A Preliminary Study on the Control of Red Bug of Bandakka

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THE RED BUG of Bandakka, *Dysdercus cingulatus* (S. *Bandakka Makuna,* T. *Vendich-Chev-Maddu-Poochi*) commonly attacks plants belonging to the families Malvaceae and Sterculiaceae. The favourite food plants of this bug besides bandakka *Hibiscus esculentis,* are cotton *Gossypium* Sp. (S. *Kapu ;* T. *Paruthi*) and red cotton *Bombax malbaricum* (S. *Katu Imbul ;* T. *Paruthi*).

The adult bug is medium sized, being about 20 mm. in length and is dull to bright orange in colour. On the underside of its body are white cross bands and spots. The first pair of its wings, which covers the folded membraneous second pair, has the distal ends black and proximal portions coloured either orange red or dull straw with a black spot in the middle of each wing. Several of these bugs in the adult and nymphal stages may be seen to cluster on pods and tender shoots of bandakka during feeding. The adults are active insects which run rapidly when disturbed, but seldom take to the wing.

The adults as well as nymphs have similar feeding habits due to the possession of the same type of piercing and sucking mouth parts and cause a considerable amount of damage. In feeding, the bugs have shown preference towards the immature pods and shoots, but they have been found to attack the hard mature seeds softened by rain. During a severe attack the pods, flower buds and shoots may shrivel up and even drop. The plants get stunted with consequent reduction in yield of marketable pods. This pest has proved itself to be a worse menace on cotton. Apart from the direct damage due to feeding habits, the staining of the lint by the bugs at harvest, lowers its quality.

An outbreak of this pest occurred during *maha* 1953-54 at the Experimental Station, Thirunelvelli, Jaffna, in about a quarter of an acre plot of bandakka, which was a varietal trial laid down by the Agricultural Research Officer, Jaffna. In the absence of parasitic flies, and the most effective predaceous bug, *Antilochus nigripes,* there was a rapid build up of the pest.

A preliminary investigation on the control of the red bug with the following chemical formulations was carried out :—

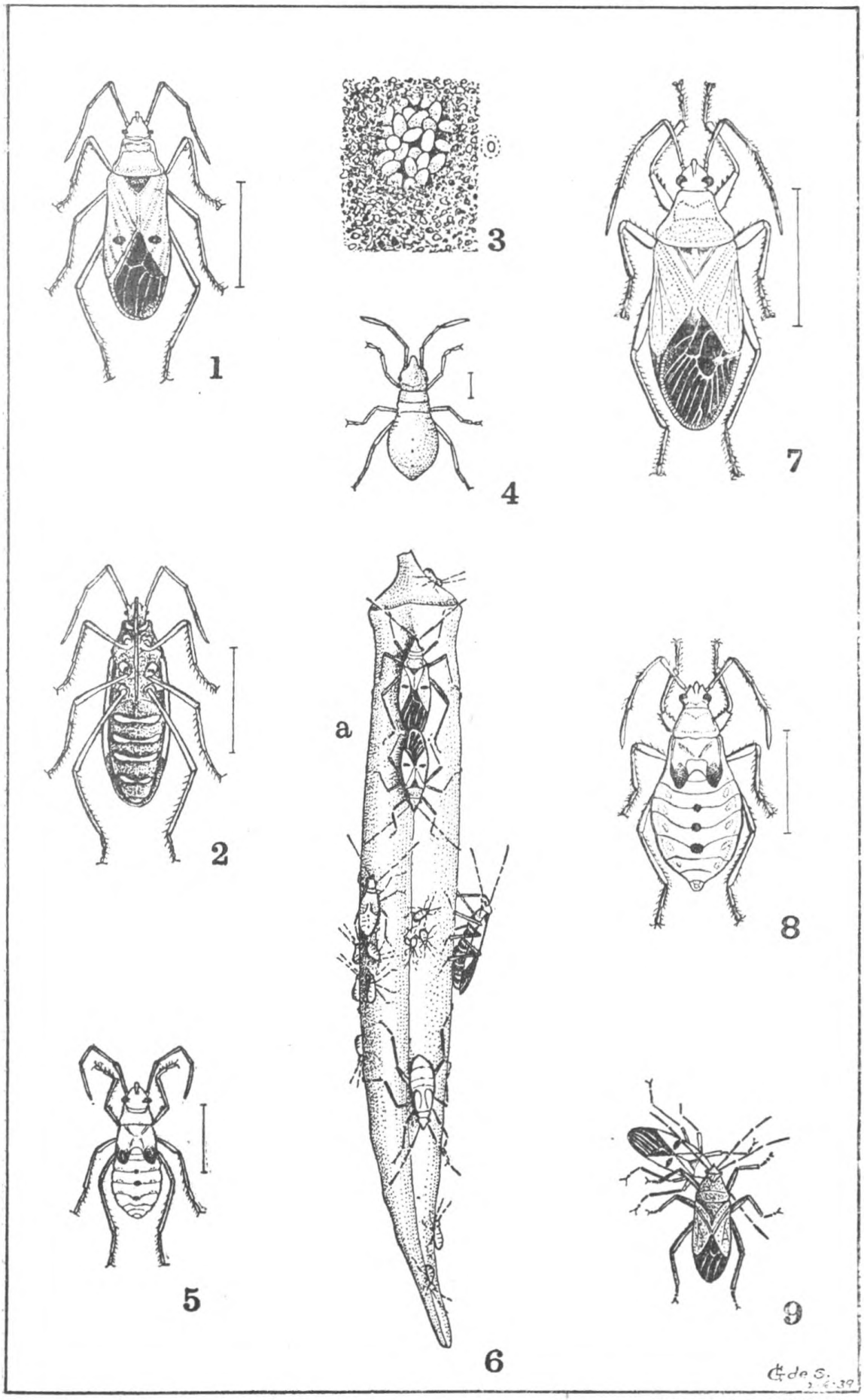
DDT 18 per cent. Emulsifiable concentrate

BHC 10 per cent. Emulsifiable concentrate

Chlordane 74 per cent. Emulsifiable concentrate

Dieldrin (1.5 lb. actual dieldrin per U.S. gallon of concentrate).

