

The Vascular Plants of Losap Atoll

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Abstract

Prior to 1988, studies and observations on Losap Atoll (Chuuk, Federated States of Micronesia) indicated a vascular flora of 43 species. A recent collection and observations of the flora of Losap Atoll indicated the presence of 101 species of vascular plants, of which 70 are indigenous and 31 are introduced species. Of these, 34 indigenous and 22 introduced species can be considered new records. An implication of these increases in numbers of species is that the floras of most atolls in the Pacific Ocean Basin are not completely known. The ethnobotany of the vascular plants is discussed briefly.

Introduction

Comprehensive botanical studies for most atolls in Micronesia are not yet available despite their relative simplicity and small size. Losap Atoll, located in the Upper Mortlock Islands of Chuuk State in the Federated States of Micronesia was made known to the Western world in 1824 when Duperrey sighted the islands (KRAMER, 1945). Unfortunately, the physical geography and botany of the atoll has been poorly described. Kramer (1935) wrote that the main export was copra and that there were small amount of bananas, papaya and mangos. There are a few brief impressions of the atoll and a photograph of one of the smaller islets shows some coconut trees (ARAKI, 1934). In 1941, the atoll was visited by a Kyushu University research survey team who erected a stele on Lewel Islet to commemorate its visit, but details of the visit are not known. The most comprehensive data set on the Micronesian flora by Fosberg *et al.* (1979, 1982, 1987) listed 47 species as present on the atoll.

This paper presents the results of plant collections on the northeastern group of islets of Losap Atoll conducted during a one week visit in July 1988. A total of 117 specimens of vascular plants were collected. The accompanying annotated list of species contains 103 entries, representing slightly more than a two-fold increase in the number of species previously reported for the atoll. Two species, previously reported by Fosberg *et al.* (1979), could not be found. Some botanic and ethnobotanic observations are also presented.

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Geographic Sketch of Losap

Losap Atoll is located at 6°53'N latitude and 152°52' E longitude, in the Upper Mortlock Islands of Chuuk State, Federated States of Micronesia (see Figure 1). The atoll consists of two groups of islets on a semi-circular reef that encloses a central lagoon which measures 27.39km² in area: Losap, with five islets (Lewel, Penipat, Sobour, Losap, and Weitée) in the northeastern part of the atoll³⁾; and Pis Losap, with four islets (Pis, Talap, Fanuanwin, Alanganunu) in the southern part of the atoll. Although the atoll is labeled Losap on most maps, the atoll's residents refer to the northeastern group of islets as Losap, and the southern group as Pis Losap. The total dry land area of Losap Atoll is small, measuring only 0.62km². Lewel Islet is the largest in area with 0.61km², while Losap Islet, the second largest islet, is 0.036km². The other islets of Sobour and Weitb are 0.018 and 0.002km², respectively. There are two other very small and isolated islets on the atoll, Alanganfanuanwin and Alanmwaseell. Araki (1934) reported the presence of two coconut trees on Alanmwaseell and that 20 to 30 years previous to his visit it was as large as Losap Islet. Because of wave erosion, the islet now measures 0.007km². The highest natural elevation on the atoll is approximately 1.5m above mean sea level. In this paper, Losap Atoll will refer to to the northeastern group of islets, where the field work for this study was conducted. Losap Atoll is densely populated. According to the last census, the population for Losap Atoll (Losap and Pis Losap) was 795 with the majority residing on Lewel Islet. However, no more than 50% of the population resides on the atoll, as many people have migrated temporarily or permanently to Weno, the capital of Chuuk State, or other parts of the United States. Thus an estimated 200 people reside in Losap (and another 100 on Pis Losap). Assuming a resident population of 200 people at any one time, the population density of Losap Atoll is 322.6 people/km².

Given its low latitude and its location in the humid Western Pacific, the high annual temperatures (about 30°C) and high annual rainfall (exceeding 2000mm) at Losap support a tropical, mixed mesophytic forest vegetation, albeit one modified by island biogeographic factors and strand ecology, in particular the zonal distribution of atoll fresh water resources and salinity, and human activities that have been described elsewhere (for example see Niering, 1956). While this zonation of vegetation (from strand vegetation on coasts to mixed, mesophytic forests in the interiors of islets) is apparent on the less disturbed islets of Losap Atoll, because of the high density of population, little natural vegetation remains on Losap Islet. Much of the islet is covered by houses.

3) The atoll is also known as Losop, Lossop, Louasappe, Luasap, Lukeisel, Royalist, Westervelts, and Duperrey Island. Figure 1 was adapted from Bryan (1971), who listed eight islets for the northeastern group of islets. These were Sobour, Losap, Lewel, and five unnamed islets). Penipat Islet was not included in the list nor drawn on his maps. Penipat Islet, located near the southwestern tip of Lewel Islet is <0.001km², is separated from Lewel Islet by a very small channel which is overtopped by a canopy of mangrove vegetation. Bryan did not name Weitb Islet on his map. Losap residents also list two other small islets between Losap and Lewel: Aseppelu and Alansouwel. Kramer (1935) listed other small islets which are no longer present.

