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Varietal Susceptibiilty of Sorghum to the Midge (*Contarinia sorghicola*) coq.

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The studies on the susceptibility of ten varieties of sorghum to the midge infestation indicated that the varieties Co. 4, Co. 11, Co. 18, K. 2 and K. 4 are resistant to the attack of this insect. The midge infestation on these varieties varied from 3.25 to 7.38 per cent. The varieties CO. 20, CSH. 1 and Swarna were highly susceptible and the infestation ranged from 29.20 to 37.51 per cent. Among the earhead characters studied the length of glumes, presence of awns and rachis length have no relationship with the resistance or susceptibility for midge in the sorghum varieties. But the nature of panicle plays a role in midge resistance since all the compact panicle varieties are resistant and the semi-compact panicle varieties are susceptible.

One of the pests of sorghum that has recently assumed serious proportions causing extensive demage to the earheads, particularly in the new high yielding varieties, is the sorghum midge, *Contarinia sorghicola*. Ball and Hastings (1912) reported the short glumes as a possible factor that contributed resistance in sorghum for the midge. Geering (1953) also suggested that the degree of apposition of glumes might be the factor for resistance. Again Bowden and Neve (1953) have reported that the length and thickness of the glumes contributed to the resistance for this insect. However, Harris (1961) revealed that the resistance due to the nature of glumes was only apparent and it depended upon the presence or absence of a more favoured alternative host plant. The degree of infestation, however varies among the cultivated varieties of sorghum. Hence preliminary studies were initiated to assess the nature add extent of damage caused by this insect to the various varieties representing the different earhead types, viz., compact, semi-compact and loose panicles. Although there are no information on the resistance or susceptibility of these varieties to the midge, very high susceptibility of the variety CSH.1 to the shootfly, *Atherigona varia soccata* has been reported by Krishnananda (1969) and Thirumurthi (1970).

MATERIALS AND METHODS

A field experiment was conducted at the Millet Breeding Station of Agricultural College and Research Institute-Coimbatore during 1970-71 to study the susceptibility of important sorghum varieties to the midge in this tract.

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The varieties used for the study were CO.4, CO.11, CO.18, CO.19, CO.20, CSH.1, Swarna, K2, K3 and K4. The seed materials were obtained from the Millet Breeding Station, Coimbatore and also the Agricultural Research Station, Koilpatti.

The experiment was laid out in a randomised block design with ten varieties as treatments and three replications.

In each plot, two earheads were selected at random 15 days after the full emergence of the panicle from the boot leaf. These harvested earheads were kept in the emergence cage. After the emergence of adults it was easy to spot the affected spikelets with the pupal case protruding out. The damage caused by the sorghum midge was assessed by counting the number of spikelets affected in each head and working out the percentage to the total number of spikelets. The number of adult midges emerged from each head was also recorded to know the damage caused in different varieties.

The earhead characters such as glume length, rachis length, presence or absence of awn and nature of panicle were correlatted with the resistance or susceptibility of the varieties based on the extent of damage.

RESULTS AND DISCUSSION

Substantial evidence is being presented regarding the differential behaviour of sorghum varieties in relation to the midge infestation for the first time. In screening the important sorghum varieties CO.4, CO.11, CO.18, CO.19, CO.20. CSH.1, Swarana K2, K3, and K4 for resistance to midge, considerable variation in the nature of earhead of the varieties in relation to the midge infestation was noticed. The varieties CSH.1 and Swarna were highly susceptible with a maximum infestation of 36.26 per cent and 37.51 per cent, respectively and the variety K.4 proved to be the least susceptible with a minimum infestation of 3.25 per cent.

Earhead characters in relation to midge resistance in sorghum : There was no correlation between the glume length in the varieties and the extent of damage by the sorghum midge (Table). Similarly the presence or absence of awn also had no influence on the percentage of infestation. There was no correlation between the rachis length and the extent of damage. The severe infestation by the midge on sorghum varieties was found to be associated with the nature of panicle. Varieties possessing compact panicles such as CO. 4, CO. 18, K. 2 and K. 4 consistently showed less infestation and those possessing semi-compact panicles represented by CO. 20. CSH. 1 and Swarna showed very high infestation. The variety CO. 19 with loose panicle was neither highly susceptible nor resistant. The susceptible nature of varieties with loose and semi-compact may be attributed to the following reasons. The adult midge oviposits continuously by moving from one spikelet to another. Hence it is able to infest more number of spikelet in the semi-compact panicles which provide enough space for the movement of

TABLE. Earhead characters and percentage of midge infestation in different varieties of sorghum

Varieties	Mean glume length (mm)	Mean rachis length (cm)	Awned/ Awnless	Nature of panicle	Percentage of infestation	No. of adults emerged
CO. 4	4.4	3.61	Awnless	Compact	4.87	218
CO. 11	4.0	3.62	Awned	,,	7.38	349
CO. 18	4.0	3.42	Awnless	,,	5.87	262
CO. 19	4.0	23.62	Awnless	Loose	20.01	1730
CG. 20	5.0	6.31	Awned	Semi-compact	29.20	1317
CSH. 1	4.4	5.32	Awnless	,,	36.26	1083
Swarna	5.4	4.66	,,	,,	37.51	1417
K. 2	4.0	3.16	,,	Compact	4.26	201
K. 3	4.4	7.25	,,	Semi-compact	20.67	1150
K. 4	5.0	3.18	,,	Compact	3.25	114
	N.S.	N.S.		C. D.	17.50*	

midges in the inter-space. On the other hand in the varieties with compact panicle, the midges are restricted from freely moving to all the spikelets for egg laying with the result they infest the spikelets present on the surface only. The nature of earhead either compact or loose panicle in providing the suitable micro-climate for the pest has been considered by Geering (1953) as an important factor for resistance in the case of *Dysdercus superstitious*. But Cherian *et al.*, (1941) observed that the varieties with compact earheads are attacked more severely than those with loose ears in the case of the earhead bug, *Calocoris angustatus*.

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