

USDA United States
Department of
Agriculture

Forest Service

**Rocky Mountain
Research Station**

General Technical
Report
RMRS-GTR-10

June 1998



Field Guide to Intermountain Sedges

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Acknowledgments

Many individuals were involved in development of this field guide from its conception through field collection, curation, manuscript preparation, review, and editing. A special thanks to Warren Clary, Project Leader of the Rocky Mountain Research Station's Riparian-Stream Ecosystems

Front cover art: *Carex nebrascensis*, drawn by Lenora Oosterhuis, an emigrant from Holland, a Forest Ecologist, and a freelance Biological Artist living in Boise, ID.

Research Work Unit, for suggesting the idea of preparing field guides for grasslike species of the Intermountain Region. For assistance in field collections, our appreciation goes to Gary Hurd for his willingness to visit remote mountainous terrain in search of uncommon high-elevation species; to Kenneth Gentz, Toiyabe National Forest, for his help with Nevada collections; to Martin Stein, Wallowa-Whitman National Forest, and Joe Duft of Boise, ID, for providing specimens; and to Richard Whitkus, University of California, Riverside, for his taxonomic

assistance. Our thanks to Don Mansfield, Albertson College; Stewart Markow, Targhee National Forest; Leila Shultz, Utah State University; and Caryl Elzinga, a private consultant, of Salmon, ID, for reviewing the manuscript. For help with field collections, curation, and manuscript preparation, we extend thanks to Bobbi Fuller, Ruth Meerkatz, Danielle Scholten, and Kristie Worth. For final editing and helpful suggestions along the way, we thank the Rocky Mountain Station Research Information staff.

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Field Guide to Intermountain Sedges

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Introduction _____

“A delightful genus to work with—”
Goodrich and Neese (1986)

Invaluable for their ability to stabilize stream banks, filter sediments, provide habitat for other organisms, and contribute to the diversity and aesthetics of Intermountain wetland and riparian areas as well as many upland communities, sedges (*Carex* spp.) constitute a challenging, species-rich genus. Recent research and community classification efforts are beginning to elucidate details of the life histories and ecological relationships of individual sedge species. Use of these data necessitate accurate identifications.

This guide was prepared to assist both specialists and nonspecialists in identifying common sedges of the Intermountain Region. The geographic area encompassing southeastern Oregon, Nevada, Utah, western Wyoming, and Idaho south of the Salmon River was considered when selecting species for inclusion (fig. 1). Because some less plentiful sedges are not included, it is recommended that identifications derived from this guide be confirmed by consulting regional floristic manuals

with dichotomous keys or local taxonomists.

The guide begins with a discussion of sedge morphology with illustrations. Then, after a general description of the genus and a key to the species, technical descriptions of each species are presented alphabetically by scientific name. These descriptions include characteristics of the plant habit, leaves, bracts, spikes, pistillate scales, perigynia, achenes, habitat and distribution, distinctive characteristics, and comparisons with similar species. Color photographs and line drawings accompany the text to illustrate growth habits, inflorescences, pistillate scales, perigynia, and achenes for each species. A glossary of terms and an index of common names follow the technical descriptions. The concluding section is an appendix providing comparisons of similar species.

Color photographs and some line drawings for this publication were prepared by the senior author. Permission for use of additional line drawings was provided by the University of Washington Press (Hitchcock and others 1969), University of California Press (Mastrogiuseppe 1993), and Columbia University Press (Cronquist and



Figure 1—Intermountain Region.

others 1977). Other drawings are from Hermann (1970). Taxonomy, morphological descriptions, common names, habitat requirements, and geographic distributions were derived from Cronquist and others (1977), Davis (1952), Gledhill (1989), Goodrich and Neese (1986), Harrington (1954), Hermann (1970), Hitchcock and Cronquist (1973), Hitchcock and others (1969), Howell (1968), Lewis (1958), Mackenzie (1931, 1935), Mastrogiuseppe (1993), Standley (1985, 1987), Taylor (1983), USDA-NRCS (1995), Van Eseltine (1925), Welsh and others (1987), and examination of specimens and notes in the Rocky Mountain Research Station Herbarium, Boise, ID; Monte L. Bean Herbarium, Brigham Young University, Provo, UT; Reno/Nesh Herbarium, University of Nevada, Reno; Intermountain Herbarium, Utah State University, Logan; Marion Ownbey Herbarium, Washington State University, Pullman; and Tucker Herbarium, Albertson College, Caldwell, ID.

