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## Report T-558 Endemic Taxa in the Flora of South Florida



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Everglades National Park, South Florida Research Center, P.O. Box 279, Homestead, Florida 33030

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Endemic Taxa in the Flora of South Florida

Report T-558

George N. Avery and Lloyd L. Loope

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South Florida Research Center  
Everglades National Park  
Homestead, Florida 33030

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TABLE OF CONTENTS

	<u>Page</u>
INTRODUCTION . . . . .	1
LITERATURE ON SOUTH FLORIDA ENDEMICS . . . . .	1
METHODS . . . . .	2
ANNOTATED LIST OF THE ENDEMIC SOUTH FLORIDA FLORA . . . . .	2
DISCUSSION . . . . .	14
ACKNOWLEDGEMENTS . . . . .	17
LITERATURE CITED . . . . .	18
Table 1. Habitat and conservation status of endemic plant taxa of South Florida . . . . .	23
Table 2. Number of endemics found in selected vegetation categories . . . . .	27
APPENDIX I - Annotated version of Robertson's (1955) list of South Florida endemics, showing differences from our list . . . . .	28

## Endemic Taxa in the Flora of South Florida

George N. Avery  
and  
Lloyd L. Loope

### INTRODUCTION

The island-like tropical area of South Florida possesses a very remarkable flora by North American standards, with a high percentage of species having tropical affinities and with fairly high local endemism. Hundreds of plant species known from the United States are found only in Florida south of Lake Okeechobee. Many of these species occur on various Caribbean islands and elsewhere in the Neotropics. This report treats those taxa endemic to South Florida, occurring in peninsular Florida south of Lake Okeechobee and/or on the Florida Keys, and found nowhere else.

The flora of South Florida is being subjected to intense pressure from human activities (urbanization, drainage, agriculture, introduction of exotic species, etc.). Natural ecosystems are rapidly disappearing outside the boundaries of areas specifically devoted to ecological conservation. Rare species in South Florida's flora, and endemic taxa particularly, are seriously threatened with extirpation if secure populations do not occur within conservation areas. Rare species are by no means assured of survival within preserves, since habitat manipulation or special protection may be required and since hurricanes and fires can have catastrophic effects over large areas. More detailed study of South Florida's flora will assist conservation efforts. This report is intended as a contribution toward that objective.

### LITERATURE ON SOUTH FLORIDA ENDEMICS

J. K. Small botanized extensively in South Florida during the early decades of the twentieth century and published numerous papers and several books (e.g., Small, 1913a; 1913b) on the flora of the area. His Manual of the Southeastern Flora (Small, 1933) remains a comprehensive, though outdated, reference for endemic plants of South Florida. Harper (1949a, 1949b, 1950) published a series of papers on the endemic flora of the state of Florida based upon an analysis of species included in Small's (1933) Manual of the Southeastern Flora. Harper listed 427 endemic species belonging to 90 families and 231 genera as interpreted by Small. He estimated endemism for the State of Florida at about one-sixth of all species.

Robertson (1953, 1955) noted the relatively high number of pineland herbaceous plants which are endemic to South Florida. He reasoned that since most of these species have specific adaptations to repeated burning and are apparently perpetuated by recurring fire, fire would appear to have been a force acting upon this ecosystem for a long time. Robertson's fire ecology investigation led to the beginning of a program of prescribed burning in pinelands of Everglades National Park which has evolved into the current Fire Management Plan (Everglades National Park, 1979) for the area.

Robertson (1955) compiled a list of 122 taxa endemic to South Florida (which he defined as Dade, Broward, Collier, and Monroe Counties), using range data from Small (1933). To our knowledge, Robertson's is the only list of South Florida endemics in the literature.

Long (1974) stated that 160 species or about 9% of the South Florida vascular flora (presumably that of Dade, Monroe, and Collier Cos. as presented in Long and Lakela, 1971) are endemic to "peninsular Florida." He did not estimate how many species of the South Florida flora are confined to the area south of Lake Okeechobee.

#### METHODS

Robertson's (1955) list and Small's (1933) Manual of the Southeastern Flora from which it was compiled proved to be good starting points. Since Robertson's list was compiled, nomenclature and taxonomy have evolved considerably and additional botanical exploration has extended ranges of some taxa formerly believed to be endemic. The recent regional flora (Long and Lakela, 1971), floras for adjacent regions (e.g., Radford, Ahles, and Bell, 1968; Adams, 1972; Leon and Alain, 1947-1963; Britton and Millspaugh, 1962) and pertinent papers and monographs on the taxa involved were consulted. Hitchcock (1950) proved to be an essential reference for the Poaceae. The herbaria of Everglades National Park (ENP) and Fairchild Tropical Garden (FTG) were consulted. One of us (Avery) has field notes from 25 years of botanical excursions in South Florida. Numerous field trips were taken in conjunction with this study during 1977 and 1978. Unless specifically stated the taxa included in the list were seen in the field and/or herbarium specimens were examined.

For purposes of this study, South Florida is defined as lying south of the Caloosahatchee River, Lake Okeechobee, and the St. Lucie Canal. As defined in this way, the area included Broward, Collier, Dade, Hendry, Monroe, Lee, Palm Beach counties and part of Martin Co. We admit to a slight bias toward the flora of Dade, Monroe, and Collier counties since this is the area with which we are most familiar.

#### ANNOTATED LIST OF THE ENDEMIC SOUTH FLORIDA FLORA

##### POLYPODIACEAE

###### Asplenium x biscayneanum (D.C. Eat.) A.A. Eat.

Originally present at Brickell Hammock and a few other hammocks on the Everglades Keys (Small, 1938). Probably now reduced to one population in privately owned Cutler Hammock.

###### Tectaria x amesiana A.A. Eat.

Known only from Hattie Bauer Hammock, except for a doubtful record from the Bahamas (Small, 1938). Neither T. coriandrifolia (Sw.) Underw. (one of the putative parents of T. x amesiana) nor T. x amesiana itself have been seen recently in South Florida.

## POACEAE

Digitaria pauciflora Hitchc.

Range given as South Florida pinelands by Small (1933) and Hitchcock (1950). Ward (1975) quotes Henrard (1950) as saying that it has been collected only once, "between Jenkins and Everglade." Both Craighead and Avery have collected specimens of a Digitaria from the transverse glades of Long Pine Key in Everglades National Park which appear to conform to descriptions of this species.

Eriochloa michauxii (Poir.) Hitchc. var. simpsonii Hitchc.

Range given as "moist places, Fort Myers to Cape Sable, Fla." (Hitchcock, 1950) and "gulf dunes, in brackish sand, Bonita Springs to Cape Sable" (Long and Lakela, 1971). No specimen seen.

Schizachyrium rhizomatum (Swallen) Gould  
(Andropogon rhizomatus Swallen)

This species is abundant in Everglades National Park and Big Cypress National Preserve on rocky and sandy substrates which are flooded for up to 4 months each year. The 11 specimens in herbaria of ENP and FTG range from Kendall in Dade Co., south to Big Pine Key and west to Mahogany Hammock in ENP.

Schizachyrium sericatum (Swallen) Gould  
(Andropogon sericatus Swallen)

This little known grass was described by Swallen (1941). It is not mentioned in Long and Lakela (1971). The type is from Ramrod Key, one of the lower Florida Keys, and the plant has been collected also on Big Pine Key. It grows in dense clumps, presumably in rocky pinelands and on roadsides. A recent search by Avery failed to find this plant.

Tripsacum floridanum Porter ex Vasey

This species is moderately common in pineland of Long Pine Key, ENP. Specimens at ENP and FTG herbaria range from ENP and Florida City to Big Pine Key and western Big Cypress National Preserve (Collier Co., Hwy. 827, 2 mi. E of Fla. 29.)

