

BIOLOGY OF *STATILIA MACULATA* (THUNBERG) (INSECTA: MANTODEA: MANTIDAE)

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ABSTRACT: The praying mantids (Order Mantodea, Class Insecta) are a group of over 2632 carnivorous polyneopteran insects distributed in tropical and subtropical habitats of the world, from the rainforest to the desert ground. The biology of *Statilia maculata* was studied in the present investigation. *Statilia maculata* shows ootheca (egg), nymph and adult stages in the life cycle. The incubation period of egg was about 18 days while nymphal period was about 75 days with seven moults. The average adult life span of male and female was 50 and 71 days respectively. The adult male and female lived for 60-70 and 65-80 days respectively.

KEY WORDS: Mantids, *Statilia maculata*, Mantodea, Mantidae, Biology.

INTRODUCTION

The praying mantids (Mantodea: Dictyoptera) are predatory insects distributed worldwide from the rainforest to the desert ground. There are 2632 valid species/subspecies of mantids belonging to 427 genera, assigned to 16 families¹. There are 169 species of mantids, distributed under 71 genera in India². Like their relatives, mantids undergo simple or incomplete metamorphosis. Praying mantids exhibit a remarkable range of behavioural and morphological adaptations associated with their habitat-specific predatory lifestyle. They have peculiar habits of prey-capture, camouflage and reproduction. Sexual cannibalism is not uncommon for female mantises like scorpions eating their mates after copulation³. Occasionally, the females decapitate the males just before

or during mating. They are known to lay eggs in complex ootheca⁴.

Statilia maculata (Thunberg) (Mantodea: Mantidae) commonly known as Asian jumping mantis is little known biologically. In China, it is used to ameliorate impotence, while in Japan it is used in mainly sugar soy sauce⁵.

The present paper deals with the biology of less known species of Mantidae.

MATERIALS AND METHODS

The adult specimens were handpicked and also collected by light trapping. Detailed studies of the specimens were carried out with a stereo zoom microscope and digital images were prepared using digital camera. Such images were then traced.

The biology of *S. maculata* was studied during January, 2016 to February, 2017 under laboratory conditions at 25 to 30°C and 75%-80% RH. Initially single

ootheca was collected along with the twig of plant material. The ootheca was then kept in rearing cage of size 20 cm x 20 cm x 30 cm and allowed to hatch. Newly hatched nymphs were segregated into 5 groups of 40-50 each and transferred in the different cages of same size and observations were made. Emerged early instars were fed with fruit fly, house fly, pieces of cockroaches and grasshoppers, mosquitoes and insect larvae. Third instar onwards, they were fed with the nymphs and adults of grasshoppers and crickets.

RESULTS AND DISCUSSION

In the present study, life cycle of the *S. maculata* was studied along with the various observations such as oviposition, hatching, nymphal development, food, mating, cannibalism and colour morphs. The developmental durations of the each stage of life cycle are also given.

The biology of the species was studied during winter of 2016 – 2017.

Ootheca (Plate A): Oothecae are little elongated, cream coloured when freshly laid, looks like a pyramid. Upon dry, it got hardened and turned brown.

Fecundity: 150-190 first instar nymphs were observed emerging from each ootheca.

(a) Incubation period: Incubation period is 18-20 at 25⁰c.

(b) Nymphal development: Developmental period ranged between 60 to 75 days during which it moults 7

times and attains adulthood. In few cases, it was observed that sixth instar nymph metamorphose to adult instead of seventh instar nymph that usually moult to adult.

(i) First instar nymph (Plate B): The newly hatched nymphs are bright green. They appear ant-like with abdomen curved upwards. The first instar lasted for 7 to 8 days.

(ii) Second instar nymph: The body colour changes to light brown after the first moult. The anterior margin of vertex has a horizontal dark brown band. This stage lasted for 6-7 days.

(iii) Third instar nymph: The margins of abdominal segments show a mixture of grey and black colour. The continuous white colour remains along mid-dorsal region of body. It moults to the fourth instar within 8-10 days.

(iv) Fourth instar nymph: The margins of abdominal segments turn from black to grey. The white stripe along mid-lateral region become faint. It moults to the fifth instar within 10-12 days.

(v) Fifth instar nymph: The wing-pads and lateral expansion of mesothorax and metathorax become clear. Light grey pigments are present laterally on abdominal segments and appear blackish at their junctions. The pronotum and forelegs become yellowish grey. This stage lasted for 10-11 days.