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Morphology

Characteristics and measurements of morphological structures are frequently used to differentiate among sedge species. Descriptions in this guide may be more easily understood if the reader refers to figures 2 through 12—illustrations of characteristics. Photographs accompanying the species description provide additional illustrations of morphological characteristics.

Several important morphological considerations for obtaining accurate identifications were discussed by Cronquist and others (1977), Hitchcock and Cronquist (1973), and Hitchcock and others (1969):

1. Perigynium and achene morphology and size (see General Description, figs. 8 to 12, and the Glossary). Characteristics and measurements of these structures are frequently used to differentiate

among sedge species. Measurements must be taken from mature structures; it is often impossible to identify immature specimens. Also, young or dried perigynia may have different shapes and colorations than mature or fresh specimens.

2. Basal leaf structure. Specimens may be described as being phyllopodic or aphylllopodic (see fig. 3 and the Glossary). Some plants, however, are slightly aphylllopodic with one or two reduced leaves at the base, but with foliage leaves also developing near the culm base.

3. Stigma number. Some species having pistillate flowers with three stigmas occasionally produce a few flowers with two stigmas, these should be considered tristigmatic species. Species normally producing two stigmas rarely produce three stigmas (*Carex saxatilis* is an exception).

General Description: *Carex* L.

Grasslike perennial herbs with short to long creeping rhizomes and hairy, fibrous roots; stems arising singly, few together, or in clumps; culms generally solid and sharply 3-angled to sometimes round in cross section, aphylllopodic (basal leaves reduced to a leaf sheath without a blade) or less frequently phyllopodic (basal leaves with well-developed blades present); leaves 3-ranked, usually clustered toward the base, but sometimes borne along the length of the fruiting culm; leaf sheaths closed, dorsal side green, ventral side usually thin and translucent, mouth shallowly concave, convex, or truncate; basal sheaths sometimes shredding; blades usually glabrous except for the generally scabrous midrib and

margins; dorsiventrally flattened, channeled, or acicular in cross section; plants usually monoecious (both male and female flowers on one plant) or occasionally dioecious (male and female flowers on separate plants); inflorescences terminal, usually subtended by an involucre bract and consisting of 1 to many spikes arranged in racemes, panicles, or heads; spikes unisexual (all flowers staminate or all pistillate) or if bisexual either androgynous (male flowers borne above the female flowers) or gynaeandrous (female flowers borne above the male flowers), or rarely with female and male flowers intermixed; each spike subtended by a bract that may or may not be sheathing at the base or by an inconspicuous, reduced bract; flowers few to many per spike, unisexual, lacking perianths; staminate flowers each subtended by a scale; stamens 3 or occasionally 2; anthers basifixed; pistillate flowers each with a 1-celled, 2- or 3-(4)-carpellate superior ovary enveloped by the persistent saclike perigynium (a specialized foliar structure) and subtended by an open scale (the pistillate scale); stigmas 2 or 3 (rarely 4), exerted

through the usually notched opening in the perigynium apex; fruit an achene enclosed by and dispersed with the perigynium at maturity; achenes lenticular if developed from a bicarpellate ovary (2 stigmas) or trigonous if developed from a tricarpellate ovary (3 stigmas); achenes of single-spiked plants often accompanied by a rachilla, an extension of the floral axis; pericarp tough, leathery, whitish or light brown to black; seed with a large amount of endosperm; embryo small, rudimentary, imbedded in the basal end of the seed. Chromosomes polycentric with $x = 6, 7, 8, 9, 10, 13$, and so forth.

The genus consists of about 1,000 species worldwide with about 533 species in North America. Sedges are widely distributed, but best developed in wet to moist regions of the North Temperate Zone and the Arctic.

