

non-stigmatic area as the barbed subule to the smooth column in the normal awn. All stages in the transition from the unicellular to the multicellular condition were met with (Fig. 6). In the commonest form of the stigmatic awn the top had multicellular feathers and the bottom unicellular hairs. The feathers of the stigmatic awn were as long as the feathers of the normal awn. The most interesting point about this stigmatic awn is the progressive decline in its total length as it tended to be more and more multicellular in condition. In the most stigmatic of this awn the total length got shortened until it approximated the combined length of the normal style and stigma. These observations throw very helpful light on the evolutionary trends from the long linear barbed awn to the specialised shorter feathery stigma.

G. N. RANGASWAMI AYYANGAR.

T. VENKATARAMANA REDDY.

Agricultural Research Institute,
Coimbatore,
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¹ *Curr. Sci.*, 1935, 3, 540-542.

² *Curr. Sci.*, 1935, 4, 176-177.

³ *Jour. Indian Bot. Soc.*, 1936, 15, 139-142.

Awned Palea in Sorghum.

IN the Gramineæ though theoretically both the lemma and the palea can have awns, awned palea are a rarity. In *Amphipogon* an advanced genus of the stipinæ, sub-tribe of the Agrostideæ, Bews¹ notes the occurrence of palea bearing awns. Arber² records another instance of awned palea in one of the Bambuseæ—*Schizostachyum chilianthum* Kurz. Awned palea are thus of rare occurrence.

The spikelet in sorghum consists of two outer involucral glumes and two inner floral glumes. It is the fourth and the innermost glume that has a palea and bears a flower. This is the normal condition. When the variety is awned, long or short, it is this fourth glume (lemma) that has the awn. The palea is not ordinarily awned.

A disturbance in this condition arises in the case of spikelets with double grains. In these spikelets the third glume develops a palea and also bears a flower.³ This extra-fertility within the spikelet is of rare occurrence and brings in its train some unusual phenomena, of which the activation of awns in the palea is one. It has already been recorded that an activation of the awn

occurred in the lemma of pedicelled spikelets when they bore grains.⁴ In an African race of *Sorghum guineense*, Stapf, segregating for double grained and single grained spikelets, the palea of the fourth glume developed awns, in eight out of the thirty plants. In another family pure for double grains all the plants showed awned palea. The new palea of the third glume in double grained spikelets did not develop the awn. In the segregating family awned palea occurred both in double grained and single grained spikelets. Five earheads were examined and it was noted that one to five per cent. of the spikelets may have their paleas awned. The abnormal double and triple awned look of the spikelets helps to spot out awned palea (Fig. 1). When the palea is awned it may be single awned or double



Fig. 1.

Awned spikelets in Sorghum with double and single awned palea.

awned. The single awn is about two-thirds the length of the normal awn though its length fluctuates within wide limits. When the palea has two awns one of these is distinctly smaller than the other (Fig. 2). In the triple awned condition (palea with two awns and lemma with its normal awn) the spikelet shows three awns of decreasing length, the decrease being in an anti-clockwise direction. The palea with two awns is of more frequent occurrence than the palea with a single awn. When the awns are pronounced there is a tendency for the palea to get bifid. In extreme cases of

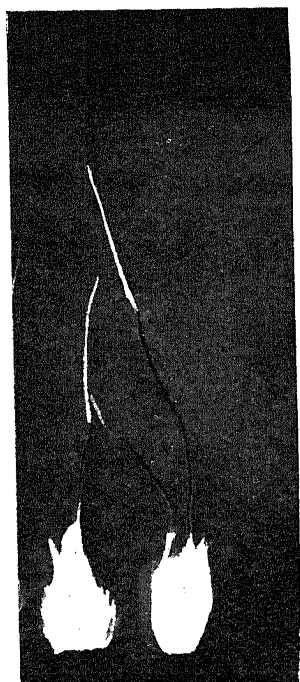


Fig. 2.
Awned palea.

bifiding the palea gets halved, and the two halves occupy a lateral instead of an opposite position with reference to the lemma. An examination of the palea manifesting this awned condition shows that the awns are the prolongations of two nerves of unequal strength in the palea. In non-awned palea these nerves exist in a less marked condition. An examination of a number of paleas shows all intermediate stages between this strong unequal two-nerved condition and the vestiges of the stronger nerve only. This prolongation of the two unequally pronounced nerves of the palea into two unequal awns, provides useful evidence in the interpretation of the palea in Gramineæ.

