with maize while yellow mosaic was high and por borer damage was low in pure crop of greengram.

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STUDIES ON *Humbertiella Ceylonica* SAUSSURE (DICTYOPTERA : MANTIDAE) WITH SPECIAL REFERENCE TO THE NUMBER OF OVARIOLES IN THE SEASONAL CYCLES

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ABSTRACT

The structure and number of ovarioles of adult female mantids *Humbertiella ceylonica* Saussure revealed that the position on the ovarioles changed during the developmental changes related to the oocyte maturity ; rainy and summer seasons favoured higher egg production, while body length and season had no correlation with the number of ovarioles.

KEY WORDS : Mantids, Ovarioles

The total number of ovarioles is significantly related to the body length of adult female in Acrididae (Phipps, 1949, 1950). Though the ovarioles number significantly varies from species to species in relation to their size, yet it is fairly stable for each species. There is little information on the number of ovarioles in mantids during different periods of the year. The present investigations were take up to observe the position, structure and the number of ovarioles in relation to the body length during different periods of the year.

MATERIALS AND METHODS

The adult female mantids *Humbertiella ceylonica* Saussure newly emerged and gravid were periodically collected from fields from

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June 1987 to May 1988 for the study. Measurements of the body were made after which they were dissected to study the number and structure of the ovarioles under microscope.

RESULTS AND DISCUSSION

In the newly emerged (1-2 days old) adult female mantid *H. ceylonica*, the ovaries lie ventral or ventro-lateral as well as posterior to the saccular region of crop. The ovarioles in the early stages were profusely ramified with fine network of tracheoles. As the oocytes matured or grew in size gradually, the position of the ovaries also correspondingly changed from lateral to dorsal side of the crop. The position of the ovary was similar both in the early and later stages. Three matured oocytes were found in each ovariole during July-November and rarely March-April. It also implies that the rainy and summer seasons are favourable for highest number of eggs production.

The minimum and maximum number of ovarioles observed in both the ovaries of a mantid were 21 and 30 having more in the left ovary than in the right of the same female mantid with 3 - 8 and 2 - 7 bunches respectively. The number of bunches in each ovary was neither related to the body size nor to the number of ovarioles in a ovary.

The body length of female mantids *H. ceylonica* had no relation to the number of ovarioles since mantids with 42 mm body length have comparatively lesser number of ovarioles where as the females of 33-38 mm body length had markedly larger number of ovarioles. The shorter bodied females, in all the seasons had apparently larger number of ovarioles than the longer bodied females. The number of ovarioles was not related to the seasonal changes. It shows that there are some intraspecific differences in each species of mantids with minimum and maximum limitations (Table). The unstable number of ovarioles may be due to the size of the adbomen as well as to the rise of the ovariole number (Waloff, 1954).

The asymmetrical arrangement of the internal organs of reproduction is one of the salient features in prying mantids.

Though the ovaries are bilaterally arranged in insects (Romoser, 1981), they were asymmetrical in *H. ceylonica*. The rate of asymmetry may be positively related to the size of the abdomen of female mantid. The smaller sized mantids have lesser variation in the ovarioles than the larger sized mantid. Though the total ovariole number between the right and left ovaries of the same is varied, yet the number in few specimens of *H. ceylonica* observed ramains the same in both the ovaries.

In connection with the environmental conditions, many of the ovarioles in the dissections of *H. ceylonica* appeared an empty tubule without oocytes especially during summer which might be due to the scarcity of prey. The present investigations in *H. ceylonica* corroborate the findings of Phipps (1949, 1950) who reported the small and empty ovarioles as a result of competition between the ovarioles for the available food.

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Table. Relation between size of body, abdomen and the ovariole number in H. ceylonica.

Body Length mm	Abdomen		No. of ovarioles		Total No. of ovarioles
	Length (mm)	Width (mm)	Left	Right	
42	30	10	23	25	48
40	19-20	9-10	24-25	21-24	45-49
38	17-19	9-11	22-27	24-27	51-52
37	18	9	30	28	58
36	15-20	7-10	20-29	22-27	42-54
35	15-20	8-11	21-30	21-27	42-57
34	14-15	7-10	24-29	22-30	46-56
33	14-16	8-10	22-28	22-29	45-56
30	14	8	27	27	54

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MORPHOLOGY AND SIGNIFICANCE OF THE SALIVARY RESERVOIR IN THE PRAYING MANTIDS (DICTYOPTERA : MANTIDAE)

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ABSTRACT

The size of the reservoir of salivary gland and length of the duct in praying mantis were directly related to the size and length of pro and meso thoracic segments respectively. Females had larger salivary gland enabling the insect to consume more pray than males.

KEY WORDS : Praying Mantids, Salivary gland, Morphology.

Little information is a available on the salivary reservoir of mantids except that of Mkhize and Kumar (1972, 1973) who mentioned the presence of the reservoir in mantids. In this paper the morphology of the salivary reservoir with the feeding rate is discussed.

MATERIALS AND METHODS

The experimental mantids *Euantissa pulchra* (Fabricius), *Elmantis trincomaliae* (Saussure), *Humbertiella ceylonica* Saussure and *Hierodula* sp were collected in Coimbatore and reared in the laboratory by providing house flies for their feeding. Dissections were done in insect saline solution for the display of the salivary reservoir. Measurements were made with an ocular micrometer under a compound microscope.

RESULTS AND DISCUSSION

As a rule the salivary reservoir in a mantid *E. pulchra* is a thin walled, transparent and posteriorly closed saccular structure found only in the left salivary gland. The proximal

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