

AN UNDESCRIBED EUISETUM FROM KANSAS.*

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For many years the writer has known a peculiar type of *Equisetum* with annual, aerial stems, growing on clayey banks and bluffs in central Kansas. This plant was referred to Braun's *Equisetum laevigatum*, although some of its most evident characters did not agree with the description of that species.

In 1903 (*Fern Bull.* **11**: 40), Eaton stated that according to his observations, *E. laevigatum* A. Br. was annual and this view is continued in Gray's *Manual*, 7th Ed. 1908, where the statement is made that the stems are "mostly annual." In a note in the *Ohio Naturalist*, **4**: 74, the writer agreed with Eaton and also suggested that *E. laevigatum* as at present understood might be a composite species. Eaton described *E. hyemale intermedium* and stated that it was "often confused with *E. laevigatum*."

The writer has had the various forms of *Equisetum*, which are involved in the confusion, under consideration since 1903 and has come to some definite conclusions which are here presented:

1. The annual form of *Equisetum* from the west usually going under the name *E. laevigatum* A. Br. is an undescribed species.

2. Braun's description of *E. laevigatum* is essentially correct.

3. Eaton's *E. hyemale* var. *intermedium* is Braun's *E. laevigatum*.

The writer examined the original material at St. Louis from which Engelmann sent specimens to Braun, and found that the plants agree well with Braun's description. They are perennial and the cones have a definite point. They are considerably smoother than the usual forms of *E. hyemale* but much rougher than the disputed plants from Kansas.

One of Engelmann's specimens of *E. laevigatum* A. Br. distinguished as variety B, *scabrellum*, collected in August, 1843, on the banks of the Mississippi below Jefferson Banks is marked in pencil as "Probably type specimen." Both branched and unbranched specimens are in the collection. This specimen has no cones. Another specimen labeled *E. laevigatum* A. Br. from sterile hills near harbors nine miles west of St. Louis, July, 1844, has the cone with a rigid point and agrees with the specimens the writer identified as *E. laevigatum*, the past summer in a trip to Kansas. It has the long dilated sheath and other distinguishing characters.

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Several years ago, while visiting the New York Bot. Garden, the late Dr. Underwood showed the writer specimens of *E. laevigatum* A. Br. from Engelmann's collections made at St. Louis in August, 1843. These plants also had the rigid points on the cones. They are probably from the same material from which Braun received his specimens.

Specimens of *E. hyemale intermedium* in the National Herbarium at Washington and at the Missouri Bot. Garden, including cotypes named by Eaton himself, agree closely with Englemann's specimens of *E. laevigatum*. Some of the specimens renamed by Eaton were originally labeled *E. laevigatum*. One of Eaton's cotypes of *E. hyemale intermedium* at the Mo. Bot. Garden appears to the writer to be the same in all essential respects as Engelmann's *laevigatum* material. The specimens was originally labeled *E. laevigatum*.

There can be no mistake as to the meaning of Braun's original description of *E. laevigatum* as translated by Engelmann and printed in *The American Journal of Science and Arts*†.

The species is characterized as follows:

"*Equiseta stichopora* (winter-*Equiseta*). Stomata disposed in two distinct ranges on each side of the groove; each range formed by one or more rows of stomata (All known species in this division have hardy evergreen stems).

Homophyadica.

Ranges of stomata consisting each of one row.

7. *E. laevigatum* A. Braun.

"Stems tall, erect, simple or somewhat branching; carinae convex, obtuse, smooth; grooves shallow on each side; with a single series of stomata, vallicular air cavities small, the carinal ones very minute; central cavity large; sheaths elongated, adpressed, with a black limb, consisting of about twenty-two leaves with one carina at base and (by the elevation of the margin and depressions of the middle) two towards the point; points linear—subulate, sphacelate, caducous, leaving a truncate-dentate margin to the sheath; branches somewhat rough; sheaths with about eight indistinctly 3-carinate leaves; points persistent subulate, sphacelate with a narrow membranous margin.

Hab. On poor clayey soil with *Andropogon* and other coarse grasses at the foot of the rocky Mississippi hills, on the banks of the river below St. Louis.

†BRAUN, ALEXANDER. A monography of the North American species of the genus *Equisetum*; translated from the author's manuscript, and with some additions, by George Engelmann. *Am. Jour. Sci. and Arts* 46:81-91. (April, 1844.)

In size and manner of growth this new species is closely allied to *E. hyemale*, and the larger variety of *E. robustum*, but it is easily distinguished by its smoothness, its long green sheaths, with a narrow black limb, and its darker green color."

This description seems to be quite accurate except is some minor points. The color is usually not darker green than in *E. hyemale* and the sheaths are usually though not always dilated above. The color of the large *Equisetums* varies considerably with the environment, and in some cases the young sheaths are more or less dilated than the old ones.

The new species may be characterized as follows:

***Equisetum kansanum* n. sp.**

Kansas Horsetail.

Aerial stems usually 1-2½ feet high, annual, very smooth, 15-30 grooved, usually without simple branches unless broken off; color mostly light-green; surface of the ridges and grooves with cross or diagonal bands; sheaths long, dilated above and usually constricted at the base, green with a narrow black band at the top; teeth deciduous; cones ovate or oblong-ovate, without a point, the apex obtuse or merely acute. On upland clayey banks along ravines and hillsides, growing in rather scattered tufts. Name derived from Kansas where the species is common.

Type locality, Bloom township, Clay County, Kansas. Specimens also from Mancos, Colorado. Type and cotype 1 deposited in the herbarium of the Ohio State University, Columbus, Ohio.

Equisetum laevigatum and *Equisetum kansanum* form the transition types between the large, evergreen scouring-rushes like *E. hyemale* and *E. robustum* on the one hand and the tall annual horsetails, like *E. fluviatile* on the other. *E. laevigatum* is perennial in Kansas although it often freezes down to near the surface of the ground in severe winters.

The habit of growth between the three species which are often confused is quite characteristic. *E. hyemale* grows in dense masses usually on creek and river banks and low places. *E. laevigatum* is rather tall and is more open and separate in its growth, abounding in Kansas, in sandy river bottoms where the soil is well filled with clay or other fine material and at the base of clayey bluffs. *E. kansanum* as stated above is also open and scattered in growth and is found mainly on clay banks along ravines and hillsides. They may be readily separated by the following key:

1. Aerial stems evergreen, rough to a greater or less degree; cones tipped with a rigid point.
 - a. Sheaths cylindrical, not dilated upward, usually with 2 black bands, sometimes entirely black; stems rough, tuberculate.

E. hyemale.
E. robustum.
 - b. Sheath elongated, dilated upward, with a narrow black band at the top and frequently with a second irregular one below; stems smoothish, only slightly tuberculate.

E. laevigatum.
2. Aerial stems annual, smooth; cones without a point.
 - a. Stems usually unbranched except when broken; sheaths elongated, dilated upward, with a narrow black band at the top, rarely with a faint second one below.

E. kansanum.

In conclusion, the writer wishes to express his thanks to the directors and curators of the three herbaria visited, for courtesies shown in the study of the valuable materials without which the solution of the problem to the writer's satisfaction would have been much more difficult.
