



Research Article

Oriental Leafhopper (Hemiptera: Cicadellidae: *Parallygus*) First Report from North West Pakistan with Redescription of *Parallygus rameshi* Viraktamath and Webb

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Abstract | The Oriental leafhopper genus *Parallygus* Melichar, 1903 is reported for the first time from North Western Part of Pakistan with redescription of habitus and male genitalia of *Parallygus rameshi* Viraktamath and Webb, 2012. A worldwide checklist with distribution for species of genus *Parallygus* Melichar is also provided.

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Introduction

Oriental leafhopper from genus *Parallygus* was established by Melichar (1903) with *P. divaricatus* Melichar as its type species from Sri Lanka. The genus *Parallygus* was first placed in tribe Athysanini due to its paired aedeagal shafts (Metcalf, 1967; Oman *et al.*, 1990; Dai *et al.*, 2012) but transferred to Scaphoideini (Zahniser and Dietrich, 2013). This genus was comprehensively studied for the first time by Dai *et al.* (2012) where they revised it with description of three species from China and India. Till date, only 5 species under this genus are reported from Oriental region. Genus *Parallygus* resembles other closely related genera i.e., genus *Platyretus* Melichar (1903), *Scaphoidophyes* Kirkaldy (1906) and *Capoideus* Theron (1974) in some external features and appearance but can be separated from all genera on the basis of genital characters having infolded subgenital plates

with slightly degenerated style apophysis lodged into them, connective U or V-shaped devoid of stem or with divided arms articulating with the aedeagus independently, aedeagus with paired shafts and two gonopores, with or without pair of ventral posteriorly directed blade-like processes, females with simple plate-like seventh sternite as compared to others (Dai *et al.* 2012).

Examined specimens were deposited in the College of Life Science, Leshan Normal University, Leshan, Sichuan, China (LSNU).

Materials and Methods

Morphological terminology follows Dietrich (2005). The specimens were observed and dissected under a stereo microscope (Zoom, 2000, Leica) for studying genital characters like pygofer, aedeagus, connective,

style and sub genital plates. Photos and measurements of adult leafhopper were taken by a ZEISS Stereo Discovery V20 stereomicroscope equipped with a ZEISS Axiocam ICc5 camera. Layers of photos were taken at different focal points with Q Imaging CCD camera and combined to form a single image from layer of images through Auto-Montage software. Photographs were processed for stabilization through Adobe Photoshop CS.

Genus *Parallygus* Melichar, 1903

Parallygus Melichar, 1903: 179. Type species: *Parallygus divaricatus* Melichar, by original designation.

Note: For genus description see Dai *et al.*, 2012: 42–44.

Checklist of genus *Parallygus* melichar worldwide distribution.

<i>Parallygus burmindicus</i> Viraktamath and Webb, 2012	India
<i>Parallygus divaricatus</i> Melichar, 1903	Sri Lanka
<i>Parallygus guttatus</i> (Matsumura, 1914)	China, India
<i>Parallygus jiuhuaensis</i> Dai and Zhang, 2012	China
<i>Parallygus rameshi</i> Viraktamath and Webb, 2012	India, Pakistan (Swat) new record

Parallygus rameshi Viraktamath and Webb, 2012.

Measurements. body length (mm): ♂ 6.1–6.4; ♀ 6.4.

crown width including eyes, 1.46 mm; crown length, 0.37 mm; pronotum width, 1.62 mm; pronotum length, 0.72 mm; scutellum width, 0.62 mm; scutellum length, 0.61 mm.

Description of male

Color: Ochraceous in general coloration (Figure 1A); crown, pronotum, scutellum and forewings with dark brown markings (Figure 1A); face whitish yellow (Figure 1B); frontoclypeus with dorsal dark brown to black spot, lateral margin with oblique brown spots (Figure 1B); anteclypeus with pair of basal brownish spots (Figure 1B).

Head: narrower than pronotum (Figure 1A); face (including eyes) as wide as long, antennal pits shallow, rather transgressing margins of frontoclypeus, transclypeal sulcus complete, clypellus with lateral margins concave, slightly widened apically (Figure 1B); eyes large; ocelli prominent, very close to eyes; labium usually not exceeding prosternum; pronotum with lateral margins carinate, anterior margin rounded,

posterior margin slightly concave; scutellum as long as pronotum or slightly shorter; forewings with claval veins usually separate; three subapical cells and four apical cells.

