



TANYMECUS XANTHURUSCHEVROLAT, 1880 (CURCULIONIDAE: ENTIMINAE), A NEW ADDITION TO CURCULIONID FAUNA OF PAKISTAN

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ABSTRACT

Curculionid weevils are a less explored group in Pakistan. In the present work, an addition to curculionid fauna of Pakistan has been made by reporting *Tanymericus xanthurus* from wild grassy vegetation. Details regarding, ecological information and GIS map for positive locality and differential characters and body measurements of the species are provided to enhance information on this new record. Recorded species belong to a genus that has many of its species reported as pest of crops (maize, jowar, barley, rice, gram, pea, sann-hemp, lentil, jute, beet root, mustard, argula, safflower, poppy, cotton, sugar beet, sunflower, peach, apple and almond) in different part of the world. Among these almost all types of plantations are grown in Pakistan and thus importance of *T. xanthurus* in Pakistan cannot be ignored.

Keywords: Coleoptera, Curculionidae, *Tanymericus, xanthurus*, Pakistan.

INTRODUCTION

Weevils belong to super family Curculionoidea of order Coleoptera (Zarazaga and Lyal, 1999). Among curculionids, most of the species are pests which damage fruits, seeds and leaves of crops and grains (Brien and Wibmer, 1978). Weevils attack almost each plant part and nearly every plant taxon (Anderson, 1995). Weevils spread under various taxonomic groups feed on plant roots, stems, leaves, flowers, fruits, or seeds. Super family Curculionoidea alone represents a record of 21 families, out of which family Curculionidae constitutes 17 subfamilies (Bouchard *et al.*, 2005) and 4600 genera (Zarazaga and Lyal, 1999; Rolf *et al.*, 2007; Tara *et al.*, 2010) including 62000 described species (Ghahari, 2010). Subfamily Entiminae represents 1150 genera and 12220 species from all biogeographically regions of the world (Thompson, 1992). Members of family Entiminae are generally known as broad-nosed weevils (Anderson, 2002). They are taken as most diverse subfamily of weevils in North America with 124 genera in 23 recognized tribes (Anderson, 2002). This subfamily encompasses all broad nosed weevils possessing well developed, deciduous mandibular processes and gonatoceros type of male genitalia and replaces subfamily Leptopiinae (Poorani and Ramamurthy, 1997). Most entimines have larvae that feed externally in the soil on roots whereas adults tend to feed on fresh foliage or

reproductive structures such as flowers or buds. Many species are generalists and feed on a broad range of plant taxa both as adults as well as larvae e.g., *Otiiorhynchus ovatus* (Linnaeus, 1758), yet others can be strictly host specific feeding on a few closely related species or genera (Anderson, 2002). Adults of many species of family Entiminae are flightless and few are parthenogenetic in nature (Anderson, 2002). A number of species are pests of ornamental plants and of agricultural products including citrus and other fruits.

Genus *Tanymericus* of subfamily Entiminae is a well-known genus of Oriental and Ethiopian region which includes large numbers of species (Ahmed *et al.*, 2006). Worldwide it represents 151 species and among these 45 species are reported from India while 16 species are known from West Bengal (Supare *et al.*, 1990). Supare *et al.* (1999) revised this genus from India and adjacent countries and reported 47 species from Ethiopian and Oriental region. Pakistan also represents Ethiopian, Palearctic and Oriental fauna due to its important geographic positioning (Zia *et al.* 2011). From Pakistan, Hashmi and Tashfeen (1992) documented fourteen species for subfamily Entiminae. According to Talwar (2014) genus *Tanymericus* is an important genus under sub tribe Tanymericina of subfamily Entiminae that includes species which are pests of a number of crops.