## CYPERACEAE

Cyperus blodgettii Britt.  
(or Mariscus blodgettii (Britt.) Koyama as given by Koyama (1974))

Small (1933) reported range as "rocky soil in hammocks, Upper Matacumbe Key and Key West." Long and Lakela (1971) included this taxon within C. pollardii Britt., which ranges from Florida to South Carolina. Horvat (1941) examined the type specimens and reported that C. blodgettii and C. pollardii may be regarded as distinct, though very closely related, entities. No specimens seen.



## AMARYLLIDACEAE

Hymenocallis latifolia (Mill.) Roem.  
(H. collieri Small and H. keyensis Small)

This is a fairly common coastal species of southern peninsular Florida and the Florida Keys. It is present in Everglades National Park, Biscayne National Monument, and Fort Jefferson National Monument.

## ORCHIDACEAE

Spiranthes lanceolata (Aubl.) Leon var. paludicola Luer

Luer (1972) states that this variety is confined to the Fakahatchee Strand. Small (1933) and Long and Lakela (1971) make no mention of S. lanceolata, presumably treating this taxon as Spiranthes orchioides (Sw.) A. Rich., a wide ranging species in tropical America.

## PIPERACEAE

Peperomia floridana Small

Small (1933) gives the range of this taxon (Rhynchophorum floridanum Small) as "high limestone hammocks, on tree trunks and rotten logs, s. peninsular Fla. and Fla. Keys." Long and Lakela (1971) give the same range. We have difficulty distinguishing this taxon from Peperomia obtusifolia (L.) Dietr morphologically. A possibility exists that P. floridana should be included within P. obtusifolia. Plants conforming to descriptions of P. floridana are found in hammocks of Long Pine Key in Everglades National Park and in cypress strands of Big Cypress National Preserve.

## POLYGONACEAE

Persicaria paludicola Small

Graham and Wood (1965) simply state that "Persicaria paludicola Small (not Pers. paludicola (Makino) Nakai, 1926) has been described from the Everglades, Florida." Small (1933) gives the range as "Everglades, Camp Jackson to Camp Longview, Fla." This general area has been drained and plowed in recent years. Long and Lakela (1971) make no mention of this taxon. No specimens seen.

## FABACEAE

Aeschynomene pratensis Small var. pratensis

Rudd (1955), who monographed the American species of Aeschynomene, gave the range as "Everglades of Florida." Specimens at FTG and ENP

are mostly from Everglades National Park. One FTG specimen is from Broward Co. The taxon is moderately common in Everglades National Park, especially in the Shark Slough area.

Amorpha crenulata Rydb.

Small (1933) gives range as: "Pinelands and edges of hammocks, Everglades Keys, Fla." Wilbur (1964) considers it restricted to Dade Co., Fla. The species is confined to the Coral Gables-South Miami area, and the vacant lots where it still grows are presently being taken for housing. One small population exists in a Dade Co. park.

Cassia keyensis (Penn.) Macbr.

Confined to pinelands of Lower Florida Keys. Common on Big Pine Key in pinelands of National Key Deer Refuge. Has been considered a synonym of Cassia grammica Spreng., but Isely (1975) considers C. keyensis a valid species.

Galactia pinetorum Small

Small gave the range as "pinelands, Everglade Keys, Fla." Specimens in ENP and FTG herbaria are from Long Pine Key in Everglades National Park and from other pinelands in southern Dade Co. The plant grows from a woody taproot which enables it to survive recurrent fires.

Galactia prostrata Small

Rogers (1949) gave the name Galactia smallii to this plant in a Ph.D. dissertation, but this name has never been published. Range is given by Small (1933) as "pinelands, Everglade Keys, pen. Fla." Actually, the range is smaller than this, as it covers only a few of the Everglade Keys, those with the highest elevation between Coconut Grove and Florida City. The plant is much like G. pinetorum in habit, but has broader leaflets.

Indigofera keyensis Small

Small (1933) gives range as "hammocks, upper Fla. Keys." Long and Lakela give range as "strand vegetation, pineland, Fla. Keys." The species occurs in small stands in strand vegetation and openings in hammocks at scattered locations from Key Largo to Key Vaca.

Tephrosia angustissima Shuttlew. ex Chapm.

Small (1933) gave range as "pinelands, Everglade Keys, Fla." Long and Lakela (1971) gave the same range. Shinnars (1962a) stated that the species is frequent in Dade Co. and examined one Brevard Co.

specimen. Isely (letter to Avery of April 12, 1976) tentatively combines T. corallicola, T. curtissii, and T. seminole under the oldest name, T. angustissima. Isely believes these are all northern manifestations of the pantropical T. purpurea (L.) Pers. complex.

No specimens of T. angustissima were found in herbaria of ENP or FTG and extensive searching by Avery in Dade Co. pinelands has yielded no Tephrosia other than T. florida. P. Krauss and M. McMahon checked specimens labeled T. angustissima in the herbarium of New York Botanical Garden in December, 1978. The eight specimens there were collected between 1877 and 1927 in pinelands from Broward Co. south through the South Miami area of Dade Co. to somewhat north of Homestead. The possibility exists that this taxon has been extirpated through habitat destruction.

#### Tephrosia seminole Shinnery

Shinnery (1962a) gives the type locality as Godden's Mission, Big Cypress, Hendry Co. It is known from 2 fragmentary specimens collected in 1919 and has not, to our knowledge, been collected since. As stated above, Isely includes this taxon within T. angustissima.

### LINACEAE

#### Linum arenicola (Small) Winkl.

Rogers (1963) states that Linum arenicola is restricted to South Florida, where it is readily distinguished from all other species by the combination of separate styles and conspicuous stipular glands. It occurs in pinelands in two somewhat disjunct areas of South Florida (Rogers, 1968): Miami and vicinity and the western Florida Keys.

#### Linum carteri Small var. carteri

Linum carteri is endemic to pinelands of Dade, Collier, and Monroe counties. Var. carteri, the pubescent plant, is said by Rogers (1968) to be restricted to the vicinity of Miami. However, FTG herbarium has a pubescent specimen from Collier Co., as well as some from the Coral Gables area of Dade Co.

#### Linum carteri Small var. smallii Rogers

This is the glabrous variety, confined to Dade, Collier, and Monroe counties (Rogers, 1968). It has been found to be common on disturbed roadsides in the Taylor Slough area of Everglades National Park. It has also been recorded from the Monument Road area of Big Cypress National Preserve.

## POLYGALACEAE

Polygala smallii Smith & Ward  
(Pilostaxis arenicola Small)

Small (1933) gave the range as "pinelands, Everglades Keys, Fla." Smith and Ward (1976) give the range as "sandy and calcareous rocky areas of the open grassy pinelands; endemic to S. Fla. (Broward and Dade counties)." Long and Lakela (1971) treated this taxon as a synonym of P. nana (Michx.) DC.

The FTG herbarium has several specimens from the South Miami and Fort Lauderdale areas. Specimens from Martin and Highland counties may belong to this taxon. Regardless of its taxonomic status, P. smallii is approaching extinction.

## EUPHORBIACEAE

Argythamnia blodgettii (Torr.) Chapm.

Range restricted to pinelands of Dade Co. and Florida Keys. Within Everglades National Park, known only from a portion of western Long Pine Key. Present at Camp Owaissa Bauer, Larry and Penny Thompson Memorial Park, and other scattered localities in Dade Co.

Chamaesyce conferta Small

Small (1933) gives range as "pinelands, Everglade Keys, pen. Fla." The species is fairly common in pinelands of ENP and adjacent Dade Co. We have observed that it sometimes invades disturbed sites.

Chamaesyce cumulicola Small

Small (1933) gives range as: "Sand dunes and scrub, Cape Romano region and lower eastern coast, Fla." Burch (1966b) characterizes the habitat as "stabilized dunes, southern Florida." Herbarium material at ENP and FTG is from lower western coast of Florida only. The habitat may no longer be present on the lower eastern coast.

