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Survey of Pipunculidae (Diptera) around Indo Nepal border of Champaran district, Bihar

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Abstract :Big headed flies of great economic importance (biocontrol agents) parasites of Rhynchota (Jassidae and Fulgoridae) which are injurious to crops. These are very rare. All together 18 specimens were collected from Indo-Nepal border area. In which two species are the new ones. (*Eudorylas raniensis* sp. Nov. *Tomosvaryella genitalata* sp. nov.)

.Keywords: Biocontrol Agent, Pollinator, Economic importance, Endoparasite

INTRODUCTION

Pipunculides belongs to family Pipunculidae of the order Diptera with a world wide distribution.

Individual flies vary in body length from 1.5 mm and can be distinguished by their large spherical or hemispherical head which is extremely mobile and composed almost entirely of compound eyes.

These flies are therefore called “Big headed flies”

The adult feed on nectar and pollen grains and have considerable value as pollinators. These insects are very rare and exequitive hovers. They live generally in shade of herbs, shrubs, in grasses, garden on the non-windy sunny days in hilly places.

The life history is also interesting as they are endoparasite of various families of order Homptera including Cicadellidae, Delphacidae & fulgoridae. The eggs are laid by its gravid female piercing in the abdomen of the host. The head of the larval parasite fills the greater part of the abdomen of the later when the pipunculidae larva quits its host it usually escapes at the junction of Metathorax and abdomen and fall on the ground burring itself beneath the

soil or among rubbish etc, where they hide themselves and turn to smooth black Puparia which ultimately give rise to the adult after detachment of the plate of Puparium.

MATERIALS AND METHOD

Following materials were used for the collection and preservation of the specimens.

1. Sweeping Net
2. Bottle containing cotton soaked with chloroform (Killing bottle)
3. White Paper
4. Spreading board
5. Twiser
6. Specimen tubes

These flies are generally caught by sweeping randomly flowers, garden, grass field, herbs, shrubs in sun shine and non windy day.

Insects swept are put into the killing bottle along with the net for sometime. As soon as the insects were killed, they were removed from the killing bottle and all the swept insects were put on the white paper and if pipunculus was present then safely taken out with the help of fine twiser and put into the specimen bottle.

As these insects are very rare hardly 3-4 hours sweep may get 1-2, and sometimes none.

Pipunculus collected were pinned through, the right

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side above the middle of the thorax. The pinned insects are properly arranged in the insects box so their body parts such as antennae, legs, head, wings and genitalia can be properly studied. These were properly labelled. The insect boxes were kept in a dry place and examined periodically. Boxes were kept cleaned. Ordinary naphthalene balls or poisonous liquid (Kreozotte Q) was used as repellent in the insect boxes.

IMPORTANT TAXONOMIC CHARACTERS :-

A. Head - Head nearly globose and quite large formed almost completely of compound eyes, it is slightly smaller in female, but in male the eyes are more appromixate at the top. The shape of the head is variable, it is hemispherical in the genus *Chalarus* and almost spherical in other genera. The colour of the eyes are variable from red, brown, dark brown to black. Ocellar bristles are present in the subfamily chalarinae.

Antennae is composed of three segments. First two joints are very short 3rd more or less elongate, oval or rounded (*Pipunculus*) generally broad at the base, or rounded (*Varrallia*, *Chalarus*).

B. Thorax - Distinctly smaller than head. Dorsum is usually bare in *Pipunculus* or with strong bristles (in chalarinae) or with Microscopic pubescence as in *Tomosvaryella*.

C. Abdomen - Normally cylindrical longer than thorax generally more or less curved. 5 segmented in male, 6 segmented in female, genitalia in male large, conspicuous affording good specific characters or in female bulbous at base and pointed at the apex curved under the venter.

D. Legs - moderate in length varying in colour from pure yellow to pure black or intermediate. The trochanter is quite variable in shape and constitute an important taxonomic character. The tibia are gently curved with many rows of short bristles. All the tarsal segments posses many rows of long fine hairs. Tarsal claws are well developed. The spine like empodium and a pair of round lobbed large pulvilli fit under the terminal segment.

