, chaffy. Involucre small, of 15 - 25 imbricate caudate to acuminate or rarely rounded scarious bracts, in fruit appressed to loosely spreading. Anthers sagittate, at base shortly caudate. Style branches without terminal appendages. Achenes small, more or less terete to obovoid, not ribbed, with often longitudinally flattened sides and sometimes papillose, usually with pappus bristles or in some heads some achenes with and some without bristles or very rarely all achenes without bristles, all similar or of somewhat different shapes.

Name, derived from the Latin *filum*, or "thread," was taken over by Linnaeus from Tournefort (1656-1708), who either referred to the hairiness of the plant or to the slenderness of its corollas.

Type Species: *Filago pyramidata* L.

A member of the Tribe *Inuleae*, this genus comprises perhaps 50 species scattered in dry, temperate to hot regions of Eurasia, North Africa and America. Plants sometimes are confused with a *Gnaphalium*. The former, however, bears a chaffy receptacle; the latter, never. Thus far only the following naturalized weed occurs in our archipelago:

FILAGO GALLICA L.
FRENCH FLUFFWEED

Filago gallicum [sic] L. Sp. Pl. 2: Addenda after Index. 1753. (We consider Linnaeus' spelling an oversight for *gallica*. He likewise misspelled "*Gnaphalium gallium*" in the Addenda for his "*Gnaphalium gallicum*" on page 857.)
Gnaphalium gallicum Allioni, Fl. Pedem. 1:174. 1785.
Logfia gallica Coson & Germain in Ann. Sci. Nat. Ser. 2. 20:291. 1843.
Oglifa gallica Chrtek & Holub in Preslia 35:10. 1963.
Filago gallica sensu Fosberg in Doty & Mnell.-Domb. Atlas Bioec. Stud. Haw. Volc. Nat. Park, Haw. Bot. Sci. Pap. 2:235. 1966.
Filago gallica sensu Wagenitz in Willdenowia 5/3:428. 1969.

Strict stiff slender 3 - 35 cm. tall silvery arachnoid-tomentose annual occasionally branched from base (especially if browsed by livestock) but usually forking in upper third into a few slender sky-reaching branches; diminutive depauperate specimens unbranched. Leaves erect, more or less appressed, linear-subulate, sessile, widest at base, acuminate, with midrib salient beneath, with margin entire and toward top somewhat revolute, central ones commonly 10 - 20 mm. long and 0.5 - 1.0 mm. wide, the uppermost far extending beyond heads. Heads sessile, narrow, 3 - 4 mm. long, 2 - 3 or rarely up to 6 in loose glomerule. Involucre somewhat 5-angled-pyramidal, with few outer bracts cuneate to very short linear-lanceolate and devoid of florets; about 5 middle bracts each subtending a linear pistillate floret, lanceolate, acuminate but at base gibbous and with age become lignescent to enclose ripened achenes completely or nearly so; innermost bracts linear-lanceolate, slightly curved, 6 - 8 subtending perfect columnar 4-dentate florets and 2 - 8 subtending filiform pistillate florets; involucre in age spreading, all its bracts with scarious often purplish-tinged margins and greenish middles which in outer bracts are arachnoid-tomentose. Achenes 0.7 - 0.9 mm. long; coarsely glandular, tawny-yellow; those enclosed being curved, smooth, devoid of pappus; the remainder being straight, narrower, furnished with single row of white readily deciduous about 2.5 mm. long capillary bristles minutely spreading-hispid toward base and antrosely so otherwise.

Type Locality: Obviously France.

Local Range: A specimen collected somewhere in Hawaii Volcanoes National Park by Frank Eggler is not presently represented in the Park herbarium, this having been "looted" by careless loan of specimens. We assume it to be *F. gallica* as this species was common and locally naturalized in shallow, arid pumice, dust and ash between bare pahoehoe masses in May 1966 (Deg. & Deg. 31,907). The plants grow quickly to maturity with the winter rains, and die to wither and disappear with the dry summer. The drawing is of a drying plant.

Extra Range: Native to the Mediterranean area, but more widely naturalized, even in Chile and in western North America. We presume the Hawaiian plants came from the sticky achenes on the boots of some visitor who had previously hiked in California. (Degener & Makinen, date to come)

(Illustrated on following page)

to the publications about Araliaceae by Drs. R.H. Eyde and C.C. Tsen repeatedly visited the trees, recognizable from afar because of their foliage, for preserved and herbarium material. They likewise painted a their Volcano [illegible] elevation for observation.

REYNOLDSIA HILLEBRANDII Sherff
(Original)
(Described on preceding page)

Pollen X 500: a, equatorial view showing sexine structure, colpus & os; b, same showing thickened sexine at poles; c, same showing noxinous breaks; d, polar view showing apocolpium & 3 colpi; e, same showing thickened nexine & nexinous breaks.
(Degeners 1970, Pulama, Hawaii)

Family : 281
Genus : Reynoldsia
Species : Hillebrandii

ARALIACEAE
ARALIA or GINSENG FAMILY

REYNOLDSIA HILLEBRANDII Sherff
HILLEBRAND REYNOLDSIA; OHE, OHE MAKAI

Reynoldsia Sandwicensis sensu Hillebr. Fl. Haw. Isl. 156. 1888. In part. (His two sheets [No. 263] deposited at Kew and said to have been collected July 1865 in Kau, Hawaii, are a mixture of *R. hillebrandii* and the Oahu *R. sandwicensis*.)
Reynoldsia Sandwicensis sensu Rock, Indig. Trees Haw. 351. 1913, as to Hawaii plants only and to the excellent plates 140 & 141.
Reynoldsia sandwicensis sensu Fagerlund & Mitchell, Checklist Pl. Haw. Nat. Park, 45. 1944.
Reynoldsia Hillebrandii Sherff in Bot. Leaflets 6;11. 1952.
Reynoldsia sandwicensis sensu Fosberg in Doty & Mueller-Dombois, Atlas Bioec. 214. 1966.
Not *Reynoldsia sandwicensis* A. Gray in Bot. U.S. Expl. Exped. 1:724. 1854.

Broad tree up to 10 meters tall with short thick trunk having thick often somewhat tortuous branches bearing twigs that are more or less white and stellate-pubescent at apex as are the buds but glabrous and pale to dark gray elsewhere. Leaves imparpinnate with all but terminal leaflet paired (or in exceptional cases pinnate with lower leaflets paired but upper leaflets alternate), 25 - 35 cm. long and commonly 20 cm. wide, shiny, entirely glabrous or with the 5 - 12 cm. long petiole occasionally stellate-pubescent toward base, with slender rachis. Leaflets 5 - 9, with slender spreading petiolules of which the lateral are 7 - 40 mm. long and the terminal 25 - 80 mm. long; leaflet blades orbicular-ovate to deltoid-ovate, 5 - 12 cm. long, 4 - 8.5 cm. wide, with apex obtuse to somewhat retuse, with broadly truncate entire base usually abruptly somewhat decurrent, above base with 3 - 7 repand- to sinuate-crenate blunt teeth per side. Inflorescence of 1 - 3 spreading subequal glabrous to glabrate branches with 5 mm. thick commonly 10 to rarely up to 20 cm. long rachis, each bearing usually 13 - 30 stiff slender peduncles 4 - 6 cm. long which toward base of rachis tend to be retrorse and toward middle at right angles but toward apex umbellately arranged; pedicels per peduncle 11 - 25, about 10 mm. long and 1 mm. wide, stiff, arranged similarly to peduncles; basal bracts 2 - 3 mm. long; flowers yellowish green, glabrous. Calyx narrow-cupuliform, 3 - 4 mm. long, 2.5 - 3 mm. mide, with subentire rim. Petals 13 - 14, narrowly oblong, 7 - 8 mm. long, about 1.2 mm. wide, connate, dehiscent at upper part at anthesis. Stamens 9 - 14: filaments about 3 mm. long; anthers narrowly oblong, about 5 mm. long, slightly curved. Pollen tricolporate, spheroidal to subprolate, 30 x 26 (28 - 32 x 22 - 28) micra; sexine pervtectate, 1 micron thick, thickened (1.7 micra) at poles, with fine supratectal elements and infrabacula; nexine about 1 micron thick, thickened near ora; colpi reaching poles at equatorial view; apocolpia about 7 micra in diameter; ora lalongate, elliptical or rectangular, the shape changeable due to breakage of nexine 2 (inner nexine), nexinous breaks always shorter than colpi. Ovary with 8 - 11 locules; stylopodium about 1.5 mm. high, 2.5 mm. wide, with 8 - 11 congested radiating stigmas. Drupes depressed-globose, purple within and without, juicy, bitter; when dried 7 - 8 mm. wide, longitudinally 8- to 11-ridged and with prominent calyx ridge one-fourth from top bearing prominently marcescent stylopodium and stigmas; while quite unripe, green to pale green except for truncate top which is deep pink except for dark purplish outer rim. Seed gray.

Type Locality: "Joseph F. Rock 10,022, alt. 1,800 ft., Kapua, South Kona, Isl. Hawaii, January, 1912 (type, Gray, my [E. E. Sherff] photograph No. 4,161)."

Local Range: This Hawaii endemic, discovered by Hillebrand in Kau, was subsequently collected by Rock at Kapua. Then Degeners in 1968 alone (No. 31,506) and with National Park Ranger T. L. Picco and Mrs. Picco studied a grove of these trees among *Diospyros sandwicensis*, *Dodonaea*, *Metrosideros*, *Neottopteris*, *Pleomele*, etc., at Pulama, mauka of Wahaula, Puna, about 60 miles distant from Rock's locality. These *ohe* are "locally common and thriving on flow at 300 feet but absent from pahoehoe." As this outstanding and unique area adjoins Hawaii Volcanoes National Park, it should be purchased for inclusion in the park by the Department of the Interior or by the Nature Conservancy for the delight and instruction of mankind. Attracted ~~to the publications about Araliaceae by Drs. R. H. Eyde and C. C. Tseng, they are recognizable from afar because of their size and light green foliage for preserved and herbarium material. The men likewise planted a one-meter sapling in their Volcano~~ garden at 3,800 feet elevation for observation. This, during the past two years, has not been thriving but is holding its own in an unusually cool, foggy spot. Though the yellowish flowers and the juicy, bitter fruit are not attracting to us, bees, wasps and flies at Pulama crawl on the former for nectar and evidently birds eat the latter for moisture and sustenance. Potable water for them is scarce in the vicinity.

Extra Range: Endemic to the Island of Hawaii.

(Illustrated on following page)

(Degeners & Tseng ______________)

FIELD WORK IN THE HAWAIIAN ISLANDS

Initiated into the mysteries of freshman botany and the making of an herbarium at the then Massachusetts Agricultural College in 1918, the senior writer the following summer botanized about Yellowstone National Park and Pike's Peak, winning for himself, with a $15 honorarium, the Hill's Prize for the best student herbarium. Since that date he has been collecting, "retail," specimens in and about the eastern United States (1920-22), Bermuda (1921); across North America via the Canadian Rockies (1922); Woods Hole and vicinity (1924); across the northern part of the United States from West to East (1925); across the southern part of the United States from East to West (1933); Fiji (1940-41); across the United States via Bryce Canyon from West to East (1942); New Providence Island (1946); Canton Atoll, Phoenix Islands (1950, 1951); from Narvik, Norway, to Goteborg, Sweden, and England, Ireland, France, Germany, Austria, Italy and Yugoslavia (1952-53); Johnston Island and Canton Atoll (1958); across America via Mexico and Guatemala from East to West (1959); 'round the World via Japan, Taiwan, Hong Kong, Thailand, Agra, Cairo and Luxor, Istanbul, Greece, Crete, Austria, Switzerland, Germany, Portugal, Spain, England, Scotland and the continental United States (1964); and Fiji and New Zealand (1968-69).

Most of such collecting, usually between 'plane flights, was done without the benefit of proper drying equipment and hence consisted of unicates or numbers with but a few duplicates. The first set of such plants was given to the senior writer's *alma mater*, now known as the University of Massachusetts, to enrich the herbarium.

"Wholesale" collecting, mostly properly equipped with metal corrugations and artificial heat for quickly drying the specimens, was practiced since about 1922 to the present in the Hawaiian Islands, and in 1940-41 in the *Fiji Islands. Because of the great research value of such material, duplicates gathered for the various numbers often may have exceeded 25 to 50 or more. The best sets are deposited at the New York Botanical Garden and the University of Massachusetts, smaller sets being sold or presented to about fifty other institutions throughout the world. Though most numbers were donated to Berlin-Dahlem from earliest times, many, excluding the ferns, were destroyed during World War II bombings. The dirth of Degener specimens deposited at Honolulu's B.P. Bishop Museum during the directorships of Drs. Gregory and Buck, on the other hand, is due to the senior writer's disapproval of some of the policies of these gentlemen.

The writers never keep a notebook — a bulky nuisance that its users so often lose or mislay — but find the margins of the newspapers in the field press ample for pertinent notes, such as height, ecology, precise locality, all written preferably with indelible pencil. That night or the next day in camp or at home, date of collection is written or stamped on the same newspaper sheet (or its fresh substitute which has the original, scribbled margins transferred to it) and the specimens are arranged for the drier.

After the plants have been properly dried, they are assorted and stored in plastic bags with camphor or a superior insect repellent until they can be inserted in their proper generic place in two herbarium cabinets available. Here the specimens may linger for a week to several decades until they are desired for monographic work or for illustrated describing in the *Flora Hawaiiensis*. Many of such specimens receive no label until actually used. From the date of collection the general locality is then consulted from the card index, any precise locality and other data studied on the newspaper margin, number assigned, the plant identified at least provisionally, and master and duplicate labels written. The study completed, the best specimen is donated to New York or Massachusetts and duplicates scattered throughout the world. It is noteworthy that the writers retain no specimens themselves as their home is on the north shore of Oahu and subject to tsunami inundation. Should they ever wish to consult many of their specimens again, they need merely go 30 miles to the Marie C. Neal Herbarium, B.P. Bishop Museum, where they have been properly mounted and safely housed. Furthermore, it is useless for anyone to guess when a plant has been collected by the writers from the number on its label. For instance, *Santalum ellipticum* collected on Oahu in 1922 may bear a higher label number than a *Santalum* species collected on Maui in 1927 or on Lanai in 1963. The numbers fall just as chance assorts the particular specimens studied.

*Degener, O., Naturalist's South Pacific Expedition: Fiji. 1-303, 1949.

(Degener & Degener, June 20, 1969)

The list of Hawaiian Archipelago collection data, enumerated chronologically for each island separately, is copied from the file cards. Such information may or may not be more precisely detailed on the specimen sheet deposited in various herbaria. For the spelling of place names, J. W. Coulter's "A Gazetteer of the Territory of Hawaii," 1–241. 1935, is very useful. Some errors easily may have crept into this extensive list; conversely some seeming errors may not be errors at all. It was amusing when the late Dr. Skottsberg, unaware that transportation had improved markedly since his last visit to the Islands, admonished the writers for having listed a collection of *Wikstroemia* from Maui for the same date as one from Hawaii. It never occurred to him that they had collected the Maui plant in the morning, enplaned about noon, and collected the Hawaii plant in the afternoon, all the same day!

On the island of Hawaii, the "Belt Road," beginning at Hilo, was furnished years ago with conspicuous stone mileposts. Even though the distance from Hilo toward Kilauea and beyond is no longer accurately measured by these posts due to straightening and otherwise modifying the road, these posts are still usefully and commonly used to designate areas, such as "27 Miles."

Besides the names of well-known botanists, businessmen and collectors, some names on plant labels represent hitherto obscure individuals. These last are mainly college and high school youngsters, who botanized for interest or for pay, and juvenile parolees from the industrial school and the home for feeble-minded who received $15 and "keep" per month. They did their share in searching for botanical prizes and more than their share carrying heavy burdens of plants back to the base where the drier was located. Some of the less advantaged lads proved splendid individuals. They fully deserve the recognition they received.

The list below of Hawaiian Archipelago field collections, mostly delightful, interesting excursions, is not complete. Whenever collections were meager or soon labeled, no special record of that day was deemed necessary for noting on a filing card and hence not to be found in the list below.

We wish to register pleas to taxonomists: When a worker describes a plant he himself has collected, his printed statement regarding the locality of his find should be considered the authentic type locality, not the legend appearing on his label. The locality recorded in print, usually composed by the author after his return to where he has access to proper maps and other bibliographic aids, is usually more accurate than a label perhaps written under difficulties in the field. On the contrary, when a worker publishes about a plant collection by some one else, his statement regarding collection data should be considered less authentic than the collector's data on his* label. For example, the *kane* writer collected for about six months in the Fiji Islands. One or two master labels were written in ink and deposited in one or two leading herbaria. For the sake of convenience and legibility, however, the thousands of duplicates scattered throughout the World had received printed labels more or less abbreviated as to precise data. We maintain the labels in script are the authentic ones deserving quotation, not those revised by others and set in linotype. Secondly, we have experienced that monographers with gifts of some of our specimens for their researches, have taken the liberty of translating our labels into German for publication, often inadvertently altering the meaning. We consider the original English version the authentic one, not the translation often erroneously included in quotation marks. Thirdly, we disapprove of the practice of some institutions to rewrite our laboriously written labels, even if in a beautiful, Spencerian hand, and then to discard our originals. We are never sure such labels have been correctly transcribed. Should corrections or notations by others be desirable, these should be added to the sheet of the specimen, not to the label.

Oahu: VIII.10.1922 Punchbowl, Honolulu; VIII.11, Haleiwa; VIII.16, Hauula; VIII.17-20, Haleiwa.

Hawaii: VIII.23, Kailua to Keauhou; VIII.24, Napoopoo & Honaunau; VIII.25-26, Kilauea; VIII.27, Kilauea via Puna Coast to Hilo; VIII.28, Paauilo.

Maui: VIII.29, Iao Valley; VIII.30, Kula & Ulupalakua.

Oahu: IX.1, Honolulu.

Kauai: IX.6, Hanalei Bay and Dry & Wet Caves; IX.7, Koloa, Spouting Horn, Lawai Beach, Kukuiolono Park; IX.8, Waimea Canyon; IX.9, Olokele Canyon.

Oahu: IX.16, Manoa Valley; IX.17, Nuuanu Valley; X.6,13,14, Mt. Tantalus; X.22, *mauka* of Ft. Shafter; X.29, Nuuanu Pali & windward.

*See first issue of Sargentia.

Hawaii: XII.10, Hilo; XII.12, Hilo Harbor; XII.13, Crater Walk, Kilauea; Bird Park, Kilauea; XII.14, Byron Trail, Kilauea; XII.15, Tree Fern Forest, Kilauea; XII.16, Byron Trail & Kilauea-Iki; XII.17, Byron Trail & Kilauea; XII.18, Halemauman; also Tree Fern Forest; XII.19, Near Volcano House & Cockett's Trail, Kilauea; XII.21, Mauna Loa & Kau Desert; XII.22, Bird Park, Kilauea; XII.24, *mauka* of Volcano House, Kilauea; XII.28, Tree Fern Forest, Kilauea.

Oahu: II. 13, 18. 1923, Mt. Tantalus; II.19, Black Point; II.20, Kolekole Pass; II.26, Black Point; III.3, Mt. Tantalus; III.10, Mt. Tantalus & Pauoa Flats; III.11, ridge on windward side of Nuuanu Valley; III.18, Blow Hole; III.30, Mt. Tantalus; IV.1, Black Point; IV.8, from Nuuanu Pali via Waimanalo and around Koko Head to Kaimuki, Honolulu; IV.22, Mt. Tantalus & Pauoa Flats; V.5, Foothills of Konahuanui; V.15, Northeast of Nuuanu Pali; V.27, Upper Manoa Valley; V.25, Waimanalo & Makapuu Point; V.27, Upper Manoa Valley; V.29–VI.2, Haleiwa; VI.11, Mt. Tantalus; VI.18, Wilhelmina Rise, Honolulu; VI.25, Waimanalo & Makapuu Point.

Oahu: IX.8.1925, Near Salt Lake Crater; X.?, Kolekole Pass & Firebreak Trail; XI.22, Pauoa Flats; XII.30, II.21.1926, Kawaihapai; III.20, Mt. Tantalus; III.28, Ridge northeast of Nuuanu Pali; IV.2 (12?), Toward summit of Konahuanui; IV. 18, Between Konahuanui & Pauoa Flats; V.1, East of Manoa Valley.

Kauai: VI.10, Kilohana Crater; VI.11, Halii Valley, also west slope of Kilohana Crater; VI.12, Halenanahu near Kilohana Crater, also Mana; VI.13, Haeleele Valley, also valley northwest of Barking Sands, also Kaulaula Valley; VI.14, Haupu Point, Nawiliwili Bay, also Niumalu Bay; VI.15, Near Lihue; VI.16, Kapaa, also Kokee; VI.17, Northeast of Kipu; VI.18, Koloa, Kukuiula, also Kalaheo; VI.19, Hanapepe Falls; VI.20, North of Wahiawa; VI.21, Damp ravine, Kokee; VI.22, Along Kokee Road; VI. 23, 25, Kokee; VI.26, 27, Halemanu; VI.28, Labeled "Waineke Swamp" due to error in U.S.G.S., map used; probably actually Lehuamakanoi; VI.30, Along Kokee Stream, also Waimea Canyon rim near Kokee; VII. 1, "Waineke Swamp," (See above); VII.2, Waimea Canyon; VII.3, Olokele Canyon; VII.4, Kalalau Trail near Kokee; VII.5, Kokee; VII.6, Lihue.

Oahu: VII 9, Kahuku.

Hawaii: VII.14, Cockett Camp, Kilauea; VII.15, Between North Kona & Kau Desert; VII.16, Kau Desert east of Kilauea-Iki; VII.17, Aa desert east of Kilauea-Iki; VII.19, Waiakea, Hilo; VII.20, Wet jungle, Glenwood; VII.21, In kipuka near road about 7 miles west of Volcano House, Kilauea; VII.22, Honuapo & vicinity; VII.23, 29 Miles; VII.24, Wet jungle between Glenwood & 29 Miles; VII.25, 1926 Lava Flow, also Waiohinu, also Punaluu; VII.26, Ranch 8 miles west of Volcano House, also between Glenwood & 29 Miles; VII.27, Between Glenwood & Volcano House; VII.28, Mauka of cane lands, Honokaa; VII.31, Arid coast between Waimea & Kohala; VIII.1, 17 miles along road from Kohala toward Waimea; VIII.6, Niulii & exposed coast; VIII.8, Forest reserve, Kohala; VIII.9, Rocky shore, Kohala; VIII.10, Kohala ditchtrail; VIII.11, Pololu Valley; VIII.12, Near Hawi; VIII 13, Between Kawaihae & Waimea; VIII.14, 17 miles along road from Kohala toward Waimea; VIII.15, 17 miles along road from Kohala toward Waimea, also between Puuwaawaa & Huehue; VIII.16, Rocky, arid, cattle range 10 miles along road from Waimea toward Kealakekua; VIII.17, 20 miles along road from Waimea toward Kona; VIII.18, 20 miles along road from Waimea toward Kona, also between Puuwaawaa & Huehue; VIII.20, 20 miles along road from Waimea toward Kona in aa desert; VIII.21-23, Between Puuwaawaa & Huehue; VIII.24, Slope of Hualalai between Huehue & Puuwaawaa; VIII.26, North of Alika Lava Flow, also rainforest above Punaluu.

Oahu: X.10, Makapuu Point; X.25, Pauoa Flats; XI.20, Slope northeast of Nuuanu Valley; XI.25, Mountains east of Wahiawa; XI.26, Northeast of Nuuanu Pali; XII.5, Kaimuki; I.9.1927, Mt. Olympus; I.15, Near Mauna Kapu & Palikea; II.6, Manoa Caves; III.19, Kawaihapai; III.20, Halawa Valley; IV.10, Hauula Valley; IV.13, Waimanalo.

Maui: VI.11-13, Hana; VI.14, Olinda pipeline trail; VI.15, Hill mauka of Olinda on way to Haleakala summit; VI.16-22, Olinda pipeline trail; VI.23, Ulupalakua; VI.24, Olinda; VI. 26-27, Olinda pipeline trail; VI.29, Near Koolau Gap, Haleakala; VI.30, On way to Ulupalakua; VII.1, Brackish marsh, Kahului; VII.2, Near Mt. Eke from Waihee & vicinity; VII.3, Near Mt. Eke; VII.4, North mauka of Ulupalakua; VII.7, Oopuola Stream in vicinity of ditchtrail; VII.9, Wailuku aeolian deposits; VII.10, Barren hills at McGregor; VII.11, Pohakea Gulch; VII.12, From Papawai Point toward Puu Anu through Manawainui Gulch; VII.14, Ditchtrail from Haiku through Honomanu Valley to Keanae; VII.15, Within Haleakala near Koolau Gap; VII.16, Olinda pipeline trail; VII.19, Keanae Valley; VII.21, Half mile north of Keahikauo; VII.23, Ridge north of Pohakea Gulch into rainforest; VII.26, Olinda pipeline trail; VII.27, Near hill northeast of Olinda, also Olinda pipeline trail; VII.29, Olinda pipeline trail; VIII.6, Olinda; VIII.7, Near Ulupalakua; VIII.8, Olinda; VIII.9, Haleakala; VIII.10-12, Koolau Gap, Haleakala; VIII.13, Haleakala; VIII.15, Koolau Gap, Haleakala; VIII.16, Haleakala; VIII.17, Koolau Gap, Haleakala; VIII.18, On dry hills near Holua Cave within Haleakala; VIII.19, Koolau Gap, Haleakala; VIII.20, Kaupo Gap, Haleakala; VIII. 25,26, Makawao; VIII.27, Near last ditchman's house on way to Mt. Eke, also summit of Mt. Eke; VIII. 29,30, Summit of Mt. Eke; VIII.31, Summit (?) of Mt. Eke to IX.5 "Last day for Mt. Eke".

Oahu. IX.24, Manoa Valley; IX.25, Hauula Valley.

Molokai; X.14, Brown's Ranch, etc.

Oahu: XI.13, Hauula: XII.11, Head of Kuliouou Valley.

Maui: I.20.1928, Haleakala; I.25, Makawao.

Oahu: II.3, Kaimuki, Honolulu; II.6, Both Konahuanui sides of Nuuanu Pali; II.7, Tantalus Crater rim; II.11, Mt. Kaala; II.12, Palolo Valley; II.15, Pupukea-Kahuku Trail; II.17, Palolo Valley; II.20, Trail along Tantalus to Pauoa Flats; II.24, Waimanalo & Kailua; II.25, Pauoa Flats toward Konahuanui; II.28, East rim of Manoa Valley up toward Mt. Olympus; III.5, Waipio-Waiawa Ridge; III.17, Punaluu, Oahu.

Molokai: IV.4, Hoolehua; IV.5, Mauna Loa; IV.6, Hoolehua; IV.7, Overlooking head of Waikolu Valley; IV.8, From Maunahui toward George Cooke's mountain house overlooking Waikolu Valley; IV.10, Wet, gullied region between Waikolu Valley & probably northern base of Puu Alii; IV.11, South of Kaulahuki; IV.12, West of Pepeopae; IV.13, South of Pepeopae; IV.14, Near Homelani Cemetery; IV.15, Ravine just south of Maunahui; IV.16, Makai of Maunahui; IV.17, Near Puu-o-Wahaula; IV. 18,19, Near

Waiahewahewa Gulch; IV.21, West side of Waikolu Valley; IV.23, Continued cutting trail & almost reached Pepeopae Bog; IV.24, Upper end of Hanalilolilo pipeline; IV.25, Moomomi & beyond; IV.26, Near Hakina Gulch; IV.28, Kepuhi along shore to Kaa; IV.29, Along Hauakea Pali & gulch north of Puu Nana; V.1, Continued cutting trail to Pepeopae Bog; V.3, Pepeopae Bog; V.4, Top of Halawa Valley, also east of Pukoo; V.5, Up east Fork of Kawela Valley; V.6, West side of Pohakunui Gulch & Kapale Gulch; V.8, Continued cutting trail through Pepeopae Bog to Ohialele Pali; V.9, Walked to Pepeopae Bog & then southeast for almost mile toward prominent bare hill; V.10, From Pepeopae Bog north to around Ohialele Pali along which we walked eastward; V.12, Kahuaawi Gulch; V.16, Almost reached Kamakaipo; V.17, Coastal cliffs north of Hoolehua; V.18, Near Lalanui; V.20, Small ravine northwest of Maunahui; V.21, Ravine northwest of Puu Makaliili; V.22, Ravine northwest of Puu Makaliili (where precipice makes further descent impossible); V.23,24, Head of Waihanau Stream; V.25, Ravine just north of Maunahui cabin; V.30,31, VI.1, Kahuaawi Gulch; VI.2, Kaunakakai & 5 miles along road to east; VI.3, Dry part of Mokomoko Gulch (6 ft. high Santalum probably red-flowered!); VI.4, Kahuaawi Gulch; VI.5, Kahuaawi Gulch & up unnamed left branch; VI.6, Along Papaala Pali; VI.7, Mokomoko Gulch; VI.9, Up Mapulehu Valley to top overlooking Wailau Valley; VI.11, East Fork of Kawela Gulch; VI.13, West Molokai; (VI.17, Moved out of Maunahui cabin for good & into Kaluaaha cottage;) VI.18, From Leper Path leading to Kalaupapa to west along coastal cliffs; VI.19, From Leper Path to east, passing 2 prominent gullies into second of which we walked until blocked by passable waterfall; VI.20, West side, Halawa Valley; VI.21, From Halawa Valley along trail to Halawaiki Gulch near its head, then toward coast until we reached stream east of Puahaunui Point. (Peucedanum sandw., between Puahaunui Pt., & Kaonihu in small ravine just off coast; Brighamia on cliffs); VI.24, Brackish marsh, Kaluaaha; VI.25, Arid region; up Kapulei Ridge to east of white Kaholoapele Mountain & then back in east gully; VI.26, Between Ualapue & Hoolehua; VI.27, Second eastern gulch, Wawaia; VI.28, Rainforest, Kaluaaha; VI.29, Kamalo Gulch; VI.30, Gulch west of Ualapue; VII.3, East part of Kaluaaha plateau; VII.10, Along road all the way from Kaunakakai to Mapulehu; VII.11, Ualapue to Kamalo; VII.12, East arm of Kaluaaha Valley; VII.13, Near Pukoo; VII.16, Up valley west of East Ohia; VII.17, On East Ohia Ridge; VII.20, Western branches of Mapulehu Valley; VII.21, Maunahui; VII.23, Western branches of Mapulehu Valley; VII.24, Near Pakanaka Pond (mangrove & near Pauwalu Colubrina); VII.25, Mapulehu; VII.27, Branch of Mapulehu Valley; VII.28, Valley west of Kamola; VII.29, One of the dry valleys between Kamalo & Kaunakakai; VII.30, Kaunakakai; VII.31, Mapulehu Valley; VIII.2-7, 11-19, Wailau Valley.

