



INTERNATIONAL JOURNAL OF PHARMACEUTICAL RESEARCH AND BIO-SCIENCE

TAXONOMICAL STUDIES ON THE FAMILY HYDROPHILIDAE (COLEOPTERA: POLYPHAGA) FROM KUMAON, GARHWAL AND AGRA REGION WITH SPECIAL REFERENCE TO THE EXTERNAL GENITAL ORGANS

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Accepted Date: 31/12/2017; Published Date: 27/02/2018

Abstract: In this study the aquatic Coleoptera species collected from the Kumaon, Garhwal and Agra region province in 1990 were evaluated. Over all 3 genera and 4 species concerning the super family Hydrophiloidea (Coleoptera: Hydrophilidae) were detected in the area.

Keywords: Moly Aquatic and terrestrial beetle's systematic account and taxonomic nomenclature, polyphaga.



PAPER-QR CODE

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Access Online On:

www.ijprbs.com

How to Cite This Article:

Shiv Kumar Saroj, IJPRBS, 2018; Volume 7(1): 27-35

INTRODUCTION

The water scavenger beetles (family: Hydrophilidae) are the largest group of the super family Hydrophiloidea, comprising about 2500 Known species. The family among Entomologists especially due to its aquatic representative, which are often abundant in most kinds of stagness waters, but also commonly inhabit streams, rivers and seepage habitats. Besides these species, the family contains terrestrial taxa that inhabit mostly leaf litter and other kinds of decaying organic material. Within the Palaearctic region, most terrestrial species inhabit experiments of various herbivorous or omnivorous mammals (e.g. cows, goats, deer, bears, etc). Most aquatic species are classified in the subfamily Hydrophilinae and the most terrestrial ones in the subfamily Spheridinae, but there are many exceptions in both subfamilies. Adult beetles are mostly saprophagous, feeding on different kinds of decaying organic matter, whereas larvae are predaceous preying on various invertebrates.

MATERIAL AND METHOD

Family Hydrophilidae which include water scavenger's beetles these are found in ponds, Lakes, Streams, rivers. A few species are known to be predacious on insect's water snails and probably on other aquatic animals. The land forms are mostly small and live along water in damp, marshy places, under the wet bark of trees and plant debris, many rotting cacti, dung and among fungi.

Process of collection

Hydrophilid beetles were collected by using Mechanical method and mechanical traps.

Mechanical method

(1) Hand collection of insects:

Hand net are usefully employed against the flying insects. Hand picking of large sized immature or mature stage of insects is the most ancient method. The regular hand picking from the paddy crops, under the plant debris and wet bark of trees.

(2) Hand Net

They may be caught very easily during the migration.

Mechanical traps

Many injurious traps have been made to catch insects as follows:

Light traps

Light traps are generally used against those insects which are attracted towards light. For this purpose a strong light may be placed or hanged in the field above a container having kerosinised water. A large number of insects attracted on the light will be killed in the kerosinised water. These beetles were collected easily from this traps.

Methods of preservation

The insects were collected by author and kept immediately with Nephthalene tab, Paradichloro benzene, Sprite, 4% or 20% or 70% Alcohol. all substances which are found to be a good preservatives. After determinating the Hydrophilid beetles were pinned and labeled as usually kept in the Entomological boxes.

Taxonomy

Family- Hydrophidae

Sub-family- Hydrophilini and Berosini

Key to genera *Regimbertia* (Fabricus) and *Globaria* (Sharp)

1(2) body convex, elongate and compressed on sides. Elytra everywhere striate punctate and pubescent. Metasternum with a simple carina along the middle.ventral segments crenate on their posterior margin.....***Regimbertia***

2(1) body also very conex but globular; of a short and broad shape. Elytra glabrous with anteriorly only 2....4 short and oblique series of larger punctures on the sides.Metasternum highly carinate along the middle , the carina deeply excised in its median part; it looks as if two short carinae were placed on a line , one before the other. Ventral sutures as deep gape separating the segments***Globaria***

Key to species *Berosus indicus* and *Berosus pulchellus*.

1(2) Elytra with apical spine, pronotum with black patch..... ***indicus***

2(1) Elytra without apical spine, pronotum with black patch.....***pulchellus***

Berosus indicus (Motschulsky)

DIAGNOSTIC CHARACTERS

Elongate brown to yellowish and punctate. Head – brownish with anterior porton yellowish, markedly deflexed often with a transverse groove, punctation dense, larger on vertex and eyes

prominent and protruberent , antennae 9 segmented (6+3) and yellowish prothorax brownish yellow, not continues with elytra in outline and wing large , dense and prominent punctures, specially on disc of pronotum scutellum –a long triangular and punctate elytra usually highly patterned, brownish yellow narrowed posteriorly and with ten rows of large and dark punctures with prominent , epipleural Angle extended into strong spine legs with middle and hind tibiae fringed on inner side with long swimming hairs 1st segment of tarsi longer than others, ventral surface dark brown and punctate (Plate No. –I).

Genitalia

Phallobase almost conical, base broadly rounded, parameres slender, uniformly thick apices bluntly rounded aedeagus less, conical, without any apical process.

