Reprinted from the *Indian Journal of Entomology*, Vol. 32, No. 4, 1970 ; pp. 386-387

177

ADAPTATION OF THE SUPERIOR LAC INSECT TO A COMMON FOOD PLANT

Though morphologically similar, the *rangeeni* and *kusmi* strains of the lac insect *Kerria lacca* (Kerr.) (Syn. *Laccifer lacca* Kerr.) are well recognised by virtue of their characteristic differences in their biology and also in the quality of lac produced (Glover, 1937). Both are bivoltine having the broods as follows.

Rainy season :

Kusmi—June-July to January-February

Rangeeni—June-July to October-November

Dry season :

Kusmi—January-February to June-July

Rangeeni—October-November to June-July

The *kusmi* strain produces the better quality lac, but the production is greatly restricted as it occurs only on *kusum* (*Schleichera oleosa*) which is neither available in abundance nor is easily accessible to the growers. *Kusmi* lac consequently constitutes hardly 10 per cent of the total production. Production of the superior lac can be boosted by extending the host range of the *kusmi* insect, and so it was thought desirable to examine the possibility of adapting the *kusmi* insect to the conventional *rangeeni* host *palas* (*Butea monosperma*) which produces the bulk of lac of commerce, by inoculating *palas* with *kusmi* brood and persisting with the survivors, if any, to continue their subsequent progenies on this plant.

Cultures of the *kusmi* strain were set up on *palas* in 1966 and survivors in each generation were chosen as parent to start the next generation on this plant. Survivors were available for four to five generations before these cultures were lost due to total mortality of the insects. The observations made during the course of this rearing work are summarised below :

(i) The insects retained their *kusmi* cycles throughout their successive generations on *palas* and produced resin of *kusmi* characteristics.

(ii) The survival rate of the insects differed greatly with the time of inoculation in the dry season. Thus, while early inoculations in January showed as good a survival rate as on *kusum* itself, inoculations in February were less so and those after the middle of March invariably met with total mortality of the insects in their earlier stages of development. Delay in inoculation in the dry season thus adversely affected the survival of the *kusmi* insect on *palas*.

In the rainy season, the insects survived normally till November-December, but they suffered heavy mortality thereafter possibly because *palas* enters the dormant phase during this period when the nutritional demands of the *kusmi* insect are highest.

(iii) The growth rate of the insects was slower on *palas*. Thus, cultures set up on 16th February, 1966 produced the fifth generation progeny from 14th March, 1968 which was lost due to total mortality of the insects in their earlier stages of development. Those started earlier survived for a generation more before these cultures also met similar fate presumably due to late inoculation in the dry season.

These observations show that *palas* is not seriously deficient in nutrients essential for the growth of *kusmi* insects. Its inability to sustain large colonies of these insects is because it is perhaps not in the right physiological state during the *kusmi* cycles. It can, however, be utilised in the dry season if inoculated early in the season.

It is of interest to note here that differences in the life cycle and resin characteristics of *rangeeni* and *kusmi* strains are retained when they are reared on the same plant under similar conditions, and hence are of genetic origin. It should, therefore, be of considerable practical interest to see whether these differences are genetically independent of each other. If so, it should be possible to combine the *rangeeni* cycles with the *kusmi* resin characteristics through hybridisation to obtain the desired insect for large scale production of the superior lac on *palas*. Work along these lines has now been initiated at this Institute.

The authors are grateful to Mr. Y. Sankaranarayanan, Director and Dr. A. Bhattacharya, Entomologist, Indian Lac Research Institute, Namkum, Ranchi, for providing the facilities. Their thanks are also due to Mr. B. P. Sah, Fieldman for his help in the maintenance of lac insect cultures.

Reference

Glover, P. M. 1937. Lac cultivation in India. Indian Lac Research Institute, Namkum, Ranchi. 147 pp.

Section of Insect Genetics,
Indian Lac Research Institute,
Namkum, Ranchi (Bihar).

N. S. Chauhan
J. Lal

(*MS. received : 19-10-1970*)