Oahu: I.4.1929, Tantalus Crater rim; I.13, East crest of Manoa Valley; I.20, Wooded base of cliffs northeast of Nuuanu Pali; I.27, Kawaihapai; II.3, East ridge of Manoa Valley; II.17, Koko Head; II.26, West side of Kahana Valley; III.3, Olomana Needle; III.29, Pupukea end of Pupukea-Kahuku Trail; III.31, Pupukea-Kahuku summit; IV.1, Rainforest near summit of Pupukea-Kahuku Trail; V.12, Near Pupukea end of Pupukea-Kahuku Trail; V.27, Diamond Head.

Hawaii: VI.7, 29 Miles; VI.9, Glenwood region; VI.11, Glenwood-Kilauea region; VI.12 (13?), Olaa; VI.15, Wet jungle between Glenwood & 29 Miles; VI.16, Along main road 40 miles from Hilo into Kau Desert; VI.18, Glenwood & 29 Miles, also Uwekahuna; VI.19, Glenwood jungle; VI.22, Near Onomea; VI.23, Jungle near Glenwood; VI.24, Jungle between Glenwood & 29 Miles; VI.27, Hilo; VI.28, Jungle between Glenwood & 29 Miles; VI.30, 27 Miles; VII.8,9, Bird Park, Kilauea; VIII.23, On way to Waikapuna; VIII.31, Kipuka Puaulu, Kilauea; IX.2, Between Kaalualu & Waiohinu hospital; IX.6-9, Half way between Kaalualu & Waiohinu; IX.10, Tree-covered aa kipuka between Kaalualu & Waiohinu; IX.12,13, Nearer Kaalualu, dry aa desert forest; IX.16, East of South Point; IX.17, South Point; IX.18, Pukawaakauhi; IX.20, Milolii; IX.21, Milolii, also Kee; IX.22, Kee; IX.23, Kee to Hilo; IX.24,25, Kalapana; IX.26, Kalapana, also (for awa) Pahoa; IX.27, Punaluu; IX.28, Puuwaawaa; IX.29,30, Kawaihae; X.1, Byron Camp, Kilauea; X.13, Chain-of-Craters Road, also jungle near Volcano House, Kilauea; X.14, Kau Desert near Kilauea; X.15, Bottom of Kilauea-Iki; X.21, Near Sulphur Banks, Kilauea; X.28,30,31, Near Fern Forest, Kilauea; XI.1, Woods between Volcano House & 29 Miles; XI.5, Near Treefern Forest; XI.9, Near Hilo Entrance of Haw. Nat. Park; XI.10,13, Near Treefern Forest, Kilaoea; XI.22, Between eastern Fern Forest Trail & Glenwood Golf Course; XI.29, Laa Manu, near Kilauea; XII.5, Near Napau Crater; XII.7, Bird Park, Kilauea; XII.12, Between Volcano House & Glenwood Golf Course, also Naalehu; XII.15, Aa kipuka at Honuapo; I.3.1930, Wet jungle along pig hunter's trail running northwest of 27 milepost, Kilauea region; I.5, Punaluu; I.13, 27 Miles; I.17, Mililii; I.18, Huehue & Puuwaawaa; I.20, Near Hind Ranch, Puuwaawaa, also around rest of island by way of Laupahoehoe; I.24, Haw. Nat. Park; I.25, Napau Crater; I.27, Kipuka Nene; II.2, Near Anuhea Golf Course, Glenwood; II.2, Puna (for Bidens), also Pahoa & Kapoho (for Clermontia); II.7, In open, wet ditch between Olaa & Pahoa (for ferns), also 1788 Lava Flow between Pahoa & Kalapana (for Bidens); II.17,18, Aa kipuka between Honuapo & Hilea; II.22, Makaopuhi Crater; III.6, South side of Hilo Bay; III.12, Puna; III.17, Punaluu; III.22, Niulii; III.23, Niulii, also Pololu Valley; III.24, Halawa, also Mookini heiau; III.25, Between Waimea & Honokaa; also near Acacia koaia stand; III.29,30, Between Ohia & Koa Mills opposite road leading to Hoopuloa; III.31, Hookena & Kailua; IV.1, Kailua; IV.9, Kilauea; IV.10, Hilo & Olaa; IV.13, Punaluu; IV.15, Bird Park & Mauna Loa Trail; IV.16, Bird Park, Kilauea; IV.19,25, 29 Miles; IV.27, Lua Manu, also 23 Miles forest; V.2, Puna; V.4, 26 Miles; V.7, Hilea & Punaluu; V.16, Thurston Lava Tube, Kilauea.

Oahu: IX.28, Valley east of Kawaihapai Railroad Station; II.28.1931, Kahuku; III.15, Waiahole Trail; III.16, Kahana Ditchtrail; III.21, Along beach from Kawaihapai to Kaena Point; III.31, South side of Koko Crater; IV.4, Waikane-Schofield Trail; IV.12, Hills east of Kawaihapai; IV.20, East ridge of Niu Valley; IV.26, West branch of valley at pali in Waianae Valley near Kolekole Pass; V.10, Small gulch on south side of upper Makua Valley; V.17, Pupukea-Kahuku; V.30 (31?), Pig God Trail to summit Stream, Punaluu; VI.6, Pig God Trail, Punaluu; VI.12, From Makapuu Head to valley opposite eastern side of Koko Crater; VI.24, Waikane; VI.28, From Makua Valley along railroad tracks to Kaena Point; VII.5, Kamehoa; VII.19, Pupukea-Kahuku; VII.26, Mt. Tantalus rim; VIII.2, Makaha Valley; VIII.5, Punaluu; VIII.11, Pig God Trail, Punaluu; VIII.16, Waimanalo; VIII.30, Barbers Point & vicinity; IX.6, Ohikilolo Valley; IX.7, First large side valley on south of Makua Valley; IX.13, Up the cliffs between end of Kawaihapai Road & Kaena Point; IX.27, Between Puu Manawahua & Palikea along ridge; X.4, Pig God Trail, Punaluu; X.11, Western ridge of Kaipapau Valley; X.18, Up Paumalu Ridge,

Family : 124
Genus : Anemone
Species : Hupehensis

RANUNCULACEAE
CROWFOOT FAMILY

ANEMONE HUPEHENSIS (Lem. & f.) Lem. & f.

(Original)
(Described on preceding page)

(Habit x 1/7) (Deg. & Deg. 31663, H.V.N.P., 1968)

*Though the *kane* writer's late friends, Kenneth R. Boynton and Mary E. Eaton, properly described and illustrated in color this species in Addisonia 16: 33. Pl. 529. 1931, the binomial must be ascribed, a bit awkwardly, to V. Lemoine and son (sons?) of Nancy, France. According to Article 29 of the International Code of Botanical Nomenclature, "Publication on or after 1 Jan. 1953 of a new name in tradesmen's catalogues or in non-scientific newspapers, even if accompanied by a Latin diagnosis, does not constitute effective publication." This ruling does not apply because the Lemoines briefly described this taxon in 1908 as a trinomial in their catalogue with a price of 2 francs a cutting, and two years later as a binomial with the reduced price of 1 franc, 25 centimes.

**Many workers in error use the name *Anemone japonica* even though this binomial never can be used again. It actually belongs to a clematis because of a mistake in identification made by Martinus Houtton in 1778. Due to another mistake in identification, Thunberg in 1784 published the binomial *Atragene japonica* for a true anemone that was being grown as a cultigen with half-filled flowers in gardens in Japan. He did not realize that this beautiful cultigen was actually of Chinese origin. In the fascinating article entitled "The History of Anemone Japonica," appearing in the Journ. Royal Hort. Soc. 72: 261-268, 297-308. 1947, Bowles and Stearn come to the conclusion that the Chinese species s.s., must be named *Anemone hupehensis* Lemoine and its cultigen "*Anemone hupehensis* Lemoine var. *japonica* (Thunb.) Bowles et Stearn, comb. nova." Regarding the species and its derivative, some interesting questions remain: was *A. hupehensis* s.s., actually purchased from some European or mainland nursery and then permitted to escape into the native forest of Hawaii, or was some cultigen purchased which then reverted in the wild to the ancestral *A. hupehensis* s.s.? Can the filled-flowered ornamental cultigen be construed a monstrosity in the sense used by the Code under Article 71? Furthermore, as Houtton preempted the specific name *japonica* for use in the true genus *Anemone*, and Bowles & Stearn used *japonica* as a varietal and not specific name, should not Thunberg as part-author of the trinomial be omitted? We believe so and hence call the ornamental, not yet known to us from the Islands, simply *Anemone hupehensis* var. *japonica* Bowles & Stearn.

Family : 124
Genus : Anemone
Species : Hupehensis

RANUNCULACEAE
CROWFOOT FAMILY

ANEMONE HUPEHENSIS (Lem. & f.) Lem. & f.
HUPEH ANEMONE (often incorrectly called Japanese Anemone)

**Anemone japonica* var. *hupehensis* V. Lemoine & f. Cat. et Prix-Courant 1908-1909, p. 42. 1908.
**Anemone hupehensis* V. Lemoine & f. ibid. 40. 1910.
**Anemone hupehensis* sensu Boynton in Addisonia 16:33. Pl. 529. 1931.
Anemone japonica var. *alba* sensu Fagerlund & Mitchell in Nat. Hist. Bull. (Haw. Nat. Park) 9:37. 1944.
Anemone japonica var. *alba* sensu Neal, In Gardens Haw. 352. 1965.
Anemone japonica sensu Fosberg in Doty & Muell.-Domb. Atlas Bioec. Stud. Haw. Volc. Nat. Park, Haw. Bot. Sci. Pap. 2:191. 1966.
Anemone japonica sensu Deg. & Deg. in Phyt. 17(5):371. 1968.
***Not Anemone japonica* Sieb. & Zucc. Fl. Jap. 1:15. 1835.

Coarse thick-stemmed hairy erect pale branching perennial herb with numerous basal leaves and commonly 1 meter tall stem longitudinally grooved and beset with antrorse arachnoid-hirtellous white pubescence especially abundant toward lower part of node; stem with branches above the 2- or 3-leaved involucre about 15-flowered. Leaves with pubescent petioles and with incised cordate blades being above evenly spaced arachnoid-hirtellous while below with thick nerves and veins antrorsely arachnoid-hirtellous: basal leaves 3–4 dm. long, with petiole shorter than the three leaflets which are distinctly petioluled and subcordate shallowly 3- to 5-lobed serrate acuminate; middle leaflet narrowly ovate while the lateral are asymmetric; stem leaves in groups of 2 or more, trifoliolate to variously trilobed, the lower often 30 cm. long and ovate as well as petioled and petiolulate but the upper down to 1 cm. long with blade cordate to acuminate at base and acuminate at apex of each lobe. Flowers 4–6 cm. wide. Sepals (by many Europeans named tepals because not readily distinguishable whether sepals or petals) 5, without arachnoid-hirtellous and white often with blush of purplish pink but glabrous and always white within, suborbicular. Stamens about 100, up to 5 mm. long: filaments pale yellow; anthers canary yellow. Carpels aggregated in many hundreds into sphere depressed at base, yellow-green with brownish stigmas. Fruiting head spherical, about 2 cm. thick, green with brownish stigmas and often somewhat pinkish where exposed to the sun; carpel with slender stiff 2–3 mm. brownish stalk surrounded for at least 10 mm. by white silky-arachnoid cloud of pubescence; body narrow-obovoid, 1.5–2 mm. long, 1 mm. wide, clothed especially toward top with antrorse white appressed pubescence.

Type Locality: *"Comme son nom l'indique, elle croît à l'état sauvage dans la province de Hou-Pe (Chine centrale) - - -."* The type plant probably originated from specimens collected by the Italian missionary Cipriano Silvestri, who had botanized in Hupeh between 1900 and 1910.

Local Range: Perhaps one of the several plants introduced illegally by the excellent, energetic, well meaning, Scotch gardener Tate of the Volcano House in the late '20s. This beautiful weed has spread from this general area year after year thanks to its air-borne achenes farther and farther into the rainforest about the Kilauea region of Hawaii Volcanoes National Park. It thrives among terrestrial Astelia plants and, as these are uprooted and eaten by feral pigs, the acrid anemone supplants them. It is nigh an act of criminal negligence to let such an exotic species take over the endemic forest, especially in a national park. Aug. 15, 1970, the writers found it naturalized at 2,500 feet elevation in the Punaluu mauka Forest Reserve, the beginning of a ghastly disaster that a wide-awake early Park Naturalist and Superintendent could have nipped in the bud.

Extra Range: Native to central China, and scattered elsewhere due to cultivation as an ornamental. Thanks to replies to our queries after mailing Hawaii specimens of this beautiful weed to authorities in Japan and Scotland such as Drs. H. Kojima, N. Takaki and H. R. Fletcher, we prefer our present determination. Our plant is often confused with a semi-double-flowered cultigen commonly known in error as "*A. japonica*," which is smaller in general, has less prominent leaf venation, different shape of leaves, more sepals, and different carpel hair. Its correct name is *Anemone hupehensis* var. *japonica* Bowles & Stearn.

(Illustrated on following page)
(Degener & Degener, Nov. 28, 1970)

Family : 124
Genus : Ranunculus
Species : Plebeius

RANUNCULACEAE
CROWFOOT FAMILY

RANUNCULUS PLEBEIUS R. Br.
COMMON AUSTRALIAN BUTTERCUP

Ranunculus plebeius R. Br. ex DC., Syst. 1:288. 1817.
Ranunculus plebeius sensu Benth., Fl. Austral. 1:13. 1863.
Ranunculus plebeius sensu Melville in Kew Bull. 10: 195, fig. 1(7, 8, 11-17). 1955.
Ranunculus plebeius sensu Briggs in Proc. Linn. Soc. N.S.W. 84:306, fig. 2, 27-31. 1960.

Fibrous-rooted non-acrid perennial herb with leaves mainly in basal rosette and with erect 20—80 cm. tall repeatedly branched stem with 4—16 flowers; lower part of stem with 2 mm. long soft spreading hair but upper part with 0.5 mm. long scattered appressed hair. Basal leaves: petioles 10—20 cm. long, hollow, often purplish toward base, with 1—2 mm. long spreading hair; blade ternate, broadly 5-angled in outline, 4—5 x 5—6.5 cm.; petiolule of terminal leaflet 5—8 mm. long, its commonly 3 x 2.8 cm. rhombic blade usually deeply trisect with the terminal segment 3-lobed and bearing 5—7 coarse teeth while its lateral leaflets with 2—4 mm. petiolules bear obliquely 5-angled trisect blades of which the lower incisions are deeper than the upper; segments coarsely toothed or if 2-lobed then lobes with 1—3 coarse teeth. Stem leaves similar but with shorter petioles and smaller blades which are less divided and have narrower segments; these gradually intergrading into the uppermost sessile sublinear 5—8 mm. long bracts. Flowers 10—14 mm. wide, on furrowed pedicels covered with 0.2—0.4 mm. long hair and elongating to 4—9 cm. Sepals 5, first spreading, later reflexed, cymbiform, ovate to elliptic, 3.5—4 x 2 mm., green to purplish in center and more or less hyaline at margin, with spreading long hair without, with 3 main nerves. Petals 5, golden-yellow, obovate, 6—7.5 x 2.5—3.5 mm., obtuse, with 5—9 nerves at lower third; nectary about 0.3 mm. above base, its broad-ovate to almost circular about 0.7 mm. long lobe attached for about half its length. Stamens 20—30: filaments linear, flat, about 2 mm. long; anthers oval, 0.8—1.0 mm. long. Pistils 30—60, about 2 mm. long: style straight, with recoiled tip. Fruiting heads almost globular to slightly longer than broad, 8—10 x 7—8 mm. Fruiting receptacle 4—5 x 1.0—1.4 mm; staminal zone glabrous, nutlet zone elliptic, hirsute between nutlets. Nutlets obovate to obovate-cuneate, 2.5—2.8 x 2.0 mm. flat, 0.9 mm. thick, smooth at the faces, slightly rugose and shouldered below the beak, with margins narrowly ridged; beak slender, 0.7—1.0 mm. long, spirally recoiled or strongly recurved.

Type Locality: Collected by Robert Brown *"in paludos prope Kingstown."* Oct.-Nov. 1804 (R. Br. No. 5253).

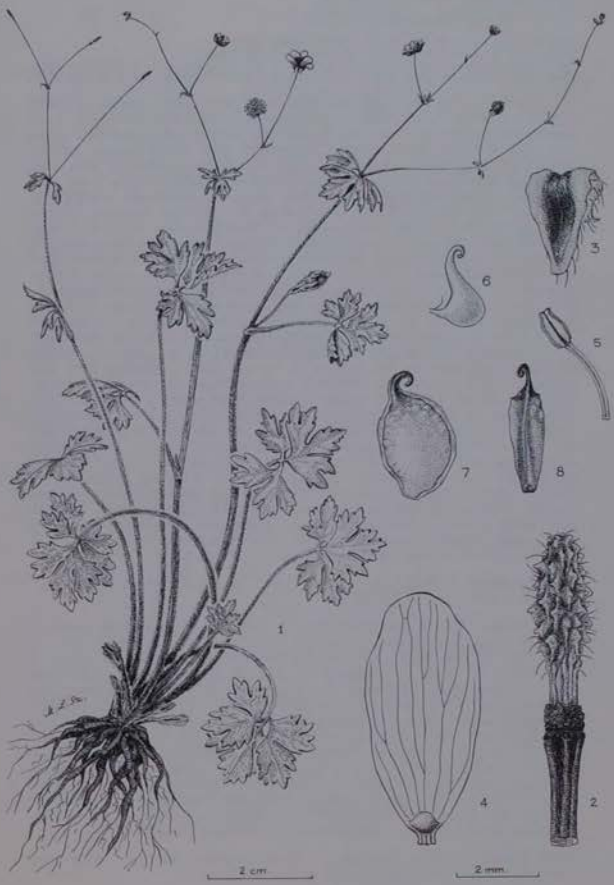
Local Range: Found naturalized by O. Degener & Murashige south of Papaloa, Capt. Cook, Kona, Hawaii, in cattle range at 5,000 feet Aug. 13, 1949 (No. 20,343: K, M, NY) and by Degeners & L. W. Bryan mauka of Kealakekua in muck in rainforest clearing at 3,400 feet May 30, 1969 (No. 31,983: AD). Thinking the plant an undescribed endemic, the Degeners carefully planted the taxon in their patch of rainforest at Volcano, Hawaii, for observation. They noted that the flowers closed at night and that the plant reseeded itself preferably on decayed, moss-covered logs. After learning of the plant's nativity from their collaborator, the *Ranunculus* specialist Hj. Eichler, they made sure to remove all plants in the garden lest this species should spread and increase its present range beyond the District of Kona. This species can be distinguished easily from our endemic ones as the latter have almost straight styles (in flower), only slightly recurved nutlet beaks and usually more divided basal leaves.

Extra Range: Eastern Australia, in damp situations in forest areas near the coast and on tablelands, usually below 1000 m s.m.

(Illustrated on following page)
(Degeners & Eichler, Nov. 28, 1970)

Family : 124
Genus : Ranunculus
Species : Plebeius

RANUNCULACEAE
CROWFOOT FAMILY



RANUNCULUS PLEBEIUS R. Br.
(Original)

(Described on preceding page)

(Drawn by M. L. Szent-Ivany from Degs. & Bryan 31,983)

Family : 274
Genus : Tibouchina
Species : Urvilleana

MELASTOMATACEAE
MELASTOME FAMILY

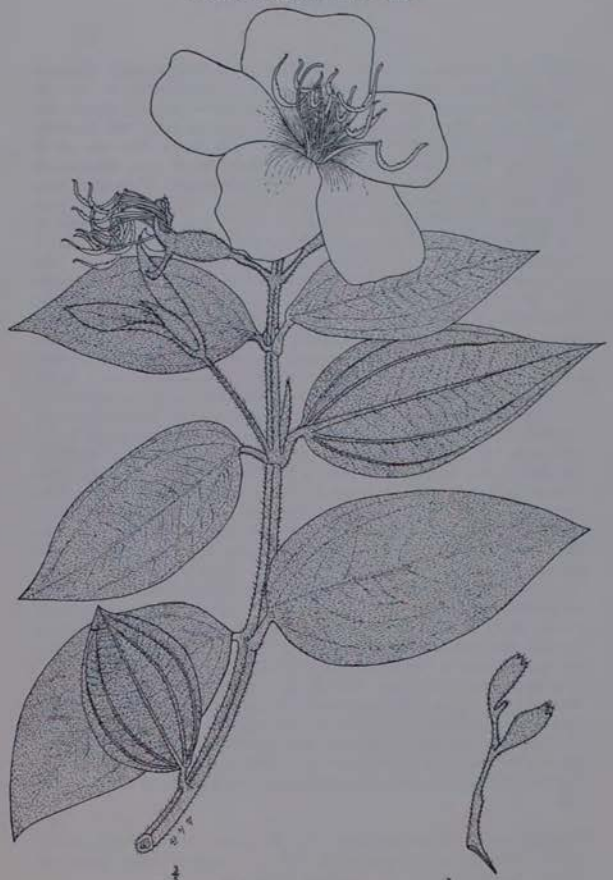
4,000 feet elevation, particularly in the Volcano area of Hawaii. Whether it ever produces viable seed in the Islands is questionable in spite of Wurdack's suspicion (p. 5). Locally, its pernicious spread appears dependent on runners and on thoughtless man carrying twigs and branches from place to place. Whenever they fall on moist ground they are apt to strike root. The Degeners used sticks of tibouchina to prop branches of lime trees to prevent their breaking under their weight of ripening fruit until frightened when each prop started growing into a competing tree. As mentioned in "Plants Hawaii National Park," Mrs. C. F. Furneaux is said to have introduced this beautiful problem plant about 1910, after a trip to South America, to her large estate near Kurtistown, Hawaii. The earliest specimen yet observed in museums is Rock 13,029, collected August 1917 at "Kalanilehua, Kilauea, Hawaii." July 23, 1926. Degener (No. 8,188) observed it "at 29 Miles, Glenwood, Hawaii. Persistent after cultivation; thriving but hardly naturalized." In spite of warnings about the danger of d'Urville's tibouchina, amateur horticulturists unfortunately have taken cuttings from this importation to plant in their gardens. As a result, this plant has formed impenetrable though beautiful tangles not only about the village of Volcano but about the residential area of Hawaii Volcanoes National Park. In 1930 it was observed growing in the garden of E. F. Bishop on Mt. Tantalus. According to R. L. MacConel in the Honolulu Star-Bulletin for September 5, 1931, a large number of these shrubs grow in many parts of the F. J. Lowry garden in upper Nuuanu Valley. This weed had spread throughout the neighborhood of these two Oahu places by 1970. Hadley comments in 1966, "This beautiful plant has escaped from the gardens and is rapidly spreading through the area (of Kokee, Kauai), posing a real threat to the native flora." According to Plucknett & Stone, "Degener (in 1930) indicated the pestiferous nature of these plants, and his prediction that they would spread has come true. At present they have a very spotty distribution, but where they have spread they often form virtually pure stands which have blighted many areas of natural vegetation and have become a foe of both the agriculturist and the conservationist." This species exemplifies the difficulty of eradicating an ornamental weed after it has once reached the Islands. No matter how its objectionable features were explained to a college faculty member at a dinner at Volcano in 1970, this otherwise intelligent lady insisted on taking cuttings for planting in her Kula garden on Maui. Future collectors should not be surprised to find *T. urvilleana* crowding out Maui's endemics thanks to this folly.

Extra Range: Native of Brazil from Rio de Janeiro to Rio Grande do Sul; widely cultivated as an ornamental under the wrong scientific name and the silly horticultural one of "Hawaiian Glorybush."

(Illustrated on following page)
(Degener & Degener, Nov. 28, 1970)

Family : 274
Genus : Tibouchina
Species : Urvilleana

MELASTOMATACEAE
MELASTOME FAMILY



½ ½
TIBOUCHINA URVILLEANA (DC.) Cogn.
(Original)

(Described on preceding page)

(Deg. 9641, 29 Miles, 6/22/29)

COMPOSITAE
COMPOSITE FAMILY

ELEPHANTOPUS L. Sp. Pl. 814. 1753.

Perennial pubescent rigid herbs with leafy or scapiform stems. Leaves basal or alternate, simple, sessile, entire to toothed, pinnately veined. Heads of 2–5 perfect whitish to blue or purple florets, 1 to several subtended by 1–3 leafy bracts and forming peduncled clusters. Receptacle small, flat or nearly so, naked. Ray florets none. Corolla with slender tube and with limb a little deeper cleft on inner side. Anthers sagittate, obtuse at base. Style branches subulate. Achenes 10-ribbed, truncate. Pappus oblong, compressed, of rigid straight persistent identical awn-like scales or bristles in 1–2 rows with outer ones often the shorter.

Name derived from the Greek for "elephant foot," a translation from the aboriginal.

Type Species: *Elephantopus scaber* L.

About 15 species mostly native to tropical America; many now pantropic weeds probably due to man taking them along for folk medicine during his migrations. This genus bears straight pappus bristles identical in character; while *Pseudelephantopus* bears some uncinate dissimilar ones. Following Engler's Syllabus der Pflanzenfamilien (1964), the genus belongs in the *Asteroideae, Vernonieae, Elephantopodinae*. None are native to the Hawaiian Islands.

(Degener & Degener, Nov. 28, 1970)

COMPOSITAE
COMPOSITE FAMILY

***PSEUDELEPHANTOPUS** Rohr, Skriv. Nat.-Selsk. 2(1):214. 1792.

Perennial rigid suffrutescent herbs with leafy stems. Leaves alternate, simple, sessile or nearly so. Heads of 4 white perfect florets, several subtended by 4 pairs of leafy bracts. Involucre with first and third pair of bracts conduplicate and with outer bracts shorter than inner. Receptacle small, flat or nearly so, naked. Ray florets none. Corolla with slender tube having limb a little deeper cleft on inner side. Anthers sagittate, obtuse at base. Style branches subulate. Achenes 10-striate, with sessile glands in grooves between antrorsely hirsutulous ridges, flattened, truncate. Pappus of a single series of usually 5–7 bristles; mostly 2 lateral bristles longer and thicker than others and 2-uncinate toward end.

Name derived from the Greek, meaning "false *Elephantopus*," in allusion to the close relationship and appearance to *Elephantopus*.

Type Species: *Pseudelephantopus spicatus* (Juss.) Rohr.

Two native American tropical weeds, the following now widely naturalized. This genus bears dissimilar pappus bristles of which about two are twice-uncinate while *Elephantopus* bears straight, identical ones. Following Engler's Syllabus der Pflanzenfamilien (1964), the genus belongs in the *Asteroideae, Vernonieae, Elephantopodinae*. Only the following, at time of writing, naturalized in our flora:

PSEUDELEPHANTOPUS SPICATUS (Juss.) Rohr
FALSE ELEPHANTSFOOT

Elephantopus spicatus Juss. ex Aubl. Pl. Guian. 2:808. 1775.
Pseudo-Elephantopus spicatus Rohr, Skriv. Nat.-Selsk. 2(1):214. 1792.
Distreptus spicatus Cass. Dict. Sci. Nat. 13:367. 1819.
Elephantopus glaber Sesse & Moc. Fl. Mex. ed. 2:197. 1894.
Elephantopus spicatus sensu Fosb. In Occas. Pap. Univ. Haw. 32:9. 1937.
Pseudelephantopus spicatus sensu Fosb. in Bull. Torr. Bot. Club 70(4):395. 1943.
Pseudoelephantopus spicatus sensu Neal, In Gard. Haw. 829. 1965.

