

## TECHNICAL NOTES

### PARASITES OF SORGHUM MIDGE, *Contarinia sorghicola* (Coq.), IN QUEENSLAND

Tryon in 1894 gave an excellent description of the damage to broom sorghum by the larvae of a Cecidomyid which he considered was a species of *Diplosis*. He described the stages of the pest and remarked *inter alia* that "Already this insect, confined as far as is at present known to Southern Queensland, and believed to be a native species, is extensively parasitised by a minute hymenopterous fly belonging to the family Chalcidae, —". The pest was obviously *Contarinia sorghicola* (Coquillet 1898).

Atherton (1941) recorded that "At least two very small wasps are parasitic on the larval or pupal stages of the sorghum midge in south-eastern Queensland". Departmental records show that the parasite species concerned were *Eupelmus australiensis* Gir. and *E. varicolor* Gir., the former being easily dominant. The type locality of both is Gordonvale, N.Q. (Girault 1915).

In January 1955 at Biloela two specimens of *Eupelmus popa* Gir. (det. Commonwealth Institute of Entomology) were bred from midge-infested *Sorghum almum* Parodi, a recent introduction into Queensland. This is the first record of *E. popa* in the State. It has been recorded from India, Java and U.S.A., where the species has been studied extensively, and it is suspected to occur in Africa (see Barnes 1956).

*Eupelmus* sp. nr. *longicarpus* Gir. (det. Commonwealth Institute of Entomology) was bred from Queensland blue grass (*Dichanthium sericeum* (R.Br.) A. Camus) at Biloela in January 1955. In March 1952 specimens of an Eulophid, *Tetrastichus* sp. (det. Commonwealth Institute of Entomology), were bred from the same species at Bongeen. Although *D. sericeum* is a minor but consistent host of sorghum midge, these may be doubtful records of *C. sorghicola* parasites, as the grass is a host of other midges (Tryon 1894 and Departmental Records). A species of *Tetrastichus* is a major parasite of *C. sorghicola* in Africa and was an important parasite in U.S.A. prior to 1926 (see Barnes 1956).

During the years 1950-1956, sorghum midge and parasites were bred or dissected from large numbers of field samples of sorghums, mostly *Sorghum vulgare* Pers., from the majority of Queensland sorghum-growing districts. Except for the two specimens of *E. popa* as mentioned, *E. australiensis* was the parasite invariably obtained.

*C. sorghicola* may place as many as 11 eggs in a floret. Seldom do more than 6 midge larvae eventuate and no more than 2 parasite larvae have been found in a floret. It is not uncommon to find 1-4 midge larvae and a parasite

larva developing concurrently to the pupal stage in the same floret. Woodruff (1929) stated that *E. popa* is a primary parasite which requires one or more midge larvae to complete its development; however, a few larvae having consumed at least one host may complete development by feeding on plant material either in the presence or in the absence of midge larvae. *E. australiensis* is also phytophagous, and there is some evidence that it will commence larval development in the absence of midge larvae; all larval stages have been found in florets in which there were no signs of midge oviposition and larval development.

*E. australiensis* has a wide distribution in Queensland, and is also spread with midge in sorghum seed (Passlow 1954). Nevertheless, percentage parasitism of sorghum midge is low in the early and mid-season crops and does not attain noticeable proportions until towards the end of the season: a causal factor is that the parasite emerges from its overwintering stage over a wider range of conditions than does its host from diapause. During the seven years' study period the highest percentage of parasites in any population sample was 24.2 based on total insects (parasites plus midge emerged and in diapause). The mean in late-maturing crops on the same basis was 14.1 per cent.: this level has little economic significance.

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