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Natural Control of Gujarat Hairy Caterpillar, *Amsacta moorei* Butler with Bio and Microbial Agents in Middle Gujarat

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ABSTRACT

The study carried out on natural enemies of Gujarat hairy caterpillar, *Amsacta moorei* Butler at Gujarat Agricultural University, Anand Campus, Anand during 1982 to 1989 revealed that the activity of egg parasite, *Telenomus* Sp. near (*T. proditor* Nixon) and larval parasite, *Plaxorista laxa* Curr. was found during 4th week of June to 1st week of August and 4th week of June to 2nd week of August, respectively, whereas NPV incidence was occured during 4th week of June to 2nd week of August. Effect of meteorological factors on the activity of bio and microbial agents of *A. moorei* was also studied.

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INTRODUCTION

Gujarat hairy caterpillar, *Amsacta moorei* Butler (Arctiidae : Lepidoptera) commonly known as 'Katra' is a seasonal polyphagous pest found in a light soil area of middle and north Gujarat. Female moth lays yellowish white eggs in cluster mostly on the under surface of leaves of weeds and grasses on bunds of the field. The young larvae hatching out from such eggs usually remain in a group and feed on the foliage. The eggs and larvae of *A. moorei* are destroyed by their natural enermies. To have information on the activity of parasite and pathogen which are reducing the population of Gujarat hairy caterpillar in nature, study was carried out in the kharif during 1982 to 1989 at Gujarat Agricultural University, Anand Campus, Anand.

MATERIALS AND METHODS

Eggs and larvae of *A. moorei* were collected from various fields around Anand and reared in the laboratory to study the parasites and microbes activities during 1982 to 1989. Regular collections of the egg masses as well as various size of larvae were made from the different fields immediately after first good rain till their availability. Parasite emergence as well as disease incidence were recorded for each collection throughout the study.

RESULTS AND DISCUSSION

The study (Table 1) revealed that the activity of egg parasite *Telenomus* Sp. near (*T. proditor* Nixon) which is also parasitising the eggs of *Achaea janata* (Kamat *et al.* 1978,

TABLE 1

Field activity of bio-agents of *A. moorei* But. in different years.

Year	*Period month*	*Week*	*Parasitism (%)*		*Larval*	*Larval mortality (%)*
			Egg mass	*Egg*		
			T. proditor		*P. laxa*	*due to NPV*
1982	July	III	—	—	2.00	24.00
		IV	—	—	0.00	20.00
	August	I	—	—	1.85	44.17
		II	—	—	2.04	4.08
		Av.	—	—	1.71	36.24
1983	July	I	0.00	0.00	0.00	4.00
		II	3.51	3.23	0.00	12.00
		III	40.00	25.00	0.00	—
		Av.	5.56	4.09	0.00	10.40
1984	June	IV	14.87	3.43	0.00	88.88
	July	I	17.28	22.72	0.00	35.82
		II	96.55	86.81	0.00	18.46
		Av.	28.80	19.79	0.00	28.39
1985	July	III	0.00	0.00	0.00	15.79
		IV	3.33	3.83	0.00	40.71
	August	I	0.00	0.00	2.11	53.16
		Av.	1.01	0.72	0.87	44.81
1986	June	IV	1.49	0.35	—	—
	July	I	53.66	44.97	11.44	64.18
		II	—	—	0.00	58.71
		III	100.00	100.00	1.43	69.29
		IV	91.67	92.57	—	—
	August	I	78.26	85.56	—	—
		Av.	36.81	22.13	7.73	63.12
1987	July	I	0.00	0.00	—	—
		II	20.00	11.77	—	—
		III	25.00	23.79	3.55	61.84
		IV	—	—	6.68	50.21
		Av.	9.51	4.11	4.53	57.30

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1988	July	I	29.41	6.42	2.66	0.88
		II	100.00	96.77	3.52	1.76
		III	—	—	0.20	25.40
		IV	—	—	0.00	34.26
		Av.	60.66	46.38	1.00	19.36
1989	June	III	0.00	0.00	—	—
		IV	0.00	0.00	6.67	3.33
	July	I	100.00	95.29	3.51	7.66
		II	100.00	99.39	1.82	5.00
		III	100.00	100.00	2.72	15.45
		Av.	66.67	73.77	3.28	7.67

Phadke and Rao, 1978) was found during 4th week of June to 1st week of August. The maximum (66.67%) egg masses were parasitised in the year 1989 which was followed by 60.66, 36.81, 28.80, 9.51, 5.56 and 1.01 per cent during the year 1988, 1986, 1984, 1987, 1983 and 1985 respectively. Same trend was found in individual egg parasitism. The maximum (73.77%) eggs were parasitised in 1989 which was followed by 46.38, 22.13, 19.79, 4.11, 4.09 and 0.72 per cent during the year 1988, 1986, 1984, 1987, 1983 and 1985 respectively. Thus, *T. proditor* activity was found in middle Gujarat agro-climatic conditions during all the years of study. However, it's activity was high in July as compared to June and August.

