Tidal Marsh Plants

L. N. Eleuterius

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An Illustrated Guide to

TIDAL MARSH PLANTS OF MISSISSIPPI

and Adjacent States

by

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This book is dedicated to
Mrs. Della McCaughan
who with sincere concern for her students
saw the value of drawing the dinosaurs.

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PREFACE

This is a resource book about Mississippi, specifically the tidal marshes of coastal Mississippi. It is my way of sharing my knowledge which was obtained from difficult field work and a study of the botanical literature over a long period of time. I prepared the book with special concern for the student and interested laymen, such as trappers, hunters and fishermen. The most important feature of this field guide or handbook is that it entails only plant species known by the author to occur in the tidal marshes of Mississippi. This particular array of species has not been previously published in a single book or volume. Prior to the present field guide, several large books commonly called manuals or regional floras had to be used to identify the local plants of tidal marshes. However, it was not my purpose or intent to eliminate the need of the larger publications, but rather to supplement them. These larger books cover the flora of large regions of the United States and contain hundreds or thousands of plant species not found in local tidal marshes. It is not expedient, efficient or wise to carry large, bulky, heavy and costly publications, some of which entail a 2 or 3 volume set, on field trips. Large reference books are simply inappropriate for field use. Yet, I often realized the need for a handy, reliable, easily used field guide in working in local tidal marshes. My intent was to prepare a light, small, pocket-sized guide or handbook for field use in our area of the Gulf coast. The present handbook fulfills this need. Of course, it will also be used on field trips and in laboratory work during my course on Salt Marsh Plant Ecology. The several large, regional floras will be used as general or additional references. I suggest that others adopt this practice. Furthermore, floras based only on written descriptions make identifying plants an awesome task for some individuals and at least burdensome for others. The illustrations in the present guide bridge this gap because they provide a rapid means of familiarization and reference, characteristics which make the guide particularly useful in the field.

Hopefully the guide will also be an aid to decision making in salt marsh management. A better knowledge of the local tidal marsh flora will definitely lead to a better appreciation for this natural resource and probably stimulate interest in botanical research in our salt marshes.

A good drawing is usually more helpful in identification of plants than a photograph. The latter is a record of a single moment, often subject to the vagaries of chance, focus, angle, light and the limitations of the film type used. Conversely, a line drawing is often a composite of much past scientific experience in which the important can be emphasized and the irrelevant edited out. Many of the plant parts illustrated also have labels, making the guide an instructional manual or a kind of textbook.

The line drawings of plants used in this book are all original and were prepared from living specimens whenever possible or from herbarium materials. Sometimes photographs were used in conjunc tion with dried plant specimens. Many of the drawings are of plants as they appear on herbarium sheets. Often plants must be bent to be mounted on herbarium sheets. Many of the drawings are of bent plants. This is not a distraction, since a larger illustration can be accommodated in a small space. The illustrations are scientific drawings and a great effort was made to avoid "arty" stylized representations which did not conform to nature. However, I tried to make certain that all were as aesthetically pleasing as possible.

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INTRODUCTION

USE OF THE GUIDE

This field guide has been prepared for individuals with some basic knowledge of plants. A good basic course in botany should be sufficient. If you have no previous training in botany, get a good general botany text from your library and learn the parts of a plant, especially flower structure. Try to learn how to distinguish a single flower from a cluster or head and a simple leaf from a leaflet of a compound one. Some effort may be required to obtain the basic knowledge to proficiently use this book. On the other hand, the more botanical knowledge you possess or obtain the easier it will be to use. For more detailed, thorough or advanced knowledge of plant taxonomy or plant systematics check Jones and Luchsinger (1979), Benson (1957) or Lawrence (1955).

A glossary of taxonomic terms can be found in any of the regional floras (Godfrey and Wooten 1979, Correll and Correll 1975, Correll and Johnston 1970, Long and Lakela 1971 and Radford, Ahles and Bell 1968). There are several published glossaries of botanic terms which can be easily acquired (Stern 1966, Jackson 1971, Featherly 1954). Other references of value are Jones (1974, 1975).

This field guide is arranged so that the user can easily become familiar with the plant groups. The illustrations allow an arrangement similar to that of some wildflower books (Duncan and Foote 1975). With some study of the contents, especially the illustrations, little trouble should be encountered in locating the proper group when attempting to identify a plant species. For example, if you have a specimen that you feel reasonably certain is a grass turn to the Poaceae and begin screening the illustrations. When you locate one that looks like your specimen, check the written description. If it looks like a grass but you aren't satisfied with what you found, check the sedges in the Cyperaceae.

Sometimes a species can only be identified by shape, markings or special features of mature seeds. In such cases, a microscope or at least a good hand lens, will be needed. It is often difficult to collect specimens with mature seeds because they are soon released after reaching maturity. Immature seeds may prevent identification of some plant species.

If you think you have a plant species collected from local tidal marshes and you do not find it in this book and you want to know its identity, place the specimen between several sheets of newspaper and put some books or a weighted cardbox on top of it. Leave the weighted or pressed specimen in a dry place for a few days. Be certain that the specimen you prepare contains flowers or seed, if at all possible. When dry, wrap the sheet of newspaper containing the specimen between pieces of cardboard and mail it to: Herbarium, Botany Section, Gulf Coast Research Laboratory, Ocean Springs, Mississippi 39564. Enclose or attach a note or letter telling when and where the specimen was collected and, of course, your name and address. The identity of the plant species will be determined and the scientific name sent back to you.

SCOPE OF THE GUIDE

This field guide covers 200 plant species which inhabit the tidal marshes of Mississippi. The species coverage is essentially an expansion and refinement of a list published by Eleuterius and McDaniel (1978). Since field work was a continuous process while preparing the list of plants and corresponding illustrations to be used in the book, approximately 220 species were collected. In evaluating what plant species to include in the book, I choose those species which are most apt to be encountered. This evaluation was based on my 12 years of professional botanical experience of studying plants in Mississippi's coastal marshes. Therefore "new" or previously undetected plant species may yet be found. However, this handbook contains all the major or most abundant plant species composing the vegetation of local tidal marshes and many that are infrequently found. A few plant species included are relatively rare. Illustrations and written descriptions for three fern species, one gymnosperm, 89 monocots, 107 dicots are included. Sixty-three (63) plant families, including 122 genera are arranged phylogenetically by family and alphabetically by genus. Illustrations are provided to help the user, especially high school and college students and the layman. However, I'm certain that professional zoologists will find the illustrations especially helpful and beneficial to their work, allowing many of my zoologist friends to become "experts" on these plants.

The plant families represented by a large number of species are the Poaceae (18), Cyperaceae (27) and Asteraceae (15). There are generally several drawings depicting each plant species. One drawing shows the entire plant, plant habit or a major portion of the plant, which would leave no doubt as to its form and appearance. An inflorescence, flower cluster and fruit or seed are also included if the structure is necessary or helpful for identifying the plant species. Taxonomic characteristics which can not be illustrated, such as color, linear measurements, frequency and place of occurrence are found in the written description on the page opposite the illustrations. Some closely related species can not be separated on drawings alone; the descriptions must be read and compared.

As systematic or taxonomic knowledge increases or improves, revisionary changes may be necessary in describing or interpreting any flora. Furthermore, a close scrutiny of any species generally reveals peculiarities previously unknown. These facts are important in understanding the biology of the species, which directly relate to taxonomic relationships. For example, recently during an extensive study of Juncus roemerianus, it was discovered that the species was composed of two kinds of plants based on flower types (Eleuterius 1974, Eleuterius and McDaniels 1974) which lead to a new description of the species (Eleuterius 1978). Close examination of other plant species or groups of species found in tidal marshes, many of which may be expanded to include entire genera, will surely reveal new and important information. Genera needing

special attention because of the wide variations in characteristics and thus difficulty in identification are: Polygonum, Sesbania, and Ludwigia. I strongly suggest that any revisionary work on these genera should include extensive plant collections from tidal marshes.

Common names of all species are included in the Table of Contents. However, in many cases they are misleading and botanically inaccurate. For instance, the Juncaceae contains the true rushes and is known as the Rush Family. Also sedges are found in the Cyperaceae or Sedge Family. Many sedges are commonly called rushes as reflected in many of the common names. The Poaceae contains the grasses. Tidal marshes are not always composed of "marsh grass." Many sedges, rushes and other kinds of plants are often found intermixed, in mosiac patterns, swards or zones.

GENERAL DESCRIPTION OF LOCAL TIDAL MARSHES

Tidal marshes are generally found locally as part of estuaries located at the mouth of rivers, in bays or bayous or on tracts of land exposed to and bordering on Mississippi Sound and on the barrier and other smaller islands. Once you gain familiarity with the plants in this guide and their general localities, you will realize that more plant species occur in the very low salinity portions of brackish marshes and in the adjacent freshwater marshes into which they grade, than in the more saline tidal marshes. A similar situation occurs along the upper edge of saline or brackish marshes where more plant species are found than near the water's edge. Therefore, if one travels up a saline bayou they will continuously encounter more plant species composing the vegetation until it grades into freshwater swamp. Similarly, if one travels from the water's edge to the upland tree line, an increasing number of plant species will be found.

Many of the plant species found in freshwater marshes also extend down into brackish marshes because they have some tolerance to salt. The extent of their distribution downstream varies in relation to individual plant tolerances, some plants having greater ability than others to tolerate salt. Some plant species also have a greater capacity for submergence than others, thus more species are generally found on slightly higher ground and in the upper edge of tidal marshes, than in the lower more frequently flooded areas.

There are some unique, relatively small areas known as salt flats or salt pans which have sandy soils and surface configurations which often trap tidal waters. Through evaporation of this entrapped water, hypersaline soil waters are produced. Around and on these salt flats a very specialized flora exists. These plant species generally have a considerable tolerance for salt and many species have fleshy or thick, succulent leaves.

Juncus roemerianus, the most abundant plant species found in Mississippi and one of the major salt marsh species found in estuaries on the Gulf and south Atlantic coasts of the United States

(Eleuterius 1976), can generally be used as the indicator plant to delineate the inward extent of brackish marshes of very low salinity. Cladium jamaiscence also becomes abundant in upper regions of the tidal marsh, especially when the marsh blends or grades into swamp. In most brackish marshes, especially those in riverine estuaries, the dominant plant is J. roemerianus. Sometimes there are many other species intermixed with the rush. This is generally the case in the very low salinity marshes in the upper reaches of the estuaries. Fewer associated plant species are found downstream as the salinity increases. In some tidal marshes of relatively high salinity J. roemerianus forms almost pure stands. Spartina alterniflora generally forms a fringe or zone of variable width between J. roemerianus and open water in the more saline estuarine areas. This band of S. alterniflora is most prevalent and best developed in the lower reaches of the coastal bayous and bays and it is not well developed nor does it extend very far up the rivers, probably because of the great outflow of fresh water. For a more detailed description of the vegetational structure of tidal marshes see Eleuterius (1972).

Thus two primary factors which influence and often control or sculpture the vegetational composition of tidal marshes are: (1) tidal inundation or the indirect influence of the tides and (2) the salt content of the flooding water. Other factors such as elevation of the marsh surface and the location of the marsh in relation to the sea are also important. Additional information on the inundation and exposure of tidal marshes may be obtained from Eleuterius and Eleuterius (1979).

Freshwater tidal marshes are those located on the extreme inland limit of tidal marshes. These marshes are influenced by tides in two ways: (1) by the backing up or restricting of the discharge or outflow of river water which causes flooding of these marshes by fresh water and (2) by the periodic intrusion and influence of salt on the plants. Generally freshwater flooding occurs during the spring. Freshwater marshes are occasionally flooded by salty waters during the summer and fall. Inundation by salt water generally occurs once to several times annually, especially during droughts. The freshwater marshes included here are directly and indirectly under the influence of the tides and are appropriately referred to as freshwater tidal marshes.

PHENOLOGY

Most vegetative growth of plant species within the tidal marshes of Mississippi occurs from March to November annually. Some species begin vegetative growth earlier than others. Flowering phenology is similar to vegetative phenology in that some species flower earlier or later than others. Generally the grasses (Poaceae) and composites (Asteraceae) produce flowers in late summer or fall. The length of anthesis, which is the period of flowering, varies between plant species. Some species produce

flowers over a much longer period of time than others. There is a definite group or array of different kinds of plants forming the spring flowering group. Another group produces flowers in summer, with some overlap of species from the spring and fall flowering groups. You will not find all of the plant species listed in this book in flower at any one time. Time of occurrence and length of anthesis for most of the plant species contained in this guide are unclear at this time and often inaccurately described for this region in most existing reference manuals and floras. This aspect of the vegetation of local tidal marshes is presently being resolved, but additional time for study is needed.

LIMITATIONS ON USE

Although this work is based on plant collections made in Mississippi, many of the plant species occur in the tidal marshes of south Mobile Bay, and in those westward to Bayou La Batre and beyond to the Alabama-Mississippi state line. Many of the plant species described herein also occur in the tidal marshes of southeastern Louisiana from the Pearl River, Lake Borgne, Rigolets area southward to the Mississippi River. Collections from marshes on Horn and Petit Bois islands are also included. However, the handbook was not intended for freshwater marshes out of the reach of tidal influence, or those marshes around upland ponds and inland rivers. It was not intended for roadside ditches or other wet areas like bogs or disturbed tidal marsh areas or spoil banks. Some plant species which grow in ditches or spoil deposits may also grow in pristine tidal marshes. However, because many other plant species, often weedy or exotic ones, also grow in ditches, bogs, spoil banks and ponds, any attempt to use this handbook on plants from such areas may be a frustrating experience. This book is intended for use in a precisely defined area: tidal marshes. Tidal marshes are herein synonymous with coastal salt marshes.

HISTORICAL PERSPECTIVE

When the frigates Le Badine, Le Marin and the escort Le Francois dropped anchor north of Ship Island on that cold, foggy 9th day of February in 1699 and Iberville with his 200 French colonists surveyed the bleak remote and forbidding landscape, they were unaware of the economic potential of the area. This richness lay hidden in the region's natural resources which had developed eons ago and are perpetuated and renewed by a most exquisite ecological system. Although the extent and vastness of the marine production were unknown at the time they did not go unnoticed. In the log of Iberville's flagship, Le Marin, seaman Pierre Margry recorded that the colonists first sampled oysters from the area on February 28, 1699. From this time on the colonists, subsequent settlers and their progeny relied on the shellfish, crabs, shrimp, fish and

turtle to supplement food from their small garden crops and the meager supplies from abroad.

For 150 years these coastal inhabitants remained essentially a people of the water or watermen. Their lives revolved around boats and waterways. On the banks of local bayous and rivers they established all their early homes, forts and cemeteries. Towns developed around water-front businesses, such as saw mills and seafood factories. Transportation along the coast was primarily by boat and each family had at least a small one. Tidal marshes were important to these early people as they were to the Indians. We know from recent scientific studies that Indians were harvesting oysters and clams from the waterways of tidal marshes at least 2000 years before the arrival of Iberville (Eleuterius and Otvos 1979). This fact is evident by the numerous ancient shell heaps which today dot the banks of old waterways. It is reasonable to assume that the Indians also exploited all available resources and hunted geese, ducks and other animals of these marshlands for thousands of years as the colonists and early settlers did during the eighteenth and early nineteenth century.

At the close of the eighteenth century there were probably less than 100 families living between Mobile, Alabama and New Orleans, Louisiana. The first railroad between these two cities was completed in 1869 and the harvesting of seafood started to become an incredibly profitable business. However, these were still the days of sail and the schooner. Biloxi, Mississippi became the "Seafood Capital of the World" in 1903 with the development of canned and processed seafood.

The population of this small seaport doubled from 1500 in 1881 when the industry began, to 3234 by 1890 and by 1910 the population reached 7,988. A single factory, of the several established, shipped out over 500 boxcar loads of canned shrimp and oysters annually, the equivalent of 25 trainloads of 20 cars each. The bountiful supply of seafood seemed limitless. The bays and bayous from Bon Secour and Bayou La Batre, Alabama, across the coast of Mississippi, to the Rigolets, Lake Borgne area of Louisiana and southward to the extensive salt marshes of that state, became estuarine "gold mines" yielding a bonanza of seafood.

Tongs were initially used to harvest oysters and long hand drawn seines were used to catch shrimp. These activities did not harm the oyster reefs or shrimp populations. However, with the introduction of towed dredges and trawls and engine-powered luggers, the rate and intensity of harvest increased until it bordered on outright plunder. It was then realized that these magnificent estuarine resources were produced and sustained only within definite, albeit, undefinable limits and that these limits could be exceeded. So conservation measures were developed and enforced. Tidal marshes as an integral part of estuarine ecosystems are primarily responsible, for the high productivity of the system. The end-product of this nearshore marine environment is the seafood which we harvest.

Plants which inhabit these tidal marshes provide the primary source of food or nutrients used by estuarine animals. Oysters, crabs, fish, shrimp and turtles are linked to tidal marsh plants through a complex food web. The relationship between tidal plants and estuarine animals are dependent on conditions which are just right. Mother nature fine-tuned the system and interrelations over millions of years. Tidal marsh plants also provide a protective habit for many aquatic animals. Stems and leaves baffle waves and water currents and consequently still the waters. A large number of stems and leaves also increase exponetially, the surface area available for animals to attach themselves, thereby providing a safe haven for many more animals than could be accommodated on a flat surface, such as a mud flat. A vegetated surface also provides more hiding places than a flat surface.

Marine scientists know that tidal marsh plants grow very fast and produce a large amount of plant material within a relatively short period of time. Their high rate of photosynthesis and metabolism probably contributes significantly to the purification of the air. Plants of tidal marshes filter our coastal waters by the absorption of not-so-clean water through the roots, subsequently release cleansed water through the leaves. This filtering process of plants certainly contributes significantly to the maintenance of clean estuarine waters.

I like to think of the vegetation of tidal marshes as the motor that drives the estuarine ecosystem, or in view of estuarine phytoplankton, as one of the most important motors. Tidal marsh plants also provide valuable genetic material for evolutionary studies. Marshes are good places to train students in a wide array of plant sciences. We know little about the plants themselves, how they reproduce, what special properties they may possess or what use the Indians and early colonists made of them which would be of great value to us now. The latter knowledge will have to be rediscovered. Furthermore, since there is so little known about our particular assemblage of aquatic plants, I believe that certain ones may be discovered to have great medicinal value or other presently unknown but useful properties.

Knowledge must be obtained now about the arrangement, structure, ecological conditions and requirements for the production and culture of seafood, before the estuaries are ruined or greatly changed. From this information estuarine systems may be enhanced by manipulation or culture systems designed to approximate estuarine systems. Culture systems which support and economically produce oysters, shrimps, crabs and certain fish will relieve pressure on our estuaries or signal their doom.

Just as the early colonist did not realize the full potential of the local seafood supply, we still do not know the full potential of our estuaries and especially the tidal marshes. Just as technological advances and new discoveries in ways and means of harvesting seafood made the commercial development of the process economically feasible, new discoveries, technologies and awareness will once again raise the value of the tidal marshes and estuaries.

Such a synthesis of achievements take time. Research on tidal marshes is relatively new, with most studies conducted within the past two decades.

The plants of tidal marshes are also good environmental indicators of stress and pollution. In polluted marshes there is no diversity of species. Generally only one species makes up the poorly developed vegetation of polluted marshes which may have large or extensive barren areas in it or associated with it. Tidal marsh plants exposed to prolonged or continuous pollution undergo a recession or decline and eventually are separated into small, widely separate clumps.

Avoid collecting in marsh areas like the lower Escatawpa River which has been damaged by industrial effluents. Domestic sewage is also allowed to enter some tidal marshes. Check to see where the sewer outfalls are located before entering a tidal marsh for collecting plants. There are presently over 50 domestic sewage discharge points and over 70 industrial wastewater outlets located in the tidal marshes and estuaries of Mississippi. I'm distressed when I see people forced off perfectly good septic tanks and connected to a municipal, county or private subdivision sewage system which far too frequently allows raw sewage to enter some of our tidal marshes and estuaries.

Today there are a large number of people densely located on the Mississippi coast and with all the industrial, residential and commercial developments that accompany large populations, tidal marshes have come under great pressure in essentially six ways: 1. alteration, 2. pollution, 3. shoreline or waterfront facilities, 4. disturbance in the drainage basin, 5. excessive use of waterways, and 6. restricting or reducing the freshwater discharge of rivers into estuaries. The most destructive activities are forms of alteration and pollution. However, I know that some of our altered marshlands can be restored and I believe that pollution can be reversed and the low productivity of our presently polluted marshes can be increased. It will require that we clean up our surface waters and preserve and protect our sources of drinking water taken from the ground.

Presently the population of the three coastal counties is about 300,000 people. The city of Biloxi has a population of 50,000. As the human population of an area increases, the natural features of the same area are generally diminished. Each ecosystem has definite limits of resilience, beyond which, the natural system is severely altered or destroyed. History has repeatedly shown this. Our coastal area has an unknown, but definite upper limit for human population growth beyond which the entire coastal environment will begin to deteriorate. If we intend to sustain and maintain the natural environment, its resources and our present way of life the, as yet, undefined population ceiling can not be exceeded. Unaltered or undisturbed ecosystems and exceedingly large populations do not mix, especially in view of the rate of population growth versus the rate of development of estuarine technology or applied science. I point this out now, for in the not

too distant future we must make a choice between our natural resources and an ever increasing population growth. Therefore, we should be cautious about mass migrations from northern climates to the "sun belt" or mass immigrations from foreign countries, at least to our coastal area. Some ceiling on population versus drinking water supplies and other natural resources should be estimated now. This position should not be construed to be against humanity or antisocial; they are a reasonable projection and represent a concerned opinion in view of preserving our tidal marshes as a natural, functional resource and as a sequestered paradise. In doing so, the quality and the way of life peculiar to this coastal region will also be preserved.

We can no longer allow certain members of our society to drill holes through our artesian strata and pump poisons through them, with all the uncertain, yet potentially terrible consequences. This is of such over-riding importance that I can not refrain from pointing it out here. If we do not stop the practice of deep well injection and land fill disposal of chemicals we will not need to worry about tidal marshes or little else, because we will probably be totally concerned about getting a good drink of water. I predict that unless the poisons that abound today are not restricted and deep well injection stopped and landfill disposal of chemical halted, a good drink of water will be of premium value in the not too distant future along the Mississippi coast. We must redefine and redirect our conservation efforts. They are not presently in focus on the right things.

As concerned citizens you should be aware and informed of the problems of survival confronting tidal marshes, but I want to leave you with a note of optimism. Winston Churchill during the threat of world domination by the Axis powers and after the first significant allied action in World War II, stated it best: "This is not the end. It is not even the beginning of the end. But it is, perhaps the end of the beginning." There is much yet to be done. And I believe that intelligence, concern and prudent decisions regarding the coast can and will prevail, and the necessary steps carried out, so that our children's children will benefit from and enjoy this land that we love.

TIDAL MARSH PLANTS

OSMUNDACEAE

Osmunda regalis

Fronds coarse, dull green, to 1.8 m tall, clustered in large tussocks, bipinnate, dimorphic; on fertile fronds, the upper pinnae transformed into sporangia; pinnules alternate 7-10, widely spaced, about 4X as long as wide; pinnae 5-10 pairs, subopposite; petioles equal to or shorter than the blade; sporangia in small clusters. Found in brackish marsh generally increasing in numbers with a decrease in salinity. Full sun. Found frequently in riverine marshes intermixed with Juncus roemerianus and other marsh plants. Also found at slightly higher elevations along the periphery of more saline marshes or in transition zones from marshes to uplands.

ASPIDIACEAE

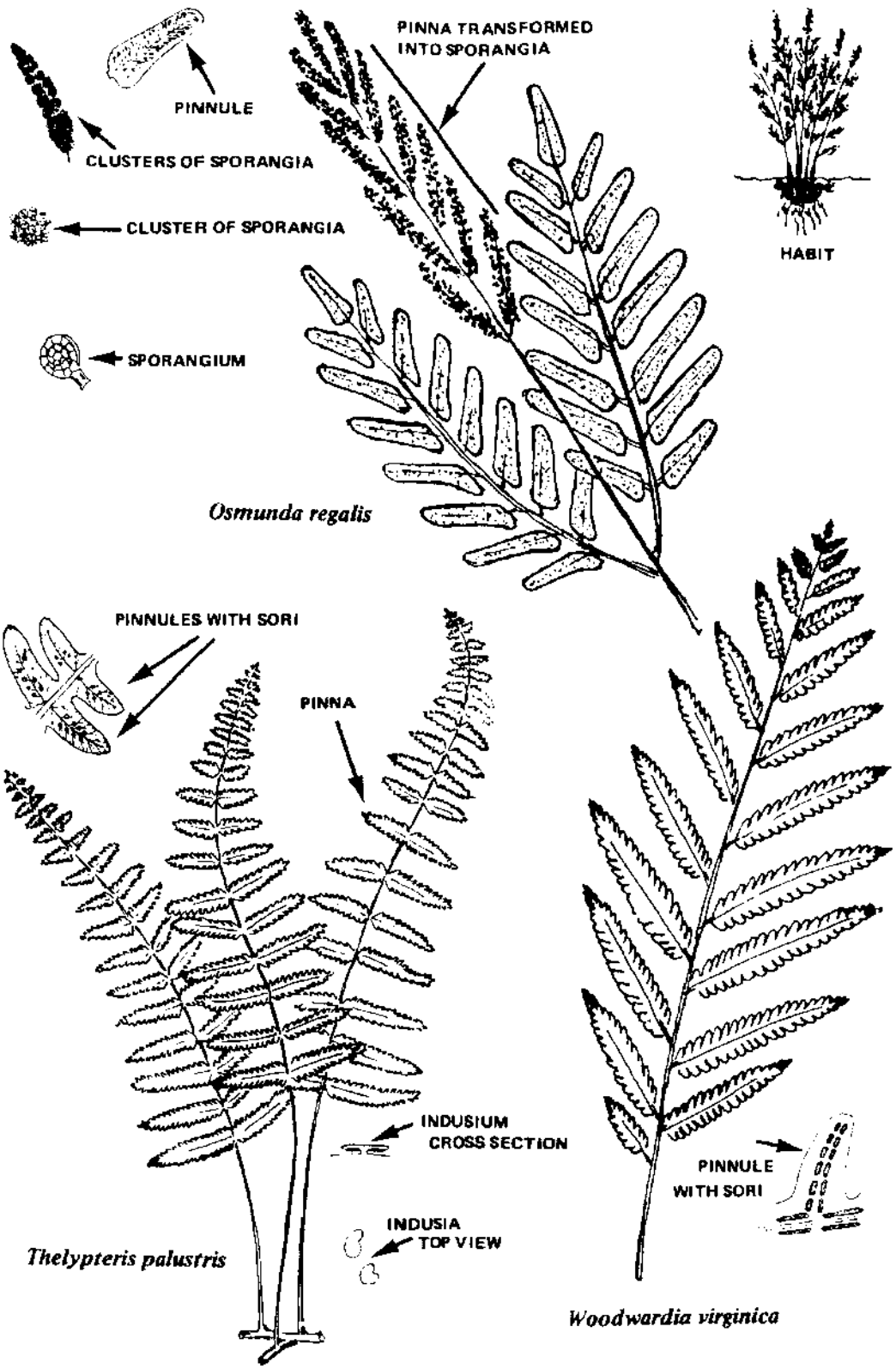
Thelypteris palustris

Fronds thin, light green or yellow green, delicate, pinnate-pinnatifid, slightly tapered at the base, to 1.2 m tall, clustered or from spreading rhizomes; pinna lobes accuminate, cut to the midrib, slightly pubescent, lowest pair opposite or nearly so and perpendicular to axis; axis pubescent, green; petiole as long as the blade, scaly at the base, smooth above; fertile fronds narrow, slightly taller than sterile ones; margins of pinna lobes curving over medial or confluent sori; indusia reniform, glabrous or with a few long hairs. Found occasionally in low salinity marshes of rivers and bayous; also in transitional areas which grade from marshes into cypress swamps. Intermixed with numerous marsh plant species. Full sun.

BLECHNACEAE

Woodwardia virginica

Fronds to 1.4 m tall, coarse, leathery in texture, found in close masses from spreading rhizomes, blade tapered at base, broadest in middle, pinnate-pinnatifid; petiole dark purple or purple-brown, shining, slightly channeled on upper side twice as long as the blade, lower part spongy, swollen, also tuberous at rhizome; pinna pointing upward, deeply pinnatifid but not to axis, tapering to both ends, sessile, alternating on axis; lower part of axis shining purple-brown, upper part dull green; pinna lobes rounded, pointing slightly toward tip of pinna. Found frequently around the edge of marshes near levees and other terrestrial areas. Full sun or partially shaded by other taller plants and sometimes overhanging trees. Often found in association with sawgrass, Cladium jamaicense.


PINNULE
CLUSTERS OF SPORANGIA
CLUSTER OF SPORANGIA
SPORANGIUM
PINNA TRANSFORMED INTO SPORANGIA
HABIT
Osmunda regalis
PINNULES WITH SORI
PINNA
INDUSIUM CROSS SECTION
INDUSIA TOP VIEW
Thelypteris palustris
PINNULE WITH SORI
Woodwardia virginica

TAXODIACEAE

Taxodium distichum

Tree, generally to 20 meters or less, in low salinity marshes; generally cone shaped when young, flattened top when old; occurs occasionally as isolated trees, and when present are often intermixed with Cladium jamaicense or Juncus roemerianus. Leaves light green, flat-linear, distichous or needle-like and pressed against slender twigs. Monoecious. Male cones about 2 mm in diameter in drooping panicles; female cones nearly spherical about 2 cm in diameter. Seeds shed in October. The preceeding description includes Taxodium ascendens Brongn. No specific distinction was found which would reliably and consistently separate the species.

