Notes upon Lithospermum.—The Hoary puccoon (*Lithospermum canescens* Lehm.) is a common prairie plant of high ground, flowering conspicuously in the month of May. This species is decidedly dimorphic, as has been previously observed by Dr. Bessey, and may be occasionally trimorphic, as reported by Mr. Smith, of Michigan. I have seen no indications of this last condition.

The styles of the long-styled flowers are from 6 to 11 mm., averaging 7.7 mm. Stamens in the same flowers are 3 to 4 mm., averaging 3.4 mm. above the receptacle. In the short-styled flowers the styles are 2 to 4 mm., averaging 2.9 mm.; and the stamens 7 to 8 mm., averaging 7.6 mm. The long or high stamens have short filaments $\frac{1}{2}$ to $\frac{1}{5}$ mm. long, attaching the anther to the corolla tube, while the short or low stamens are practically sessile.

It is, however, to the pollen of this plant that attention is called. That of the high stamens ranges from 11–13 by 22–25μ, with an average of 12 by 24μ. That of the short stamens varies frem 7–10 by 15–21μ, and averaging 8 by 17.5μ, or about two-thirds of the diameter of that of the high stamens.

The measurements are not easily taken owing to the peculiar shape of the grains, which consist of two large portions connected by an isthmus, the whole being somewhat dumb-bell shaped, with one end larger than the other. In fact the outlines made upon white paper by using the camera might be easily mistaken for representations of boot tracks in the snow.

Upon making comparative tests for germinative power, it was found that after a given period in sugar solution about one in fifty of the short-stamen grains had pushed out tubes of a length not exceeding the longer diameter of the grain. During the same time, twice as many of the larger grains produced tubes some of which were ten times the longer diameter of the pollen.

The tubes of the pollen from the high anthers need to grow through a longer distance of style and this may be sufficient reason for the greater vigor of each germinating grain, but the reason for the larger percentage of tube-producing grains may not be so apparent. It may be true that the difference in size in grains might render the same strength of sugar solution unequally favorable for growth.

Turning to the stigmas, there is a corresponding difference between those of the two lengths of styles. That of the long styles is 25 per cent. larger than of the short, and the papillæ of its surface are about twice as long.

Considerable attention was given to a corresponding study of another prairie puccoon, namely, Lithospermum angustifolium. I was not able to satisfy myself that the latter is distinctly dimorphic. There was a great variation in the lengths of the styles and stamens, but the age of the flower seemed to have much to do with this. The tube of the corolla elongates rapidly at the time when the lobes are spreading and the

growth carries the stamens upward. In the bud the style is uniformly longer than the stamens, but later on it may be equal to or shorter.

The pollen of this species is large and spherical, 47–50μ, with several prominent pores. There was no marked difference found between the grains from stamens of various lengths. There was also no evident difference between the stigma of the pistil with styles of various heights.

The remarkable difference between the pollen of the two Lithospermums may have its value in classification. In no other instance have I observed such wide dissimilarities in size, shape and markings within the same genus. As a rule, the pollen of a genus follows the same type with slight variations, except possibly in the matter of size. The differences might be termed generic, and in the proper classification the L. angustifolium may well be separated from the genus containing the L. canescens—in fact this is done in De Candolle's Prodromus, where the L. angustifolium is one of the species constituting the genus Pentalophus. —Byron D. Halsted, *Rutgers College, New Brunswick, N. J.*

CURRENT LITERATURE.

The genus Carex.

No genus is more severely let alone by the average botanist than this huge group of sedges. Our North American species have long been studied by Prof. L. H. Bailey, and his views have been set forth in a series of papers, published mostly in this journal, and in his monograph, which appeared among the *Proc. Amer. Acad.* publications for 1886. We have before us his latest contribution[1] to this subject, after having had the opportunity of seeing all the existing types of our North American species. This has been so thoroughly done, that almost every name which has been applied to N. Am. species is accounted for. This necessitates very many changes, more than one likes to see, but they seem necessary, and presently the new names will be just as familiar as the old. It is impossible to pass an opinion off hand upon a work of this kind, for a critic must have all the facts before him before his opinion is worth anything. It is often injustice to a monographer to pass judgment too hastily upon his work, for his opinions are the result of long and patient study, while a flippant criticism is entirely unembarrassed by facts. Therefore, the best test of such a work as that of Professor Bailey is its wearing power. It would be impossible in this brief notice to mention even the principal changes in nomenclature. In this connection the Torrey Botanical Club should be congratulated upon the appearance of this initial number of its proposed series of memoirs. It is a movement in the right direction, and should be encouraged by the hearty support of American botanists.

[1] Bailey, L. H.—Studies of the types of various species of the genus Carex. Memoirs of the Torr. Bot. Club, Vol. I, No. 1. pp. 85. Issued May 25, 1889. Price $1.00.

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