Chamaesyce deltoidea (Engelm. ex Chapm.) Small  
subsp. deltoidea var. adhaerens (Small) Burch

Small (1933) gives range as "pinelands, Everglade Keys, pen. Fla." This taxon is currently present in several remnant pineland habitats between Homestead and Naranja, including Camp Owaissa Bauer, a Dade County park.

Chamaesyce deltoidea subsp. deltoidea var. deltoidea

Small (1933) gives range as "pinelands, Everglade Keys, pen. Fla." This taxon is currently present in several remnant pineland habitats between

Cutler Ridge and South Miami, including pinelands at Larry and Penny Thompson Memorial Park and at the U.S. Dept. of Agriculture Sub-tropical Horticulture Research Station.

Chamaesyce deltoidea subsp. serpyllum (Small) Burch

Small (1933) gives range as "pinelands, lower Florida Keys." Herbarium specimens at FTG and ENP are from Big Pine Key only.

Chamaesyce garberi (Engelm. ex Chapm.) Small

Small (1933) gives range as: "Pinelands, hammocks, and sand dunes, Everglade Keys and Cape Sable, pen. Fla. and Florida Keys. Adventive at Mobile, Ala." Presently known from a small area of Management Block "A" of Long Pine Key, ENP, from Cape Sable, and from several of the lower Florida Keys.

Chamaesyce pinetorum Small

Small (1933) gives range as: "Pinelands, Everglade Keys, pen. Fla." The species is common in pinelands of ENP and occurs north along the Miami Rock Ridge to the vicinity of Perrine.

Chamaesyce porteriana Small var. keyensis (Small) Burch

Small (1933) gives range as: "Sand-dunes and pinelands, lower Fla. Keys." Small populations are known from Long Key to Cudjoe Key.

Chamaesyce porteriana var. porteriana

Small (1933) gives range as "pinelands, Everglade Keys, pen. Fla." This taxon is common in pinelands of Everglades National Park and occurs sparingly north to the vicinity of South Miami.

Chamaesyce porteriana var. scoparia (Small) Burch

Small (1933) gives range as "pinelands, lower Fla. Keys." Type collected by Small from Big Pine Key. Specimens which seem to fit the description of this taxon have recently been collected by D. and S. Black from the Lostmans Pines area of Big Cypress National Preserve.

Croton arenicola Small

Small (1933) gave the range as "pinelands and sand-dunes, Everglade Keys, Fla. and Florida Keys." Long and Lakela (1971) placed this taxon in synonymy with C. glandulosus L. var. glandulosus, a widely distributed plant of southeastern U.S. and the American tropics. Webster



(1967) considered it possible that this taxon might be a separate species, however, based on the distinctiveness of populations with short and densely pubescent leaves.

Croton glandulosus L. var. simpsonii Ferguson

Small (1933) gave the range as "s. pen. Fla. and on the Keys." Long and Lakela (1971) include this taxon as a South Florida endemic. The plant was described by Ferguson (1901) from a specimen from Coconut Grove. Verification of herbarium material is difficult because characters used in the keys for C. glandulosus var. glandulosus and var. simpsonii overlap.

Phyllanthus pentaphyllus C. Wright ex Griseb.  
subsp. pentaphyllus var. floridanus Webster

Small (1933) gives range as: "pinelands, Everglade Keys, Fla. and lower Florida Keys." Webster (1970) states that var. floridanus is dioecious and is restricted to southern Florida. This taxon is abundant in pinelands of ENP and adjacent Dade Co.

Poinsettia pinetorum Small

Small (1933) gives range as: "Pinelands and sandy places, Everglade Keys, pen. Fla. and Florida Keys-(W.I.)." Burch (1966a) states that the species is "found only in the pinelands of the oolitic limestone in Dade and Monroe Counties." Small (1913) listed "(Cuba)" in the range instead of "(W.I.)." However, Leon and Alain (1947-63) do not list this name for Cuba. The range given by Burch is therefore assumed to be correct. This species is fairly common in pinelands of ENP and adjacent Dade Co.

Stillingia sylvatica L. subsp. tenuis (Small) Rogers

Small (1933) gives range as: "Everglades, Fla." Rogers (1951) states that it is confined to the extreme SE coast of Fla., usually growing only where limestone outcrops occur at the surface, without or with a very slight sandy soil mantle. The taxon is local, but moderately common in remaining pinelands of southern Dade Co., including those in ENP.

Tragia saxicola Small

Small (1933) gives range as: "Pinelands, Everglade Keys, pen. Fla. and Florida Keys." Herbarium material and our field notes show a distribution from Coral Gables to Long Pine Key of ENP and on Big Pine Key. The species is abundant in pinelands of Long Pine Key, ENP.

## CISTACEAE

Lechea lakelae Wilbur

This endemic species was described by Wilbur (1974). Wilbur states that it is present on Marco Island, Collier Co. and that it was formerly also in Broward Co. We have not seen specimens or living plants.

## CACTACEAE

Cereus robinii (Lem.) L. Benson var. deeringii (Small) L. Benson

Small (1933) gave the range (for Cephalocereus deeringii Small) as "rocky hammocks, upper Fla. Keys, from the s. front of Big Pine Key to Upper Matecumbe Key. Long and Lakela (1971) give the range as "rocky hammocks, Matecumbe Key, Florida Keys." Presently known only from Long Key and Big Pine Key.

Opuntia eburnispina Small

Small (1933) cited this only from Romano Island in the Ten Thousand Islands, and Long and Lakela (1971) did not list the name. It may exist on other islands of the extreme southwest coast of Florida where beach ridges of sand occur. Confirmation is needed of the continued existence and range of this species. Avery observed it on an island within Everglades National Park in 1967.

## MYRTACEAE

Myrcianthes fragrans (Sw.) McVaugh var. simpsonii (Small) R. W. Long

Small (1933) gave the range for Anamomis simpsonii Small as "hammocks lower e. coast and Everglade Keys, Fla." Long (1970b) stated that "there is some justification for maintaining M. simpsonii because the cymes are several flowered, usually 10-14," and established the taxon as a variety of M. fragrans. McVaugh (1963) stated that ". . . populations . . . are evidently related in a way not yet understood. It would seem premature to assign varietal or subspecific names to most of these populations until their taxonomy can be more adequately worked out." Considerable confusion still exists with this taxon. For example, it is unclear whether populations of Big Cypress National Preserve belong to var. simpsonii or var. fragrans.

## ONAGRACEAE

Ludwigia spathulifolia Small

Small (1933) gave range as "wet ground, Everglades, Fla." Not included by Long and Lakela (1971). Munz (1944) included this as a valid species and cited material from Dade and Lee Cos. Recently collected by Avery from Taylor Slough, Everglades National Park.

## OLEACEAE

Forestiera segregata (Jacq.) Krug & Urb.  
var. pinetorum (Small) M. C. Johnst.

Small (1933) regarded the shrubby, narrow-leaved Forestiera of Dade County pinelands as a species distinct from the arborescent F. segregata of coastal hammocks. Long and Lakela (1971) considered the pineland plant a variety of F. segregata, following Johnston (1958). The endemic taxon is widespread, but seldom abundant in pinelands of southern Dade County, including those of Everglades National Park.

## CONVOLVULACEAE

Evolvulus sericeus Sw. var. averyi Ward

This endemic variety, named by Ward (1968), has been collected only in Dade County and the Florida Keys. It is said to differ from two other varieties in having leaf blades pubescent on both sides. The type is from Big Pine Key, but the variety appears to be widespread in pinelands of Dade County.

Jacquemontia curtissii Peter ex Hall. f.

Small (1933) gave range as "pinelands and adjacent Everglades, s. pen. Fla." It is rather common in pinelands and rocky prairies of Everglades National Park, adjacent Dade County, and Big Cypress National Preserve (Collier Co.).

