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A New Species of Phenocarpa Odontopetalis (Hymenoptera : Braconidae) from western ghat of India

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ABSTRACT

We present and described here a New species of Phenocarpa Odontopetalis sp.nov. (Hymenoptera : Braconidae) from western ghat of India. The affinities of the new species with the related species are discussed.
Keywords: Phenocarpa Odontopetalis Sp.Nov., Braconid, Western Ghat.

I. INTRODUCTION

Insect is the most diverse taxa on earth secured important place in human life. Some of its function are beneficial to human while some are hazardous. Insect are act as notorious pest causes heavy losses to human aspect. The taxonomic study of them provide much basic data essential for effective management of insect pest. Efforts are being made all over the world to combat insect pest through various technique. The protection of agriculture crops forest and human and his domestic animals from annoyance and damage by various kinds of pest remains a chronic problem. The problems of energy crises food deficiency timber drugs pollinator's parasite and predator ultimately depends on insect taxonomic exploration (Gupta 1964). Studies on insect taxonomy provide much of the basic data essential for effective management of insect fauna. So that harmful insect can be controlled and beneficial forms can be exploited for better management of mankind. Pest control is recognized as an acceptable and necessary part of modern agriculture.

Insects are the notorious pest cause heavy losses to human assets. The protection of agricultural crops , forest and man and his domestic animals from annoyance and damage by various kinds of pests remains a chronic problem. As we endeavor to improve production processes and to develop more effective and acceptable tactics for achieving this protection, we must give high priority to all potentially useful techniques for the control and management of insect.

Efforts are being made all over the world to combat insect pest through various techniques. Pest control recognized as the necessary of modern agriculture. Methods employ very greatly and tend to reflect compromises involving three determining factors: technological capabilities, economical risibility and social acceptability but these are subject to change with time. Whatever method is chosen, energy resources continue to dwindle under the impact of increasing population and it is inevitable that greater reliance must be placed upon renewable resources in pest management. One alternative is the use of a pest management method that uses the energy of the pests own biomass to fuel a self-perpetuating control system.

When insecticides, chemical agents particularly those of the general nature used, a broad spectrum of insect is destroyed, in addition to target insect. The efforts are made throughout the world to fight insect through different techniques are not so satisfactory. This situation forced scientist to search for new "Integrated Pest management" is the result of such efforts, which is practical, economic and protective for all crops and the environment. It includes the natural insecticides, juvenile hormones, attractants, repellant, sterile male technique, biocides of microbial origin , use of pathogens , predators and parasitoids as biocontrol agents.

The use of biocontrol agent for the control of pest has been an integral part of pest management strategy in crop production, forestry and in protection of man and animals. The important and unique advantages of the method well recognized; numerous treatises deals with accomplishment and methodologies. Also, there have been significant development in past decade. The implementation of new pest management tactics and concomitant changes in production method certainly required increased reliance on biological control methods. This appear to be new opportunities for the use of biological control agents based on developing research. With increased understanding of genetics, the population biology of biocontrol agents and of the factors that influence their behavior, the practical application of these methods becomes more complicated but potentially more useful. In addition, the use of biological control agents is inextricably interconnected with social economic and environmental factors that cannot be ignored. One of the solution to such a pest situation is the classical approach to biological control, i.e., the search for and introduction of exotic biotic agents.

Among different methods employed in integrated pest management, bicontrol method are more economic, practical and effective control of pests by the use of biocontrol have attracted scientist to exploit. The knowledge pertaining to taxonomy, biology, behavior and distribution of different species. The proper identification of the parasitoids is must so that the correct parasitoid will be introduced for effective control.

The order hymenoptera Arthropoda (Insecta) is one of the largest order insect contains more number of parasitic species than any other group of insects. Most of them are beneficial and economically important to agriculture and forestry either as parasitoid or predators of pests of crops.

The family Braconidae is one of the largest family of order hymenoptera. The family includes parasitic hymenopterous flies which beneficial to human beings since they play important role in biological control method. The family Braconidae contains about 10,000 species in the world so far known . the total number of braconid species is estimated to be 40,000 worldwide. More than 2000 species from North America and more than 1100 are known in the territory of USSR (Kurhade 1992). Our knowledge of the oriental Braconidae is extremely merge. Although many species have been described from time to time, We know only about tenth of the fauna occuruing here. There are no consolidated monograph to identify the species and no comprehensive volume of indian Braconidae except Bhat and Gupta (1977) dealing with subfamily Aganthidae from orient.

Braconids are parasitic on all the major orders of insect like Lepidoptera, Coleoptera , Diptera rarely Hymenoptera. Braconids are egg, egglarval and larval parasitoids and kill the host by feeding on host body fluid, spin their cocoon,Puppa and emerge as adults. Thus they destroy a large number of hosts of economic importance and constitute one of the major biological weapon.

