carpels are present quite distinct from one another. This is quite clear from the accompanying figure which represents a transverse section of the ovary about its middle. There are seen on the outside 18 bundles for the six perianth leaves, each perianth leaf being supplied by three (one midrib bundle and two lateral bundles). Next there are six stamen bundles, one for each stamen, just to the inside of the six midrib bundles of the perianth leaves. Finally we see in the middle of the transverse section, the vascular supply of the three carpels, consisting in each case of a dorsal bundle, two dorso-lateral bundles at the sides of the carpels, two ventral bundles and their lateral branches. It is thus quite clear that in this case the inferior ovary is the result of fusion of the basal portions of six perianth leaves, six stamens and ovaries of three carpels.

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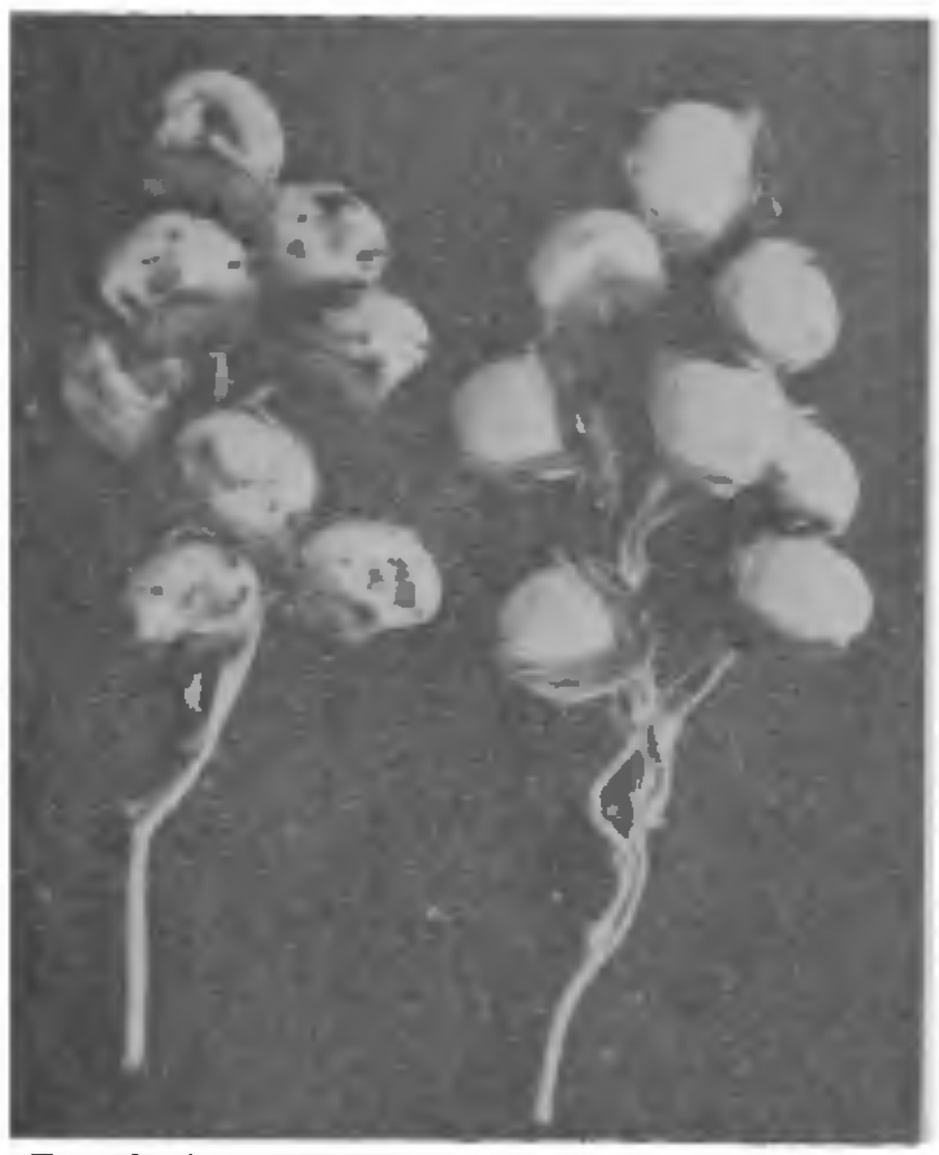
The Occurrence and Inheritance of Purple Blotched Grains in Sorghum

THE sorghum grain may be white or coloured, and may be pearly or chalky. When coloured, the colour may be yellow, red or brown. The depth of yellow and red may vary; so also that of brown, which could be independent or be superimposed on yellow or red. These variations will appear differently on pearly and chalky backgrounds. The many possible combinations of these factors result in the wealth of colours in the sorghum grain. The above colours are whole and are manifested over the whole of the pericarp. There are a few deviations from this whole colour manifestation. One such deviation in which the grain tips are purple coloured has been recorded[1]; here the purple tip is definitely round the stylar base.