Genus *Tanymericus* is broadly considered as pest of plant families likes Asteraceae, Fabaceae, Chenopodiaceae,

Amaranthaceae, Polygonaceae, Convolvulaceae, Brassicaceae and Urticaceae from Europe and Asia (Talwar, 2014). They may be among the first enemies to consume healthy plants or may be specialists on decaying tissues or the dead remains of plants felled by other causes (Farrell *et al.*, 2001; Lanteri *et al.*, 2002). According to Talwar (2014) Genus *Tanymecus* primarily a pest of *Triticum* (wheat) and other cereals like *Zea mays* (maize), *Sorghum* sp. (jowar), *Hordeum vulgare* (barley) and *Oryza sativa* (rice). This weevil group also attacks a number of winter crops like *Cicera rietinum* (gram), *Pisum sativum* (pea), *Cortalaria juncea* (sann hemp) and *Lens esculenta* (Lentil). Its attack has also been recorded on *Corchorus corchori* (jute), *Beta vulgaris* (beetroot), *Brassica* (mustard), *Eruca sativa* (argula), *Carthamusi nctorius* (safflower), *Papaver* (poppy) and *Gossypium* (cotton) plants (Butani and Jotwani, 1984; Mane *et al.*, 2010). Some species of this genus are known to attack sugar beet in Greece (Anonymous, 2001) and it attacks on sunflower, peach, apple and Almond are also reported (Papadopoul, 2005). Besides their pest status, few species of *Tanymecus* act as biocontrol agents of insect pests, some have medicinal importance while some other are edible in some parts of the globe (Marshall, 1916). Being an agricultural country and in view of above cited information, presence of *Tanymecu* species in Pakistan carries immense importance and in view of this a survey to explore *Tanymecus* species complex was planned in present study.

MATERIALS AND METHODS

Surveys were conducted during the years 2015-2017 to collect adults of *Tanymecus* weevils in Himalayan foothills of Pakistan. Specimens were collected through hand picking, beating method and sweep net method and placed in glass jars having ethyl acetate soaked butter paper in it. In laboratory, specimens were placed in humid chamber to soften and then shifted to moisture absorbent paper before pinning. Following pinning, they were labeled and shifted to storage boxes. Host plants were identified at National Herbarium Program at National Agricultural Research Center (NARC) Islamabad. Taxonomic identification of specimens was done at National Insect Museum, NARC following taxonomic literature by Marshall (1916). Measurements of different body parts i.e., rostrum, elytra, antenna, legs, abdomen etc. were taken through divider and scale method following Bhatti (2018). Ecological information for the surveyed localities was recorded through GARMIN GPS and Metrological department. GIS map for positive locality was developed using Arc GIS10.5 software. Identified specimens were kept at National Insect Museum for future reference and study.

RESULTS AND DISCUSSION

Comprehensive surveys done during active season of years 2015-2017 to explore adult weevils from Himalayan foothills of Pakistan revealed a new record (*Tanymecus xanthurus*) for Pakistan. Three adults were recorded for the species from a single locality. Details for the recorded species is discussed as below,

Tanymecus xanthurus Chevrolat, 1880

Synonym: *Cercophorus xanthurus* Chevrolat 1880

Taxonomic description

Body length: 11 mm; width: 4 mm. Color black with dense pale brown setae and irregular white patches. Eyes located laterally, prominent and broadly ovate. Rostrum with small angular emarginations terminally with central carina shorter. Antennae with scape reaching to posterior margin of eyes, funicle with joint 1st longer than 2nd. Prothorax as long as broad, dominated by setae on disk with lateral stripe of dull orange scales, sides parallel from base to middle, strongly narrow towards apex, with small pits and very short central line. Elytra acuminate, apices bearing mucro with long pale hairs; setae recumbent in position. Legs black, with light scales, tibiae without tooth.

Differential Characters

Collected specimen tally with the published taxonomic description of Marshall (1916) except for following characters,

- i) Scape of antenna only touches front margin of eye.
- ii) No central line present over prothorax.