Among the most renowned scientist from the world , who worked on the Braconidae are Nees (1834) , Dalla, Torre (1898), Ashmead (1889, 1890, 1898,1900, 1904, Schulterer (1833, 1889), Thomson (1953), Mathews (1970), Rao and Chalikwar (1975), Sharma and Chaterjee (1970), Gokulpure (1970), Odak and Dhamdhere (1970), Achterberg (1993), Bhat Shama and Gupta (1977), Bhat shama (1979), Mohd. Ishaq (1983), Kurhade and Nikam (1992, 1994).

The work on the Braconidae from central India had been submitted in past. On the account of all these aspects the taxonomic research on Braconid flies has exploited in the present study from Western Maharashtra, Agricultural part of India as these are actively involved in natural control of insects pests. The aim behind this investigation was to increase the knowledge of Braconid parasitoids (living weapon) which play a major role in controlling the noxious pests, ultimately results in increasing the yield of crops and other economic commodities.

II. METHOD AND MATERIAL

The Taxonomic identification in the present study is mainly carried out by the author from various district viz., Pune , Kolhapur and Ahamadnagar of Western Maharashtra during 1997-2001. Braconids were collected on grass and weeds , near the crop like sugarcane, Groundnut, sorghum, cotton, Vegetables like Brinjale, Potatoes. Maximum Collections were made

during rainy season by using Light traps and associated equipment's.

The collected specimens were Killed and preserved in 70% alcohol. The killed specimens were Pinned, dried and kept in insect store boxes. Antennae, wings and Hind legs were mounted on slides in Distrene plasticizer Xylene.

For the details of morphological peculiarities, the collected specimens were examined under the monocular and Binocular microscopes for taxonomic studies. Figures were drawn with help of binocular and monocular cameralucida. All the measurements recorded in Millimeter.

For the generic treatment work by the Marsh (1965, 1966), Bhat and Gupta (1977), Nixon (1938, 1939, 1943), Fischer (1978), Achtreberg (1976), were consulted and for the specific treatment 'Hymenopterorum catalogus' by Shenefelt (1969a, 1970, 1972, 1973a, 1973b, 1974, 1975) were followed.

The determination of the species of the genera studied have been made by using reliable keys to various genera by the Rao and and Chalikwar (1970), Rao (1961), Nixon (1943), Fischer (1978), Bhat and Gupta (1977), Shaw (1985) and Marsh (1966).

Keys to the Indian species have been made for some genera, those where not provided earlier and the new taxa have been determined accordingly. The terminologies used in the paper follows that of the Townes (1969). Some important taxonomic terms pertaining to the present study are expressed in figures.

III. RESULTS AND DISCUSSION

Phenocarpa Odontopetalis ,sp.nov

Female 3mm (Figure 1). Head 2x as broad as long, vertex smooth, shiny, polished, sparsely pubescent, interocellar space 0.4 times as long as ocellocular distance, ocelii at equidistance triangle; ocellar region raised, shiny with median depression. ; Frons slightly concave, anteriorly rugoso-reticulate, posteriorly smooth, shiny, polished, laterally weakly punctate, pubescent, face 1.7x as broad as long, slightly convex, medially triangularly elevated, punctate, sparsely pubescent; clypeus 0.5 times as long as wide, convex, weakly, shallowly punctate, elongately pubescent; malar space absent, mandible paddle like, 1.9x as long as wide basally, 2.2x as long as wide medially; tridentate, dentine petal like, weakly punctate, labial palp 3 segmented, eye nearly rounded,1.2x as long as wide temple broad, convex, smooth, polished. Occipital carina absent, antenna 2+25 segmented, scape 1.4x as long as wide apically, 2.5x as long as basically, 1.8x wide apically, bell shaped, sparsely pubescent; first penultimate segment 3.5x as long as wide, second segment 6.3x as long as wide basally, 5x as long as wide apically longer than the rest of flagellar segments.