This description was developed from Cronquist and others (1977), Goodrich and Neese (1986), Hermann (1970), Hitchcock and Cronquist (1973), Hitchcock and others (1969), Howell (1968), Mackenzie (1931, 1935), Mastrogriuseppe (1993), and Welsh and others (1987).

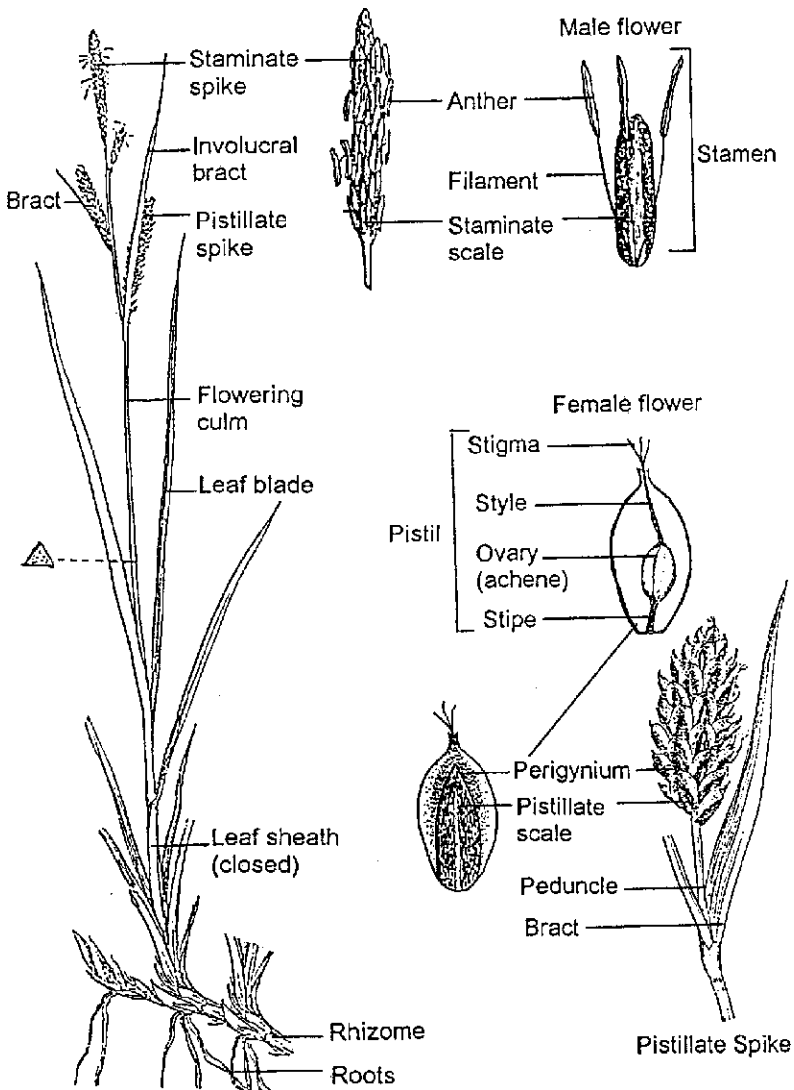
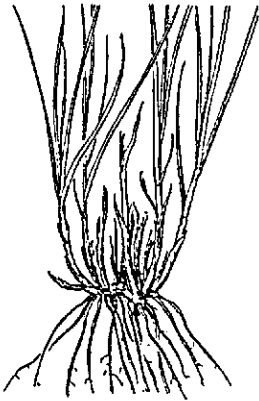
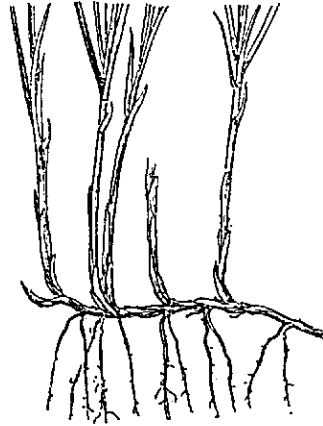


Figure 2—Sedge morphology.