In this note the occurrence and inheritance of purple blotched grains are recorded. Some of the varieties received from America, which are African in origin, are described as having flecked, red or black splashed grain. Possibly, these belong to the group of blotched grains.

The blotching is due to patches of purple coloured areas randomly distributed over the seed coat (see illustration). The colour of



Blotched Not Blotch d
Sorghum grains
FIG. 1

blotching may be reddish purple or blackish purple according as the root, leaf-sheath, and glume parts are coloured reddish purple or blackish purple. Blotching shows best against a white background. It could manifest on a background of other pericarp colours. Blotching is confined mostly to the pericarp layer. The colour is concentrated in the cuticle and epicarp, and gets lighter in the hypoderm and mesocarp, and in the cross and tube cells below. When blotching is heavy, it disintegrates all these layers and penetrates into the endosperm which it discolours slightly. In extreme cases there may be little pockets of air and this is revealed by tiny bubbles coming out when blotched grains are soaked. The blotches vary in size from a pin head to 2 mm. in diameter. Small blotches run into each other. They have no regularity in shape. They occur mostly in the exposed portions of the grains and could also occur at the base of the grain clipped up by the glumes and not exposed to light.

Blotching appears late in the development of the seed and is not noticed before the milky stage. Small blotches form in the dough stage of the grain and spread as the seeds mature.

Blotched grains are essentially African in origin. They are met with mostly among the Kafirs (*Sorghum caffrorum*, Beauv.), Feteritas (*S. caudatum*, Stapf.) and Nigricans [*S. nigricans* (Ruiz et Pavon) Snowden]. The Indian sorghums are free from blotching, though there are odd types of *Sorghum cernuum* evidencing a taint of blotching. Blotched grains tend to occur mostly in varieties with a blackish purple leaf-sheath and with grains having opaque and chalky colour.

In a cross between blotched and non-blotched grain types, the F_1 was blotched and the F_2 gave a simple monogenic ratio. In family A.S. 5379 which segregated for blotching there were 105 plants with blotched grains and 31 without blotching, showing that the blotched condition was a simple dominant to the common unblotched condition.

In crosses between a Kafir with blotched and purple tipped grain and a Milo with neither blotching nor purple tip, the F_1 had both blotching and purple tip. In the F_2 there was segregation for both the characters. Family A.S. 5382 gave a ratio of 64 purple tipped and blotched, 21 blotched alone, 20 purple tipped alone, and 7 with neither purple tip nor blotching. This segregation shows that the factor for purple blotching is independent of the factor P_{GT} which produces a purple tipped grain.

A factor designated PB produces purple blotches on the sorghum grain. PB is a simple dominant to pb. The factor pair PB — pb is independent in inheritance of the factor pair P_{GT} — p_{gt}, determining the presence or absence of a purple tip on the sorghum grain.

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[1] Rangaswami Ayyangar, *et al.*, *Proc. Ind. Acad. Sci.*, (B), 1938, **8**, 396–98.

Genic Differences Governing the Distribution of Stigmatic Feathers in Sorghum

The physical attributes of the style and stigma in sorghum, their length, and the length and distribution of stigmatic feathers have been given in a previous article.[1] The homology of style and stigma to the subule and column of the awn has been proved in a subsequent article.[2] Further data[3] on this homology were furnished, and the simple dominance of an equal stylar and stigmatic distribution to a longer style and a shorter stigmatic area has been recorded. In two subsequent articles[4,5] a localisation of the feathers and the extension of the feather to the stylar arms, with corresponding repurcussions on the awn was described and the inheritance of basal feathers given. In this note we are recording the fact that the distribution of the feathers on the stigma may be bushy or sparse with a genetic background.

The stigmatic feathers are very bushy in all cultivated varieties and also in the wild types. This is the normal condition. Among the African varieties of sorghum received through the courtesy of Kew, and grown at the Millets Breeding Station, three races of *Sorghum coriaceum* Snowden and one of *S. conspicuum* Snowden have sparse stigmatic hairs. To the naked eye this was easy to detect at the time of anthesis. The feathers in the sparse type were about 25 to 30 per one millimetre length of stigma as against 150 to 200 of the normal stigma. The individual feathers in the sparse type were slightly longer than those of the bushy type and the stylar arms were also a bit thicker.

A.S. 4378—a sparse feathered *Sorghum coriaceum* was crossed with A.S. 60—a bushy feathered *Sorghum durra*. The F_1 was like the bushy parent. In the F_2 the following segregations were obtained:—