The above characters provided an accurate method of separation of the two sexes. The adults also showed dimorphism by way of their external colour variations, the male being paler than the female which is brown in colour.

Department of Agricultural Entomology,
Tamil Nadu Agricultural University,
Coimbatore 641 003
Tamil Nadu, *March* 30, 1976.

K. NARAYANAN.
V. V. RAMAMURTHY.
R. GOVINDARAJAN.
S. JAYARAJ.

1. Boles, H. P. and Mozke, F. O., In *Insect Colonization and Mass Production*, (Ed. C. N. Smith), Academic Press, New York, 1966, pp. 265.
2. Narayanan, K. and Jayaraj, S., *Symposium on Oriental Entomology*, Calcutta, Abstract, 1973, p. 40.
3. Sithanantham, S. and Subramániam, T. R., *Madras agric. J.*, 1975, **62**, 62.

THE GRASS SEED INFESTING THRIPS *CHIROTHRIPS MEXICANUS* CRAWFORD ON *PENNISETUM TYPHOIDEUM* AND ITS PRINCIPAL ALTERNATE HOST *CHLORIS BARBATA*

MANY Gramineae and Cyperaceae in cultivated fields provide a perennial source of species of *Chirothrips*, *Anaphothrips*, *Bregmatothrips*, *Caliothrips* and *Haplothrips* to mention some of the major genera, are often of considerable importance in view of their build up in many crops at different stages of their growth. Species of *Chirothrips* have been known to feed on the ovarian tissues of many grass species destroying a good proportions of the seeds. Of such well-known species of *Chirothrips* are *C. mexicanus*, *C. falsus* Priesner producing a considerable decrease in the yield of Bermuda grass seed (Roney, 1949)[1] and Rhodes grass seed (Riherd 1954)[2] in the United States of America, of Timothy grass seed by *C. manicatus* Haliday and *C. hamatus* Trybom in Sweden (Johannson, 1946)[3] of meadow fox tail grass by *C. hamatus* in Finland (Hukkinen 1936)[4] and of cocksfoot seeds by *C. pallidicornis* Priesner in New Zealand (Doull, 1956[5]; Lewis, 1973[6]).

In so far as has been known the species *C. maximi* Ananthakrishnan, *C. ramakrishnai* Ananthakrishnan, *C. mexicanus* and *C. meridionalis* Bagnall form the major grass infesting thrips in India. While reporting for the first time the damage potential of the polyphagous cosmopolitan species *C. mexicanus* to young, growing ears of *Pennisetum typhoides*, observations presented herein also attempt at a correlation between their abundance in *Pennisetum* with that of its major alternative host *Chloris barbata*, abundant in *Pennisetum* fields. The incidence of this species in *Chloris barbata* is of the range of 25–30 individuals/branch of the four-branched spike, each with 44–50 spikelets, presenting an unusual preponderance of males to the extent of resulting in a sex ratio of 2:1 to 5:1 (males: females), appears to be of considerable interest suggesting an arrhenotokous partherogenetic mode of reproduction occurring side by side with normal sexual reproduction.

Regular collections of *Chloris barbata* inflorescence as well as on the young growing, maturing and scenescent earheads of *Pennisetum*, provided evidence of the abudnance of *Chirothrips mexicanus* with population counts ranging from 30–48 in young earheads and decreasing to 22–32 in ripening earheads/25 beats, with scarcely an individual in the seenscent earheads the corresponding population counts in *Chloris barbata* range from 10–197 adults/25 beats (Fig. 1)