TYPHACEAE

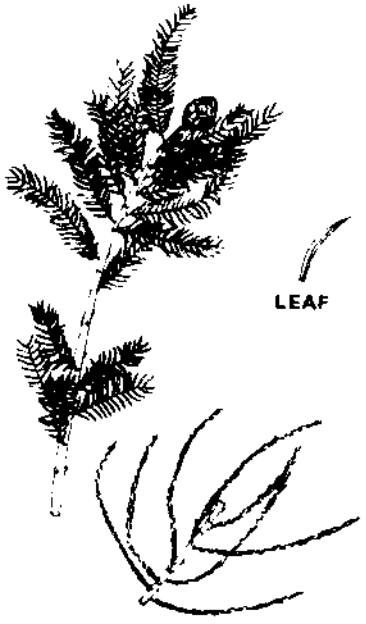
Typha angustifolia

Plant 1.5 m tall; leaves, narrow, strongly convex, 4-15 mm wide, much exceeding the inflorescence in height; stem pith white; staminate and pistillate flowers usually separated on the same spike; pistillate portion of the spike reddish brown, 10-20 cm or more long, usually 5-15 cm in diameter; pistillate flowers with a fleshy narrow stigma; seed terete; denuded old axis covered with stout blunt compound papillate pedicels about 0.6 mm long. The only species of Typha known to occur in the salt marshes of Mississippi.

POTAMOGETONACEAE

Potamogeton nodosus

Floating leaves, coriaceous, elliptic, 5-10 cm long, acute or rounded, entire with marginal denticles, base rounded or cuneate with 9-24 major veins; stipules 3-9 cm long, 2-keeled; petioles to 10 cm long; submerged leaves thin, linear-lanceolate to broadly lance-elliptic tapering gradually to the base, stipules brownish, decaying early; rhizome white, with rusty red spots, stele of triotype; spike dense, cylinderic, 4-6 cm long; peduncle stout to 6 cm long; seeds brownish 3-4 mm long with tuberculate dorsal keel; two lateral ridges, beak blunt. Rare. Found submerged in bayous draining marshes in the upper reaches or low salinity regions of riverine estuaries. Also found in shallow pools in marshes and in old oxbow lakes.



CONE

TWIG WITH LEAF BUDS

TWIG WITH NEEDLE-LIKE LEAVES

LEAF

Taxodium distichum

LEAF CROSS SECTION

HABIT

Typha angustifolia

FLOWER

TOP VIEW

SEED

SIDE VIEW

END VIEW

LEAF MARGIN

Potamogeton nodosus

Potamogeton pectinatus

Floating leaves absent; submerged leaves filiform to narrowly linear; entire to 15 cm long, about 1 mm wide, 1 to 3 veins, with conspicuous cross veins, the lateral vein marginal; stipules prominent 2-5 mm long forming a sheath; leaf appear to arise from the sheath; rhizomes spreading with terminal bulblets; stems terete or slightly compressed, about 1 mm in diameter, much branched; spike composed of 2-4 interrupted unequally spaced whorls of flowers; seeds 3-4 mm long, rounded with a short blunt beak. Frequently found along sloping shores in bayous draining low salinity tidal marshes and in marshes of oxbow lakes. Also along shallow accreting shores of creeks and rivers adjacent to brackish marshes and in ponds and persistent pools of water within some low salinity marshes. Sometimes mistaken in the vegetative state as Ruppia maritima.

Potamogeton pusillus

No floating leaves; submerged leaves linear, to 4 cm long, entire, base with a pair of glands; rhizomes present with cormlike buds; spikes of 3-5 separated few flowered whorls, 6-12 mm long; fruit obovoid, 2-3 mm long, olive-green, smooth; seeds about 2 mm long, rounded or ridged dorsally, beak blunt. Infrequent. Found in shallow waterways in freshwater and very low salinity, brackish marshes. Also in pools and oxbow lakes in and adjacent to these marshes.

RUPPIACEAE

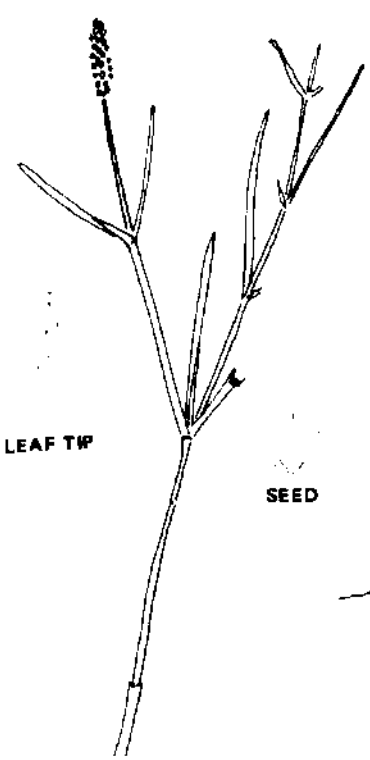
Ruppia maritima

Leaves alternate, threadlike, but distinctly flattened in cross section, with 1 vein, to 10 cm long, about .3 mm wide, and pointed apical; stipular sheath 6-10 mm long, membraneous; stem white or green variable in length to 1.5 m long; flowers on a long coil which elongates after anthesis; stamens without filaments, anthers sessile; mature carpels ovoid about 2 mm long; seed black about 3 mm long. Plant generally in submerged beds, but very often exposed on the marsh surface. Occurs often exposed in mats on the surface of tidally inundated marshes dominated by Juncus roemerianus in relatively high salinity marshes 5-15°/$_{oo}$ and submerged in extensive beds along banks and bottoms of bayous and on mud flats in local bays.

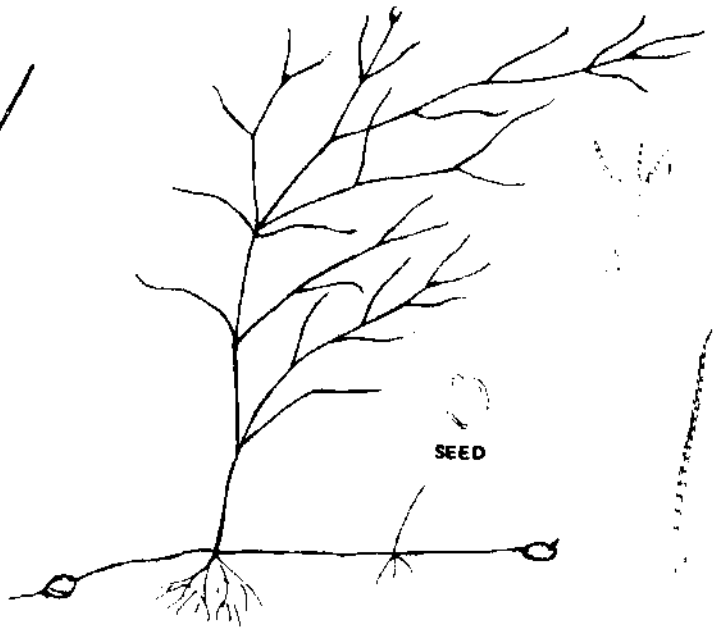
NAJADACEAE

Najas guadalupensis

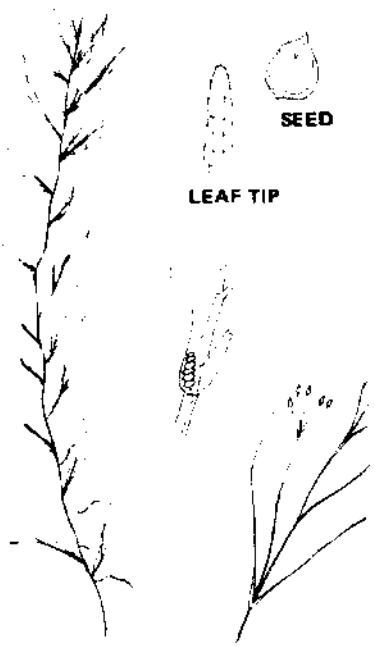
Plants flaccid; stems slender, threadlike, branched, to about 60 cm long, habit (form) variable and submerged; leaves narrow, linear, flat to 2.5 cm long and 2 mm wide, tapered to an acute or obtuse apex and usually tipped with 1 or 4 spines, marginal teeth single-celled, very minute, sometimes absent; basal leaf sheaths rounded or sloping, few-toothed or sometimes entire, the teeth very minute; flowers 2-3 mm long; seeds ellipsoid, dull, reticulate with 4-sided areolae, no endosperm, the cotyledon coiled. Frequent. Found in pools and waterways of very low salinity marshes.



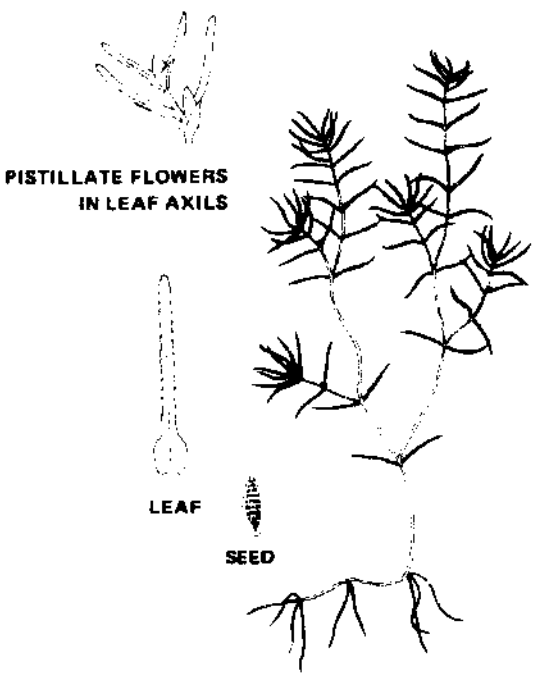
Potamogeton pectinatus



Potamogeton pusillus



Ruppia maritima



Najas guadalupensis

JUNCAGINACEAE

Triglochin striata

Perennial from stolons, 4-20 cm tall; leaves basal, linear, but thick appearing terete; erect but not stiff, about 5 mm wide; racemes cylindric, equal to or shorter than the leaves; flowers perfect and numerous, ebracteate; pedicels 0.2 to 1.5 mm long; sepals 3, oblong, 1.5-2 mm long; petals absent; stamens 3; styles absent; ovary superior, 1 locular, 1 ovulate; aggregate of seeds, somewhat globose, about 2 mm long; seeds about 1 mm broad, with 3 dorsal ridges and a beak. Infrequent. Brackish marshes. Often found near small sources of freshwater from upland drainage.

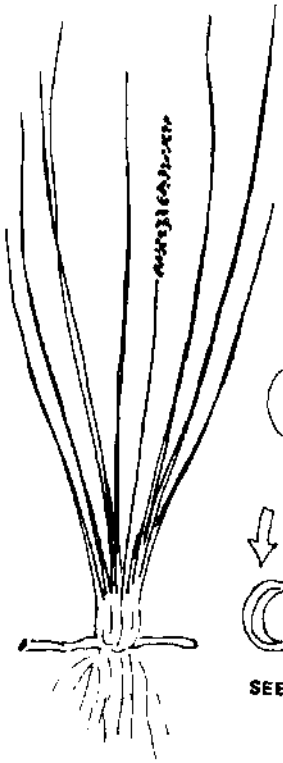
ALISMATACEAE

Sagittaria graminea

Plants generally monoecious, sometimes polygamo-monoecious and occasionally dioecious. Erect perennial, reaching 20 cm in height, solitary or clumped habit from short, slender rhizomes; plant entirely or partially submerged; leaves basal, thin, linear, acute to shortly acuminate phyllodia or with slender bladless petioles or with narrow lanceolate blades; scape simple (unbranched), usually longer than the leaves; flowers arranged in 2-12 whorls on ascending or spreading pedicels to 3 cm long; the lower one or two whorls composed of pistillate flowers, sometimes all staminate; pistillate flowers sometimes with ascending or recurved pedicels 0.5-6.5 cm long, staminate flowers with erect, slender pedicels; bracts free or connate, to 1.5 cm long; petals white, 6-20 mm long; sepals of pistillate spreading or recurving in fruit, 3-6 mm long; staminate flowers with numerous stamens, filaments pubescent and dilated at the base; pedicels of lowest whorl of flowers sometimes recurved in fruit; fruiting heads 0.5-1.5 cm broad; achenes 1.2-3 mm long, beak obsolete or oblique, resin ducts 2-3. Found frequently in shallow brackish water and marshes.

Sagittaria lancifolia

Erect perennial, reaching 40 cm in height, rhizomes stout and deeply buried; leaves basal, elliptic, linear, lanceolate or ovate to 35 cm long; blades without basal lobes; petioles to 20 cm long. Flowers imperfect and distributed as the preceeding. Scape simple or branched at lower nodes, the main axis having as many as 12 whorls of flowers, the lower 1 to 4 whorls composed of pistillate flowers with pedicels to 25 mm long, pedicels bearing staminate flowers 35 mm long; bracts connate, smooth or striate not papillose, to 1.5 cm long; petal white to 2 cm long; stamens numerous linear; pubescent filaments not dilated at the base, longer than the anthers; sepals papillose; fruiting heads about 1.5 cm in diameter; seeds cuneate-oblanceolate, falcate, to 2.5 mm long and 1 mm wide, resin duct 1. Considered here to include Sagittaria falcata Pursh. Found abundantly in fresh to brackish marshes, generally occurring in large clumps and often forming large stands up to an acre.



FLOWERS

FRUIT

SEED

FLOWER

Triglochin striata

SEED

HABIT

Sagittaria graminea

LEAF

LORESCENCE

FLOWER

SEED HEAD

HABIT

PETIOLE
CROSS SECTION

Sagittaria lancifolia

Sagittaria latifolia

Plant large, to 1 m tall, partially submerged, arising perennially from large rhizomes or corms, solitary or forming large clumps; leaves basal, sagittate, immature ones linear to ovate; leaf blade to 2.5 cm long, with basal lobes; petioles to 1 m long; flowers imperfect and types distributed as above, arranged in whorls of 10 or less, pedicels sometimes ascending, 0.5-6 cm long; bracts 2.5 cm long; petals white to 2.5 cm long; stamens numerous, filaments glabrous and linear; fruiting heads 1-2.5 cm broad; achenes 2.5-4 mm long, with broad marginal wings, but no keels, beak lateral, resin duct 1. Infrequent. Fresh and very low salinity marshes. More often found along the edge of waterways and on low levees.

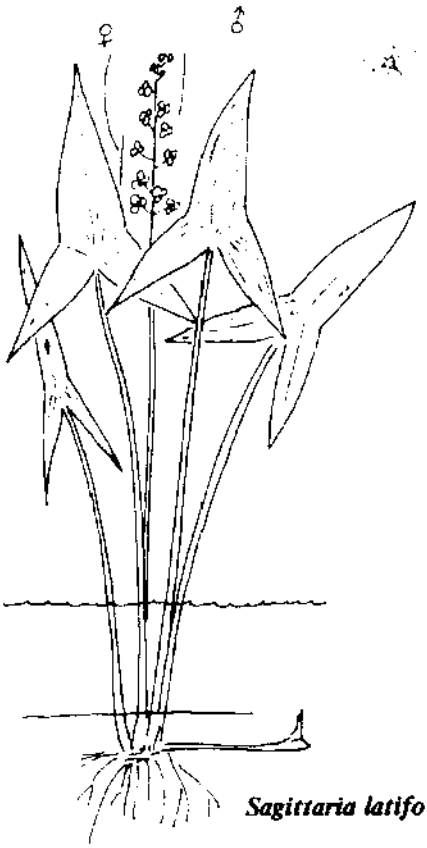
Sagittaria subulata

Sex distribution as above. Plant small, generally less than 20 cm long, submerged, perennial from slender rhizomes, also occurs as an annual; leaves basal and essentially phyllodial, to 10 cm long, with the floating ends occasionally with lanceolate to ovate blades; flowers in 10 whorls or less; pistillate with recurved pedicels 1-1.5 cm long; staminate on elongate, filiform pedicels; bracts connate to 3.5 cm long; petals white, 4-10 cm long; sepals of pistillate flowers spreading or recurved in fruit 2.5 mm long; stamens 7-15 in staminate flowers, filaments glabrous; fruiting head 5-7 mm broad, seeds 1.5-2 mm long, beak recurved or oblique. Less frequently found than other species of Sagittaria. Fresh and low salinity waterways and marshes.

HYDROCHARITACEAE

Elodea canadensis

Dioecious or polygamo-dioecious, submerged aquatic; generally rooted perennial with slender rhizomes, also occurs free-floating; leaves in whorls of 3, 8-15 mm long, 1-5 mm wide, usually imbricate apically, elliptic, linear, or oblong, acute, serrulate and sessile; staminate flowers on axillary spathes (stalks); pistillate spathe cylinderic, flowers on a long threadlike stalk, to 15 cm, which is the elongated base of the hypanthium; sepals and petals 2-3 mm long, white; staminodia 3; stigmas 3-4 mm long; capsule ovoid, 6 mm long; seed narrowly cylinderic 4.5 mm long, glabrous. Common to infrequent in fresh and low salinity marshes.



Sagittaria latifolia

FLOWERS

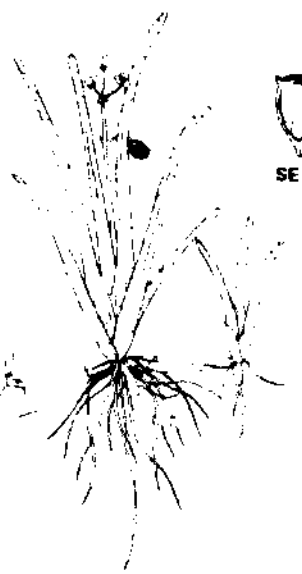
SEED HEAD

SEED

VARIATIONS IN LEAF SHAPE

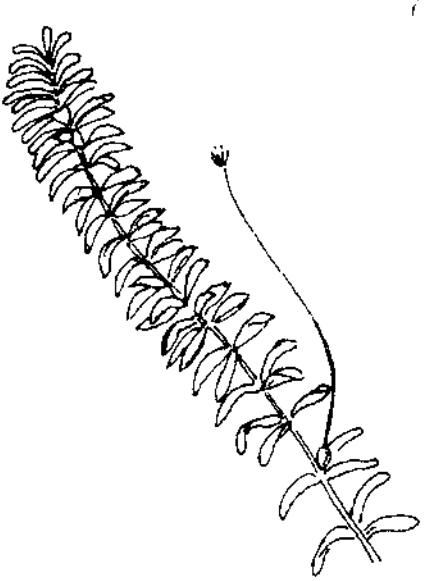
HABIT

SEED



Sagittaria subulata

SEED



PISTILLATE FLOWER IN LEAF AXIL

Elodea canadensis

Vallisneria americana

Plant a submerged perennial from long slender, white or pinkish rhizomes; leaves clustered at the base, strap-like or ribbon-like, often more than 15 cm long, flaccid, net-veination apparent; staminate spathes with 2 or 3 parts, bluntly acuminate, 1-2 cm long on thick clavate scapes to 5 cm long; staminate flowers numerous, crowded on a short-pedunculate spadix and enclosed in a spathe, becoming detached at maturity and floating to the surface. Pollen is often released before the spathe detaches; pistillate spathe to 1 meter long, curved or spiraled; pistillate flowers solitary in the spathe, floating on the water surface; hypanthium linear-cylinderic, in flower 2.5-3 cm long, 2 mm thick; sepals fused to the inferior ovary; fruit cylinderic, indehiscent to 15 cm long. Abundant as beds along the edge of waterways adjacent to low salinity (brackish) marshes.

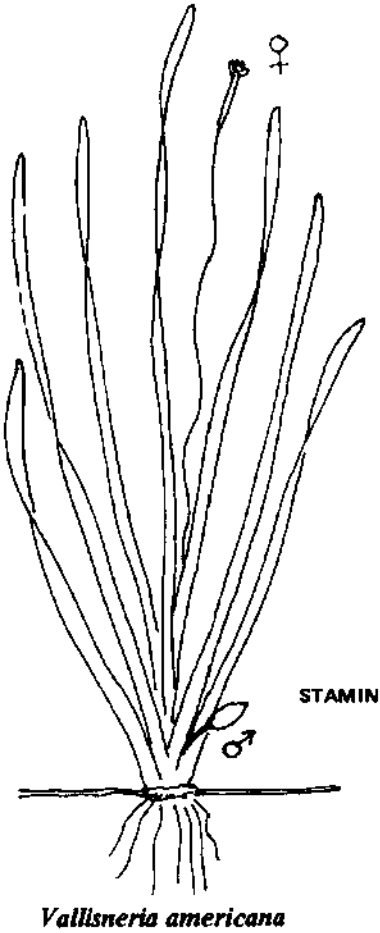
POACEAE

Andropogon elliottii

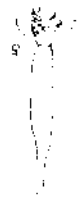
Cespitose perennial, stiff, erect culms, to 1 m tall; nodes glabrous, internodes long-hirsute below the nodes, glabrous below; blades to 30 cm long, 1-4 mm wide; sheaths appressed, overlapping, inflated, pilose or glabrous; racemes usually 2, about 3 cm long; sessile spikelet of a pair fertile; fertile spikelets 3-5 mm long; fertile lemma awn twisted, 0.8-2 mm long; sterile spikelet and pedicel longer than the fertile spikelet, pedicel uniform; ligule membraneous; lemmas of sterile and fertile florets membraneous.

Distichlis spicata

Dioecious perennial with stout spreading rhizomes, forming dense mats; culms 15-45 cm tall, with many nodes and internodes, usually covered by leaf sheaths to the inflorescence, nodes and internodes glabrous; leaves distinctly distichous, stiff blades to 15 cm long, attenuate, 1-3 mm wide, both surfaces and margins glabrous, but hirsute or long trichomes at base of blade; sheaths overlapping, glabrous; ligules membraneous and fringed, 0.2 mm long; auricles absent; inflorescence of pistillate flowers more robust than that of staminate flowers; spiklets large, several flowered, laterally flattened; pistillate flowers in spikes or short compact panicles and staminate flowers in spikes or compact racemes; glumes unequal, acute, 3-5 veins; lemmas broad, with about 9 indistinct veins, rounded, cuspidate, 3-4 mm long, awnless, those of pistillate spikelets coriaceous, thicker than those of the staminate spikelets; paleas large, equal to lemma body, strongly 2-keeled; grain brownish, obliquely ovoid 1.5-2.5 mm long. An important plant of salt marshes, covering large areas as monotypic vegetation and intermixed. The species has a tolerance to high concentrations of interstitial salt water, which often exceeds full sea strength ($35°/_{oo}$). Found abundantly in the more saline areas of tidal marshes.



Vallisneria americana



PISTILLATE FLOWER

SEED

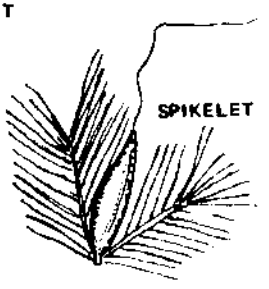
LEAF TIP

STAMINATE FLOWER

HABIT

SPIKELETS

LIGULE



SPIKELET

Andropogon elliottii

SEED

Distichlis spicata

Echinochloa crusgalli

Tufted annual; culms to 1.5 m tall, erect or nodding spikes; leaf blades elongate, cauline, 5 mm or less wide and to 4 dm long, scaberulous on both surfaces and on leaf margin; sheaths glabrous; ligules reduced; panicle 8-30 cm long, 2-10 cm broad, thick and nodding, if slender then erect; spikelets 3-5 mm long excluding the awns; first glume 1-2 mm long, 2nd glume cuspidate to short-awned, body 3-4 mm long, awn to 5 mm long; sterile lemma body 3-4 mm long, unawned or awn 1-10 mm long; fertile lemma and palea 2.8-4.5 mm long; grain 1.5-2 mm long. Found in very low salinity tidal marshes and freshwater marshes. Often found on levees intermixed with other herbs and shrubs.

Echinochloa walteri

Species description essentially the same as that above. The characteristics used in separating this taxa from the above are the papillose or papillose-hirsute sheaths, spinulose trichomes on the veins of the second glume, conspicuously papillose veins of the sterile lemma and awns 4-43 mm long. Infrequent in brackish and common in freshwater marshes.

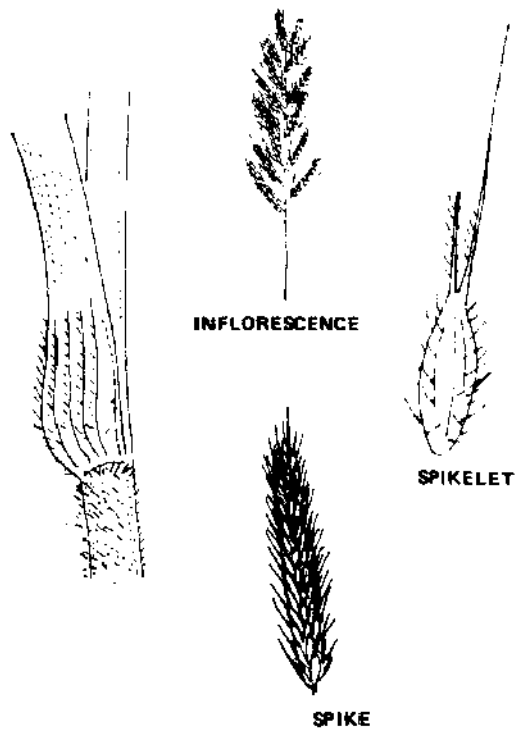
Erianthus giganteus

Perennial; culm to 4 m tall; nodes bearded; internodes glabrous or pubescent; blades to 50 cm long; panicle silvery to purplish, 15-40 cm long; rachis and peduncle densely villous; spikelets usually villous and scaberulous, 4-8 mm long; awn terete, nearly straight, 10-30 mm long; callus beard exceeding the spikelet. Infrequent. Found in freshwater and some brackish marshes, especially those of very low salinity. Also found in the upper edge of more saline marshes.

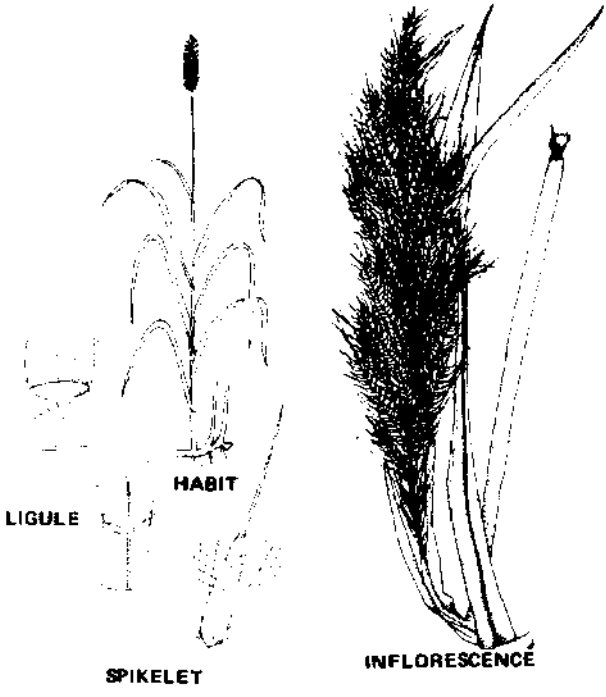
Hydrochloa caroliniensis

Monoecious perennial with pistillate and staminate flowers borne in separate, inconspicuous racemes or panicles on the same plant; submerged with slender, much branched culms to 1.5 m in length and short floating leaves to 5 cm long and to 4 mm broad, usually glabrous on both surfaces or scaberulous above, margins scaberulous, pilose apically; ligule a thin, lacerate membrane; pistillate inflorescences axillary within the sheaths, 3-4 flowered, 6-8 mm long; spikelets 1 flowered; pistillate floret about 2 mm long, spikelet with 7-veined lemma and 2-veined palea; pistillate glumes absent; lemmas and paleas subequal, scarious, glabrous, acute 2-3 mm long; staminate inflorescence exserted from an axillary sheath, 3-4 flowered, 7-10 mm long; staminate floret about 4 mm long, glumes and paleas absent; lemmas 7-veined, scarious, glabrous, acute 3-5 mm long; stamens 6. Occurs rooted in low salinity and freshwater bayous and creeks a few centimeters to a meter in depth. Frequently found in ponds and pools within the tidal marshes.

