

A NOTE ON THE BIOLOGY OF *XANTHOPIMPLA NANA NANA* SCHULZ. (HYMENOPTERA: ICHNEUMONIDAE), A PUPAL PARASITOID OF *OPISINA ARENOSELLA* WLK. ON COCONUT

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Abstract

The association of *Xanthopimpla nana nana* schulz with *Opisina arenosella* WLK is seasonal from August to January. Like *Xanthopimpla punctata* F., *X. nana nana* also selects breeding sites close to the sea shore, back waters, rivers, etc. Maximum parasitism by it was 31.6% during November, 1984. Egg period was 26-28 hours, larval period 5 to 9 days and pupal period 6 to 9 days. Females survived for 24 to 95 days. *X. nana nana* is difficult to rear in the laboratory during summer months. Short descriptions of the immature stages and their distinguishing features are also provided.

INTRODUCTION

Three species of *Xanthopimpla* viz. *X. punctata* F (Ayyar & Margabandu, 1934), *X. nana nana* Schulz and *Xanthopimpla* sp. (Pillai & Nair, 1983; 1987) were recorded as pupal parasitoids of the leaf eating caterpillar pest of coconut, *Opisina arenosella* WLK. (Lepidoptera: Oecophoridae). All the three species are found in the pest-infested tracts of Kollam District, Kerala. Unlike many other hymenopteran parasitoids, *X. punctata* and *X. nana nana* possess certain special characters in common. They appear in the coconut gardens only after the initial rains. *X. punctata* oviposits in the pupae of *O. arenosella* from July to December and *X. nana nana* from August to January. Both species select breeding sites close to the sea shore, back waters, streams, lakes, canals, rivers and paddy fields. The area will usually be having high

pest population (Pillai & Nair, 1989). Several adults of the species congregate in the selected site and try to dominate other pupal parasitoids for a short period. Both species breed in different selected locations without usually mixing up their populations. *X. punctata* and *X. nana nana* suppress even the sturdy parasitoid like *Brachymeria nosatoi* Habu, while *B. nephantidis* Gahan maintains its population without much damage in such sites. *X. punctata* and *X. nana nana* instead of uniformly dispersing to all the pest infested areas, confine themselves to small, pest enclaves here and there (Pillai & Nair, 1990). In this short paper, additional information on the life history, extent of parasitism, description of immature stages etc, of *X. nana nana* are furnished.

a. Distinguishing features

The distinguishing features of the

three species of *Xanthopimpla* parasite on *O. arenosella* were given by Pillai & Nair (1990) wherein the authors mention about a prominent round black punctation on the coxa of each of the metathoracic legs of both sexes of *Xanthopimpla* sp. This was erroneous and this particular punctation on the coxa is a distinguishing mark of *X. nana nana*.

Xanthopimpla sp. can be easily distinguished with the black pretarsus, smaller size, short ovipositor sheath (usually 1mm) and with the other features mentioned by Pillai & Nair (1990).

b. Mating

Pillai & Nair (1983) provided an account of its mating habits. On mounting the female, the male may also lock the abdomen of the female between the metathoracic

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legs with the claw to claw hold. In some cases, during mating, the male is found fanning the wings at high speed for a longer period than the time taken for rest and the process is repeated till termination of mating.

Life history

X. nana nana is difficult to rear in the laboratory. During summer months, mating and oviposition under laboratory conditions are difficult. Preoviposition period is often extended to 26 days in summer. *Anadevidia peponis* (F.) and *O. arenosella* pupae were used for rearing. Once the female parasitoid has commenced feeding on the host's haemolymph, the host feeding is continued for every 2 to 4 days throughout its life span. Large quantities of the host's haemolymph are consumed by each female parasitoid.

A culture of *X. nana nana* was maintained in the laboratory, using the glass chimney method adopted by Pillai & Nair (1983). The life cycle was completed in 12 to 16 days on *O. arenosella* and 13 to 21 days on *A. peponis*.