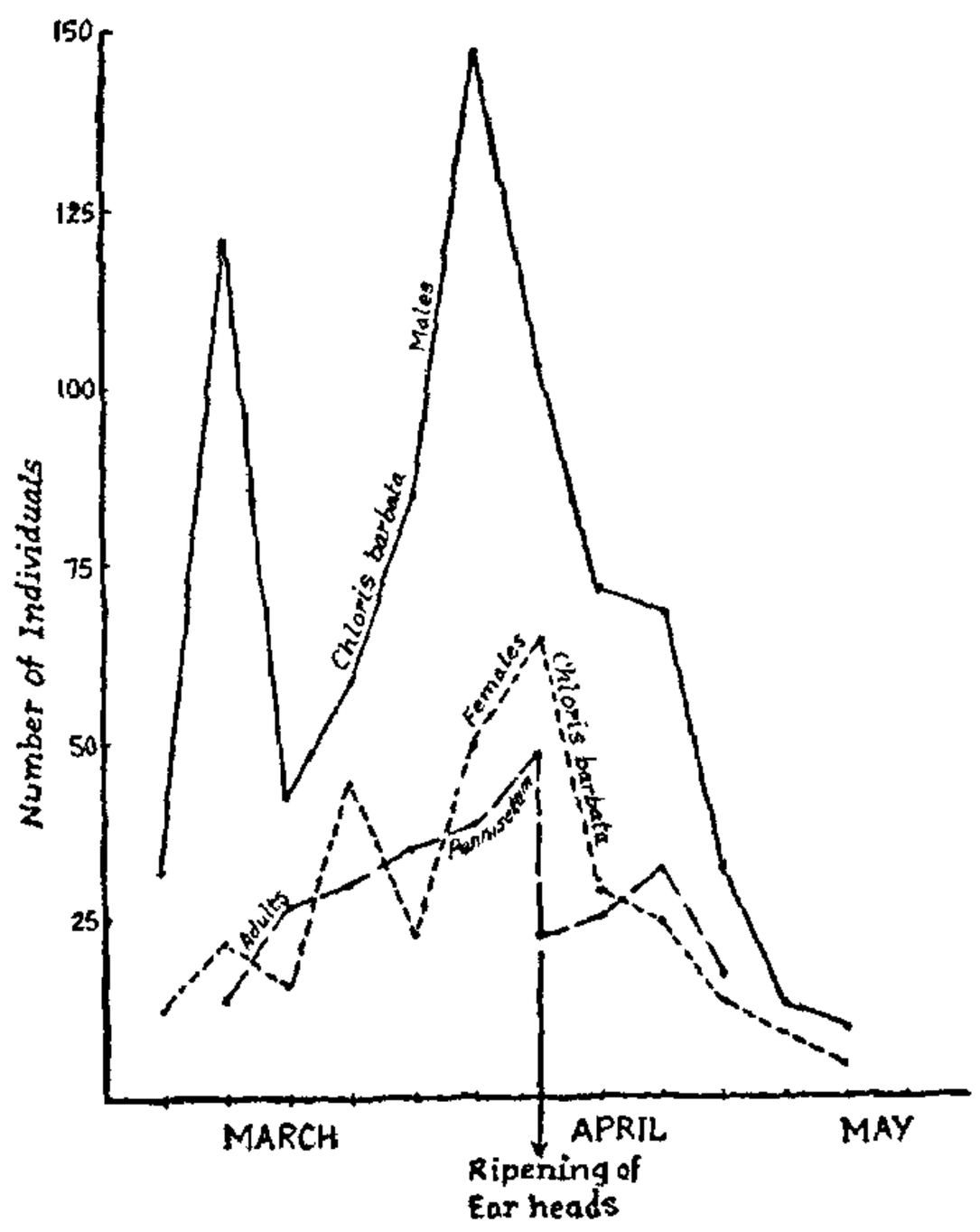

FIG. 1. Trends of infestation of *Chirothrips mexicanus on Pennisetum typhoides* and *Chloris barbata*

Only one egg is laid per floret, the larva feeding on the growing ovarian tissue, preventing seed formation. It was earlier reported in *C. pallidicornis* (Doull, 1956)[6] that, when the populations of *Chirothrips* reach 20/inflorescence, 30% cocksfoot seeds got destroyed. Examination of the inflorescence of *Chloris barbata* reveal all stages of development from egg to pupa with one individual per flower. Of 176–200 florets of *Chloris barbata* examined on a complete branched spike, 57–75 individuals of *C. mexicanus* occurred in various stages of development, there being only one individual per floret. The overall seed damage in *Pennisetum* was of the order of 5–10% of the cases, while in *Chloris barbata* the very heavy incidence

indicated a total damage of 60% of the seeds. In view the ability *C. mexicanus* to maintain a steady population in this weed lost *Chloris barbata*, the possibility of a very heavy build up in *Pennisetum* ears cannot be overlooked. Further work in this direction is in progress.