Jacquemontia reclinata House

Range restricted to coastal dunes of southeastern Florida. It is not known from the West Indies, as both Small (1933) and Long & Lakela (1971) indicate. This fleshy-leaved, prostrate plant is presently found in only a few scattered stations on the shores of Palm Beach, Broward, and Dade counties. D. F. Austin (1979) states that the species could become extinct within ten years.

## VERBENACEAE

Lantana depressa Small

Small (1933) gives range as: "Pinelands, Everglade Keys, Fla." Moldenke (1972) gives range as St. Lucie to Dade Cos. The species is fairly common in pinelands of ENP and adjacent Dade Co. Soon after Long (1970) described this taxon as a variety (L. ovatifolia Britt. var. reclinata R. W. Long), Moldenke (1972) listed the new variety as a synonym of Small's name, L. depressa. We adopt Moldenke's view here.

## LAMIACEAE

Hyptis alata (Raf.) Shinnars var. stenophylla Shinnars

Long and Lakela (1971) include both var. stenophylla and var. alata as occurring in South Florida. Shinnars (1962) stated that the type of var. stenophylla is from Palm Beach Co. and cited material from Charlotte, Collier, and Dade counties. We interpret the Hyptis common in pinelands of Everglades National Park as Hyptis alata var. stenophylla.

Salvia blodgettii Chapm.

No recent collections of this had been seen by Long and Lakela (1971). It was known from hammocks of Key West by Small (1933) and may still be present in vacant lots on that key, or perhaps on nearby keys. More work is needed to relocate this inconspicuous plant.

## SCROPHULARIACEAE

Gerardia keyensis (Penn.) Penn.

Small (1933) and Pennell (1935) both considered this an endemic species occurring in pinelands of Big Pine Key, Fla. Long and Lakela (1971), however, listed the name as a synonym of Agalinis filifolia (Nutt.) Raf. We follow Pennell. A plant of this taxon was collected recently by Avery on Big Pine Key.

## ACANTHACEAE

Dyschoriste oblongifolia (Michx.) Kuntze var. angusta (Gray) R. W. Long

This taxon is abundant in pinelands of Everglades National Park, adjacent Dade Co., and Big Cypress National Preserve (Collier Co.). It has been recently collected on Grand Bahama Island (Dr. D. S. Correll, personal communication), but since it is known from only one station in the Bahamas, we still include it tentatively as a South Florida endemic.

Elytraria caroliniensis (J. F. Gmel.) Pers. var. angustifolia (Fern.) Blake

Long (1970a) considered the plant called Tubiflora angustifolia (Fern.) Small in Small (1933) to be a narrow-leaved variety of the wide-ranging Elytraria caroliniensis. This endemic taxon is confined to Dade and Collier counties (Long, 1970a). Within Everglades National Park, this plant is most common in the transverse glades of Long Pine Key. It is fairly common in prairies of Big Cypress National Preserve.

Ruellia caroliniensis (J. F. Gmel.) Steud.  
subsp. caroliniensis var. succulenta (Small) R. W. Long

Long (1970a) called this taxon "a distinctive ecotype, generally restricted to the Everglades region." It is an erect plant, usually purple

and with swollen hollow stems, which grows in wet places. The common Ruellia of Everglades National Park pinelands is interpreted by the authors to be Ruellia carolinensis subsp. ciliosa (Pursh) R. W. Long var. heteromorpha (Fern.) R. W. Long.

#### LENTIBULARIACEAE

##### Pinguicula pumila Michx. var. buswellii Moldenke

Moldenke (1934) described this variety, citing only two stations in Collier Co. Neither Small (1933) nor Long and Lakela (1971) regarded this taxon as distinct from P. pumila. D. and S. Black have recently collected specimens fitting the description of this taxon from the Loop Road area of Big Cypress National Preserve.

#### CUCURBITACEAE

##### Cucurbita okeechobeensis (Small) L. H. Bailey

The Okeechobee Gourd is now known from only a few localities on the southern edge of Lake Okeechobee, whereas it was once common in a forest of pond-apple (Annona glabra) trees that had covered the same range. The baseball-sized fruit is hard-shelled and keeps well, and the pulp is said to make excellent pie filling. A few south Florida naturalists cultivate the plant as a novelty, and otherwise it is close to extinction. Ward (1979) states that it is now almost entirely found in disturbed areas such as ditch banks and wet road shoulders.

#### ASTERACEAE

##### Ageratum littorale Gray

Small (1933) gave range as "sand-dune and shore hammocks, Fla. Keys and Cape Sable." Ledin (1951) found it on sandy and rocky shores of the Keys, especially Key West, and Cape Sable. Personal observations (Avery) show it growing from Indian Key to Key West. Not seen recently on Cape Sable by authors.

##### Aster concolor L. var. simulatus (Small) R. W. Long

Small (1933) gave range as "pinelands, Everglade Keys, Fla." Ledin (1951) reported that it occurs only in dry pinelands of Dade Co. Based on herbarium material (6 sheets from FTG and ENP), the taxon appears to have been fairly widespread in Dade Co. In spite of its rather striking appearance, the authors are currently aware of only a few field localities where the taxon can be found. Long (1970) cited specimens from northern and central counties of Florida, but Long and Lakela (1971) state that it is endemic to South Florida.



Borrichia x cubana Britt. & Blake

Semple and Semple (1977) found this taxon, a presumed hybrid of B. arborescens and B. frutescens, from MacArthur Causeway (Miami) at the north to the Saddlebunch Keys on the south (North of Miami, only B. frutescens was found.) Previously, the hybrid was known only from the type specimen collected near Havana, Cuba. The Flora de Cuba (Leon and Alain, 1947-63) does not list B. frutescens.

Brickellia mosieri (Small) Shinnars

Shinnars (1946) cites this taxon as "a highly restricted endemic, known from a small area in southeastern Florida." Long and Lakela (1971) cite it as a South Florida endemic, but give the name as Kuhnia eupatorioides L. var. floridana R. W. Long. It is presently known from remnant pinelands between Coral Gables and Florida City, Dade County, and is apparently not present in Everglades National Park.

Eupatorium frustratum B. L. Robinson

Ledin (1951) reported that this species is found in low places around mangrove hammocks on Cape Sable, Key Largo and the Ten Thousand Islands. Davis (1942) reported it from the Florida Sand Keys. Personal observation indicates that within the mainland portions (SW Everglades National Park) of its restricted range, this species can be quite common, often growing in partly shaded situations under Conocarpus. On the Florida Keys, it grows in small colonies and is not seen often.

Melanthera parvifolia Small

Small (1933) and Ledin (1951) recognized two species, M. parvifolia and M. radiata Small, which were lumped into a single species (M. parvifolia Small) by Long and Lakela (1971) and Parks (1973). Long and Lakela (1971) give the range as "pinelands, lime rock, coastal strand, endemic to southern Florida." Occurs in Dade Co. and on a few of the Keys.

## DISCUSSION

Comparison with list of endemics compiled by Robertson

Our list of South Florida endemics includes 65 taxa. The list compiled by Robertson (1955), based on Small (1933), contained 122 taxa. Appendix I is an annotated version of Robertson's endemic list, showing how our list differs and some of the reasons for the differences.

The major reasons for our reduction in endemics from Robertson's list are: (1) J. K. Small was a taxonomic "splitter," many of whose taxa have been "lumped" with non-endemics by more recent taxonomic treatments. (2) Additional collecting

in West Indian islands has resulted in finding "former South Florida endemics" outside South Florida. (3) Increasingly broad and intensive taxonomic work in recent years has resulted in the merging of South Florida taxa with West Indian taxa, both of which had formerly been studied in relative isolation.

We would like to stress the tentative nature of our analysis of endemics and mention the continuing need for additional taxonomic work by specialists to clarify relationships between West Indian and South Florida taxa.

