https://doi.org/10.29321/MAJ.10.A04385

A Note on the mealy Bug — Pseudococcus virgatus Cockerell, on Gliricidia maculata H & B and its Control

By

Dr. S. KRISHNASWAMY, B. sc. (Ag.), Assoc. I. A. R. I., PH. D.
and
K. R. NAGARAJA RAO, B. sc. (Hons.)
Agricultural Research Institute, Coimbatore

Mealy bugs belong to the family - 'Coccidae' – a category which includes some of the most serious pests of crops, ornamental plants and particularly of fruit trees also. As implied in the name, most of the species are provided with a mealy covering all over their body. The life history and habits in general are briefly as follows. The full grown females are mostly stationary, fixing themselves more or less permanently to their feeding spots on their host plants. The eggs are extruded below the body of the female. The nymphs hatch out in due course, crawl about upto a certain stage of their development and in their turn establish themselves in suitable parts. The adults and young are provided with needle-like mouth parts with which they pierce the plant tissue and suck up the juice. They occur in small groups or colonies, invariably on the tender and succulent shoots, but a good many forms are also found on other parts of the plants, like the stem, fruits, etc. The damage caused by the bugs is often serious, since the heavy drain on the cell sap would naturally reflect on the health of the host, if not kill it outright.

The approved method of control advocated, so far, is the application of frequent and copious washes of contact insecticides like Fish oil rosin soap, Crude oil emulsion, etc. But their efficacy has been only partial, due to the fact that the mortality is effected only by contact and that the spray fluids are generally unable to permeate into the mealy covering, with which most of the members of this group are provided. The incidence of these Coccids, in some cases, is so wide-spread and serious, that mechanical and insecticidal methods are well-nigh impracticable. More novel methods like biological control are resorted to under such conditions. The classical example of this method in the Madras State, is the practical extermination of the cottony cushion scale – *Icerya purchasi Maskell* — by its predator – *Rodilia cardinalis* Muls —.

The Pest: (Pseudococcus virgatus –): This bug, besides having profuse mealy covering over its body, is also characterised by the presence of a pair of long waxy, tail – like appendages. It is distributed practically all over the world. Coming nearer home, Green (1) has recorded it on a

number of hosts like *Talinum*, *Calliandra sp*, *Castilloa elastica*, *Sagitaria sp*, *Thunbergia sp*, *Asparagus*, *Lilium*, crotons and tomato in Ceylon. Ramakrishna Iyer (2) records it on crotons, tomato, cambodia cotton, *Lantana*, custard apple, *Sesbania* and pepper vines in South India. From the wide array of the alternative hosts, some of which are crops of economic importance, it is evident that the potentialities of this mealy bug are immense, as it may at any time develop to uncontrollable limits on the hosts already known or take to newer crops not recorded so far.

Nature and extent of damage: This mealy bug occurred in a very serious form on a plantation of *Gliricidia maculata* H & B – raised within the premises of the Agricultural College, Coimbatore, which incidentally forms a new host of this pest. This shrub is, of late, gaining considerable importance as a good source of green manure, by virtue of which it is being exploited on an extensive scale in the present intensive drive for producing more food. As is characteristic of these bugs, hundreds of them were found clustered in small colonies towards the tender portions of the plants. Due to their destructive activity, the plants first exhibited an unhealthy appearance. With the progressive increase in the bug population and the consequent damage, there was a wholesale shedding of the leaves, thus defeating the very object for which the plantation is being maintained.

The incidence of this Coccid in such a severe form was an experience by itself, and the opportunity was availed of to try some of the recent synthetic and systemic insecticides against this pest.

Material and Methods: The following variants, viz – sprays of HETP 0·15% and 0·1%, Parathion 0·025%, Gammalin 0·1%, DDT emulsion (Psyloxtox -250), 0·02 and 0·04, DDT suspension 0·2%, BHC suspension 0·1 and 0·2%, dusts of BHC 5% and 10%, DDT 5%, Agrocide cotton dust and Parathion 2% – and sprays of the systemic chemicals, Isopestox, Pestox, Sytam and Tetrax at 0·15% were tried in three sets of experiments. The results were compared with those of the standard insecticide – Fish oil rosin soap – (1 lb. in 4 gallons). Initial and post treatment population counts were recorded 48 hours, and a fortnight later on random samples of ten twigs (each six inches in length) per treatment. The details are furnished in Statements I, II and III appended.

Results: The data furnished in Statement I, indicate the high efficacy of BHC spray 0·2% as the percentage of reduction in population was 94·8 in the course of 48 hours. Sprays of DDT emulsion (Psylortox 250) 0·04%, DDT suspension 0·2%, HETP 0·15%, Parthion 0·025% and

BHC 0·1% come next in the respective order of efficacy, all of them causing more than 50% reduction.

In the second set of experiments (Statement II), where the dusts were used, the best results were obtained in Parathion 2% and the percentage of reduction in 48 hours was 98 4. BHC dusts 5 and 10% and Agrocide cotton dust also gave a reduction of more than 50% in the population, within the same period.