Growth habit



Cespitose
(culms tufted or clumped)

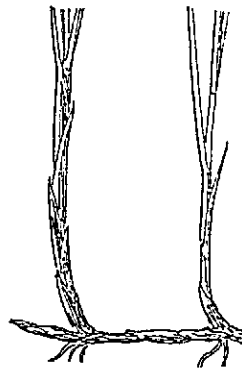


Rhizomatous
(Culms arising singly
or few together)

Basal leaves



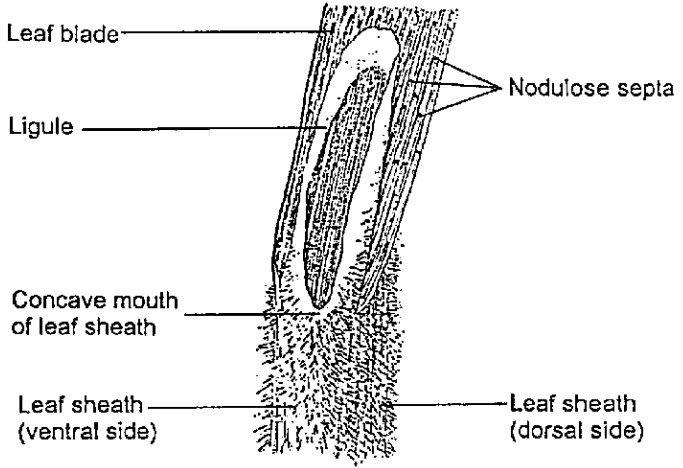
Phyllopodic
(lower basal leaves
well developed)



Aphylopodic
(lower basal leaves
reduced to scales)

Figure 3—Sedge growth habit and characteristics of basal leaves.

Leaf morphology



Cross section of leaf blade



Flat



Folded



Canaliculate



Terete

Leaf margins



Involute (rolled toward the ventral side)



Revolute (rolled toward the dorsal side)



Scarbrous (with small i)

Figure 4—Sedge morphology—leaves.

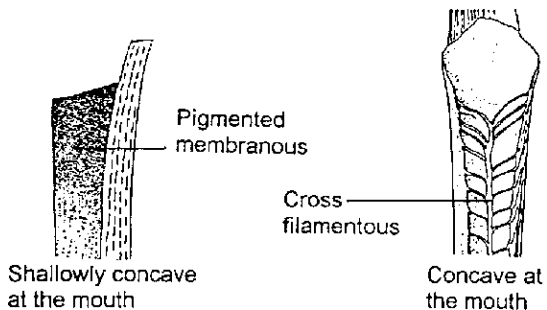
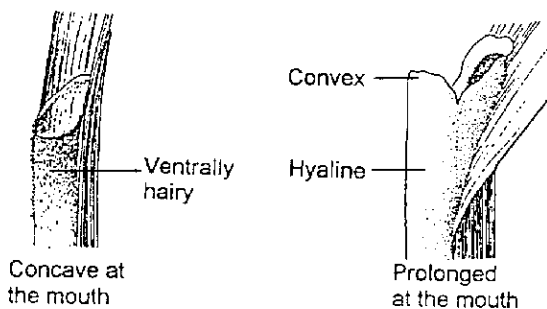
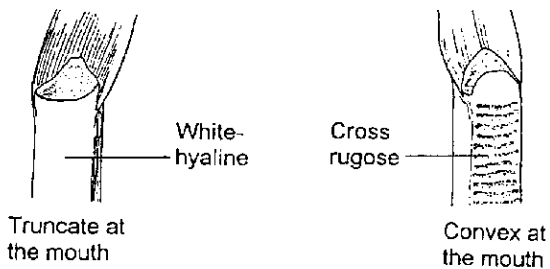
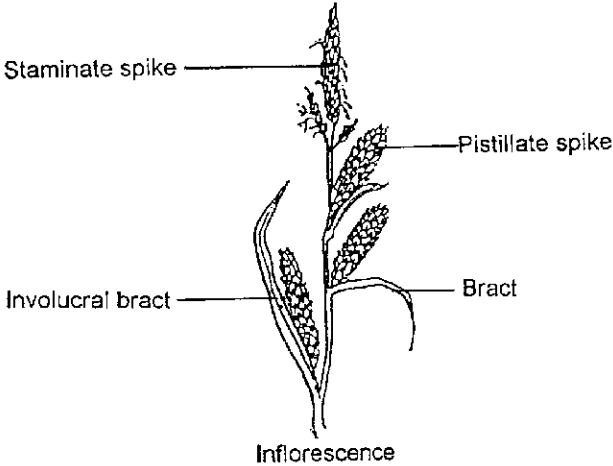


Figure 5—Sedge morphology—ventral leaf sheaths.