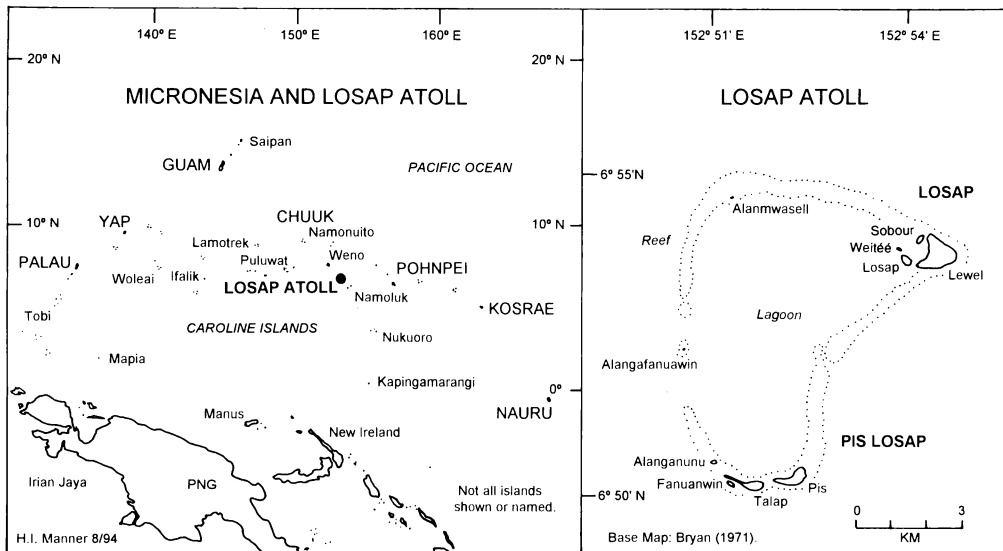


Fig. 1

The smaller islets, Sobour and Weitee, have been little modified by human activities and are dominated by a strand vegetation. Lewel Islet, which has a large fresh water lens, has been excavated in its interior for the swamp cultivation of *Cyrtosperma chamissionis*. Breadfruit (*Artocarpus altilis* and *A. mariennensis*) and coconut agroforests are important components of this islet's vegetation.

Methods

Botanical collection were conducted on Losap Atoll during the first week of July 1988. All islets except Weitee were visited at least twice in order to get a complete collection of specimens as possible. It was not possible to visit Weitee Islet because a recent death had occurred there, rendering it "off-limits". Residents volunteered or were also asked to bring in specimens, or tell us where to find them, and identify them by their local name(s). The specimens were labeled, pressed, air-dried and shipped to the Guam Herbarium for identification and mounting.

Results and Discussion

The results of plant studies on Losap Atoll are presented in Table 1. In comparison to the 43 species listed by Fosberg *et al.* (1979, 1982, 1987), a total of 101 species of vascular plants were either collected or observed during that one week survey. This represents an increase of 58 species, all of which are considered new records for the

atoll. The largest percentage gain in species was observed among the introduced dicotyledonae which increased from 3 to 20 species. There are two possible reasons for this. First, many of these species are ornamentals or small weeds which may have been introduced to the atoll long after the original species listing by Fosberg *et al.* (1979, 1982, 1987) was compiled. This is not unlikely as there is almost monthly, if not more often, passenger traffic (which would include plant material) between Weno, the capital of Chuuk State and Losap Atoll on boats of various sizes. When returning from a larger island, many atoll residents bring back new species or cultivars of food or ornamental plants to their island. Second, some of these species are small weeds that could have easily been overlooked during a shorter field study. However, many newly recorded indigenous monocots and dicots were found as shown in Table 1. Indigenous dicots were nearly doubled, from the 25 species recorded by Fosberg *et al.* (1979) to the 47 species found in this study. The number of indigenous monocots increased by 100% from 8 species to 18. By contrast, two species previously listed by Fosberg *et al.* (1979), *Clerodendrum inerme var. oceanicum* and *Bougainvillea glabra* were not found during the survey of the atoll in 1988. They may have been overlooked or became extinct. The overall increases in the numbers of species, however, reinforce the idea that the floras of many atoll islands have been incompletely studied (see also Manner and Mallon, 1989).

Table 1. Comparison of Species Numbers for Losap Atoll

	Indigenous		Introduced		Totals	
	FSO ¹	HIM & DS ²	FSO	HIM & DS	FSO	HIM & DS
Pteridophyta	2	5	0	0	2	5
Monocotyledonae	8	18	5	11	13	29
Dicotyledonae	25	47	3	20	28	67
Totals	35	70	8	31	43	101

Note:¹FSO refers to the following three references: Fosberg *et al.*, 1979, 1982, 1987.

²HIM & DS refers to H. I. Manner and D. Sana (this) collection of 1988.

Table 2 presents the distribution of species on Losap's islets. This table should be considered provisional as one islet could not be visited, and second, there was little attempt made to determine species distribution according to islets. However, the data on species distribution on Losap Atoll suggests a relationship with islet sizes and major uses. The small islets of Sobour, Penipat, and Weitb are little modified for subsistence agriculture or other human landuses. While coconuts are often harvested from these islets, the vegetation is dominated by indigenous strand species. In all likelihood, the freshwater lenses on these islets are too small or impermanent to support a more mesophytic vegetation.