G. N. RANGASWAMI AYYANGAR.
T. VENKATARAMANA REDDY.

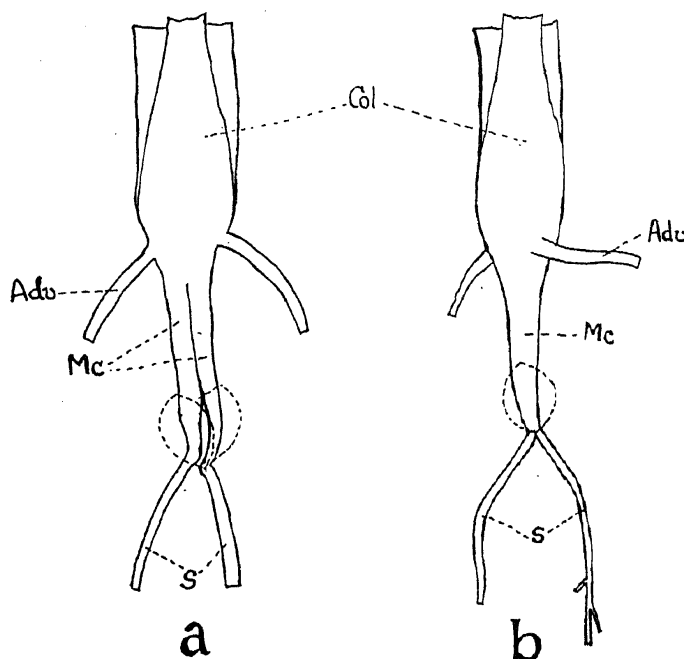
Agricultural Research Institute,
Coimbatore,
April 14, 1936.

- ¹ Bews. J. W., *The World Grasses*, 1929, 14 & 120.
² Arber, *The Gramineæ*, 1934, 112-13.
³ *Madras Agr. J.*, 1936, 24, 15-18.
⁴ *Curr. Sci.*, 1935, 3, 540-542.

False Polyembryony in *Setaria italica*, Beauv.

DURING the examination of a number of *Setaria* seedlings of K. 193—a loose-panicked, few-tillered variety—3 instances of two radicles arising from a single seed were

noticed. In two seedlings, there were two radicles per seedling, but there was only one



False Polyembryony in *Setaria italica*.

- (a) Seedling with two mesocotyls and two seminal roots.
(b) Seedling with one mesocotyl and two seminal roots.

Col.... Coleoptile. Mc.. Mesocotyl.
Adv.... Adventitious roots. S.... Seminal root or Radicle.

plumule (*vide* Illustration b). In the third seedling there were two mesocotyls and two radicles attached to a single plumule (*vide* Illustration a). In Maize, Kiesselbach (1926)¹ noted seedlings with (1) two plumules each with its own coleoptile and two primary roots enclosed in a single coleorhiza; (2) a single plumule with two primary roots in a single coleorhiza. Rangaswami Ayyangar and Panduranga Rao (1934)² recorded in *Paspalum scrobiculatum* L., a case in which there were two plumules each with its own coleoptile but with a single radicle. The first two seedlings described above belong to the second group of Kiesselbach. The occurrence of two mesocotyls, each with its own radicle, attached to a single plumule is not on record. The causes of such false polyembryony are obscure. False polyembryony being a rarity in Gramineæ, this case is interesting.

C. VIJAYARAGHAVAN.
V. PANDURANGA RAO.

Agricultural Research Station,
Hagari,
Bellary P. O.
April, 17, 1936.

- ¹ *Amer. Jour. Bot.*, 1926, 13, 33-34.
² *Madras Agr. J.*, 1934, 22, 419.