It is also worth mentioning that published description by Marshall (1916) had a lacuna that it lacked details for the Venter segments. This shortcoming in Marshall's work is also here by tackled by providing detailed information for the Venter as below,

Segment 1 longer than segment 2, segment 2 also longer than segments 3 +4 together while segment 5 (anal segment) bearing tuft of hairs in male and two anal carina in females; Hind tibia bearing two free claws.

Remarks

The specimens were recorded from wild grasses (*Poa annua*). This species is a new addition to country's known Curculionid's fauna. Earlier it was known from India and South Asia (Marshall, 1916).

Present study was undertaken with an objective to explore weevil fauna of sub-Himalaya with special emphasis on genus *Tanymecus*. It revealed important records among which *Tanymecus xanthurus* discussed here. Genus *Tanymecus* is an important genus that includes species which acts as pests of a number of crops. According to Armstrong *et al.* (1997), some species of *Tanymecus* are important pests of edible cereals and legumes. As documented by Marshall (1916), Nagpal (1948) and Abdullah and Abdul (2011), *Tanymecus hispidus* known to attack *Gossypium*, *Saccharum* (sugarcane), *Oryza sativa*, *Zea mays*, *Dalbergia sissoo* (shisham) and *Zizyphus jujuba* (ber). Sabesh (2006-2007) reported attack of *Tanymecus princeps* over *Gossypium* and *T. sciurus* over *Saccharum*. Talwar (2014) also documented Genus *Tanymecus* as a pest of many plant families like, Asteraceae, Fabaceae, Chenopodiaceae, Amaranthaceae, Polygonaceae, Convolvulaceae, Brassicaceae and Urticaceae from Europe and Asia. In Pakistan six species of *Tanymecu* have been documented by Qazi *et al.* (2017), yet there is no information about host record. There is thus a dire need to study host preference of these reported species as pest status of *Tanymecus* is already evident from above discussion. In the present work, specimens of *Tanymecus xanthurus* were recorded from grass (*Poa annua*) but its further search in the area along with information on more hosts should be worked out.

If we look into the global distribution of *Tanymecus xanthurus*, it is an Oriental species documented from India

and South Asia (Marshall, 1916). With the inclusion of *Tanymecus xanthurus* through present work, *Tanymecus* fauna of Pakistan become rich with seven species. Pakistan represents an important geographic position. It lies with the latitudes of 23°35' to 37°05' North and longitudes of 60° 50' to 77°50' East. Insect fauna of Pakistan confirms its transitional position as it has abundance of Oriental, Palearctic, and Ethiopian (Afrotropical) fauna. The Oriental representation

of species in Pakistan is continuous with those of Indian Punjab and Rajasthan (Rafi *et al.*, 2010; Zia *et al.*, 2011). Keeping in view documented information by Marshall (1916) who reported lot of species of genus *Tanymecus* from Oriental region, it can easily be expected that more surveys in Pakistan especially in Oriental representation can bring forward important records for the country.

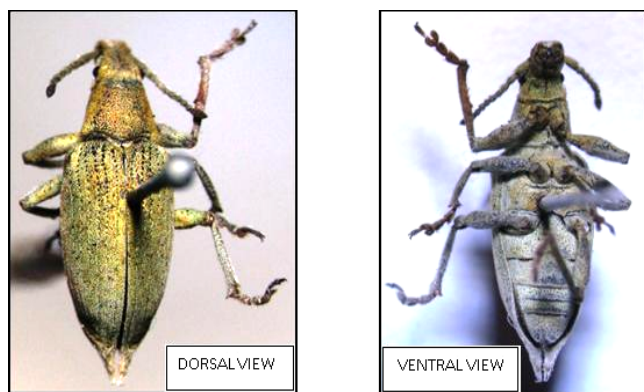


Fig. 1
Dorsal and ventral view for recorded *Tanymecus xanthurus*.