By contrast, Losap and Lewel Islets have been greatly modified by human activities. Losap Islet serves as the village site for all residents, while Lewel Islet is used primarily for the subsistence agriculture or horticulture. Thus, ornamental species are found

Table 2. Provisional Distribution of Species on Losap Atoll

Islet	Lewel	Losap	Sobour	Penipat	Weitéé
Pteridophyta	5	2	0	0	0
Monocotyledonae	21	14	1	1	1
Indigenous	13	6	0	0	0
Introduced	8	8	1	1	1
Dicotyledonae	47	41	2	5	2
Indigenous	44	20	2	5	2
Introduced	3	21	0	0	0
Totals-All Species	73	57	3	7	3
Indigenous	62	28	2	5	2
Introduced	11	29	1	1	1

on Losap Islet only, and while both islets have a fairly large component of herbs, almost all dicotyledonous, introduced weeds are restricted to Losap Islet. Only one introduced dicotyledonous weed was found on Lewel Islet. On Lewel Islet, most introduced monocotyledonous herbs were restricted to the gaint swamp taro pits. Not surprisingly, a greater number of indigenous species and total number of species were found on Lewel Islet (62 and 73 species, respectively) than on Losap Islet (28 and 57 species, respectively). All indigeous ferns as well as the indigenous orchid were found on Lewel Islet. Cultivated food plants are present on both Lewel and Losap Islet, but are much more abundant on Lewel Islet. The two breadfruit species *Artocarpus mariennensis* and *A. altilis*, and bananas *Musa* sp. are present on both Losap and Lewel Islets. The abundance of these species are much less on Losap Islet because of its high density of population.

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Annotated List of Species

In the annotated list that follows, all vascular plants collected or observed on Losap during the fieldwork period between July 1-8, 1988 are presented in accordance to Fosberg's (Fosberg *et al*, 1979, 1982, 1987) schema of taxonomic relationships and origin. Details of the species' abundance, islet and place collected, growth habit, traditional use, local name and date collected are given. Specimens deposited in the Guam Herbarium (GUAM) are identified by our initials and field collection number (i.e., HIM & DS 5). Introduced species, as defined by Fosberg *et al* (1979, 1982, 1987) are indicated by an asterisk (*). Species previously recorded for Losap Atoll by Fosberg *et al* (1979, 1982, and 1987) are indicated by the initials FSO, date and page number. Species not recorded prior to this study are considered new records. The Guam Herbarium number is also listed. Species that have been deposited in the Guam Herbarium without numbers have not been catalogued yet.

Pteridophyta
POLYPODIACEAE
***Acrostium aureum* L.**

Rare to frequent fern, collected from taro pit at Piaman, Lewel Islet. Local name: *weliel*, *welial*. Field Coll. No.: HIM & DS 57, 70; Date collected: June 4, 1988. New record. GUAM No. (Accession in process).

***Asplenium nidus* L. Sensu lato**

Frequently found epiphyte on breadfruit and other trees in the breadfruit agroforest on Lewel Islet. Rare on Losap Islet, absent on Penipat Islet. Leaf is used for medicine; sap used as a glue to stop leaks in canoes. Local Name: *luk*. Field Coll. No.: HIM & DS 1. Date collected: June 2, 1988. FSO 1982: 45. GUAM No. (Accession in process).

***Nephrolepis saligna* Carr.**

Common to abundant epiphyte and ground cover on Lewel Islet, rare on Losap Islet. Used locally as a medicine. Local Name: *amara*. Field Coll. No.: HIM & DS 4. Date collected: June 2, 1988. New record. GUAM No. (Accession in process).

***Polypodium scolopendria* (Burm. f.) Copel.**

Abundant epiphyte found throughout Lewel Islet. Local Name: *chichi*. Field Coll. No.: HIM & DS 5. Collected June 2, 1988. FSO 1982: 67. GUAM No. (Accession in process).

***Thelypteris interrupta* (Willd.) Iwats.**

Common fern found in the Apinipwel and Piaman taro pits on Lewel Islet. Local Name: *amara*. Field Coll. No.: HIM & DS 33, 51, 63. Date collected: June 3 and 4, 1988. New record. GUAM No. 28196, 28197.

Monocotyledonae**PANDANACEAE*****Pandanus dubius* Spreng. var. *dubius***

Rare pandanus found at Pachengal, Lewel Islet. The leaves are used as a mulch and organic fertilizer in the *Cyrtosperma* pits. Local name: *poku*. Collected June 3, 1988. Field Coll. No.: HIM & DS 49. FSO 1987: 22. GUAM No. (Accession in process).

***Pandanus tectorius* Park. (sensu latissimo).**

Frequently found species on the atoll, seen on Losap and Lewel Islets. The fruit is eaten, and the leaves were formerly used as thatching. Observed, but not collected. Local name: *fach*. FSO 1987: 25-26.

***Pandanus* sp.**

Pandanus cultivated for its leaves in weaving, and said to be introduced from Satawal or Houk. Local name: maang. Common on Lewel Islet. Observed, but not collected.

ZOSTERACEAE***Cymodocea rotundata* Ehrenb. & Hempr. ex Aschers.**

Common sea grass collected from shallow channel between Losap and Lewel Islets. Local name: *much*. Collected June 7, 1988. HIM & DS 105. New record. GUAM No. (Accession in process).