#### Relative richness in endemics of South Florida vegetation types

Table 1 summarizes vegetation categories in which taxa endemic to South Florida are found. Table 2 presents the total number of endemics found in each vegetation category and a rough estimate of the percentage of total area of Dade, Monroe, and Collier counties (where the endemics are concentrated) covered by each vegetation category.

The Miami Rock Ridge pineland, between South Miami and Mahogany Hammock in Everglades National Park, is notably rich in endemics. It provides habitat for 32 endemic taxa, one-half of the South Florida endemics. Of the 32, 17 are confined to the Miami Rock Ridge pinelands. Others are shared with pinelands of the Florida Keys, pinelands of Collier County, and/or adjacent prairies. Coastal uplands, pinelands of the Lower Florida Keys, and tropical hardwood hammocks are moderately rich in endemism in relation to their area. Coastal lowland (including the extensive mangrove zone of South Florida) and freshwater wetland (including the Everglades marshes) are notably underrepresented by endemics.

#### South Florida endemism in relation to geologic history

The presence in South Florida of approximately 65 endemic plant taxa, about 4% of the total flora, is of special interest since the entire area was under the sea as recently as 70,000 years B.P. (before present) or less. There seems to be little controversy concerning the fact that South Florida was under water during the Sangamon Interglacial period until the onset of the Early Wisconsin glacial period about 70,000 years ago (Richards, 1965; Hoffmeister, 1974). Another incursion of the sea may have occurred during a major interglacial period about 35,000 B.P., between the Early and Late Wisconsin Glacial periods. During full glacial times, the sea level had dropped to a depth of about 135 m below its present stand and all present continental shelf areas lay out of the water. South Florida was approximately twice as wide then as it is now (Fairbridge, 1974). Clearly, most of South Florida was upland during the glacial periods, probably being without extensive wetland areas and with extensive limestone bedrock at or near the surface. The oldest radiocarbon dates recorded for peat deposits from the Everglades and from mangrove swamps are approximately 5000 years old (Gleason, et al., 1974). According to Fairbridge (1974), sea level rose concurrently with glacial retreat until about 6000 years ago and has since been oscillating. His scenario (Fairbridge, 1974, Table 1) includes a rise in sea level to up to 4 m above the present one during the period of 6000-4700 B.P. In contrast, Scholl, Craighead, and Stuiver (1969) present evidence that sea level in South Florida has been rising continuously during the past 7000 years.

Long (1974) interpreted the geological evidence as indicating that the South Florida flora is "only about 5,000-3,000 years old at most." His interpretation apparently gives major weight to Fairbridge's hypothesized 4 m rise in sea level (6000-4700 B.P.), which would have put most of South Florida under water.

Because of the tentative nature of the geological record of Holocene sea level in relation to the extremely flat expanse of South Florida, the only conclusion that can be drawn regarding the time available for evolution of endemic plants in South Florida is that it has been between 5,000 and 70,000 years. The wetland ecosystems of South Florida were definitely a minor component of the vegetation mosaic until about 5000 years ago. Coastal habitats have existed continually, of course, but have only been fairly stable for the past 5000 years or so. Upland habitats, probably quite similar to that occupied by Miami Rock Ridge pinelands at present, have been quite extensive in South Florida for most of the past 70,000 years, but may have been inundated about 35,000 and 5,000 years ago. The richness of endemism in present pinelands would seem to suggest that upland refugia existed at least during the most recent sea level high.

#### Conservation of South Florida endemics and "near-endemics"

As stated in the introduction, a major reason for this report is to assist efforts at conserving the element of the South Florida flora which is most in need of protection. In spite of the fact that 39% of the land area of Dade, Monroe and Collier counties is included in Everglades National Park, Big Cypress National Preserve, or Biscayne National Monument, only 30-32 of 65 endemic taxa occur within the boundaries of those parks. Most endemic taxa occur in unprotected rockland pinelands or coastal situations, which are the sites which have undergone the most modification during the 20th century.

Table 1 indicates which endemic taxa occur within the boundaries of national parks, and for those which do not, which ones are believed by the authors to be in critical need of special measures to preserve what populations may survive. One-fourth of the endemic South Florida plant taxa are in immediate danger of extinction. Further discussion of this problem is included in Loope, Black, Black, and Avery (1979) and in Loope and Avery (1979). More information is clearly needed concerning taxa not protected in national parks.

For purposes of conservation in South Florida, there is a need for analysis of distribution and status of certain species which, though not endemic to South Florida, have a major portion of their range within South Florida and may ultimately depend upon the South Florida portion of their range for survival. Two major distribution patterns are apparent to the authors for such species: Florida endemics and taxa held in common by South Florida and the Bahama Islands. Many taxa formerly thought to be South Florida endemics are now classed in these two categories. In most cases, we are unaware of their detailed range and status outside South Florida. In some cases, they may have an extremely limited range outside South Florida. Examples of taxa which need analysis include the following: Cereus gracilis var. simpsonii, Warea carteri, Acacia pinetorum, Verbena maritima, Colubrina cubensis var. floridana, Ipomoea microdactyla, and Ernodea littoralis var. angusta.

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Table 1. Habitat and conservation status of endemic plant taxa of South Florida. Where taxon occurs in several habitats, underlined symbol denotes primary habitat.

Legend for habitat:

- PM = Miami Rock Ridge pineland
- PK = Pineland of Lower Florida Keys
- PB = Pineland of Big Cypress Swamp and Collier Co.
- H = Tropical hardwood hammocks
- MP = Muhlenbergia-dominated prairie or other prairie with short (3-4 months or less) hydroperiod.
- WP = Freshwater wetland, prairie inundated 5-6 months or more
- TS = Taxodium strands, domes, or prairies.
- CU = Coastal upland (dunes or other rarely inundated site)
- CL = Coastal lowland (saline, periodically inundated)
- D = Disturbed sites

Legend for Conservation Status:

- P = Substantial portion of existing populations receiving protection in National Parks.
- N = Not known to occur in National Parks (Everglades National Park, Big Cypress National Preserve, Biscayne National Monument).
- EX = Believed by authors to be in danger of imminent extinction.
- U = Known initially from very few collections and not collected for many years. Taxonomic and conservation status uncertain.

<u>Endemic taxon</u>	<u>Habitat(s)</u>	<u>Conservation Status</u>	<u>Page No. In Text</u>
Aeschynomene pratensis var. pratensis	WP	P	4
Ageratum littorale	<u>CU</u> , CL	N	13
Amorpha crenulata	PM	N, EX	5
Argythamnia blodgettii	PM, PK	P (limited)	7
Asplenium x biscayneanum	H	N, EX	2
Aster concolor var. simulatus	PM	N, EX	13
Borrichia x cubana	CL	P	14
Brickellia mosieri	PM	N, EX	14
Cassia keyensis	PK	N	5
Cereus robinii var. deeringii	H	N, EX	10
Chamaesyce conferta	<u>PM</u> , D	P	7
Chamaesyce cumulicola	CU	N	7
Chamaesyce deltoidea var. adhaerens	PM	N, EX	7
Chamaesyce deltoidea var. deltoidea	PM	N, EX	7
Chamaesyce deltoidea var. serpyllum	PK	N, EX	8
Chamaesyce garberi	PM, <u>CU</u>	P	8
Chamaesyce pinetorum	PM	P	8
Chamaesyce porteriana var. keyensis	PK, CU	N, EX	8
Chamaesyce porteriana var. porteriana	PM	P	8
Chamaesyce porteriana var. scoparia	PK	N, EX	8
Croton arenicola	PM, CU	N	8



