University of Nebraska - Lincoln
DigitalCommons@University of Nebraska - Lincoln

Papers in Systematics & Biological Diversity | Papers in the Biological Sciences

12-1-1881

The Asparagus for Histological Study

Charles E. Bessey
University of Nebraska - Lincoln

Follow this and additional works at: http://digitalcommons.unl.edu/bioscisystematics

Part of the Other Life Sciences Commons

Bessey, Charles E., "The Asparagus for Histological Study" (1881). *Papers in Systematics & Biological Diversity.* Paper 7.
http://digitalcommons.unl.edu/bioscisystematics/7

This Article is brought to you for free and open access by the Papers in the Biological Sciences at DigitalCommons@University of Nebraska - Lincoln. It has been accepted for inclusion in Papers in Systematics & Biological Diversity by an authorized administrator of DigitalCommons@University of Nebraska - Lincoln.

Botanical Gazette, Vol. 6, No. 12 (Dec., 1881), pp. 294-295

The Asparagus for Histological Study.—I have for several years been wanting a good Monocotyledon for histological study in the botanical laboratory, one which should be for its sub class what the pumpkin is for the Dicotyledons. The Indian Corn, which is commonly used, is too difficult, and too greatly specialized a type, exhibiting as it does the peculiar nodal structure of the stem of the Gramineæ, rather than the structure of the stem of Monocotyledons in general. A good representative stem. and one which can be obtained everywhere in good condition, from early spring until the end of the season, is the Asparagus. This has been carefully studied the past season in the botanical laboratory of the Iowa Agricultural College, by Miss Fannie J. Perrett, from whose thesis I select the following results :

The epidermis is composed of elongated cells quite regular in outline, and of deep radial, as compared with tangential diameter. The external walls are well thickened. The stomata are abundant, and are regularly disposed. They appear to develop directly from mother-cells cut off by transverse fission from the ends of ordinary cells. It is an easy matter to secure transverse sections of stomata by making repeated cross sections of the stem. Trichomes appear to be wanting.

The hypoderma is composed of collenchyma and parenchyma, the latter being rich in chlorophyll. Beneath the hypodermal tract is a meristem layer, to be more particularly noticed hereafter. The remainder of the Fundamental System of tissues is composed of large and long-celled parenchyma.

The fibro-vascular bundles are closed; that is, they contain, when fully developed, no meristem tissue. In a transverse section

each bundle consists of a V-shaped mass of tracheary tissue, including spiral, reticulated and pitted vessels, the last mentioned occupying the upper parts of the arms of the V, others lying towards its point. The cavity of the V, which looks toward the periphery of the stem, contains a poorly developed sieve tissue. Small-celled parenchyma on its peripheral and lateral surfaces, and a varying amount of fibrous tissue, mostly in connection with the tracheary tissue, complete the structural elements of the bundle.

In the meristem layer mentioned above, new bundles arise, and thus increase the stem in a sort of exogenous manner, as is done in the Dragon trees and other tree-Liliaceæ. This feature alone in the structure of the Asparagus stem makes it an exceedingly valuable one for study, as bundles of all ages may readily be obtained in the same section.

In the stem at the base of each leaf, those ascending bundles which are connected with the fibro-vascular system of the leaf, divide into four branches, two of which continue upward through the stem, while two pass outward into the leaf. In each bundle, the ascending cauline portions unite right and left with corresponding portions of the adjacent bundles, while in a similar manner those which pass into the leaf unite right and left, and form the principal leaf veins. The bundles in the stem which connect with the fibro-vascular system of the lateral stems (branches) divide at the baseof the latter into two parts, which unite right and left and thus form the bundles of the lateral stem. A few of the branch-bundles have a deep connection in the stem with bundles which have also an upward cauline extension.

It must not be forgotten that the leaves of the Asparagus are quite small, flat, triangular, bract-like structures, and that the needle-shaped bodies which constitute the so-called leaves, are in reality short, leafless, lateral stems.—C. E. BESSEY, *Ames, Iowa.*