HYDROCHARITACEAE***Enhalus acoroides* (L.f.) Royle**

Common to abundant sea grass collected from shallow channel between Losap and Lewel Islets. Local name: *onon*. Common. Collected June 7, 1988. Field Coll. No.: HIM & DS 104. New record. GUAM No. (Accession in process).

POACEAE*** *Cenchrus echinatus* L.**

Frequently occurring trailside plant collected on Lewel Islet; also found on Losap

Islet. Local Name: *satan*. Date Collected June 2, 1988. Field Coll. No.: HIM & DS 29. New record. GUAM No. 28200.

* *Cynodon dactylon* (L.) Pers. var. *dactylon*

Naturalized lawn grass, not too common on Losap Islet. No local name. Field Coll. No.: HIM & DS 84. FSO 1987: 35. GUAM No. (Accession in process).

* *Digitaria violascens* Link

Frequently occurring grass found in patches. Collected and used as a mulch fertilizer in *Cyrtosperma* taro patches on Lewel Islet. Local name: *pei*. Date collected: June 2, 1988. Field Coll. No.: HIM & DS 10. New record. GUAM No. (Accession in process).

* *Eleusine indica* (L.) Gaertn.

Common grass on Losap Islet, frequent on Lewel Islet in trailside locations. No local name. Collected June 4, 1988. Field Coll. No.: HIM & DS 98. New record. GUAM No. 28210.

Eragrostis amabilis (L.) W. & A.

Abundant ground cover species in village areas on Losap Islet. No local name. Collected June 4, 1988. Field Coll. No.: HIM & DS 83. FSO 1987: 42. GUAM No. (Accession in process).

Lepturus repens var. *septentrionalis* Fosb.

Common to abundant ground cover on Lewel Islet. Local Name: *feitil*. Collected June 2, 1988. Field Coll. No.: HIM & DS 27. FSO 1987: 48. GUAM No. 28201, 28202.

* *Paspalum conjugatum* Berg.

Frequently found grass of disturbed sites on Losap and Lewel Islets. Local name: *feitil*. Collected June 4, 1988. Field Coll. No.: HIM & DS 67 (Lewel Is.), 85 (Losap

Islet). New Record. GUAM No. (Accession in process).

Sporobolus fertilis (Steud.) Clayton

Frequent weed in village area on Losap Islet. Local name: *fetil*. Collected June 4, 1988. Field Coll. No.: HIM & DS 88. New record. GUAM No. (Accession in process).

Thuarea involuta (Forst. f.) R. Br. ex R. & S.

Common strand and trailside grass on Lewel and Losap Islets. Local name: *fetil*. Collected June 3, 1988. Field Coll. No.: HIM & DS 53. FSO 1987: 62. GUAM No. 28211, 28212.

Zoysia matrella (L.) Merr.

Rare grass on Losap Islet. Although native to Micronesia, this species is said to have been introduced to Losap Islet. Local name: *sipa*. Collected June 7, 1988. Field Coll. No.: HIM & DS 106. New record. GUAM No. 28209.

CYPERACEAE

Cyperus kyllingia Endl.

Common sedge in Apinipwel taro pit on Lewel Islet. Local name: *muchumuch*. Collected June 3, 1988. Field Coll. No.: HIM & DS 45. New record. GUAM No. 28251.

Cyperus odoratus L. var. *odoratus*

Common sedge of Apinipwel taro pits of Lewel Islet. Local name: *likaulul*. Collected June 2, 1988. Field Coll. No.: HIM & DS 31. FSO 1987: 67. GUAM No. 28198, 28199.

Cyperus sp.

Sedge collected from Apinipwel taro pit on Lewel Islet. Local name: *muchumuch*. Collected June 3, 1988. Field Coll. No.: HIM & DS 47. GUAM No. (Accession in process).

Cyperus sp.

Sedge collected from Piaman taro pit on Lewel Islet. Local name: *likaulul*. Collected June 4, 1988. Field Coll. No.: HIM & DS 64. GUAM No. (Accession in process).

Eleocharis geniculata (L.) R. & S.

Sedge collected from taro pit at Piaman, Lewel Islet. Local name: *muchumuch*. Collected June 4, 1988. Field Coll. No.: HIM & DS 65. FSO 1987: 69. GUAM No. (Accession in process).

Fimbristylis cymosa R. Br. (sensu lato).

Sedge common to abundant in open and disturbed areas on Lewel Islet. Used in traditional medicine. Local name: *pukerumwech*. Collected June 2, 1988. Field Coll. No.: HIM & DS 25. New record. GUAM No. 28203, 28204.

ARECACEAE

* *Cocos nucifera*

Common to abundant on all islets of Losap Atoll. Four varieties are recognized. The many uses of this tree have been widely published elsewhere (see for example, Manner and Mallon, 1989). Local name: *nu*. Not collected. FSO 1987: 82.

ARACEAE

* *Alocasia macrorrhiza* (L.) G. Don var. *macrorrhiza*

Rare aroid cultivated in kitchen garden on Losap Islet. This species is not a prominent staple crop. Local name: *ka*. Collected June 4, 1988. Field Coll. No.: HIM & DS 79. New record. GUAM No. (Accession in process).

