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The New Record Of *Apentels Papiliones*(Hymenoptera: Braconidae) As A Bio-control Agents Of Lime Butterfly *Papilo demoles* (Lepidoptera: Papilionidae) From Warnanagar, Western Maharashtra.

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Abstract
Papilio demoles,a lepidopteran larva grows on the plant foliage, due to plantation of hybrid variety and more profitable farming methods in Maharashtra some of the minor insect pests become a major pest, to control pests farmers use pesticides unsystematically in various agro ecosystems of Western Maharashatra. Pesticides lead serious problems such as pest resistance, air pollution, water pollution; soil pollution etc. leads to several cancers asthma, infertility like harmful diseases. However, bio-control is very good alternative for chemical control. Parasitoid Apenteles papiliones is the first time reported as an effective parasitoid over Papilio demoles from Warana region of Western Maharashtra. It was observed that 70% larvae of P. demoleus from citrus orchard of Warana nursery were infested by A. papiliones. After Observation authors are concluded that A. papiliones can be used as effective bio-control agents of P. demoleus.
Key words: *Parasitoid, Warana, bio-control, Apenteles papiliones, Papilio demoleu*
Materials And Methods: *Larvae of P. Demoles collected from Wrana plant Nursury. Reared and screen them for parasitoid Apenteles papiliones. Infested larvae separated and kept in large size tes-tube, emerged parasitoids collected preserved by pinning method and some specimens stored in 70% alcohol for identification.*
Results: *First time observation made on Apenteles papiliones regarding biocontrol agents for P. demoles. A. papiliones have a good bio-control potential to control P. demoles. Host larvae of about second instars (fifth to six day old) were preferred to oviposit and within 12 to 16 days larvae of parasitoids grown inside the host larvae and after completion of larval growth they make pores in host larval body from innreside and come outside at a time and soon after within two days host larvae died. There is tremendous pressure of pesticides because of its indiscriminate use in various agro ecosystems of India. Pesticides lead serious problems such as pest resistance, air pollution, water pollution; soil pollution etc. leads to several asthama, cancer like dreadful diseases. However, bio-control is very good alternative for chemical control. Brconids (Hymenoptera: Broconidae) parasitic files are highly potential bi- control agents*
Conclusion*: The parasitic larva kills their hosts in the process of their development and they always act as entomophagus but the adults are free living and mostly vegetarian. A. pailiones can be used to control against the devastating defoliator P.demoles*
Key Words: *parasitod, Cancer, asthama,biocontrol agent ,P. demoles , A. papiliones*

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I. Introduction

Butterflies (Insecta: Lepidoptera) counts in the unique feature of the area. India host 1501 species of butterflies (Goanker, 1996); of which peninsular India host 350. Butterflies are good pollinator, attractive, indicator of environmental qualities. However, their larval forms grow on the plant foliage, due to more profitable farming methods in Maharashtra some of the minor pests become a major pests e.g. Cabbage butterfly (*Paris rapae*), Lime butterfly (*Papilio demoleu)* commonly called as lemon, citrus or checkered swallowtail, it is found throughout southern Asia (Corbet and Pendlebuty ,1992.) extending from Iran (Larsen, 1977.) and the middle east India and from Indo Pacific (Van-Wright and Jong, 2003) to New Guinea and Australia (Parson,1995;Barby, 2000.) It's principal host is the genus *citrus* (Rutaceae). In India this butterfly has been discovered as important citrus pest which rapidly expanding and it is known as plague of citrus grove not only India but Saudi Arabia and Iran Badawai, (1981). Narayanmma, *et al.*(2001) reported up to 83% defoliation of young grove trees in Andhra Pradesh. Thakare and Borale ,(1974) reported an outbreak sever enough to

skeletonized entire citrus garden. The larvae prefer young nursery plant grown 1to 2 feet height and completely defoliate nursery Yunes and Munir, (1972)

Studies of natural source mortality by nematodes (*Steinernrma* sp. Nematoda: Rhabditida: Steinernematdae) was reported by Singh, (1993b) in control of caterpillars of *P. demoleus* in India and Bidawi, (1981), who reported pupal mortality caused by application of *Bacillus infusion*. Thakare and Borale published a photograph of unidentified dipterans parasitoid, are suggested to regulate local population of *P. demoles*.

First time we have reported a parasitoid *Apenteles papiliones* efficiently parasitizing *P.demoleus* from Western Maharashtra. It was observed that 70% larvae of *P. demoleus* from citrus orchard of Warana nursery were infested by *P. demoles*

II. Materials And Methods

P. demoles larvae were collected from citrus orchard of Warana plant nursery and were reared, nourished daily with fresh leaves of citrus plant up to 20 days. Maintain this larval culture for parasitoid screening and observation were noted, photograph was taken, and infested larvae were kept in the large sized test tube to collect emerged parasitoid from it. Parasitoid preserved by pinning method and some of them kept in 70% alcohol for father identification.