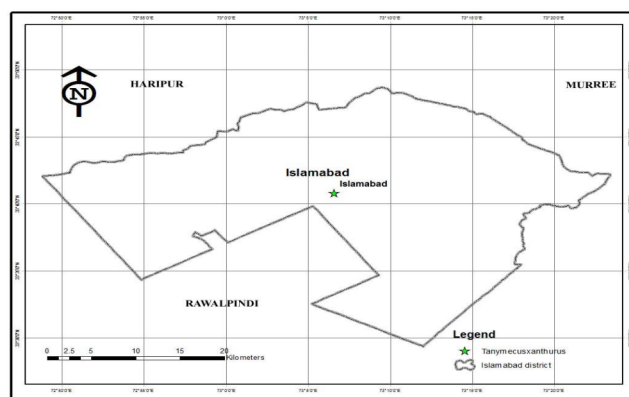


Fig. 2
GIS map showing presence of *Tanymecus xanthurus* in Pakistan.

Table 1.
Details for positive locality of recorded *Tanymecus xanthurus* specimens.

Material Examined					Ecological Observations			
District	Locality	?	?	Date	Lat. (N)	Long. (E)	Height (Ft)	Temp. (°C)
Islamabad	NARC	1	2	21-vii-2016	33°68	73°11	1663	31

REFERENCES

Abdullah, M.D. and M.M. Abdul, 2011. Influence of climate changes on the abundance of major insect pests of sugarcane, 499-513. In : Climate change and food security in Asia (Lal R, V.K. Mannava, S. Kumar, S.M.A. Faiz, R.A.H.M. Mustafizur and R.I. Khandakar Eds) Springer Science Business Media B.V.

Ahmed, Z., S.A. Rizvi, M.A. Akhtar and I.A. Yasir, 2006. A new species of *Tanymecus germar* (Coleoptera: Curculionidae) from Sindh, Pakistan. *Int. J. Biol. Biotech*, 3(1): 19-2.

Ahmed, Z., S.A. Rizvi, I. Khatri and N.S. Arien, 2010. A new species of *Tanymecus germar* (Coleoptera: Curculionidae) from Sindh, Pakistan. *Pak. J. Entomol. Karachi*, 25(2): 97-100.

Anderson, R.S., 1995. An evolutionary perspective of diversity in Curculionoidea. *Mem. Entomol. Soc. Washington*, 14: 103-114.

Anderson, R.S., 2002. Weevils and plants: Phylogenetic versus ecological mediation of evolution of host plant associations in Curculionidae (Curculioninae). *Mem. Entomol. Soc. Canada*, 165: 197-232.

Anonymous, 2001. Insects of sugar beet (*Beta vulgaris* L.) in Greece. Hellenic Sugar Industry, SA. Larissa Hellas.

Armstrong, J.S., A. Cattanch and L. Bus, 1997. Defoliating weevil identified and damage described from southern end of the Red River Valley. *Sugar beet Res. Ext. Reports*, 28:256-257

Bhatti, A.R., 2018. Weevil (Coleoptera: Curculionidae) fauna of Himalayan foothills of Pakistan. M.Phil. Thesis, Deptt. Plant & Environ. Protec. PIASA, The Univ. of Agric, Peshawar.

Bouchard, P., L. Lesage, H. Goulet, N.J. Bostanian, C. Vincent, A. Zmudzinska and J. Lasnier, 2005. Weevil (Coleoptera: Curculionoidea) diversity and abundance in two Quebec vineyards. *Ann. Entomol. Soc. America*, 98: 565-574.

Farrell, B.D., A.S. Sequeira, B.B. Normark, B.H. Jordal, J. Chung and B.D. O'meara, 2001. Evolution of agriculture in beetles (Curculionidae: Scolytinae and Platypodinae). *Evo.*, 55: 2011-2027.

Ghahari, H., Y. Genrikh, Y.G. Arzanov, A.A. Legalov and M. Tabari, 2010. Weevils (Coleoptera: Curculionidae) in Iranian rice fields and surrounding grassland. *Mun. Ent. Zool.* 1-5.