* *Colocasia esculenta* (L.) Schott

Cultivated food plant, less prominent than *Cyrtosperma chamissionis* as a food plant on Losap Atoll. Three varieties are recognized. Local name: *oni*. Observed, but not collected. FSO 1987: 91.

* *Cyrtosperma chamissionis* (Schott) Merr.

The major cultivated aroid on the atoll. Eleven varieties are recognized. Local name *pula*. Observed, but not collected. FSO 1987: 91.

LILIACEAE

* *Crinum asiaticum* var. *procerum* (Carey) Bak.

Occasional ornamental on Losap Islet. Local name: *kiop*. Observed but not collected. FSO 1987: 101.

MUSACEAE

* *Musa x sapientum* L.

Common to abundant in village and houses. Local name: *uch*. Observed, but not collected. New record.

TACCACEAE

Tacca leontopetaloides (L.) O. Ktze.

Commonly found under open coconut and breadfruit agroforest on Lewel Islet, but rare on Losap Islet. Formerly cultivated and eaten food plant. This specimen was collected from Lewel Islet. Local name: *mokmok*. Collected June 2, 1988. Field Coll. No.: HIM & DS 2. FSO 1987: 106. GUAM No. 28205.

ORCHIDACEAE

Dendrobium sp.

Rare epiphyte on coconut tree at Pienur, Lewel Islet. Local name: *welial*. Collected June 4, 1988. Field Coll. No.: HIM & DS 61. Local name: *welial*. New record as FSO 1987 do not list any *Dendrobium* spp. for the atolls of Micronesia. GUAM No. (Accession in process).

Dicotyledonae
CASUARINACEAE
***Casuarina equisetifolia* L.**

Rare species, only two individuals found on beach at Pachengal, Lewel Islet; none on the other islets. One specimen stands 20m high. Introduced from Anguar in the late 1930s. Leaves used as an organic fertilizer. Local name: *weku*. Collected June 4, 1988. Field Coll. No.: HIM & DS 60. New record. GUAM No. (Accession in process).

PIPERACEAE
***Piper bonapense* C. DC.**

Frequently found climber in woodlands and trailside. Used in traditional medicine. Local name: *anuk*. Collected from Lewel Islet on June 2, 1988. Field Coll. No.: HIM & DS 22. FSO 1979: 50. GUAM No. (Accession in process).

MORACEAE
*** *Artocarpus altilis* (Park.) Fosb.**

Common to abundant tree of the breadfruit agroforest on Lewel Islet, reaching 30m high. Less common on smaller islets. Wood used in the construction of canoes and houses. Local name: *mei*. The most common variety is called *mei koeng*. Collected June 4, 1988. Field Coll. No.: HIM & DS 69, 109. FSO 1979: 52. GUAM No. (Accession in process).

MORACEAE
***Artocarpus mariannensis* Trec.**

Common to abundant tree of village and islet interiors, also 30m in height. Seeded breadfruit. Local name: *mei*. Many varieties found on the atoll, particularly *mei cheche* on Lewel Islet. Some found on Losap Islet. Same uses as *A. artocarpus*. Collected June 3, 1988. Field Coll. No.: HIM & DS 54. New record. GUAM No. (Accession in process).

***Ficus prolixa* var. *carolinensis* (Warb.) Fosb.**

Large, rare tree found in the Piaman agroforest, Lewel Islet. Used in traditional medicine. Local name: *aw*. Collected June 4, 1988. Field Coll. No.: HIM & DS 59.

New record. GUAM No. (Accession in process).

Ficus tinctoria var. *neo-ebudarium* (Summerh.) Fosb.

Common tree of interiors. Specimen collected at strand forest at Tonocha, Lewel Islet. Used in traditional medicine. Local name: *awen*. Collected June 3, 1988. Field Coll. No.: HIM & DS 48. FSO 1979: 56. GUAM No. (Accession in process).

CANNABIDACEAE

Cannabis sativa L.

Rare, illegal pot plant. Secretively grown by younger males. Specimen seen and photographed on Losap Islet. New record.

URTICACEAE

Laportea ruderalis (Forst. f.) Chew

Frequent herb of trails and waste places on Lewel Islet. Local name: *fetanukuch*. Collected June 2, 1988. Field Coll. No.: HIM & DS 6. New record. GUAM No. (Accession in process).

Pipturus argenteus (Forst. f.) Wedd. var. *argenteus*

Frequent to commonly occurring shrub of woodlands on Lewel and Losap Islets. Local name: *aroma*. Collected June 4, 1988. Field Coll. No.: HIM & DS 62, 95. New record. GUAM No. (Accession in process).

Procris pedunculata (Forst.) Wedd.

Common shrub of woodland pathways on Lewel Islet. Traditional uses include medicine and pig's feed. Local name: *kummit*. Collected June 2, 1988. Field Coll. No.: HIM & DS 9. FSO 1979: 63. GUAM No. (Accession in process).

POLYGONACEAE

Polygonum minus var. *procerum* (Danser) Steward

Frequent herb found at the Apinipwel taro pits, Lewel Islet. No local name. Collected June 3, 1988. Field Coll. No.: HIM & DS 38. New record. GUAM No. 28237, 28238.