Distribution

Pauri, Dehradun (Garhwal region) UK.

Material Examined

1 male, 1 female Dehradun (UK.) 28.VII. 1992, Coll.Saroj S.K.

Remarks

These littoral species are very strong swimmers with thick long hairs on legs and able to rise forcefully enough to obtain air, they are also climbers and diver in habit and able to dive from surface. They are fairly common in blackish water and less so in the other two type of water.

Berosus pulchellus (Orchymont)

DIAGNOSTIC CHARACTERS

Elongated, brown to light gray colour, heavily punctured head well developed, with prominent bulging eyes, light dark in colour. Antennae 9 segmented, the apical segment very broad and well developed while the rest of the segment small, less developed, small and fine setae present. Prothorax rectangular, light yellow, heavily punctured, scutellum small and triangular elytra boat shaped, light gray in colour with many parallel long strips, each strips heavily punctured. Legs simple, femur slender, broad at the base, tibia shorter than femur, cylindrical covered with fine small setae except the two setae which are well developed and spine like. The tarsus 4 segmented, the 1st segment larger than the other segment, the last segment bear two curved claws ventral surface – light gray in colour (Plate No.-II).

Size

3.2 mm. in length

Genitalia

The genitalia are very well developed consisting a well-developed oval phallobase and two well developed elongated parameres as long as the aedeagus. The aedeagus located between the paramere cylindrical running up to the apices of the parameres.

Distribution

Bhimtal, Saat Tal, Kumaon region (UK) and Etah (UP)

Material Examined

8 Male Bhimtal, saat tal kumaon region(UK) and District Etah (UP.) 24. Vill. 1992.Coll. Saroj, S.K

Remarks

These beetles were collected in the ponds. The habitate is similar to that of *Berosus indicus* But differs elytra with apical spine pronotum without black patches.

Regimbertia attenuata (fab.)

DIAGNOSTIC CHARACTERS

Strongly convex, elongate, compressed on side, uniform deep and shining black and punctate. head small, rounded anteriorly and puncturation dense and distinct and eyes large, convex and eyes large, convex and prominent , antenna 8 segmented (5+3) prothorax – narrowly applied within the emargination of the anterior side of elytra and punctuation on pronotum dense. Scutellum triangular with punctuate. Elytra – shortly narrowed posteriorly, striate punctuate and pubescent, intermediate puncture slightly smaller on rows legs- simple with spines and swimming hairs, middle and hind tibiae with long swimming hairs on inner side. 1st tarsal segment short, last segment bears a pairs of curved claws. Ventral surface- black and pubescent (Plate No.-III).

Size

7.7mm. in length.

Genitalia

Phallobase broad, conical narrow Proximally and attached with hooks, some what stout, pointed At the apex, aedeagus long, slender, apically with nipple like process.

Distribution

Naukuchiyan Jheel, Ranikhet (Kumaon) UK. District Eta (UP).

Material Examined

2 Male Nanital, Naukuchiyan jheel (Kumaon region) UK. 18. Vill. 1992. Coll. Saroj, S.K.

Remarks

These beetles were collected from Decaying fungi on the flotting surface of water. These Locality are partially shaded by marginal vegetation. The Soil is muddy and at places sandy Grawal.

Globaria leachi (Hope)

DIAGNOSTIC CHARACTERS

Body short, dark black, rounded, smooth Shiny, with punctures on the dorsal and lateral sides. Head Well developed, narrow at the apex and broad at the base ,Heavely punctured, eyes prominent, rounded , light yellow .Antennae curved with 8 segmented, the proximal segment long, While distal 3 segments rounded, less hairy . Prothorax -Broad well developed, heavely punctured, with median suture, Meso-thorax, meta-thorax and abdomen covered with elytra, scutellum small, triangular. Elytra dark black, oval and Convex at the dorsal side. Legs well developed with broad Femur and narrow tibia which is very much pointed at the Proximal end side, broad at the distal end heavely furnished With long setae, all the setae are nearly equal in size Except the two setae which are well developed and spine like,Tarsus 5 segmented 1st segment long and broad while last 3 Segments short and narrow covered with short setae, last Segment of the tarsus bears two curved dark black claws (Plate No.-IV).

Size

4 mm. in length

Genitalia

The phallobase well developed broad in the Middle and some what narrower at two ends. The parameres Short long broad at the base narrow at the apex. Aedeagus Short, long broad in the middle and rounded at the apex.

Distribution

Haldwani, w. Almora. Ranikhet (Kumaon region) UK.