Coarse herb up to 1 meter tall from loose rosette with numerous stiff suberect branches loosely hirsutulous with antrorsely appressed hair and ending in long terminal spikes. Leaves beneath resinous-punctate and with ribs and nerves sparingly hirsutulous, above sparingly hirsutulous: basal and lower ones clasping, spatulate to obovate, subentire to crenate or rarely serrulate, 6–15 cm. long, usually obtuse at apex; upper ones lanceolate to linear-lanceolate, acute, entire, much smaller. Heads solitary or usually in small clusters in the axils of reduced sublinear leaves or linear bracts, sessile, narrow-oblong, of about 4 white to whitish florets, usually 2–4 subtended by 8–12 mm. long involucres having lanceolate aristate-acuminate whitish-margined bracts. Achene 2.5–3 mm. long, grayish brown. Pappus: 3–1 (0) on outer side of achene usually about half as long as the remainder, slender, hispidulous, straight or rarely irregular uncinate toward apex, narrowly paleaceous-dilated and hairy at base and there sometimes lacerate into 1 or 2 much shorter bristles; 2 (3) on inner side of achene almost setiform, about as long as the straight part of lateral awns, straight, hispidulous throughout, paleaceous-dilated at base and there cleft into 1 to several bristly or paleaceous segments on each side; 2 on the angles stouter, very stiff, at base paleaceous and cleft like the inner awns, minutely hispidulous below, smooth and terete above, stramineous, abruptly and tightly twice-uncinate above with extreme tip minutely hispidulous and in that position 4–5 mm. long.

Type Locality: Jean Baptiste Christophore Fusee Aublet (1723-1778) published this binomial in his "*Histoire des plantes de la Guiane francaise - - - .*"

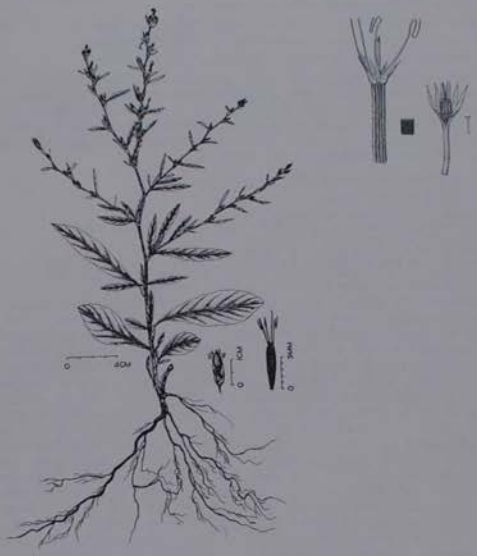
Local Range: This nasty weed seems first to have appeared naturalized in the early 1930s in pastures and waste places about Makena, Kauai. It was collected in 1935 about Makaha, Oahu, and in 1957 about Kealakekua, Hawaii. Residents are warned to eradicate it as soon as observed because, once established, it is nigh hopeless to do so.

Extra Range: Native to tropical America, this weed resembles a typical *Elephantopus* until the surprising development of the achene with its doubly hooked bristles is noted. The plant has two features that promotes its present wide distribution throughout warm and tropical regions throughout the world: the ability of its achenes to adhere to fur and clothing, and the plant's modest usefulness. In folk medicine it is used as a cough syrup, and in more primitive regions is fashioned into a crude broom or brush.

(Illustrated on following page)

Family : 344
Genus : Pseudelephantopus

COMPOSITAE
COMPOSITE FAMILY



PSEUDELEPHANTOPUS SPICATUS (Juss.) Rohr

(Original & after Pancho, Vega & Plucknett)
(Described on preceding page)

*Rohr spelled the name of his new genus *Pseudo-Elephantopus*. According to the International Code of Botanical Nomenclature (1961), Article 73, Note 1, the spelling of a word must be the same as "when the name was validly published." Yet according to Recommendation 73G(d), "Note. - - - [Hyphens] should all be eliminated in botanical names and epithets except in *nidus-avis*, *terrae-novae* and similar Latin pseudo-compounds." Though the words are actually Greek rather than Latin, according to this ruling Rohr's name might be *PseudoElephantopus*, a word with an absurdly placed capital letter. Though we know of no directive to change such a letter to the lower case, we consider it common sense to do so. Furthermore, according to Recommendation 73G(b) "Before a vowel the final vowel of this stem [of a compound name combining elements derived from two or more Greek words] - - - is normally elided - - -." Hence of the various spellings used by other writers, we consider the only correct one to be "*Pseudelephantopus*," granting Rohr credit in spite of the modification.

Family : 344
Genus : Lipochaeta
Species : Porophila

COMPOSITAE
COMPOSITE FAMILY

LIPOCHAETA POROPHILA Deg. & Deg.
ROCK-LOVING LIPOCHAETA: NEHE

Lipochaeta porophila sp. nov. Procumbens diffusque, 1–4 m. latis. Foliis petiolo 2–10 mm. longo; lamina lanceolato-elliptica, 10–40 mm. longa, 3–15 mm. lata. Capitula circa 8–10 mm. lata. Flores ligulati 4, circa 6 mm. longa et tubulosi circa 27. Achaenia biaristata, corpora 2 mm. longa.

Densely antrorsely appressed hispid fruticose procumbent perennial forming 1–4 meter wide mats with pale green somewhat squarish twigs. Leaves numerous, hispid throughout but especially so beneath, thin-fleshy: blade lanceolate-elliptic, with one pair of blunt obscure serrations toward distal third or fourth and up to eight pairs scattered more widely especially on vigorous shoots, with prominent midrib and two prominent ribs arising above base of blade, not glaucous, with nerves and veins somewhat salient beneath and (when held against the light) translucent; blade 10–40 mm. long and 3–15 mm. wide, acute to somewhat obtuse at apex, acuminate at base; petiole 2–10 mm. long. Heads at anthesis 8–10 mm. wide and 4–5 mm. high, mostly solitary, on peduncles bearing 1–2 scattered thick-subulate up to 3 mm. long bracts and at anthesis 10–20 mm. long but lengthened in fruit to 20 or up to rarely 60 mm. Involucre hemispheric: bracts about 10, glabrous within and strigose-hispid without, often ciliate near base, obtuse at apex, almost uniformly 2.5 mm. long, oval-oblong and 1.5 mm. wide to elliptic-oblong and narrower. Receptacle minute-columnar. Ray florets 4, yellow, not evenly spaced but concentrated toward three-fourths of circumference of head, 6 mm. long, at apex deeply 2-dentate and sometimes shallowly a few times besides, glabrous on upper surface but antrorsely sparingly hispidulous especially along veins on lower surface; stigma yellow, with branches acute toward apex. Disk florets about 27, 5-lobed. Achenes cuneate-obovate, dull, brownish gray, longitudinally angled, the body 2 mm. long with round-truncate apex antrorsely hispid and beset with one long and one short arista.

Type Locality: Degeners & Piccos 31,985. Between Punaluu & Kamehame Hill, Kau, Hawaii. About three plants seen on sun-scorched aa near coast, June 7, 1969.

Local Range: An exceedingly rare halo- and xerophyte limited not to a *kipuka* but to a sun-scorched, barren, aa lava flow stretching to the ocean. This shrub is related to *Lipochaeta integrifolia* from which it can be distinguished at a glance in the field by having thinner, differently shaped leaf blades and prominent petioles, and by possessing small heads bearing about 27 disk florets and only 4 ray florets. If the coming tourist hotels and ubiquitous golf courses do not exterminate this lovely creation, the introduction of axis deer from India to the Island of Hawaii may well do so. As the biologic wisdom of some of our state legislators is in inverse ratio to their political astuteness, such a folly of introducing ever more foreign herbivores to this island is an ever present danger.

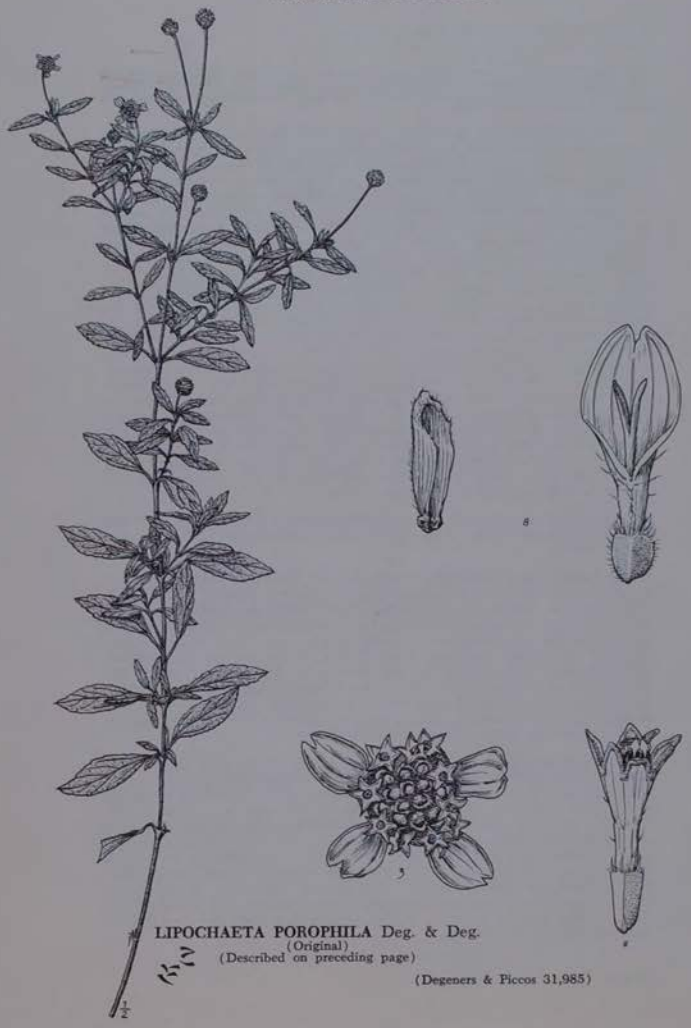
Extra Range and Notice: Not known elsewhere. The reader should note that the type specimen of this novelty, like all others described by one or both Degeners, is represented in the Herbarium of the New York Botanical Garden, an institution of which the senior writer has been long a staff member. All future types shall be deposited there also. In the case of a novelty described with another author, however, the type will be deposited in the collaborator's institution and the cotype, if available, at New York or *vice versa*. This was a common procedure begun with the late Dr. Earl E. Sherff of the Field Museum. This present explanation is not to be construed as a trivial footnote, but rather as an announcement of importance made at this time so place of deposit of novelties need not be repeated unnecessarily in our writings.

(Illustrated on following page)

(Degener & Degener, Nov. 28, 1970)

Family : 344
Genus : Lipochaeta
Species : Porophila

COMPOSITAE
COMPOSITE FAMILY

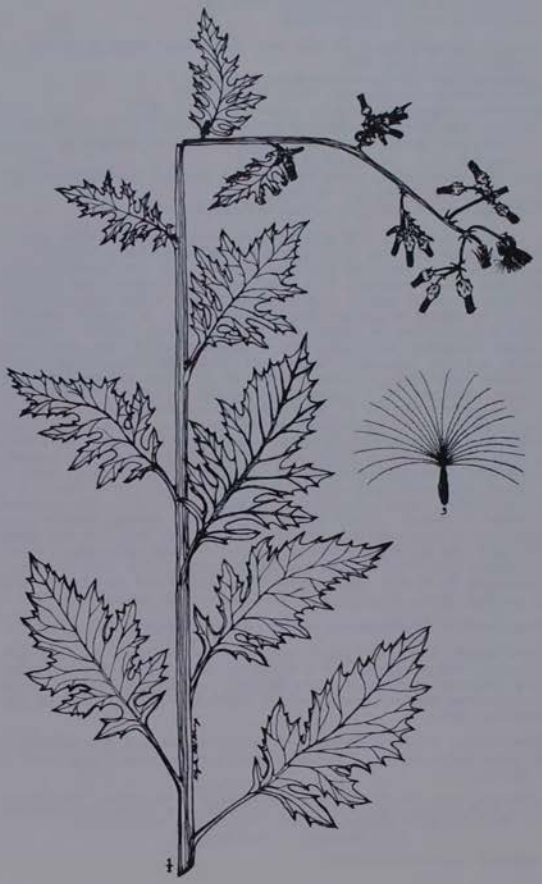


LIPOCHAETA POROPHILA Deg. & Deg.
(Original)
(Described on preceding page)

(Degeners & Piccos 31,985)

Family : 344
Genus : Erechtites
Species : Valerianifolia

COMPOSITAE
COMPOSITE FAMILY



ERECHTITES VALERIANIFOLIA (Wolf) DC.
(Original)
(Described on preceding page)

(Deg. & Deg. 31,595)

COMPOSITAE
COMPOSITE FAMILY

ERECHTITES VALERIANIFOLIA (Wolf) DC.
VALERIANLEAVED BURNWEED

**Senecio valerianifolius* Wolf, Ind. Sem. Hort. Berol. 1825; *ex* Reichb. Ic. Bot. Exot. 1 : 59. 1826.
Crassocephalum valerianaefolium Less. in Linnaea 5 : 163. 1830.
**Erechtites valerianaefolia* DC. Prodr. 6 : 295. 1837.
Eupatorium Angosturae Polak in Linnaea 41 : 575. 1877.
Erechtites hieracifolia sensu St. John & Hosaka, Weeds P. F. Haw. 161. 1932. (In part: "purplish" florets are characteristic of the present species and not of *E. hieracifolia* (L.) Raf.)
Erechtites valerianifolia sensu Fagerlund & Mitchell in Nat. Hist. Bull. (Haw. Nat. Park) 9 : 60. 1944.
Erechtites valerianaefolia sensu Neal, In Gard. Haw. 853. 1965.

Robust 2–20 dm. tall quick-growing annual with spreading fibrous yellowish roots and thick fleshy strongly ribbed somewhat puberulent stem with white to purplish pith and often in upper half with numerous erect branches. Leaves commonly 1.5–10 cm. wide and 5–20 cm. long of which one-third is fleshy petiole rounded beneath and deeply sulcate above, elliptic to oblong in outline, deeply pinnate-lobed to -parted with terminal segment often the largest, with rounded sinuses, coarsely irregularly dentate, somewhat scurfy-pubescent throughout, above dull green with rachis and ribs impressed, below pale green sometimes purple-tinged and with rachis and ribs prominent, cuneate to obtuse at base, acuminate at apex; when juvenile or depauperate not lobed but serrate and thus simulating somewhat those of *E. hieracifolia*. Heads mostly densely crowded, short-pediceled, pink to purplish, 10–14 mm. long, about 4 mm. wide below and 3 mm. above. Receptacle concave in flower but flat-convex in fruit. Involucre: inner bracts up to 10 mm. long, more or less connate, green and often scareous-margined, abruptly acute at apex, erect at anthesis, marcescent and appressed-reflexed in fruit; outer bracts few, linear-subulate, about 1 mm. long and similar but shorter than scattered bractlets of pedicel. Florets about 75 per head, slightly exserted from involucre. Achene with body stramineous, 3–4 mm. long, 0.3 mm. thick, dull, subterete, its deep longitudinal grooves antrorsely puberulent, truncate at concave base, truncate with persistent projecting style base at concave apex; with 8–10 mm. long pappus white below and increasingly pink to purplish above, almost microscopically antrorsely barbed.

Type Locality: *"Habitatio non constat"*, according to Reichenbach.

Local Range: This coarse weed thrives in wetter clearings, roadsides, pastures and older pineapple fields probably on all the islands. It was presumably accidentally introduced during the early part of the Twentieth Century as O. Degener collected specimens (No. 1519) June 1923 on "Tantalus Mt., Honolulu, Oahu."

Extra Range: Native to Central and South America, and now naturalized in many warm regions. The tender parts may be cooked and eaten as a potherb.

*According to Recommendation 73 G (c) of the Int. Code Bot. Nomen., before a consonant the final vowal of the first word of a compound name of Latin origin is reduced to *i*. Hence the correct orthography is *valerianifolia* and not *valerianaefolia*.

(Illustrated on following page)

(Degener & Degener, June 20, 1969)

Family : 344
Genus : Erechtites

COMPOSITAE
COMPOSITE FAMILY

ERECHTITES Raf. Fl. Ludov. 65. 1817.

Erect usually coarse and sparingly branched annual to rarely perennial herbs. Leaves alternate, simple, entire to pinnately dissected. Inflorescence corymbose--paniculate at ends of stem and branches. Involucre cylindric, swollen at base, with one series of linear acute more or less herbaceous bracts and with or without a few smaller basal ones. Receptacle naked, concave to flat. Florets many, slender, tubular, fertile: marginal ones in 2 to several series, pistillate, with filiform corollas having 2- to 4-toothed limb; central florets perfect or fertile or rarely sterile, with narrowly tubular corollas having 4- to 5-toothed limb, with anthers obtuse and entire to slightly sagittate at base, with elongate flattened style-branches truncate to obtuse at apex. Achenes linear-oblong, angled or striate, tapering. Pappus of all florets copious, of very fine silky smooth white to pink or purplish bristles.

Name modified from *Erechthites;* according to Constantine Samuel Rafinesque (1783-1840) it "was one of those given by Dioscorides to the Senecio."

Type Species: *Erechtites hieracifolia* (L.) Raf.

About half a dozen species native of America and Australasia.

KEY TO LOCAL SPECIES:

Pappus white; leaves mostly serrate ..... **E. hieracifolia**

Pappus pink to purplish; leaves deeply pinnately dissected ..... **E. valerianifolia**

(Degener & Degener, June 20, 1969)

Family : 5
Genus : Dicranopteris
Species : Emarginata
Variety : Inaequalis

GLEICHENIACEAE
GLEICHENIA FAMILY

DICRANOPTERIS EMARGINATA var. **INAEQUALIS** Deg. & Deg.

Dicranopteris emarginata var. *inaequalis* var. nov., *a D. emarginata var. emarginata in pinnis abortivis plus minusque differt.*

Differing from the species itself in having the fronds greatly reduced in blade surface. Ultimate pinnae very variable in different fronds and variable along their own length; part may be devoid of blade tissue entirely and consist for some cm. of only rachis, it may be divided into rounded segments a few mm. long or segments that are coarsely antrorsely pointed, or it may have such segments joined by wings of the midrib to lend to the ultimate pinnule a more or less sinuate appearance; all the foregoing shapes may be interrupted here and there by single pinnules or groups of pinnules resembling those of the species itself; rarely are some pinnules forked. Lateral pinnae shorter than ultimate ones, linear and 4 mm. wide or variously modified to be sinuate or coarsely antrorsely pointed or occasionally beset with 1 or a few pinnules. Sori often present, apparently normal.

Type Locality: Pahoa, Puna, Hawaii. Covering several acres in open, grassy Metrosideros forest at about 800 feet. Deg. & Deg. 31,277, July 7, 1967.

Local Range: Evidently a successful mutant that not only covers several acres in the type locality, it grows likewise in a small area about 8 miles distant, as the crow or spore flies, at upper Kaimu Homesteads. This latter colony (Deg. & Deg. 31,508), collected Feb. 12, 1968, bears fronds with a little less blade tissue.

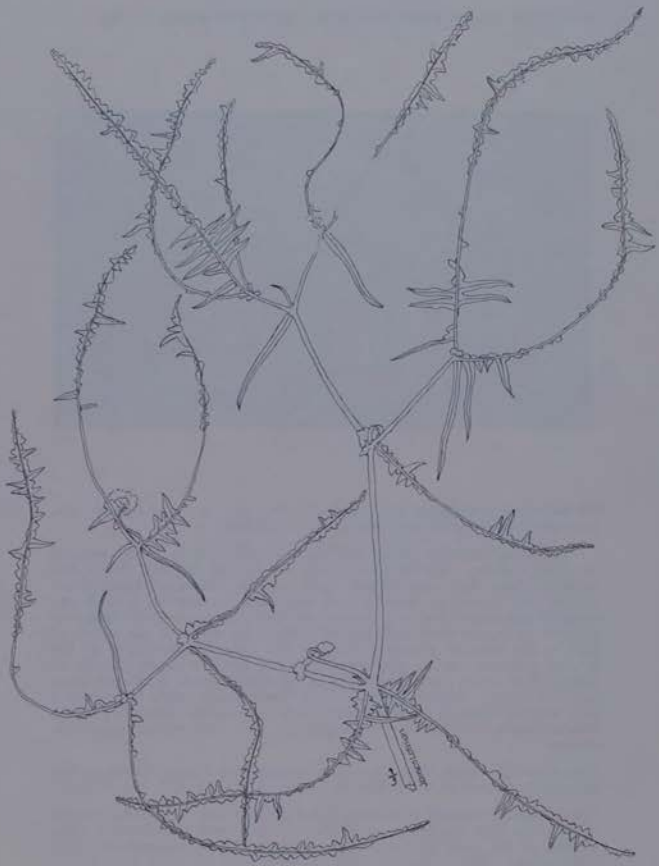
Extra Range: Not known elsewhere. A similar mutant seems to be the variety *duffii* of *Nephrolepis cordifolia.*

(Illustrated on following page)

(Degener & Degener, June 20, 1969)

Family : 5
Genus : Dicranopteris
Species : Emarginata
Variety : Inaequalis

GLEICHENIACEAE
GLEICHENIA FAMILY



DICRANOPTERIS EMARGINATA var. **INAEQUALIS** Deg. & Deg.
(Original)
(Described on preceding page)

(Deg. & Deg. 31,277a)

Hawaii: II.18,1952, Along Saddle Road, west of Pohakuloa; II.15, Mauka of Kulani Prison.

Maui: II.26, Maliku, Paia, also Iao Valley; II.27, Hana to Waiopai to Manawainui; II.28, Kahakuloa.

Lanai: III.1, Lae Wahie lighthouse, also Keomuku (for Lipochaeta), also Maunalei (for Nestegis).

Maui: III.23, Kupau; VII.27,1954, Keanae; VII.30, More or less Iao Valley; VIII.1, Wailuku Streambed; VIII.2, Silversword Lodge, Haleakala; VIII.3, Haleakala rim; VIII.4, West Maui circle tour.

Oahu: IX.11, X.3, Opaeula.

Hawaii: XI.14, Kaalualu, also Waiohinu.

Maui: XI.16, Black Gorge, Iao Valley.

Molokai: XI.19, Top of Waikolu Valley.

Oahu: I.4.1955, Makaleha Valley; I.10, Cliffs northwest of Koko Head Lighthouse overlooking Waimanalo; IV.14, Kealia Trail, Kawaihapai.

Kauai: IX.7, Pihea, southeast rim of Kalalau; IX.9, Kohua Ridge; IX.14, Kumuwela Ridge; IX.15, Top of Halemanu, Kokee; IX.18, Lehuamakanoi Bog; IX.20, Kokui Trail, Waimea Canyon; IX.23, Mauka of Nualolo Valley.

Oahu: IV.10.1956, 1,000 feet east of Kaena Point; VI.2, Kaena Point.

Lanai: VIII.1957.

Molokai: VII.30,1958, Makai of Maunahui.

Oahu: XI.24, Near end of Aiiumanu Road, Kahaluu Valley.

Maui: III.24.1959, From Hailaau mauka along Puu Kukui Trail; III.25, Puu Kukui Trail up to silversword bogs near Violet Lake at about 5,000 feet; III.26, About the Hailaau house at about 3,000 feet and makai along jeep road, Puu Kukui; III.27, Ditchtrail at Honokowai, also at beginning of Honokowai Gulch; III.28,29, Hailaau, Puu Kukui; III.30, Honokohau Ditchtrail through tunnels, also at Punalau Coast (for Wikstroemia, Schiedea), also Honokohau Valley to lychee grove; III.31, Hailaau and along Puu Kukui Trail; IV.1, Collect at 1951 Lahaina Tunnel, also from Kihei via Makena to Ulupalakua and Puu Mahoe; IV.2, Decadent, dryland forest from Puu Mahoe along Skyline Drive at about 6,000 feet.

Molokai: IV.3, Halawa Valley also collecting along summit of Cliff Trail to Kalaupapa airfield.

Maui: V.28, Koolau Gap, west side, Haleakala; V.29, Kapalaoa, Haleakala; V.30, Mauka of Kapalaoa, Haleakala; V.31, Holua, Haleakala; VI.1, Koolau Gap, east side, Haleakala; VI.4, Paliku, Haleakala; VI.6, Around East Maui; VI.9, Wailuku to Lahaina and beyond.

Molokai: I.15.1960, Leper Lookout, also Maunahui.

Maui: I.17, Skyline Drive, Ulupalakua

Lanai: I.18, Munro Trail.

Kauai: XI.15, Halemanu, Kokee Region; XI.16, East rim along jeep road, Kalalau Valley; XI.17, East of Halemanu, Kokee Region; XI.18, Waimea Canyon rim between Tourist Lookout and top of Kukui Trail; XI.19, Kokee, Ditch Trail west of Kokee Stream; XI.20, Puu Ka Ohelo Trail (Watertank Trail), Kokee Region; XI.21, Kukui Trail, Waimea Canyon; XI.22, Barking Sands, Polihale; XI.23, Near beach, Puu Keke; XI.24, Kaaweiki Bidge; XI.25, Kilauea Lighthouse, Kapaa, also Napali Cliff Trail near Makena; XI.26, Mohina Road to Alakai Swamp Trail to Lehuamakanoi; XI.27, Cliffs & dunes, Mana, Polihale; XI.28, (Avocado) Pear Valley, southwest of Puuhinahina, Kokee Region; XI.29, West rim of Kalalau Valley; XI.30, Kumuwela Trail near Waipoo Falls, Kokee Region; XII.1, Western side of Lawai Bay; XII.2, Open woods, Halemanu, Kokee Region.

Oahu: XII.11, Bryan's Mountain Trail, Mostly rainforest at 2,000 feet, Koolau Range; I.21.1961, Raised reef, Barbers Point; I.22, Opaeula; II.5, Poamoho Jeep Trail; II.19, Helemano; II.26, Blow Hole, also Kalihi Tunnel area; III.9, Poamoho Trail to summit.

Kauai: III.11, Opaikaa Falls, also Wailua Falls; III.12, (Munroiodendron area.) At about 1,000 feet, western slope of Nonou, near Waihua; also at 300 feet, Anahola (for Wikstroemia); III.13, Kamahuna Ridge, west of Kealia; III.14, Puolo, Hanapepe; also Kalalau rim; III.15, Pipeline Trail, west side of Halemanu, Kokee; also back of Kokee Museum; also west side of Halemanu; III.16, West slope of Omoe, near Koloa; III.17, Hanamaulu Bay.

Oahu: IV.7, East slope of Kankonahua Gulch near U. of H., Exp. Station; IV.30, Poamoho Trail; VI.10, Flats above western end of Makua Valley; VI.25, Poamoho Trail.

Molokai: VI.30, Makakupaia and vicinity.

Maui: VII.1, Silversword Inn, Haleakala; VII.2, Kula, also Waikamoi; VII.3, Wailuaiki; VII.4, Near Wailuaiki, also Nahiku; VII.5, Wailua Falls, south of Hana, also west of Kaupo Village, also at Huialoha Congregational Church, Kaupo (for Jacquemontia); VII.6, Iao Valley; VII.7, Hanaka Ridge; also "Lahaina Reservoir," windswept, bare ridge; Nanawale (for Wikstroemia); also Pokalani.

Hawaii: VII.7, Pohoiki, Kalapana; VII.8, About Kulani Prison; VII.9, Near 31 Milestone, Saddle Road, Kohala; also 6 Miles, Saddle Road, mauka of Hilo; VII.10, At about 4,000 feet, Makapala, Mauka, Kohala; VII.11, 148a, near Wright Road, northeast of Kilauea; also na lava jungle between Hookena and 1950 Lava Flow, north branch; also Pahala; also Puuwaawaa; VII.13, Bulldozed fern forest near end of Route 148a, northeast of Kilauea; also Kulani Street, mauka of Kurtistown; VII.14, 25 Miles, Royal Haw. Estates; also Kulani Prison Road about 15 miles mauka of Hilo; VII.15, Mauka of Akaka Falls, also Laupahoehoe; VII.16, 2 miles west of Queen's Bath; near Hilina Pali; also Kipuka near Pahoa; also near 1955 Lava Flow.

Oahu: IX.10, Poamoho Trail; II.17, 1962, Dense, shrubby forest mauka of Paumalu (new military road); II.19, Bryan's Mountain Trail, Opaeula; also Helemano Gulch; III.26, Kawailki Ditch Trail, Kawailoa; III.30, Kealia Trail, Kawaihapai; III.31,

Southeast of Peacock Flats, Mokuleia; IV.23,26, Mauka of Peacock Flats, Mokuleia; IV.29, Poamoho; V.6, Southeast of Nike Station, Kawaihapai, also north rim of Makua Valley; V.12, Densely shrubby ridge mauka of Puumalu (new military road); VII.20, West of Peacock Flats, Mokuleia; VIII.29, Kaluaa Gulch, Puu Kaua (for Hesperomannia at 2,400 feet); IX.7, From 2,000 feet upward, Mt. Kaala road; IX.11, Kukui forest mainly at about 1,900 feet, between Nike Station and Peacock Flats, Mokuleia; IX.21, Near road, Mt. Kaala; VI.30.1963, Kawaiki (for Hibiscus kokio var. caumii).

