https://doi.org/10.29321/MAJ.10.A02124

Madras Agric. J. 75 [9 & 10] 304-307 September & October, 1988

ROLE OF INSECTS IN SECONDARY SPREAD OF ERGOT DISEASE OF PEARL MILLET*

T. DAKSHINAMOORTHY[1], K. SIVAPRAKASAM[2] and A. V. RANGARAJAN[3]

Seven insect species viz., *Apis florea, Musca domestica, Tachina fallax, Oxycotonia versicolor, Dolycoris indicus, Syrphus* sp. and *Camponotus compressus* visited the sugary disease infected earheads. Among them housefly, *M. domestica, Syrphus* sp. and *T. fallax* visited were more in number. More number of insects visited the infected earheads during morning hours between 7.00 and 10.00 a.m. *A. florea* and *M. domestica* followed by *T. fallax* carried more conidial load on their body

Pearl millet (**Pennisetum typhoides** (Burm.) Stapf and Hubb.) is subjected to the attack of many diseases of which the sugary/ergot disease caused by **Claviceps fusiformis** Lov. is an important one. The honey dew of the pathogen formed a unique substrate for various insects which helped in spreading the disease from infected to healthy and disease free florets in pearl millet earheads (Saxena **et. al.**, 1977). All insect species prevalent in the infected fields were contaminated with conidia of **C. fusiformis** (Verma and Pathak, 1984). The objective of this study was to find out the association of insects with sugary disease.

MATERIALS AND METHODS

To find out the insect species associated with sugary disease incidence five infected earheads were selected at random and total number of insects visiting the infected earheads recorded at hourly intervals from 6 a.m. to 6 p.m. for 3 days. Insects were collected in polythene bags and identified. The conidial load carried by each insect was assessed. Collecting five insects in each species from the infected earheads in 5 ml/sterile distilled water kept in injection vial. The injection vials were shaken well to remove the conidia sticking to the body surface and other parts. The conidia were estimated by using haemocytometer.

RESULTS

Seven insect species viz., **Apis florea** Fabr., **Musca domestica** Howlett., **Tachina fallax** Mg., **Oxycetonia versicolor** Lafory., **Dolycoris indicus** Stal., **Syrphus** sp. and **Camponotus compressus** Bingham visited the sugary disease infected earheads. Out of seven insect species more number of housefly, M. **domestica** visited the sugary disease infected earheads. On an average 4.47 houseflies had visited infected earheads per hour. This was followed by **Syrphus** sp. and **T. fallax** with 3.42 and 3.25 insects respectively per five

*Part of M. Sc. Thesis of first author

1 Agricultural Officer, Directorate of Agriculture, Madras

2 & 3 Professors, Centre for Plant Protection Studies, Tamil Nadu Agricultural University, Coimbatore-641 003

Table 1 Number of conidia of *Clavjceps fusiformis* carried by different species of insects visiting the sugary disease infected ea-heads of pearl millet

Name of the Insect	Family	Order	Mean number of conidia per insect ($x10^5$)
Apis florea Fabr.	Apidae	Hymenoptera	85
Musca domestica Howlett.	Muscidae	Diptera	66
Tachina fallax Mg.	Tachinidae	Diptera	61
Oxycetonia versicolor lefroy	Cetonidae	Coleoptera	34
Dolycoris Indicus Stal.	Pentatomidae	Neuroptera	18
Syrphus sp.	Syrphida	Diptera	13
Camponotus compressus Bingham	Formicidae	Hymenoptera	11

Table 2 Interaction between the number of insects species and periods in hours visiting the sugary disease infected earheads

Period in hours	Insect species [No/3 earheads]							Mean
	A	B	C	D	E	F	G	
6-7 a. m.	0.33	1.00	5.33	3.00	2.67	3.00	0 67	2.29
	(0 88)	(1.17)	(2 40)	(1.87)	(1.77)	(1.68)	(1.05)	(1.57)
7-8 a. m.	4.33	2.00	7 67	2.33	4.33	5 00	0 87	3.76
	(2.18)	(1.44))	(2.85)	(1.68)	(2.16)	(2.34)	(1 05)	(1.96
8-9 a. m.	5.67	1.00	7.00	2.67	4 67	5 33	1 67	4.00
	(2 45)	(1.10)	(2.74)	(1.74)	(2.27)	(2.40)	(1 46)	(2.02)
9-10 a. m.	4.00	1.67	8.00	2.67	5.00	5.67	1.67	4.10
	(2.12)	(1 46)	(2.90)	(1.76)	(2.34)	(2 48)	(1.46)	(2.07)
10-11a. m.	0.67	0.67	5 33	2 67	4.00	7.67	1 67	3.24
	(1.05)	(1.05)	(2.39)	(1.72)	(2.08)	(2.85)	(1 45)	(1.80)
11-12 p. m	0 00	0.33	5.00	1.33	3 67	1.67	0.57	1 88
	(0 71)	(0 89)	(2.33)	(1.34)	(2.02)	(1.39)	(1.05)	(1.39)
12-1 p. m.	0 00	1 00	1.00	0.00	1.33	0.67	0 33	0 76
	(0.71)	(1.17)	(1.22)	(0.71)	(1.34)	(1 05)	(0 88)	(1.01)
1-2 p. m.	0 00	0 00	0.67	0.67	0 67	0.33	0 33	0 52
	(0.71)	(0.71)	(1 05)	(1.05)	(1 05)	(0.88)	(0 88)	(0.90)
2-3 p. m.	1.33	1.00	4.00	1 67	3 00	2 67	1 33	2.14
	(1.27)	(1.17)	(2 08)	(1 46)	(1 84)	(1 77)	(1.27)	(1 55)
3-4 p. m.	2 67	1 00	4 33	2 00	4 33	5 00	1 00	2 91
	(1 77)	(1.17)	(3 20)	(1 58)	(2 18)	(2 34)	(1.17)	(1 77)