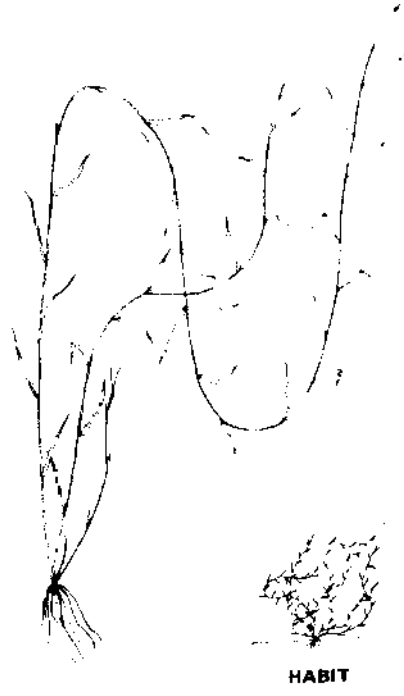
Echinochloa crusgalli



Echinochloa walteri



Erianthus giganteus



Hydrochloa caroliniensis

Panicum hemitomon

Perennial, spreading from extensive rhizomes; culms to 1.5 m tall, usually hard, stiff; blades 10-30 cm long; panicle constricted, 15-25 cm long; branches ascending; spikelets 2-3 mm long; first glume half the length of the spikelet; palea lustrous, yellowish, about 2.2 mm long. Infrequent. Found on levees and especially in the upper edge of tidal marshes.

Panicum repens

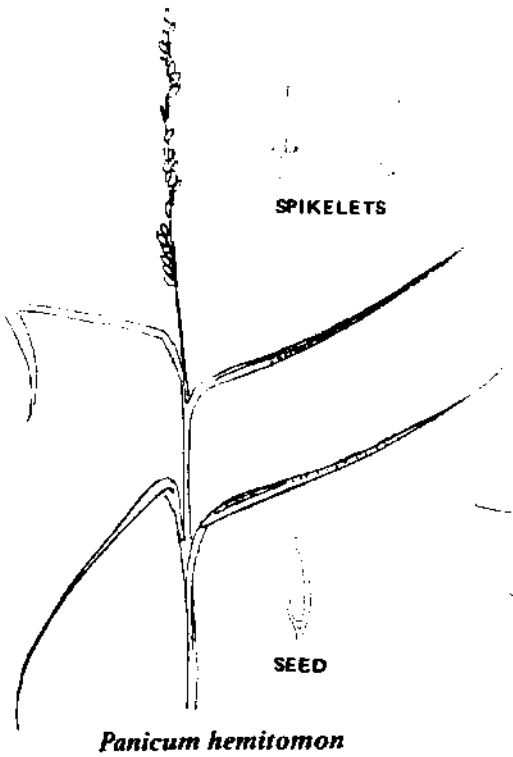
Perennial with long spreading rhizomes; culms upright from 30-80 cm tall; leaf blades glabrous to pilose, flat or folded 2-5 mm wide; inflorescence on open panicle 7-12 cm long; spikelets 2-3 mm long, ovate; first glume less than half as long as the spikelet, loose, truncate. Frequently found on sandy shores and along the edge of saline to freshwater marshes. Often found extending into ponds as a mat at the surface.

Panicum virgatum

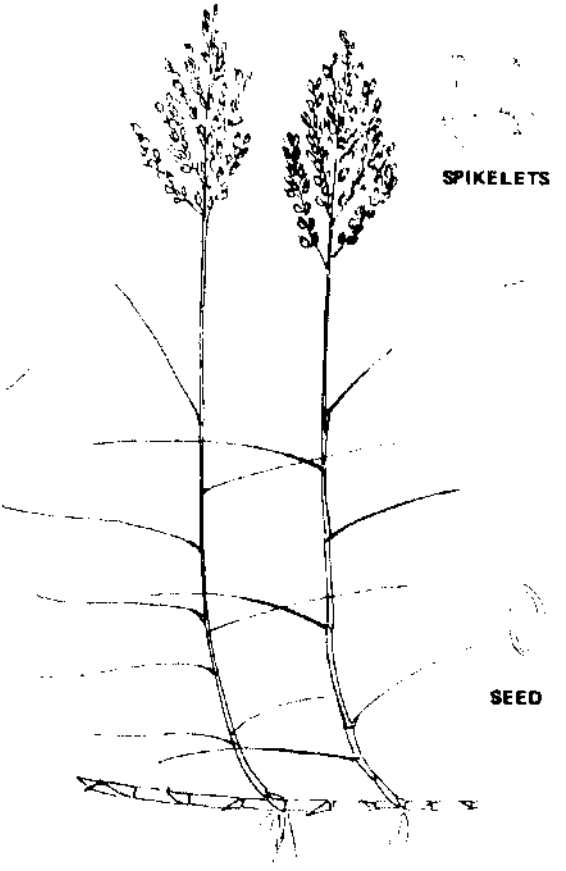
Monoecious perennial from rhizomes with short horizontal distance between aerial shoots and thus forming large, dense clumps 1-2 m tall; leaf blades 1-6 dm long and 3-15 mm wide, flat, glabrous, sometimes pilose near the base (at least in ours); inflorescence a diffuse and open panicle; spikelets full, 2-flowered, round in cross section, often gaping, glabrous, about 4 mm long, acuminate-pointed; terminal flower fertile, basal sterile, neutral or staminate; first glume clasping, almost as long as the spikelet, 5-9 veined, acute to keeled-cuspidate, about 2.5 mm long; second glume and sterile lemma 7-9 veined 3-4 mm long, sterile palea 2.5 mm or less long; fertile lemma and palea 2.5 mm or less long; grain gray about 1 mm long; flowers often all sterile (no seed produced). Found intermixed with Juncus roemerianus in brackish marshes as small scattered clumps or tufts. In very low salinity areas, often dominating large tracts of several hundred square feet or as a codominate over several hundred acres during the fall. Also found on levees.

Paspalum distichum

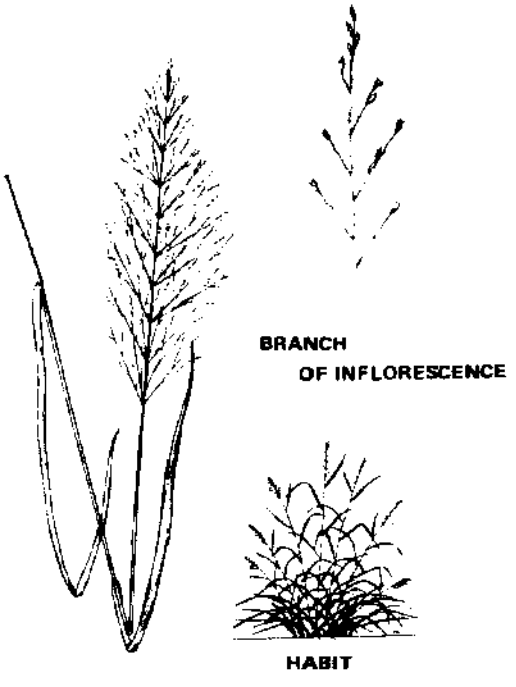
Monoecious perennial. Mat forming from rhizomes and stolons; culm to 30 cm tall; nodes and internodes glabrous; nodes sometimes pubescent; blades 12 cm long or less, about 5 mm wide, both surfaces glabrous, generally setose basally; sheath loose and glabrous, with apical trichomes; ligules 2 mm or less long; inflorescence composed of 2 (paired) racemes (conjugate), 2-5 cm long, terminal floret fertile, basal floret sterile; spikelets pubescent, ellipsoid, plano-convex, acute to acuminate, about 3 mm long, in 2 rows. First glume absent or ovate; second glume and sterile lemma 3-veined, 3 mm (or less) long, sterile palea absent or rudimentary; fertile lemma and palea veinless, 3 mm or less long; grain yellow, oblong to ellipsoid, 2 mm long. Infrequent as mats in brackish marshes, frequently found intermixed as individuals along the edge of brackish marshes and with Spartina patens in sandy marshes behind beach ridges.



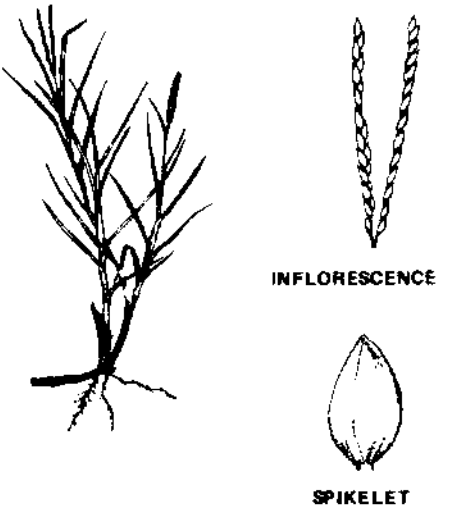
Panicum hemitomon



Panicum repens



Panicum virgatum



Paspalum distichum

Paspalum urvillei

Monoecious; coarse cespitose perennial; rhizomes short, stout; culms 1-2 m tall, nodes and internodes glabrous or with pubescent nodes; blades 40 cm long or less, 3-15 mm wide, glabrous on both sides, hirsute basally on upper surface; sheath papillose-hirsute, dense basally, less apically; ligules 4-8 mm long; inflorescence composed of 17-25 racemes (racemose), ascending, 5-10 cm long; spikelets ellipsoid, acuminate 2-3 mm long, in 4 rows; first glume absent; second glume and sterile lemma 3-veined, acuminate, 3 mm (or less) long; fertile lemma and palea veinless; grain brownish, broadly ellipsoid, 1-2 mm long. Infrequent. Found on levees and in low salinity or freshwater marsh. Also in transitional zones.

Phragmites communis

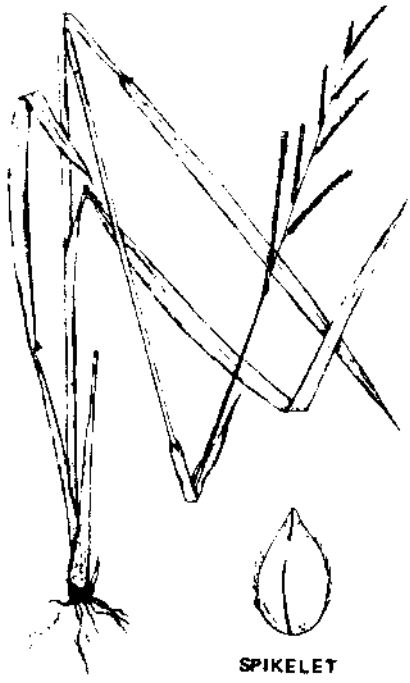
Monoecious perennial with large rhizomes and sometimes with leafy stolons; culms 2-4 m tall; inflorescence a terminal panicle, 20-40 cm long, silky, densely flowered; spikelets several flowered, 10-15 mm long; lower florets staminate or neuter; glumes purplish, lanceolate acute, unequal, the first shorter than the second, the second shorter than the floret; lemma long acuminate, glabrous, 3 veined; florets reduced upward; rachilla trichomes, long pilose, exceeding the lemma. Plant forms dense, monotypic stands over large areas of salt marsh. Commonly found on levees along marshland waterways. Apparently tolerates moderate to high salinity. Occupies the higher marsh elevations, rarely intermixed, found in small dense patches to extensive stands.

Sacciolepis striata

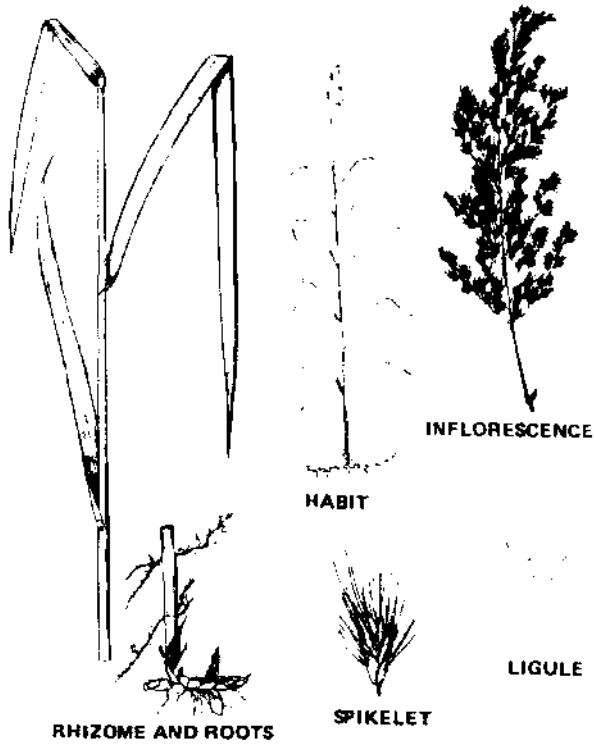
Perennial with stolons; culms weak, creeping about 50 cm long; leaves cauline with distinct veination, to 15 cm long and 18 mm (or less) wide, margins scaberulous; sheath glabrous or papillose-pubescent, trichomes on margins; inflorescence a spike-like or narrowly cylinderic panicle; spikelet, 2-flowered, asymmetrically ovoid, 4-5 mm long; florets perfect; first glume 3-5 veins, the second glume gibbous, many veins; sterile lemma below the fertile floret, 2 keeled; fertile lemma and palea with indistinct veins, about 2 mm long; glumes and lemmas awnless; grain grayish 1-1.5 mm long. Forms large colonies, but more often found as patches intermixed in low salinity and freshwater marshes.

Setaria geniculata

Monoecious, polygamous or with perfect florets; tufted perennial with short, knotty, rhizomes; culms geniculate, about 60 cm long, nodes and internodes glabrous, often purplish; leaves flat, thin; mature blades about 20 cm long x 6 mm wide, upper surface sparsely pilose basally; sheath margin glabrous; ligules about 1 mm long; panicles 1-8 cm long, with a diameter of 15 mm; spikelets 1.2-1.6 mm broad, elliptic and 2.5-3 mm long, subtended by numerous stiff bristles; lower florets usually staminate. Found as occasional tufts in low salinity and freshwater marshes and along the edge of high salinity marshes. Also found in transitional marsh near pine barrens and occasionally around the elevated sandy marsh areas, bordering salt flats.



Paspalum urvillei



Phragmites communis

Sacciolepis striata

Setaria geniculata

Setaria magna

Monoecious annual; robust culms about 1 m long, erect; leaves to 60 cm long and 1-4 cm wide with villous base (above the puberulent sheath; panicles tapering 25-60 cm long, 2-3 mm thick; spikelets numerous about 2 mm long and subtended by 1-4 bristles or none; fertile lemma smooth and lustrous; floret perfect. Habitat and distribution as above.

Spartina alterniflora

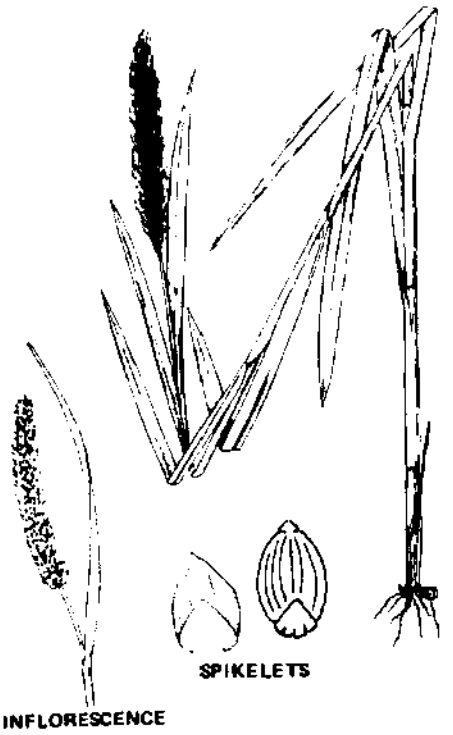
Perennial with robust culms and elongating rhizomes, spreading, culms height variable but uniform within stands, to 2 m tall; leaf blades to 40 cm long x 10 mm wide, smooth, tapered; sheath margin puberulent; ligule a ring of trichomes; inflorescence a panicle; spikes 5-30 per panicle, 4-10 cm long, 3-5 mm thick, tightly appressed and overlapping or diverging slightly; spikelets sessile 10-50 per spike about 10 mm long, crowded on one side of the panicle branch; second glume as long as the spikelet, first glume shorter. Keels of the glumes and lemma slightly pubescent; florets perfect; grain olivaceous to yellowish, linear-ellipsoid about 7 mm long. Very abundant. An important salt marsh plant. Generally occurring in extensive stands in saline areas or intermixed with Juncus roemerianus and other species in brackish areas. Monotypic stands occur in areas adjacent to open bodies of water of relatively high salinity which are of low elevation and frequent tidal-inundation.

Spartina cynosuroides

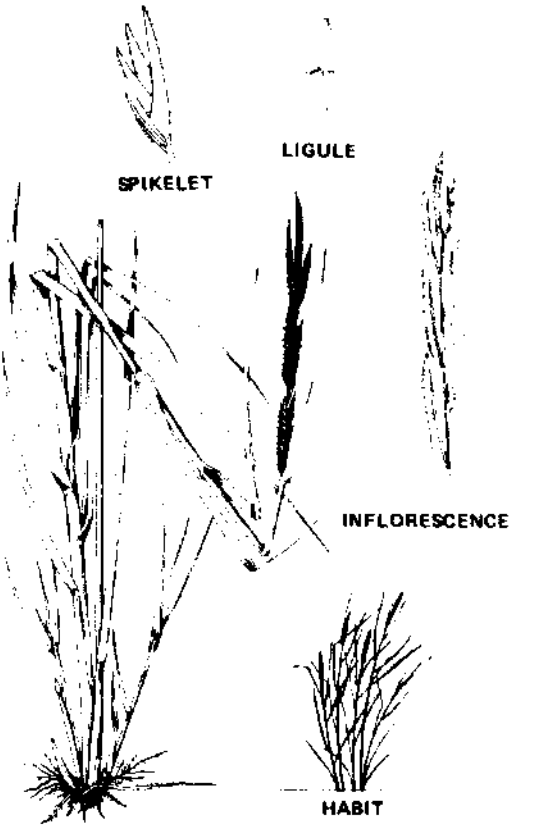
Stout perennial spreading by deeply buried elongating rhizomes; culm to 3 m tall; leaf blades to 70 cm long and 25 mm wide; tapered; ligule a ring of trichomes; inflorescence a panicle 15-30 cm long, with the 20-50 spikes spreading outward or diverging at angles of 30-45°, not overlapping unless forced; spikelets to 70 per spike, 10-15 mm long; second glume as long as the 1-flowered spikelet, first glume shorter; glumes and lemma keeled, with some pubescence; florets perfect. Grain flat, ellipsoid, olivaceous. Forms dense stands in brackish marshes, but more frequently occurs intermixed as small clumps in marshes dominated by Juncus roemerianus.

Spartina patens

Wiry perennial spreading from elongating rhizomes of small diameter; culms spreading or erect, to 1 m long; leaves slender, to 40 cm long x 3 mm wide, mostly involute; inflorescence a panicle 9-20 cm long, spikes 2-7 per panicle, 1-7 cm long, usually diverging at angles of 10-45°, remotely distributed on the axis, slightly overlapping if forced, spikelets 20-50 per spike 5-15 mm long; glumes unequal; glume and lemma hispid on the keels at least distally; floret perfect; grain flat, ellipsoidal and olivaceous. Generally found abundantly in dense stands on higher elevations of saline marsh, especially near upland areas. Also found intermixed with Juncus roemerianus in brackish marshes.

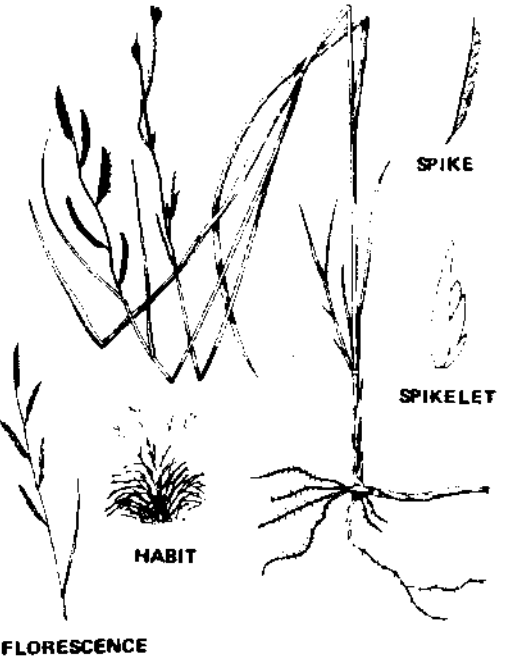


Setaria magna



Spartina alterniflora

Spartina cynosuroides



Spartina patens

Spartina spartinae

Densely clumped perennial, elongating rhizomes absent; culms to 1.5 m long; blades to 50 cm long x 5 mm wide at the base, partially involute; panicle spikelike, 10-40 mm long, usually tapered to both ends; spikes 10-60 per panicle 10-30 cm long, tightly appressed to the axis and much overlapping; spikelets 5-10 mm long, 15-40 per spike, sessile, closed or apparently so; stigmas and stamens not excerted; first glume 2-6 mm long, second glume 4-8 mm long, lemma equal to second glume or nearly so, keels of glume and lemma hispid. Found at high elevations within intertidal marsh of relatively high salinity. Frequently associated with Spartina patens and old bayou systems (with much meandering). Also abundant in sandy marsh areas at slightly higher elevations and adjacent to salt flats.

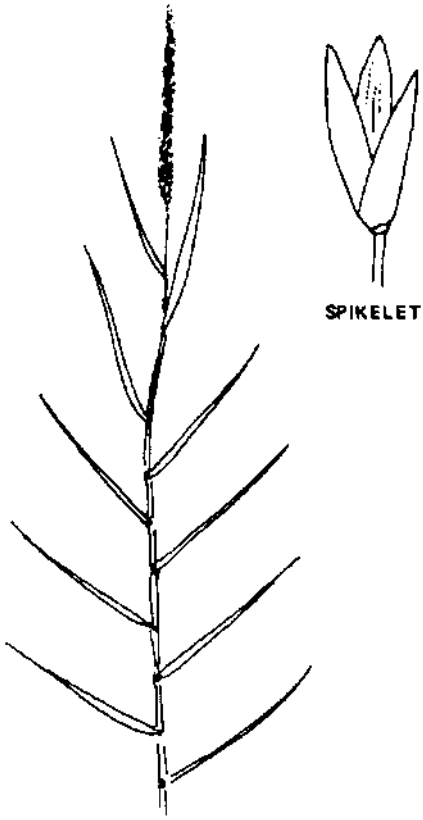
Sporobolus virginicus

Perennial spreading elongating rhizomes; culms to 40 cm long; leaves conspicuously distichous; blades septate 3-20 cm long x 3-4 mm wide, often involute; sheath glabrous below, long pilose apically; panicle narrow, 3-8 cm long, dense, spikelike; spikelets about 2 mm long, on short 2 mm long pedicels; glumes, lemmas and paleas veinless; lemmas and paleas about equal and longer than glumes; floret perfect; fruit a utricle, reddish, oblong-ellipsoid, 1 mm long. Brackish and saline marshes generally on sandy substratum, where it forms dense stands. In the absence of flowers and seed, often confused with Distichlis spicata. A colonizer of new terrain at the upper intertidal zone on accreting shores.

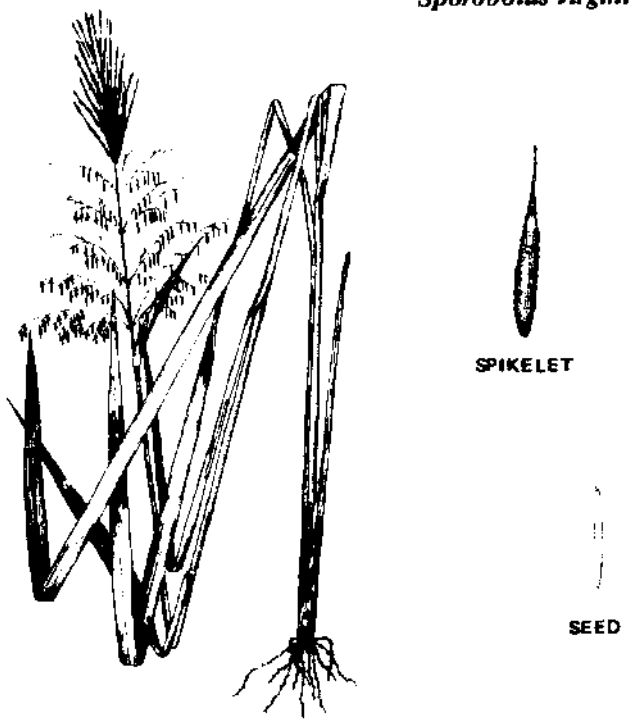
Zizania aquatica

Monoecious, rhizomatous perennial; culm to 3 m tall; blades glabrous, to 120 cm long x 5 cm wide, margins scaberulous, often densely pubescent at the base; panicle large, open, 30-50 cm long, the upper portion with appressed branches, ascending at maturity, bearing pistillate spikelets, the lower portion with spreading branches bearing staminate spikelets; panicle branches dark green or reddish and olive streaks; spikelets consisting of a single naked, unisexual floret; glumes absent or much reduced, rudimentary or vestigial; pistillate spikelets erect, about 2-3 cm long, terete, on short club-shaped pedicels, the lemma, 3-veined, indurate at maturity and bearing an awn 2-8 cm long; staminate spikelets, reddish on thin pedicels, 7-10 mm long, not indurate or awned; grain reddish to olive, light to dark brown, narrowly cylindrical 10-25 mm long. Forms dense stands in brackish and freshwater marshes. Also occurs as scattered patches along waterways. Lower part of plant generally submerged in water.

Spartina spartinae



Sporobolus virginicus



Zizania aquatica

Zizaniopsis miliacea

Monoecious, rhizomatous perennial, culms to 3 m tall; leaves glabrous, 120 cm long x 4 cm wide; panicles open 40-60 cm long, 4-15 cm broad; branching verticillately; branches light green ascending (appressed when very immature); (spikelet consisting of 1 naked, unisexual floret; no glumes; pistillate spikelets terminal on inflorescence branches; staminate spikelets basal on same branches; appearing similar; pistillate spikelet 5-10 mm long; lemma 7 veined, accuminate, awned; awn 2-20 mm long, pedicel 1-10 mm long; staminate spikelet, not reddish, light green to green, about 8 mm long, lemma awnless, mucronate; grain yellowish, obovoid, stipitate about 3 mm long. Habitat and distribution same as above.

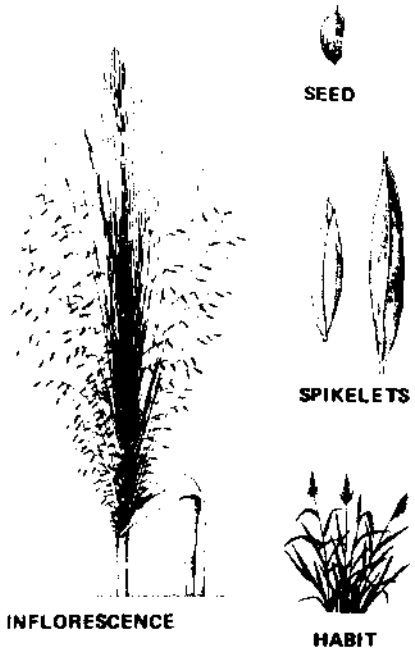
Cyperaceae

Carex albolutescens

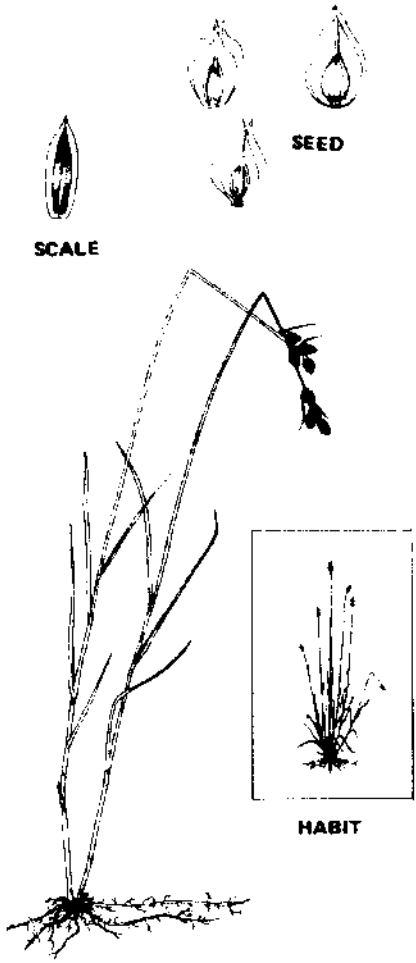
Monoecious perennial from thin rhizomes, culms to 1 m tall, sharply triangular in cross section; blades 1-3 mm wide; shorter than culms, lower one extremely short; sheaths tight; inflorescence usually an aggregate of 3-10 terminal spikes; spikes 5-15 mm long x 3-5 mm broad; scales shorter and narrower than perigynia; bract absent (no bristles in Carex, but scales and often bracts); perigynia 30-50 per spike about 3 mm long, broadly obovate, widest below the middle, seed body veined on both faces, obovoid, somewhat plano-convex; beak 0.5-1 mm long, flat, bidentate, serrulate, at anthesis green, at maturity brown; seed lenticular, about 1.5 mm long x 1 mm wide. Infrequently found in very low salinity and freshwater marshes and on adjacent levees.