The activity of larval parasite, *Plaxorista laxa* Curr. was observed during 4th week of June to 2nd week of August. the maximum (11.44%) parasitism was in the 1st week of July 1986 when there was no rain but early good rain in the 4th week of June may have enhanced the activity of larval parasite. In heavy (more than 100 mm) rain period no parasite activity was found. The per cent parasitism during 1986, 1987, 1989, 1982, 1988 and 1985 was 7.73, 4.53, 3.28, 1.71, 1.0 and 0.87 respectively. No activity was found in 1983 and 1984 may be due to more rain in the 1st week of July. The field collected medium size larvae (Table 2) were comparatively more (6.68%) parasitised than small (1.14%) and full grown larvae (1.13%).

The larval mortality due to microbial agent NPV (Table 1) was observed during 4th week of June to 2nd week of August. However maximum (63.12%) larval mortality due to NPV was during 1986 which was followed by 57.30, 44.81, 36.24, 28.39, 19.36, 10.40 and 7.67 per cent during 1987, 1985, 1982, 1984, 1988 and 1989 respectively. The larval mortality due to NPV (Table 2) was more (40.42%) of field collected medium size larvae as compared to small (31.62%) and full grown larvae (25.39%). Considerable larval mortality was observed in the 4th week of June as well as 1st and 2nd week of July eventhough in absence of rain. In fact high rain reduced the incidence of NPV in *A. moorei* during 1983, 1988 and 1989, whereas low rain in 1986 and 1987 enhanced the disease incidence.

TABLE 2

Suceptibility of different size larvae of *A. moorei* to *Plaxorista laxa* Curr. and NPV in field condition.

Collection on Year	Months	Fort-night	Size of larvae	No. of larvae observed	No (%) to P. laxa	Larval mortality due to NPV
1986	July	I	Small	122	0 (0.00)	119 (97.54)
			Medium	257	31(12.06)	185 (71.98)
			Full grown	167	2 (1.20)	32 (19.16)
		II	Medium	140	20(14.29)	97 (69.29)
1987	July	II	Small	100	0 (0.00)	94 (94.00)
			Medium	570	41 (7.19)	420 (73.68)
			Full grown	543	14 (2.58)	181 (33.33)
1988	July	I	Small	105	0 (0.00)	0. (0.00)
			Medium	245	15 (6.12)	2 (0.82)
			Full grown	158	0 (0.00)	4 (2.53)
		II	Small	80	0 (0.00)	1 (1.25)
			Medium	240	2 (0.83)	45 (18.75)
			Full grown	892	0 (0.00)	283 (31.72)
1989	June	II	Small	30	1 (3.33)	2 (6.67)
			Medium	30	3(10.00)	0 (0.00)
	July	I	Small	265	7 (2.64)	6 (2.26)
			Medium	480	19 (3.96)	44 (9.17)
			Full grown	245	5 (2.04)	20 (8.16)
		II	Full grown	110	3 (2.72)	17 (15.45)
1986 to 1989		II	Small	702	8 (1.14)	222 (31.62)
			Medium	1962	131 (6.68)	793 (40.42)
			Full grown	2115	24 (1.13)	537 (25.39)

The study on correlationship between occurance of egg and larval parasites and Nuclear polyhedrosis virus of *A. moorei* and meteorological factors (Table 3) revealed negative (r = -0.47) correlationship between egg parasite *T. Proditor* and maximum temperature, however no correlationship between larval parasite *P. laxa* and any of weather factors was observed during the study period. The positive correlationship between the incidence of NPV and maximum temperature (r = 0.41) whereas negative correlationship with relative humidity (r = -0.62), rainfall (r = -0.48) and rainy days (r = -0.48) was observed. Sharma and Yadav (1994) have similar observations for the correlationship between maximum temperature and relative humidity with predatory coccinelid.

TABLE 3

Correlation coefficient for natural enemies of *A. moorei* and meteorological factors.

Natural enemy	*Meteorological factors*	*Correlation coefficient (r)*
Egg parasite *Telenomus Proditor*	Maximum temperature	-0.47
Neuclear poly hedrosis virus (NPV)	Maximum temperature	0.41
	Relative humidity	-0.62
	Rainfall	-0.48
	Rainy days	-0.48

REFERENCES

Kamat, M. M., Bagal, S. R., Thobbi, V. V., Rao, V. G. and Phadke, C. H. 1978. Biological control of castor semi looper through the use of entomogenous fungus *Nomuraea rileyi*. *Indian J. of Botany.* 1(1-2) : 69-74.

Phadke, C. H. and Rao, V. G. 1978. Studies on the entomogenous fungus *Nomuraea rileyi* (Farlow) Samson I. *Curr. Sci.* 47(14) : 511-512.

Sharma, R. P. and Yadav, R. P. 1994. Population dynamics of bean aphid (*Aphis craccivora* Koch) and it's predatory coccinelid complex in relation to crop type (Lintil, Lanthyrus and Fababean) *J. Ent. Res.* 18(1) : 25-36.