AMARANTHACEAE

Achyranthes aspera L.

Rare herb of trailsides and coconut and breadfruit agroforests on Lewel Islet. Local name: *likekur*. Collected June 2, 1988. Field Coll. No.: HIM & DS 7. New Record. GUAM No. (Accession in process).

Alternanthera sessilis (L.) R. Br. ex DC.

Frequently found herb of disturbed sites on Lewel Islet. No local name. Collected June 3, 1988. Field Coll. No.: HIM & DS 46. New record. GUAM No. 28269, 28274.

NYCTAGINACEAE

* *Bougainvillea glabra* Choisy

Reported by FSO 1979: 72. Not observed by authors.

* *Bougainvillea spectabilis* Willd.?

Rare ornamental. Only one seen on Losap Islet. No local name. Introduced from Moen by Adkes Epinup's mother. Collected June 4, 1988. Field Coll. No.: HIM & DS 78. New record. GUAM No. (Accession in process).

* *Mirabilis jalapa* L.

Occasional ornamental of Losap Islet. Local name: 4 o'clock flower. Introduced from Weno. Collected June 4, 1988. Field Coll. No.: HIM & DS 91. New record. GUAM No. (Accession in process).

Pisonia grandis R. Br.

Common tree of woodlands on Lewel Islet. Only one plant seen on Losap Islet. Uncooked leaves are fed to pigs. Local name: *mok*, *mweek*. Collected June 2, 1988. Field Coll. No.: HIM & DS 24, 102. FSO 1979: 73. GUAM No. 28231, 28240.

LAURACEAE

Cassytha filiformis L.

Frequent parasitic climber of *Pemphis acidula* and *Scaevola sericea* on Lewel Islet. Seldom used organic fertilizer. Local name: *wechiel*. Collected June 2, 1988. Field Coll. No.: HIM & DS 12. New record. GUAM No. (Accession in process).

HERNANDIACEAE

Hernandia sonora L.

Occasional strand tree. Local name: *akurang*. Specimen collected from strand forest at Tonucha, Lewel Islet. Used in traditional medicine. Collected June 3, 1988. Field Coll. No.: HIM & DS 42. New record. GUAM No. 28272.

CAPPARIDACEAE

Crateva speciosa Volk.

Common understory agroforest species, abundant on Lewel Islet only. The fruit is eaten. Local name: *afuch*. Collected June 2, 1988. Field Coll. No.: HIM & DS 11. FSO 1979: 85. GUAM No. (Accession in process).

FABACEAE/CAESALPINIOIDEAE

* *Delonix regia* (Boj.) Raf

Rare ornamental tree growing in village on Losap Islet. Introduced from Weno. No local name. Collected June 4, 1988. Field Coll. No.: HIM & DS 80. New record. GUAM No. (Accession in process).

FABACEAE/PAPILLIONIDEAE

Sophora tomentosa L.

Common shrub, especially along the strand of Lewel Islet. Local name: *pisinom*. Collected June 2, 1988. HIM & DS 14. FSO 1979: 118. GUAM No. 28248, 28249.

Vigna marina (Burm.) Merr.

Abundant strand and trailside plant on Lewel Islet. Local name: *olu*. Used in traditional medicine and as an organic fertilizer in the taro pits. Collected June 2, 1988. HIM & DS 17. FSO 1979: 120. GUAM No. 28246.

RUTACEAE

* *Citrus aurantifolia* (Christm.) Swingle

Rare, cultivated fruit tree in village on Losap Islet. Local name: *laimes*. Collected June 2, 1988. Field Coll. No.: HIM & DS 89. FSO 1979: 122. GUAM No. 28712.

SIMAROUBACEAE

Soulamea amara Lam.

Common small tree or shrub in strand forests and coconut agroforests on Lewel and Penipat Islets. A few trees on Losap Islet. Local name: *marras*. Collected on June 2 and 7, 1988. Field Coll. No.: HIM & DS 15, 100. FSO 1979: 126. GUAM No. 28226, 28227.

EUPHORBIACEAE

Euphorbia chamissonis (Kl. & Gke.) Boiss.

Common trailside weed seen on Lewel Islet only. No local name. Collected June 2 and 7, 1988. Field Coll. No.: HIM & DS 3, 107. New record. GUAM No. 28232.

* *Euphorbia prostrata* Ait.

Common weed of village area on Losap Islet, rare on Lewel Islet. No local name. Collected June 4, 1988. Field Coll. No.: HIM & DS 81. New record. GUAM No. (Accession in process).

* *Jatropha integerrima* Jacq.

Common introduced ornamental on Losap Islet. No local name. Collected June 4, 1988. Field Coll. No.: HIM & DS 93. New record. GUAM No. (Accession in process).

* *Phyllanthus amarus* Sch. & Th.

Common weed of village and waste sites on Losap Islet. Local name: *likanur*. Collected June 4, 1988. Field Coll. No.: HIM & DS 90. New record. GUAM No. (Accession in process).

SAPINDACEAE

Allophyllus timoriensis (DC.) Bl.

Frequent tree species of woodlands on Lewel Islet. Local name: *nge*. Collected June 3 and 4, 1988. Field Coll. No.: HIM & DS 44, 50, 58. New record. GUAM No. 28270, 28271.