Cladium jamaicense

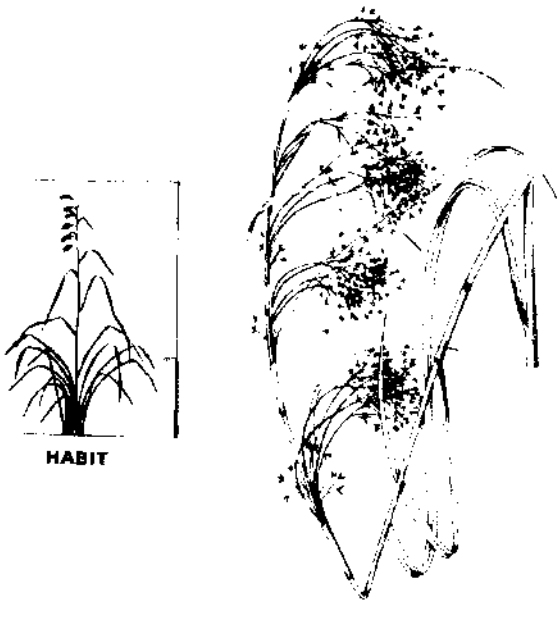
Monoecious perennial from stout scaly rhizomes; culms to 3 m tall, terete or nearly so; leaves coarse, cauline, most arising basally, from 3 planes characteristic of sedges; blades to 1 m long, margins cartilaginous with saw toothed serrulation; sheaths loose, much overlapping; inflorescence elongate, decompound, cymose, to 1 m long, often drooping; spikelets ovoid, chestnut brown 3-6 mm long, in clusters of 2-6 at ends of somewhat flattened branchlets, each with a single unisexual floret, subtended by 2 or 3 spirally imbricate scales; perianth absent; seed obovoid to subglobose often pitted, shiny, olivaceous brownish or streaked with purple to 3 mm long, the apiculate 0.5 to 1 mm long. Forms extremely dense, almost impenetrable, monotypic stands in low salinity and freshwater marshes. Also occurs along the upland edge of some saline marshes. Most often found intermixed as small clumps with Juncus roemerianus and other plant species in brackish marsh. The serrulated leaf margins are dangerous cutting edges. Care should be taken in collecting the plant and traversing areas dominated by this species.



Zizaniopsis miliacea



Carex albolutescens



Cladium jamaicense

Cyperus articulatus

Perennial from reddish rhizomes; culms terete or vaguely triangular distinctly septate, to 50 m tall; leaves usually represented by a few loose sheaths near the base; blades flat, absent or reduced, to 2 cm long; inflorescence subtended by 2 or 3 bracts about 3 cm long; inflorescence terminal, umbel-like consisting of 4-12 clusters (or heads) composed of 3-20 spikelets no true spikes present; some spikelets sessile, others on slender, geniculate peduncles to 12 cm long; the longer peduncles often bearing secondary peduncles; usually each peduncle subtended by a bract; spikelets 6-25 mm long, subtended by a minute bract and composed of many flowers (usually 10 or more); flowers perfect, covered by a scale; fertile scales (flowers and scale as a unit) distichously, pinnately or subdigitate arranged on the rachis; scales keeled or veined yellowish brown; rachilla winged; stamens 3; seed brown, trigonous, oblong. Frequently found intermixed as clumps in low salinity and freshwater marshes and infrequent along the upland edge of more saline (brackish) marshes.

Cyperus filicinus

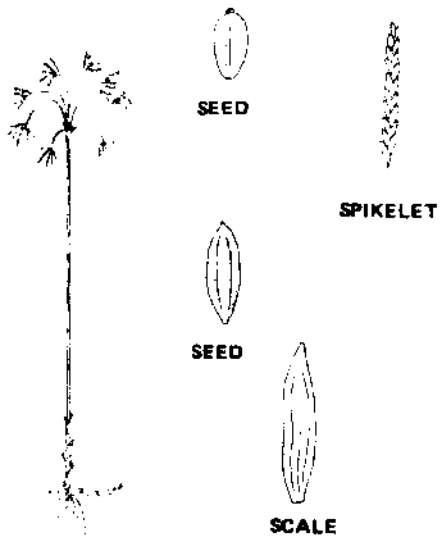
Annual, culms ribbed, to 30 cm tall; leaves basal; blades 1-3 mm wide bracts 2 or 3, 1-3 mm wide; spikelets 1-10, digitate or essentially so; spikelet many flowered; scales 3-5 veined, yellowish, shiny, green keeled about 3 mm long; rachis glabrous, slightly winged; seed brown, lustrous, papillose, lenticular, oblong-obovoid, 1-2 mm long. Infrequently found in low salinity and freshwater marshes.

Cyperus haspan

Annual; culms soft, short lived, roots often reddish; leaf blades absent usually, if present 2 or 3 cm long x 2 mm wide; bracts 2 or 3, 1-2 mm wide; spikelets numerous in decompound umbellate, pedunculate clusters; spikelets digitate within the cluster; spikelets with 5-20 flowers, 2-10 mm long x 1 mm wide; fertile scales pinnate on the rachis; rachilla flat, grooved, wings narrow; scales 3 veined, reddish or yellowish, to 1.5 mm long, acute or short cuspidate; seeds, yellowish to whitish, lustrous, papillose, trigonous, obovoid or ellipsoid 0.5 mm long. Infrequent in low salinity and freshwater marshes.

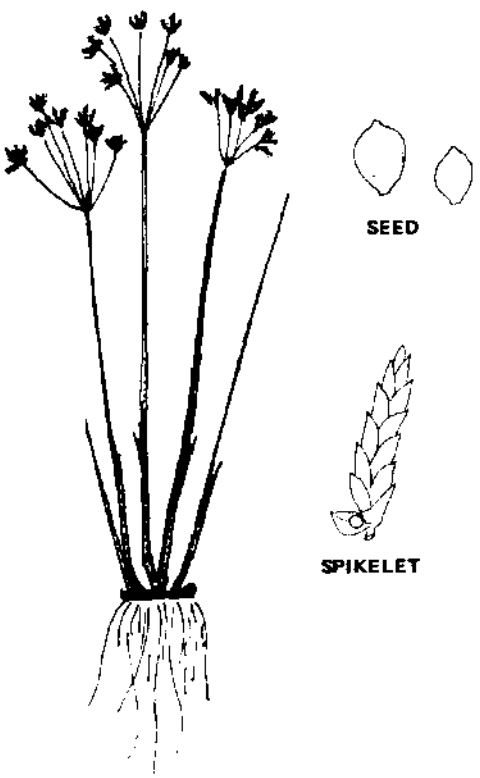
Cyperus odoratus

Tufted annual; culm stout, acutely angled, to 1 m tall; sheaths spotted purple; bracts numerous; most exceeding the inflorescence; spikes numerous, congested; rachis grooved, smooth; spikelets narrowly linear, 1-2 cm long; scales 3-7 veins, overlapping, brownish red, green midrib, 2-3 mm long. Seeds silvery brown, 1.5-1.8 mm long. Infrequent. Freshwater and brackish marshes.



Cyperus articulatus

Cyperus filicinus



Cyperus haspan

Cyperus odoratus

Cyperus retrorsus

Perennial from thick rhizomes; culms to 1 m tall; leaves basal; blades to 1 cm wide; sheaths with red spots (occasional) on abaxial surface; bracts 3-7, about 1 cm wide; inflorescence composed of congested sessile and pedunculate spikes of unequal length; spikes cylinderic or subcylinderic with spikelets whorled or irregular around the rachis; spikelets 1-4 flowered 3-5 mm long, 1 mm wide; scales to 2.5 mm long; seed 1.5 mm long, reddish or olivaceous, lustrous, slightly papillose, trigonous, oblong or ellipsoid. Infrequent in low salinity and freshwater marshes.

Cyperus virens

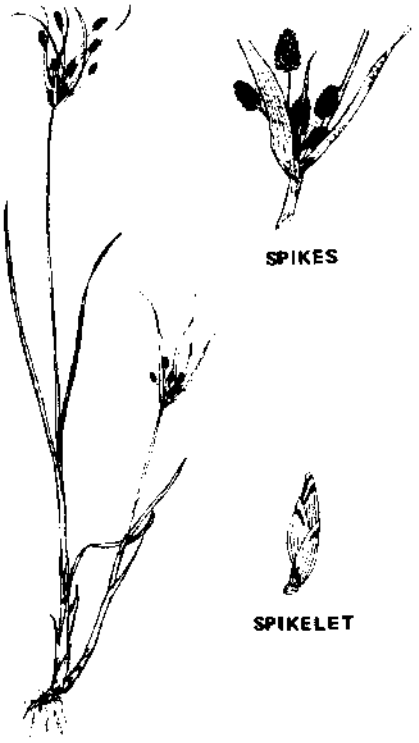
Perennial from short, stout rhizomes; culms ribbed, to 1 m tall; leafy basally; blades narrow 1-15 mm wide, septate but often not apparent; bracts 2-many; spikelets many in congested umbellate clusters; peduncles unequal; spikelets many flowered, digitate, 4-10 mm long; scales smooth, yellow-green, flat keeled, about 2 mm long, margins hyaline; rachilla wingless; seed ellipsoid to ovoid, to 1.5 mm long, stipitate and apiculate. Infrequent in low salinity and freshwater marshes.

Dichromena colorata

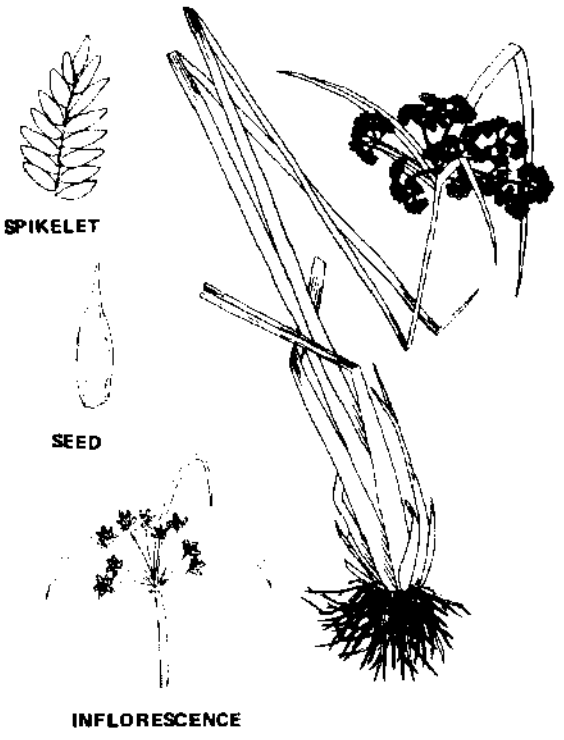
Monoecious or polygamous; perennial from elongated rhizomes of small diameter 0.5 to 1.5 mm; culm ribbed, to 50 cm tall; leaves glabrous and basal, much shorter than culm, narrow to 1 cm wide; bracts white basally, green apically, usually 5 or 6; inflorescence, terminal, consisting of congested many flowered spikelets; lower flowers of spikelet, pistillate or perfect, upper staminate, sessile. Scales spirally imbricate, midrib raised, white with brownish base; seed rugulose transverse, ellipsoid or obovoid, brown or yellowish, biconvex. Tubercles 0.5-1 mm long. Infrequent in low salinity and freshwater marshes.

Eleocharis caribaea

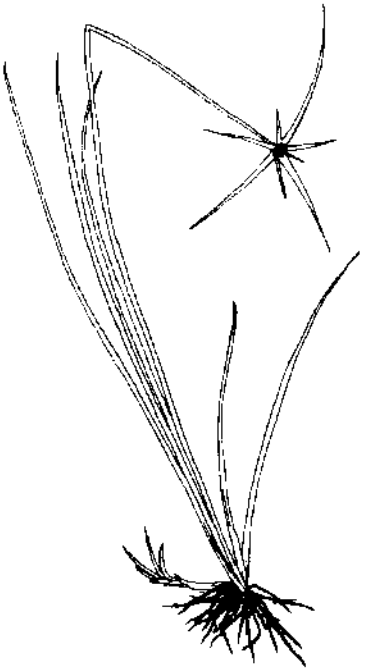
Densely tufted annual; culms terete or coarsely ribbed on drying, about 4-30 cm tall; sheath greenish or brown at apex, appressed; spikelets solitary 3-6 mm long; reddish or yellowish scales 1.5-2 mm long; generally 7 bristles reddish or dark colored, barbed, about equal to or slightly longer than the tubercle; style 2 branched; seed biconvex pale-green to purplish-black at maturity, shiny, 0.1-0.2 mm long. Occasional. Found on sandy shores, especially in marshes of lagoons and ponds on the barrier islands.



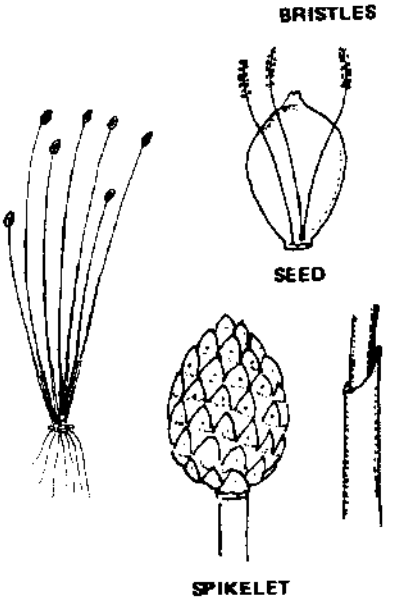
Cyperus retrorsus



Cyperus virens



Dichromena colorata



Eleocharis caribaea

Eleocharis cellulosa

Densely tufted perennial; culms 50-80 cm tall, terete or ribbed, sheaths usually reddish; spikelets solitary, cylindric 19-36 cm long, not thicker than culm, 50-90 flowers; style 3-branched; seed dark brown and pitted or reticulate about 2 mm long, tubercle pale, stout; scale with prominent midrib 5-6 mm long; bristles smooth (not serrulate) about 6 mostly longer than the tubercle. Frequent. Common in some coastal marshes.

Eleocharis flavescens

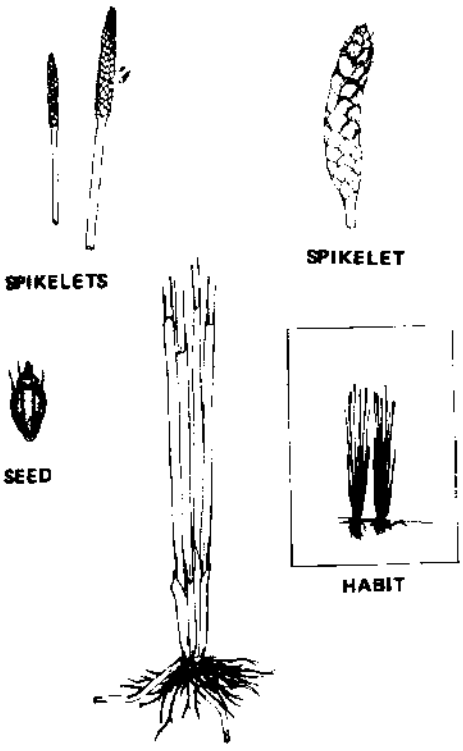
Tufted perennial; culms to 30 cm tall, generally weakly developed or flaccid and coarsely ribbed; sheaths white, pointed and fragile; spikelets solitary, 2-7 mm long, cylindric, thicker than culm with 15-25 flowers; style 2-branched; scales without prominent midrib; bristles absent or variable in length, barbed; seed about 1 mm long, olive, brown, red-brown or red-black, pitted, dull. Infrequent. Generally found on sandy marsh soil.

Eleocharis obtusa

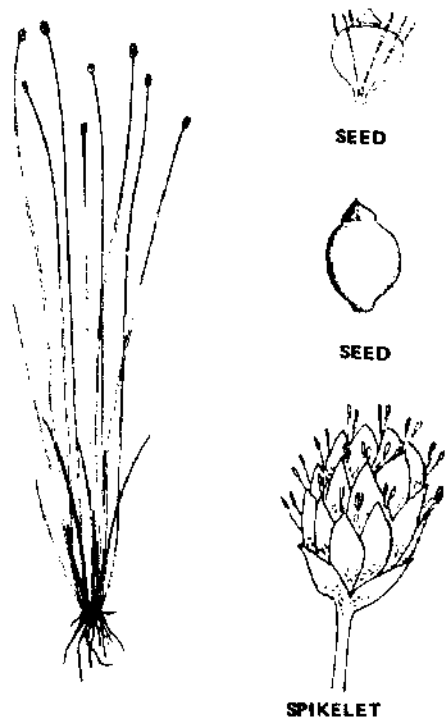
Densely tufted annual; culms to 70 cm tall; sheaths obliquely truncated at the apex, purplish basally; spikelets solitary, cylindric, thicker than culm, 3-15 mm long, 50-100 flowers; style 2 or 3 branched; seed biconvex, dark brown, smooth and shining, 1-1.5 mm long, tubercle 1/3-1/2 length of seed; bristles 6, brown, barbed, usually longer than tubercle; scales thin, reddish, green keeled, 1-2 mm long. Infrequent. Generally found on sandy marsh soil.

Eleocharis parvula

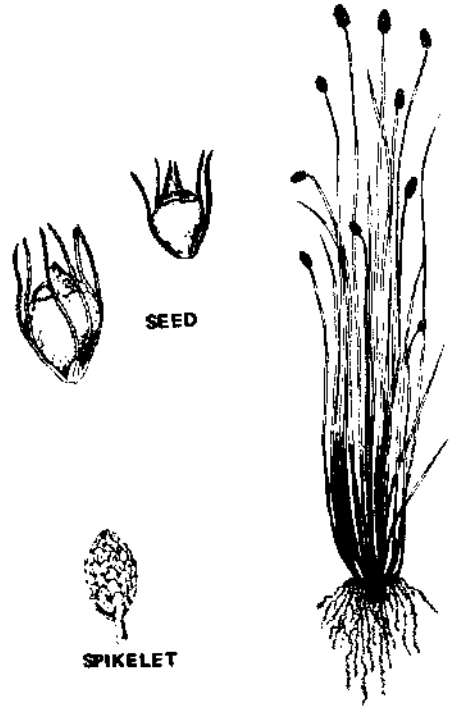
Tufted perennial; culms 2-15 cm long; sheaths very small, inconspicuous, hyline, often reddish; spikelets thicker than the culm, flattened, generally 5-8 flowers, sometimes to 20; scales straw colored or brown; style 3 branched; seeds 1-1.5 mm long, yellowish, dark brown or black, smooth, plano-convex, trigonous or tetragonous; tubercle continuous with the seed; bristles 4-6 or absent, equaling or exceeding the tubercle, yellowish, retrorse barbed. Often difficult to identify because of a lack of mature seeds. Abundant. Forms extensive, dense mats in open areas in saline and brackish marshes.



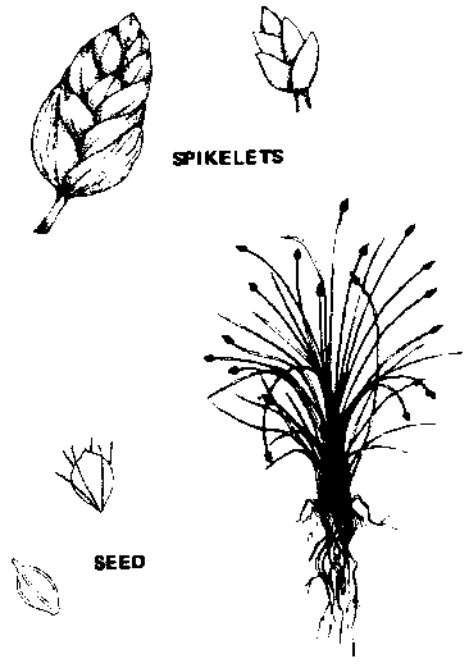
Eleocharis cellulosa



Eleocharis flavescens



Eleocharis obtusa



Eleocharis parvula

Eleocharis quadrangulata

Tufted perennial; culm stout to 1 meter tall, sharperly 4 angled; sheaths thin, brownish or often reddish; spikelets 40-90 flowers, cylindric not thicker than the culm; scales 5-6 mm long; perianth bristles 6, as long as or longer than the tubercle, with minute retrorse serrulations; style 2 or 3 branched; seed yellow to brown, shiny or marked with transverse elongated cells, biconvex 1.5-2.5 mm long, tubercle conic, deltoid or oblong about 1/3 to 1/2 as long as the seed. Infrequent. Often found as small stands in mud or peaty soils.

Fimbristylis autumnalis

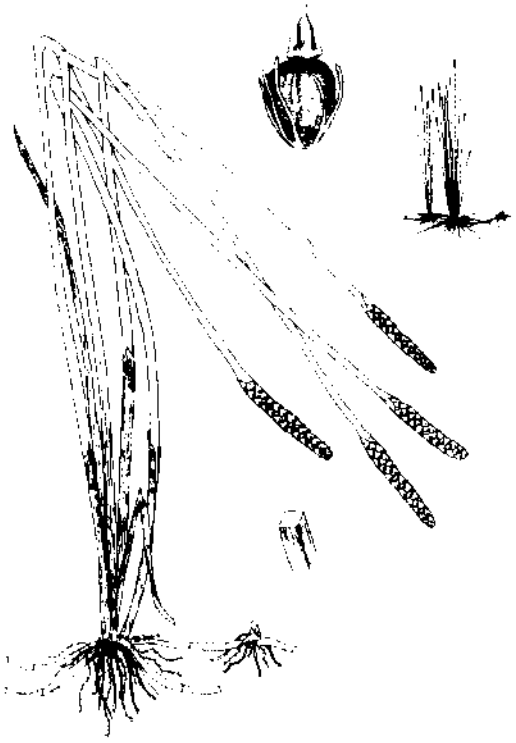
Tufted annual, usually 10-30 cm tall; leaves thin, linear, flat and spreading and sometimes equaling the culm in length; inflorescence a terminal cyme, composed of sessile and pedicellate spikelets or a paniculate system of cymes; style 3-branched, stamens 2; scales spiral; seed pale-brown to white, smooth or verrucose, 1 mm long; no bristles. Infrequent in sandy marshes and along the edge of marshes.

Fimbristylis caroliniana

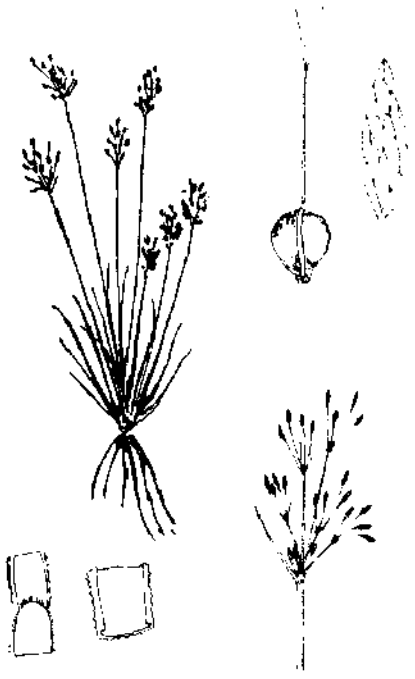
Tufted perennial with culms to 1 m tall; base shallowly set in the substrate; leaves firm about 2.5 mm wide and about half as long as the scapes; inflorescence form essentially the same as above, except the spikelets are larger; style 2-branched; stamens 3; scales spiral; seed lenticular, pale to dark brown, often lustrous, finely reticulate about 1.5 mm long. Frequently found as small solitary clumps in sandy soils of brackish and saline marshes, especially the upper edge.

Fimbristylis castanea

Densely tufted perennial to 1 m tall; with the base of the plant very dark reddish brown or castaneous (chestnut), lustrous, deeply set in the substratum, the outer leaves of a tuft persistent as imbricate scales; leaves from 1/3 as long as the culm to nearly as long, blades narrow 2 or 3 mm, sheaths pale to dark brown or very deep lustrous reddish brown; inflorescence form, style and stamens essentially the same as above; seed lenticular 1.5-2 mm long dark brown or reddish brown, often lustrous. Includes Fimbristylis spadicea of others. Frequent. Commonly found in peat, mud and sand substrates.



Eleocharis quadrangulata



Fimbristylis autumnalis

Fimbristylis caroliniana

Fimbristylis castanea

Fuirena scirpoidea

Perennial with ribbed culms to 60 cm tall; leaves cauline, sheaths with small blades; inflorescence with 1 to 3 spikelets; scales spiral with short straight awns; perianth bristles 3, retrorsely barbed, equaling or shorter than the seed; seed brown, lustrous, stipitate, about 1 mm long, with concave sides. Rare. Sandy shores and banks.

Fuirena squarrosa

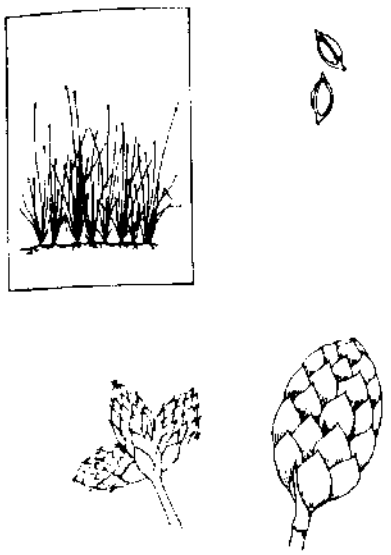
Perennial vegetatively similar to above; spikelet 2-6, scales spiral, with long recurved awns; mature seed generally less than 1 mm long, ivory white or reddish. Frequent on sandy soil of brackish marshes.

Psilocarya nitens

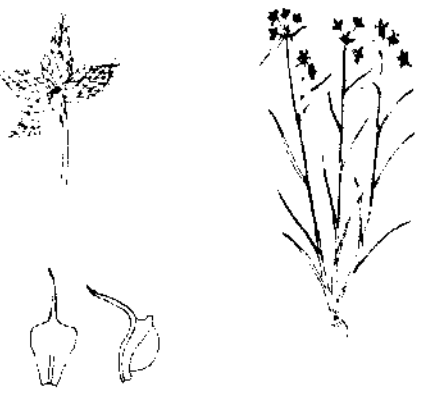
Tufted perennial, to 60 cm tall; leaves basal, to 25 cm long and 5 mm wide; inflorescence terminal and axillary, composed of racemes or cymes of spikelets; spikelets about 5-10 cm long; scales spiral, brown; perianth bristles absent; seed brown or yellowish, lustrous, strongly transversely ridged or wrinkled, about 1 mm long. Infrequent or rare. Sandy soils.

Rhynchospora corniculata

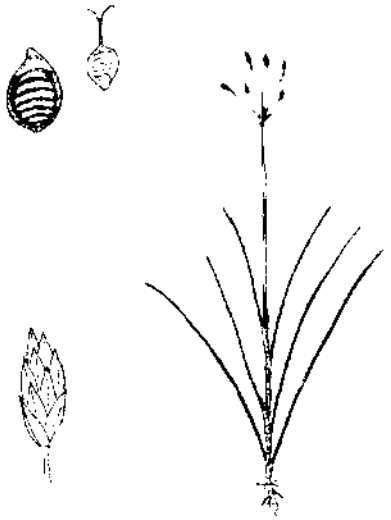
Tufted perennial or with spreading rhizomes; leaves shorter than the culms; culm to 1 m tall; inflorescence diffusely branched, ascending or spreading, consisting of clusters of flowers; the distal part of the spikelet consisting of the protruding tubercle; scales spiral, dark brown; seed 4-5 mm long, dark brown, flat on 2 faces; beaked with tubercle about 15 cm long; bristles 2-6, stiff, 1/3 to 2/3 length of seed. Frequent. Low salinity marshes, near the upper edge of marshes and along low levees.



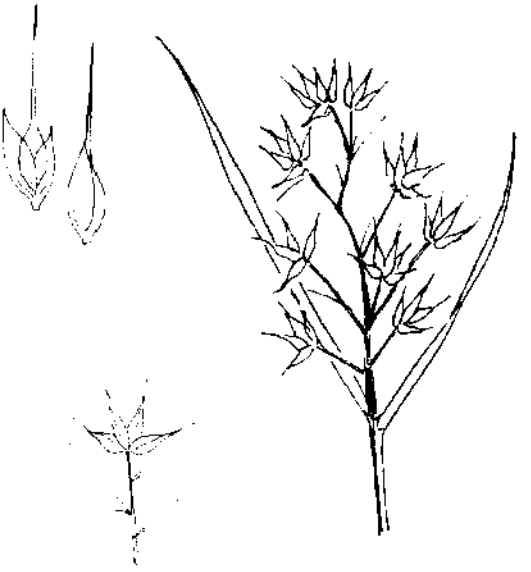
Fuirena scirpoidea



Fuirena squarrosa



Psilocarya nitens



Rhynchospora corniculata

Rhynchospora fascicularis

Vegetatively similar to above; inflorescence composed of terminal clusters of several flowers, overtopped by long setaceous bracts; mature flowers 3-5 mm long; with mature seed - dark brown or red brown; scales caducous with long awn; bristles about 6, rudimentary to length of seed, minutely antrorsely barbed; seed about 1.5 mm long, biconvex or flattened on 2 faces, very dark brown, sometimes with pale area on flat sides, smooth, beaked; tubercle about 0.5 mm long. Distribution similar to above.

Rhynchospora macrostachya

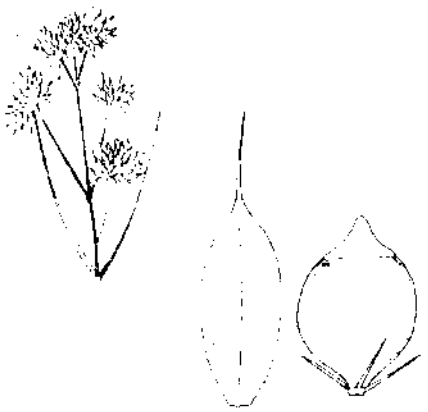
Clumped perennial; culm, stout, 3-angled, to 1.5 m tall; inflorescence terminal with clusters of flowers; cluster dark brown with mature seed, over topped by long bracts; bristles about 6, stiff, brown, antrorsely barbed, from 1 to 3 times as long as the seed; seed flat on 2 faces, about 5 mm long, dark-brown or red-brown, beaked; tubercle 3 to 4 times as long as the seed. Frequent. Low salinity and freshwater tidal marshes.