This work was carried out during the tenure of ICAR grant for which thanks are due.

Entomology Research Unit, T. N. ANANTHAKRISHNAN.
Loyola College, G. THIRUMALAI.
Madras 600 034, *November* 2, 1976.

1. Roney, J. N., *J. Econ. Ent.*, 1949, **42**, 555.
2. Riherd, P. T., *Ibid.*, 1954, **47**, 709.
3. Johannson, E., *Meddn. St. Vaxtsa Amst.*, 1946, **45**, 1.
4. Hukkinen, Y., *Valt. Maatalouskoet, Julk*, 1936, **81**, 1.
5. Doull, K. M., *N.Z. Jl. Sci. Technol.* (*A*), 1956, **38**, 56.
6. Lewis, T., *Thrips, Their Biology, Ecology and Economic Importance*. Academic Press, London, 1973.

CHROMOSOMES OF DIPLOID AND TRIPLOID *PUSCHKINIA LIBANOTICA* L.

Puschkinia libanotica L. (Fam. Liliaceae) has got five pairs of easily distinguishable chromosomes (Fig. 1). So far no heterochromatin has been detected in these chromosomes[7]. A few triploids were identified for the first time in *Puschkinia* (Fig. 2). Triploids appeared in the population with extremely low frequency. Of 2000 bulbs scored only 9 triploids without B chromosomes were isolated. Their chromosome length, chromosome volume, chromosome mass and DNA content were estimated and compared with diploids (Table I).

FIGS. 1–2. Fig. 1. Chromosomes of *Puschkinia*; $2n=10$ (× *ca.* 2,300). Fig. 2. Triploid in *Puschkinia*; $2n = 15$ (× *ca.* 2,000).

TABLE I

Chromosome length and volume, chromosome mass and DNA content

	Total chromosome length (micron)	Total chromosome[1] volume (cubic micron)	Chromosome mass[2] (× 10^{-11} gm)	DNA content[3] (arb. unit)
Diploid	71·59	191·64	19·37	18·03
Triploid	110·79	290·56	29·73	27 24

1. Chromosome volume measured at metaphase from 40 well spread cells (Figs. 1, 2) considering chromatids as cylindrical in form.

2. Chromosome mass = Total dry mass − nuclelar dry mass; estimates were made by interference microscopy (Davies[2]) in 40 2C nuclei isolated from root tips following the method of McLeish[4].

3. DNA content estimated by Feulgen photometry (McLeish and Sunderland[5] using Barr and Stroud Integrating Microdensitometer. 40 2C nuclei were estimated.

These characters in triploids showed a proportionate increase at a constant rate of 1·5 times as compared to diploids. This indicated that there was no change in chromosome length, chromosome volume, its mass and DNA content consequent to polyploidy. It was therefore, concluded that no chromosome reorganisation took place during the process of polyploidisation. On the other hand, several genera of Liliaceous family such as *Trillium, Fritillaria* and *Paris* showed diminution of chromosome size[1], where the chromosomes are characterised by significant amount of heterochromatin. La Cour's[3] observations in *Trillium tschonoskii* are also significant, where reduction of heterochromatic segments was noted in tetraploids. In the light of present observations it can be suggested that the effect of polyploidy is different in chromsomes with heterochromatin from those without.

Sharma[6] also observed no variation in chromosome size in tetraploids of *Vicia sativa* where no significant amount of heterochromatin was observed in the chromosomes of diploids. *V. faba* on the other hand having prominent heterochromatic segments in diploids, showed significant differerce in chromosome size in polyploids. From the present comparison, it therefore follows, that species where diploids do not have any significant amount of heterochromatin may not show any difference in chromosome size at increased level of ploidy.

The author is thankful to Prof. H. Rees, Department of Agricultural Botany, University College of Wales, Aberystwyth, Wales, U.K., for his guidance