Unisexual spikes
(staminate and pistillate spikes are separate)



Bisexual spikes
(staminate and pistillate flowers on one spike)

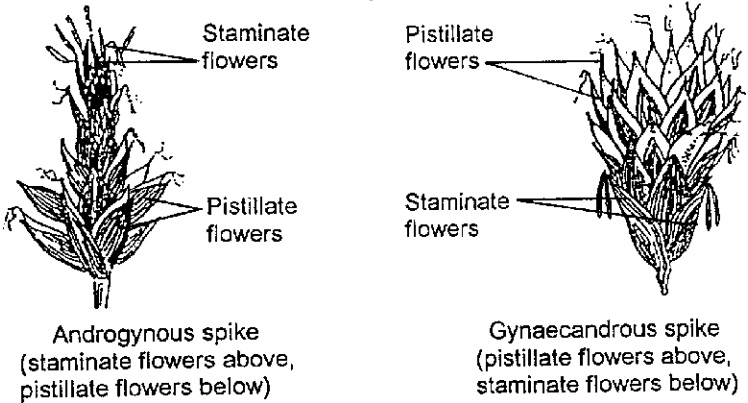


Figure 6—Sedge morphology—unisexual and bisexual spikes.



Linear
(perigynia
appressed)



Ovoid-pyriform
(perigynia
spreading-
ascending)



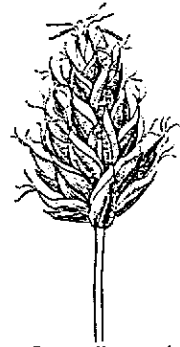
Oblong
(perigynia
ascending)



Broadly oblong
(perigynia spreading,
bottle-brush
outline)



Few pistillate
flowers, (perigynia
erect ascending)



Broadly ovoid
(perigynia
ascending to
spreading-
ascending)

Figure 7—Sedge morphology—solitary spike inflorescences.

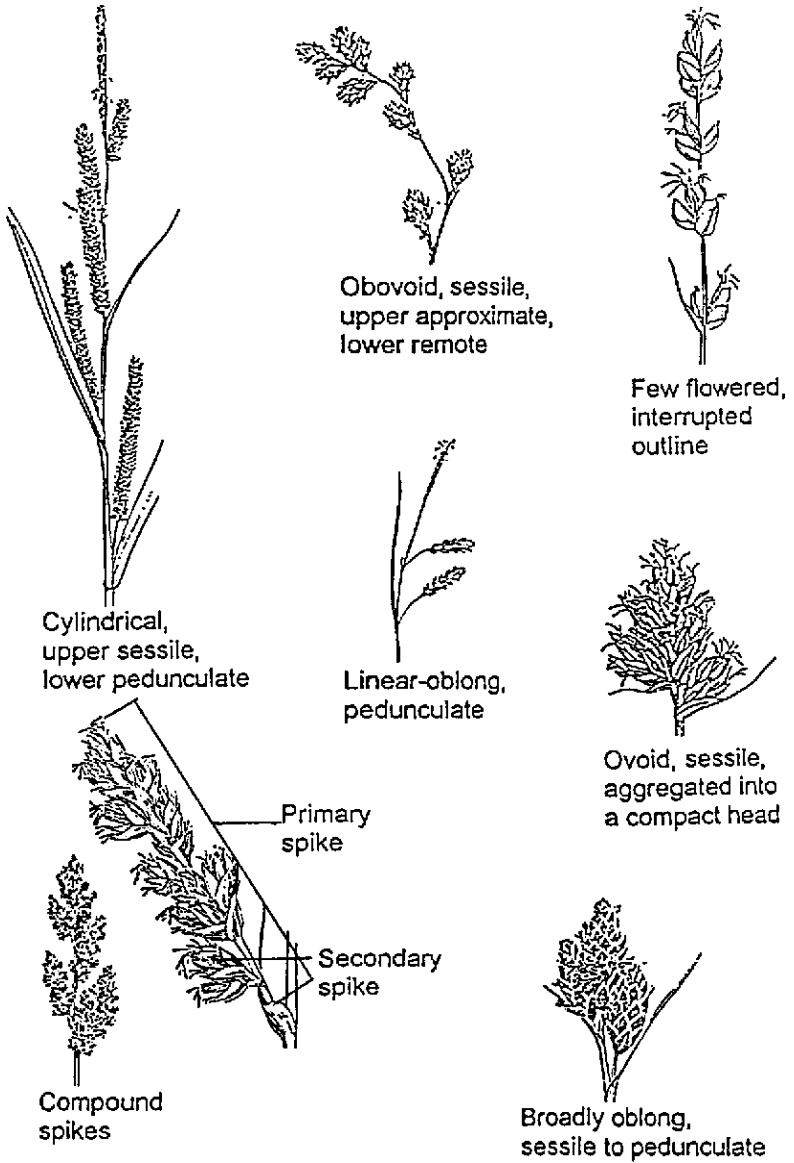
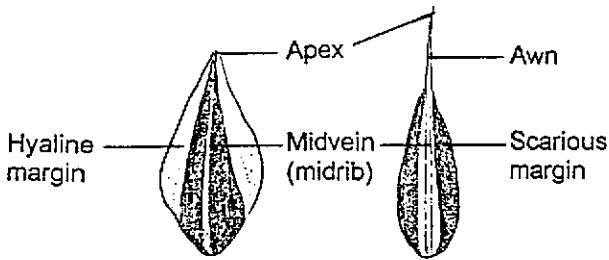


