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SOMATIC CHROMOSOME COMPLEMENTS IN BOUTELOUA

BY

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PREVIEW

SOMATIC CHROMOSOME COMPLEMENTS IN BOUTELOUA

by

Jess L. Fults

A THESIS

**Presented to the Faculty of
The Graduate College in the University of Nebraska
in Partial Fulfillment of Requirements
for the Degree of Doctor of Philosophy
Department of Botany**

**Lincoln, Nebraska
May, 1941**



UMI Number: DP14081

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SOMATIC CHROMOSOME COMPLEMENTS IN BOUTELOUA

Jess L. Fults

Certain species and biotypes in Poa (Brown 1939, Tinney 1940), Paspalum (Burton 1940), Spartina (Church 1929a, 1929b and 1940), Andropogon (Church 1929a, 1940), Agropyron (Peto 1930) and other grass genera (Nielsen 1939) have recently been analysed cytologically. These investigations have shown that in the above genera, differences between species, and between biotypes within species are often correlated with such cytological phenomena as polyploidy, cytomyxis and parthenogenesis. This coupled with the fact that there is much variation in plant form between biotypes of certain species of Bouteloua suggested a study of their chromosome complements to determine whether a similar condition existed in this genus.

An early taxonomic treatment (Griffiths 1912) of the genus Bouteloua described and listed 36 species. The range of the genus is from Ontario and Maine south to the West Indies, the Argentine, and the Galapagos Islands. The center of distribution and the greatest number of species are found in west Texas, southern New Mexico, Arizona and northern Mexico where such species as Bouteloua rothrockii Vasey, B. eriopoda (Torr.) Torr., B. aristidoides (H.B.K.) Griseb., B. barbata Lag., B. gracilis (H.B.K.) Lag. and others often form a dominant part of the vegetation. The species which forms the greatest numerical dominance is

undoubtedly the common blue grama (Bouteloua gracilis) of the southern, central and northern Great Plains. This species, along with side-oats grama, B. curtipendula, has the greatest range of any of the species and together are typical of the two subdivisions of the genus—the Chondrosium and Atheropogon sections respectively.

Since the publication of Griffiths monograph (1912), Hitchcock (1935) has listed those species occurring in the continental United States. He did not include 5 of the species described by Griffiths. He also added 1 variety, thereby reducing the number of species in the genus to 31 plus 1 variety. Since the publication of Hitchcock's work, Swallen (1935) has described 1 new species from California (Bouteloua annua Swallen). To these, in the writer's opinion, should be added one species described by Featherly (1931) from Oklahoma (Bouteloua pectinata Featherly). In this report the writer recognizes 33 species and 1 variety.

Of these 33 species and 1 variety, 7 species, including 6 biotypes of blue grama (B. gracilis), 5 of side-oats grama (B. curtipendula) and 3 of hairy grama (B. hirsuta Lag.) from numerous seed sources, have been studied cytologically. Root tip chromosomes have been observed in 1 or more biotypes in the following species: Bouteloua breviseta Vasey, B. curtipendula (Michx.) Torr., B. eriopoda (Torr.) Torr., B. gracilis (H.B.K.) Lag., B. hirsuta Lag., B. rigidiseta (Steud.) Hitchc., and B. rothrockii Vasey.

The extreme variation in plant type in the widely

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distributed forms of blue grama and side-oats grama has long been known (Griffiths 1912). Griffiths acknowledged that the northern plains form of blue grama, which normally produces a rough bunchy sod, with few culms and abundant basal leaves, was different from the typical southwestern bunchgrass with many culms and culm leaves. However, the fact that both are present in the southwest and that intermediate types occur, led Griffiths to the opinion that neither form should be recognized as a distinct variety. Since Hitchcock (1935) did not name or describe these separately he evidently agreed with Griffiths' interpretation. Hitchcock did concede B. gracilis var. stricta (Vasey) Hitchc. as being different and according to the writer's interpretation of Griffiths (1912), is typical of the tall, robust, strictly bunchy form of the southwest.

MATERIALS AND METHODS

The plants used in this investigation were single plant cultures from seed sources ranging from Craigville, Alberta, to Iowa, southern Arizona, and New Mexico. One hundred fourteen plants were studied from 85 localities, distributed over every state west of the 100th meridian to the Sierras excepting Idaho, Utah, and Nevada. In B. breviseta 1 plant from 1 locality was studied; in B. curtispindula 48 plants representing 38 sources; in B. eriopoda 5 plants from 3 different areas; in B. gracilis 55 plants from 38 places of collection; in B. hirsuta 3 plants from 3 areas; and in