4-5 p. m.	2.33	0.67	3.33	2.33	3.00	2.67	1.00	2.19
	(1.44)	(1.05)	(1.95)	(1.68)	(1.86)	(1.76)	(1.22)	(1.57)
5-6 p. m.	0.33	1.33	2.00	2.67	2.33	1.33	1.00	1.57
	(0.88)	(1.17)	(1.56)	(1.77)	(1.55)	(1.29)	(1.17)	(1.34)
Mean	1.39	1.01	4.47	2.04	3.25	3.42	1.00	
	1.35	(1.35)	(2.14)	(1.55)	(1.87)	(1.87)	(1.18)	

[Figures in parentheses represent transformed values]

A. *Apis florea*
B. *Oxycetonia versicolor*
C. *Musca domestica*
D. *Camponotus* sp.
E. *Tachina fallax*
F. *Syrphus* so.
G. *Dolycoris indicus*

C. D. [P=0.05]	
Insects	0.16
Periods	0.21
Periods x Insects	0.55

earheads of pearl millet infected by sugary disease. More number of insects visited the infected earheads during morning hours between 7 and 10 a. m. The visit of the insects to the earheads of pearl millet infected by sugary disease was significantly less during the other hours of the day. Significant interaction between periods and insect species was also observed (Table 1).

Among the various inset species **A. florea** carried more number of conidia (85 x 10^5 per insect) followed by **M. domestica** (65 x 10^5) and **T. fallax** (61 x 10^5). The least conidial load (11 x 10^5) was carried by **C. compressus** (Table 2).

DISCUSSION

Seven insect species frequently visited sugary disease infected earheads. Among them, more number of **M. domestica** followed by **Syrphus** sp. and **T. fallax** visited the diseased earheads. The frequency of visit was more during morning between 7 and 10 a. m. This is in support of the findings of Sarma **et al.** (1983) who observed that several insects including honey bees visited the sugary disease infected earheads. Among the insect species which visited the diseased earheads in the present study, the little bee **A. florea** carried more conidia followed by **M. domestica** and **T. fallax**. The **C. compressus** carried the least conidia on its body. Similar observations on the variation in the conidial load carried by different species of insects were made by Verma and Pathak (1984).

REFERENCES

SAXENA, H. K. R.K.GROVER and K. S. BILGRAMI. 1977. Ergot epidemic of pearl millet in Rajasthan. 439-451 pp. In : *Recent Advances in the Bjology of Microorganims* (Ed.) K. S. Bilgrami and K. M. Vyas. Bishan Singh and Mahendra Pal Singh Publishers. Daheradun, India

SHARMA, Y. P., R. S. SINGH and R. K. TRIPATHI, 1983. Role of insects in secondary spread of ergot disease of pearl millet (*Pennisetum americanum*). *Indian Phytopath 36 :* 131-133.

VERMA, G. P. and V. N. PATHAK 1984. Role of insects in secondary spread of pearl millet ergot *Phytopa hylactica 16* : 257-258.

Madras Agric. J. 75 [9 & 10] 307-317 September & October, 1988

QUALITY CHARACTERISTICS OF TAMIL NADU RICES

P. PILLAIYAR*

The high yielding varieties though grown on a large scale in Tamil Nadu, do not possess the desired quality attributes. Among 25 varieties studied none is extra long; the dimentional distributions and other quality factors are very narrow. Based on 'normalized grain weight', only two varieties are superfine. Varieties represent all GT groups. Cooking time and swelling ratio cannot be considered as indices of rice quality. Among cooking quality parameters like the elongation ratio, elongation index, proportionate change and others, the first one seems to be better in indicating rice quality. The cooking quality characteristics of IR 50 is very poor.

Consumers judge the quality of rice mostly on its appearance particularly, the colour, size and shape and on its elongation during cooking. Millers and traders, on the other hand, prefer a variety capable of giving high total and head rice recovery. Though the former is governed by genetic make up, the latter is mostly determined by the pre-and post-harvest practices. Commercial classifications of rice are based on its size and shape (Anonymous, 1968; 1980). Recently Bhattacharya and Sowbhagya (1980), Bhattacharya et.al. (1982A) and Showbhagya et al.. (1984) after examining various classifications, proposed a new rice classification taking into consideration of the length, shape (length : breadth ratio) and 'normalised grain weight' (10w/L). Tenderness and cohesiveness are the attributes that are

* Paddy Processing Research Centre (TNAU), Tiruvarur - 610 001