Figure 8—Sedge morphology—multiple spike inflorescences.

Pistillate scale morphology



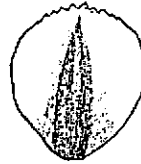
Shapes and apices of pistillate scales



Narrowly oblong,
truncate apex



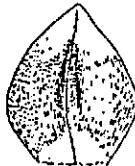
Broadly oblong,
obtuse apex



Orbicular,
erose apex



Oblong,
mucronate apex



Ovate, broadly
acute apex



Ovate, hyaline
apex and upper
margins



Awl-shaped,
acuminate
apex



Lanceolate,
setaceous
or awned

Figure 9—Sedge morphology—pistillate scales.

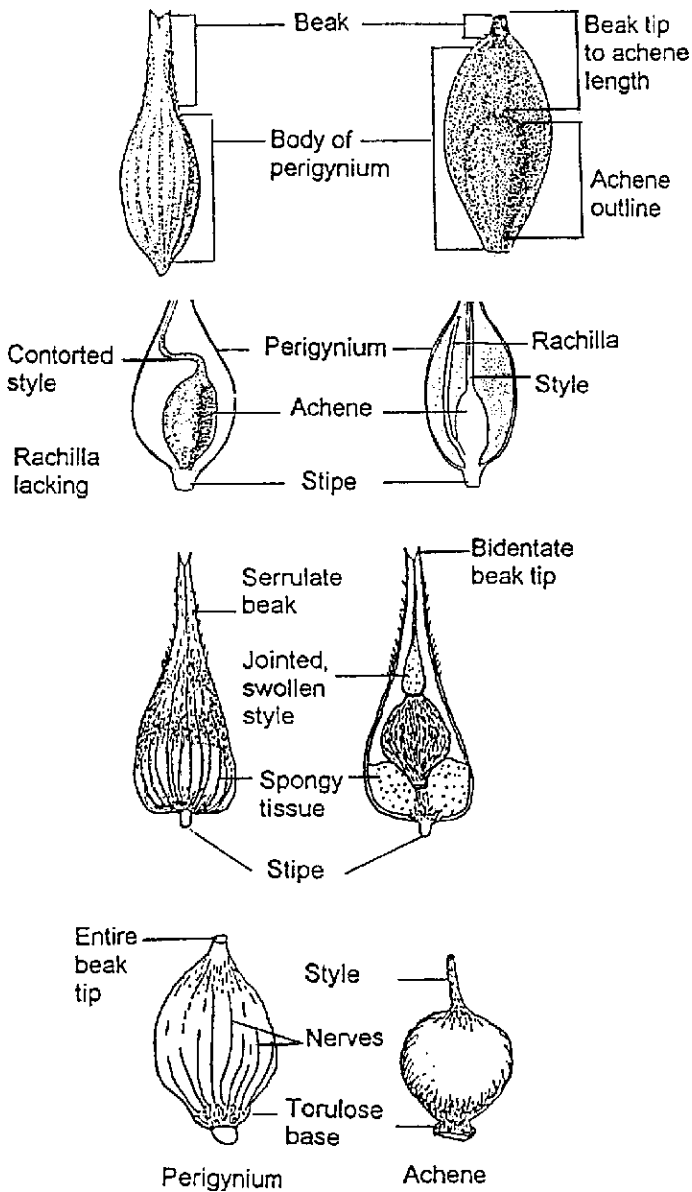
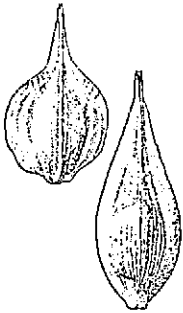