III. Results And Discussion

First time observation made on *Apenteles papiliones* regarding bio-control agents for P. *demoles*. *A. papiliones* having a good bio-control potential to control P. *demoles*. A collected and reared larva of P. demoles was found infested by *A. papiliones*. Host larvae of about second instars (fifth to six day old) were preferred to oviposit and within 12 to 16 days larvae of parasitoids grown inside the host larvae and after completion of larval growth they make pores in host larval body from inner side and come out at a time. Large number of larvae prefer to come out from ventro- lateral sides of five to eight segments of abdomen of the host larva, those larvae emerged from dorsal sides of the host larva they rolled down under side of the host and then weave their cocoons in gregarious condition. It was also observed that isolated, solitary larvae of *A. papiliones* was failed to weave its cocoon. Host larvae live up to two days after emergence of parasitoid and then die. Parasitoid was identified by taking help of taxonomists Sathe et.al.

There is tremendous pressure of pesticides because of its indiscriminate use in various agro ecosystems of India. Pesticides lead serious problems such as pest resistance, air pollution, water pollution; soil pollution etc. leads to several asthma, cancer like dreadful diseases. However, bio-control is very good alternative for chemical control. Brconids (Hymenoptera: Broconidae) parasitic files are highly potential bi- control agents. The parasitoids is an intermediates term which inherits the qualities of predators of true parasite which has been used first by Reuter (1913) The parasitic larva kill their hosts in the process of their development and they always act as entomophagus but the adults are free living and mostly vegetarian. *A. pailiones* may be used to control against the devastating defoliator *P.demoles*

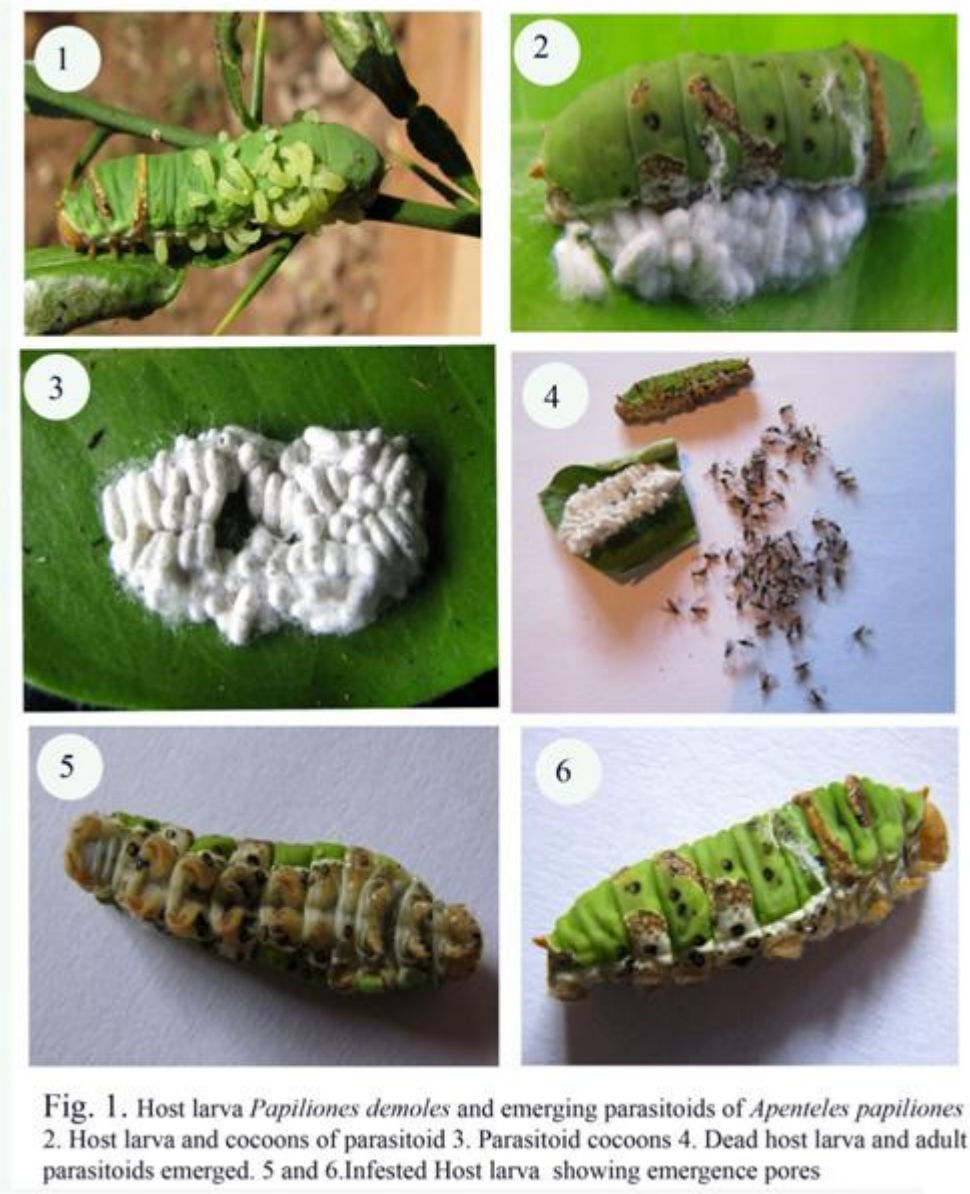

Fig. 1. Host larva *Papiliones demoles* and emerging parasitoids of *Apenteles papiliones* 2. Host larva and cocoons of parasitoid 3. Parasitoid cocoons 4. Dead host larva and adult parasitoids emerged. 5 and 6.Infested Host larva showing emergence pores

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