TILIACEAE

Triumfetta procumbens Forst. f.

Common on strand, agroforests and trails of Lewel Islet. Local name: *ara*. Collected June 2, 1988. Field Coll. No.: HIM & DS 8. FSO 1979: 159. GUAM No. (Accession in process).

MALVACEAE

* *Hibiscus rosa-sinensis* L. var *rosa-sinensis*.

Rare cultivated ornamental on Losap Islet only. Local name not recorded. Collected June 4, 1988. Field Coll. No.: HIM & DS 73. New record. GUAM No. (Accession in process).

Hibiscus tiliaceus L.

Frequent strand and woodland tree on Lewel and Losap Islets. Local name: *kalifo*. Collected June 3, 1988. Field Coll. No.: HIM & DS 30. New record. GUAM No. 28216.

Thespesia populnea (L.) Sol. ex Correa

Frequent to common strand and lagoon shore tree of Lewel Islet. Local name: *pene*. Collected June 3, 1988. Field Coll. No.: HIM & DS 32, 40, 41. New record. GUAM No. 28217, 28235, 28275.

CLUSIACEAE

Calophyllum inophyllum L. var. *inophyllum*

Rare species on Lewel and Losap Islets. Very useful tree in traditional construction and handicrafts. Local name: *rakich*. Collected June 4, 1988. Field Coll. No.: HIM & DS 56. FSO 1979: 170. GUAM No. (Accession in process).

Mammea odorata (Raf.) Kosterm.

Medium sized tree on all islets; frequent on Sobour Islet, rare on Lewel Islet. Local name: *liffous*. Collected June 4, 1988. Field Coll. No.: HIM & DS 72. FSO 1979: 172. GUAM No. (Accession in process).

CARIACEAE

* *Carica papaya* L.

Common fruit tree of village and interior agroforests. Local name: *pwaipwai*. Observed, but not collected. New record.

LYTHRACEAE

Pemphis acidula Forst.

Common strand, trailside and mangrove forest tree on Lewel and Losap Islets. Found also on Penipat Islet. The wood of this species is very hard and is used in traditional handicrafts and tools. Local name: *chekiss*. Collected June 2, 1988. Field Coll. No.: HIM & DS 21. FSO 1979: 181. GUAM No. 28242.

RHIZOPHORACEAE

Bruguiera gymnorhiza (L.) Lam. f. *gymnorhiza*

Frequently occurring mangrove species at Apisu, Lewel Islet. Local name: *ong*,

yong. Collected June 3, 1988. Field Coll. No.: HIM & DS 35. FSO 1979: 182. GUAM No. 28215.

Rhizophora mucronata* Lam. var. *mucronata

Common mangrove forest species from Apisu, Lewel Islet. Also found on Losap Islet. Wood used in construction. Local name: *chia*. Collected June 3, 1988. Field Coll. No.: HIM & DS 37. FSO 1979: 83. GUAM No. 28276, 28277.

SONNERATIACEAE

***Sonneratia alba* J. E. Sm.**

Rare mangrove species from Apisu, Lewel Islet. Local name: *pulupul*. Collected June 3, 1988. Field Coll. No.: HIM & DS 36. FSO 1979: 184. GUAM No. 28213, 28214.

COMBRETACEAE

***Lumnitzera littorea* (Jack) Voigt**

Common mangrove species. The wood is used as a building material. Collected at Apisu, Lewel Islet. Local name: *wei*. Collected June 3, 1988. Field Coll. No.: HIM & DS 34. FSO 1979: 185. GUAM No. (Accession in process).

***Terminalia catappa* L.**

Common tree of strand and woodlands on Losap and Lewel Islets. The nut is eaten. Local name: *asas*. Collected June 4, 1988. Field Coll. No.: HIM & DS 97. New record. GUAM No. (Accession in process).

***Terminalia samoensis* Rech.**

Common shrub of the strand on Lewel Islet. Also found on Losap Islet. Local name: *kin*. The nut is sometimes eaten and the wood is used for canoe paddles. Collected June 2, 1988. Field Coll. No.: HIM & DS 16. New record. GUAM No. (Accession in process).

LECYTHIDACEAE

Barringtonia asiatica (L.) Kurz

Large tree on Penipat Islet and Losap Islet. Not seen of Lewel Islet. Local name: *kul*. Collected June 4, 1988. Field Coll. No.: HIM & DS 94, 99. New record. GUAM No. 28228.

MYRTACEAE

Eugenia javanica Lam.

Frequently occurring tree on Lewel Islet and Losap Islet. Edible fruits. Local name: *faniap*. Collected June 4, 1988. Field Coll. No.: HIM & DS 68. FSO 1979: 189. GUAM No. (Accession in process).

ONAGRACEAE

Ludwigia octovalvis (Jacq.) Raven

Common weed of the taro swamp at Apinipwel, Lewel Islet. No local name. Collected June 3, 1988. Field Coll. No.: HIM & DS 39. FSO 1979: 195. GUAM No. 28236.

GENTIANACEAE

Fagraea sp.

Rare tree on Lewel Islet near Piaman. Local name: *seoul*. Collected June 7, 1988. Field Coll. No.: HIM & DS 101. New record. GUAM No. (Accession in process).