Figure 10—Sedge morphology—perigynia and achenes.

Perigynium types



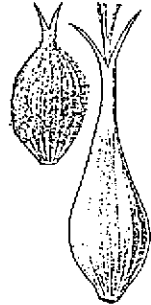
Winged, flat to plano-convex



Sharp-edged, plano-convex, lower finely nerved

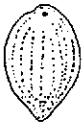


Flattened, marginal nerved



Inflated, coarsely nerved

Perigynium beak types



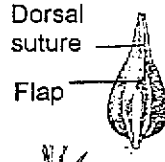
Beakless



Short, entire



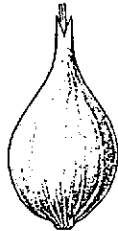
Slender, erose



Dorsal suture
Flap



III-defined, obliquely cleft



Abruptly contracted, bidentate

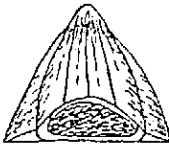


Short, abruptly contracted, forked



Long, gradually tapered, divaricate

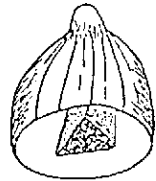
Figure 11—Sedge morphology—perigynia.



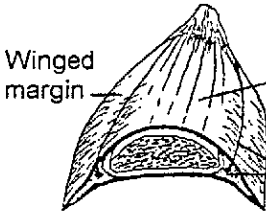
Perigynium
plano-convex,
achene
plano-convex



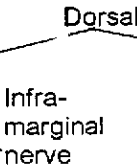
Perigynium
flattened,
achene
lenticular



Perigynium
inflated,
achene
trigonous

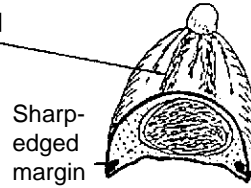


Winged
margin



Dorsal

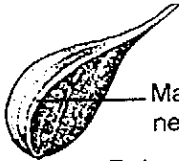
Infra-
marginal
nerve



Sharp-
edged
margin

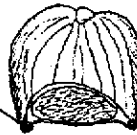
Perigynium concavo-convex,
achene plano-convex

Perigynium concavo-convex,
achene lenticular



Marginal
nerve

Raised margin,
achene lenticular

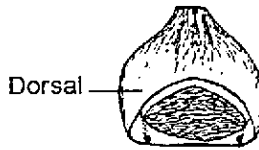


Marginal
nerve

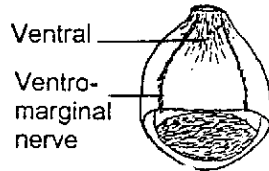
Thin edged margin,
achene lenticular



Perigynium
biconvex or
lenticular,
achene lenticular



Dorsal



Ventral

Ventro-
marginal
nerve

Perigynium strongly
plano-convex, achene
lenticular or
obcompressed

Figure 12—Sedge morphology—perigynium and achene cross sections; perigynium nerves.