E. Wings - wings are very large and narrow generally longer than the body. They vary from brown to hyaline, however most species have only slight tinge. The sub costa and first longitudinal vein (R1) are of moderate length. The radial sector is two brached. The anterior branch (R2+3) designed as second longitudinal vein and the posterior or branch (R4+5), the third vein. The true position of R4 in not clearly understood whether it is fused with R3 or with

basal portion of R5. The cross veins are r-m (between R4+5 and M1+2), M-cu (between M3+4 & cu) and cross vein m (between M1+2 and M3+4). The fourth vein (M1+2) is divided into four sections. First section from base to branch of media, second from branch of media upto r-m cross vein, third section from r-m to m-cross vein, and fourth section from m-cross vein to wing margins. This vein of great taxonomic importance as the comparative length of 2nd and 3rd sections, which depends upon the position of r-m cross vein in relation to the discal cell, is a good diagenetic character. The presence or absence of an appendage on the last section of vein is an important generic character.

TAXONOMIC DESCRIPTION :

I. Eudorylas raniensis Sp. nov.

Female :- Body moderate sized, cylindrical, predominantly ash black.

Head Globose, as long as broad, slightly broader than the thorax. Light maroon shiny with a light black shade over the frons around antenna. Facets of the anterior portion are greatly enlarged compared to those in the posterior part of the eye. Both eyes separated by a narrow silvery black strip of 3 rows of enlarged eye facets. Ocelli - black with tinge of yellow spot at the apex. Occiput- narrow, silvery black, sparsly distributed brown minute hairs.

Antenna 1st-antennal segment is narrow black, 2nd antennal segment black broad making a cup shaped structure, bearing a part of bristles above and no bristle below 3rd antennal segment is acuminate. Colour yellowish brown at the base and yellow at the apex. Arista 2x to 3rd antennal segment.

Thorax Predominantly rough black with sparsly distributed minute brown hairs. Pro & Mesonotum - rough brownish black at the dorsal side and rough black at both lateral sides. Scutellum - narrow golden brown. Propleural fan absent. Humeri - brownish yellow. Halter stem - yellow. Head - yellowish brown.

Wing Hyaline with deep brown stigma filling the 3rd costal segment just slightly more than 4th section, r-m cross vein is situated near the middle of discal cell.

Legs :- Predominantly blackish brown. Femora are completely bare lacking ciliation on the dorsal surface except a single row of minute ciliation on the ventral surface sparsly present. Tibia with the adjacent rows of brown species present dorsally and ventrally having prominent base giving a minute spotted appearance to the tibia. Tarsi

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with many rows of short yellow setae extending their full length. Tarsal claw and pulvilli unusually large and well developed claws are entirely yellow except for the curved black apex.

Abdomen :- Moderate long cylindrical predominantly ash black brown. 1st tergum is silvery ash, 2nd and 3rd segment has silvery black base with semicircle brown shade. 4th & 5th tergum are predominantly brownish black. 5th tergum has a round silvery ash spot towards left basal portion, whereas 6th tergum is complete brown & rough narrow at the base, giving a triangular appearance. 1st abdominal segment bears two large and one small spine on both lateral sides of abdomen. Base of the ovipositor protrudes out in the form of a small half semi circle globose mass in dorsal view, ventrally the base of ovipositor globose, much hairy with white silvery hairs. Piercer more curved and fine blade like reaching up to the end of 5th abdominal segment. Base of the piercer is somewhat unique quadrant from.

Size of body - 3.4 mm Wings - 3.8 mm Specimen examined - Holotype, Hatauda (Shahid Park)

3000 ft.

Remarks :- This species comes near *Pipunculus (Eudorvlas?) luteolus* sp. nov. and *Pip (Eud) totoflavus* sp. nov. described by D. Elmo hardy in having the shape of the head and nature of distribution of facets of eyes, wing venation shape and colour of the thorax, colour and nature of ciliation over the pieces of the legs, tarsal claw and pulvilli but differ in shape of 3rd antennal segment, colour

& shape of the abdomen, shape of ovipositor having quadrant handle of the piercer and curve blade and presence of r-m cross vein near the middle of discal cell.

2. *Tomosvaryella genitalata* sp. nov. :- Male :- A predominantly subshining black hairy species. Head :- Globose head, slightly broader than thorax compound eyes jointed on the frons for a very rows of eyes facets. Face silvery brown frons silvery grey. Occiput shining black with light brown pollinose over it.

Antenna :- 1st segment narrow black. 2nd segment brown black with a pair of bristles above and 3 below. Arista black twice as long as antenna.

Thorax Metallic black in ground color, grey on the sides.

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