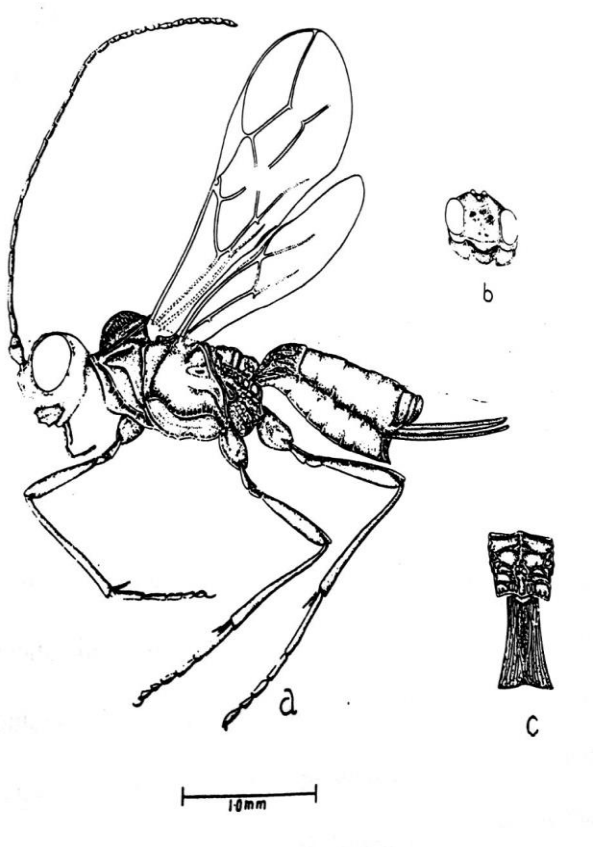

Figure 1. Phenocarpa Odontopetalis ,sp.nov (female)
a) Body profile **b)** head **c)** propedeum

Thorax 1.8x as long as wide , pronotol collar swollen, smooth, medially rugoso-reticular, laterally smooth, shiny, pronotum smooth, shiny polish, mesoscutum smooth, elongately pubescent, notauli distinct, complete prescutellar depression with one median carina, rest of the area rugoso-reticulate, scutellum shiny, smooth, metanotum smooth, metanotal sulcus crenulate; propedeum (figure 1c) with basal median carina ; first and second pleural area apically smooth, basally carinated, transverse apical carinae and lateral

longitudinal carinae distinct ; middle areola rugoso-reticulate; third pleural area rectangular, propleurum with posterior flange, marginally rugoso-reticulate, mesopleurum smooth,sparsely pubiscent, mesopleural furrow distinct, mesopleural suture distinct, mesopleural fovea deep, anterior corner of mesopleurum with broad groove.

Fore wing 3.9x times wide , stigma 5x as long as wide, costa 1.1x as long as metacarpus, 1.7xlong as stigma, first abscissa of radius 0.5 time long as width of stigma; second abscissa of radius 6.3x time long as first abscissa radius, third abscissa 1.6x longer than second abscissa , para stigma 2.5x as long as wide , three cubital cells present, first intercubitus 0.8 times long as first recurrent, second intercubitus interstitial; brachius as long as first recurrent ; nervulus slightly inclivous, whole wing covered with bristle, marginal bristles long.

Hind wing 5x as long as wide, subcostella 1.4 x as long as mediella, costella with eight long bristles, submediella 0.4 times long as mediella; basella nearly as long as submediella; radiella not reaching upto margin, nervellus as long as postnervellus, distad, inclivous, whole wing covered with bristles.

Hind coxa 1.5x long, wide, shiny, trochanter 2.7x as long, medially inverted, funnel shaped, sparsely pubescent; trochantellus 2x as along as wide 0.8 times longer as trochanter, femur 1.7x as wide apically as basally, slender, shiny smooth; tibia 1.4x as long as femur, slender, 2x wide apically and basally, sparsely pubescent, tibial spur 0.3 times long as basitarsus.

First abdominal tergite 1.9x long as wide basally, longitudinally striate, with mid-dorsal longitudinal carina; second targite 0.4 times as long as wide apically and 2.3x wide basally, ovipositor as long as ovipositor sheath, 0.7 times as long as abdomen, arrow headed, pointed; ovipositor sheath smooth, shiny with long pubescence.

Body blackish-brown, head, thorax, first abdominal tergite black; mandible, ventral side of leg yellowish brown; tip of the mandible, antenna, dorsal side of leg, second to last abdominal segments, ovipositors sheath, dark blackish brown; ovipositior brownish.

Male : Unknown
Holotype : female : India : western Maharashtra :Pune, 20 X 2000,
Light trap ; A. A. Shaikh Coll. Antenna, Wings and legs mounted On slides and labelled as above.
Paratypes 3 : two females : data same as holotype.

IV. CONCLUSION

In accordance with the key to the oriental species of Phaenocrpa by Papp (1967), new species, Phaenocarpa odontopatalis superficially resembles with the indian species Phaenocarpa nitida, Thomson in having; i) frons without median longitudinal carina, ii) face slightly convex, without median longitudinal carina, iii) mesocutum polished, pubescent, without median ridge, iv) notauli distinct, v) pronotum smooth, polished, pubescent, vi) first abdominal tergite striated. However, the new species , phaenocarpa odontopetalis differs from the same in having : i) malar space absent, ii) antenna 2+25 segmented iii) terminal segment 2.5x as long as wide iv) sulcus with single median transverse carina, v) propleurum with posterior flange, vi) mesopoleurum polished, smooth, anterior corner rugoso-reticulate, vii) metapleurum rugoso-reticulate and viii) propodeum carinated, rugoso-reticulate with median longitudinal carina.

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