Scirpus americanus

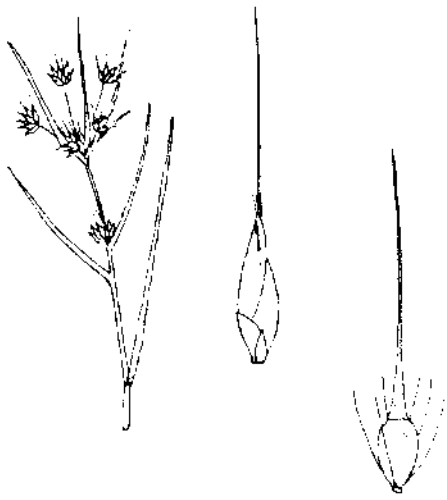
Perennial, rhizomes, white, brown or reddish; culm to 2 m tall, 3-angled; bract erect, appearing as a continuation of the culm, 3-15 cm long; inflorescence generally a terminal cluster of 3-4 sessile spikelets, 25-50 flowers; bristles about 4, about as long as the seed, retrorsely barbed; seed 2-3 mm long, plano-convex, smooth, shiny dark-brown at maturity. Frequent. Sandy beaches, low salinity marshes.

Scirpus olneyi

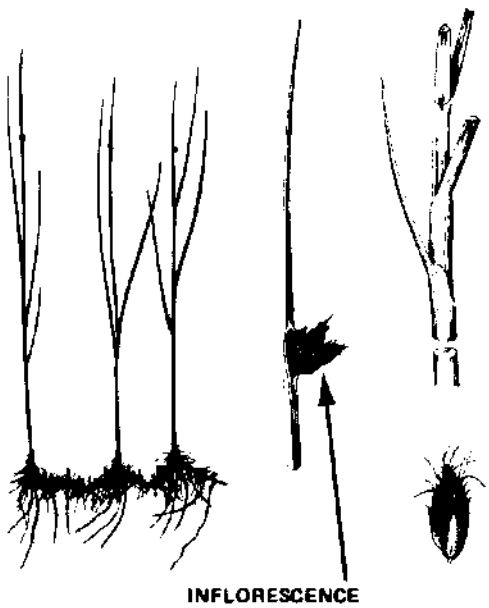
Perennial, rhizomes thick and spreading, white, red or brown; culm 3-angled with concave sides, to 2 m tall; bract short 1-2 cm long (locally); inflorescence a dense cluster of 2-15 sessile spikelets, 25-40 flowers; scales reddish brown with yellow midrib; bristles 4, retrorsely barbed, about as long as the seed; seed smooth, plano-convex, 2-2.8 mm long, black, dark brown or yellowish. Abundant, forming extensive stands. One of the major plants found in local salt marshes.



Rhynchospora fascicularis



Rhynchospora macrostachya



Scirpus americanus

Scirpus olneyi

Scirpus robustus

Perennial, rhizomes thick; culm 3 angled, to 1 m tall; leaves with flat blades; bracts leaflike; inflorescence consisting of 2-15 stout, robust, sessile or often with some peduncled spikelets; scales 6-10 mm long, brown to purplish, awn 1-5 mm long, recurved or straight; bristles shorter than the seed or absent; seed 3-4 mm long, biconvex or one face more convex than the other, dark-brown to black when mature. Abundant. Occasionally intermixed with Scirpus olneyi and other marsh plants in more elevated marsh areas.

Scirpus validus

Perennial, culms to 3.5 m long with large air chambers as seen in cross section; leaf blades absent; inflorescence a cluster of 10-120 spikelets, some sessile, most pedunculate; spikelets with 20-50 flowers; scales brown or reddish, with a short awn; bristles 4-6, about as long as the seed, retrorsely barbed; seed plano-convex, yellow, gray or brown, about 2 mm long. Abundant in low salinity, riverine marshes, forming large dense stands. The bases of the plants generally submerged.

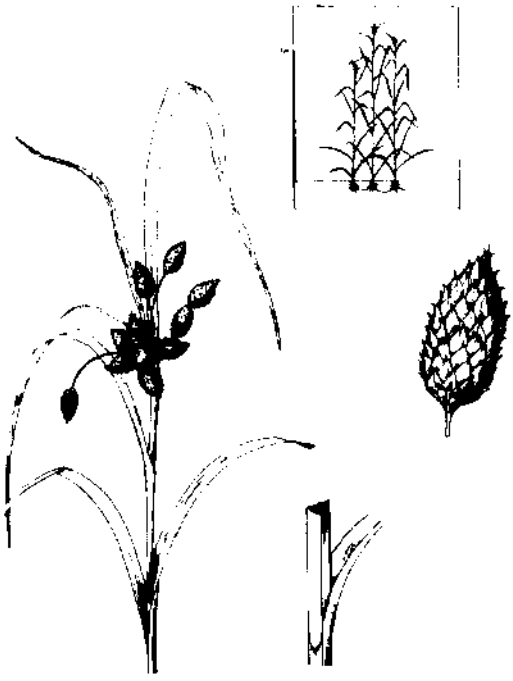
ARECACEAE

Sabal minor

Shrub or shurblike plant with a terminal cluster of large palmate, bluish green leaves, segments cleft at tip, 1-2 m wide; petiole not spinose-serrate; spadix to 3 m long. Frequent. Common on levees and along the upper edge of all marshes.

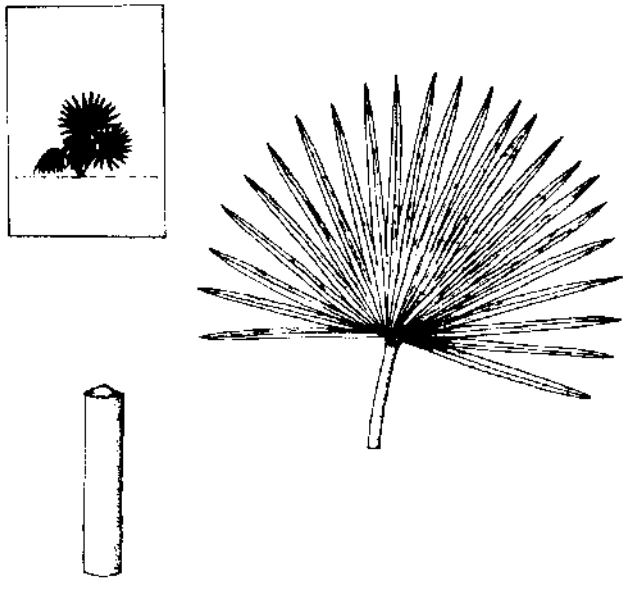
Serenoa repens

Shrub or shrublike with a terminal cluster of palmate leaves, to 1 m wide; petiole spinose-serrate; spadix shorter than the leaves. Leaf not illustrated but similar in form to Sabal minor. Abundant in the upper edge of salt marshes, especially on the barrier islands.



Scirpus robustus

Scirpus validus



Sabal minor

Serenoa repens

ARACEAE

Peltandra virginica

Plants from thick rhizomes and tuber-like roots; leaves sagittate or hastate to 40 cm long; spathe green with pale or whitish margins; spadix white to orange, slender and tapering; berry dark green, 6-15 mm in diameter, fleshy, containing 1-7 seeds. Frequent. Found in low salinity riverine marshes and tidal freshwater marshes.

XYRIDACEAE

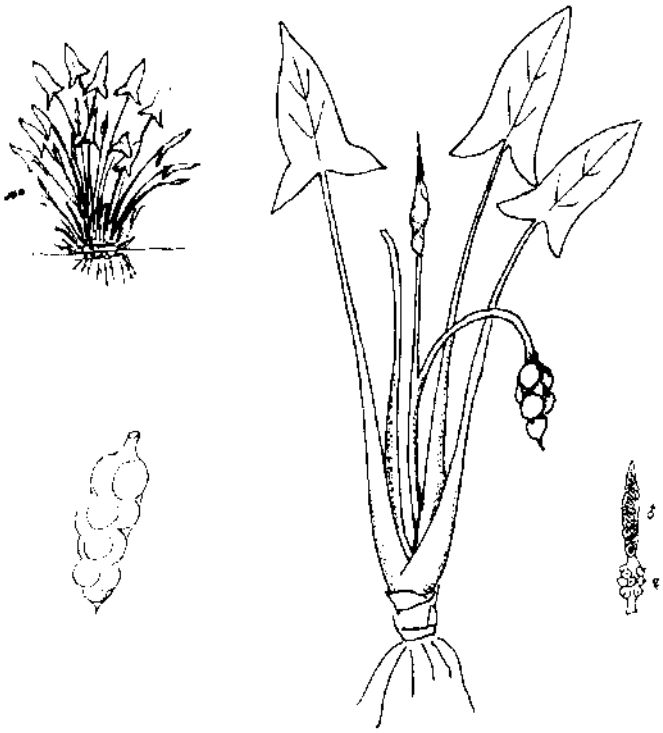
Xyris iridifolia

Iridiform leaves spotted or streaked with red, arising distichously from thin, reddish, fleshy rhizomes; spike 10-30 mm long, consisting of overlapping, dark purplish or reddish brown bracts, shining; corolla yellow, ephemeral; 3 petals; 3 stamens; fruit a capsule; seeds minute, ellipsoid or fusiform, 1 mm long or less, dark, farinose. Frequent. Freshwater and low salinity marshes.

ERIOCAULACEAE

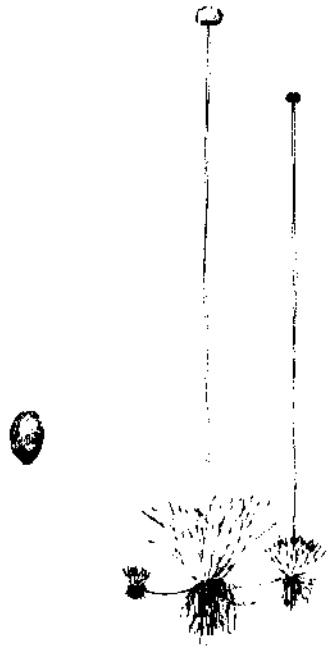
Eriocaulon decangulare

Leaves arising basally, linear, tapering to 30 cm long; culms to 70 cm tall; flowers in white, compact, solitary hemispheric heads, 6-15 mm broad; stamens 4-6 per flower; seed 1 mm or less in length. Frequent in low salinity or freshwater marshes, especially in riverine marshes.



Peltandra virginica

Xyris iridifolia



Eriocaulon decangulare

PONTEDERIACEAE

Pontederia cordata

Leaves lanceolate, hastate or cordate to 18 cm long, clumped or clustered, arising basally; inflorescence spicate, flowers perfect, funnelform, lobes blue, upper marked with yellow, 6-9 mm long; stamens 6: 3 long, 3 short; fruit ellipsoid 4-8 mm long; seed solitary, red, glutinous 3-4 mm long. Frequent in fresh and brackish marshes.

JUNCACEAE

Juncus acuminatus

Tufted perennial; culm to 80 cm tall; leaves few at the base, most scattered up the culm, laterally compressed, thick near the middle and terete toward the apex, weakly but definitely septate, 1-3 mm wide; inflorescence terminal, with sparsely arranged dense clusters consisting of 5-50 (usually about 15) perfect flowers; fruit a straw-colored capsule 3-4 mm long, about as long as the perianth, tapered toward the apex; seeds 0.3-0.4 mm long. Infrequent. Found intermixed with other plants in freshwater and brackish marshes and along the upper edge of more saline marshes.

Juncus brachycarpus

Densely tufted perennial; culms 20-60 cm tall, usually about 40 cm tall; leaves terete and scattered up the culm, septate-apparent at the tips; inflorescence consisting of 3-20, seldom more than 10, congested clusters of perfect flowers; clusters actually spherical heads; petals 3/4 as long as the sepals; capsule apiculate, 2-3 mm long, concealed by the perianth; seed apiculate, reticulate 0.2-0.3 mm long. Distribution as above.

Juncus bufonius

Tufted annual; culms to 30 cm tall, reddish; leaf sheaths swollen basally, thicker than the blades; inflorescence a panicle 1/4 to 4/5 the entire plant; flowers perfect; sepals 3.5-6.5 mm long, petals shorter; capsule blunt, shorter than the petals and often flattened apically, 3-4.5 mm long, purple-brown; seeds plump, pale 0.4-0.5 mm long. Distribution as above.

Pontederia cordata

Juncus acuminatus

Juncus brachycarpus

Juncus bufonius

Juncus canadensis

Tufted perennial; culms to 1 m tall; leaves terete, septate-not conspicuous except at the tips; inflorescence consisting of compact, spherical clusters of 5-50 flowers, arranged in loose, cymes or panicles; capsule light brown, longer than the perianth, conic, 3-4 mm long; seeds slender, fusiform, long tailed at each end; tails whitish; plump, pale seed body brown and faintly lined longitudinally; overall length of seed 1-2 mm. Rare. Low salinity and freshwater marshes.

Juncus diffusissimus

Tufted perennial; culm to 30 cm tall; leaves few, scattered upward on the culm, blades ascending, terete and septate; inflorescence diffusely branched and widely spreading; usually about 5 flowers per cluster, sometimes less and occasionally as many as 8; capsule usually twice as long as the perianth or longer, golden brown, slender, apiculate, 4-6 mm long; seeds 0.3-0.4 mm long. Infrequent. Occurs on sandy shores in low salinity and freshwater marshes or intermixed with other plants as scattered clumps.

Juncus effusus

Densely tufted perennial; leaves to about 1.5 m tall, terete, easily crushed; inflorescence generally a tufted, much branched panicle, of flower clusters, sometimes open and spreading; clusters with 2-8 flowers; capsules mostly 2-2.5 mm long, round at the apex, brown, equaling or slightly exceeding the perianth; seeds about 0.5 mm long. Frequent in brackish riverine marshes, in the upper regions of saline bayous and throughout freshwater marshes.

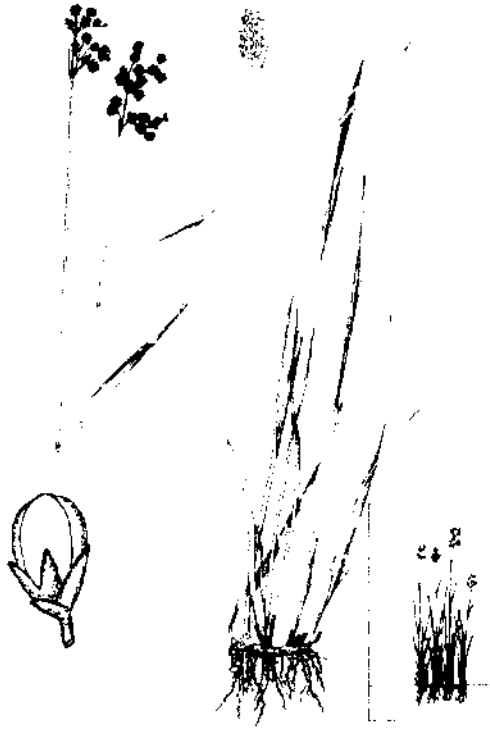
Juncus marginatus

Perennial from thickened base, rhizomes with tuber-like bulbs or enlargements; culm to 1 m tall; inflorescence usually consisting of 15 or more clusters of flowers; clusters generally with about 5 flowers or less; involucral bract generally shorter than the inflorescence and often inconspicuous; capsule plump, reddish brown and lustrous, 2-3 mm long; seeds variable in size and shape, pale, reddish to dark amber, about 0.5 mm long. Distribution similar to Juncus effusus.

Juncus canadensis

Juncus diffusissimus

Juncus effusus



Juncus marginatus

Juncus megacephalus

Perennial with hard knotty rhizomatous base; leaves scattered up the culm, terete, strongly septate; inflorescence of 3-11 compact spherical clusters, sparingly branched, mostly less than 10 cm long; involucral bract inconspicuous; capsule subulate, light brown with purple tip, equaling or slightly exceeding the sepals; seeds slender, apiculate, dark amber, 0.4-0.5 mm long. Infrequent. Brackish and freshwater marshes, intermixed or near the upper edge of some marshes.

Juncus polycephalus

Perennial, stout from thick rhizomes; culm to 1 m tall; leaves to 30-40 cm long, incompletely septate, compressed; inflorescence large, spreading, usually consisting of 10 spherical flower clusters; capsule with long, slender beak, exceeding the perianth, overall length 6-8 mm; seed chestnut brown, about 0.5 mm or less in length. Distribution similar to above.

Juncus roemerianus

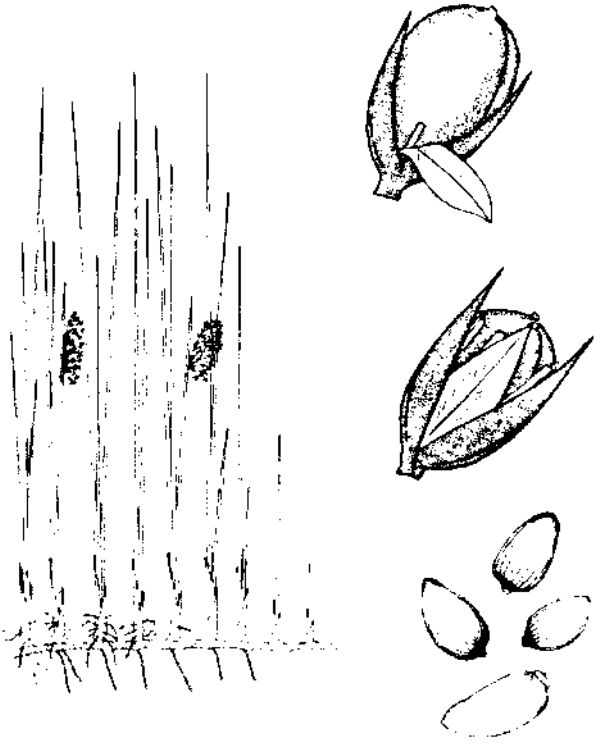
Perennial, from stout spreading rhizomes; leaves to 2 m tall; culm shorter than leaves; inflorescence a panicle of all imperfect or perfect flowers, highly variable in size; clusters consisting of 2-8 flowers; capsules from perfect flowers tan to brown, enclosed by or equaling the perianth, capsules from pistillate flowers exceeding the perianth, chestnut (castaneous) or reddish brown; 4.5 to 5.5 mm long; seeds from perfect flowers pale, tan or brown, seeds from pistillate flowers golden brown, reddish or dark brown, 0.3 to 0.6 mm long. Abundant. The most common tidal marsh plant in Mississippi forming extensive and often dense stands.

Juncus scirpoides

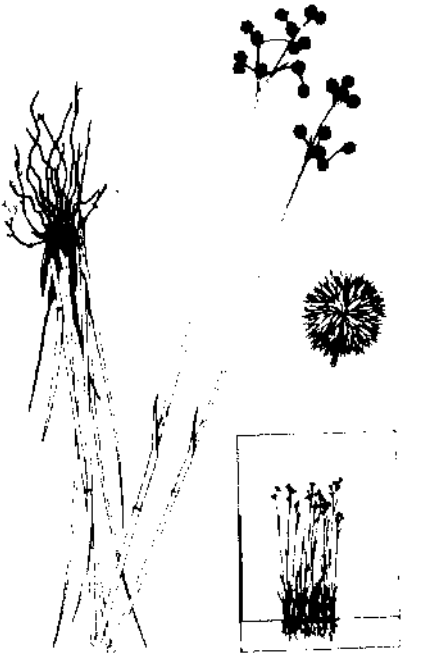
Vegetatively similar to Juncus megacephalus, but generally much shorter to 50 cm tall; inflorescence also similar in arrangement of flower clusters; clusters many flowered 25-50, clusters often lobed, appearing as fused clusters; capsule with slender beak, exceeding the perianth; seeds apiculate, about 0.5 mm long. Infrequent. Sandy or muddy areas and near levees in brackish and freshwater marshes.

Juncus megacephalus

Juncus polycephalus



Juncus roemerianus



Juncus scirpoides

Juncus trigonocarpus

Perennial, erect or ascending, culms to 1 m tall, curving or trailing and rooting near the base; leaves terete, stout, septate; inflorescence branches erect or nearly so; clusters with 2-4 flowers; capsule 3 angled, dark red and usually twice as long as the perianth; seeds brown and conspicuously caudate at each end by enveloping yellow or white membrane, overall length 2-3 mm. Infrequent. Especially on sandy shores along waterways in riverine marshes and intermixed in brackish and freshwater marshes.

Juncus validus

Vegetatively similar to Juncus polycephalus; inflorescence spreading 15-30 cm wide, of spherical flower clusters, 30-50 flowers per cluster, capsule dark brown, 4-5 mm long, tapering to the apex, subulate, exceeding the perianth; seeds about 0.4 mm long. Distribution similar to that described for the preceeding species.

LILIACEAE

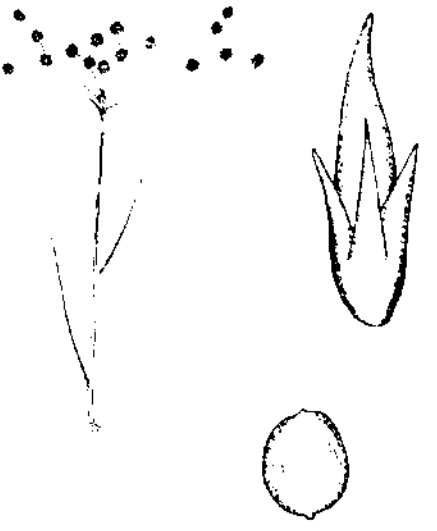
Smilax bona-nox

Woody vine; leaf blades variable in shape, about 4-8 cm long; berry, black, 6-8 mm in diameter, one-seeded; seed brown, 5-6 mm in diameter. Frequent along the upper edge of brackish marsh and in very low salinity marshes proper. Found growing in a stand of Juncus roemerianus in the marshes of Bluff Creek.

Smilax laurifolia

Woody vine; leaves variable, 6-10 cm long; berry black, 1 seeded, about 7 mm in diameter; seed black 4-5 mm in diameter. Distribution similar to above.

Juncus trigonocarpus



Juncus validus

Smilax bona-nox

Smilax laurifolia

Smilax walteri

Woody vine; leaves variable, 5-14 cm long; berry coral red about 6-8 mm in diameter, one seeded; seed about 5-6 mm in diameter, dark brown. Distribution similar to above.

AMARYLLIDACEAE

Crinum americanum

Plants arising from bulbs; leaves to 1 m long; culm shorter, with umbels of 5 or more white flowers; capsule thin walled with 1 to several seeds, 3-4 cm in diameter. Abundant in brackish marshes, generally intermixed with Juncus roemerianus or as wide patches or almost pure zones near the water's edge.

Hymenocallis occidentalis

Plants arising from bulbs; leaves to 1 m long; culm shorter, with umbels of 3-9 white flowers; corolla funnel form; capsule fleshy, 1-6 seeds in each of the 3 locules. Distribution similar to the preceeding.

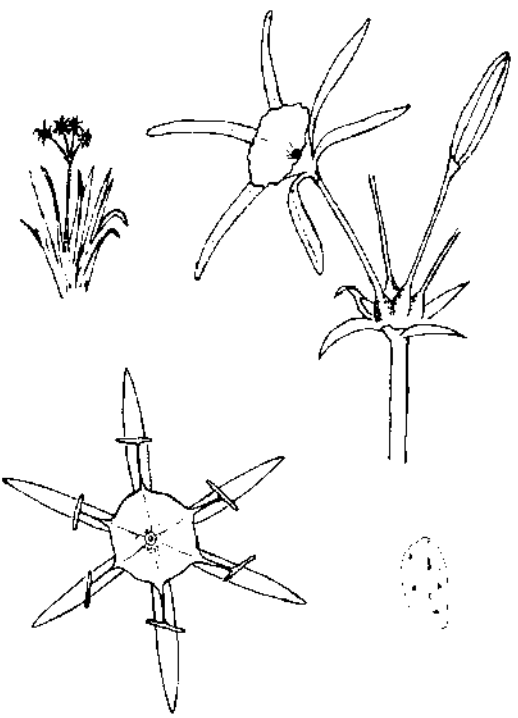
IRIDACEAE

Iris virginica

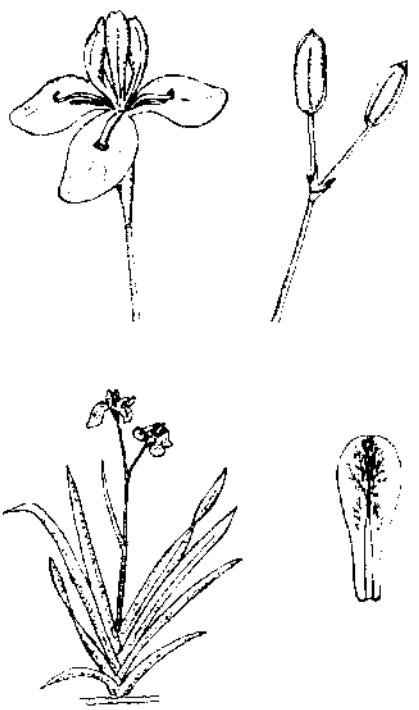
Perennial from thick rhizome; culm to 70 cm tall; flowers blue, purple or violet, petals streaked or blotched with white, yellow, orange or red; capsule 4-8 cm long, 3 angled. Frequent in brackish and freshwater marshes. Generally intermixed with Juncus roemerianus and other marsh plants, sometimes forming wide zones or stands.

Smilax walteri

Crinum americanum



Hymenocallis occidentalis



Iris virginica

ORCHIDACEAE

Spiranthes odorata

Basal leaves absent; culm to 70 cm tall; flowers white; perianth downy-pubescent; flowers with mixed odor of vanilla, coumarin and jasmine. Frequent. Found in flower in late October to December in brackish riverine marshes. Apparently having considerable salt tolerance.

SAURURACEAE

Saururus cernuus

Perennial from fleshy rhizome; culm to about 80 cm tall; leaves 10-20 cm long; flowers white, fruit a capsule. Frequent along low salinity waterways and in brackish and freshwater marshes.

MYRICACEAE

Myrica cerifera

Shrub; leaves with resin dots especially on the lower surface; pistillate catkins 0.5 to 1 cm long; staminate catkins 1-1.5 cm long; fruit gray, 2-3 cm in diameter, waxy. Abundant. One of the most common shrubs forming the upper border of salt marshes. Also frequently occurs on slightly elevated areas within the marsh such as on small levees, and sandy or muddy ridges.

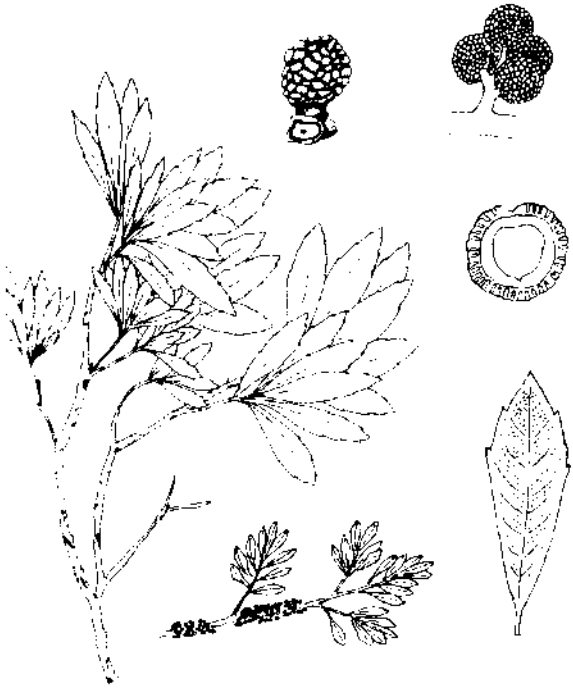
POLYGONACEAE

Brunnichia cirrhosa

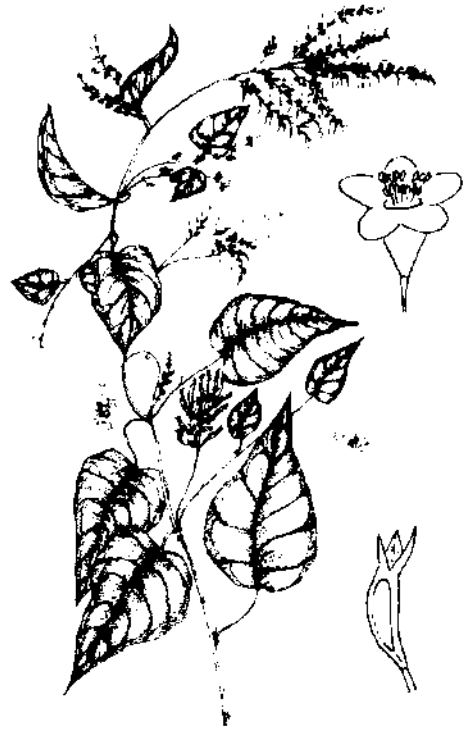
Woody vine; leaves to 10 cm long; flowers white in panicles, spikelike racemes, calyx greenish or yellow-green; seed about 6 mm long, triangular, enclosed in a well-developed hypanthium. Infrequent. On levees and in the upper edge of brackish marshes.