APOCYNACEAE

* *Catharanthus roseus* (L.) G. Don

Cultivated ornamental, introduced from Weno. No local name. Collected June 4, 1988. Field Coll. No.: HIM & DS 96. New record. GUAM No. (Accession in process).

Neisosperma oppositifolia (Lam.) Fosb. & Sachet

Rare tree of Rewalei woodland on Lewel Islet. Local name: *umo*. Collected June 4, 1988. Field Coll. No.: HIM & DS 55. New record. GUAM No. (Accession in process).

* *Plumeria rubra* L.

Common ornamental tree in on Losap Islet. Local name: *seoul*. Not collected. New record.

CONVOLVULACEAE

* *Ipomoea batatas* (L.) Lam.

Cultivated in village. Local name not recorded. Not collected. New record.

BORAGINACEAE

Cordia subcordata Lam.

Common strand tree on Lewel Islet, but rarer on Losap Islet. Small edible nut. Local name: *anikat*. Collected June 2, 1988. Field Coll. No.: HIM & DS 13. FSO 1979: 230. GUAM No. 28250.

Tournefortia argentea L. f.

Frequently found strand tree on Lewel Islet, less common on Losap Islet. Local name: *amloset*. Collected June 2 and 7, 1988. Field Coll. No.: HIM & DS 20, 103. FSO 1979: 231. GUAM No. 28233, 28243.

VERBENACEAE

Clerodendrum inerme var. *oceanicum*

Listed by FSO 1979: 235 for Losap Atoll, but not observed.

Premna obtusifolia R. Br.

Abundant shrub in strand forest and coconut woodlands of Lewel Islet. Few on Losap Islet. Local name: *lior*. Collected June 2, 1988. Field Coll. No.: HIM & DS 18. FSO 1979: 237. GUAM No. 28245.

* *Stachytarpheta urticifolia* Sims

Common weed of disturbed sites on Losap Islet. Local name: forget (so named after forget me not because of violet colored flowers). Collected June 4, 1988. Field Coll. No.: HIM & DS 86. New record. GUAM No. (Accession in process).

Unidentified Verbenaceae

Specimen collected June 3, 1988 at Tonucha, Lewel Islet. Field Coll. No.: HIM & DS 43. GUAM No. (Accession in process).

SCROPHULARIACEAE

* *Bacopa procumbens* (Mill.) Greenm.

Common prostrate herb found at Losap School, Losap Islet. No local name. Collected June 4, 1988. Field Coll. No.: HIM & DS 75. GUAM No. (Accession in process).

Lindernia sp.

Collected on June 3, 1988 at Lewel Islet. Field Coll. No.: HIM & DS 52. GUAM No. (Accession in process).

ACANTHACEAE

* *Blechnum brownei* var. *puberulum* Leonard

Common weed in village, Losap Islet. Collected June 4, 1988. Field Coll. No.: HIM & DS 92. New record. GUAM No. (Accession in process).

RUBIACEAE

* *Dentella repens* J. & G. Forst.

Prostrate white flowering herb found trailside on Losap Islet. No local name. Collected June 4, 1988. Field Coll. No.: HIM & DS 77. New record. GUAM No. (Accession in process).

Guettarda speciosa L.

Frequently occurring tree in woodland and strand forest on Lewel Islet. Flowers are used to perfume coconut oil. Local name: *mosor*. Collected June 2 and 4, 1988. Field Coll. No.: HIM & DS 23, 66. FSO 1979: 265. GUAM No. 28234.

* *Hedyotis corymbosa* (L.) Lam.

Prostrate herb frequently found at Losap school area, Losap Islet. No local name. Collected June 4, 1988. Field Coll. No.: HIM & DS 74. New record. GUAM No. 28387.

Morinda citrifolia L. var. *citrifolia*

Common shrub/tree reaching 5 m high on Lewel and Losap Islets. Local name: *nopur*. Collected June 4, 1988. Field Coll. No.: HIM & DS 76. FSO 1979: 271. GUAM No. (Accession in process).

GOODENIACEAE

Scaevola taccada (Gaertn.) Roxb.

Frequent strand and woodland shrub. Found on all islets, but rare on Losap Islet. Local name: *nut*. Collected June 2, 1988. Field Coll. No.: HIM & DS 19. FSO 1979: 281. GUAM No. 28244.

COMPOSITAE

Vernonia cinerea (L.) Less. sensu lato

Rare weed in waste and disturbed sites in village and school area, Losap Islet. No local name. Collected June 4, 1988. Field Coll. No.: HIM & DS 82. New record. GUAM No. (Accession in process).

* *Wedelia trilobata* (L.) Hitchc.

Introduced locally abundant ground cover in village on Losap Islet. Local name: *sunflower* (because of the color of its flowers). Collected June 4, 1988. Field Coll. No.: HIM & DS 87. New record. GUAM No. (Accession in process).

Wollastonia biflora (L.) DC. var. *biflora*

Common shrub of woodlands and upper strand of Lewel Islet, but rare on Losap Islet. Local name: *atuat*. Used as a medicine and an organic fertilizer. Collected June 2, 1988. Field Coll. No.: HIM & DS 26. FSO 1979: 293. GUAM No. 28218.

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