Lanai: VII.15, Cemetery mauka of Lanai City; VII.16, At about 1,700 feet, Malau; VII.17, At 1,300 feet, along Keomuku Highway; VII.18, East of Pohoula at about 2,000 feet; VII.20, East of Puupehe (Bird Hetau) (for Lipochaeta); also Leinohaunui Pali (for low Lip., & Canavalia); also Kahoio Pali (for erect, twiggy, 5 - 6 feet high Lip.); VII.22, Kaumalapau; VII.23, Lanaihale; VII.24, In sand and red soil, Poaiwa; VII.25, Among scrub vegetation at 2,000 feet, mauka of Lanai City; VII.26, At 2,500 feet, head of Hulopoe Gulch at Munro Trail; VII.27, Kanepuu; VII.28, Planted forest, at about 2,000 feet, Kapano Gulch; VII.29, At 2,500 feet, head of Hulopoe Gulch at Munro Trail; VII.31, Calcareous outcrop, Lae Hi Point; VIII.1, At about 2,000 feet, head of Hulopoe Gulch at Munro Trail; VIII.9, Lae Hi; also mauka of Kahokunui; also at Pohakuloa, northern Lanai (for algae); also Poaiwa; VIII.10, Kapohaku Gulch near pump; VIII.11, At 2,500 feet, head of Hulopoe Gulch at Munro Trail; VIII.13, Lanaihale, also at 2,250 feet, southern branch of Kapua Gulch; also Puhielelu Ridge; also at about 2,000 feet at Hulopoe Gulch; VIII.14,15, At 1,750 feet, Kanepuu; VIII.16, Lanaihale, also at about 2,500 feet at Kapohaku Gulch (for Cyanea); VIII.17, Maunalei Gulch; VIII.18, In Kapobako Gulch up to waterfall; VIII.19, Ridge, Kapohaku Gulch; VIII.20, At about 3,000 feet, south side of Waiakeakua; VIII.23, At 1,000 feet half mile south of Kaumalapau; VIII.24,25, At about 2,250 feet, south branch of Kapua Gulch; VIII.26, Along Munro Trail northwest of Lanaihale; VIII.31, Kapano Gulch; IX.2, Manele; IX.4, Shrubby, fogbelt forest south of Lanaihale; IX.5, Munro Trail; IX.6, North slope of Waiakeakua; IX.7, Mahana; IX.9, Kahinahina Ridge (for Viola); IX.10, Koloiki Ridge (between Maunalei & Naio Valleys); IX.12, Puu Nene & down Kaiholena Ridge overlooking Lanai City; IX.13, Koloiki Ridge; IX.14, Munro Trail; IX.16, Upper branch of Naio Gulch near water tunnel, IX.18, Awalua, north Lanai; also Kanepuu; I.6.1964, Beyond cemetery; I.7, Between Hulopoe head and Lanaihale & beyond a little way along Munro Trail; I.9, Half mile east of Huawai Bay near heiau of coral; I.11, Mauka of Kaumalapau at 500 feet; I.13, Unnamed gulch southeast of Haalelepaakai, at about 2,800 feet (gulch north of Cockroach Hill Gulch), also at 1,500 feet, Koala Gulch (for Acacia "koaia"); I.14, Unnamed gulch southeast of Haalelepaakai, also along entire Munro Trail; I.15, at 1,500 feet, small gulch on west side of Maunalei Gulch near Kauiki; I.16, Honopu Gulch; I.17, Unnamed gulch southeast of Haalepaakai (south branch of "Exocarpos Valley"), also mesophytic forest just mauka of Melinis slopes at 1,800 feet; I.18, Unnamed gulch southeast of Haalelepaakai (south branch of "Exocarpos Valley"); I.19, Near Kaumalapau, also near top of Naio Gulch;I.20, Puumakani & vicinity, I.21, Kaunolu Bay; I.22, East ridge of Kuahua Gulch; I.23, Kapano Gulch; I.24, Mauka of Kaluanui Flats; I.25, Munro Trail; I.26, Maunalei Valley & around beach past Lopa to Naha; I.27, Puu Mano, also near Manele; I.28, At 1,500 feet, northwest of Leinukalahua; I.29, Awalua; I.31, Lapaiki (at 400-800 feet, Lipochaeta); II.1, Patch of dryish, shrubby forest at 2,800 feet west of divide, hanging valley southeast of Waiakeakua.

Oahu: IX.10, Poamoho Trail; II.17.1962, Dense, shrubby forest mauka of Paumalu near head of Oio Stream at 1,200 feet; I.4,7.1966, Kawailoa; II.21, Outlet of Anahulu River; III.1,5, Gulch along nike road northwest of Peacock Flats at 1,200 feet, Mokuleia, III.8, at 1,100 feet along cane field south of Paalaa-uka, Kawailoa, also at 1,100 feet near head of Ashley Road, Kawailoa; III.10, At 300 feet, north side of Helemano Gulch; III.17, Ditch trail north of intake, at 1,100 feet, Opaeula; III.19, Nuuanu Pali; III.20, Tantalus-Panoa Flats Trail; III.24, Ashley Road, near head, Kawailoa; III.29, South of Kaiwikoele Stream (South side of Waimea Valley); IV.3, Mauka of Peacock Flats, Mokuleia; IV.6, at 1,000 feet, area north of upper Opaeula Reservoir.

Hawaii: V.2,3, Rainforest, 29 Miles; V.4, Chain-of-Craters Road, also Pohiokeawe (Poliokeawe incorrectly on U.S.G.S. map) Kipuka, also Naulu Forest, etc.; V.5, 1 mile south southeast of 28 Miles, Keaau Forest, Puna; rainforest at 3,500 feet; V.6, At about 6,500 feet, near end of Mauna Loa Strip Road, Haw. Nat. Park; V.7,8, Cibotium-Metrosideros forest at 3,200 feet, south southeast of 27 Miles, Keaau Forest, Puna; V.9, At 2,250 feet, Hilina Pali Lookout; V.10, About Hilo; V.12, On way to Punaluu from 29 Miles, also at 3,200 feet at Footprints Trail to Mauna-Iki; V.13, Wright Road near 27 Miles, Volcano, Olaa Forest, Puna; V.14, At 550 feet, abandoned Hawaiian village, Naulu Forest, Haw. Volc. Nat. Park, Puna; also at 100 feet, petroglyph area; also south southeast of 28 Miles, Volcano, Puna; V.16, Cibotium-Metrosideros forest at 3,000 feet, south southeast of 25 Miles, Olaa Forest; V.17, At 4,200 feet, mauka of Kipuka Ki, aa lava flow; also at 4,000 feet, Kipuka Puaulu, Haw. Volc. Nat. Park; V.18, At 1,500 feet, 2 miles north of Mountain View, Puna; also Coconut Island, Hilo (for lichens); V.19, Kau Desert on southeast side of Kilauea Crater; V.20, Puna 1960 eruption area from Kapoho past Honohulu Landing to Makuu; also Waiakahiula fishing village; also Keonepoko-Iki (for Vittaria); V.21, Open rainforest at 29 Miles, Puna; V.22, Northwest end of Wright Road among homesteads, near 27 Miles, Puna; V.23, Laukapu Road, Olaa Forest, 26 Miles, Puna; V.24, Between 29 Miles & South Point; also Whittington Park, Honuapo, Kau; V.25, Near Laukapu Street & Wright Road, 27 Miles, Puna; V.26, At 5,250 feet, eastern side of Puu Kulani near Stainback Highway; also at 1,400 feet, Olaa Forest Reserve at about 16 Miles; V.27, At 2,200 feet at 1881 Pahoehoe lava flow along Stainback Highway, V.28, Napau Crater; V.30, Kealakomo Hawaiian Village ruins, Puna.

Oahu: VII.7, Gulch along nike road northwest of Peacock Flats at 1,200 feet, Mokuleia; IX.15, Salt Lake.

Hawaii: X.11, South of 27 Miles, Puna; X.13, At 3,200 feet, at edge of Haw. Volc. Nat. Park boundary & Ainahou Ranch; X.14, Rainbow Falls, Hilo; X.16, at 3,000 feet, near Anuhea & Alii Kane Roads, 26 Miles, Puna; X.17, Kipuka Pnaulu & Kipuka Ki, Haw. Volc. Nat. Park; X.18, At 2,500 feet along Belt Road south of Haw. Volc. Nat. Park (for Pittosporum terminaliodes var. macrocarpum); X.19, Haw. Volc. Nat. Park's Wilderness Area along Wright Road, Puna; X.20, Laukapu Street, 28 Miles, Puna; X.23, 26 Miles, Puna; X.27, Kilauea Forest Reserve area presently being bulldozed

Waialee; X.25, Near summit, second ridge east of Kulioiou Valley; XI.1, Southern slope of Kahanahaiki Valley; XI.8, Kaipapau streambed; XI.11, Wilhelmina Rise to summit divide; XI.14, Narrow middle Waialae ridge up to where it meets larger eastern Waialae ridge; XI.22, Gully southeast of Kahuku entrance of Pupukea-Kahuku Trail; XI.28, Up trail in Keawaula Valley to top & then down gully on northeast side of Kahanahaiki Valley; XI.29, Narrow northeast gully in Ohikilolo Valley; XII.5, Pupukea-Kahuku along summit divide toward east; XII.13, Mokapu Peninsula; I.3.1932, Southeast side of Makua Valley near its head; I.10, Puuiki Gulch; I.17, Pig God Trail to summit, Punaluu; I.20, Kailua marsh; I.24, Pupukea-Kahuku Trail & along Kahuku divide; I.31, Up Keawaula Trail to plateau & then down Kaena Point along ridge; II.7, First gully makai south side of Keaau Valley; II.14, (Bidens) On grassy slopes near cliffs on hog-back leading from shore near Heeia to cliffs; III.5 (6?), Pupukea-Kahuku region; III.13, Northeast side of Kaala base; III.20, South & east sides within Palolo Crater; III.23, Keaau Valley; III.24, From Keawaula Valley into Makua Valley; III.27, Kaipapau Valley; IV.4, Head of Makua Valley; IV.10, Roadside, Waianae; IV.17, Ridge north of South Halawa Gulch & then down into North Halawa Gulch; IV.24, Southwest slope of Kaala, Waianae Valley; IV.27, Kaena Point; V.1, Lualualei Valley 1 mile east of Mauna Kuwale (for Marsilea), also 500 feet northwest of Puu Kailio near Kolekole Pass (for Bidens); V.8, Between Barbers Point & Pearl Harbor chiefly along beach; V.22, Pig God Trail to top & beyond Kahuanui Stream (where most plants were collected); V.28, Pupukea-Kahuku; VI.4, Middle ridge of Niu Valley and on its western slope; VI.10, East ridge of Manoa Valley; VI.11, Puuiki Gulch (formerly called "gulch north of middle ridge between Puu Kamaohanui & Puu Pane"); VI.22, Up Pig God Trail to cabin & far beyond, Punaluu; VI.26, Up ridge on right side of head of Makua Valley to summit ridge & along it to Piko Trail; VII.3, From Kahana Church up ridge to summit of mountain southeast of Kahana Bay; VII.10, On summit from top of Piko Trail to end of spur dividing Makua Valley from Kahanahaiki Valley; VII.17 (18?), From Piko Trail around rim of middle of Kahanahaiki Valley; VII.28, Puuloa (for Cressa); VII.31 (30?), West side of Pohakea Pass; VII.2, Heeia; VIII.7, Small valley northeast of Puu Hapapa; VIII.14, Large branch of Lualualei Valley southwest of Pohakea Pass; VIII.21, Niu Valley up streambed & down west ridge; VIII.28, Hauula vicinity; IX.2, Pig God Trail, Punaluu; IX.4, Aiea ridge & gully; IX.11, Waiawa Valley; IX.18, Third small valley northeast of Palikea on Honolulu side (this contains pipeline arising from tunnel); IX.27, Southeast corner of Makua Valley (for Neowawraea ((Drypetes)) with Charlie Judd); X.2, (perhaps "X.4 on sheets"), Manana Gulch; X.9, Piko Trail, Makua; X.23, Below Palikea (Third small valley south of one collected on IX.18); X.26, Around Mt. Tantalus rim; X.30, Small valley southeast of Puu Hapapa; XI.6, Northern slope of Kahana Valley just opposite small Hawaiian church; XI.13, Up ridge leading to summit ridge half way between Kaala and Kalena on Waianae Valley side; XII.4, Up same ridge (as XI.13) from pipeline toward Kaala in Lualualei Valley; XII.11, Gully having prominent dyke (this is just east of Abortopetalum Valley); III.14.1933, Mokuleia; III.27, Pupukea-Kahuku region on Kahuku side; III.20, IV.2, Directly mauka of Kawela Bay; IV.12, Kamokuiki Valley (between Puuiki & Puu Kamaohanui); IV.30, Pupukea-Kahuku region; V.7, Pupukea-Kahuku Trail; V.26,1935, Middle Halawa Ridge; VI.2, Kipapa Trail to summit ridge; VI.9, Waimano; VI.12, Mokuleia; VI.16, Anahulu Trail; VI.?, Blow Hole; VI.23, Kuliouou Valley; VII.3, Waimanalo; VII.4, Pig God Trail, Punaluu, to very summit of Koolau Range (distance of 6 miles along trail); VII.7, East ridge, Kaipapau Valley; VII.14, Kawaihapai, Kealia CCC Trail; VII.15, Pasture & dunes, Kawaihapai; VII.20, Kaena Point; VII.21, West side of Makaleha Valley on trail meeting Piko Trail; VII.22, Nanakuli; VII.28, Kaipapau; VII.29, Malaekahana Trail Laie; VIII.18, Poamoho Trail, Laie; VIII.25, West of Poamoho Trail, Laie; X.6, Waimano Trail toward summit; X.21, Sacred Falls; XI.3, Waimalu; XI.12, Around Mt. Tantalus rim; XI.20, Mt. Tantalus Cliff Trail; XI.23, Palehua; XII.1, Nanakuli Valley below Mauna Kapu; XII.16, From Palehua along ridge to Palikea; I.5.1936, Palikea; I.19, East slope of Puu Kaua; II.2, Half way up Mt. Kaala from Firebreak Trail; II.9, Kawailki; II.16, Aiea CCC Trail; II.22 (23?), Lahilahi; III.1, East side of Palikea along new CCC firebreak trail to Pohakea Pass; III.15, CCC Trail, Aiea; III.29, East ridge of Manoa Valley; III.31, Lahilahi; IV.1, Northeast slope of Puu Kamakalii; IV.10, Talus southwest of Waimanalo Landing; IV.13, Kaumokunui Gulch, Mokuleia; IV.19, Ekahanui; IV.21 (22?), South Ekahanui (for most plants), also northeast (for Pelea, also Ekahanui Ridge) along Waianae Contour Trail (for Bidens); V.12, Middle Palawai Ridge; X.22, Puu Kaupakuhale; X.23, West central branch of Makaleha Valley; XI. 22, Southeast slope of Puu Kamakalii; II.2.1937, Kealia CCC Trail, Kawaihapai; II.25, Puulupe Trail, Kawailoa; III.3, Waiahole; III.6, Waimea Valley; III.12, Southwest of Dillingham Crowbar Ranch, Kawaihapai; III.17, Kaumuku Gulch, also Puuiki Gulch; III.26, Ridge directly north of Mt. Kaala; III.29, Pig God Trail, Punaluu; IV.11, East side of Kaaawa Gulch, north slope of Mt. Kaala (NOT Kaaawa of Koolau Range); IV.17, Ridge directly north of Puu Kamaohanui; IV.26, North of Mt. Kaala; VII.25, From Makua around Kaena Point to Kawaihapai; VIII.10, Waianu (near Waiahole); X.24, Dillingham Crowbar Ranch CCC Trail to Piko Trail at head of Makua Valley; XII.6, Aiea Trail to summit ridge; XI.19, Southeast slope of Mt. Kaala; I.1.1938, Northeast of Kahanahaiki Valley; I.16, Overlooking Kahanahaiki Valley and north of its rim; II.27, Ridge northwest of Kahuanui Valley, Hauula; III.21, Piko Trail, Makua Valley; IV.3, Pupukea-Kahuku; IV.24, Pupukea-Kahuku region; V.1, Summit of Mt. Kaala; VII.3, Kawailoa, CCC Trail to summit divide; VII.17, Kauiki; VII.24, Waimea Valley; VIII.2, Kaaawa Gulch (north of Mt. Kaala); VIII.12 (13?), Kaumokunui Gulch; IX.2, Pupukea; IX.3, East slope of Puu Hapapa; II.11.1939, Makaleha Valley; III.18, Sacred Falls, north rim of Kahuanui Valley; III.23, Anahulu Trail; III.25, Between Puu Pane & Mailii; IV.9, Large valley on northeast slope of Puu Hapapa; IV.30, Mauka of Kawaiiki ditch intake; V.7, Northeast ridge of Puu Hapapa to summit; V.21, Honouliuli Trail on east slope of Puu Hapapa; V.28, East of Kanehoa; VI.4, First ridge just southeast of Schofield Barracks boundary, Puu Hapapa; down short spur just east of Puu Hapapa summit.

Maui: VII.25, Haleakala; VII.26, Haleakala rim chiefly from Rest House to Koolau Gap; VII.28, Southeast ridge of Iao Valley; VII.30, McGregor; VIII.2, Maliko Bay; VIII.5, Paliku, Haleakala; VIII.7, Trail from Paliku to northeast rim of Haleakala Crater; VIII.9, Foggy region north of Kuiki just outside Haleakala Section of Nat. Park boundary; VIII.11, Mt. Haleakala southeast along Kaupo Gap cliffs and across Gap to Paliku, Haleakala Crater; VIII.15, Cliffs south of Kuiki along east side of Kaupo Gap, Haleakala; VIII.19, From Paliku to Holua Cave, Haleakala; VIII.20, Northwest

(Degener & Degener, June 20, 1969)

side of Koolau Gap, Haleakala, below cliffs at 5,750 feet; VIII.25, Ukumehame Gulch; VIII.26 Makai of Polipoli Springs; VIII.28, Olowalu Valley; VIII.30, Hana (by way of Makawao along main road).

Oahu: IX.23, Summit of Mt. Kaala; X.8, Kanehoa (for Stenogyne kanehoana Deg. & Sherff).

Kauai: XII.22, Omoe, Kipu; XII.23, North slope of Pohakuokane, Haena; XII.24, Napali Trail between Makana & Waiahuakua; XII.25, Waiokihi, Hanalei; XII.26, Kawaiumakua, Anahola; XII.27, Dunes east of Makahuiena Point; XII.28, Nukumoi, Koloa; XII.29, Hanapepe, also Waimea Valley outlook; XII.31, Kalualea, Koloa (up to 1,800 feet); I.2.1940, Kaawalua Valley, Mana; I.3, Miloli'i Trail, Kokee; I.5, Half mile southwest of Hokunui, Nawiliwili; I.8, Three-fourth mile southwest of Hokunui, Nawiliwili.

Oahu: III.20, Honouliuli Contour Trail below Puu Kanehoa; III.31, Northeast ridge of Puu Kanehoa; IV.11, Kaumokunui; IV.14, Northeast ridge of Puu Kanehoa; IV.28, Peahinaia Trail; V.1, Middle ridge east of Puu Kanehoa; V.19, West branch of Kaaawa Gulch (north of Mt. Kaala) having abandoned ditch tunnel; VI.11, Waipilopilo, Haiula; VI.16, Oio, Paumalu Trail; VI.23, Summit ridge between Puu Kanehoa & Puu Kaua; VII.4, Haiula Valley; VIII.3, Kealia-Makua Trail; IX.1, Near Kapuhi, Kawaihapai; IX.8, North slope of Papale Gulch, Haiula; IX.15, Beach, Kawaihapai.

Maui: II.28.1948, Pukalani; VII.21, Kamole Gulch; XII.26, Nawini; XII.31, Waihee;

Oahu: II.22.1949, Mt. Kaala; III.20, Pupukea; V.2, Mokuleia mauka.

Maui: V.14, North of Waiehu Cemetery.

Oahu: V.17, Pohakea Pass; VI.12, Mauna Kuwale; VI.18, Keolu Hills, near Kailua; VI.19, Bowman Trail, near Ft. Shafter; VI.27, Wiliwilinui Ridge; VII.3, Near Poamoho Stream; VII.10, North of Mt. Kaala; VII.17, Pohakea Pass; VII.24, Second ridge east of Dupont Trail, north of Mt. Kaala.

Molokai: VIII.1, Vicinity of Halawa Valley; VIII.2, Kainalu, Pukoo.

Lanai: VIII.4, Decadent forest at 2,500 feet, Waiakeakua.

Maui: VIII.7, Paupau Ridge, mauka of Lahaina; VIII.8, Hana.

Hawaii: VIII.10, Kapoho Light House; VIII.11, Saddle Road; VIII.12, Papaloa, Capt. Cook; VIII.13, At 5,000 feet, south of Papaloa, Capt. Cook; VIII.14, At 5,100 feet, northeast of Papaloa, Capt. Cook; VIII.15, Northwest of Papaloa, Capt. Cook; VIII.16, Makai of Papaloa, Capt. Cook; VIII.17, Puuwaawaa; VIII.18, North of Pohakuloa; VIII.20, Along Saddle Road north of Papaloa (?) & Puu Huluhulu; VIII.21, Judd Trail Between Na Puukoloa and 1859 Lava Flow; VIII.22, Puu Laau at 7,500 feet, Mauna Kea; VIII.23, Around Mauna Kea; VIII.25, At about 7,500 feet at Puukoloa and to northern edge of 1859 Lava Flow; VIII.26, South of Saddle Road 23½ miles from Hilo; VIII.27, At 3,800 feet, rainswept plateau at head of Alakahi Valley, Kohala; VIII.28, Kipuka along Saddle Road 21 miles from Hilo; VIII.29, Kipuka south of Saddle Road 19 miles from Hilo; VIII.30, Kipuka along Saddle Road 16 miles from Hilo; IX.1, At about 9,500 feet northeast of Halepohaku, Mauna Kea; IX.2, At 9,500 feet northwest of Halepohaku, Mauna Kea; IX.3, Near top of Mauna Kea; IX.4, At about 8,500 feet east of Halepohaku, Mauna Kea; IX.5, At 2,000 feet along Saddle Road 7 miles from Hilo; IX.7, Along main road near Papa, Kona; IX.19 Judd Trail.

Oahu: X.23, Dupont Trail, Mt. Kaala; XI.7, Palehua to Nanakuli; XII.26, Dupont Trail, northern slope of Mt. Kaala; I.3.1950, At 1,000 feet southeast of Puu Kamanamui; I.8, Kealia Trail, Kawaihapai; I.15, Shrubby ridge at 1,000 feet at head of Koloa Gulch near Laie.

Kauai: I.29, Haena, also at 200 feet in Hanalei Valley; I.30, Dryish ledges at 500 feet overlooking Hanapepe Valley, also Kalalau Lookout; I.31, East of Kalalau Lookout (on U.S.G.S., map 1937 "Kilohana Lookout"); II.1, Near Kalalau, Kalalau Valley rim, also near Kokee Stream; II.4, Up to 700 feet northeast of Kapalikea, Hanalei; II.7, Along ditchtrail at 3,500 feet, east of Kumuweia Ridge, Kokee; also rocky pasture at 200 feet, Waipio Valley, Kekaha.

Oahu: II.20, Gulch east of Dupont Trail, Mt. Kaala; II.26, Black Junction and along divide 1½ miles to southeast; III.5, Kaipapau Valley; III.12, Dupont Trail, Mt. Kaala; III.19, 21, Kaena Point; III.26, North of Puu Pane; IV.2, First small gulch northwest of Puu Pane Peak; IV.8, Kawaihapai & Kaena Point; IV.23, Gulch southwest of Dillingham Crowbar Ranch at 1,700 feet; IV.30, Dark forest at 2,000 feet, narrow gulch southwest of Dillingham Crowbar Ranch, Mokuleia; V.7, At 2,000 feet, north of head of Kahanahaiki Valley; V.14, At 1,500, near Pahole Gulch, Mokuleia; VI.11, At 3,100, Central Haleauau Gulch south of Mt. Kaala; VI.22, Deep gulch mauka of Kaaawa Point, Koolau Range, also at 700 feet at Papaakoko, Hauula; VI.28, At 2,500 feet between Puu Manawahua and Mauna Kapu; VI.29, At 700 feet, south side of Nanakuli Valley east of Puu Manawahua; VII.2, At 1,200 – 1,600 feet, east side of East Branch of Makaleha Valley below Dupont Trail; VII.4, (Began) East Branch of East Makaleha Valley and (ended) East Makaleha Valley, West Branch; VII.26, Near Manini Gulch, Kaena; VII.27, North of Kamananui, Waimea; VII.30, East Branch of East Makaleha Valley (Pritchardia is at 1,800 feet); VIII.2, At 1,700 feet, Kaumoku nui Gulch, north slope of Mt. Kaala; VIII.19 (not "20"), Central Makaleha Valley Ridge; VIII.27, Kawailki; IX.17, Hanging forest at 1,500 feet, southeast slope of Makua Valley opposite Piko Trail; IX.19, Pupukea-Kahuku; IX.30 (not "10.1"), Up to 1,800 - 1,900 feet, East spur of East Ridge of West Branch of East Makaleha Valley; X.9, At 1,700 feet, easternmost gulch of West Branch of East Makaleha Valley; X.22, Puu Hapapa; X.29, At about 2,800 feet, between Mauna Kapu & Palikea; XI.5, Up to 1,500 feet, ridge mauka of church, south side of Kahana Valley; XI.14, Overlooking head of Makua Valley; XI.15, East Makaleha Valley.

Maui: XI.23, Iao Valley; XI.24, Between Red Hill and Kalikinui cabin, Haleakala (Makai of Kahua, south slope of Haleakala); XI.27, at 2,000, Hanakaoo Gulch, near Lahaina, at 2,000 feet; XI.28, Near Makamakaole Stream.

Oahu: XII.14, At 2,500 feet, summit ridge at head of Makua Valley; also at about 1,800 feet at Keawapilau, Mokuleia; XII.19, Small, erect, central ridge near head of Waiiope Valley; I.12.1951, at 2,500 feet, Main Central Ridge of Makaleha Valley; I.25, Southwest side of Poamoho Gulch south of Brodie Camp, at 500 feet; I.28, South Haleauau Valley below Mt. Kaala summit.

Family : 200
Genus : Ilex

AQUIFOLIACEAE
HOLLY FAMILY

KEY TO LOCAL SPECIES:

1 Drupes purplish black; corolla mostly 6- to 13-merous; flowers on this year's twigs; leaves entire or nearly so (Common endemic; *kawau*) ——— **I. anomala s.l.**

1 Drupes red to rarely brownish (or in some cultigens yellow); corolla commonly 4- to 8-merous; flowers on this or last year's twigs; leaves entire to acrid-prickly (Rare introductions):

2 Leaves entire to serrate, not acrid-prickly; drupe red to brownish:

3 Leaves 10 cm. long or less; drupe red:

4 Flowers on this year's twigs; leaves entire to shallowly toothed, often pubescent beneath when young (North American; dahoon) ——— **I. cassine**

4 Flowers on last year's twigs; leaves entire or merely with a few teeth, never pubescent (Japanese) ——— **I. integra**

3 Leaves (5) 10–25 cm. long; wavy-toothed; drupe red to brownish (South American; Paraguaytea) ——— **I. paraguariensis**

2 Leaves coarsely acrid-prickly; drupe red:

3 Leaves oval to ovate or elliptic-lanceolate with numerous prickles scattered throughout:

4 Flowers on last year's twigs; leaves conspicuously shiny (European; English holly) ——— **I. aquifolium**

4 Flowers on this year's twigs; leaves dull (North American; American holly) ——— **I. opaca**

3 Leaves quadrangular-oblong with 3 prickles at dilated apex and 2–4 near truncate base (Chinese; Chinese holly) ——— **I. cornuta**

According to L. W. Bryan (Haw. Pl. Record 51:30-31. 1947.), all the above exotic species, including the yellow-fruited, spiny-leaved *I. sikkimensis* and *Ilex* sp. PI 112222 ("Holly introduced from China, growing fairly well"), were being grown and tested in the Forest Reserve of the Island of Hawaii. How many of these introductions have persisted to the time of this present writing we do not know. The *Ilex* the reader should expect to see in our forests is the endemic one commonly known as *kawau*. Its leaves, somewhat like those of the endemic *Diospyros hillebrandii*, are unusual in being prominently veined on the dark upper surface and smooth on the pale lower one.