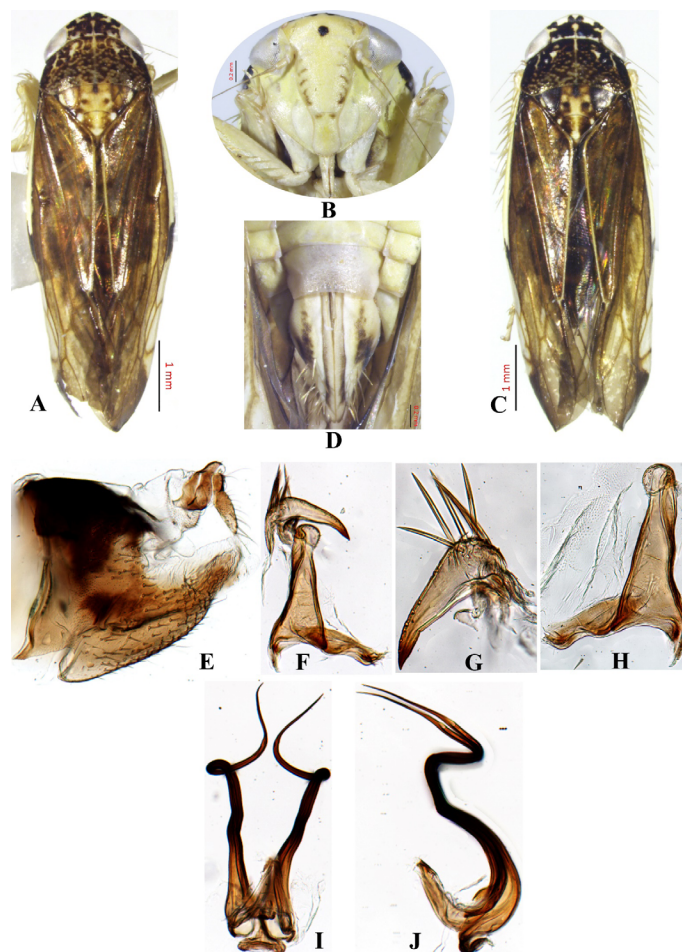


Figure 1: *Parallygus rameshi* Viraktamath and Webb. (A) Habitus, dorsal view ♂; (B) Face; (C) Habitus, dorsal view ♀; (D) Female seventh sternite, ventral view; (E) Pygofer lobe, lateral view ♂; (F) Subgenital plate and style, dorsal view ♂; (G) Subgenital plate, dorsal view ♂; (H) Style, dorsal view ♂; (I) Aedeagus, dorsal view and (J) Aedeagus, lateral view.

Pygofer lobe slightly longer than high, posteriorly rounded, with posterodorsal rounded membranous lobe; posterior half with macrosetae (Figure 1E); subgenital plates slightly semi-circular, apically rounded with few macrosetae, with anterior pointed extension (Figure 1F-G). Connective without stem, arms divided, articulated independently with base of shaft (Figure 1I). Aedeagus dorsal apodeme well developed, with two shafts, each shaft gradually narrowed towards apex, strongly sinuately curved with attenuated apex extending beyond gonopore (Figure 1I-J). Gonopore subapical (Figure 1J).

Material examined: (n=3, 2♂, 1♀) Pakistan: Khyber Pakhtunkhwa: Swat, 35.2227° N, 72.4258° E, 975 m,

14-viii-2019, coll. Hassan Naveed.

Distribution: India, Pakistan (Swat) new record.

Results and Discussion

This species was only described from India and here first time reported from Swat, Khyber Pakhtunkhwa, Pakistan during recent collection trip in 2019. All specimens were collected by net sweeping from grasses. Here, redescription of the habitus and male genitalia along with their photographs in detail is provided for easy identification of *Parallygus rameshi*. Collection of this species from Pakistan suggests that this genus needs more efforts to be explored from this area.

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Novelty Statement

The leafhopper genus *Parallygus* is reported and described for the first time from Pakistan with colored photographs of habitus and male genitalia.

Author's Contribution

Hassan Naveed: Species description and manuscript writing.

Kamran Sohail: Technical guidelines.

Gul Zamin Khan and Yalin Zhang: Proofreading of the manuscript.

Conflict of interest

The authors have declared no conflict of interest.

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