<u>Endemic taxon</u>	<u>Habitat(s)</u>	<u>Conservation Status</u>	<u>Page No. In Text</u>
<i>Croton glandulosus</i> var. <i>simpsonii</i>	PM	N, U	9
<i>Cucurbita okeechobeensis</i>	D	N, EX	13
<i>Cyperus blodgettii</i>	H	N, EX, U	3
<i>Digitaria pauciflora</i>	MP	P	3
<i>Dyschoriste oblongifolia</i> var. <i>angusta</i>	<u>PM</u> , PB	P	12
<i>Elytraria caroliniensis</i> var. <i>angustifolia</i>	<u>MP</u> , PB	P	12
<i>Eriochloa michauxii</i> var. <i>simpsonii</i>	CU, CL	P?, U	3
<i>Eupatorium frustratum</i>	CL	P	14
<i>Evolvulus sericeus</i> var. <i>averyi</i>	PM, PK	P	11
<i>Forestiera segregata</i> var. <i>pinetorum</i>	PM	P	11
<i>Galactia pinetorum</i>	PM	P	5
<i>Galactia prostrata</i>	PM	N, U	5
<i>Gerardia keyensis</i>	PK	N	12
<i>Hymenocallis latifolia</i>	CU, CL	P	4
<i>Hyptis alata</i> var. <i>stenophylla</i>	PM	P	12
<i>Indigofera keyensis</i>	CU	N	5
<i>Jacquemontia curtisii</i>	PM, PB	P	11
<i>Jacquemontia reclinata</i>	CU	N, EX	11
<i>Lantana depressa</i>	PM	P	11
<i>Lechea lakelae</i>	CU	N, EX	10
<i>Linum arenicola</i>	PM, <u>PK</u>	N	6
<i>Linum carteri</i> var. <i>carteri</i>	PM, PB?	N, EX?	6

<u>Endemic taxon</u>	<u>Habitat(s)</u>	<u>Conservation Status</u>	<u>Page No. In Text</u>
<i>Linum carteri</i> var. <i>smallii</i>	PM, PB, D	P	6
<i>Ludwigia spathulifolia</i>	WP	P	10
<i>Melanthera parvifolia</i>	PM, PK	P	14
<i>Myrcianthes fragrans</i> var. <i>simpsonii</i>	H	P	10
<i>Opuntia eburnispina</i>	CU	N, U	10
<i>Peperomia floridana</i>	H, TS	P	4
<i>Persicaria paludicola</i>	WP	N, U	4
<i>Phyllanthus pentaphyllus</i> var. <i>floridanus</i>	PM, PK	P	9
<i>Pinguicula pumila</i> var. <i>buswellii</i>	WP	P? U	13
<i>Poinsettia pinetorum</i>	PM	P	9
<i>Polygala smallii</i>	PM	N, EX	7
<i>Ruellia caroliniensis</i> var. <i>succulenta</i>	MP	P	12
<i>Salvia blodgettii</i>	H	N, EX	12
<i>Schizachyrium rhizomatum</i>	MP, PM, PB	P	3
<i>Schizachyrium sericatum</i>	PK	N, EX?	3
<i>Spiranthes lanceolata</i> var. <i>paludicola</i>	TS	N	4
<i>Stillingia sylvatica</i> ssp. <i>tenuis</i>	PM	P	9
<i>Tectaria x amesiana</i>	H	N, EX	2
<i>Tephrosia angustissima</i>	PM	N, EX	5
<i>Tephrosia seminole</i>	PB	N, U	6
<i>Tragia saxicola</i>	PM, PK	P	9
<i>Tripsacum floridanum</i>	<u>PM</u> , PB	P	3

Table 2. Number of endemics found in selected vegetation categories in relation to rough estimate of the percentage of the total area of Dade, Monroe and Collier Cos. currently covered by that category.

<u>Vegetation Category</u>	<u>Number of endemics found in vegetation category</u>		<u>% of total area covered by vegetation category</u>
	(number restricted to that vegetation category in parentheses)		
Miami Rock Ridge pineland (PM)	32	(17)	1
Pineland of Lower Florida Keys (PK)	14	(5)	1
Pineland of Big Cypress and Collier Co. (PB)	8	(1)	5-10
Tropical hardwood hammocks (H)	9	(6)	1
<u>Muhlenbergia prairie</u> (MP)	4	(1)	10
Freshwater wetland (WP)	4	(4)	30-35
<u>Taxodium strands, domes, or prairies</u> (TS)	2	(0)	5-10
Coastal upland (CU)	11	(5)	3
Coastal lowland (CL)	5	(2)	15
Disturbed sites (D)	3	(0)	20-25

Appendix I. Annotated version of Robertson's (1955) list of South Florida endemics, showing differences from our list.

LIST OF ENDEMIC PLANTS OF SOUTH FLORIDA (after Small, 1933)

(Ranges largely restricted to area including Dade,  
Broward, Collier and Monroe Counties)

Key

- \* - principally occurring in pine forests  
 \*\* - principally occurring in Everglades marshes  
 \*\*\* - principally occurring in tropical hammock forests

Numbers in parenthesis are page references in Small (1933)

- E - indicates that taxon is considered endemic in 1979  
 X - indicates that taxon is not considered endemic in 1979

	<u>1955 List</u>	<u>1979 Annotation</u>
Poaceae		
E (37)	* <u>Tripsacum floridanum</u> Porter	= <u>T. floridanum</u> Porter ex Vasey
E (51)	* <u>Syntherisma pauciflorum</u> A. Hitchc.	= <u>Digitaria pauciflora</u> Hitchc.
Cyperaceae		
X (150)	*** <u>Cyperus litoreus</u> (Clarke) Britton	= <u>C. pollardii</u> Britt. (Horvat, 1941) which ranges to N.C. and Cuba.
X (152)	** <u>C. Winkleri</u> Britton and Small	= <u>C. pollardii</u> Britt. (Horvat, 1941)
E (153)	*** <u>C. Blodgettii</u> "Torr."	= <u>C. blodgettii</u> Britt.
X (159)	* <u>Stenophyllus Carteri</u> Britton	= <u>Bulbostylis ciliatifolia</u> (Ell.) Fern. var. <u>coarctata</u> (Ell.) Kral (Kral, 1971) which ranges to Cuba.
X (173)	* <u>Dichromena floridensis</u> Britton	Has been found throughout Bahama Islands.
Arecaceae		
X (240)	*** <u>Sabal Jamesiana</u> Small	= <u>S. palmetto</u> (Walt.) Lodd. ex Schult., which ranges N to N.C.

1955 List1979 Annotation

## Bromeliaceae

X (271) \*\*\* Tillandsia hystricina Small= T. fasciculata Sw. var. densispica Mez, which ranges to Mexico, C. Amer., and W.I.

## Leucojaceae

X (319) \*\*\* Agave decipiens Baker

Believed to have been brought to Fla. from Yucatan (Standley, 1930).

E (322) Hymenocallis keyensis Small= H. latifolia (Mill.) Roem.X (323) H. Collieri Small= H. latifolia, same as above.

## Orchidaceae

X (377) \* Limodorum pinetorum Small= Calopogon multiflorus Lindl., which ranges N to Miss., Ala., Ga.

## Piperaceae

E (401) \*\*\* Rhynchosporum floridanum Small= Peperomia floridana Small

## Ulmaceae

X (442) \*\*\* Trema floridana Britton= T. micranthum (L.) Bl. Ranges S to W.I., Mexico, and Argentina (Adams, 1972).

## Polygonaceae

X (450) \* Polygonella brachystachya Meisn.= P. polygama (Vent.) Engelm. & Gray, which ranges N to N.C.E (457) \*\* Persicaria paludicola Small

## Pisoniaceae

X (490) \*\*\* Torrubia globosa Small= Guapira discolor (Spreng.) Little (Little, 1976), which ranges to West Indies.

1955 List1979 AnnotationX (490) \*\*\* T. floridana Britton= Guapira floridana (Britt.) Lundell;  
Possibly = Guapira discolor, but  
status has apparently never been  
disputed; collected only once on  
Rock Key, 12 mi. W of Key West  
and probably now extinct.