Spiranthes odorata

Saururus cernuus



Myrica cerifera



Brunnichia cirrhosa

Polygonum hydropiperoides

Stem erect or decumbent at the base, rooting at the nodes; leaves strigose to 3 cm wide or wider; ocreae strigose and ciliated, hairs marginal and less than 5 mm long; a stout, full raceme; calyx white, greenish, pink or rose colored; seeds black, smooth, trigonous with rounded edges 1.8-3 mm long. Frequent. Commonly intermixed with other plants in brackish and freshwater marshes.

Polygonum punctatum

Vegetatively similar to preceeding except leaves glabrous and generally narrower (to 2 cm) than above, but not always; ocreae glabrous or obscurely strigose, bristles less than 5 mm long; raceme slender ; calyx greenish sometimes dotted with dark, yellow glands; seed trigonous, black or dark brown, 1.8-3 mm long. Distribution same as above.

Polygonum setaceum

Vegetatively similar to preceeding but generally coarser and stouter than above species, also with slightly wider leaves, to 4 cm wide; ocreae densely strigose and ciliated, bristles marginal up to 1.5 cm long and enlarged at the base; calyx green, pink or white; seed 2-3 mm long, black, shiny. Distribution same as above.

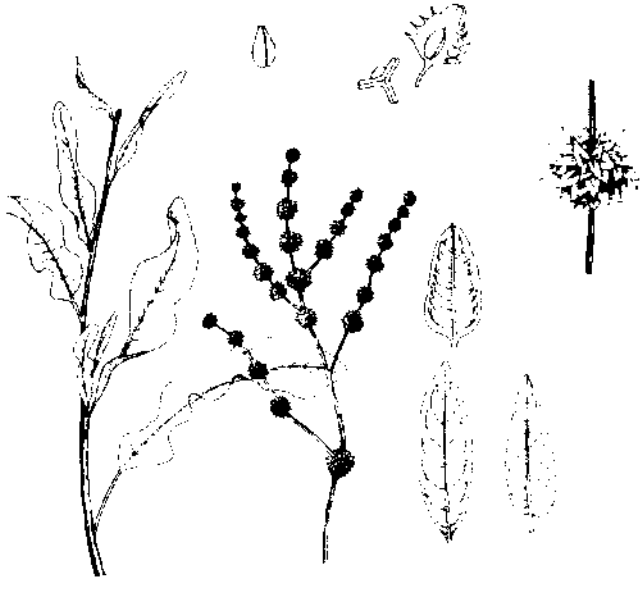
Rumex obtusifolius

Plants to 1 m tall; leaves dark green to purplish, 15-25 cm long, basal ones larger to 2.5 times as long as broad, cordate at base of leaf; pedicels thick, jointed in the middle, no longer than the fruit, valves yellow, dark brown, golden or red-brown, valves 3-4 mm long at maturity. Infrequent. Found in the upper edge of marshes.

Polygonum hydropiperoides

Polygonum punctatum

Polygonum setaceum



Rumex obtusifolius

Rumex verticillatus

Plants to 1 m tall; cauline leaves green, to dark green, narrowly linear-lanceolate, 6-9 times as long as wide, basal leaves dark green, 5-7 times as long as broad, pedicels 2.5 to 5 times as long as the valves, valves yellow, dark brown, golden or red-brown, valves at maturity 4-5 mm long. Found as the preceeding.

CHENOPODIACEAE

Atriplex arenaria

Annual to 60 cm tall; leaves alternate, broadly oblong, lance-ovate to obovate 1-3 cm long, silvery-scurfy, entire or undulate; pistillate flowers axillary or occasionally on lower part of staminate spikes; fruiting bracts rhombic to 7 mm long, prominently serrate, usually two serrated crests on the face; seeds reddish brown 2-3 mm long. Infrequent. Found in marshes of the more saline portion of estuaries, in hypersaline marshes and in dune-marsh transitional zones.

Atriplex patula

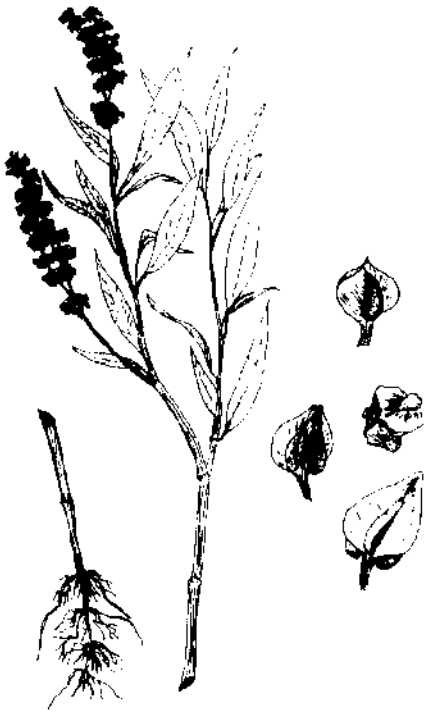
Annual to 1 m tall; upper leaves lanceolate to hastate oblong, dark green often with purple tint; lower leaves hastate, sinuate, cuneate to truncate sometimes broadly triangulate, entire or remotely dentate; fruiting bracts reddish with age, rhombic to rhombic-ovate, to 5 mm long, remotely denticulate, the face smooth or with low crests with few teeth; seeds yellowish or black, 1.5-2.5 mm long. Distribution similar to above, but this species found mostly in saline marshes proper and on low levees of the waterways. Plant not illustrated, but appearance essentially the same as Atriplex arenaria.

Chenopodium album

Annual to 3 m tall, entire plant farinose; leaves thick-fleshy or thin-soft, light green, sometimes tinted red or turning reddish; leaves 2.5-8 cm long, variable in shape as shown; inflorescence, white-mealy to glabrous, compact, narrow, grayish-green, pericarp adherent to the seed; seed black, shining 1-1.5 mm broad, smooth to minutely pitted. Frequent in brackish and saline marshes.

Salicornia bigelovii

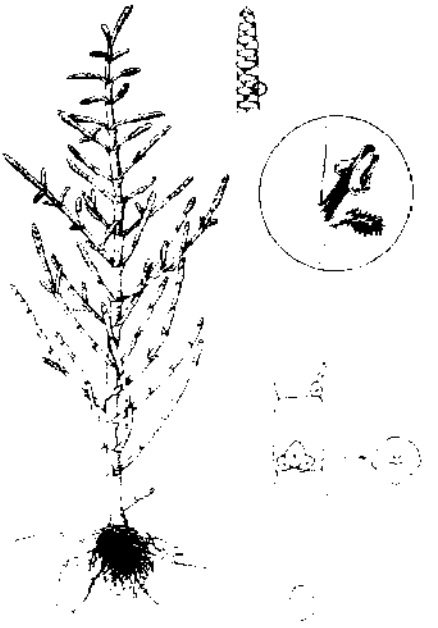
Annual to 60 cm tall, pale green to green, succulent and stout, often turning red or reddish especially at maturity; stem erect with spreading and ascending fleshy branches; seed dull brown or black, 1.5-2 mm long. Frequent. Restricted to but abundant in marshes of highest salinity, such as hypersaline salt flats. Often forming dense almost pure stands, swards or zones.



Rumex verticillatus

Atriplex arenaria

Chenopodium album



Salicornia bigelovii

Salicornia virginica

Perennial from elongated rhizomes; erect or prostrate stems to 30 cm tall, fleshy, succulent, coloration similar to the preceeding; seed 0.5 to 1 mm long, dull brown or gray, sometimes covered with slender curved hairs. Distribution as above.

Suaeda linearis

Annual glabrous, glaucous, to 80 cm tall; stem becoming woody; leaves pale green to dark green, fleshy, entire, 1.5-3 cm long; utricle enclosed by calyx; seed horizontal, black, shining, about 1-1.5 mm wide. Infrequent. Found in the most saline marshes and in the upper edge of marshes near sand dunes.

BATACEAE

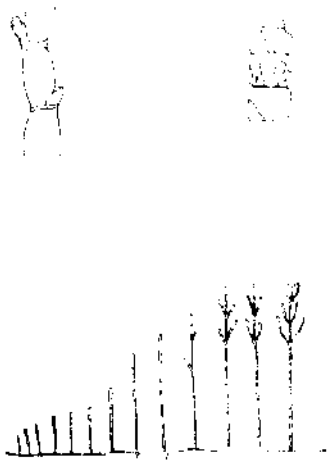
Batis maritima

Perennial, pale green, shrubby, with long spreading or prostrate woody stems which root at the nodes; leaves recurved to 3 cm long; flowers in short, rounded cone-like, axillary inflorescences, sessile or pedunculate; sepals of pistillate flowers fuse to form a multiple of 2-8 fruits, 1-2 cm long. Infrequent. Restricted highly saline marshes. Distribution the same as described for Salicornia bigelovii.

AMARANTHACEAE

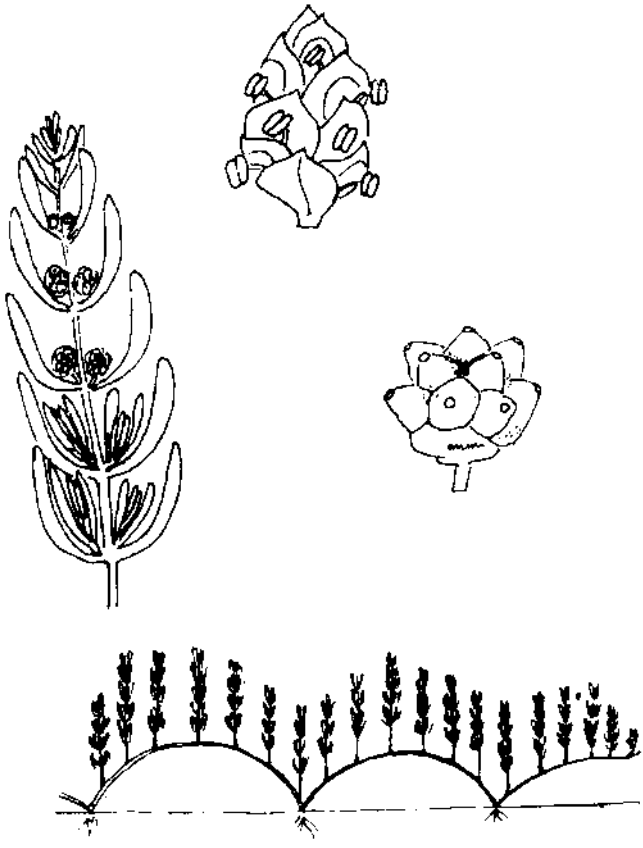
Alternanthera philoxeroides

Perennial aquatic, stems often 1 meter long or longer, stout, fleshy, glabrous, rooting at the nodes; leaves linear, lanceolate to obovate to 12 cm long; white flowers sessile in the bractlets, with a sweet odor; sepals to 6 mm long. Infrequent in freshwater and very low salinity marshes. Forming mats, often floating.



Salicornia virginica

Suaeda linearis



Batis maritima

Alternanthera philoxeroides

AIZOACEAE

Sesuvium portulacastrum

Fleshy perennial, prostrate, glabrous; leaves to 5 cm long; pedicellate flowers to 1 cm long, solitary, pink; sepals with a horn-like appendage; fruit about 7 mm long; seed black, smooth and lustrous 1-1.5 mm long. Infrequent. Found in the upper edge of marshes that border sandy beach ridges or dunes and along sandy shores.

CERATOPHYLLACEAE

Ceratophyllum demersum

Plants submerged; leaves 1-3 cm long, about 0.5 mm wide, linear, divided 2 or 3 times, in whorls on elongate stems, leaves toothed antrorsely; seed 4-6 mm long with two basal spines and a persistent style to 1 cm long. Frequent in very low salinity and freshwater bayous, often forming large masses. Also found in relatively deep pools in brackish marshes of low salinity.

NYMPHAEACEAE

Nuphar luteum

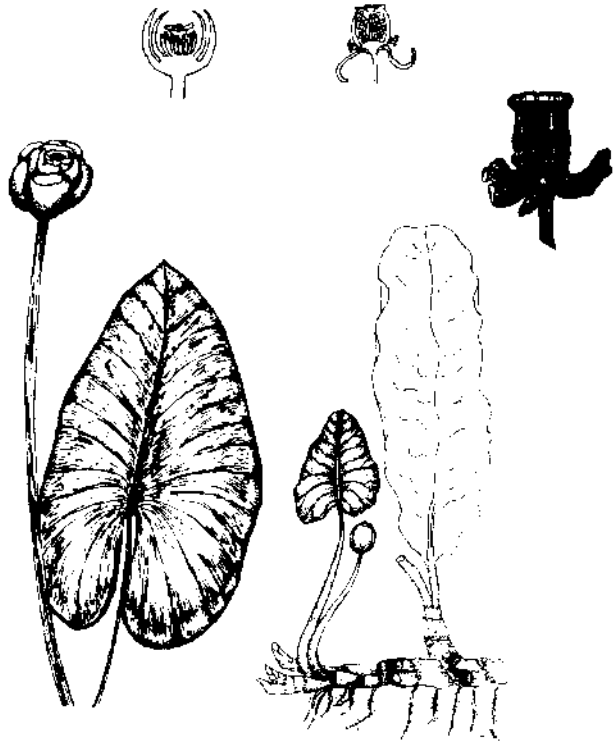
Leaves submerged and emerged, arising spirally from thick rhizomes; leaves ovate, suborbicular or elliptic-ovate, smooth, leaf blades to 40 cm long; flowers 3-5 cm wide, bright yellow within; fruit about 3.5 cm long; seed numerous, broadly ovoid, 4-6 mm long, yellow to brown. Frequent. Found along the lower edge of marshes, especially in rivers, where distinct zones are often formed.

Nymphaea odorata

Leaves floating, red tinged, 15-20 cm wide; rhizome stout to 3 cm thick; flowers white to pinkish, fragrant; sepals about 5-6 mm long; fruit berrylike about 2.8 cm in diameter; seeds about 2 mm long, ellipsoid. Frequent. Found primarily in pools and waterways within brackish and freshwater marshes and in marshes of oxbow lakes.

Sesuvium portulacastrum

Ceratophyllum demersum



Nuphar luteum

Nymphaea odorata

NELUMBONACEAE

Nelumbo lutea

Leaves 30-70 cm wide; peduncles arising to a meter above the water surface; perianth yellow, to 25 cm across; fruit nutlike, indehiscent. Rare. Only observed once in sluggish embayments, impounded bayous and oxbow lakes of the lower Pearl River.

RANUNCULACEAE

Ranunculus carolinianus

Clumped perennial to 50 cm tall; leaves to 10 cm wide; flowers yellow; petals shining, 8-10 mm long; seeds brown or reddish, 2-3.5 mm long, beaked; beak 1.5-2.5 mm long. Rare. Found in the upper edge of marshes where freshwater runoff drains into the marsh or from natural seepage areas.

Ranunculus pusillus

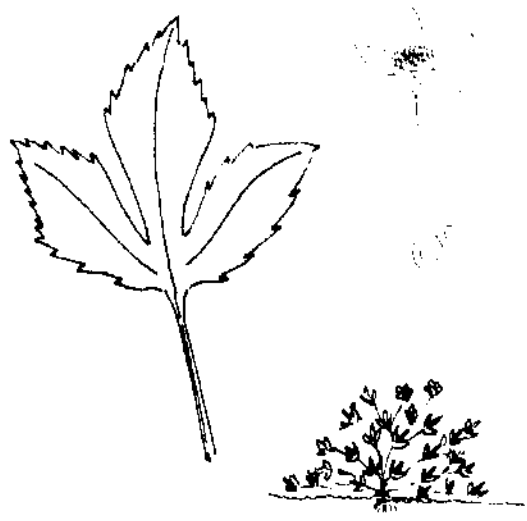
Clumped annual, to 50 cm tall; leaves 1-4 cm long; flowers yellow, shining; petals about 2 mm long; generally equal to or shorter than the sepals; seeds brownish, about 1 mm long, with a very short beak. Rare. Distribution similar to the preceeding species.

MAGNOLIACEAE

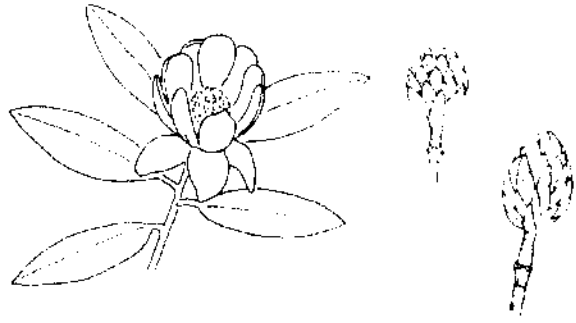
Magnolia virginiana

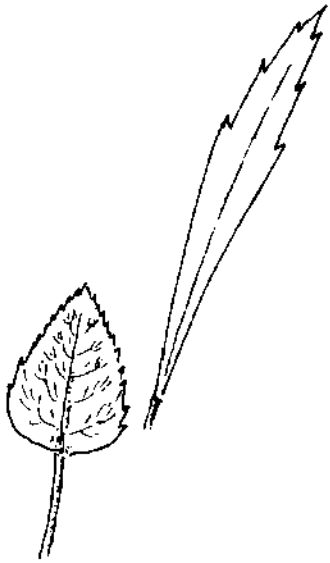
Occurs as a shrub not over 2 m tall in low salinity marshes proper, where it is generally stunted and consequently does not produce flowers or fruit. Leaves silvery and silky beneath, 10-15 cm long; flowers white, small 5-7 cm across, fragrant of lemon; fruit 4-5 cm long, dark red; seed bright red, about 8 mm long. Frequent as a mature tree on larger levees of rivers adjacent to brackish marshes and along the upland border of salt marshes.

Nelumbo lutea



Ranunculus carolinianus





Ranunculus pusillus

Magnolia virginiana

LAURACEAE

Persea palustris

Form of occurrence and distribution in the tidal marshes similar to the preceeding. Leaves dark green with tomentose, hairy lower surface, 10-15 cm long; petioles tomentose; flowers in small panicles, peduncles to 7 cm long; fruits 10-18 mm wide, dark blue or black, about 1 cm long.

FABACEAE

Amorpha fruticosa

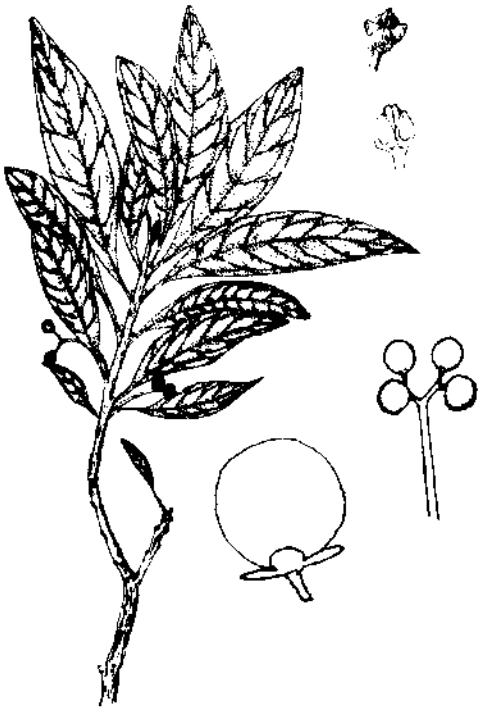
Shrub 2-3 m tall; leaves 10-20 cm long, covered with short-appressed hairs; flowers in racemes, purple to dark blue; pods to 6-7 mm long, with conspicuous resin glands or dots. Frequent along the upper edge of brackish and saline marshes.

Sesbania drummondii

Shrub to 4 m tall; leaves 10-20 cm long; flowers to 2 cm long, yellow or orange with red lines; pod septate, brown, 5-6 cm long about 1 cm wide, 4-winged the entire length; seeds 2-7 per pod generally 4 or 5, loose in the mature pod, brown. Common along the upper edge of more saline mainland marshes, on sandy berms and around sandy insular marshes.

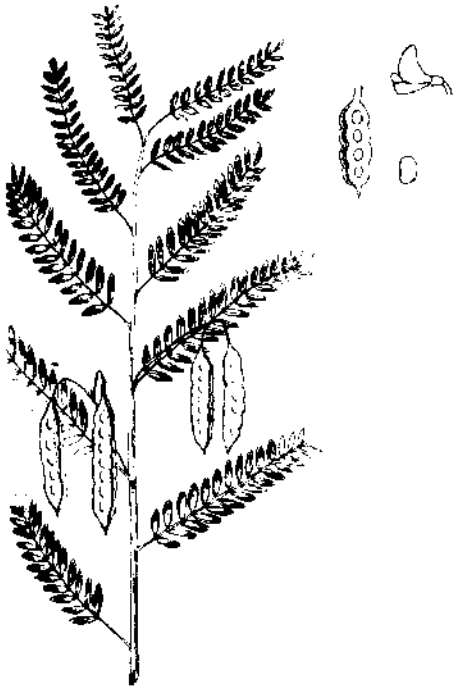
Sesbania exaltata

Shrub to 4 m tall; leaves 12-30 cm long; flowers to 2 cm long, yellow mottled with purple; legume linear, 10-20 cm long, 3-4 mm broad, 20-40 seeds, septate, brown; seed olive brown, mottled with black about 3 mm long. Distribution similar to the preceeding.



Persea palustris

Amorpha fruticosa



Sesbania drummondii

Sesbania exaltata

Sesbania punicea

Shrub to 4 m tall; leaves 10-20 cm long; flowers about to 2 cm long with purplish red, glabrous calyx and reddish purple petals sometimes rose or orange; pod beaked, stipitate, 5-8 cm long, 1-1.5 cm thick, strongly 4-winged, septate, with several seeds, coriaceous. Taxonomically similar to Sesbania drummondii. Distribution similar to the preceeding.

Sesbania vesicarium

Shrub to 3 m tall; flowers with yellow petals or tinged with red or pink, red or orange, to 2 cm long; pods bladder like, green, acuminate at both ends, generally 2-seeded sometimes 3, septated; mature pods tan, valves separating at maturity into thick outer and thin, papery-membranous inner layer. Distribution same as above.

Vigna luteola

Vine; flowers yellow, about 2 cm long; pods 4-7 cm long, dull brown, sometimes streaked with dark green; valves black; seeds, several, 3 mm wide, rectangular, convex on broad facets; hilum prominent, white. Frequent. Found in the upper edge of brackish and saline marshes especially near sandy shores, berms or dunes.

ANACARDIACEAE

Rhus radicans

Generally a vine, but in brackish marshes the habit becomes erect or shrublike with thickened, stout stems; distributed down into the marsh proper from shrub zone as scattered individual plants. Found intermixed with Juncus roemerianus in brackish marshes and more frequently with Cladium jamaicense. Flowers white or cream colored; immature fruit whitish; mature fruit black or blue-black, seeds 4 mm broad.

Sesbania punicea

Sesbania vesicaria

Vigna luteola

Rhus radicans

AQUIFOLIACEAE

Ilex decidua

Shrub generally less than 6 m tall; leaves relatively thin, to 8 cm long; flowers solitary, white about 4 mm long; fruit bright-red or orange, to 7.5 mm in diameter, lustrous; seeds 4 per fruit, grooved on the back, to 5 mm long. Frequent along the upper edge of marshes, especially in sandy areas, such as berms.

Ilex vomitoria

Shrub generally less than 4 m tall; twigs usually short, stout, rigid, obtusely angled; leaves generally less than 4 cm long, most 1-3 cm long, coriaceous, dark green, lustrous; flowers white about 3 mm long; fruit bright-red, rarely yellowish, to 6.5 mm in diameter; seeds grooved on back, 3-4 mm long. Distribution same as above.

ACERACEAE

Acer rubrum

Tree, generally occurring dwarfed or as seedlings in low salinity or freshwater tidal marshes. Here most seedlings fail prior to reaching a height of 1 m. Surviving plants usually less than 2 m tall. No flowers or seeds produced on plants found in the marsh proper. Leaves to 10 cm, light to dark green, generally with bright red petioles; seeds in red samaras 15-25 mm long on long peduncles. Mature trees occur frequently on levees in low salinity marshes and along the upper edge of marshes.

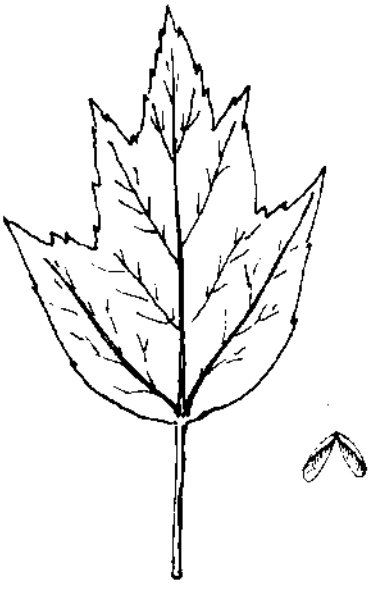
MALVACEAE

Hibiscus coccineus

Shrublike herb, to 3 m tall; leaf blades dark green, to 25 cm long; petals crimson, or deep red, to 15 cm long; capsule about 2.5 cm long. Rare. Occurs intermixed with other plants in brackish marsh or near the upper edge of more saline marshes.

Ilex decidua

Ilex vomitoria



Acer rubrum

Hibiscus coccineus

Hibiscus grandiflorus

Shrublike herb, to 3 m tall; leaves dark green to 25 cm long; petals pink or purple, sometimes red at the base, to 15 cm long; capsule 2-3 cm long, coarsely pubescent. Found abundantly in brackish marshes on Horn Island, less frequently elsewhere. Generally occurs intermixed or as small stands.

Hibiscus moscheutos

Shrublike herb, to 3 m tall; leaves dark green to 25 cm long; petals white (rarely pinkish) with a red band at the base, 6-15 cm long; capsule 2-4 cm long; seeds globose to pyriform, dark brown, papillose. Abundant. Wide spread generally as isolated clumps in the marsh proper.

Kosteletzkya virginica

Shrublike herb to 2 m tall; leaves light green to grayish, 8-22 cm long; flowers pink to 10 cm long; capsule about 1 cm in diameter; seed smooth, ovoid, dark brown or black, 3-4 mm broad. Abundant. Distribution is similar to Hibiscus moscheutos.

HYPERICACEAE

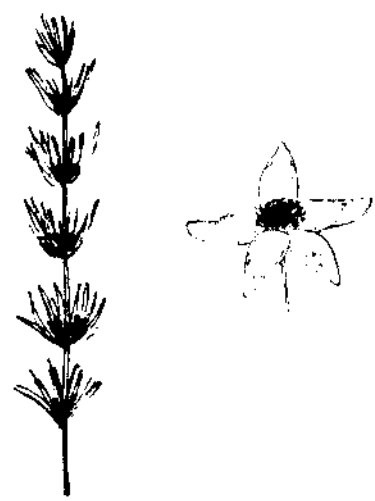
Hypericum fasciculatum

Shrub, to 1 m tall, but generally much less in low salinity or freshwater tidal marshes. Leaves numerous, linear-filiform or narrow linear, largest to 2 cm long, sessile, with fascicles of smaller leaves in their axils; flowers numerous, bright yellow, capsules ovoid, brown about 6 mm long; seed brown 0.5-0.6 mm long. Frequent in low salinity and freshwater marshes, especially in those marsh areas which grade into tree covered swamps.

Hibiscus grandiflorus

Hibiscus moscheutos

Kosteletzkya virginica



Hypericum fasciculatum

LYTHRACEAE

Ammannia coccinea

Stems spreading or depressed; leaves to 16 cm long, base clasping; flowers sessile, pink or purple, calyx tube 3-4 mm long; style slender; capsule about 3.5 mm long; pedicels absent or to 0.5 mm long. Frequent. Intermixed in brackish and freshwater tidal marshes.

Ammannia teres

Similar to the above, but leaves smaller to 6 cm long, lower leaves tapering to the base, upper leaves clasping; flowers pink, smaller than above, style thick; calyx tube 4.5-5 mm long; capsules 4-5 mm long; pedicels absent or to 1 mm long; seed whitish-brown. Distributed as the preceeding. Plant not illustrated, but appearance essentially the same as Ammannia coccinea.

Lythrum lineare

Perennial to 1 m tall; leaves to 4 cm long, mostly opposite; flowers axillary, white or violet, 1.5-3 mm long; capsule 3-4 mm long; seeds brown or yellow, linear-elliptic about 0.7 mm long. Frequent in brackish and freshwater tidal marshes. Generally intermixed with other kinds of plants.