Incubation period : 26-28 hours
Larval period : 5-9 days
Pupal period : 6-9 days
Longevity of females : 24-95 days

Parasitism

X. nana nana is commonly found in Monroethuruthu, Mayyanad, Eravipuram and Panickerkadavu areas of Kollam district from August to January. During November and December, 1984, parasitism by it was 31.59% at

Mayyanad and 13.54% at Panickerkadavu. The details of parasitism are as follows:

	Nov.1984 Mayyanad	Dec.1984 Panickerkadavu
No. of pupae of <i>O. arenosella</i> collected	307	155
No. of pupae parasitised	161	87
Percent total parasitism	52.44 (161/307)	56.13 (87/155)
% parasitism by <i>X. nana nana</i>	31.59 (97/307)	13.54 (21/155)
(Total No. of adults of <i>X. nana nana</i> emerged = 118, Males = 64, Females = 54 Percentage of female progeny = 45.76)		
% parasitism by <i>Brachymeria nosatoi</i>	1.30 (4/307)	11.61 (18/155)
% parasitism by <i>B. nephantidis</i>	13.03 (40/307)	23.22 (36/155)
% parasitism by <i>B. excarinata</i> GAHAN	0.65 (2/307)	--
% parasitism by <i>B. lasus</i> (WALKER)	--	3.22 (5/155)
% parasitism by <i>Trichospilus pupivorus</i> FERR	4.88 (15/307)	3.22 (5/155)
% parasitism by <i>Antrocephalus hakonensis</i> ASHM	--	1.29 (2/155)
% parasitism by the hyperparasitoid <i>Eurytoma allotibialis</i> ASHM	0.97 (3/307)	--

e. Immature stages

Eggs: White, elongate, strongly curved, translucent and higher than those of *X. punctata* and *Xanthopimpla* sp. Anterior end three to four times broader than the posterior end.

First instar larva: Head conspicuous, light yellow, body segments distinct and tapering towards the posterior end, 2mm long.

Mature larva: Light brown, larger than the larvae of other two species of *Xanthopimpla*, up to 16mm long and 5mm broad, when reared in the pupae of *A. peponis*, head small and thoracic segments much

smaller than the abdominal segments.

Prepupa: Head 1.5mm long, thorax 2.5 to 3mm, abdomen 10mm long, yellowish, eyes brown, fat globules visible.

Pupa: Light yellow to yellow, markings and punctations begin to show up on the third day of pupation.

Male pupa: Markings on the thorax and four pairs of abdominal punctations on the third, fourth, fifth and sixth segments appears faintly, eyes and ocelli become black on the fourth day, the punctations on the first and sev-

enth abdominal segments appear. The second abdominal segment is without punctation. Wing pads become darker. Head and thorax 4mm long, abdomen 4.5 to 5mm long.

Female pupae: Markings on the thorax and punctations on the abdominal segments are broader than those of *Xanthopimpla* sp. The ovipositor sheath is broader than that of the other two species, but shorter than that of *X. punctata*. The ovipositor sheath is lightly curved upwards. The pair of punctation on the first abdominal segment is somewhat conical. The second segment is without punctation. The second pair of punctation on the third segment is broad and closer and the next two pairs of punctations are larger and the small round dot-like punctations on the sixth segment are placed wide apart. The next segment possesses a single largest punctation which covers the entire length of the segment. Towards the end, the dumbel-shaped marking could be seen in the centre.

Adults: The males of *Xanthopimpla* sp. and *X. nana nana* are similar in appearance. The prothoracic and mesothoracic legs of *X. nana nana* possess black patches and markings which are absent in *Xanthopimpla* sp. The second abdominal segment in *X. nana nana* may or may not have a pair of black dots and the last abdominal segment possesses an inverted 'V' shaped marking, which are also absent in the male of *Xanthopimpla* sp. The black round, punctation present on the coxa of each metathoracic leg of both sexes of *X. nana nana* is also absent in *Xanthopimpla* sp. Pretarsus and distal end of tarsus are black in

both sexes of *Xanthopimpla* sp., while the pretarsus in *X. nana nana* is brown. With this character alone, males of both the species can be easily distinguished. The abdominal punctations on the adult female are as described for the female pupae of *X. nana nana*. Females are 8.5 to 13mm long with an ovipositor sheath of 1-3mm.

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