## Papaveraceae

X (548) Argemone leiocarpa Greene= A. mexicana L. forma leiocarpa  
(Greene) G. B. Ownbey

## Brassicaceae

X (574) \* Warea Carteri SmallRanges N to Brevard and Polk counties;  
may be = W. cuneifolia (Muhl.) Nutt.  
which ranges N to S.C. and Ala.

## Amygdalaceae

X (646) \* Geobalanus pallidus Small= Licania michauxii Prance, which  
ranges N to Miss. and Ga. (Prance, 1970).

## Mimosaceae

X (654) \* Vachellia peninsularis Small= Acacia pinetorum Hermann, which  
is also present in West Indies.X (655) \* V. insularis Small= Acacia pinetorum HermannX (657) \* Leptoglottis angustisiliqua Britton  
and Rose= Schrankia microphylla (Dryand.) Standl.  
which ranges N to Va.

## Cassiaceae

E (663) \* Chamaecrista keyensis Pennell= Cassia keyensis (Penn.) Macbr.X (663) \* C. Deeringiana Small and Pennell= Cassia deeringiana (Small & Penn.)  
Macbr. which ranges N into central Fla.



1955 List1979 Annotation

## Fabaceae

- E (690) \* Amorpha crenulata Rydb.
- X (694) \*\*\* Parosela floridana Rydb. = Dalea carthaginensis (Jacq.) Macbr. subsp. domingensis (DC.) Clausen, which ranges to West Indies
- E (698) \*\*\* Indigofera keyensis Small
- X (706) \* Cracca rugelii (Shuttlw.) Heller = Tephrosia rugelii Shuttlew. ex B.L. Robins., which is a species of north and central Florida.
- X (707) \* C. corallicola Small = Tephrosia corallicola (Small) Leon, which occurs also in Cuba.
- E (708) \* C. angustissima (Shuttlw.) Kuntze = Tephrosia angustissima Shuttlew. ex Chapm.
- X (714) \* Rhynchosia cinerea Nash Ranges N through central Florida.
- X (716) \*\*\* Erythrina arborea (Chapm.) Small = E. herbacea L., which ranges W to Texas and N to N.C.
- E (719) \* Galactia prostrata Small
- E (719) \* G. pinetorum Small
- X (719) \* G. parvifolia A. Rich Present also in Cuba, Jamaica, & Hispaniola, according to Long and Lakela (1971) and Adams (1972).
- E (727) \*\* Aeschynomene pratensis Small Var. pratensis is endemic.
- X (730) \* Stylosanthes calcicola Small Recently found by Dr. D. S. Correll in Bahamas.
- Linaceae
- E (752) \* Cathartolinum arenicola Small = Linum arenicola (Small) Winkl.
- E (752) \* C. carteri Small = Linum carteri Small var. carteri

1955 List1979 Annotation

## Polygalaceae

- X (766) \* Asemeia leiodes (blake) Small = Polygala grandiflora Walt. var. angustifolia T. & G., also present in Cuba and Hispaniola.
- X (766) A. cumulicola Small = Polygala grandiflora Walt. var. angustifolia T. & G.
- X (767) \*\* A. miamiensis Small = Polygala grandiflora Walt. var. angustifolia T. & G.
- X (772) \* Polygala praetervisa Chodat = P. boykinii Nutt. var. sparsifolia Wheelock, found recently by Dr. D. S. Correll to be common in the Bahamas.
- X (772) \* P. flagellaris Small = Polygala boykinii Nutt. var. sparsifolia Wheelock (Long, 1970b)
- E (773) \* Pilostaxis arenicola Small = Polygala smallii Smith & Ward
- Euphorbiaceae
- X (782) \* Croton Fergusonii Small = C. linearis Jacq. (Britton & Millspaugh, 1920)
- E (782) \* C. arenicola Small
- E (784) \* Ditaxis Blodgettii (Torr.) Pax. = Argythamnia blodgettii (Torr.) Chapm.
- E (788) \* Tragia saxicola Small
- E (789) \*\* Stillingia tenuis Small = S. sylvatica L. subsp. tenuis (Small) Rogers
- E (794) Chamaesyce cumulicola Small
- X (794) \* C. Chiogenes Small = C. blodgettii (Engelm. ex Hitchc.) Small, which occurs also in W.I., Central Amer.

1955 List1979 Annotation

- |           |                                      |  |
|-----------|--------------------------------------|--|
| X (794) * | <u>C. brachypoda</u> Small           | Probably = <u>C. garberi</u> (Engelm. ex Chapm.) Small, but is not accounted for as a synonym by Burch (1966b), Webster (1967), or Long and Lakela (1971). |
| X (795) * | <u>C. mosieri</u> Small              | = <u>C. garberi</u> (Engelm. ex Chapm.) Small  |
| E (795)   | <u>C. garberi</u> Small              | = <u>C. garberi</u> (Engelm. ex Chapm.) Small  |
| E (795) * | <u>C. serpyllum</u> Small            | = <u>C. deltoidea</u> (Engelm. ex Chapm.) Small subsp. <u>serpyllum</u> (Small) Burch  |
| E (795) * | <u>C. adhaerens</u> Small            | = <u>C. deltoidea</u> subsp. <u>deltoidea</u> (Engelm.) Burch var. <u>adhaerens</u> (Small) Burch  |
| E (795) * | <u>C. deltoidea</u> (Engelm.) Small  | = <u>C. deltoidea</u> subsp. <u>deltoidea</u> var. <u>deltoidea</u>  |
| E (795) * | <u>C. porteriana</u> Small           | = <u>C. porteriana</u> Small var. <u>porteriana</u>  |
| E (795) * | <u>C. scoparia</u> Small             | = <u>C. porteriana</u> var. <u>scoparia</u> (Small) Burch  |
| X (796)   | <u>C. adicioides</u> Small           | Probably = <u>C. porteriana</u> var. <u>keyensis</u> (Small) Burch, but this needs confirmation.   |
| E (796)   | <u>C. keyensis</u> Small             | = <u>C. porteriana</u> var. <u>keyensis</u> (Small) Burch  |
| E (796) * | <u>C. pinetorum</u> Small            |  |
| X (797)   | <u>C. mathewsii</u> Small            | = <u>C. maculata</u> (L.) Small (Wheeler, 1939), a widespread weed.  |
| E (797) * | <u>C. conferta</u> Small             |  |
| X (797) * | <u>C. adenoptera</u> (Bertol.) Small | = <u>C. adenoptera</u> subsp. <u>pergamena</u> (Small) Burch, has been also found in Cuba, Hispaniola.   |

1955 List1979 Annotation

## Dodonaeaceae

X \*(821). \*\*\* Dodonaea microcarya Small

= D. viscosa (L.) Jacq. var. arborescens (Cunn.) Sherff forma eleagnoides (Rudolphi ex Ledeb. & Adlerst.) Brizicky. Very similar material from the Bahamas is labelled D. ehrenbergii Schlechtend. at Fairchild Tropical Garden herbarium.

## Sapindaceae

(827) \*\*\* Cardiospermum keyense Small

= C. corindum L. (Long and Lakela, 1971), which occurs also in West Indies.

## Turneraceae

X (877) \*\* Piriqueta glabrescens Small

= P. caroliniana (Walt.) Urb. var. glabra (DC.) Urb.

## Cistaceae

X (883) \* Lechea exserta Small

= L. sessilifolia Raf., which ranges N to S.C. (Hodgdon, 1938; Wilbur, 1974.)

## Opuntiaceae

X (902) \*\*\* Opuntia abjecta Small

= O. triacantha (Willd.) Sweet, which occurs also in West Indies (Long and Lakela, 1971).

E (903) O. eburnispina SmallX (904) O. ochrocentra Small

= O. cubensis Britt. & Rose, according to Long and Lakela (1971). O. cubensis occurs in Cuba, according to Leon and Alain (1947-63). We believe that O. ochrocentra = O. stricta var. dillenii (Ker.-Gawl.) L. Benson.