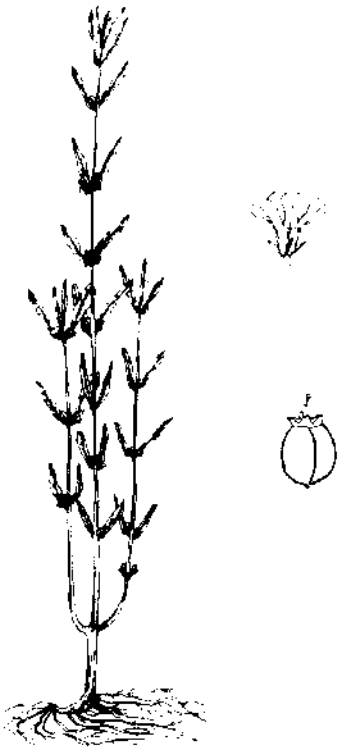
ONAGRACEAE

Ludwigia alata

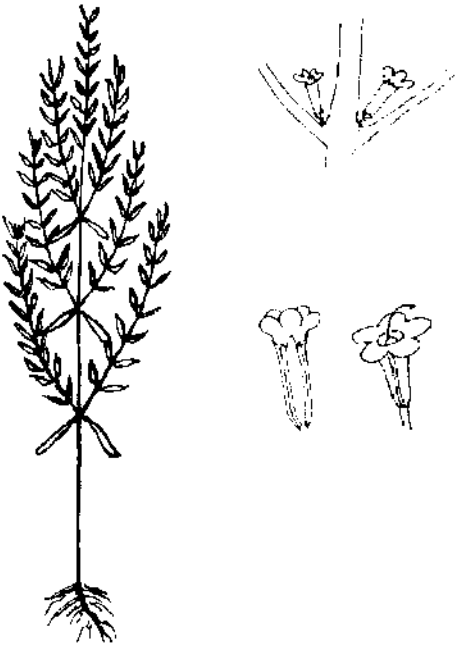
Stems angled or winged to 1 m tall; leaves to 10 cm long; flowers axillary, inconspicuous; petals yellow, minute or none; 4 bracts extending from the top of the hypanthium and equaling the capsule; capsules 4-angled or narrowly winged, 3-4 mm long, mostly sessile or with pedicels less than 3 mm long. Infrequent. Found in freshwater tidal marshes and on the levees of waterways in brackish marshes.

Ludwigia alternifolia

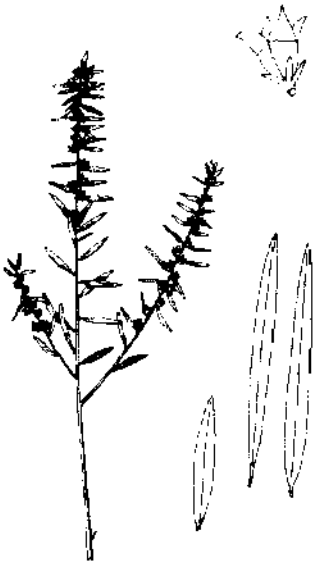
Plant similar to the above, but with conspicuous yellow flowers; sepals and petals about 6 mm long; pedicellate capsules; pedicels 3-5 mm long, bearing 2 lanceolate bracteoles near the summit. Distributed as described for the preceeding.



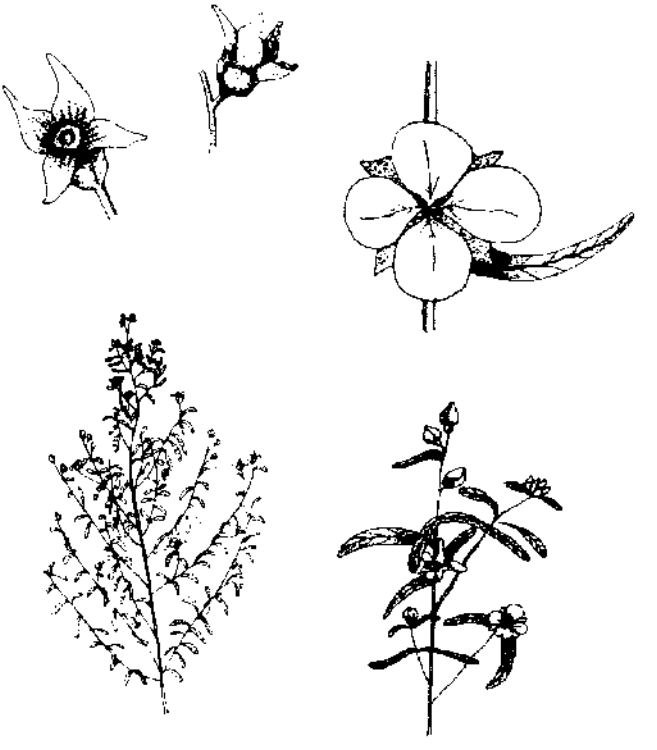
Ammannia coccinea



Lythrum lineare



Ludwigia alata



Ludwigia alternifolia

Ludwigia leptocarpa

Robust plant; hairy leaves to 20 cm long; flowers yellow, sessile or pedicellate in upper leaf axils; hypanthium and capsule hirsute; capsule cylinderical, 4-6 cm long; pedicels absent or to 2 cm long; seed uniseriate, free inside, brownish endocarp. Distributed as described for the preceeding.

Ludwigia maritima

Stems glabrous or nearly so, to 1 m tall; leaves to 10 cm long; petals yellow, 7-15 mm long; sepals reflexed longer than the hypanthium; capsules cubical, 6-10 mm long, 4 angled, usually slightly winged, pubescent; pedicels to 15 mm long; bracteoles, linear, 2-4 mm long. Distributed as described for the preceeding.

Ludwigia sphaerocarpa

Stems much branched, pubescent, to 1 m tall; leaves glabrous, or finely pubescent, to 10 cm long, those subtending flowers generally shorter, but similar in shape, often some leaves sessile, others with petioles; flowers sessile, axillary, or with short pedicels to 0.5 mm long; no petals; capsules hirsute, 2-4 mm long, as a sphere, not angled, bracteoles to 2 mm long. Distributed as described for the preceeding.

HALORAGACEAE

Proserpinaca pectinata

Partially submerged or found growing on moist soil; leaves deeply pinnatifid to 25 mm long; flowers axillary, sessile, minute, solitary or in groups of 2 or 3; calyx 3-angled, greenish; seed 3-4 mm wide, irregularly ridged. Infrequent. Primarily in freshwater marshes of rivers. Also in pools, ponds and marshes on the barrier islands.

Myriophyllum exalbescens

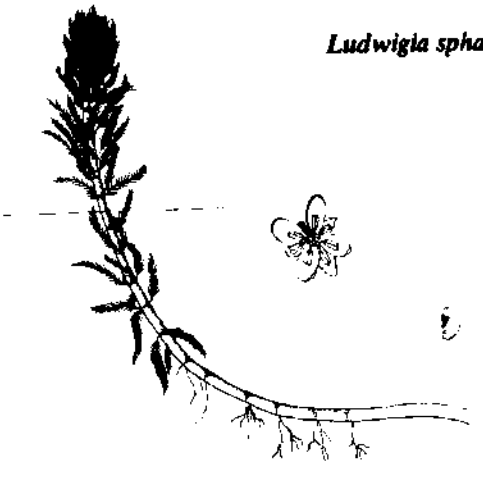
Leaves all whorled, to 3 mm long; spikes emersed 4-10 cm long, lower flowers pistillate, upper ones staminate; petals about 2.5 mm long; mature mericarps 2-3 mm long, rounded on the back and summit or sometimes tuberculate. Frequent. Found in the shallow waters of freshwater bayous of riverine marshes and in the waterways and pools of low salinity marshes.

Ludwigia leptocarpa

Ludwigia maritima

Ludwigia sphaerocarp

Proserpinaca pectinata



Myriophyllum exalbescens

Myriophyllum heterophyllum

Plants with dimorphic leaves, submerged leaves pinnate 2-5 cm long, emersed leaves variable in shape to 2 cm long; spikes emersed to 40 cm; flowers distributed as the preceeding; mature mericarp with 2 ridges on the back but rounded on the sides, frequently prominently beaked. Infrequent. Distributed as described for the preceeding.

APIACEAE

Centella asiatica

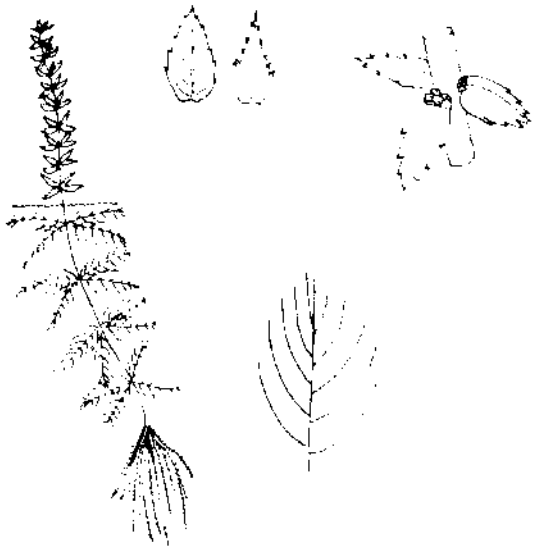
Perennial, rhizomes generally white; leaves 1.5-3.5 cm long, variable in shape, pubescent beneath; inflorescence an umbel; flowers with white petals; fruit flattened laterally 3-4 mm broad, prominently ribbed and reticulate. Infrequent. Found along the upper edge of saline and brackish marshes which border dunes, on slightly elevated sandy ridges and in freshwater marshes.

Cicuta maculata

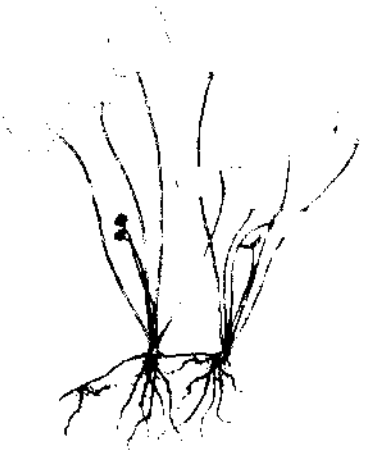
Perennial, stout, shrublike, to 3 m tall; with fleshy, tuberous roots; leaflets to 20 cm long; coarsely serrate or entire; flowers in umbels, white; fruit ovoid to orbicular 2-4 mm long, with prominent, rounded, pale brown ribs separated by dark brown or reddish brown intervals. Frequent in brackish riverine marshes and on low levees adjacent to waterways of more saline marshes.

Eryngium yuccifolium

Stems erect to 1.5 m tall; leaves coriaceous, linear, parallel-veined to 80 cm long, margins spinose; inflorescence a compact head, cymosely branched, 8-25 mm long; petals white or greenish; fruit 2-3 mm long, smooth or obscurely tubercular. Infrequent along the upper edge of the brackish and saline marshes. Not observed in freshwater marshes.



Myriophyllum heterophyllum



Centella asiatica

Cicuta maculata

Eryngium yuccifolium

Hydrocotyle bonariensis

Plant glabrous, stems as stolons or rhizomes, white, slender, to 45 cm tall; leaves to 15 cm in diameter; peduncles much exceeding the leaves (petioles); flowers white in proliferous compound umbels, stylopodium depressed; fruit about 3 mm wide, conspicuously ribbed. Frequent in sandy marsh areas.

Hydrocotyle umbellata

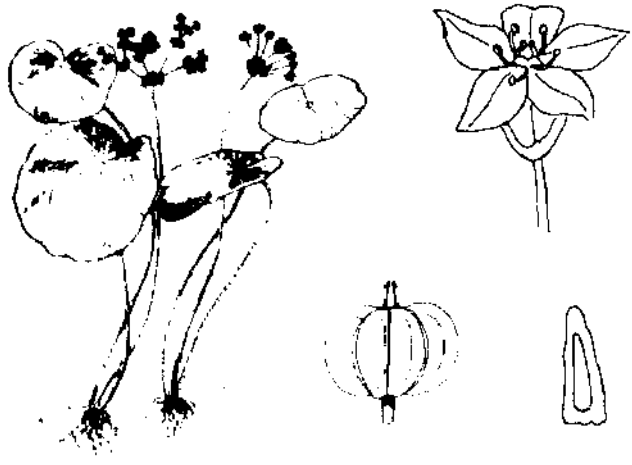
Plant vegetatively similar to the preceeding, except that the leaves are generally smaller but sometimes up to 7 cm in diameter; umbels simple with 10 or more flowers; peduncle equal to or exceeding the leaves; fruit 2-3 m wide, with a distinctly notched or cordate base, margins acute. Distribution same as the preceeding.

Hydrocotyle verticillata

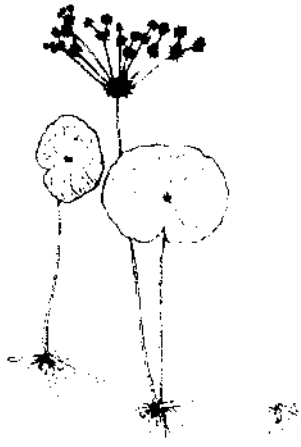
Plant vegetatively similar to the preceeding; peduncle shorter, but sometimes exceeding the leaves; inflorescence simple or to a 3-forked spike to 17 cm long, with 2 to 7 few-flowered verticils, the interverticillar distance to 6 cm; flowers mostly sessile; fruit 3-4 mm wide, rounded or truncate at the base, margins acute. Distribution same as the preceeding.

Lilaeopsis carolinensis

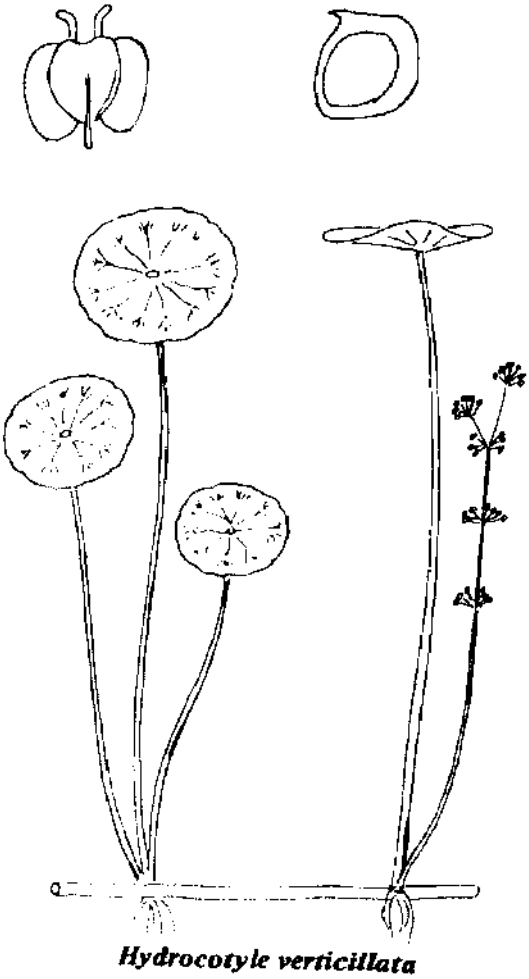
Stems are slender, white rhizomes; leaves are phyllodes up to 3 cm long, with 7-15 transverse septa; peduncles 1-5 cm long, bearing 5-15 white flowers; fruit about 3 mm long, with corky, uniform ribs. Infrequent. Forms a dense surface cover or mat in open areas and as an understory layer beneath Juncus roemerianus and other salt marsh plants.



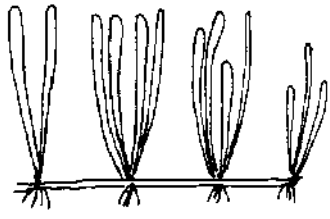
Hydrocotyle bonariensis

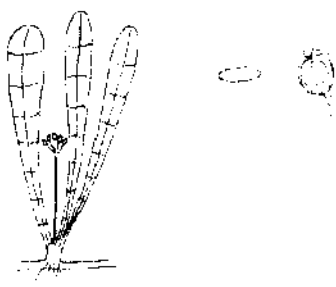


Hydrocotyle umbellata



Hydrocotyle verticillata





Lilaeopsis carolinensis

Lilaeopsis chinensis

Stems as the preceeding; phyllodes to 3 cm long, with 4-8 transverse septa; peduncles sometimes equaling but generally much exceeding the leaves, bearing 4-9 white flowers; fruit about 2 mm long, pinched at the base. Very abundant. Distribution same as the preceeding.

Oxypolis filiformis

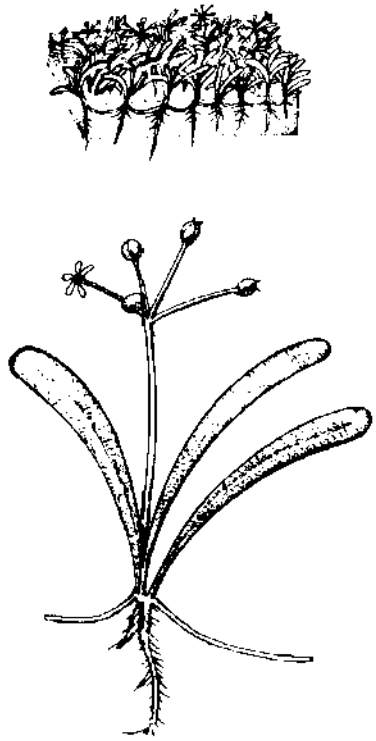
Plants to 1.5 m tall; leaves reduced to filiform or linear, septate phyllodes, the upper bract-like, the basal to 50 cm long; flowers white, in compound umbels; involucral bracts many, thread-like; fruit broadly elliptic, 4-6 mm long, notched at the summit, winged. Frequent. Brackish and low salinity riverine marshes.

Ptilimnium capillaceum

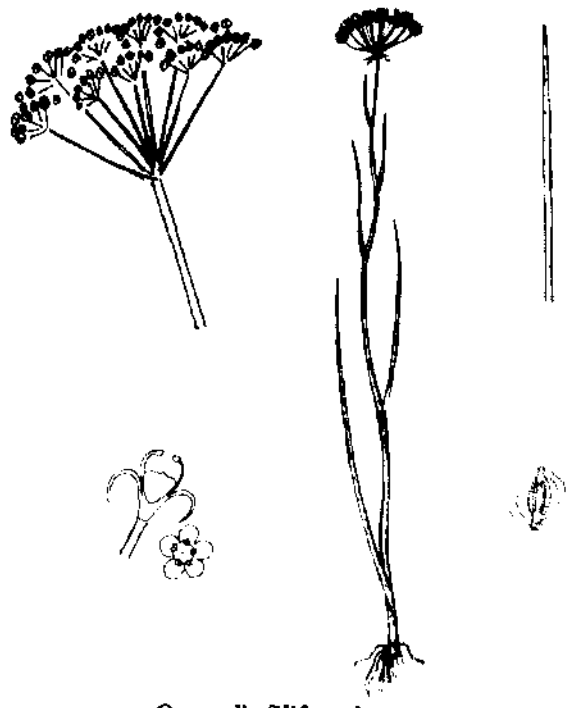
Plants to 1.5 m tall; leaves 4-10 cm long pinnately dissected into fine, filiform segments; involucrals bracts foliaceous; flowers in umbels 2-5 cm wide; overtopping the leaves; fruit broadly ovoid, 2-3 mm long, the lateral ribs conspicuous. Distribution same as the above.

Sium suave

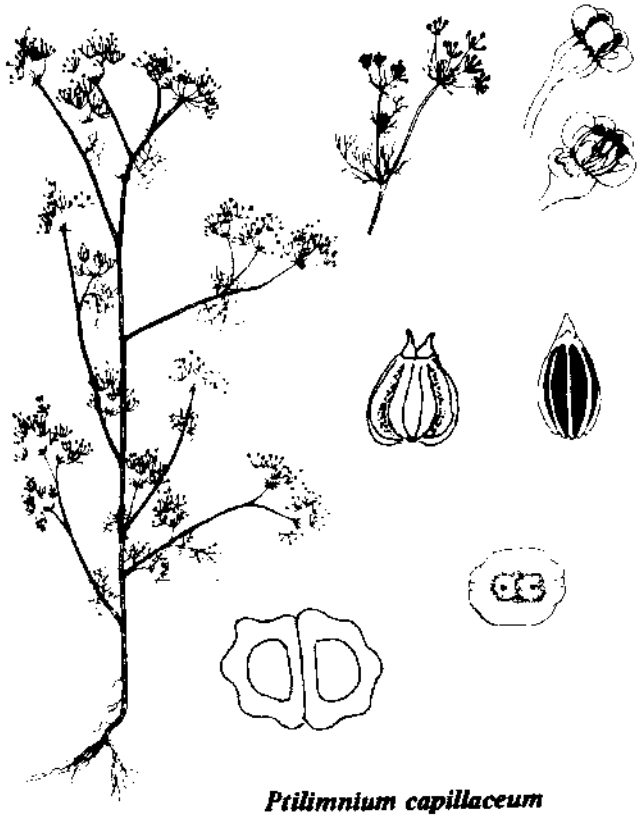
Perennial, stout, shrublike, to 2 m tall; leaves 10-25 cm long; umbels compound; peduncles stout 3-10 cm long; petals white; fruit glabrous, strongly ribbed, 3-4 mm long; mericarps stellate-rounded in cross section, the seed face plane, ribs prominent, a group of reinforcing cells in the apex of each rib. Locally more abundant in brackish riverine marshes than the preceeding two species.



Lilaeopsis chinensis



Oxypolis filiformis



Ptilimnium capillaceum

Sium suave

PRIMULACEAE

Samolus parviflorus

Plants to 50 cm tall; leaves 2-7 cm long; flowers in elongate, open, terminal racemes; calyx tube 5-lobed, persistent; corolla campanulate, 5-lobed, 2-3 mm broad; white; capsule 2-3 mm in diameter; seeds reddish brown, reticulate, triangular 0.3-0.5 mm long. Frequent in brackish marshes.

NYSSACEAE

Nyssa aquatica

Stunted and shrublike in the marsh proper, a mature tree on levees adjacent to waterways and marshes of rivers and along the edge of brackish and saline bayous. Leaves to 30 cm long, about half as wide; fruit 2-4 cm long, usually 3 cm long, oblong-elliptic, oval, or slightly obovoid, dark purple, bluish to black; stone with 10 sharp narrow wings.

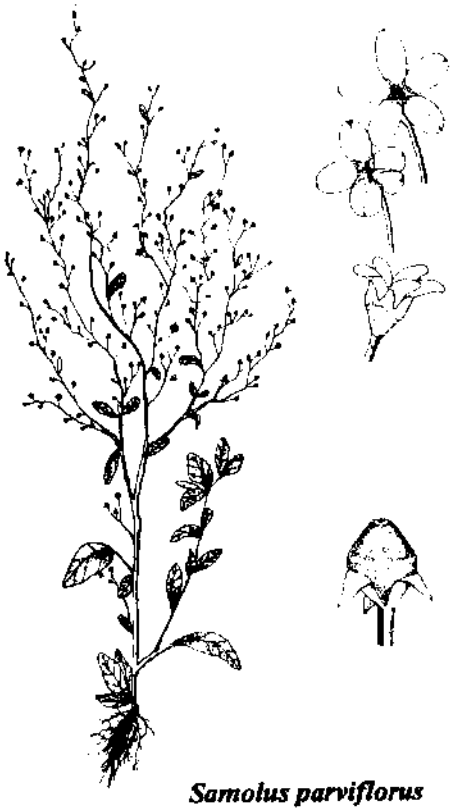
Nyssa sylvatica

Often stunted in brackish marsh; a mature tree on levees or in marshes along the edge of swamps. More abundant than Nyssa aquatica. Leaves to 15 cm long, variable in shape; fruit 10-15 mm long, blue, ellipsoid to subglobose, usually spherical or nearly so; stone oval, with about 10 shallow grooves and as many broad ridges.

PLUMBAGINACEAE

Limonium carolinianum

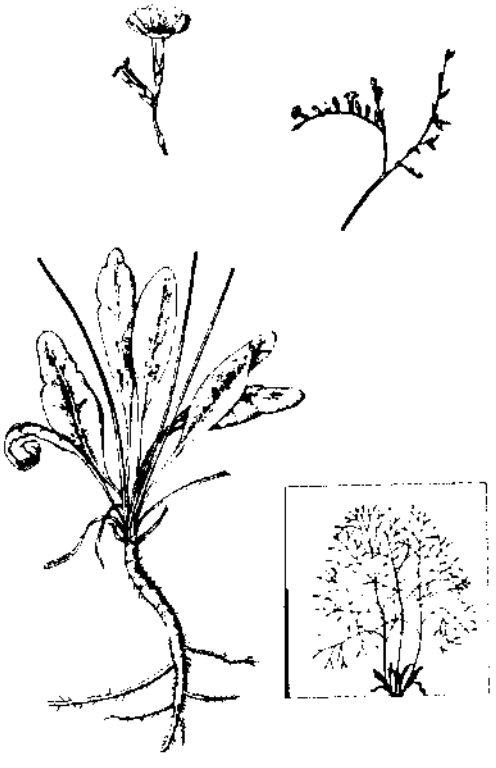
Perennial; culm to 60 cm tall; leaves mostly in a basal rosette; flowers blue to purple or lavender; capsule 5-7 mm long. Frequent in saline marshes and sandy salt flats.



Samolus parviflorus

Nyssa aquatica

Nyssa sylvatica



Limonium carolinianum

GENTIANACEAE

Sabatia dodecandra

Perennial, to 60 cm tall; leaves 2-5 cm long; corolla lobes 6-10 or more, pink or whitish, yellow at the base; capsule 6-7 mm long, ovoid to ellipsoid; seeds olive-brown, 0.4-0.5 mm long. Infrequent. Found in saline marshes and salt flats.

Sabatia stellaris

Perennial, to 40 cm tall; leaves 2-4 cm long; corolla pink sometimes whitish with a yellow center, lobes 5 or 6; capsule 5-10 mm long; seeds black to brown, 0.3 to 0.4 mm long. Infrequent. Found as the preceeding.

Nymphoides aquatica

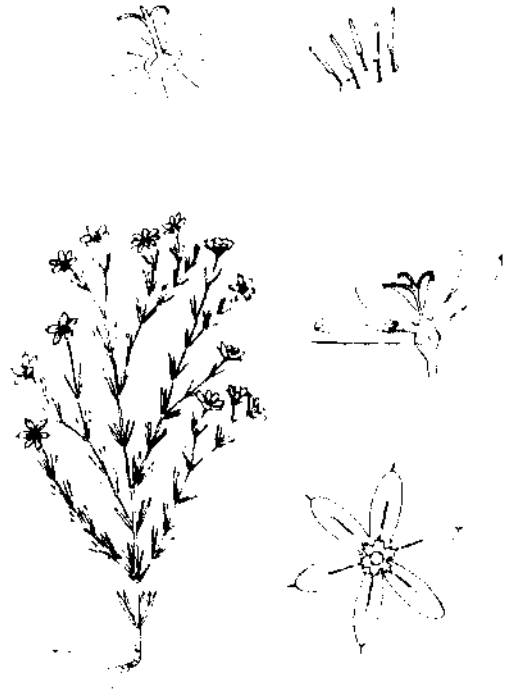
Plant with submerged and floating leaves; leaves green above, purple beneath, 4-20 cm long; inflorescence to 8 cm below the leaf; pedicels to 10 cm long at anthesis; corolla white, 15 mm wide; calyx to 5 mm long; capsule elongate, 5-7 mm long; seeds about 1.5 mm long, with many rounded projections or glands. Infrequent. Found along the edge of waterways which drain low salinity and freshwater marshes.

ASCLEPIADACEAE

Asclepias lanceolata

Plants to 1.5 m tall; leaves to 20 cm long; inflorescence composed of 1-4 umbels; flowers red, orange-red or reddish purple; corolla 9-12 mm long; hoods 6-7 mm long; pods erect on deflexed pedicels; seeds oval, about 1 cm long. Frequent in brackish and saline marshes.

Sabatia dodecandra



Sabatia stellaris

Nymphoides aquatica

Asclepias lanceolata

Asclepias perennis

Plants to 1 m tall; leaves 6-12 cm long; umbels 2-4; corolla white, 3-4 mm long; hoods about 2.5 mm long; pod 5-8 mm long; seeds 9-12 mm long. Infrequent. Freshwater or low salinity marshes and in the upper edge of brackish marshes.

Cynanchum palustre

Vine; leaves 4-8 mm long, drooping; flowers in cymes over 1 cm wide; corolla white, purplish or greenish, about 3.5 mm long; pods 4-6 mm long. Frequent in the upper edge of brackish and saline marshes and near the edge of salt flats.

CONVOLVULACEAE

Calystegia sepium

Vine; leaves 5-10 mm long; flowers axillary; corolla white to rose-purple, 4-7 cm long, 5-7 cm broad. Rare. Found in the upper edge of tidal marshes, often on sandy soils.

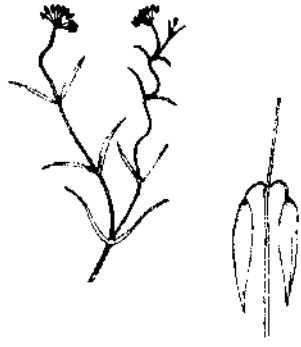
Cuscuta indecora

Vine, parasitic on Sesbania, Solidago, Baccharis, Pluchea, Iva, Borrichia and probably other marsh plants. Flowers white 3-5 mm long, corolla lobes generally shorter than the tube, acute with inflexed tip; capsule globose; seeds about 1.7 mm long. Frequent.

Cuscuta pentagona

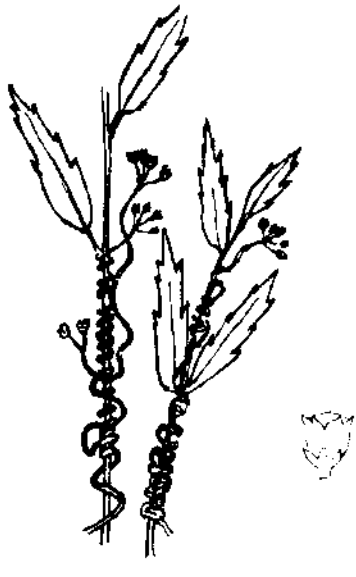
Vine, parasitic on Hibiscus, Solidago, Myrica, Hypericum, Lycopus and probably other salt marsh plants. Flowers white; corolla 1-2 mm long, as long or slightly longer than the tube; corolla lobes spreading or reflexed; capsule about 2 mm long; seed about 1 mm long or slightly longer. Infrequent. Plant not illustrated, but appearance essentially the same as Cuscuta indecora.