Material Examined

3 Male , Haldwani, w. Almora, Ranikhet (Kumaon region) UK. 14, 1. 1990. Coll. Saroj, S.K.

Remarks

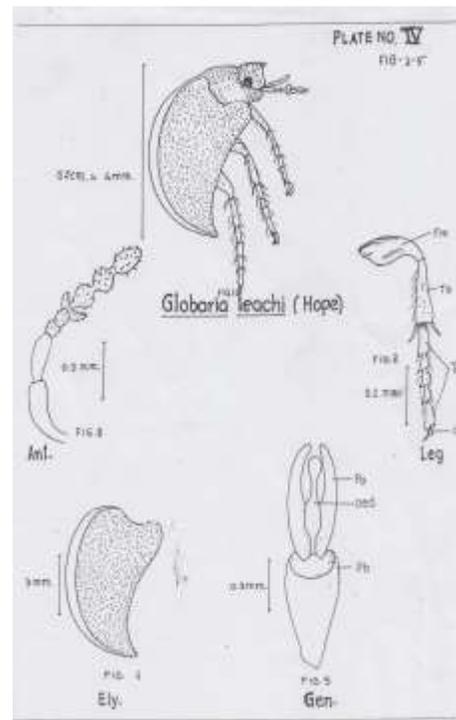
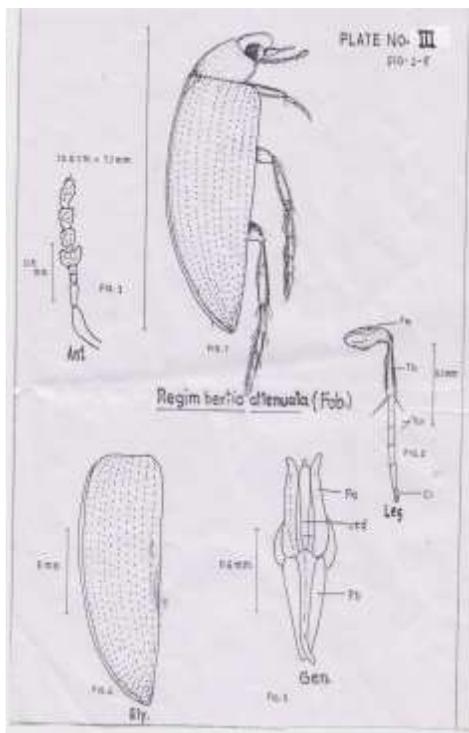
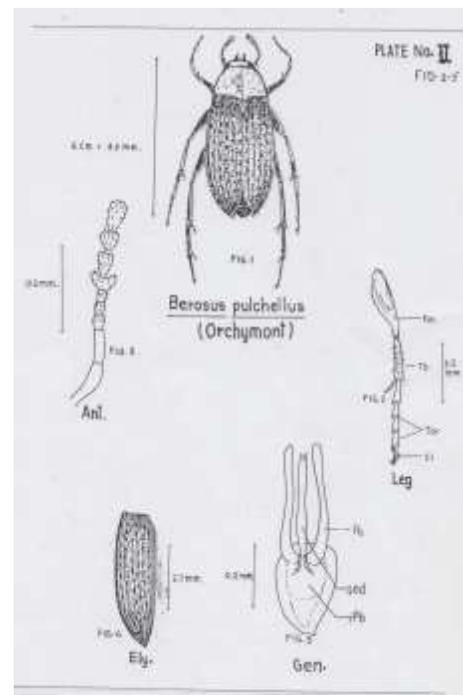
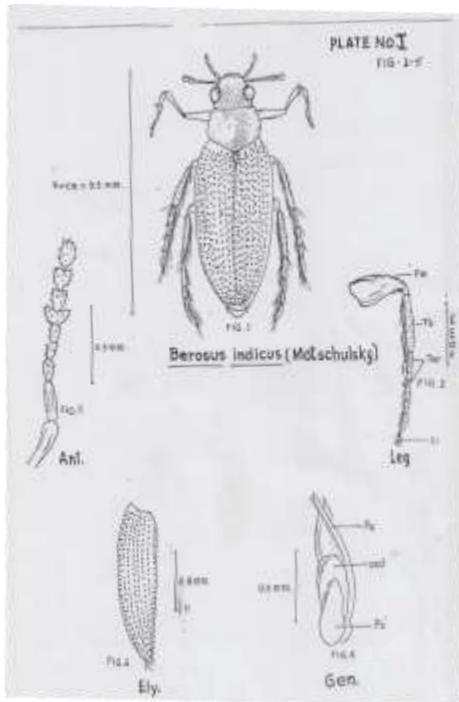
This species is known in the terrestrial Forms. in the present survey these beetles have been Collected from mercury tube light and plants debris.

DISCUSSION

The present account deals with 4 species belonging to 3 genera collected from various districts of Uttar Pradesh; specially Kumaon, Garhwal and Agra region. These Beetles are widely distributed thought-out the state. The present investigation is mainly based on taxonomy of Hydrophilid beetles with special reference to their genitalia. The previous classifications of these beetles were based on the experimental genetal characters like colour marking, wings venation, number of segment of antennae, shape of elytra etc. But in recent investigations, it is found that beside the above taxonomical characters the very important taxonomical characters are the external genetal organs which are neglected so far to be a very important and non changeable characters on which the correct key for the identification can be made.

ACKNOWLEDGEMENT

The author is thankful to the Dr. P.K Singh, Dean, Department of (Ag.) Entomology R.B.S College Agra for kind help in preparation of this research paper. The helpful cooperation rendered by Dr. Lalit Mohan, Assistant Professor, Department of Zoology, Dayalbagh Educational Institute (Deemed University), Agra.



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