AQUIFOLIACEAE
HOLLY FAMILY

Trees or shrubs with watery sap, mostly evergreen. Leaves alternate or very rarely opposite, simple, petioled, usually leathery, punctate or not, with stipules minute and deciduous or absent. Flowers regular or nearly so, usually greenish to white or yellowish, perfect or unisexual by abortion, in axillary cymose or fascicled inflorescences or rarely solitary. Calyx hypogynous, 3- to 10-parted to -dentate or obsolete, usually persistent, imbricate in bud. Corolla hypogynous, of 3—13 lobes which are free or at base connate, deciduous, imbricate or valvate in the bud. Stamens as many as petals or rarely none, alternate with them, free or slightly adherent to the bases; anthers introrse, 2-celled, dehiscing lengthwise. Disk none. Ovary 1, globose to ovoid, superior, 3- to 13-celled; ovules 1 or rarely 2 in each cell, pendulous from apex; style short and terminal or none; stigmas often confluent or united into lobes or capitate. Staminate flowers usually bear rudimentary pistil; while pistillate flowers usually bear stamen-like staminodia with sterile anthers. Fruit a small berry-like black to purplish or red or rarely yellow drupe enclosing 2—13 one-seeded nutlets. Seed with copious fleshy endosperm and small straight embryo at top with radicle pointed upward.

A family consisting of the monospecific North American *Nemopanthus*, the small New Caledonian *Phelline* and the cosmopolitan *Ilex* with 300—400 species distributed mostly in tropical and temperate regions; rare in Africa and Australia. Only the following genus is represented in the Hawaiian Islands.

ILEX L. Syst. ed.1. 1735; Sp. Pl. 125. 1753.

Description of the family except that the petals are neither linear and distinct (as in *Nemopanthus*) nor valvate in the bud and distinct (as in *Phelline*).

Name derived from the ancient Latin for the hollyoak, *Quercus ilex* L..

Type Species: *Ilex aquifolium* L.

PANDANACEAE
SCREWPINE FAMILY

Coarse sympodially branched often candelabra-shaped glabrous trees or shrubs with often aerial stilt roots replacing earliest roots *(Pandanus)* or without stilt roots (Pandanus, *Sararanga)* or root-climbing lianes *(Freycinetia).* Leaves spirally arranged in 2—4 rows and usually crowded at ends of branches, simple, linear-lanceolate and often caudate to very rarely linear throughout, sheathing at base, usually coriaceous, mostly sharply serate along margins and keeled abaxial side of midrib; stomata simple or variously modified with overlapping scales or simply or branched papillae. Inflorescence terminal, simple or compound, usually clavate and capitate in outline, of usually densely crowded flowers, with spathe-like mostly colored and/or fleshy palatable bracts. Flowers dioecious (though obviously ancestrally perfect as shown in frequent reversions such as in *Pandanus douglasii* Gaud., Deg. & Deg. 21,924, cf., B.C. Stone in Phytomorphology 18:500, 1968.), devoid of perianth except for rudimentary one in *Sararanga;* pollination by wind, insects, birds, bats, rats, etc. Staminate flower: spicate to umbellate on short to long pedicels; stamens few to many by chorisis, often somewhat confluent; anthers erect, basifixed or (in *Sararanga)* versatile, 2- to rarely 4-locular, usually caudate, dehiscing lengthwise; ovary none or very rarely rudimentary and minute. Pistillate: 1—100 congested more or less connate carpels forming phalanges on thick-fleshy or woody axis; staminodia rarely present and if so the hypogynous or adnate to base of ovary; ovary per carpel containing one basal or many parietal anatropous ovules, free or confluent with adjacent ovaries into phalanges with separate or connate stigmas; stigma sessile or nearly so, bearing as does

Family : 36

PANDANACEAE
SCREWPINE FAMILY

much of interior of pistil papillae and mucilage. Fruit a clavate to capitate syncarp usually massive, with carpels drupaceous or baccate, Seed small, with thin testa surrounding much oily endosperm and minute basal embryo.

A tropical family, of wide distribution except in the New World, of three genera of which *Sararanga* (2 species) of New Guinea, Solomons and Philippines is the most primitive. The family is related to the *Sparganiaceae* and *Typhaceae*, but not as intimately as these two are to each other. Its genera, *Pandanus* with about 750 species, and *Freycinetia* with perhaps 250, have speciated extensively in the islands of the Western Pacific.

KEY TO LOCAL GENERA:

1 Lianes with adventitious climbing roots; staminodia in pistillate flowers hypogynous; ovaries with numerous ovules; placentas parietal, 2 or more; staminate inflorescense with age more or less clavate but pistillate one a fleshy clavate to rarely globose syncarp.
(Native) ..... **Freycinetia**

1 Coarse erect shrubs or trees (sprawling in usually sterile Fiji cultigen used for plaiting) with mostly stiff thick adventitious stilt roots; staminodia in pistillate flowers none; ovaries with solitary ovules; placentas subbasal; staminate inflorescence with age clavate but pistillate one a massive woody to partly fleshy globose to rarely clavate syncarp.
(Native & introduced) ..... **Pandanus**

Family : 305
Genus : Rauvolfia

APOCYNACEAE
DOGBANE FAMILY

***RAUVOLFIA** L. Sp. Pl. 208. 1753.

Not *Rauwolfia* Ruiz & Pav. Fl. Peruv. 2 : 26. 1799.
***Rauwolfia* DC. Prodr. 8 : 336. 1844.

Shrubs or trees, glabrous or rarely pubescent, with abundant milky juice. Leaves whorled or rarely opposite. Flowers small, in peduncled often umbellate cymes, white to yellowish or greenish. Calyx small, 5-cleft or -parted, glandless, imbricate, the lobes obtuse to acute. Corolla salverform, with cylindric tube often dilated at place of insertion of stamens, constricted at throat, devoid of scales, surmounted by 5 sinistrorse lobes. Stamens small, included or nearly so, inserted at middle of tube or higher; anthers obtuse or acute, with sacs unappendaged. Disk annular or cup-shaped or lobed. Carpels superior, 2, distinct or connate, each containing 2 pendulous ovules; styles filiform; stigma thick, annular or with reflexed membrane at base. Fruit usually emarginate and with median vertical constriction because composed of 2 usually connate blackish or rarely red drupes having crustaceous endosperm. Seeds ovoid, with fleshy endosperm.

Named after the German physician Leonhart Rauwolf (*Leonardus Rauvolfius*), who botanized in the Orient about 1575.

Type Species: *Rauvolfia tetraphylla* L.

About 80 species, native of the tropics of both the Old and the New Worlds. The genus suddenly gained fame because of *R. serpentina* of India, Ceylon and Java and *R. vomitoria* of Africa, two species of which the roots furnish the crystalline alkaloid reserpine. The former plant was used in the crude form by medicine men of India for centuries, and mentioned in Hindu books of 1,000 to 800 B.C. Its Sanskrit name *sarpagandha*, a corruption for "snake" and "moon", alludes to the plant's local use for the treatment of snakebite and lunacy. Reserpine was extracted in its pure form first in 1952 in Basel, Switzerland. It and its derivatives, administered in tablet form by mouth, are now extensively employed with dramatic results in the treatment of patients suffering from high blood pressure and mental ills. The local species, all closely related to one another and comprising the isolated Section *Ochrosioides*, seem to have developed from a single ancestor originally from America or less likely from Africa.

*Entire genus adapted largely from the recent publications of Earl E. Sherff.

**The original spelling *Rauvolfia* must be retained according to the present International Rules of Botanical Nomenclature.

(Degener & Degener, 2/15/57) (Aided by National Science Foundation)

Family : 305
Genus : Rauvolfia

APOCYNACEAE
DOGBANE FAMILY

KEY TO LOCAL KINDS OF RAUVOLFIA:

(A provisional key based partly on insufficient and fragmentary material. The recent, amazing importance of some foreign species should stimulate local workers to renewed collecting and study of *kas* in the field. Then a revised key may be published to replace the present one.)

1. Leaves mostly 20 – 40 mm. wide, narrow-oblong to elliptic-oblanceolate or -obovate:
   2. Principal leaves 20 – 30 mm. wide, narrowly elliptic-oblong to -oblanceolate, tapering or subacuminate at each end; corolla less than 7 mm. long; pedicels scarcely exserted (Southern Oahu) ..... **R. forbesii**
   2. Principal leaves 15 – 30 mm. wide, narrow-oblong, more or less obtuse at apex; flowers unknown (East Maui) ..... **R. mauiensis**
   2. Principal leaves 20 – 40 mm. wide, elliptic-oblong to narrowly oblong-obovate, tapering or subacuminate at each end; corolla up to 10 – 11 mm. long; pedicels exserted, obvious (Southern Kauai) ..... **R. helleri**

1. Leaves mostly 25 – 60 mm. wide and proportionally wider than those above, obtuse to acute at each end (in *R. sandwicensis* var. *subacuminata* leaves may be subacuminate at apex):
   2. Calyx 5 – 7 mm. long; leaves 25 – 50 mm. wide (Oahu, Lanai) ..... **R. degeneri**
   2. Calyx usually less than 3 mm. long:
      3. Inflorescence open; pedicels slender, obvious, about 2 mm. long; leaves acute at each end, up to 35 mm. wide (Hawaii) ..... **R. remotiflora**
      3. Inflorescence congested; pedicels stoutish and short or inconspicuous; leaves subacute to obtuse at each end or at apex rounded:
         4. Corolla, if fully developed, very slender, up to about 10 mm. long; calyx about 1.5 mm. long:
            5. Leaves 35 – 50 mm. wide; small tree or shrub (Molokai, West & East Maui, Lanai) ..... **R. molokaiensis** s.s.
            5. Leaves up to 30 mm. wide; 10 meter tall tree (Molokai) ..... **R. molokaiensis** var. **parvifolia**
         4. Corolla, if fully developed, swollen above, shorter; calyx about 1.5 – 3 mm. long or longer:
            5. Leaves obtuse to acute at apex, 25 – 50 mm. wide (Oahu, West Maui) ..... **R. sandwicensis** s.s.
            5. Leaves mostly subacuminate at apex, 50 – 60 mm. wide (Kauai) ..... **R. sandwicensis** var. **subacuminata**

(Degener & Degener, 2/15/57)

Family : 305
Genus : Rauvolfia
Species: Sandwicensis

APOCYNACEAE
DOGBANE FAMILY

RAUVOLFIA SANDWICENSIS A. DC.
HAWAIIAN RAUVOLFIA or DEVILPEPPER; HAO

Rauwolfia sandwicensis A. DC. Prodr. 8 : 339. 1844.
Rauvolfia sandwicensis sensu Sherff in Field Mus. Nat. Hist. (Bot. Ser.) 23 (7) : 325. 1947.
Rauvolfia sandwicensis var. *typica* Sherff in Field Mus. Nat. Hist. (Bot. Ser.) 23 (7) : 325. 1947.

Similar to *R. degeneri* in habit and foliage. Calyx usually 1.5 – 3 or rarely up to 4 mm. long; lobes apically subacute to obtuse or rotundate-subtruncate, at base sometimes broadly cordate-auriculate. Corolla when well developed with tube 3 – 4 or rarely 5 – 6 mm. long and with 3 – 4 mm. long swollen limb and throat, with style included; if abortive then much surpassed by the commonly 7 mm. long style; stigma about 0.4 mm. long.

Type Locality: "*in insulis Sandwich* (*Gaudich.!*)."

Local Range: This small tree grows here and there in the summit rain-forest and on the drier foothills of both mountain ranges of Oahu. It was also found by Forbes in the Honokahau Drainage Basin in 1917 and in Olowalu Valley in 1920, and by Degener in Olowalu Valley in 1939, West Maui. Because of its relationship to the snakeroot *R. serpentina* of India, the writers in 1954 were engaged by Ciba Pharmaceutical Products, Inc., to procure roots of this and other Hawaiian *hao* for assay as to their content of the drug reserpine. Regarding *R. sandwicensis* Dr. H. B. MacPhillamy reported that the sample contained approximately 0.01% reserpine according to assay by paper chromatography.

Extra Range: Limited to the Hawaiian Islands with the following variety:

RAUVOLFIA SANDWICENSIS var. **SUBACUMINATA** Sherff

Rauvolfia sandwicensis var. *subacuminata* Sherff in Field Mus. Nat. Hist. (Bot. Ser.) 23 (7) : 326. 1947.

Leaves often 5 – 6 cm. wide and at apex subacuminate.

Type Locality: "Isl. Kauai."

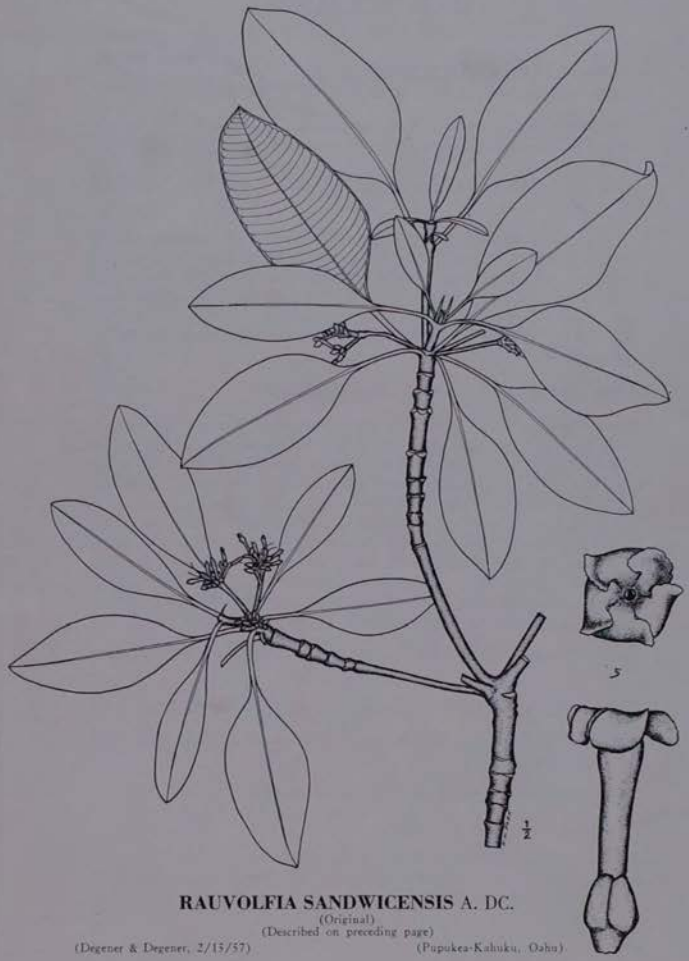
Local Range: Discovered by Remy in 1851 - 55 somewhere on Kauai, and by Degener and his assistant Wiebke "in light woods on mountain, northeast of Kipu," Kauai, in 1926.

(Species illustrated on following page)

(Degener & Degener, 2/15/57) (Aided by National Science Foundation)

Family : 305
Genus : Rauvolfia
Species: Sandwicensis

APOCYNACEAE
DOGBANE FAMILY



RAUVOLFIA SANDWICENSIS A. DC.
(Original)
(Described on preceding page)
(Degener & Degener, 2/15/57) (Pupukea-Kahuku, Oahu)

ACANTHACEAE

Graptophyllum sessilifolium sp. nov.

Frutex ad 2 m. altus calycis lobis exceptis ubique glaber, ramulis elongatis gracilibus novellis subcomplanatis demum teretibus cinerascentibus; foliis subsessilibus interdum subamplexicaulibus, petiolis crassis canaliculatis 0.5–2 mm. longis, laminis chartaceis vel subcoriaceis in sicco olivaceo-viridibus oblongis vel anguste ovato-oblongis, (3.5–) 6–9 cm. longis, 2–4 cm. latis, basi leviter cordatis, apice rotundatis vel obtusis, margine integris et leviter revolutis, utrinque cystolithis linearibus 0.2–0.4 mm. longis manifeste ornatis, costa supra leviter subtus valde elevata, nervis secundariis utrinsecus 4–6 arcuato-adscendentibus utrinque prominulis vel subimmersis, rete venularum obscuro; inflorescentiis apices ramulorum versus axillaribus cymosis plurifloris ad 5 cm. longis, pedunculo (circiter 1 cm. longo) et ramulis gracilibus subteretibus, bracteis papyraceis lanceolato-deltoideis acutis 1.5–2 mm. longis subpersistentibus, bracteolis similibus 0.5–1 mm. longis; pedicellis gracilibus sub anthesi et fructu 7–12 mm. longis superne in calycis tubum gradatim incrassatis; calycis lobis 5 erectis lanceolatis, 1.7–2 mm. longis, 1–1.3 mm. latis, acuminatis, extus glabris, intus minute puberulis, inconspicue 3- vel 5-nerviis; corolla membranacea 25–30 mm. longa curvata, tubo circiter 13 mm. longo et 2–2.5 mm. diametro superne in faucem ventricosum sensim ampliato, lobis 5 subaequalibus, 8–9 mm. longis, 3.5–4 mm. latis, apice rotundatis et obscure puberulis, 2 posticis paullo minoribus et altius connatis; staminibus 2 non exsertis, filamentis gracilibus circiter 7 mm. longis, antheris oblongis 3–3.5 mm. longis obtusis; disco carnoso integro ovario haud latiore; ovario oblongo sub anthesi circiter 3 mm. longo in stylum filiformem quam corollam breviorem attenuato, stigmate minuto, ovulis in quoque loculo 2 superpositis; capsula anguste obovoidea circiter 2 cm. longa, basi stipitata, apice acuta, seminibus 2 compresso-suborbicularibus conspicue rugulosis.

VANUA LEVU: Mathuata: Southern slopes of Mt. Numbuiloa, east of Lambasa, alt. 350–500 m., Nov. 10, 1947, *Smith 6566* (A TYPE, US) (shrub 1–2 m. high, with elongate branches, in steep open forest; corolla rich pink).

The closest relative of the new species seems to be *G. insularum* (A. Gray) A. C. Sm., fairly abundant in Fiji (for distributional notes see Sargentia 1: 118. 1942), which, however, has distinctly petiolate leaves, of which the blades are thinner, more obviously nerved, and obtuse to acute at base. Although the flowers of the two species are essentially similar, *G. insularum* often has the inflorescence-branches and pedicels (as well as young vegetative parts) closely puberulent, and the inflorescence comparatively contracted and fewer-flowered.

COMPOSITAE

Centipeda minima (L.) A. Br. & Aschers. Ind. Sem. Hort. Berol. App. 6. 1867.

VANUA LEVU: Mathuata: Seanggangga Plateau, in drainage of Korovuli River, vicinity of Natua, alt. 100–200 m., *Smith 6885* (A, US) (on edge of pond in open rolling country; corolla-lobes pale green).

Although I find no previous published record of the occurrence of this plant in Fiji, Mr. William Greenwood has indicated its presence by including it in an unpublished list. In the cited locality in Mathuata the small plants were quite common, although very inconspicuous, growing on moist savanna with *Cyperus polystachyos* Rottb., *Fimbristylis annua* var. *diphylla* (Retz.) Kükenth., *Echinochloa colonum* (L.) Link, *Paspalum orbiculare* Forst., *Jussiaea suffruticosa* var. *ligustrifolia* (H. B. K.) Griseb., *Limnophila fragrans* (Forst.) Seem., and *Erechtites valerianaefolia* DC. Although this would seem to be an association of widespread weeds, I have not seen the *Centipeda* elsewhere in Fiji.

DEPARTMENT OF BOTANY,
U. S. NATIONAL MUSEUM,
SMITHSONIAN INSTITUTION.

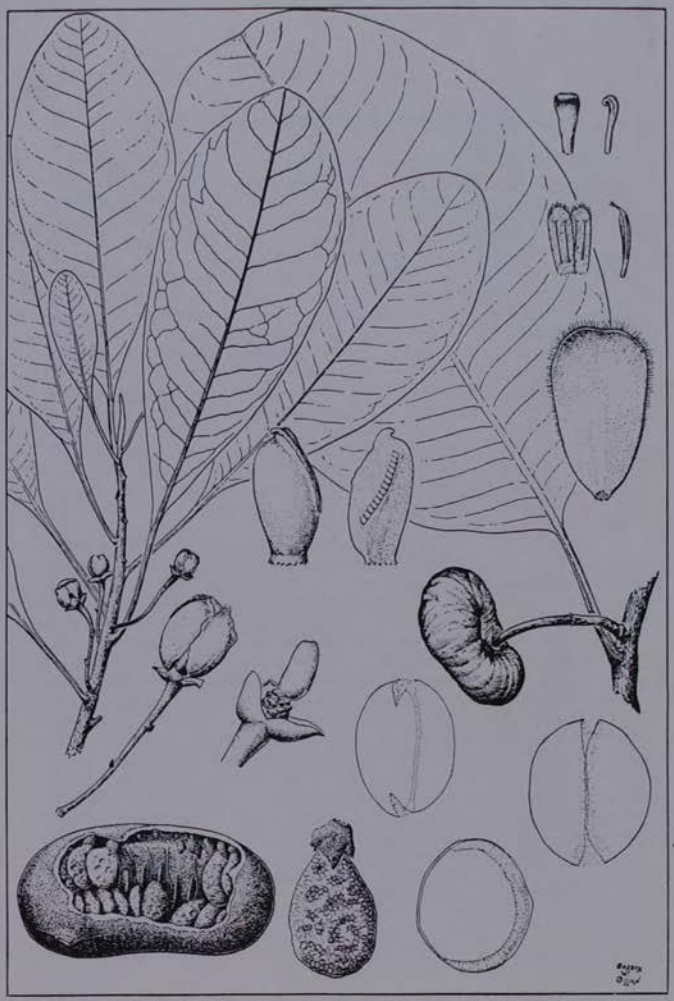
CHAPTER XI

A Bachelor Acquires A Family

Ordonez entered in his diary for February 24, 1941: "Go hiking—Mr. Degener, Timothe and I. Reach the top of a neighboring mountain. Timothe is receiving inspiration in the botanical line. I guess he hasn't much to think or worry about. That's why he is absorbed in what he does manually. Mr. Degener is indeed happy, contented, and patient in his botanical accomplishments! Romance is evidently permeating my mind. Occasional day-dreaming is common! A great hinderance to success!"

February 24, that memorable day, we followed faithful Timothe into what he called the Nauwanga forest. That memorable day we found a tree with rather ugly flowers and, being as usual greedy for specimens to scatter far and wide among worthy institutions to stimulate study, I collected ample material. There were numerous flowers but considerable search disclosed only a single fruit. This collection, to which I gave the number 14,537, was pressed and dried like all other collections and in due time mailed from Nandarivatu to Dr. Smith. Later, when I returned to my beach home in Hawaii Nei, Smith wrote me some astoundingly gratifying letters. I was flabbergasted! February 24 is truly far more important to me than the anniversary of my birthday or the date of my death. February 24 is my private, personal, memorable "Memorial Day."

The story was told officially by I. W. Bailey and A. C. Smith in the Journal of the Arnold Arboretum 23:356-365. Pl. 1-5. 1942. I quote in part: "In 1934 the junior author [Smith] collected specimens of a fruiting tree on the Fijian island of Vanua Levu, but efforts to place the plant in a family failed. Neither fruit nor foilage suggested any plant previously known from the Pacific. Although wood from the trunk was available, no definite suggestion of a family could be made by those who examined the specimen. Recently, a re-examination of the wood and a study of the internal structure of the twigs and leaves indicated that the plant is related to the Magnoliaceae, and it has subsequently been ascertained that the plant is conspecific with a tree collected in flowering condition in the interior of Vitu Levu by Mr. Otto Degener in 1941. This Fijian plant, which is now represented by ample foliage, flowers, fruits, and wood, is definitely a member of the ranalian complex. It exhibits close similarities to the Magnoliaceae, particularly in the internal structure of its vegetative organs, in its pollen, and in the vascularization of its stamens. However, we cannot place it in the Magnoliaceae, for reasons to be discussed on succeeding pages . . . . These three families, Magnoliaceae, Himantandraceae, and the proposed Degeneriaceae, form a group with salient morphological similarities . . . . The remarkable stamens and carpel of *Degeneria* deserve special consideration, since they are likely to prove of some significance in future discussions of the floral morphology of the angiosperms."



The tree Degeneria vitiensis, the only known member of the primitive Degeneria Family. (After Bailey & Smith)

Degeneria vitiensis Bailey & Smith

Sample

Family : 344
Genus : Bidens
Species : Awaluana

COMPOSITAE
COMPOSITE FAMILY

BIDENS AWALUANA Deg. Deg. & Sherff
AWALUA BIDENS; KOKOOLAU

Bidens awaluana Deg. Deg. & Sherff in Occas. Pap. B.P. Bishop Mus. 23(7): 124. 1964.

Slender shrub about 6 dm. tall, subglabrous, widely branched; stem about 1.5–2 mm. thick, lengthwise minutely grooved, lower down minutely alate, above sharply quadrangulate. Leaves opposite, elongately and very slenderly petioled; petiole 10–35 mm. long, often sparsely aciculate-ciliate toward base; blade deltoid-ovate, up to 65 mm. long and 60 mm. wide, bipinnate, bottom leaflets a single pair and more often slenderly petiolulate, segments exceedingly membranaceous, oblanceolate-linear and entire up to cuneately expanded and 1- or 2-dentate or -lobulate, apicules somewhat rounded and calloused or subacute. Heads few, very slenderly peduncled; peduncles up to 15 cm. long, solitary or 2- to 5-clustered at ends of branchlets; radiate, about 15–24 mm. wide and 7–9 mm. tall at anthesis. Involucre's outer bracts about 5–7, spreading, linear-oblong, about 4–5 mm. long, dorsally glabrous, marginally setulose, narrowed toward indurated tip, finally sometimes reflexed; inner ones wider, subequal. Ligulate florets about 5, yellow, subtruncate and obsoletely denticulate at apex, with ligule oblong and about 10 mm. long. Chaff scales oblong-lanceolate, glabrous, 5–7 mm. long. Disk florets slightly surpassing chaff scales. Achenes much obcompressed, winged, the body oblanceolate and gray or dull black, 3.5–6 mm. long and about 1.5 mm. wide, sharply sulcate, lengthwise 1-ribbed along middle of ventral surface, at apex awnless and at times slightly constricted and scarcely capitulate, margins more or less papillate; wings brown-stramineous, under 1 mm. wide. at top rounded-obtuse.

Type Locality: "*Otto & Isa Degener* 28769, locally common on arid, windswept pili and *Sida* slopes and not observed elsewhere; now more or less restricted to *Vachellia farnesiana* (farnesiana), where thorns protect from antelope, deer, and goat; at 500 feet altitude, *mauka* (i.e., inland or toward the mountains) from Awalua, Island of Lanai, January 29, 1964 - - - -."

Local Range: Known only from the type locality. This is one of the very few instances where an exotic weed tree has prevented the extermination of a very localized endemic.

Extra Range: This is a very unusual species somewhat simulating in leaf form the common *Bidens triplinervia* var. *macrantha* (Wedd.) Sherff of South America. The achene, however, shows a strong affinity to that of *B. macrocarpa* (Gray) Sherff of Oahu. Hence the Lanai plant is definitely a member of the Section *Campylotheca* (Cass.) Nutt.

(Illustrated on following page)

(Degener & Degener, June 10, 1970)

Please note style: For general text just about any font can be used to fill the page; reverse has the plate. O.D.

~~New Illustrated Flora of the Hawaiian Islands~~

Family : 68
Genus : Pleomele
Species : Hawaiiensis

LILIACEAE
LILY FAMILY

ole. ms.

Sample

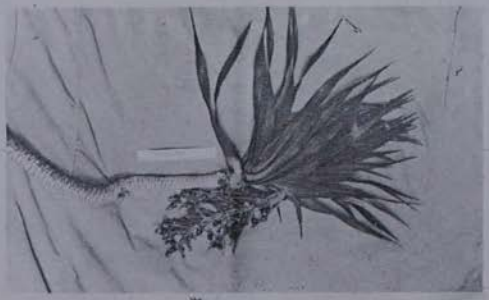
Put 3 photos here.

ole. ms.

PLEOMELE HAWAIIENSIS Deg. & Deg.
(Original)
(Described on preceding page)
(Deg. & Deg. 34,432)

Family: 68
Genus: Pleomele
Species: Hawaiiensis

LILIACEAE
LILY FAMILY



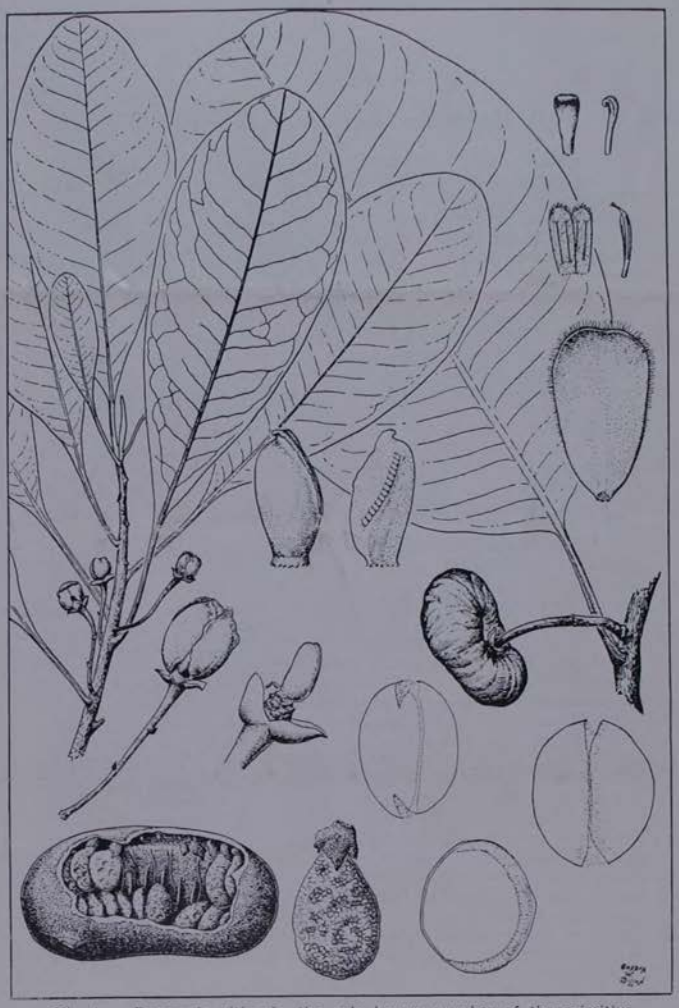
Drawings by Herbert Mann photos.

