Research Article

Three New Records of Genus *Ptochus* Schoenherr, 1826 (Coleoptera: Curculionidae: Entiminae) from Pakistan

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Abstract | In the present work entimind weevils, an ignored group of class Insecta in Pakistan was explored. For this, comprehensive surveys were undertaken in Pothohar plateau of Punjab province. Results revealed three new to country records viz. *Ptochus assamensis, P. ovulum* and *P. limbatus*. The species were recorded from walnut (*Juglans regia*) trees and Khabbal Grass (*Cyanodon dactylon),* which highlight their importance. Keeping in view topographic gradients, ecological complex in Pothohar plateau and pest status of curculionid weevils, further surveys are suggested to unveil more important records from the area.

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Introduction

Weevils belong to super family Curculionoidea of order Coleoptera (Zarazaga and Lyal, 1999). Most curculionids, are pests of fruits, seeds and leaves of crops and grains (Bhatti *et al*., 2018). Weevils attack almost each plant part and nearly every plant taxon (Anderson, 1995). Family Curculionidae (Zarazaga and Lyal, 1999) has a worldwide record of 62000 described species spread under 17 subfamilies (Bhatti *et al*., 2018) and 6000 genera (Tara *et al*., 2010; Marvaldi and Lanteri, 2005; Hammond, 1992; Spangler, 1982). Out of 17 subfamilies, Entiminae is broad nosed weevils distributed throughout the world particularly in the tropics with 55 tribes, 1340 genera (Nikolai *et al*., 2006) and 12,000 species (Zarazaga and Lyal, 1999). Many of these Entimines are important leaf feeders in their adult stage and root or shoot feeders in their larval stage. The genera namely *Ptochus*, *Blosyrodes*, *Blosyrus*, *Cratopus*, *Cyrtozemia*, *Dermatoxenus*, *Drepanoderes*, *Geotragus*, *Lepidospyris*, *Leptomias*, *Pachynotus*, *Phacephorus* and *Atmetonychus* are taxonomically important in India and the adjacent countries, especially Nepal, Bangladesh, Pakistan, Myanmar and Sri Lanka (Mahendiran, 2009).

Genus *Ptochus* is described by Schoenherr (1826) under broad group on which Gonatoceri and Marshall (1916) included under group Otiorrhynchides of the subfamily Otiorrhynchinae under the division Adelognathi. However, Thompson (1992) demoted Otiorrhynchinae to a tribe of Entiminae. Zarazaga and Lyal (1999) included under sub-tribe Myllocerina and tribe Cyphicerini of subfamily Entiminae. *Ptochus* was first described by Schoenherr (1826). It is well distributed in Oriental and European regions with

79 species worldwide, Russia (twelve species), China (six species), Greece, Azerbaijan (five species each), Mongolia, Aremenia, Kazakhstan, Turkey, (three species each), Congo, Iran, Italy, Central Asia (two species each) and West Africa, Afghanistan, Croatia, Japan, Senegal, Kyrgyzstan and Serbia (one species each) are other regions (Mahendiran, 2009). Among neighboring countries to Pakistan, 22 species were recorded in India (Marshall, 1916), three species from Sri Lanka and one species each from Nepal and Myanmar (Mahendiran, 2009). However, four species under genus *Ptochus* are known to be recorded in Pakistan (Kazi *et al*., 2017). Being an agricultural country and in view of reported geographic range, *Ptochus* complex in Pakistan can easily be expected. In view of this, a comprehensive survey was conducted in various hilly localities in Potohar region to record weevil fauna.

Materials and Methods

Surveys were carried out during 2015-2017 to record adults of weevils in Himalayan foothills of Pakistan. Specimens were collected through hand picking, beating method and through sweep net from different localities of district Rawalpindi and district Islamabad. Ethyl acetate was used for killing collected specimens. Dead specimens were kept in separate vials. Information regarding locality, date of collection, and collector's name was written on vialusing lead pencil. Collected specimens were identified following Marshall (1916). For updated status of subfamily, Zarazaga and Lyal (1999) were followed and subfamily characterization had been taken through Thompson (1992). General morphological characters were examined using Olympus stereoscope, SZ2-ILST.

Measurements of different body parts i.e., rostrum, elytra, antenna, legs, abdomen etc. were taken through divider and scale method. Coordinates and ecological data for the surveyed localities were recorded through GARMIN GPS and Metrological department respectively. GIS map for positive localities was developed using Arc GIS 10.5 software. Host plants were identified at National Herbarium Program (NHP) at National Agricultural Research Center (NARC) Islamabad. Identified specimens were kept at National Insect Museum for future reference and study.

Results and Discussion

Comprehensive surveys were undertaken during active season between 2015-2017 to explore adult weevils from Himalayan foothills of Pakistan which revealed three new records for Pakistan. A total of 40 specimens were recorded from two host plants (Walnut tree and Khabal grass) and four different localities of district Islamabad and Rawalpindi. Details for each recorded species are discussed below in Figures 1, 2 and 3.