	<u>1955 List</u>	<u>1979 Annotation</u>
X (905)	<u>O. atropensis</u> Small	= <u>O. stricta</u> Haw. var. <u>dillenii</u> (Ker-Gawl.) L. Benson, a widespread species (Long and Lakela, 1971).
X (906) *	<u>O. austrina</u> Small	= <u>O. humifusa</u> (Raf.) Raf. var. <u>austrina</u> (Small) Dress; Long and Lakela (1971) call the taxon <u>O. compressa</u> var. <u>austrina</u> , which ranges to La. & S.C. Dress (1975) put <u>O. compressa</u> into synonymy with <u>O. humifusa</u> .
X (907)	<u>O. cumulicola</u> Small	= <u>O. humifusa</u> (Raf.) Raf. var. <u>austrina</u> Small, but this opinion of the authors needs confirmation.
X (907) ***	<u>O. keyensis</u> Britton	= <u>O. stricta</u> Haw. var. <u>dillenii</u> (Ker-Gawl.) L. Benson, a wide-ranging taxon, according to Long and Lakela (1971)
X (908) ***	<u>O. tenuiflora</u> Small	= <u>O. stricta</u> Haw. var. <u>dillenii</u> (Ker-Gawl.) L. Benson, in the opinion of the authors.
X (910)	<u>O. zebrina</u> Small	= <u>O. stricta</u> Haw. var. <u>dillenii</u> (Ker-Gawl.) L. Benson, a wide-ranging species, according to Long and Lakela (1971).
X (912) ***	<u>Consolea corallicola</u> Small	= <u>Opuntia spinosissima</u> (Martyn) Mill., according to Long and Lakela (1971). This species also occurs in Jamaica (Adams, 1972).
X (915) ***	<u>Acanthocereus floridanus</u> Small	= <u>Cereus pentagonus</u> (L.) Haw., a wide-ranging species, according to Long and Lakela (1971).
X (916) ***	<u>Harrisia Simpsonii</u> Small	= <u>Cereus gracilis</u> Mill. var. <u>simpsonii</u> (Small) L. Benson, reduced to synonymy by Benson (1969). A near endemic which ranges N to the Tampa Bay area according to Lakela et al. (1976).

1955 List1979 Annotation

- E (917) \*\*\* Cephalocereus Deeringii Small = Cereus robinii (Lem.) L. Benson var. deeringii (Small) L. Benson, reduced to synonymy by Benson (1969).
- X (917) \*\*\* C. keyensis Britton & Rose = Cereus robinii (Lem.) L. Benson var. robinii (Benson, 1969), which also occurs in Cuba (Long and Lakela, 1971).
- Myrtaceae
- X (935) \*\*\* Eugenia anthera Small = Eugenia foetida Pers., a widespread species (Little, 1978).
- E (936) \*\*\* Anomomis simpsonii Small = Myrcianthes fragrans (Sw.) McVaugh var. simpsonii (Small) R. W. Long
- X (936) \*\*\* A. dicrana (Berg.) Britton = Myrcianthes fragrans (Sw.) McVaugh var. fragrans (Long, 1970b), which is widespread in tropical America.
- Epilobiaceae
- E (943) \*\* Ludwigia spathulifolia Small
- X (952) Gaura simulans Small = G. angustifolia Michx., which ranges N to N.C.
- Ebenaceae
- X (1030) \*\*\* Diospyros Mosieri Small = D. virginiana L., widespread in eastern U.S.
- Oleaceae
- E (1040) \* Forestiera pinetorum Small = F. segregata (Jacq.) Krug & Urb. var. pinetorum (Small) M. C. Johnst.
- Apocynaceae
- X (1061) \* Urechites pinetorum Small = U. lutea (L.) Britt. var. sericea R. W. Long, which also occurs in West Indies.



1955 List1979 Annotation

- X (1062) \* Rhabdadenia corallicola Small = Angadenia sagraei (A.DC.) Miers, found also in Bahamas.

## Convolvulaceae

- X (1082) \* Evolvulus macilentus Small = E. sericeus Sw. var. glaberrimus Robins., also known from Belize (Ward, 1968).
- E (1089) \* Jacquemontia curtissii Peter = J. curtissii Peter ex Hall. f.

## Heliotropiaceae

- X (1132) Heliotropium phyllostachyum Torr. = H. fruticosum L., which is widespread in West Indies and Central Amer.
- X (1132) \* H. Leavenworthii Torr. = H. polyphyllum Lehm. var. leavenworthii Gray, ranges N to Taylor and Volusia counties, Fla. (Ward and Fantz, 1977).
- X (1132) \* H. horizontale Small = H. polyphyllum Lehm. var. polyphyllum, present also in South America (Ward and Fantz, 1977). We believe that H. horizontale = H. polyphyllum var. leavenworthii Gray.

## Verbenaceae

- X (1138) Glandularia maritima Small = Verbena maritima Small, which ranges N to St. Johns Co. (Moldenke, 1971).
- E (1142) \* Lantana depressa Small

## Lamiaceae

- E (1163) \*\*\* Salvia blodgettii Chapm. More information needed; may be extinct since Small (1933) gave range as "Hammocks, Key West, Fla.," a habitat which no longer exists.

1955 List1979 Annotation

## Rhinanthaceae

E (1220) \* Agalinis keyensis Pennell = Gerardia keyensis (Penn.) Penn.

## Acanthaceae

E (1227) \*\* Tubiflora angustifolia (Fernald) Small = Elytraria caroliniensis (J. F. Gmel.) Pers. var. angustifolia (Fern.) Blake

E (1228) \* Dyschoriste angusta (A. Gray) Small = D. oblongifolia (Michx.) Kuntze var. angusta (Gray) R. W. Long

E (1228) \*\* Ruellia succulenta Small = R. caroliniensis (J. F. Gmel.) Steud. subsp. caroliniensis var. succulenta (Small) R. W. Long

X (1229) \* Gerardia floridana (A. Gray) Small = Stenandrium dulce (Cav.) Nees var. floridanum Gray, which ranges N to Citrus and Osceola counties, Fla. (Long, 1970a).

## Rubiaceae

X (1256) \* Houstonia filifolia (A. Gray) Small = Hedyotis nigricans (Lam.) Fosb. var. filifolia (Cham.) Shinnery, also found in Texas, Ala., Mo.

X (1264) \* Borreria terminalis Small = Spermacoce verticellata L., also of trop. Amer. and trop. Afr. (Wunderlin, 1979).

X (1265) Spermacoce keyensis Small = S. tenuior L., widespread in trop. Amer. (Wunderlin, 1979).

## Carduaceae

X (1315) \* Vernonia Blodgettii Small Range has been extended to include northern Bahamas (Gillis and Proctor, 1975).

E (1320) Ageratum littorale A. Gray

E (1320) \*\*\* Osmia frustrata (B. L. Robinson) Small = Eupatorium frustratum B. L. Robins.

1955 List1979 Annotation

- E (1329) \* Kuhnia Mosieri Small = Brickellia mosieri (Small) Shinners
- X (1341) \* Pityopsis Tracyi Small = Heterotheca graminifolia (Michx.)  
Shinners var. tracyi (Small) R. W. Long,  
which ranges N to Flagler Co.
- E (1384) \* Aster simulatus Small = Aster concolor L. var. simulatus  
(Small) R. W. Long
- E (1384) \* Melanthera parvifolia Small
- X (1419) \*\* M. radiata Small = M. parvifolia Small, same as  
above (Parks, 1973).
- X (1463) Flaveria latifolia (J. R. Johnst.)  
Rydb. = F. linearis Lag. var. latifolia  
J. R. Johnst., which ranges N to  
Volusia and Taylor counties  
(Ward, 1968b).
- X (1483) \*\* Cirsium vittatum Small = C. horridulum Michx. var. vittatum  
(Small) R. W. Long, for which the  
range has been extended into the  
Bahamas (Hill, 1976).