PLEOMELE HAWAIIENSIS Deg. & Deg.
(Original)
(Described on preceding page)
(Deg. & Deg. 34,432)

what informally introduced him to my colored friends and acquaintances and, for want of something to say at the moment, repeated our botanical discussion. The visitor pushed the youths rudely aside. Then, to my extreme mortification, he loudly described the Fijians as unreliable and as inveterate liars, and that any information I might get from a native was worthless. My visitor was entitled to his opinion. But to be so uncouth and offensive as to mouth it before these colored people indicated some abysmal racial hatred. I felt deeply ashamed of my fellow white man. I explained to the Fijians, and Ordonez bore me out, that white people in Hawaii and in the northern, more civilized parts of the United States, are not at all like the man who had just visited us. They are friendly and polite, more like the Fijians themselves.

Another visitor at our Nandala home was Tommy, pronounced "Toe-may" by his master Timothe. Tommy was a large, white, black-marked dog, mostly setter. Having owned dogs as household pets in Honolulu, I rather liked having him lie under the table at my feet. Hearing Timothe address the dog with the words "Tomba" and "Tommy" about equally often, I thought *tomba* meant the Fijian for "Tom," particularly as Fijians add a vowel to most English names ending in a consonant. Whenever I wished to pet the dog, I would beckon to him and say "Here, Tomba." Instead of coming, Tommy acted strangely and usually went out the doorway into the open. When I criticised the dog's varying attitudes of friendliness, Timothe finally explained that "*tomba*" in Fijian meant "get out," and that my beckoning action belied my words. Furthermore, I learned that Timothe was the Biblical name "Timothy" Fijianized, and that *Mbembe* meant "butterfly." Timothe's little brother Lucy had been named for Luke of Biblical fame. This missionary practice of having natives forego their perfectly good Fijian names for Biblical ones, and even disown Fijian ones in preference for new ones culled from the Bible, is often a farce. Rev. Walter Lawry in a book printed in 1852 about Tongan and Fijian missions, describes how Namosemalua, king of Vewa, adopted "Melchisedec" as "his name in baptism." To me "Namosemalua" and "Melchisedec" sound about equal as barbaric tongue twisters. For simplification the minister might better have baptized the king "Mbembe" or "Jim."

Though professionally interested in plants and concentrating upon their collection and study, I am attracted as a hobby to most remaining phases of Natural History. I always carried a "cyanid bottle" with me or had one within reach. When strange insects flew to my lantern at night while I was working on my plants, I caught, killed and preserved them. As my friend Dr. C. P. Alexander of the University of Massachusetts was particularly interested in *Tipulidae*, or crane-flies, I paid particular attention to these two-winged, long-legged insects. I placed them dry in paper packets, labeled as to locality and date, and then mailed them to him in Postum containers with odd accumulations of dead tree crickets, wasps, flies, etc. They reached him at his study in Amherst usually in good condition. Among my catch were some novelties; and one pretty, green species, as a souvenir of my hunt, is now to bear my name.



The tree Degeneria vitiensis, the only known member of the primitive Degeneria Family. (After Bailey & Smith)

NEW ILLUSTRATED HAWAIIAN FLORA

(Flora Hawaiiensis)

By OTTO DEGENER, B.S., M.S.

Botanist, University of Hawaii, 1925-'27

Collaborator in Hawaiian Botany, New York Botanical Garden, 1935 —

Botanist, Archbold "Cheng Ho" Expedition, 1940-'41, and codiscoverer of the new Fijian plant family Degeneriaceae

Uniquely bound loose-leaf volumes profusely illustrating and describing the wild and cultivated ferns and flowering plants of our gardens, roadsides and mountains. Here are the authoritative books giving you the plant's correct English and scientific names, native home, distribution, present and former uses and other facts of interest. Moreover, as many of these plants are found elsewhere in the South Seas, **this work is useful in the study of other Pacific regions.**

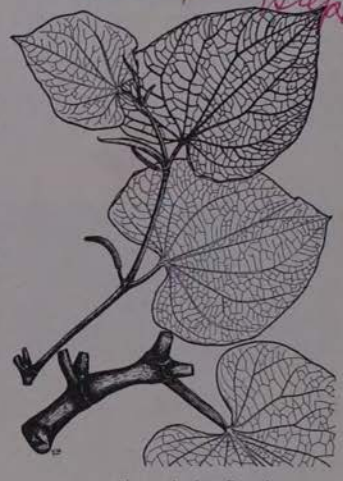
Read about the Spanish moss & auto cushions, tacca and calico frocks, a runaway orchid, pickleweed to lay the dust, Mexican tea, 4 o'clock face powder, cherimoya, avocado & rats, air-plant, klu & perfume, poinciana & pavements, peanut chocolate, Clitoria and blue rice, wiliwili & surfboard, indigo, Tephrosia fish poison, Pride-of-India, mahogany & Kalakaua, poinsettia, caster-oil, California pepper-tree, christmasberry, soapberry, kokio the missing link, milo & calabash, passionflowers, day-blooming cereus, cochineal cactus, prickly pear, pomegranate & Pliny, Indian almond & Indian summer, rose apple and Byron, mountain apple, fuchsia, Chinese violet, scarlet pimpernel, Natal plum, periwinkle, dodder, Cape gooseberry & poha jam, popolo, African tulip, Liberian coffee, gardenia, hedgehog gourd, Star-of-Bethlehem & blindness, Trematolobelia the native saltshaker, maidenhair, Bermuda grass & hayfever, waterhyacinth & navigation, yam & whaling, wauke, macadamia, Diamond Head sandalwood, seagrape jelly, chickweed, Ulupalakua goldencup, caper sauce, thimbleberry, Chile algaroba & bees, Canary tagasaste, cotton & Don Marin, kamani & Molokai, anatto & butter, crownflower, apple-of-Peru, false ipecac, tree-thistle, and silverswords galore!

(**Flora Hawaiiensis**, Books I-IV, have been sold out, but a slightly revised and cheaper edition is now ready, with 1192 pages, including 450 full-page plates, for ~~$6.00~~ $10.00.

Flora Hawaiiensis, Book V, in preparation.

For the above books or for information write: OTTO DEGENER, New York Botanical Garden, Bronx Park, New York 58, N.Y., or OTTO DEGENER, 2334 University Ave., Honolulu, T.H.

Cocos nucifera L.



Piper methysticum Forst. f.

Illustrations reduced one-fourth from New Illustrated Hawaiian Flora and Plants of Hawaii National Park.

PLANTS OF HAWAII NATIONAL PARK
ILLUSTRATIVE OF
PLANTS AND CUSTOMS OF THE SOUTH SEAS

By OTTO DEGENER, B.S., M.S.

Naturalist, Hawaii National Park, 1929
Collaborator in Hawaiian Botany, New York Botanical Garden, 1935 —

A book of human interest emphasizing the culture of the ancient Hawaiians. As many of the plants growing in Hawaii grow likewise in other islands of the Pacific and as many of the ancient Hawaiian customs are like the customs of the present inhabitants of other Pacific Islands, this book is actually illustrative of plants and customs of the South Seas. Read about tree ferns and the pulu industry, hala and mat making, lele and hula dancing, idols, sugarcane and pineapple industries, coconut and the giant crab, taro and edible past-like poi, ti leaves for dresses, banana and the taboo, shampoo ginger and earth oven, beefwood tree, breadfruit and surfing, making of bark cloth, sandalwood and the disastrous New Hebrides expedition, mistletoe and other parasites, koa and its two kinds of leaves, outrigger canoe, grass house, candlenut-lighting, human sacrifices, passion flower, guava and coffee, the poisonous Star-of-Bethlehem, besides other plants and native customs.
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Fijian sitting dance, after "Naturalist's South Pacific Expedition."

Book 7

of

FLORA HAWAIIENSIS

or

New Illustrated Flora of the Hawaiian Islands

by

Otto Degener, Sc.D.
Isa Degener, Dr. Rer. Nat.

Printed in U.S.A.
1960 - 1969

And I brought you into a plentiful country,
To eat the fruit thereof and the goodness thereof;
But when ye entered, ye defiled my land,
And made mine heritage an abomination.
Jeremiah 2:7

Family: 332
Genus: Coprosma
Species: Waimeae

RUBIACEAE

MADDER FAMILY

COPROSMA WAIMEAE Wawra
WAIMEA (CANYON) COPROSMA; OLENA

Coprosma waimeae Wawra in Flora 57:327. 1874.
Coprosma foliosa sensu Hillebr. Fl. Haw. Isl. 186. 1888. (As to Kauai plant only.)
Coprosma waimeae sensu Heller in Minn. Bot. Stud. Bull. 1:895. 1897.
Comprosma waimeae sensu Rock, Indig. Trees Haw. Isl. 465. 1913.
Comprosma waimeae sensu W. R. B. Oliver in B. P. Bish. Mus. Bull. 132:163. 1935.

Small rather variable tree wtih glabrous to very rarely sparsely pilose branches. Leaves elliptic to obovate, coriaceous, acute to rarely obtuse at apex, acuminate to somewhat abruptly narrowed at base, reticulate beneath and smooth above, glabrous or rarely a few hairs on midrib above andor beneath; blade 25-85 mm. long, 15-40 mm. wide; petiole 5-15 mm. long; stipules broadly triangular, prominently cuspidate, glabrous or very rarely sparsely ciliolate. Staminate flowers 3, on glabrous to rarely sparsely pubescent 7-12 mm. long peduncles of which usually only 1 arises from leaf axil; bracts paired, narrow-ovate; calyx cup-shaped, dentate; corolla funnelform, with usually 8 linear lobes; stamens about 8, lobed at base, apiculate. Pistillate flowers 1-4 but usually 3, on 12-20 mm. long peduncle, bearing pair of broadly to narrowly spatulate up to 5-8 mm. long bracts; calyx cup-shaped, dentate; corolla with short tube and about 8 narrow acuminate lobes. Drupe globose to obovoid, orange, 8-12 mm. long, crowned by calyx teeth.

Type Locality: "Kauai; Gebiet von Halemanu; 2100."

Local Range: This species inhabits the rainforest above about 2,000 feet elevation about Waimea Canyon, Kauai. It is not found about Waimea, or *Kamuela, on the Island of Hawaii as the name might denote. The vernacular name *olena* alludes to the yellow color of the wood. The fruit of this species is probably the largest in the Islands for the genus.

Extra Range: Not known elsewhere. By presently considering this a "rather variable" species, we really confess our present ignorance regarding the different varieties and forms that probably exist, or at least existed before exotic weeds like the blackberry competed with them.

*As Waimea, or "reddish water," was the name of communities on Kauai, Oahu and Hawaii, letters often went astray. To be sure that their letters would reach Waimea on the Island of Hawaii, individuals addressed them to "Kamuela," the Hawaiian name of Samuel Parker, the postmaster there.

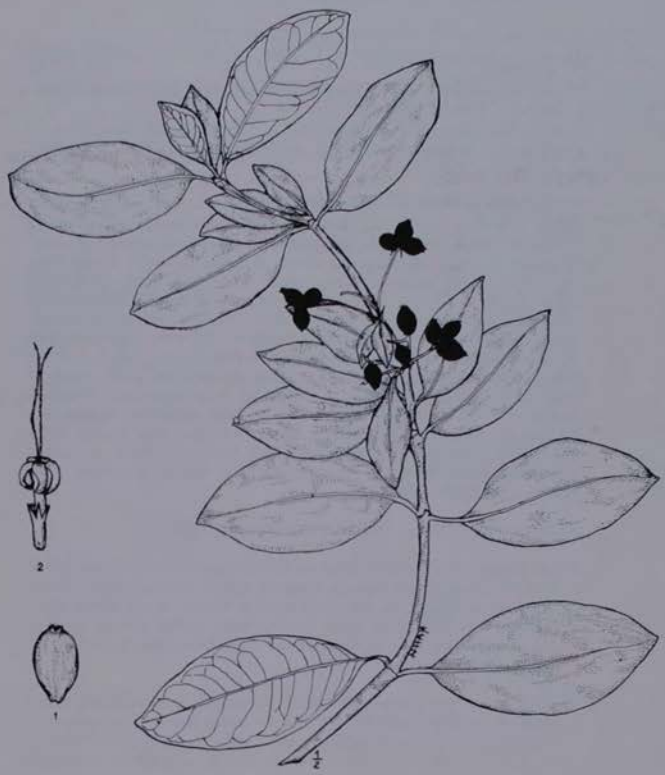
(Illustrated on following page)

(Degener & Degener, 9/15/78)

Family: 332
Genus: Coprosma
Species: Waimeae

RUBIACEAE

MADDER FAMILY



COPROSMA WAIMEAE Wawra

(Original)

(Described on preceding page)

(Deg. & Deg., 30,786, Kokee, 11/19/60)

Family: 308
Genus: Grammica
Species: Sandwichiana

CUSCUTACEAE

DODDER FAMILY

GRAMMICA SANDWICHIANA (Choisy) Degeners, Hadač & Chrtek
HAWAIIAN DODDER: KAUNOA, POLOLO

Cuscuta sandwichiana Choisy in Mém. Soc. Phys. Hist. Nat. Genève 9:289. 1841.
Not *Cuscuta sandvicensis* var. *mimosae* Hooker f. in Trans. Linn. Soc. 20:205. 1847.
Not *Cuscuta sandwichiana* var. *mimosae* Anderss. Om. Galap. Veg. 214. 1854.
Not *Cuscuta sandwicensis* Anderss. Om. Galap. Veg. 89. 1847 [1860?]
Cuscuta sandwichiana sensu Degener, Fl. Haw., Fam. 308: Cuscuta. 6/14/33, 9/15/46.
Grammica sandwichiana (Choisy) Degeners, Hadač & Chrtek *comb. nov.*

Stem slender, orange-yellow. Leaves reduced to 2 mm. long lanceolate scales. Flowers often glandular, 3-4 or rarely up to 5 mm. long, on bracteate pedicels usually less than 5 mm. long to form compound open cymes on peduncles 1 cm. long or less. Calyx campanulate, scarious, shiny, deeply 5-cleft with triangular-ovate somewhat acute to almost obtuse lobes about 1.5 mm. long which are sometimes medially thickened to form a slight ridge, marcescent. Corolla urn-shaped, thin, about 4 mm high, the tube bearing no scales but with 1.5 mm long ovate to triangular somewhat acute persistent lobes which are inflexed at the top and erect or reflexed but finally appressed to the ripening capsule. Stamens inserted in the sinuses between the lobes and shorter than the lobes; filaments thickish, often subulate; anthers subsessile, oblong, about as long as filaments. Ovary depressed-obovoid, about 2 mm. high; style distinct, exserted, almost as long as ovary; stigma capitate. Fruit a depressed-globose to rarely globose indehiscent capsule about 3 mm high with apical 2-branched cavity projecting into placenta from which divergent marcescent styles arise when these sometimes persist. Seeds light brown, dull, much depressed-globose and almost 2 mm. wide and 1 mm. thick or somewhat angular from pressure, with oblong perpendicular hilum.

Type Locality: Hawaiian Islands.

Local Range: Growing on probably all the larger Islands at lower elevations often along coastal dunes and in arid regions. It is found commonly on *Convolvulaceae, Heliotropium, Scaevola* and *Pluchea.* At Hilo, Island of Hawaii, a form with fasciated flowers was collected in 1922. In the "Song of the Lei of the Hawaiian Islands," the dodder is mentioned as being emblematic of the Island of Lanai. This plant is sometimes confused with *Cassytha filiformis* L., of the *Cassythaceae* (Family 138). The latter, because of its greenish yellow, firm stems and its habit of growing mostly on shrubs and trees, can be distinguished easily from the dodder even when both plants are devoid of flowers and fruits.

Extra Range: Endemic to the Hawaiian Islands. It belongs to the Subsection *Californicae*, to which five species chiefly native to western North America also belong.

GRAMMICA SANDWICHIANA var. **KAILUANA** (Yuncker) Degeners, Hadač & Chrtek

Cuscuta sandwichiana var. *kailuana* Yuncker in Mem. Torr. Bot. Club 18:158. 1932.
Grammica sandwichiana var. *kailuana* (Yuncker) Degeners, Hadač & Chrtek *comb. nov.*

Differing from the species itself in having pedicels often longer than the flower and in bearing short insignificant yet definite bifid or truncate or triangular scales at base of corolla and alternating with its lobes.

Type Locality: "Hawaii, Kailua along beach."

Local Range: Thus far recorded from Kailua, Hawaii; Moomomi, Molokai; and Kaena Point, Oahu. At Kailua, where Otto Degener found the type material, Hawaiians were sacking the plant to carry away to their swine as food.

Extra Range: Endemic to the Hawaiian Islands. This taxon is anomalous in being the only member of the Subsection *Californicae* possessing infrastaminal scales. As the presence of these scales is a primitive feature and their absence is due to reduction or simplification, the relationship of the Hawaiian dodders to one another is quite opposite to the nomenclatural status. The variety *kailuana* seems to be the original stock from which *Grammica sandwichiana s. str.*, or, according to more modern orthography, var. *sandwichiana*, was derived.

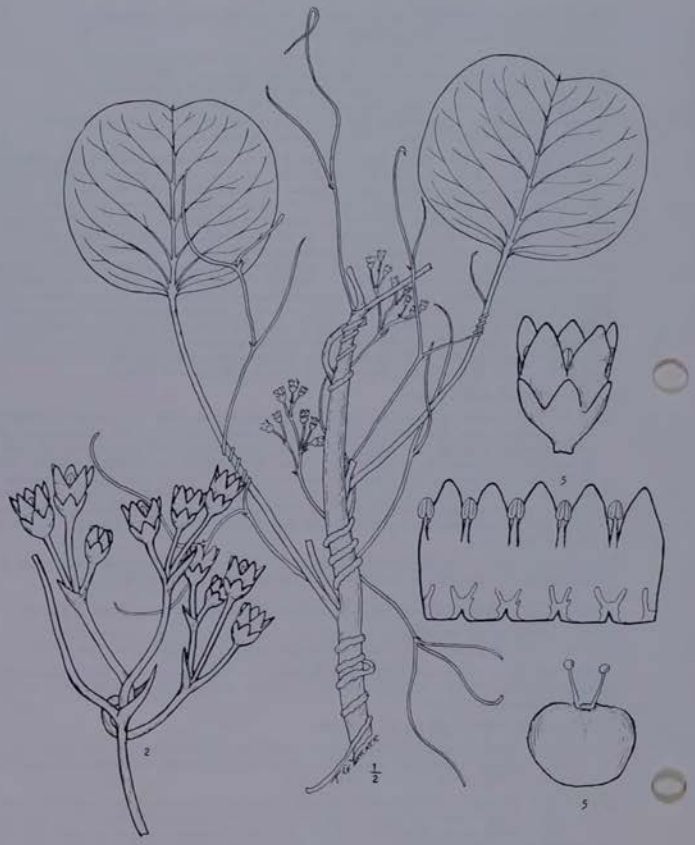
(Variety illustrated on following page)

(Degeners, Hadac & Chrtek 9/15/78, to displace Cuscuta:Sandwichiana 6/14/33 & 9/15/46).

Family: 308
Genus: Grammica
Species: Sandwichiana
Variety: Kailuana

CUSCUTACEAE

DODDER FAMILY



GRAMMICA SANDWICHIANA var. **KAILUANA** (Yuncker) Degeners, Hadač & Chrtek on *Ipomoea*

(Described on preceding page)

(Degeners, Hadac & Chrtek 9/15/78, to displace Cuscuta 6/14/33 & 9/15/46) (Kailua, Hawaii)

CUSCUTACEAE

DODDER FAMILY

Whitish or yellowish to reddish filiform dextrorsely twining glabrous lax herbs practically always devoid of chlorophyll, parasitic by numerous haustoria on herbs or shrubs and very rarely on trees. Leaves reduced to minute alternate functionless scales. Flowers perfect, regular, small, usually more or less cymosely clustered, whitish to pink or reddish. Calyx inferior, 5-lobed or 5-parted or of 5 distinct sepals (rarely 4- or 3-lobed or 4- or 3-parted or of 4 or 3 distinct sepals or very rarely doubled). Corolla 5-lobed (rarely 4- or 3-lobed or very rarely doubled), the tube bearing as many fimbriate or crenulate scales as there are lobes and these alternate with the lobes or very rarely wanting; lobes imbricate in the bud. Stamens as many as the corolla lobes and inserted in the throat or sinuses above the scales, often shortly exserted; anthers short, ovate to oval, obtuse, introrse; 2-celled, longitudinally dehiscent. Ovary 2-celled; ovules 2 in each cell, anatropous; styles 1 or 2; terminal, distinct or rarely united below; stigmas linear to capitate. Fruit a globose or ovoid capsule, circumscissile near base or irregularly bursting or indehiscent, 3- or 4-seeded. Seeds glabrous: embryo linear, terete, curved or spiral, with apex bearing 1-4 minute alternate; endosperm fleshy; cotyledons none or very rarely present but then rudimentary scales. Seeds germinate in the soil but soon the root and lower part of stem of seedling dies while the upper part attaches itself to the host. Because the dodder lacks chlorophyll completely (except in a very few exotic species that exhibit a slight greenish tinge in their stems), it must henceforth derive all its nutrition from its host.

A family, comparatively recently evolved from the *Convolvulaceae* through parasitism, and consisting of at least four genera of which only *Grammica* is native to the Islands. Because many readers of the Flora are unfamiliar with this strange family, we here give a synoptic key:

1. Style 1; stem mostly robust; inflorescence racemose or paniculate:
   2. Corolla persistent; stigmas capitate to ovate; 2n = 28 (Old World) . . . . . *Monogynella* Des Moul., Études. Org. Cusc. 65. 1853. Type: *M. vahliana* Des Moul., *i.e.*, *M. monogyna* (Vahl) Hadač & Chrtek
   2. Corolla deciduous; stigmas conic to subulate; as far as known 2n = 28, 32 or 42 (Small, mostly Old World) . . . . . *Kadurias* Raf., Fl. Tellur. 4:91. 1836. Type: *K. reflexa* (Roxb.) Raf.

1. Style 2; stamens mostly thin; inflorescence usually capitate or racemose and only rarely paniculate:
   2. Styles of equal length; stigmas cylindric to subulate; inflorescence globose heads; as far as known 2n = 14, 28, 42. (Mostly Old World) . . . . . *Cuscuta* L., *s. str.*, Sp. Pl. 1:124. 1753. Type: *Cuscuta europaea* L.
   2. Styles of unequal length; stigmas capitate; inflorescence various, from globose heads to racemose or paniculate; as far as known two groups (perhaps genera) occur with 2n = 32 or 56 and with 2n = 30 or 60. (Mostly New World) . . . . . *Grammica* Lour., Fl. Cochinch., 170. 1790. Type: *Grammica aphylla* Lour., *i.e.*, *G. chinensis* (Lam.) Hadač & Chrtek

(Degeners, Hadac & Chrtek 9/15/78, to displace Cuscuta 6/14/33 & 9/15/46)

Family: 308
Genus: Grammica

CUSCUTACEAE

DODDER FAMILY

GRAMMICA Lour. Fl. Cochinch. 170. 1790.

Whitish to reddish glabrous lax herbaceous plants with mostly thin stems. Leaves very reduced. Flowers perfect, regular, small, whitish to reddish, in compact or loose globular inflorescence or in loose racemose or paniculate inflorescence. Pedicles shorter or longer than flowers. Calyx 5- or 4-lobed with lobes upright or deflexed. Corolla 5- or 4-lobed with lobes upright or deflexed, persistent at maturity, surrounding the capsule or rarely corolla detached from its base at maturity to form a cap to the capsule. Stamens as many as corolla lobes. Styles 2 with one style usually shorter than the other; stigmas capitate. Seeds usually 0.8-2.8 mm. long; embryo with 2-4 windings of the spiral.

Name supposed to have been derived from the Greek *gramma, i.e.*, "line," in reference to the appearance of the plant.

Type Species: *Grammica aphylla* Lour., i.e., *Grammica chinensis* (Lam.) Hadač & Chrtek

About 70 species known throughout the World, but most abundant in America. Many species are of considerable economic importance because of their parasitism of tobacco, flax, clover, etc.

HOOKERIACEAE
HOOKERIA FAMILY

DISTICHOPHYLLUM FREYCINETII (Schwaegr.) Mitt.

Hypnum freycinetii Schwaegr., Suppl. 3(2): 279. 1830.
Hookeria contortifolia Mont., Ann. Sc. Nat. Bot. Ser. 2, 19: 240. 1843.
Distichophyllum freycinetii Mitt. *in* Seem., Fl. Vit. 392. 1873.
Mniadelphus Hillebrandii C. Muell., Flora 82: 459. 1896.

Dioicous. Robust plants in dense mats, lemon-yellow to dull yellowish-green above and pale brown below; more robust than *D. paradoxum*. Stems procumbent, dark brown, up to 6 cm. or more long, simple or at times with scattered branches, densely beset with rhizoids on underside, up to 4 cm. long and 0.45 mm. wide but with leaves up to 5 or rarely 10 mm. wide; in cross-section round-hexagonal, without a central cylinder, basic tissue composed of irregular white cells and rarely with brown, thick walled cells intermixed, with a single layer of cortical cells. Leaves much shriveled and contorted when dry, the lateral rows widely spreading, complanate, oblong-ovate, about 3 mm. long, 0.55 mm. wide at insertion, and at top 0.84 mm. wide, asymmetrically divided by costa to midleaf, abruptly narrowed at apex to a cuspidate point 0.1 to 0.2 mm. long, up to 4 or 5 mm. by 1.4 mm. wide, distinctly bordered with 2 or 3 rows of long narrow cells; margin plane below but occasionally minutely denticulate in upper part by projecting cell corners, otherwise entire; costa slender, faintly but distinctly ending about 15-20 cells below apex, in cross-section planoconvex with faint convexity on dorsal side, composed of 2 upper layers of circular to oval cells having lumens of 5μ and one ventral layer of 5 cells with lumens of 3μ; interior cells of leaf base hexagonal, lax, thin-walled, commonly about 30μ long by 20μ wide but toward costa larger and toward margin smaller, extending upward in a wide median band to or slightly beyond end of costa; cells toward basal margin rectangular, commonly about 16μ long; cells of upper part of leaf hexagonal, collenchymatous, with firm pellucid walls; marginal cells porose, 50-55μ long by 4μ wide in upper and middle part and 90-100μ long in basal part. Inner perichaetial leaves oblong-ovate, abruptly narrowed to a short, slender, ecostate, acuminate point. Seta slender, smooth, 2 cm. long; capsule short, ovoid, horizontal without a distinct neck; urn 1.5 mm. long; peristome teeth yellowish, finely cross-striated, not furrowed along median line, with segments of inner peristome equaling the teeth and arising from a high basal membrane; lid and calyptra unknown to writers. Spores smooth, 10-12μ.

Type Locality: Hawaii. The writers interpret this to be the Island of Hawaii.

Local Range: Frequent on all of the larger islands, growing in wet forests on the ground, on embankments, at the base of trees, and rarely epiphytically. The capsules have been seldom collected. The Degeners collected on Lanai, No. 28,682, for example, from "Between Puu Aalii and Lanaihale. On ground in dense shrubby rain forest at 3,000 ft. Jan. 7, 1964." It was associated with *Dicranella hochreutineri, Campylopus fumarioli, Funaria subintegra, Distichophyllum paradoxum, Acroporium fusco-flavum, and lichens.* Collections have been made on Oahu, in the Kahana Valley along the northern loop trail, and near the Kahana Saddle-Summit trail in deeply shaded banks (Hoe, 1974). Hillebrand's collections, reported by C. Müller, indicate localities on Molokai, and Kauai as well.