Figure 1: *Dorsal view of Ptochus assamensis ventral view of Ptochus assamensis.*

Figure 2: *Dorsal view of Ptochus ovulum ventral view of Ptochus ovulum.*

Figure 3: *Lateral view of Ptochus limbatus dorsal view of Ptochus limbatus.*

Ptochus assamensis Marshall, 1916

Taxonomic description: Body black, with grey scales. Head wide; eyes located laterally, small, curved; forehead with impressed parallel stripes. Rostrum equally long and wide, apically dilated and stoutly conical from base to middle, upper surface shallowly impressed and tri-carinate with finely impressed parallel lines at base. Antennae pitchy black; funicle with basal two segments equal in length, segments 3-7 subequal and slightly longer than wide. Prothorax wider than long, sides markedly rounded, maximally broad medially with equal width at base and apex. Pronotum showing reduced central carina with irregular small rounded pits hidden by scales. Scutellum invisible. Elytra oval shaped, sub-truncate at base, maximally broad medially, with deeply punctate striae.

Body measurement: Length: 7.5-8 mm; Width: 2-2.5 mm.

Differential characters: Recorded specimen resembled with published taxonomic description of Marshall (1916) except hind tibia having two claws which are free; Scape of antenna touches the prothorax margin and Venter with segment 1, 2 equally in size and segment 2 also longer than 3+4.

Host plant: Walnut (*Juglans regia*) tree.

Earlier records for Pakistan: Nil.

Remarks: This species has been recorded first time from country.

Distribution: India, South Asia (Marshall, 1916; Mahendiran, 2009).

Ptochus ovulum Marshall, 1916

Taxonomic description: General color black, with uniform pale scales at dorsum and ventrum. Head with impressed parallel line, central furrow visible at forehead, position of eyes sub-dorsal, nearly circular and moderately convex. Rostrum equally long and broad, sharply pointed from base to middle and dilated apically, upper surface elevated shallowly having visible carina showing small pits. Antennae dark ferruginous; funicle with joint 1 almost double in size of segment 2nd, basal joints 3-7 longer with elongate club. Prothorax oblong, sides particularly rounded, maximally broad at middle and equal width of apex and base together. Notum contains irregular small visible rounded. Scutellum visible. Elytra ovate, sub-truncate at base, broadest at middle and elytral interval consisting short depressed stiff hairs.

Body measurement: Length: 6.5-7 mm; Width: 2-2.5 mm

Differential characters: Recorded specimen tally with published taxonomic description of Marshall (1916) excludinghind tibia having two claws which are free and Venter with segment 1, 2 equally in size and segment 2 also longer than 3+4.

Host plant: Khabbal Grass (*Cynodon dactylon*).

Earlier records for Pakistan: Nil.

Remarks: This species is recorded first time from Pakistan.

Distribution: India, South Asia (Marshall, 1916; Mahendiran, 2009).

Ptochus limbatus Marshall, 1916

Taxonomic description: Body reddish brown with dorsum having brown scales densely and ventrally located with uniform greenish-grey scales. Head having well defined lateral lines; eyes large and convex located sub-lateral. Rostrum oblong, step by step pointed from base to middle and apical side clearly dilated with three central carina along scrobes. Antennae ferruginous; funicle with joint 1st longer than joint 2nd and joints 3rd while joint 4th subequal and longer than rest with elongate club. Prothorax equally oblong, sides poorly rounded, wider medially. Scutellum distinct, clothed with green scales. Elytra with at ends equally narrow in male and wider in female, ending abruptly toward base, maximally broad at middle, striae contains small rounded deeply pits, fine striae appearance.

Body measurement: Length: 7.5-8 mm; Width: 2-2.5 mm

Differential character: Recorded specimen has resemblance with published taxonomic description of Marshall (1916) and with these additional features i.e. Prothorax having long seta; funicle segment 3rd slightly longer segment 4th and segment 7th also longer

than segments 5th and segment 6th together.

Remarks: The taxonomic description of Marshall not provided any information regarding leg and ventral positioning. Following features, hind tibia having two claws which are free and venter with segment 1st longer than segment 2nd and segment 2nd also longer than segment 3rd and segment 4th are additional.

Host plant: Walnut tree (*Juglans regia*).

Earlier records for Pakistan: Nil,

Remarks: This species is recorded first time from Pakistan

Distribution: From India, south Asia (Marshall, 1916).

Data for distribution of each recorded species and ecology of visited site is given in Table 1.

Details distribution for *P. assamensis, P. ovulum and P. imbatus* in Pothohar region of Pakistan are provided in Figure 4.