The plot of bandakka had forty-one rows of plants, forty of which were divided into ten blocks, each containing



BLOCK BY SURVEY DEPT. CEYLON.

1. Dorsal aspect of adult Red Cotton Bug. 2. Ventral aspect of same. 3. Mass of eggs laid in soil. 4. Second stage cotton bug. 5. Fifth stage bug showing wingpads. 6. Bandakka pod showing a mating pair of bugs at *a*, and other stages of bug feeding. 7. Adult predaceous bug. 8. Fifth stage predaceous bug, showing wingpads. 9. Predaceous bug feeding on cotton bug.

6 and 9 are natural size. The lines near others show natural sizes

four rows. The plants were of very good growth, carrying the first few pods and a large number of flowers.

An estimate of the pest infestation before the commencement of the treatment gave an average of eight bugs per plant on ten plants selected at random. These counts included the nymphs as well as adults. Immediately after the counts were made the blocks were treated with the following concentrations of insecticides (per cent. actual insecticide in prepared spray), and the treatments were randomised :—

Block 1	..	DDT	.. ·03%
Block 2	..	Dieldrin	.. ·75%
Block 3	..	Untreated check	—
Block 4	..	Chlordane	.. ·2%
Block 5	..	BHC	.. ·003%
Block 6	..	Dieldrin	.. ·5%
Block 7	..	Chlordane	.. ·15%
Block 8	..	Untreated check	—
Block 9	..	DDT	.. ·05%
Block 10	..	BHC	.. ·02%

Each plant was thoroughly sprayed at the rate of 1½ gallons of spray solution per treatment on each block, using a knapsack sprayer.

There was very bright and hot weather on the day of spraying and on the next day. On the second day after spraying there were heavy showers, while a drizzle persisted on the third day after the treatment.

Five days after the first treatment, a second treatment with the same insecticides was carried out using a higher concentration as the insect population had not been affected by the first treatment. The second treatment was carried out using the same equipment and the same volume of spray per block. The concentrations of the insecticides in the prepared spray were as follows :—

Chlordane—·9% and ·4%
DDT—·2% and ·1%
Dieldrin—3% and 1·5%
BHC—·1% and ·06%

Three hours after treatment a complete paralysis was noticed in the case of nymphs, and twitching of the limbs in the adults. On the second day after the second treatment, a representative random count of the insect population showed a 100 per cent. mortality in blocks 1, 2, 4, 5, 6, 7, and 9. In blocks 3, 8, and 10 the intensity per plant was on an average 12, 8, and 1 respectively. In all the treatments except those with Benzene hexa chloride at a low concentration, there was complete freedom from the pest. Unsprayed check blocks too showed a reduction in the insect population probably due to spray drift. The insecticides had no phytotoxic effects on the sprayed plants at the concentrations used.

Eighteen days after the second treatment a reinfestation of the plants by these bugs was noticed. Mostly nymphs and a very few adults were found in this instance. This would suggest that the insecticides under Jaffna conditions have no impertant residual effects against this pest for more than fourteen to eighteen days.

On the basis of the gallonage of spray required per block, about 40 gallons of spray liquid will be required per acre using a knapsack sprayer. Of all the chemical treatments employed DDT has proved the cheapest, while it is as effective as any of the other chemicals used. For complete control of

Mortality of Red Bugs 24 hours after spraying with a Series of Insecticides at various Concentrations

Plot No.	*Concentration of Insecticide*	*Dilution Rate in 1 Gallon of Water of Formulation*	*Average Infestation of Bugs per Plant*					
			Prior to spraying			*24 hrs. after spraying*		
			ADULTS	NYMPHS	TOTAL	ADULTS	NYMPHS	TOTAL
1	D. D. T. ·1%	1 fl. oz.	9	5	14	—	—	—
2	Dieldrin 3%	2 ,, ,,	5	4	9	—	—	—
3	Control	—	7	7	14	11	1	12
4	Chlordane ·9%	2 fl. oz.	5	—	5	—	—	—
5	B. H. C. ·06%	1 ,, ,,	10	5	15	—	—	—
6	Dieldrin 1·5%	1 ,, ,,	5	7	12	—	—	—
7	Chlordane ·4%	1 ,, ,,	8	5	13	—	—	—
8	Control	—	8	12	20	8	—	8
9	D. D. T. ·2%	2 fl. oz.	5	3	8	—	—	—
10	B. H. C. ·1%	2 ,, ,,	8	4	12	1	—	1

an infestation of red bugs on bandakka, about two pints of a 15 per cent. to 25 per cent. DDT emulsifiable concentrate will be required. This would work out at a cost of about Rs. 4.25 for insecticide alone per acre. In addition to its cheapness and its effectiveness it presents about the least hazard to human beings if harvesting is avoided for three weeks to a month after the last spraying with DDT.

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