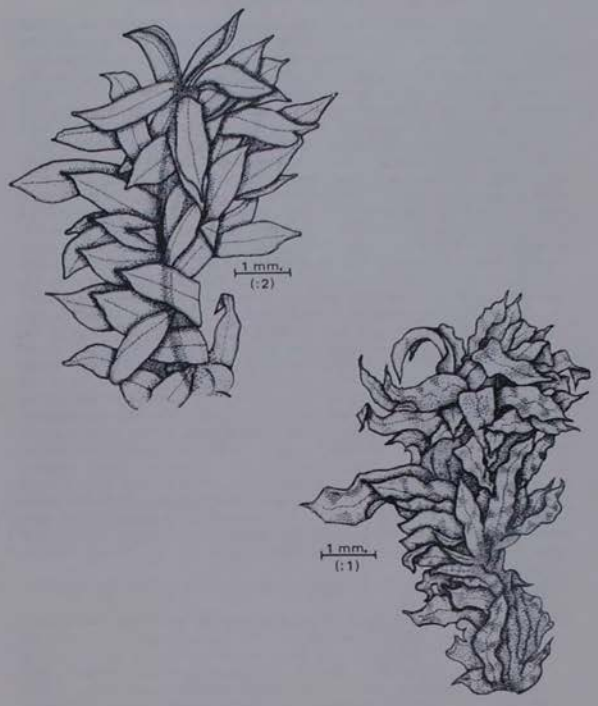
Extra Range: Endemic to the Hawaiian Islands.

(Illustrated on following pages)

(Degener, Degener, H. Hörmann, and Douglas R. Smith, May 16, 1980)

Family : 73
Genus : Distichophyllum
Species : Freycinetii

HOOKERIACEAE
HOOKERIA FAMILY



DISTICHOPHYLLUM FREYCINETII (Schwaegr.) Mitt.
(Original)
(Moss & plate described on preceding page)
(Deg. & Deg. 27,495, East Maui, July 1961)

Family: 68
Genus: Pleomele
Species: Hawaiiensis

LILIACEAE
LILY FAMILY

PLEOMELE HAWAIIENSIS Deg. & Deg. s. s.
HAWAII PLEOMELE: HALAPEPE

Pleomele hawaiiensis Deg. & Deg. *sp. nov. Arbor 15 m. alta, a foliis circa 30 cm. longis et 2.5—3.0 latis et floribus 4 cm. longis.*

Glabrous 15 meter tall profusely branched tree with smoothish grayish bark and mainly coarse erect main branches bearing ultimate branches that are 2—2.5 cm. thick and grow 15—20 cm. long yearly from near side of previous year's marcescent or fallen inflorescence; ultimate branches crossed with horizontal 1 mm. wide pale brown-gray to yellowish leaf scars that coalesce to isolate narrow angular-lenticular areas of bark whitish toward base of current year's growth and yellowish toward top. Leaves crowded at the ends of the branches, linear-lanceolate, entire, coriaceous, green, longitudinally densely striate, with slender slightly raised midrib on upper surface but hardly on lower, about 30 cm. long and 2.5—3.0 cm. wide, rather uniformly thick, with partly clasping base about 3 cm. wide, with acuminate acicular slightly plicate apex having margins connate. Flowers on orange pedicels 4—10 mm. long in recurved panicles 3—4 cm. long, many deciduous and those fruiting with rest of flower marcescent with perianth tube bursting lengthwise with swelling of fruit. Perianth pale yellow, glabrous, narrowly campanulate, persistent; tube about 30 mm. long and toward apex 10 mm. wide, thickened on inner face by adnate part of linear filament; lobes about 10 mm. long, 4 mm. wide at base, broadly lanceolate and somewhat cucullate toward obtuse apex, with midrib extending to apex. Free part of stamens almost as long as lobe, distally curved at insertion and slightly narrower than base of lobe, thick and narrow-deltoid for about 6 mm. and thereafter terete; anther thick, 4 mm. long. Ovary 10 mm. long, 5 mm. wide; style filiform, 30—35 mm. long; stigma 3-lobed. Fruit red, (probably) about 8 mm. wide. Seeds 1—3 per fruit.

Type Locality: Deg. & Deg., No. 34,422. Type tree. At 1,900 feet near "Belt Road", mauka of Pohue Bay, Kau, Hawaii. Two P., trees in ¼ acre aa kipuka with Metrosideros & Maba. Sept. 4, 1977.

Local Range: As the annual growth in height, terminating in a flower cluster, shows; this type tree is 75 to 100 years old. It grows in a kipuka, or oasis of better soil surrounded by newer, near barren lava. It is watered not so much by rain as by mist and fogdrip from afternoon trade winds. Many Hawaiian Phanerogams have been officially listed as endangered and on the verge of extinction unless man curtail factors of destruction he has let loose with design or by accident upon this former Paradise of the Pacific. This magnificent, odd treelily was injured by road construction bulldozers rolling boulders and rocks against it in September 1977. Having no scientific name, it had missed the list of plants deserving special care. This is an example, as the writers proposed some years ago, why all native Hawaiian Phanerogams should be listed as endangered unless experts have found special species sufficiently abundant and robust to withstand harvesting or some destruction. Wishing better material for our present description, we were horrified on our visit July 12, 1980 that some vandal nitwit, apparently with a cane knife, had chopped and removed two main branches of this tree! Being ourselves not too far evolved beyond our knifewielder we, with feelings akin to murder in our hearts, regretted that trying to pray the culprit to death would be futile. Our visit for better material, however, was partially successful as an exotic furcrea growing below its crown had intercepted on its spreading leaves many falling, drying flowers useful for this description. Those reaching the ground had rotted away. We do not know the past nor present distribution, but assume it is the Island of Hawaii. Lacking sufficient material for thorough comparison, we provisionally describe one taxon below as a variety.

Extra Range: Endemic with its close relatives to the Hawaiian Islands.

PLEOMELE HAWAIIENSIS var. MAUIENSIS Deg. & Deg.
MAUI PLEOMELE; HALAPEPE

Pleomele hawaiiensis var. *mauiensis* Deg. & Deg. *var. nov. A specie foliis longior differt.*

From the poor material available we note that the leaves are usually 4—5 dm. long and, in comparison to the type itself, the flowers are slightly longer with more prominent perianth lobes and stamens.

Type Locality: Deg. & Deg. No. 27,742. Olinda, Maui. Open forest, July 7, 1961.

Local Range: Imperfectly known from Olinda, Maui and hence modestly named and described as a mere variety of the Hawaii plant. Additional exploration, collecting and proper study, as in so many taxa lumped together because of uncertainty, is necessary to probably show it to be of specific rank. We wish to affirm again that since we are staff members of the New York Botanical Garden, type specimens are deposited at that institution unless stated otherwise perhaps because of the wishes of some collaborator.

Botanist Degener In Fiji On An Anti-British Hate

P.J.M. Dec. 1950

WE have received from Mr. Otto Degener, of Hawaii—that indefatigible producer of books with a botanic flavour—one of his latest contributions to Pacific bookshelves—namely "Naturalist's South Pacific Expedition—Fiji."

Mr. Degener spent 8 months in the South Seas, before World War II, as a member of the scientific expedition organised by Mrs. Anne Archbold, and which travelled in the famous ocean-going junk, Cheng Ho. This colourful account of their voyage on the Cheng Ho, and of his search in Fiji for botanical specimens, is of interest to the general reader as well as to the botanist. Mr. Degener has a racy style and can tell an excellent story.

The book was published in 1949, and one Honolulu reviewer described it as "an account of botanising, of social studies, of cannibalism, of fire-walking, religion, native treatment for leprosy, Fiji drums, tatooing and pet doodlebugs. . . . Degener . . . discourses on the copra industry, witchcraft, native chewing-gum and jungle intoxicants."

In this book, Mr. Degener rather strongly criticises British Colonial rule as he saw it in Fiji, and he contrasts the condition of the Fijians unfavourably with what he is pleased to describe as the emancipated Hawaiians. However, as no one is likely to accept Mr. Degener as an authority on the merits or otherwise of Colonial rule, it is not necessary to accept seriously his references to Colonialism. His books on botany are interesting and valuable; but, as a writer on political affairs he goes into that class of Americans who, in the past 50 years, by their persistent and ill-informed pre-occupation with Colonial affairs in South-east Asia, laid the foundations for the present unholy mess there.

There was no trouble in our North-west Pacific frontier while Brown Brother was kept in his proper place under the system of Colonialism, and helped gradually to assume the responsibilities of self-government; but, since the New Planners have given us an independent Burma, and India, and Indonesia, and Philippines, our troubles have mounted high and are still mounting. . . . If Mr. Degener's idea of a well-governed Pacific Territory is seen in that rather mongrel array in Hawaii, then most people probably will vote for Fiji as it is under British "Colonialism."

ANYONE who knows the real Fiji, and in the light of that knowledge reads Mr. Degener's book, will question the honesty of Mr. Degener's conclusions, in relation to British rule there.

It looks very much as if Mr. Degener is an Anglophobe who used his opportunities in Fiji to feed his anti-British hates. There is proof of this in his persistent, unsupported accusation that the British, for their own selfish purposes, keep the Fijians in a state of peonage and that the Fijians are miserably poor, ill-treated and dispirited. He refers on page 277 to Fiji as "a colony whose white population with very, very few exceptions considers the kai Viti sub-human"; and he quotes and heartily endorses the statement of a hate-ridden negro: "The British Empire is one of the greatest enslavers of human beings."

It is indicated that Mr. Degener tried to bounce one or two British officials, and was put back into his place with a thump. He formed a friendship with a Fijian youth, who called him "father"; but when he wanted to take the Fijian back with him to Hawaii, to be a sort of "son" and personal servant, the Fiji authorities very wisely refused permission. Whereupon Mr. Degener, in capital letters, says the Fijians are "truly island prisoners," and cuts loose with a paean of hatred of all things British.

Perhaps we had better leave it at that. Mr. Degener publishes the book himself (see advertisement in this issue) and its price is $5—which, in our debased British currency, is over £2.

Justificatif. Extrait du Journal de la Société des Océanistes

(Tome V. Décembre 1949. pp. 199-200)

enfin le *Continent Austral*, ils le voient partout, notamment *au sud de Tahiti* (III, 130-31) où il s'agit certainement de nuages épais; ils prennent d'abord Tahiti pour une *péninsule* qui s'en détache, et manœuvrent pour la contourner et ne pas se laisser sous-venter dans un golfe (IV, 135). Lorsqu'ils ont appris (par les indigènes?) que Tahiti est *une île* (IV, 155) ils n'en persistent pas moins à croire que les canots qui arrivent de l'ouest ou du sud proviennent de ce continent tout proche (IV, 228). Robertson est porté à regarder Tahiti comme la base indispensable pour l'exploration et — naturellement — l'annexion de ce continent de mythe (V, 234 sq.).

Le *master* fut d'ailleurs l'un des héros involontaires, et répugnant à verser le sang, de la fameuse échauffourée navale du 24 juin (153-157). Ses fonctions le retenant à bord, il ne fit à terre que quelques rares excursions, mais fut témoin des visites de la « Reine » Purea, et assista lui-même au dîner de cette « souveraine » dans son « Palais ». Cependant il abonde en anecdotes savoureuses sur l'*intercourse* entre marins et Tahitiens, dont certain épisode rappelle nos meilleurs fabliaux (184-85; 196-200; 207-09) et montre à son tour la cause réelle du vol de tous les clous du bord par les matelots en bordée! « J'appris... qu'une nouvelle sorte de commerce avait attiré ce jour-là la plus grande partie de leur attention, mais il serait plus juste de l'appeler l'antique commerce... un brave garçon d'Irlandais, l'un de nos *marines*, fut le premier à l'inaugurer, ce pourquoi il reçut une sérieuse râclée des permissionnaires pour n'avoir pas commencé plus décemment, dans une maison ou derrière un arbre ou un buisson : l'excuse de Paddy était la crainte de perdre l'honneur d'avoir eu la première. »

Victoria et le *cant* ne régnaient pas encore.

Jean-Paul FAIVRE.

DEGENER, Otto. **Naturalist's South Pacific expedition : Fiji.** Honolulu, Paradise of the Pacific, 1949. VIII, 303 p., ill. 8°.

Il s'agit de la deuxième expédition du « Cheng-Ho » organisée en 1940 par Mrs Anne Archbold, dans les mers du Sud. L'auteur, un Américain, en faisait partie comme botaniste; à ce titre d'ailleurs et en tant que naturaliste il a travaillé à l'Université de Hawaii, au Parc national de Hawaii, et au Jardin botanique de New-York. Ce livre sera donc avant tout une relation de ses recherches et de ses découvertes. M. Otto Degener a donné son nom à une nouvelle espèce de plante : l'arbre « Degeneria vitiensis », seul spécimen connu de la famille des « Dégénériacées », proche parente de celle des Magnoliacées. Il herborise ainsi autour de Suva et dans l'intérieur de Viti-Levu, et dans Vanua-Levu, où, à Mbalanga dans la baie de Savu-Savu, il cultive quelques plantes autour de sa petite maison, et récolte les cocos.

Cependant ce livre — non exclusivement scientifique — se lit comme un roman, car l'auteur y narre ses diverses aventures, et d'une manière attachante; il n'est point seul d'ailleurs à faire partie de l'expédition ; il y a d'autres chercheurs, en divers domaines, et aussi l'équipage du « Cheng-Ho ». Voici pour ceux que les questions de marine intéressent quelques détails sur ce bâtiment de 125 tonneaux : c'est un yatch construit à Hong-Kong par des Chinois et sous la direction d'un architecte naval américain, en partie d'après une jonque de la flotte de l'amiral Cheng-Ho (XV^e siècle), avec des bois précieux de Bornéo; son gréement est semblable à celui des jonques avec trois grandes voiles qu'avec

Otto Degener's New Book 2/23/50

"Naturalist's South Pacific Expedition: Fiji" is the latest work by Waialua naturalist Otto Degener. Reviewing the book for the Journal of the New York Botanical Garden, Frank E. Egler, Atoj Forest, Norfolk, Conn, says:

"Otto Degener has a niche in botanical history for giving his name to the Degeneriaceae, the genus Degeneria, and numerous little 'degeneri's' as specific names. He now has another niche: as the author of this volume, which recounts his explorations while with the Anne Archbold expedition on the motorized junk Cheng-Ho. Here is a book to take its place beside the classics of the 19th century traveling naturalists, thoroughly modern, yet in an established style and tradition that has a parallel in such compositions as Prokofiev's 'Classical Symphony.'

"The author has a rare trait of choosing his native friends with discernment, and of gaining their affection with their confidence—a task difficult in a land where the race problem is no better (or worse) than in our own lynch-conscious southern towns. As a result, this delightful account of his wanderings about the islands, filled with the human side of his experiences yet presented with the impartiality of a scientist (even to a minutely detailed description of yangona drinking with clocked notations, some at one-half minute intervals during the ceremony), all give us an exciting picture of the islands of today.

"The book is written with a complete lack of the 'diplomacy' that often colors the words of professional lecturers and travelers and others seeking to climb success's ladder, and the narrative is backed by supporting chapters on the history of Fiji and its customs. When today has gone, the volume will serve the ethnologists of the future for its basic data of this age.

" 'Portrait of Otto Degener' might well be the subtitle of this unusual book, which is all the more pleasing since the picture appears unplanned and unconsciously drawn. A hundred little anecdotes, some uncomplimentary to himself, and the absence of such stories as many authors use to prime their pompousness, all have their cumulative effect. As one closes the book, one knows not only Fiji, but also Otto Degener the man — so sage and kindly that one wishes more of his kind would tread the earth."

DEGENER, O. Plant Breeding Abstracts 20: 180. 1950?
Naturalist's South Pacific Expedition: Fiji, 1949.
O. Degener, Box 187, Waialud, Oahu, Hawaii 1949 : $5.00 : Pp. 303 : illus.

Mr Degener, well known for his work on the flora of Hawaii, has here brought out an account of a visit to Fiji, on which he collected plants, studied their local uses, and interested himself in the life and customs of the Fijians. The account is in narrative form and consequently the information contained is very scattered, though there is an index of plant names. A great part of the book deals solely with Fijian life, and here the author expresses the strongest criticism of the attitude of the Europeans to the Fijians. This criticism would have gained in effect had the author shown rather more evidence of being able to appreciate points of view with which he disagrees.

FLORA HAWAIIENSIS (R)

Family: 308

Genus : Grammica

Species : Sandwichiana

GRAMMICA SANDWICHIANA (Choisy) Degeners, Hadač & Chrtek
HAWAIIAN DODDER: KAUNOA, POLOLO
Cuscuta sandwichiana Choisy in Mem. Soc. Phys. Hist. Nat. Geneve 9: 280. 1841.
Not Cuscuta sandvicensis var. mimosae Hooker f. in Trans. Linn. Soc. 20:205. 1847.
Not Cuscuta sandwichiana var. mimosae Anderss. Om. Calap. Veg. 214. 1854.
Not Cuscuta sandwicensis Anderss. Om. Calap. Veg. 89. 1857, [1860]
Cuscuta sandwichiana sensu Degener Fl. Haw., Fam. 308: Cuscuta. 6/14/33, 9/15/46.
Grammica sandwichiana Degeners, Hadač & Chrtek comb. nov.
(Choisy)

Stem slender, orange-yellow. Leaves reduced to 2 mm. long lanceolate scales. Flowers often glandular, 3-4 or rarely up to 5 mm. long, on bracteate pedicels usually less than 5 mm. long to form compound open cymes on peduncles 1 cm. long or less. Calyx campanulate, scarious, shiny, deeply 5-cleft with triangular-ovate somewhat acute to almost obtuse lobes about 1.5 mm. long which are sometimes medianly thickened to form a slight ridge, marcescent. Corolla urn-shaped, thin, about 4 mm. high, the tube bearing no scales but with 1.5 mm. long ovate to triangular somewhat acute persistent lobes which are inflexed at the top and erect or reflexed but finally appressed to the ripening capsule. Stamens inserted in the sinuses between the lobes and shorter than the lobes; filaments thickish, often subulate; anthers subsessile, oblong, about as long as the filaments. Ovary depressed-obovoid, about 2 mm. high; style distinct, exserted, almost as long as the ovary; stigma capitate. Fruit a depressed-globose to rarely globose indehiscent capsule about 3 mm. high with apical 2-branched cavity projecting into placenta from which divergent marcescent styles arise when these sometimes persist. Seeds light brown, dull, much depressed-globose and almost 2 mm. wide and 1 mm. thick or somewhat angular from pressure, with oblong perpendicular hilum.

Type Locality: Hawaiian Islands.

Local Range: Growing on probably all the larger Islands at lower elevations often along coastal dunes and in arid regions. It is found commonly on Convolvulaceae, Heliotropium, Scaevola and Pluchea. At Hilo, Island of Hawaii, a form with fasciated flowers was collected in 1922. In the "Song of the Lei of the Hawaiian Islands," the dodder is mentioned as being emblematic of the Island of Lanai. This plant is sometimes confused with Cassytha filiformis L., of the Cassythaceae (Family 138). The latter because of its greenish yellow, firm stems and its habit of growing mostly on shrubs and trees, can be distinguied easily from the dodder even when both plants are devoid of flowers and fruits.

Extra Range: Endemic to the Hawaiian Islands. It belongs to the Subsection Californicae, to which five species chiefly native to western North America also belong.

GRAMMICA SANDWICHIANA var. KAILUANA (Yunker) Degeners, Hadač & Chrtek
Cuscuta sandwichiana var. kailuana Yunker in Mem. Torr. Bot. Club 18:158. 1932.
Grammica sandwichiana var. kailuana (Yunker) Degeners, Hadač & Chrtek comb. nov.

Differing from the species in having pedicels often longer than the flower and in bearing short insignificant yet definite bifid or truncate or triangular scales at base of corolla and alternating with its lobes.

Type Locality: "Hawaii, Kailua along beach."

Local Range: Thus far recorded from Kailua, Hawaii; Moomomi, Molokai; and Kaena Point, Oahu. At Kailua, where Otto Degener found the type material, Hawaiians were sacking the plant to carry away to their swine as food.

over

crowd all on 1 page, cut in Proof

Bold

Extra Range: Endemic to the Hawaiian Islands. This plant is anomalous in being the only member of the Subsection Californicae possessing infrastaminal scales. As the presence of these scales is a primitive feature and their absence is due to reduction or simplification, the relationship of the Hawaiian dodders to one another is quite opposite to the nomenclatural status. The variety kailuana seems to be the original stock from which Grammica sandwichiana s.str., or var. ~~sandwichiana~~ sandwichiana, was derived.

(Variety illustrated on following page)

(Degeners, Hadač & Chrtek / /77, to displace Cuscuta : Sandwichiana 6/14/33 & 9/15/46)

/ date to follow

according to more modern authorities

all on / page; cut

on page 2

Family : 179
Genus : Pelea
Species : Hawaiensis

RUTACEAE
RUE FAMILY

inflorescence compact, 2–3 cm. long (Hawaii) ~~P. h. var. gaudichaudii~~

4 Blades cordate to subcordate at base or rarely merely emarginate; inflorescence about 4–6 cm. long:
5 Blades puberulent beneath; petioles mostly 7–18 mm. long (Maui) P. h. var. racemiflora
5 Blades glabrate beneath; petioles mostly 20–45 long (Maui) P. h. var. remyana

PELEA HAWAIENSIS var. **BRIGHAMII** (St. John) B. C. Stone

Pelea cinerea var. *sulfurea* sensu Rock (so far as Rock No. 8550 is concerned, which he collected "on the Island of Maui above Makawao slopes of Mount Haleakala."); not *Pelea cinerea* var. *sulfurea* sensu Rock (of which the type is Hillebrand's plant from Lanai). Both are described in Bot. Gaz. 65(3): 265. 1918.
Pelea **Brighami* St. John in Lloydia 7:271. 1944.
Pelea hawaiensis var. **Brighamii* Stone in Pac. Sc. 17(4): 409. 1963.

Tree. Twigs puberulous. Leaves with oval glabrous 3.5–10 cm. long blades with emarginate apex. Capsule 10–14 mm. across, densely puberulous.

Type Locality: "*Maui, Makawao, H. Mann & W. T. Brigham 377,* (Ho.)."

Local Range: Known from Makawao, Olinda and Olowalu, Maui. Stone improved St. John's *orthography, according to Recommendation 73C, (b) of the International Code of Botanical Nomenclature; as well as his placement of this variety from Section *Cubicarpa* to the correct *Apocarpa*.

PELEA HAWAIENSIS var. **GAUDICHAUDII** (St. John) B. C. Stone

Brunelia sandwicensis Gaud. in Freyc. Voy. Bot. 93. 1827. *Nom. nud.*
Pelea Gaudichaudii St. John in Lloydia 7(3): 272. 1944.
Pelea hawaiensis var. *Gaudichaudii* Stone in Pac. Sc. 16(4): 369. 1962.
Pelea hawaiensis var. *Gaudichaudii* sensu Stone in Pac. Sc. 17(4): 410. 1963.

Tree. Leaves: petiole 7–15 mm. long, with appressed hirsutulous pale tawny hair; blade glabrate, 25–51 mm. long, 14–25 mm. wide, subcoriaceous, ovate, the midrib sparsely appressed hirsutulous beneath. Inflorescence 15- to 25-flowered, with axes and minute lanceolate bracts densely puberulent. Perianth externally finely appressed-puberulent. Ovary puberulent; style spreading-puberulent; stigma rotate, with 4 minutely papillose reddish lobes. Stamens in pistillate flowers rudimentary. Capsule about 16–22 mm. wide, with discrete follicular externally densely tawny-hirsutulous follicles; exocarp firm; endocarp pale, villous, thin-cartilaginous. Seed 3–4 mm. long, ovoid, with thin papery glossy-black testa and minutely warty endosperm.

Type Locality: "Iles Sandwich, *Gaudichaud* (P.)."

Local Range: Limited to the Island of Hawaii, where it is most easily seen in Kipuka Puaulu of Hawaii Volcanoes National Park.

PELEA HAWAIENSIS var. **MOLOKAIANA** B. C. Stone in Pac. Sc. 17(4): 409. 1963.

Tree. Twigs densely tawny–hirsutulous. Leaves with densely hirsutulous petioles; blades lanceolate-ovate, rounded to acute at apex, subcordate to cordate at base, up to 8 cm. long and 3.5 cm. wide, densely hirsutulous beneath.

Type Locality: "Molokai: Ridge below Puu Kolekole, July 1912, *Forbes 126. Mo.*"

Local Range: Known only from the original collection, and probably extinct.

PELEA HAWAIENSIS var. **PILOSA** St. John

Pelea cinerea var. β Hillebr. Fl. Haw. Isl. 69. 1888. (As to Lanai plants with pilose leaves.)
~~*Pelea hawaiensis* var. *pilosa* St. John in Lloydia 7: 272. 1944.~~
Pelea hawaiensis var. *pilosa* sensu Stone [illegible] Sc. 17(4): 409. 1963.

Family : 179
Genus : Pelea
Species : Hawaiensis

RUTACEAE
RUE FAMILY

PELEA HAWAIENSIS Wawra s.s.
HAWAII PELEA; ALANI

Pelea Hawaiensis Wawra in Flora 56:110. 1873.
Pelea cinerea var. γ Hillebr. Fl. Haw. Isl. 69. 1888.
**Pelea cinerea* var. γ sensu Rock, Indig. Trees Haw. 239. 1913. (In part.)
Pelea cinerea var. *hawaiensis* Rock in Bot. Gaz 65(3): 265.-1918.
Pelea hawaiensis sensu Stone in Pac. Sc. 17(4): 407. 1963.

Divaricately branched tree with smooth light-brown bark and reddish tomentulose twigs glabrate with age. Leaves opposite, oblong, 4–5 cm. long, coriaceous, acute at apex, reddish-tomentulose when young but soon glabrate except for hirtellous petiole and ribs beneath. Flowers in 3- to 27-flowered densely puberulent to tomentulose thick-peduncled cymes in axils of upper leaves. Sepals deltoid, acute, tomentulose. Petals narrow-deltoid, tomentulose, often reddish within. Stamens with laterally compressed glabrous filaments and cordate anthers. Ovary ovoid-globose, 4-sulcate, densely tawny to golden tomentulose; style hirsutulous; stigma dark maroon. Capsule apocarpous, commonly 16–34 mm. wide, often subtended by the persistent sepals, persistently fulvous to reddish pubescent; endocarp firm, thickly pilose with pale hair.

Type Locality: "Hawai, aus Hillebrands Herbar 2318. Ich erhielt einen kleinen Zweig von Dr. Hillebrand; von der Kapsel ist nur ein Rudiment vorhanden; unsere Art unterscheidet sich leicht durch den Blütenbau und die verhältnissmassig sehr kleinen Blätter von allen anderen Peleen." From the sheet deposited in Vienna we find the species was collected in Kawaihaeiuka in 1862.

Local Range: The species itself is endemic to Hawaii and perhaps Maui. But some of its varieties, some strong and others weak, occur also on Molokai, Maui and Lanai. The following is adapted after B. C. Stone:

KEY TO VARIETIES:

1 Capsule mostly 27–34 mm. wide:
  2 Leaves at first tomentulose to pilose throughout but with age glabrescent; inflorescence compact, with peduncle about 2 mm. thick, densely tomentulose; capsular pubescence fulvous to brownish orange (Maui?, Hawaii) ..... **P. hawaiensis s.s.**
  2 Leaves always glabrous and glossy; inflorescence elongate, with peduncle up to 1 mm. thick, glabrous or nearly so; capsular pubescence reddish (Maui, Hawaii) ..... **P. h. var. rubra**
1 Capsule mostly 16–22 mm. wide:
  2 Blades densely shaggy-pilose beneath, short-lanceolate; inflorescence usually 3- to 9-flowered:
    3 Blades cordate at base; tomentum fulvous, extremely minute (Molokai) ..... **P. h. var. molokaiana**
    3 Blades subcuneate to rounded at base; tomentum brownish or olivaceous, with hair up to 0.7 mm. long (Maui, Lanai) ..... **P. h. var. pilosa**
  2 Blades tomentulose to glabrate beneath but sometimes with age glabrescent; inflorescence various:
    3 Inflorescence mostly 3- to 7-flowered:
      4 Blades cuneate at base, glabrate to glabrous beneath, ovate (Maui) ..... **P. h. var. brighamii**
      4 Blades cordate to emarginate at base, slightly puberulent on midrib above, elongate to often acuminate (Lanai) ..... **P. h. var. sulfurea**
    3 Inflorescence mostly 9- to 27-flowered:
      4 Blades cuneate to rarely slightly emarginate at base; inflorescence compact, 2–3 cm. long (Hawaii) ..... **P. h. var. gaudichaudii**

* Though V. MacCaughey in Bull. Torr. Bot. Club 44(3):149. 1917, mentions numerous *Pelea* taxa on page 149, we generally ignore his "An annotated list of the forest trees of the Hawaiian Archipelago." The article, which could have been an excellent review of Rock's book, is of such a character that it elicited an angry response from Dr. Rock.

SAMOAN VERSUS HAWAIIAN MOSSES (MUSCI)

By
Otto & Isa Degener

Meeting in Leningrad during the XII International Botanical Congress, Dr. Wolfram Schultze-Motel of Berlin-Dahlem informed us that he would mail us a copy of his monograph concerning Die Moose der Samoa-Inseln, appearing in Willdenowia 7:333-408. 1974. On our return to Hawaii we were delighted to find the copy, with six colored photographs and three diagrams, awaiting us.