Present study was undertaken with an objective to explore weevil fauna of sub-Himalaya with special emphasis on genus *Ptochus*. Genus *Ptochus*is an important genus that includes species which acts as pests of a number of crops. This genus has a lot of economic importance which reveals that it is feeding not only on crops (Ding *et al*., 2000; Varma and Tandan, 1996; Zhou and Zhou, 1989; Butani and Jotwani, 1984; Nayar *et al*., 1976) but on plants as serious pest of roses, many greenhouse plants, as well as citrus and other fruit trees (Teriplehorn and Johnson, 2005). Radha *et al*. (1970) observed *Ptochus ovulum*as feeding on the medicinal plant *Coleus aromaticus*. This genus wasalso reported feeding on the Parthenium by Kumar *et al*. (1979). *Ptochus* sp. was recorded as a pest of medicinal plant *Gloriosasuperba* from Bangalore (Hanumantha and Rajagopal, 1995a). In Pakistan, Kazi *et al*. (2017) reported four species under genus *Ptochus (P. crinitus, P. noxius, P. percussus,* and *P. afflicuts)* which had been documented based on fauna of British India (Marshall, 1916). However, there is no information about host record. In present study, two out of three species, namely *Ptochusasamensis* and *P. limbatus* were recorded from walnut tree (*Juglans regia*) and one species namely *P. ovulum* feed on Khabbal grass (*Cynodon dactylon)* but its further systematic study in relation to host range should be carried out in future in theses area . If we investigate the universal distribution of these three species of genus *Ptochus*, these are Oriental species documented from India and South Asia (Marshall, 1916). With the inclusion of three *Ptochus* species through present work, total number of reported species under genus *Ptochus* reaches to seven.

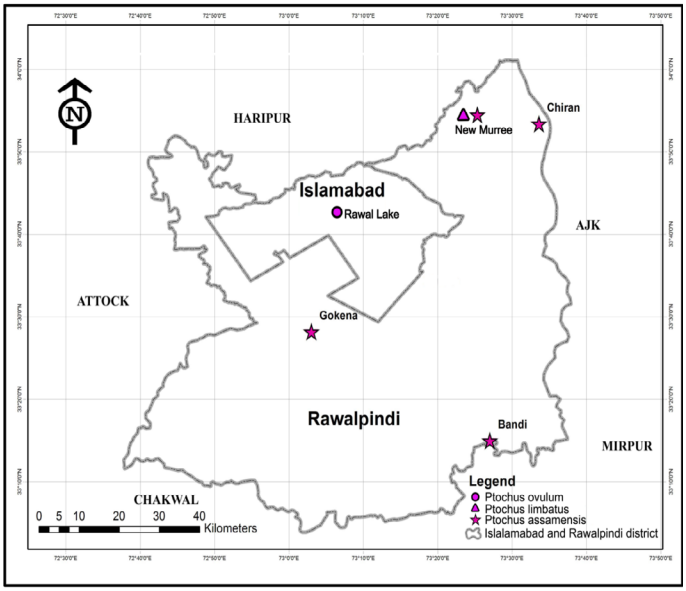

Figure 4: *Distribution for P. assamensis, P. ovulum and P. imbatus in Potohar region of Pakistan.*

Table 1: *Distribution and ecological observations for P. assamensis, P. ovulum and P. limbatus.*

Material examined							Coordinates		Ecological paramaters	
Species	Province	District	Locality	♂	♀	Date	Lat. (N)	Long.'(E)	Height (Ft)	Temp. (°C)
Ptochus assamensis	Punjab	Islamabad	Gokina	1	-	26-viii-2016	33º 47	73º 05	3259	28
		Rawalpindi	New Murree	5	2	17-v-2016	33°54	73°23	7587	29
			Chirah	3	3	17-v-2016	33º 25	73º 45	2254	29
			Baandi	4	2	17-v-2016	33º 25	73º 45	2254	29
Ptochus ovulum	Punjab	Islamabad	Rawal Lake	1	-	18-vii-2016	33°70	73°12	1765	32
Ptochus limbatus	Punjab	Rawalpindi	New Murree	11	09	17-v-2016	33°90	73°39	7587	29

Conclusions and Recommendations

Keeping in view the findings of present work, it can easily be concluded that Pothohar plateau of Punjab province has a rich curculionid fauna which need to be further explored in perspective of topographic gradients and ecological complex represented by the plateau.

Keeping in view findings of present study and economic importance of weevils, Curculionid fauna should be explored in details from each ecological zone of the country.

Novelty Statement

These three species are first time reported from Pakistan known as New records from genus *Ptochus* of the Pakistan.

Author's Contribution

Abdul Rauf Bhatti: Collection of field data and designed the experiments.
Ahmed Zia: Facilitated in editing of tables regarding ecological data and GIS Map.
Falak Naz: Assisted in paper writing and proof reading.
Amjad Usman: Facilitated in the taxonomic part at confirmation of species.
Ghulam Sarwar: Assisted in paper writing (Introduction and justification of study).
Rukhshanda Saleem: Assisted in paper writing and proof reading.
Amadud Din: Facilitated in collection of field data.

Conflict of interest
The authors have declared no conflict of interest.

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