

VEGETATIVE APOMIXIS ('VIVIPARY') IN *BOUTELOUA HIRSUTA* LAG. (POACEAE)

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Vegetative apomixis in the inflorescences of various angiosperms is well-known. The summaries of Stebbins (1941), Gustafsson (1946, 1947), and Nygren (1954) list 44 taxa known to show this reproductive mechanism, 3 of which are dicots, 17 are grasses, and 24 are other monocots (particularly *Agave* and *Allium*). The production of asexual bulblets (or plantlets) on a parental individual is often mistakenly called 'vivipary', a term best reserved (in botany) for the process whereby seeds germinate while the fruit is still held by the inflorescence. In vegetative apomixis some portion of the inflorescence itself develops into buds, bulblets, or proliferations (Stebbins, 1941).

The hairy grama grass, *Bouteloua hirsuta* Lag., is a frequent component of the prairies of the United States and Mexico, ranging from North Dakota to Wisconsin, south to California and Mexico, and east to Louisiana and peninsular Florida. In July, 1981 two unusual populations were observed on the coastal prairie of Texas as follows: REFUGIO CO.: open coastal prairie 1.5 mi SE of Willow Lake, Willow Lake Pasture, Greta Ranch, ca 8 mi NE of Refugio, 15 Jul 1981, S. R. Hill 10501 (COLO, GH, MARY, MO, NMCR, NY, TAES, VT); short grass prairie remnant, south side of hwy 77, House Pasture, Greta Ranch, 8 mi NE of Refugio, 19 Jul 1981, S. R. Hill 10570a (GH, MARY, TAES, VT). Their spikes bore numerous and conspicuous green plantlets in place of normal greyish spikelets. I had not encountered such plants previously during a four year vegetation study of the area.

Vegetative apomixis in *Bouteloua hirsuta* was briefly mentioned by Gould (1968, p. 72) and by Gould and Box (1965, p. 36), the latter of which states: "The plants of our area frequently are viviparous in the early summer." However, the authors did not provide an illustration nor information on what structures were involved, both of which are provided in this paper. The monograph on *Bouteloua* and related genera by Griffiths (1912) made no reference to vegetative apomixis.

Gametophytic apomixis, specifically apospory, has been reported in *Bouteloua curtipendula* (Michx.) Torr. by Mohamed and Gould (1966) but this process has not been found in *Bouteloua* section *Chondrosioides* to which *B. hirsuta* belongs. Vegetative apomixis has not been reported for the inflorescences of any other species of *Bouteloua*.



Fig. 1. *Bouteloua hirsuta* Lag. a). habit, inflorescence with plantlets replacing spikelets, line-scale = 1 cm (Hill 10570a); b) normal spikelet, lateral view; c) vegetative spikelet, second glume and first lemma; d) mature plantlet in spikelet; e) detail of plantlet base and fertile floret. (b-e, line-scale = 1 mm; Hill 10501).

The normal spikelet bears two glumes (the second of which often has tuberculate bristle-hairs), a fertile floret, and a sterile floret (Fig. 1, b). The lemma of the fertile floret has a trifurcate apex with awns, and encloses the unornamented bicarinate palea. The sterile floret or rudiment is a stipitate lemma with three well-developed awns. In the present case (Fig. 1, a) only the floral bracts within the individual spikelet are transformed. Young plantlets or bulblets are seen in spikelets throughout the inflorescence. The older spikes of the season often bore both normal spikelets with mature fruits and atypical spikelets with well-developed plantlets. However, in younger spikes there were no normal spikelets, but only transformed spikelets in which the lemma of the fertile floret was green, elongated, and bore tuberculate hairs more typical of vegetative portions of the plant (Fig. 1, c). In these spikelets the palea was rudimentary and green, and the rudiment itself was absent and, therefore, not involved. The mature plantlets in the older spikes were seen to have originated totally from the rudiment (Fig. 1, d-e), and in each spikelet the fertile floret often bore a mature fruit.

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