- Hashmi, AA. and A. Tashfeen, 1992. Coleoptera of Pakistan. Proce. Pak. Cong. Zool., 12: 133-170
- Lanteri, A.A., A.E. Marvaldi and S. Suarez, 2002. Gorgojos de la Argentina y susplantashuéspedes. Tomo I: Apionidae y Curculionidae. Publ. Espec. Soc. Entomol. Argent, 1:1-98
- Linnaeus, C., 1758. Systema Naturae per regna trianaturae, secundum classes, ordines, genera, species, cum caracteribus, differentiis, synonymis, 10 (1): 824 pp.
- Marshall, G.A.K., 1916. Coleoptera. Rhynchophora: Curculionidae. In: Shipley, A. E. (ed.): The Fauna of British India, including Ceylon and Burma. London. Taylor & Francis, 367 pp.
- Nagpal, H. D., 1948. Insect pests of Cotton in India, 49.
- Brien, C.W. and G.J. Wibmer, 1978. Numbers of genera and species of Curculionidae (Coleoptera). Entomol. News, 89: 89-92.
- Oberprieler, R.G., 2004. Phylogeny and evolution of the Brachycerinae sensu lato (Coleoptera: Curculionidae). Abstracts CD-ROM, XXII, Int. Cong. Entomol. Brisbane, 15-21.
- Papadopoulos, C.S., 2005. First record for Greece of *Mesagroicus pilifer* Boheman (Coleoptera: Curculionidae) in sugar beet seedlings. Entomol. Gen., 28: 65-67.
- Poorani, J. and V.V. Ramamurthy, 1997. Weevils of the genus *Lepropus* Schoenherr from the Oriental region (Coleoptera: Curculionidae: Entiminae). Oriental Insects, 31: 1-82.
- Rafi, M.A., W. Jürgen, M.A. Matin, A. Zia, A. Sultan and F. Naz, 2010. Faunistics of tiger beetles (Coleoptera: Cicindelidae) from Pakistan. J. Ins. Sci., 10:78 available online: insectscience.org/10.78
- Rolf, G., Oberprieler, Adrianae, Marvaldi and A. Roberts, 2007. Weevil, weevils, weevils, everywhere. Zootaxa, 1668:491-520
- Sabesh, M., 2006. List of Insect & Mite pests of Cotton in India [http/ www.cicr.org](http://www.cicr.org).
- Spangler, P.J., 1982. Introduction to the 1982 Edition. In: Blackwelder R.E. Checklist of the Coleopterous insects of Mexico, Central America, the West Indies, and South America. Smithsonian Institution United States Nat. Mus. Bull., 185(1).
- Supare, R.N., S. Ghai and V.V. Rammurthy, 1999. A revision of *Tanymecus* from India and adjacent countries (Coleoptera: Curculionidae). Oriental Insect, 24:1-126.
- Talwar, N., 2014. Trophic relationships, Life cycle strategies and distribution pattern of genus *Curculio* (Curculioninae: Curculionidae: Coleoptera), Ind. J. For., 36:463-466.
- Tara, J.S., S. Sunail and K. Ramnik, 2010. A record of weevil (Coleoptera: Curculionidae) diversity from district Samba (J&K). The Bioscan, 5(3): 391-394
- Thompson, R.T., 1992. Observations on the morphology and classification of weevils (Coleoptera, Curculionidae) with a key to major groups. J. Nat. Hist., 26: 835-891.
- Zarazaga, M.A.A. and C.H.C. Lyal, 1999. A world catalogue of families and genera of Curculionodea (Insect: Coleoptera). The natural History Museum. Entomipaxis, C. P. Edition.
- Zia, A., M. Naeem, M.A. Rafi, F. Naz, S. Afsheen and M. Ilyas, 2011. Damselflies (Zygoptera: Odonata) of Pakistan: Part 1. J. Ins. Sci., 11:102.