As may be seen from Statement III, the systemic chemicals also have been quite efficient as the reduction ranged from 80·2% to 95·2% in the course of 48 hours. Despite the slight variations in the immediate effects of these chemicals, the bugs were practically exterminated in all the treatments in about a fortnight, while the population has gone on increasing in the controls. Compared with the performance of the different variants, Fish oil rosin soap spray has exerted a reduction of only 42·7% and has had little or no residual effects.

Conclusion: The above data show the higher efficacy of the synthetic and systemic chemicals over Fish oil rosin soap for the control of this mealy bug. The results of BHC spray 0·2% Parathion dust 2% and sprays of Isopestox, Pestox, Sytam and Tetrax at 0·15% were particularly convincing.

NOTE: Due to the limited material and the large number of the variants, the experiments had to be conducted on a small scale, more on an exploratory basis and the calculation of the economics of the difierent chemicals was. therefore, not possible. A word of caution is also necessary about the use of these chemicals. Some of them, especially Parathion and the systemic insecticides are somewhat dangerous to handle and should, on no account, be allowed to come in contact with the body. Further, they are also likely to be absorbed and retained by the plants. This phenomenon often results in ruining the edible qualities of the produce, particularly in the case of BHC. Besides these, the possible hazards to man and other animals consuming the produce is another but more serious aspect. The chemicals have, therefore, to be used with extreme care on crops like vegetables, fruits, etc. If their application is inevitable, it should be stopped by four to six weeks before harvest.

Acknowledgement: The authors wish to express their thanks to Sri S. Ramachandran, Government Entomologist for his guidance in the work and in the preparation of this note.

BIBLIOGRAPHY

Ernest Green, E — 1922 — 'The Coccidae of Ceylon' part V — P. 371 – 373.

Ramakrishna Ayyar, T. V. — 1929 — 'Contributions to our knowledge of South Indian Coccidae'. P. 58 – 59.

STATEMENT I.

Spraying Formulations.

No.	Treatments	Initial population			Population after 48 hours			Percentage of reduction in the total population by 48 hours	Population after a fortnight			Percentage of increase or decrease in the total population over the initial count
		Adults	Nymphs	Total	Adults	Nymphs	Total		Adults	Nymphs	Total	
1.	H. E. T. P. 0·15%	48	465	513	5	194	199	61·2	15	157	172	66·5
2.	H. E. T. P. 0·1%	78	345	423	20	246	266	37·1	9	96	105	75·2
3.	Parathion 0·025%	132	281	413	16	155	171	58·6	24	77	101	75·5
4.	Gammalin 0·01%	78	262	340	27	218	245	27·9	7	58	65	80·9
5.	DDT (Psylortox – 250) – 0·02%	103	527	630	52	466	548	43·0	43	175	218	65·4
6.	DDT (Psylortox – 250) emulsion 0·04%	43	1192	1235	20	332	352	71·5	51	234	285	76·9
7.	DDT suspension 0·2%	81	914	995	33	251	284	71·5	75	185	260	73·9
8.	BHC suspension 0·1%	14	535	549	1	247	248	54·8	23	52	75	86·3
9.	BHC suspension 0·2%	57	655	712		37	37	94·8	2	15	17	97·6
10.	Fish Oil Rosin Soap (1 lb. in 4 gallons)	97	676	773	59	394	453	42·7	82	330	412	46·7
11.	Control	4	515	519	7	623	630	plus 21·4*	54	603	657	26·6*

* Increase in the percentage of population over the initial count.

STATEMENT II.

Dust Formulations.

No.	Treatments	Initial population			Population after 48 hours			Percentage of reduction in the total population by 48 hours	Population after a fortnight			Percentage of increase or decrease in the total population over the initial count
		Adults	Nymphs	Total	Adults	Nymphs	Total		Adults	Nymphs	Total	
1.	BHC 5%	52	285	337	37	228	265	68·3	12	53	65	92·2
2.	BHC 10%	150	472	622	32	232	264	57·6	8	5	12	98·1
3.	DDT 5%	48	371	419	29	347	376	10·3	82	86	168	59·9
4.	Agrocido cotton dust	132	212	344	29	128	157	54·4	7	212	219	36·7
5.	Parathion dust	53	386	439	..	7	7	98·4	..	..	..	100·0
6.	Control	56	459	515	66	494	560	8·7*	22	207	229	55·5

STATEMENT III.

Systemic Insecticide.

1.	Isopestox 0·15%	166	234	400	2	17	19	95·2	4		5	98·7
2.	Pestox 0·15%	96	1174	127	16	165	181	85·7	4	..	4	99·7
3.	Sytam 0·15%	56	428	484	33	63	96	80·2	7	2	9	98·1
4.	Tetrax 0·15%	131	636	767	37	106	143	81·4	12	30	32	95·8
5.	Control	4	515	519	7	623	630	21·4*	54	603	57	26·6*

Increase of percentage of population over initial