Asclepias perennis



Cynanchum palustre

Calystegia sepium



Cuscuta indecora

Ipomoea purpurea

Vine; leaves variable, 4-12 cm long; flowers purple to pink, bluish, redish or white, 3.5-6 cm long; capsule about 1 cm in diameter, 3 chambered. Frequent. Found primarily on levees and in the upper edge of marshes, but often found in the main part of brackish and freshwater tidal marshes.

Ipomoea sagittata

Vine; leaves variable, 4-10 cm long; corolla rose-lavender, 6-10 cm long; capsule about 1 cm broad; seeds hirsute-villous on the angles. Abundant. Found throughout all tidal marsh types.

BORAGINACEAE

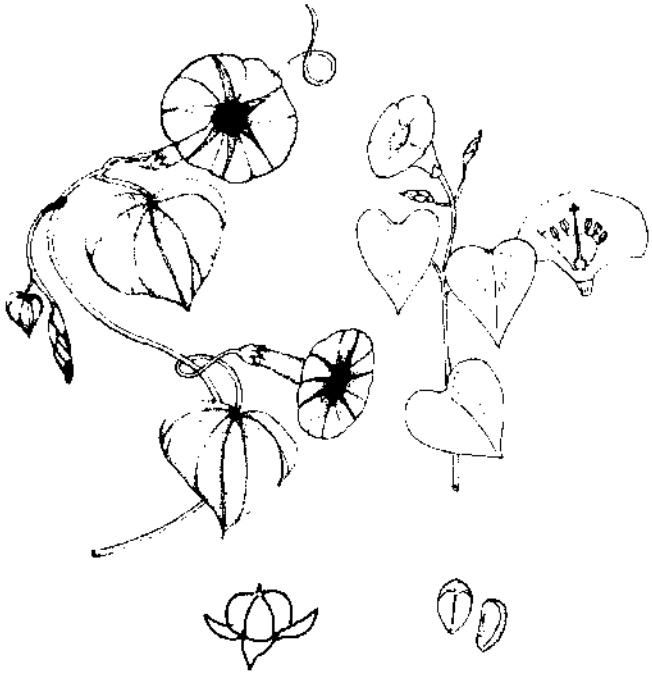
Heliotropium curassavicum

Plant to 60 cm tall; leaves mostly cauline, lower most reduced; corolla white or tinged with blue or purple, with a yellow center; 4 mericarps, 1.5-3 mm long, depressed-ovoid. Infrequent. Found in the most saline marshes, especially sandy marsh shores and in the upper edge of marshes that border sand dunes.

VERBENACEAE

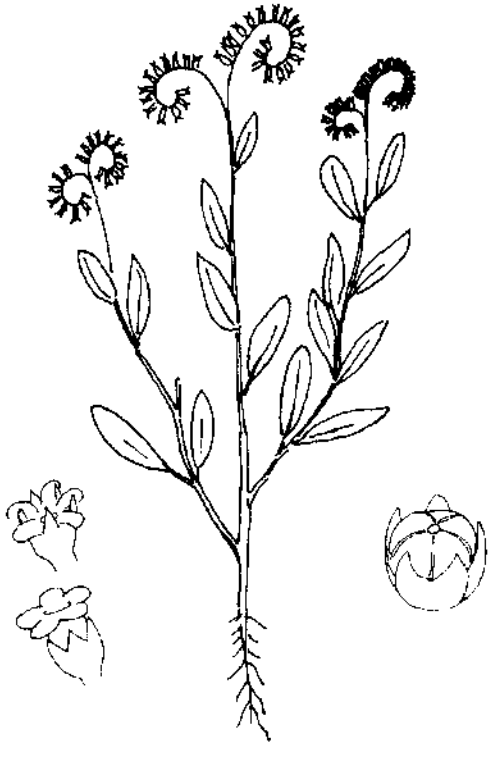
Lippia nodiflora

Stems prostrate, rooting at the nodes, to 1 m long; culm erect or nearly so, to 10 cm long; leaves 1-8 cm long; inflorescence cylindric, densely flowered to 2.5 cm long; corolla dark rose-purple sometimes tipped with white; fruits 1 mm long. Frequent. Found in brackish marsh devoid of tall vegetation and in highly organic soils or peats in the upper edge of saline marshes. Throughout freshwater tidal marshes.

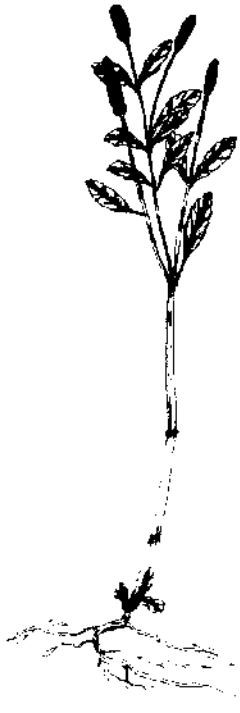


Ipomoea purpurea

Ipomoea sagittata



Heliotropium curassavicum



Lippia nodiflora

LAMIACEAE

Lycopus rubellus

Stems arising from stolons or rhizomes, tuberous at the base, to 1 m tall; leaves thin, dark green, sometimes tinged with purple, dull, to 15 cm long, sometimes leaves sharply serrate-dentate and lower surfaces pubescent; calyx 2-2.8 mm long, lobes distinctly shorter than the corolla; corolla white often with purple dots, 3-4 mm long; mericarps shorter than the calyx, 1-1.4 mm long. Frequent. Found throughout most tidal marshes.

Lycopus virginicus

Vegetatively similar to the preceeding, except not tuberous at the base but with tuber-bearing rhizomes or stolons; leaves purplish or greenish-purple; calyx 1.5-2 mm long, lobes ½ the length of the calyx, but sometimes equal to the corolla; corolla 2.5-3 mm long; mericarps exceeding the calyx lobes, 1.3-1.8 mm long. Distribution same as the above.

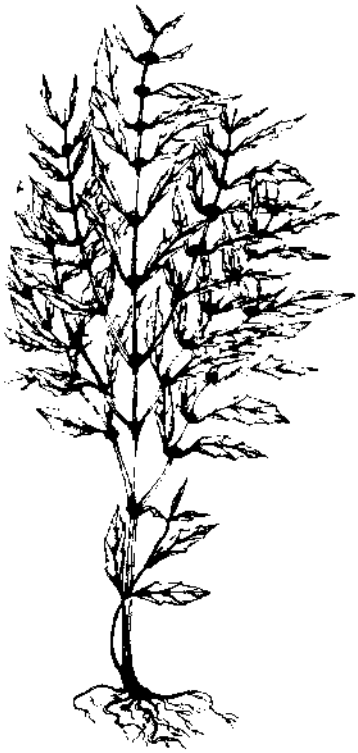
Teucrium canadense

Perennial to 1 m tall; stems quadrangular, pubescent; leaves 6-10 cm long, lower surfaces silvery with minute closely appressed hairs; spikes 20-30 cm long; calyx 7-9 mm long, 2 lipped, the 3 upper lobes longer and wider than the lower; corolla pink-purple, lavender, zygomorphic, 10-15 mm long, 1 lipped, 5 lobed, lateral lobes smaller than the middle; mericarps yellowish brown, reticulate, ellipsoid to obovoid, 1.9-2.1 mm long. Infrequent. Found in brackish and freshwater marshes and in the upper edge of more saline marshes.

LENTIBULARIACEAE

Utricularia subulata

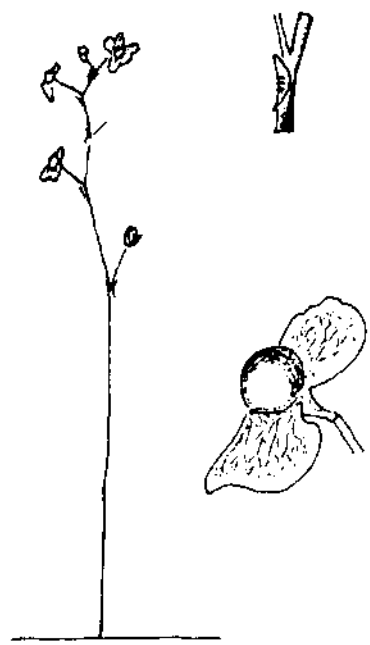
Plant generally less than 10 cm tall; leaves short (1 cm or less), filiform, reduced or absent or essentially so, sometimes with small bladders; corolla yellow, 5-9 mm long; bract peltate; bractlets absent; capsules brown, globose, 1.5-2 mm long; seeds numerous, brown or yellow, reticulate, oblong about 0.2 mm long. Infrequent. Found on sandy shores, peaty areas in brackish marshes and throughout freshwater tidal marshes. Plants often found in areas which are frequently inundated.



Lycopus rubellus

Lycopus virginicus

Teucrium canadense



Utricularia subulata

SCROPHULARIACEAE

Agalinis maritima

Annual to 70 cm tall; leaves generally succulent, thick or fleshy, glabrous, light green, to 3 cm long; flowers pink, purplish, violet or lavender, zygomorphic about 16 mm long; capsule globose, 4-6 mm long. Infrequent. Found throughout brackish and most saline marshes.

Agalinis purpurea

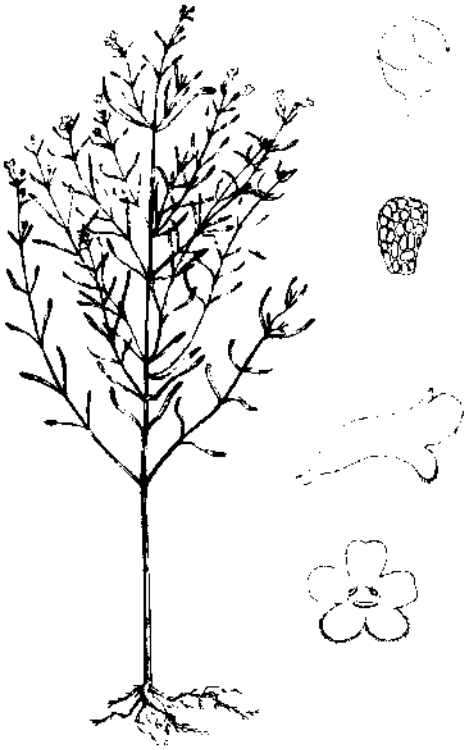
Annual to 1 m tall; leaves linear, scabrous above, 2-4 cm long; corolla 2-4 cm long, purple, the throat lined with yellow, spotted with purple and lanose at the base of the 2 upper corolla lobes: capsule 5-7 mm long, globose. Distribution similar to the preceeding.

Bacopa monnieri

Stems spreading, prostrate, forming mats; leaves thick, fleshy, 1-1.5 cm long; flowers solitary in leaf axils; corolla white, pinkish, campanulate, the lobes equaling the tube, 8-10 mm long; capsule ovoid, 5-7 mm long; seed grayish brown. Infrequent. Found throughout low salinity and freshwater tidal marshes and on levees and in the upper edge of more saline marshes.

Micranthemum umbrosum

Stems and leaves prostrate, fleshy, thick, roundish, spreading, forming mats; leaves 4-10 mm long; corolla white or purplish, to 1 mm long, shorter than the calyx; capsule about 1 mm in diameter. Distributed as the preceeding.



Agalinis maritima

Agalinis purpurea

Bacopa monnieri

Micranthemum umbrosum

RUBIACEAE

Cephalanthus occidentalis

Shrub to 2 m tall in tidal marshes; leaves 6-15 cm long; flowers in spherical heads, 2-3.5 cm in diameter; corolla white, tube slender, 6-10 mm long, pubescent on the inner surface; seeds elongate, 4-7 mm long. Infrequent. On levees and near the upper edge of brackish and saline marshes, throughout freshwater tidal marshes and around oxbow lakes.

Diodia virginiana

Plant procumbent or prostrate, spreading, branches forked to 60 cm long; leaves thin, to 7 cm long; corolla white, tube filiform, 7-9 mm long; fruit pubescent 5-9 mm long, ellipsoid, obtusely ribbed. Infrequent. Found primarily in the upper edge of tidal marshes often on sandy soils.

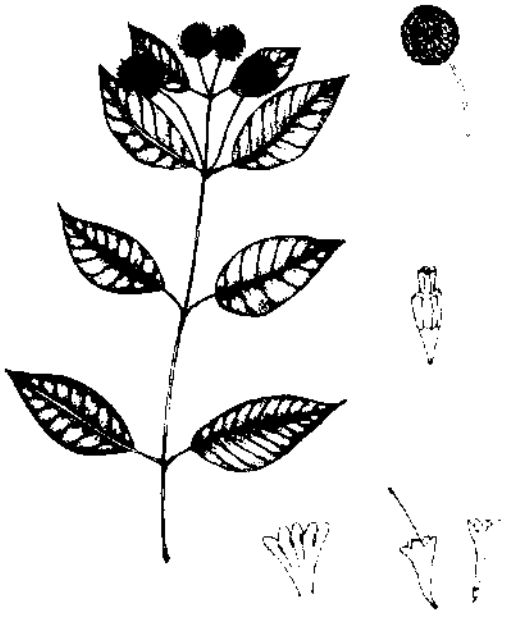
Galium tinctorium

Perennial to 60 cm tall; stems stiff, retrorse-scabrous on the angles; leaves thin, light green, usually 5 or 6 per node, 5-12 mm long; corolla white, 3-lobed; fruit dry, black, smooth, about 1.5 mm in diameter. Infrequent. Found randomly throughout most riverine brackish marshes.

CAMPANULACEAE

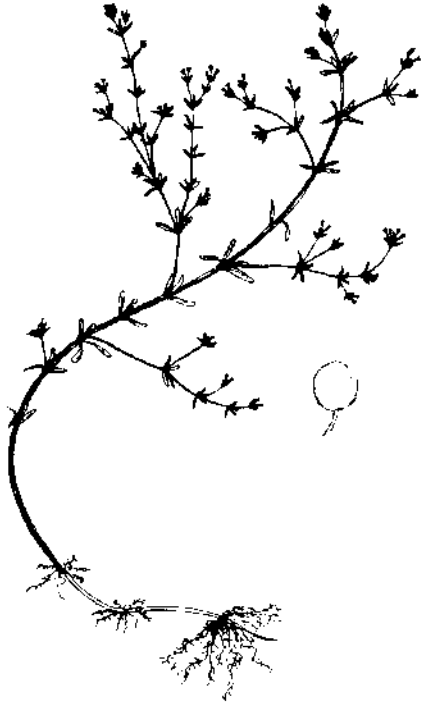
Lobelia cardinalis

Perennial to 1.5 m tall; leaves 5-20 cm long; petioles to 3 cm long; racemes to 50 cm long; flower red, scarlet, tube 1.5-2.5 cm long; capsule ovoid to spherical, 0.8-1.5 cm broad; seeds yellowish, brown, tuberculate, oblong, 0.5-1 mm long. Abundant. Found in marshes of saline and brackish bayous, generally concentrated in the portions of lower or intermediate salinity; also found in riverine marshes, but less abundantly than in tidal bayous.



Cephalanthus occidentalis

Diodia virginiana



Galium tinctorium

Lobelia cardinalis

ASTERACEAE

Aster tenuifolius

Perennial, to 60 cm tall; leaves succulent, thick, glabrous, linear or essentially so, to 15 cm long, most 10 cm or less, the lower leaves shedded as the plant grows upward; bracts whitish with green midrib; ray flowers white, sometimes lavender, 1-2 cm long; disc flowers yellow to red; seed brown, fusiform, 3-4 mm long, prominently ribbed. Frequent. Found throughout most brackish and saline marshes.

Baccharis halimifolia

Shrub to 4 m tall, mostly 2 m tall or less; leaves 3-7 cm long, coarsely serrate, mostly toward the apex; flowers in heads, campanulate; heads in clusters; pappus white, that of pistillate flowers much exceeding the corollas; the bristles somewhat fringed at the tip. Abundant. Found on levees and other slightly elevated areas within tidal marshes. Common in the upper edge of most tidal marshes.

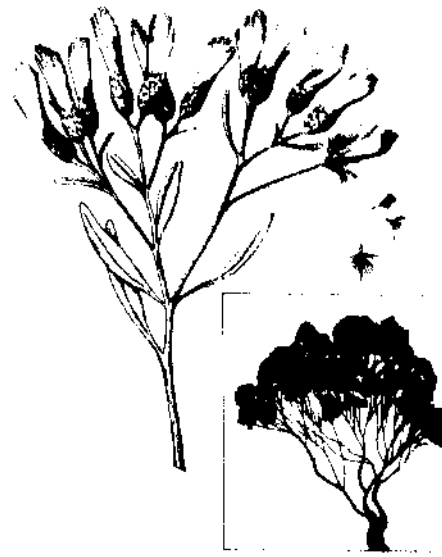
Bidens frondosa

Annual, to 1 m tall; leaves pinnate, 3-5 divided, membraneous, 5-20 cm long; petioles 1-6 cm long; rays golden yellow, 2-3.5 mm long; disc to 1 cm wide; seeds flat, blackish, 1 rib on each face, seed body 6-10 mm long; pappus awns 2, retrorsely or antrorsely barbed, 3-4.5 mm long. Infrequent. Found in brackish marshes and freshwater tidal marshes and in the upper edge of more saline marshes.

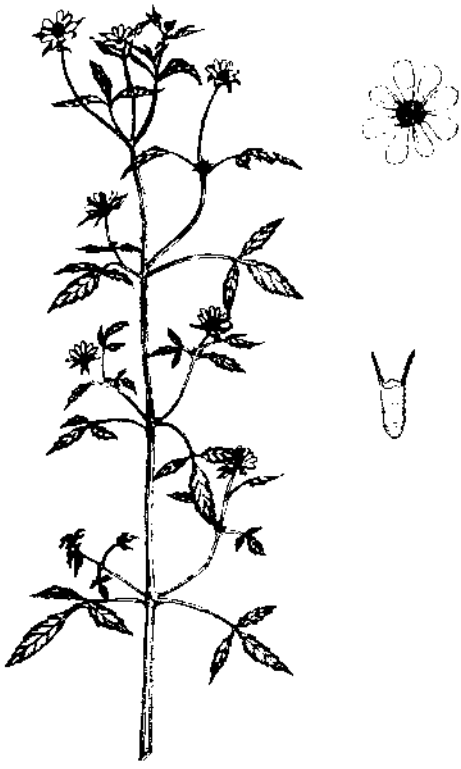
Bidens mitis

Annual to 1 m tall; petioles 3-30 mm long; leaves to 12 cm long, leaves pinnately divided; vegetatively similar to Bidens frondosa; rays golden yellow, 1-2 cm long; disc about 1 cm wide; seed, flat, black, very small, seed body 2-4 mm long, glabrous; awns very short, tooth-like or absent, 0.5-1 mm long, antrorsely setose. Distributed similar to Bidens frondosa.

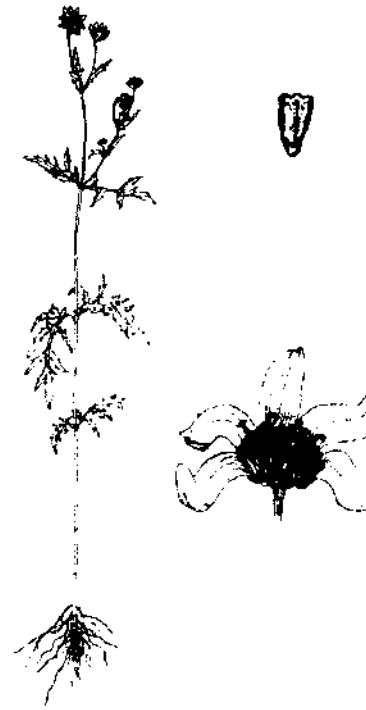
Aster tenuifolius



Baccharis halimifolia



Bidens frondosa



Bidens mitis

Boltonia asteroides

Plant to 2 m tall, much branched; leaves linear 3-12 cm long; flowers in heads; rays white to pink, purple or blue, 5-15 mm long; disc 6-10 mm broad, yellow or white; pappus-awns usually well developed; seeds 2-2.5 mm long; awns 0.3-0.9 mm long. Frequent. Found throughout brackish and freshwater tidal marshes.

Boltonia caroliniana

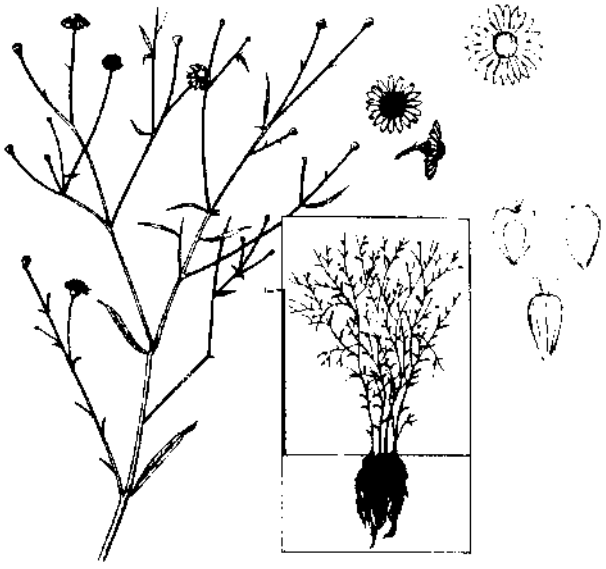
Plants to 2 m tall, much branched; leaves and flower color similar to Boltonia asteroides, but leaves generally wider and longer; disc 3-8 mm wide; rays 8-12 mm long; seeds 2-2.7 mm long, the wing 0.3-0.5 mm wide; awns 0.5-0.7 mm long or absent. Distributed same as the preceeding.

Borrichia frutescens

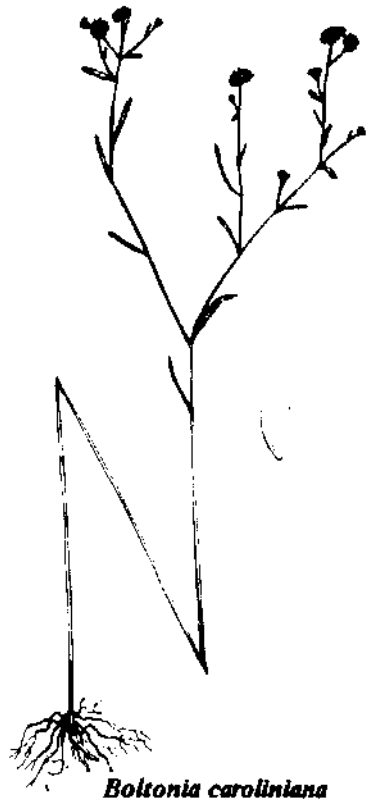
Perennial to 60 cm tall; leaves thick, succulent, 2-7 cm long; flowers in heads, the disc 1-1.5 cm wide; ray flowers, pistillate, 15-30, fertile; rays bright yellow or tinged with orange, disk flowers numerous, perfect, the corolla yellow and 5-toothed terminally; seeds black, tapered to the base, 3-4 mm long, glabrous; pappus a cartilaginous united ring, toothed and often erose. Abundant. Restricted to marshes of highest salinity and along the upper edge of these marshes.

Eclipta alba

Annual, stems spreading sometimes weakly erect, to 1 m long; leaves to 13 cm long; petioles obscured by decurrent tissue; flowers in heads, rays white, pistillate, 1-2 mm long, with several white trichomes at junction of blade and tube; disc flowers white, numerous and perfect; seeds brown, 2-2.5 mm long, glabrous on the sides, pubescent on top, seeds of the disc quadrangular, warty, seeds of the rays flattened or puckered on the sides, pappus, a very short crown or absent. Infrequent. Occurs in freshwater and the lower salinity portions of brackish marshes.



Boltonia asteroides



Boltonia caroliniana

Borrichia frutescens

Eclipta alba

Eupatorium serotinum

Perennial to 1.5 m tall, leaves 6-12 cm long; corymb 1.5-4 cm broad, 9-15 flowers; corolla white 2-4 mm long; seeds 1.7-2.8 mm long, resinous-glandular; pappus white, 3-3.5 mm long. Infrequent. Occurs in tidal freshwater and brackish marshes.

Iva frutescens

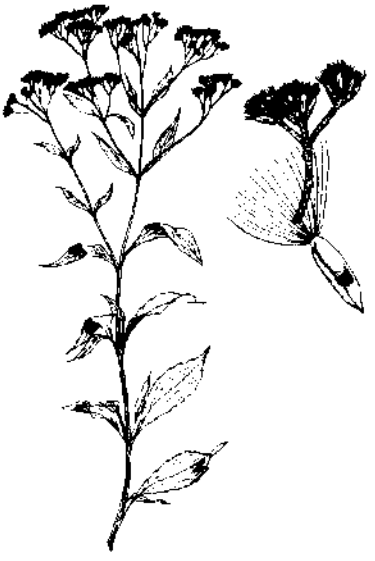
Shrub, to 3 m tall; leaves thick, pubescent, 3-8 cm long; petiole 3-10 mm long; flowers in heads in the axils of the reduced and narrow upper leaves; corollas 1-2 mm long; seeds black-brown, with resin dots, 1-3.9 mm long. Abundant. A common shrub of saline and brackish marshes. Generally found on slightly elevated areas within the marsh or in the upper edge of the marsh and near sandy beach ridges within the marsh.

Mikania scandens

Vine, leaves to 14 cm long, generally less than 10 cm long; heads in corymbs, 2-8 cm broad; flowers discoid, perfect, white to pinkish; seeds black, tapered to the base, 1.8-2.4 mm long, 4-5 ribbed, resinous-glandular; pappus bristles white, antrorsely barbed, 2-3 mm long. Infrequent. Found in freshwater or brackish marshes of very low salinity.

Pluchea camphorata

Plant to 60 cm tall in local marshes; leaves 7-20 cm long, sparsely covered with resin dots; heads convex on top, not flat topped; corollas pink; bracts slightly or evidently purple; seeds pink to tan, 0.6-1 mm long, densely pubescent. Frequently found throughout most local marshes.



Eupatorium serotinum

Iva frutescens

Mikania scandens

Pluchea camphorata

Pluchea foetida

Plant to 60 cm tall in local marshes; leaves 4-10 cm long, closely sessile or cordate-clasping, sometimes petiolate; heads several or numerous in short, broad, tending to be flat-topped inflorescences; corollas mostly creamy-white sometimes white or pink; involucral bracts glandular or glabrous; seeds pinkish, about 1 mm long, pubescent on the angles. Distributed as the preceeding.

Pluchea purpurascens

Plant to 60 cm tall in local marshes; leaves 4-12 cm long, short petiolate or sessile; heads pink-purple, several heads in several to numerous flat-topped inflorescences which have a layered appearance, lateral branches of the inflorescence overtopping or equaling the central; the bracts commonly more or less pink or purple at least toward the tips; seeds 1-1.5 mm long, pubescent on the angles. Distributed as the preceeding.

Solidago sempervirens

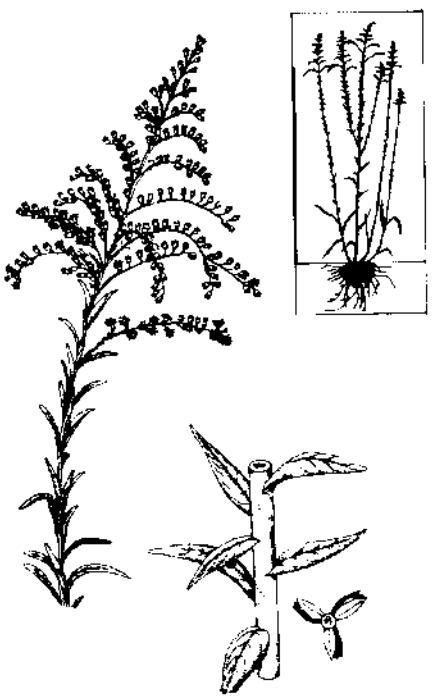
Plant to 2 m tall, arising from a basal rosette; stem leaves 5-25 cm long, basal leaves 15-40 cm long; flowers yellow in a terminal inflorescence; rays 3-5 mm long; seeds pubescent. Abundant. Common in brackish marshes of very low salinity and freshwater tidal marshes, also found in the upper edge of more saline marsh areas.

Solidago tenuifolia

Plant to 70 cm tall; leaves 3-7 cm long; yellow flowers in sessile heads; heads in clusters; involucres 4-6 mm long, pappus 3-4 mm long; seed hairy. Infrequent. Not as wide spread as Solidago sempervirens. Essentially restricted to the upper edge of tidal marshes. Also found in some freshwater tidal marshes and in sandy insular marshes.

Pluchea foetida

Pluchea purpurascens



Solidago sempervirens

Solidago tenuifolia

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A. Borrichia frutescens, B. Pontederia cordata, C. Hibiscus moscheutos, D. Kosteletzkya virginica, E. Juncus roemerianus, F. Asclepias lanceolata, G. Xyris iridifolia, H. Batis maritima, I. Iris virginica, J. Nymphaea odorata, K. Amorpha fruticosa, L. Spartina alterniflora, M. Perfect flower of Juncus roemerianus, N. Hymenocallis occidentalis.