The author visited the islands Manono, Savai'i, Tutuila and Upolu April to June 1972, collecting 1498 Numbers. These, mostly mosses (Musci) , are properly cited in the text. On his return to Berlin-Dahlem, he sojourned from June 22 to 30 in Honolulu. Among the eleven sections of the monograph, he deals with Topography; Geology; Climate; Flora of Ferns, Flowering Plants and Mosses; Moss Associations; Human Population Explosion at the Expense of the Native Biota; and (Lack of) Conservation. In fact, on pages 348-349 he deplores the destruction of the endemic biota of Samoa by man in his continuous search for more arable land. He quotes appropriately Van Steenis that "- - - no agronomist has been able to prove that an unborn baby to be added to the three billion of existing people is worth more for our civilization than the life of a now existing orang-utan or rhinoceros, magnificent creations of evolution." Though members of the most destructive of Primates ourselves, we reviewers can visualize what a Paradise for myriads of humbler taxa of plants and animals this World would be were our species reduced through birth control or otherwise by 99%.

Pages 349 to 403 are devoted to pure Systematics. Comparing the Hawaiian Archipelago with that of the Samoan, using for convenience *Degeners & Hoermann's publication, we find

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*Degeners & Hoermann. Mosses of Hawaii. Degeners' Flora Hawaiiana Leaflet No. 2:1-8.1973.

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we find that both are just about short of forty families, of which about 23 are common to both archipelagos. Of the 202 species presently known from the Samoan, about 43 genera are represented by a single species; the rest having 2, 3, 4, 5 and 6 until we come to Bryum with 7, Fissidens with 10, Calymperes with 14, and Extropothecium with a large swarm of yet uncounted taxa. For the Hawaiian Archipelago, we expect the further discovery of a few additional species with continued exploration of such fascinating areas

as the outer slopes of Haleakala, and of Eke and Puu Kukui; for the Samoan, very/ very many more.

As in the case of the moss flora of the Hawaiian Archipelago, a few species in the Samoan can be considered pantropic; otherwise, however, relationship with the New World is practically wanting. This is astonishing/ when one notes that lichens of the Hawaiian, as shown by Oscar Klement, are closely related to the lichens of South America!

Species found growing in the crowns of trees, even in the fog- and rain-belt, are occasionally exposed to extreme dry spells and to unusual intensity of ultraviolet light. This last factor is somewhat mitigated by such mosses possessing a thicker cell wall and being brilliant red through claret to almost black. Parts of the same individual plant/ when shaded, Schultze-Motel reminds us, are green. This interesting adaptation, so common all about us and so easily observed when walking along the Fossil Footprint Trail in Hawaii Volcanoes National Park, hardly gets the attention it deserves.

Crevices of Savai'i's more recent aa and pahoehoe flows, designated as mu in the vernacular, harbor such genera as Brachymenium, Campylopus, Macromitrium, Mniomalia and Philonotis.

A few questions regarding orthography occur, such as on page 351. There we should like to read "Fissidens daltoniifolius" and on page 375, "Hypnodendron." We have been using "Rhacopilaceae", while Schultze-Motel on page 379 and elsewhere uses "Racopilaceae"and "Racopilum."

The specialist in Phanerogams should not be confused by the estimate made in 1910 by the elder Rechinger, unfortunately quoted by Schultze-Motel, that only 688 species of "Siphonogamen" occur in Samoa. A casual stopover in Samoa by one of the reviewers convinced him that this statement is just as absurd for Samoa as is the one that the "Native specific and Infraspecific plants" number a mere 2,668 for the Hawaiian Islands.

The bibliography comprises 130 references. Though Bartram's excellent manual of Hawaiian mosses is cited, there is no reference to the more recent publications of W.J. Hoe nor of Degener & Hoermann. A copy of the last was mailed to Berlin-Dahlem March 31, 1973; while Dr. Schultze-Motel's monograph was completed November 24, 1973. For any one studying mosses throughout the Pacific and its western borders, Die Moose der Samoa-Inseln is indispensable.

Family : 169c
Genus : Vicia
Species : Menziesii

LEGUMINOSAE
LEGUME FAMILY

VICIA MENZIESII Spreng.
(Original)
(Described on preceding page)

Family: Grammica

Spread evenly Book

NEW ILLUSTRATED FLORA OF THE HAWAIIAN ISLANDS

Family: 308
Genus : Grammica

CUSCUTACEAE
DODDER FAMILY

Bold

GRAMMICA Lour. Fl. Cochinch. 179. 1790.

i

Whtich to reddish glabrous lax herbaceous plants with mostly thin stems. Leaves very reduced. Flowers perfect, regular, small, whitish to reddish, in compact or loose globular inflorescence or in loose racemose or paniculate inflorescence. Pedicels shorter or longer than flowers. Calyx 5- or 4-lobed with lobes upright or deflexed. Corolla 5- or 4-lobed with lobes upright or deflexed, persistent at maturity, surrounding the capsule or rarely corolla detached from its base at maturity to form a cap to the capsule. Stamens as many as ~~corolla~~ corolla lobes. Styles 2, one style usually shorter than the other; stigmas capitate. Seeds usually 0.8 - 2.8 mm. long; embryo with 2 - 4 windings of the spiral.

with

Bold

Name supposed to have been derived from the Greek gramma, i.e., "line"; in reference to the appearance of the plant.

Type Species: Grammica aphylla Lour., i.e., Grammica chinensis (Lam.) Hadač & Chrtek

About 70 species known throughout the World, but most abundant in America. Many species are of considerable economic importance because of their parasitism of tobacco, flax, clover, etc.

CUSCUTACEAE
DODDER FAMILY

Whitish or yellowish to reddish filiform dextrorsely twining glabrous lax XXXXXXXXXX herbs practically always devoid of chlorophyll, parasitic by numerous haustoria on herbs or shrubs and very rarely on trees. Leaves reduced to minute alternate functionless scales. Flowers perfect, regular, small, usually more or less cymosely clustered, whitish to pink or reddish. Calyx inferior, 5-lobed or 5-parted or of 5 distinct sepals (rarely 4- or 3-lobed or 4-/// or 3-parted or of 4 or 3 distinct sepals or very rarely doubled). Corolla 5-lobed (rarely 4- or 3-lobed or very rarely doubled), the tube bearing as many fimbriate or crenulate scales as there are lobes and these alternate with the lobes or very rarely wanting; lobes imbricate in the bud. Stamens as many as the corolla lobes and inserted in the throat or sinuses above the scales, often shortly exserted; anthers short, ovate to oval, obtuse, introrse, 2-celled, longitudinally dehiscent. Ovary 2-celled; ovules 2 in each cell anatropous; styles 1 or 2, terminal, distinct or rarely united below; stigmas linear to capitate. Fruit a globose or ovoid capsule, circumscissile near base or irregularly bursting or indehiscent, 3- or 4-seeded. Seeds glabrous; embryo linear, terete, curved or spiral, with apex bearing 1-4 minute alternate; endosperm fleshy; cotyledons none or very rarely present but then rudimentary, stalks Seeds germinate in the soil but soon the root and lower part of stem of seedling dies while the upper part attaches itself to the host. Because the dodder lacks chlorophyll completely (except in a very few exotic species that exhibit a slight greenish tinge in their stems), it must henceforth derive all its nutrition from its host.

A family, comparatively recently evolved from the Convolvulaceae through parasitism, and consisting of at least four genera of which only Grammica is native to the Islands. Because many readers of the Flora are unfamiliar with this strange family, we here give a synoptic key:

1. Style 1; stem mostly robust; inflorescence racemose or paniculate:
   2. Corolla persistent; stigmas capitate to ovate; 2n = 28 (Old World)- Monogynella Des Moul.,

      Études Org. Cusc. 65. 1853. Type: M. vahliana Des Moul., i.e., M. monogyna (Vahl) Hadač & Chrtek

   2. Corolla deciduous; stigmas conic to subulate; as far as known 2n = 28, 32 or 42 (Small, mostly Old World) - - - - - - - Kadurias Raf., Fl. Tellur. 4:91. 1836. Type: K. reflexa (Roxb.) Raf.
1. Style 2; stems mostly thin; inflorescence usually capitate or racemose and only rarely paniculate:
   2. Styles of equal length; stigmas cylindric to subulate; inflorescence globose heads; as far as know 2n =14, 28, 42. (Mostly Old World) - Cuscuta L., s. str., Sp. Pl. 1:124. 1753. Type: Cuscuta europaea L.
   2. Styles of unequal length; stigmas capitate, inflorescence various, from globose heads to racemose or paniculate; as far as known two groups (perhaps genera) occur with 2n = 32 or 56 and with 2n = 30 or 60. (Mostly New World) - Grammica Lour., Fl. Cochinch., 170. 1790. Type: Grammica aphylla Lour., i.e., G. chinensis (Lam.) Hadač & Chrtek

(Degeners, Hadač & Chrtek / /77. to displace Cuscuta 6/14/33 & 9/15/46)

Family: 308

CUSCUTACEAE

Dodder family

Whitish, yellowish to reddish filiform dextrorsely twining glabrous lax herbaceous plants practically always devoid of chlorophyll, parasitic by numerous minute suckers (called haustoria) on herbs or shrubs and very rarely on trees. Leaves reduced to minute alternate functionless scales. Flowers perfect, regular, small, usually more or less cymosely clustered, whitish to pink or reddish. Calyx inferior, 5-lobed or 5-parted or of 5 distinct sepals (rarely 4- or 3-lobed or 4- or 3-parted or of 4 or 3 distinct sepals or very rarely doubled). Corolla 5-lobed (rarely 4- or 3-lobed, or very rarely doubled), the tube bearing as many fimbriate or crenulate scales as there are lobes and these alternate with the lobes or very rarely wanting; lobes imbricate in the bud. Stamens as many as the corolla lobes and inserted in the throat or sinuses above the scales, often shortly exserted; anthers short, ovate to oval, obtuse, introrse, 2-celled, longitudinaly dehiscent. Ovary 2-celled; ovules 2 in each cell, anatropous; styles 1 or 2, terminal, distinct or rarely united below; stigmas linear to capitate. Fruit a globose or ovoid capsule, circumscissile near base or irregularly bursting or indehiscent, 3- or 4-seeded. Seeds glabrous; embryo linear, terete, curved or spiral, with apex bearing 1-4 minute alternate scales; endosperm fleshy; cotyledons none or very rarely present but then rudimentary. Seeds germinate in the soil but soon the root and lower part of stem of seedling dies while the upper part attaches itself to the host. Because the cuscuta lacks chlorophyll completely (excepting in a very few exotic species that exhibit a slight greenish tinge in their stems), it must henceforth derive all its nutrition from its host.

A family

A family, comparatively recently evolved from the Convolvulaceae, through parasitism, consisting of at least four genera:

1. Cuscuta L. s. str., Sp. Pl. 1:124, 1753 (excl. Grammica, Kadurias, Monogynella). Type: Cuscuta europaea L.

2. Grammica Lour., Fl. Cochinch., 170, 1790. Type: Grammica aphylla Lour., i.e. G. chinensis (Lam.) Hadač et Chrtek.

3. Kadurias Raf., Fl. Tellur. 4:91, 1836. Type: K. reflexa (Roxb.) Raf.

4. Monogynella Des Moul., Etudes Org. Cusc. 65, 1853. Type: M. vahliana Des Moul., i. e. M. monogyna (Vahl) Hadač et Chrtek.

1. Style 1; stem mostly robust, inflorescence racemose or paniculate:
   2. Corolla not deciduous, stigmas capitate to ovate. 2n = 28 (Old World) ..... Monogynella
   2. Corolla deciduous, stigmas conic to subulate. As far as known 2n = 28, 32 or 42 (small mostly Old World genus).. Kadurias
1. Style 2; stem mostly thin, inflorescence usually capitate or racemose and only rarely paniculate:
   3. Styles of equal length, stigmas cylindric to subulate, inflorescence globose heads. As far as known 2n = 14, 28, 42 (mostly Old World) ..... Cuscuta s. str.
   3. Styles of unequal length, stigmas capitate, inflorescence various, from globous heads to racemose or paniculate. As far as known two groupes (perhaps genera) occur with 2n = 32 or 56 or 2n = 30 or 60 (mostly New World)..... Grammica

NEW ILLUSTRATED FLORA OF THE HAWAIIAN ISLANDS

Family: 308
Genus: Grammica

CUSCUTACEAE

Dodder family

Grammica Lour. Fl. Cochinch. 170. 1790.

Whitish to reddish glabrous lax herbaceous plants with mostly thin stem. Leaves very reduced. Flowers perfect, regular small, whitish to redish in compact or loose globular inflorescence or in loose racemose or paniculate inflorescence. Pedicells shorter or longer than flowers. Calyx 5 - 4 lobed, corolla 5 - 4 lobed, lobes upright or deflexed, corolla persistent at maturity, surrounding the capsule or rarely corolla detached from its base at maturity forming a cap to the capsule. Stamens as many as corolla lobes. Styles two, one style usually shorter then the other, stigmas capitate, seeds usually 0,8 - 2,8 mm long, embryo with 3 - 4 windings of the spiral.

Name supposed to have been derived from the Greec gramma,i.e. line.
Type Species: Grammica aphylla Lour., i.e. Gramica chinensis (Lam.) Hadač et Chrtek.
About 70 species known throughout the World: most abundant in America. Many species are of considerable economic importance because of their parasitism on tobacco, flax, clover, etc.

FLORA HAWAIIENSIS

Family 308
Genus: Grammica
Species Sandwichiana

Grammica Sandwichiana (Choisy) Degen, Hadač et Chrtek

Hawaiian Dodder; Kaunoa, Pololo

Bas.: Cuscuta sandwichiana Choisy in Mem. Soc. Phys. Hist. Nat. Geneve 9:280, 1841.

Not Cuscuta sandvicensis var. mimosae Hooker f. in Trans. Linn. Soc. 20:205, 1847.

Not Cuscuta sandvichiana var mimosae Anderss. Om. Galap. Veg. 214, 1854.

Not Cuscuta sandwicensis Anderss. Om. Galap. Veg. 89. 1857 (1860?).

Stem slender, orange-yellow. Leaves reduced to 2 mm long lanceolate scales. Flowers often glandular, 3-4 or rarely up to 5 mm. long, on bracteate pedicels usually less than 5 mm. long to form compound open cymes on peduncles 1 cm. long or less. Calyx campanulate, scarious, shiny, deeply 5-cleft with triangular-ovate somewhat acute to almost obtuse lobes about 1.5 mm. long which are sometimes medianly thickened to form a slight ridge, marcescent. Corolla urn-shaped, thin, about 4 mm. high, the tube bearing no scales but with 1.5 mm. long ovate to triangular somewhat acute persistent lobes which are inflexed at the top and erect or reflexed but finally appressed to the ripening capsule. Stamens inserted in the sinuses between the lobes and shorter than the lobes; filaments thickish, often subulate; anthers subsessile, oblong, about as long as the filaments. Ovary depressed-obovoid, about 2 mm. high; style distinct, exserted, almost as long as the ovary; stigma capitate. Fruit a depressed-globose to rarely globose indehiscent capsule about 3 mm. high with apical 2-branched cavity projecting into placenta from which divergent marcescent styles arise when these sometimes persist. Seeds light brown, dull, much depressed-globose and almost

2 mm. wide and 1 mm. thick or somewhat angular from pressure with oblong perpendicular hilum.

Type locality: Hawaiian Islands.

Local Range: Growing on probably all the larger islands at lower elevations often along coastal dunes and in arid regions. It is commonly found on Convolvulaceae, Heliotropium, Scaevola and Pluchea. At Hilo, Island of Hawaii, a form with fasciated flowers was collected in 1922. In the " Song of the Lei of the Hawaiian Islands", the dodder is mentioned as being emblematic of the Island of Lanai. This plant is sometimes confused with Cassytha filiformis L., of the Cassythaceae. The latter because of its greenish yellow, firm stems and its habit of growing mostly on trees and shrubs can be distinguished easily from the dodder even when both plants are devoid of flowers and fruits.

Extra Range: Endemic to the Hawaiian Islands. It belongs to the subsection Californicae, to which five species native chiefly to western North America also belong.

Grammica Sandwichiana var. kailuana (Yunker) Degener, Hadeč et Chrtek Bas.: Cuscuta sandwichiana var. kailuana Yunker in Mem. Torrey Bot. Club 18:158, 1932.

Differing from the species in having pedicels often longer than the flower and in bearing short insignificant yet definite bifid or truncate or triangular scales at base of corolla and alternating with its lobes.

Type Locality: "Hawaiii, Kailua along beach"

Local Range: Thus far recorded only from Kailua, Hawaii; Moomomi, Molokai; and Kaena Point, Oahu. At Kailua, where the writer Otto Degener found the type material, Hawaiians were sacking the plant to carry away to their swine as food.

Extra Range: Endemic to the Hawaiian Islands. This plant is anoma-

lous in being the only member of the subsection Californicae possessing infrastaminal scales. As the presence of these scales is a primitive feature and their absence is due to reduction or simplification, the relationship of the Hawaiian dodders to one another is quite opposite to the nomenclature status. The variety kailauana seems to be the original stock, from which the Grammica sandwichiana var. sandwichiana was derived. Unfortunately, there is no possibility to change this situation, the specific name "sandwichiana" having priority, as far as we include both varieties in one species.

FLORA HAWAIIENSIS

Family : 332
Genus : Coprosma
Species : Waimeae

67,163

Bold RUBIACEAE
MADDER FAMILY

Bold COPROSMA WAIMEAE Wawra
WAIMEA (CANYON) COPROSMA; OLENA

Coprosma waimeae Wawra in Flora 57:327. 1874.
Coprosma foliosa sensu Hillebr. Fl. Haw. Isl. 186. 1888. (As to Kauai plant only.)
Coprosma waimeae sensu Heller in Bull. Minn. Bot. Stud. 1:895. 1897.
Coprosma waimeae sensu Rock, Indig. Trees Haw. Isl. 465. 1913.
Coprosma waimeae sensu W.R.B. Oliver in B.P. Bish. Mus. Bull. 132:163. 1935.

Small rather variable tree with glabrous to very rarely sparsely pilose branches. Leaves elliptic to obovate, coriaceous, acute to rarely obtuse at apex, acuminate to somewhat abruptly narrowed at base, reticulate beneath and smooth above, glabrous or rarely a few hairs on midrib above andor beneath; blade 25-85 mm. long, 15-40 mm. wide; petiole 5-15 mm. long; stipules broadly triangular, prominently cuspidate, glabrous or very rarely sparsely ciliolate. Staminate flowers 3, on glabrous to rarely sparsely pubescent 7-12 mm. long peduncles of which usually only 1 arises from leaf axil; bracts paired, narrowovate; calyx cup-shaped, dentate; corolla funnelform, with usually 8 linear lobes; stamens about 8, lobed at base, apiculate. Pistillate flowers 1-4 but usually 3, on 12-~~18~~ 20 mm. long peduncle, bearing pair of broadly to narrowly spatulate yp to 5-8 mm. long bracts; calyx cup-shaped, dentate; corolla with short tibe and about ~~8~~ 8 narrow acuminate lobes. Drupe globose to obovoid, orange, 8-12 mm. long, crowned by ~~calyx~~ calyx teeth.

Bold Type Locality: "Kauai; Gebiet von Halemanu; 2100."

Bold Local Range: This species inhabits the rainforest above about 2,000 feet elevation about Waimea Canyon, Kauai. It is not found about Waimea, or *Kamuela, on the Islandof Hawaii as the name might denote. The vernacular name olena alludes to the yellow cobor of the wood. The fruit of this species is probably the largest in the Islands for the genus.

Bold Extra Range: Not known elsewhere. By presently considering this a "rather variable" species, we really confess our present ignorance regarding the different varieties and forms that probably exist, or at least existed before before exotic weeds like the blaxkberry

competed with them.

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*As Waimea, or "reddish water," was the name of communities on Kauai, Oahu and Hawaii, letters ~~~~ often went astray. To be sure that their letters would reach Waimea on the Island of Hawaii, individuals addressed them to "Kamuela," the Hawaiian name of Samuel Parker, the postmaster there.

(Illustrated on following page)

(Degener & Degener, / /77)

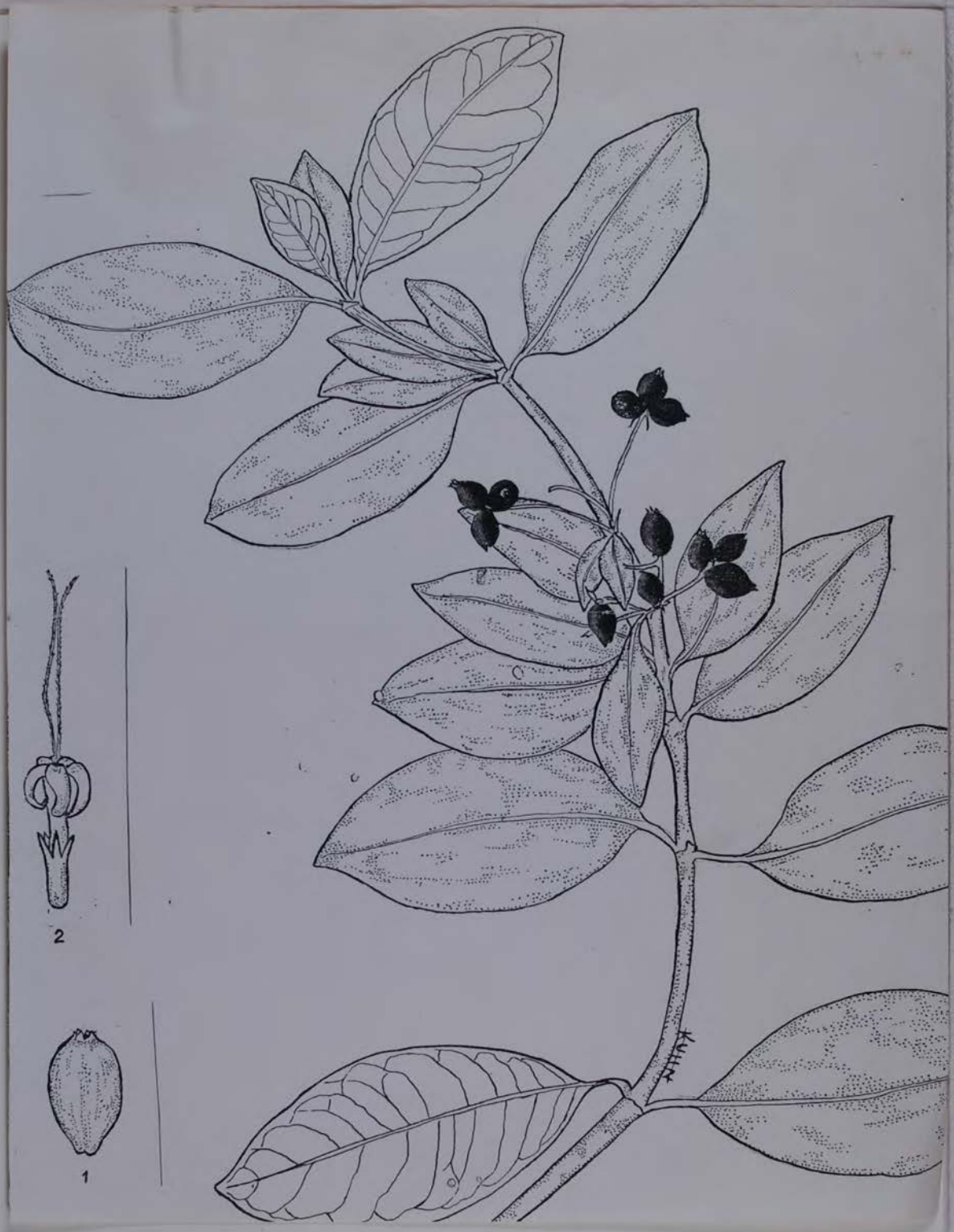
NEW ILLUSTRATED FLORA OF THE HAWAIIAN ISLANDS

Family : 332
Genus : Coprosma
Species : Waimeae

~~XXXXX~~
RUBIACEAE
MADDER FAMILY

~~1446~~
COPROSMA WAIMEAE ~~Wawra~~
(Original)

(Deg. & Deg., 30,786, Kokee, 11/19/60)



FLORA HAWAIIENSIS R

Family: 68
Genus : Pleomele
Species: Hawaiiensis

LILIACEAE
LILY FAMILY

PLEOMELE HAWAIIENSIS Deg. & Deg. s.s.
HAWAII PLEOMELE: HALAPEPE

Pleomele hawaiiensis Deg. & Deg. sp. nov. Arbor 15 m. alta, a foliis circa 30 cm. longis et 2.5-3.0 cm. latis et floribus 4 cm. longis.

Glabrous 15 meter tall profusely branched tree with smoothish grayish bark and mainly coarse erect main branches bearing ultimate branches that are 2-2.5 cm. thick and grow 15-20 cm. long yearly from near side of previous year's marcescent or fallen inflorescence; ultimate branches crossed with horizontal 1 mm. wide pale brown-gray to yellowish leaf scars that coalesce to isolate narrow angular-lenticular areas of bark whitish toward base of current year's growth and yellowish toward top. Leaves crowded at the ends of the branches, linear-lanceolate, entire, coriaceous, green, longitudinally densely striate, with slender slightly raised midrib on upper surface but hardly on lower, about 30 cm. long and 2.5-3.0 cm. wide, rather uniformly thick, with partly clasping base about 3 cm. wide, with acuminate acicular slightly plicate apex having margins connate. Flowers on orange pedicels 4-10 mm. long in recurved panicles 3-4 dm. long, many deciduous and those fruiting with rest of flower marcescent with perianth tube bursting lengthwise with swelling of fruit. Perianth pale yellow, glabrous, narrowly campanulate, pefsistent; tube about 30 mm. long and toward apex 10 mm. wide, thickened on inner face by adnate part of linear filament; lobes about 10 mm. long, 4 mm. wide at base, broadly lanceolate and somewhat cucullate toward obtuse apex, with midrib extending to apex. Free part of stamens almost as long as lobe, distally curved at insertion and slightly narrower than base of lobe, thick and narrow-deltoid for about 6 mm. and thereafter terete; anther thick, 4 mm. long. Ovary 10 mm. long, 5 mm. wide; style filiform, 30-35 mm. long; stigma 3-lobed. Fruit red, (probably) about 8 mm. wide. Seeds 1-3 per fruit.

Bold Type Locality: Deg. & Deg., No. 54,432. Type tree. At 1,900 feet near "Belt Road", mauka of Pohue Bay, Kau, Hawaii. Two P., trees in ½ acre aa kipuka with Metrosideros & Maba. Sept. 4, 1977.

Bold Local Range: As the annual growth in height, terminating in a flower cluster, shows; this type tree is 75 to 100 years old. It grows in a kipuka, or oasis of better soil surrounded by newer, near barren lava. It is watered not so much by rain as by mist and fogdrip from afternoon trade winds. Many Hawaiian Phanerogams have been officially listed as endangered and on the verge of extinction unless man curtail factors

of destruction XXXXX he has let loose with design or by accident upon this former Paradise of the Pacific. This magnificent, odd treelily was injured by road construction bulldozers rolling boulders and rocks against it in September 1977. Having no scientific name, it had missed the list of plants deserving special care. This is an example, as the writers proposed some years ago, why XXXXXXXXX all native Hawaiian Phanerogams should be listed as endangered unless experts have found special species sufficiently abundant and robust to withstand harvesting or some destruction. Wishing better material for our present description, we were horried on our visit July 12, 1980 that some vandal nitwit, apparently with a caneknife, had chopped and removed two main branches of this tree! Being ourselves not too far evolved beyond our knifewielder we, with feelings akin to murder in our hearts, regretted that trying to pray the culprit to death would be futile. Our visit for better material, however, was partially successful as an exotic furcrea growing below its crown had intercepted on its spreading leaves many falling, drying flowers useful for this description. Those reaching the ground had rotted away. We do not know the past nor present distribution, but assume it is the Island of Hawaii. Lacking sufficient material for thorough comparison, we provisionally describe one taxon below as a variety.

Extra Range: Endemic with its close relatives to the Hawaiian Islands.

PLEOMELE HAWAIIENSIS var. MAUIENSIS Deg. & Deg.
MUI PLEOMELE; HALAPEPE

Pleomele hawaiiensis var. mauiensis Deg. & Deg. var. nov. A specie foliis longior differt.

From the poor material available we note that the leaves are usually 4-5 dm. long and, in comparison to the type itself, the flowers are slightly longer with more prominent perianth lobes and stamens.

Type Locality: Deg. & Deg. No. 27,742. Olinda, Maui. Open forest, July 7, 1961.

Local Range: Imperfectly known from Olinda, Maui and hence modestly named and described as a mere variety of the Hawaii plant. Additional exploration, collecting and proper study, as in so many taxa lumped together because of uncertainty, is necessary to probably show it to be of specific rank. We wish to affirm again that since we are staff members of the New York Botanical Garden, type specimens are deposited at that institution unless stated otherwise perhaps because of the wishes of some collaborator.

for September 20, 1980

FLORA HAWAIIENSIS R

Family: 68
Genus : Pleomele
Species: Hawaiiensis

LILIACEAE
LILY FAMILY

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