(vi) Sixth instar nymph: General body colour becomes lighter than in the previous instar. In forelegs, the inner side of femur has black patches at the base of spines, a patch also develops proximal to yellow claw groove, and internal spines are darker at apices. Lateral margins of wing pads are yellowish white. It moults to the adult within 12-14 days.

(vii) Seventh instar nymph: The antennae turn brown. Transverse bands on vertex and frons are light brown; postero-dorsal area is less black. The wing pads develop distinct veins and are darker laterally and pale brown dorsally. The carina is black and distinct. This stage lasted for 8-10 days after which it was transformed into adult stage.

(viii) Adult (Plate C, D): Body length (vertex to the abdominal tip) 3.9 cm for male and 5.0 cm for female (Fig. 1). The adult male and female lived for 60-70 and 65-80 days, respectively. Body is brownish, forewing with costal area opaque, discoidal area semi-opaque and smoky; brownish towards upper margin and tip. Vertex is with blackish markings on dorsal surface. Prosternum near coxal joint is with black patch. In forelegs, coxae have 6-7 triangular whitish spines and few spinules and also with internal black patch, femora with shining, pale yellow patch, often bordered anteriorly by a black line;

larger internal spines entirely black in some female whose wings are deep smoky. Costal area of forewings is opaque, discoidal area semiopaque in female, almost hyaline in male.

Food: Immediately after hatching, newly hatched nymphs were provided with diet of larva and aphids. Early 3 instars feed on *Drosophila* spp. Later instars and adults fed mainly on the diet of nymphs and adults of grasshopper and crickets.

Sexual cannibalism: Nymphal cannibalism is very common. Sexual cannibalism was also observed like other mantid species.

Colour morphs: No colour morph was found. Every adult specimen was blackish or dark brown in colour.

Distribution: India: Andaman Island, Andhra Pradesh, Arunachal Pradesh, Assam, Bihar, Himachal Pradesh, Kerala, Madhya Pradesh, Maharashtra, Meghalaya, Odisha, Punjab, Sikkim, Uttar Pradesh, West Bengal; **Elsewhere:** Annam, Borneo, China, Japan, Java, Korea, Labuan, Laos, Malaysia, Maluku Islands, Myanmar, Nepal, New Guinea, New Zealand, Pakistan, Palawan, Philippines, Sri Lanka, Sumatra, Thailand, Vietnam.

Remarks: Laboratory rearing produced offsprings whose hindwings were almost hyaline and forewings less smoky. Because of this *S. maculata* var.

hyalina of Giglio-Tos was synonymised with *S. maculata* (Thunberg) by Ehrmann⁶. Specimens with hindwings

both light and deep smoky occur sympatrically.

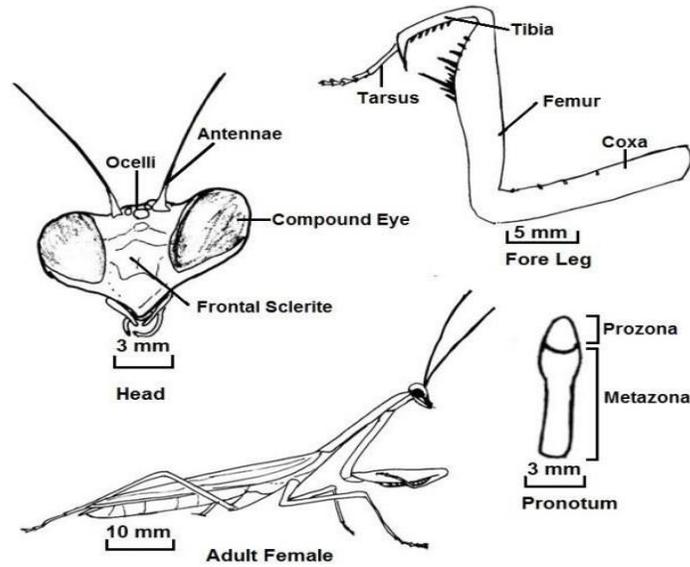


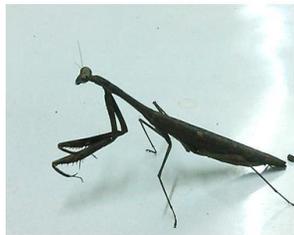
Fig. 1. *Statilia maculata* Thunberg, 1784



[A]



[B]



[C]



[D]

Plate [A-B]. Ootheca and Ootheca with first insatr of *Statilia maculata*. Plate [C-D]. Adult *Statilia maculata* (Thunberg, 1784) lateral view and ventral view.

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