

Taxonomic Studies of Tetriginae (*Tetrigidae: Orthoptera*) of Thal Area, Punjab–Pakistan

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ABSTRACT

Six species and five genera, viz., *Ergatettix*, *Euparatettix*, *Formosatettix*, *Hedotettix* and *Paratettix*, of the tetrigids (pygmy grasshoppers) under the subfamily Tetriginae were collected from various localities of Thal Area of the Punjab. Out of these, genus *Formosatettix* with the species *F. larvatus* is a new record from Pakistan, while the species, *Hedotettix attenuatus*, is a new record from the Punjab.

Key Words: Orthoptera; Tetrigidae; Tetriginae

INTRODUCTION

The taxonomic studies on Tetrigidae of Indo-Pak subcontinent have been made mainly by Kirby (1914) and Hancock (1915). A number of genera and species were described by Hancock (1912, 1913), Bei-Bienko and Mishchenko (1951), Pajni and Shalla (1983), Wagan and Kevan (1992) and Suhail *et al.* (1994).

Very little systematic work has been done on the tetrigid fauna of Thal area of Punjab. The fragmentary notes and descriptions available include those of Moeed (1971), Ahmad (1977) and Ahmad (1980) but most of their species needed confirmation. Keeping this fact in view, an extensive survey was carried out in various localities of a diversified area "Thal" of the Punjab during 1994-1995, which revealed that genus *Formosatettix* with the species *F. larvatus* being a new record from Pakistan, while the species *Hedotettix attenuatus* is a new record from Punjab.

MATERIALS AND METHODS

The specimens were killed in a cyanide bottle and pinned. Most of the specimens were with wings folded on their bodies and legs improperly placed. In order to make a study of such specimens, they were kept in a relaxing jar for 1-2 days, 8-10 specimens at a time. After relaxation, they were mounted on spreading boards and the left tegmen and wing of each specimen were fully spread so that the maculation could be studied. Hind legs were placed in an inverted "V" position. All the mounted material was left on spreading boards for 4-6 days; then transferred to boxes after labelling for preservation. Naphthalene balls mounted on pins and BHC powder were used as fumigant to save the preserved specimens from the attack of insects. These

collections were supplemented with specimens from the students' collection of the Department of Agricultural Entomology, University of Agriculture, Faisalabad.

A revolving stage and a WILD M3B binocular microscope (10X X 1.6X) was used for identifying the specimens up to the specific level. The measurements (maximum length and width) of body, pronotum, tegmen and hind femur were taken with a finely pointed divider and a ruler and their means and standard deviation were worked out. The type specimens have been deposited in the Insect Museum, Department of Agricultural Entomology, University of Agriculture, Faisalabad.

A list of six species under five genera including their measurements of different body parts along with standard deviation and ratio, distribution and habitat is given in this paper.

RESULTS AND DISCUSSION

Subfamily Tetriginae

It is represented by six species and five genera:

Genus *Hedotettix* Bolivar

1842. *Acridium* (*Tettix*), de Haan, Temm. Verh., Orth., p. 167.

1871. *Tettix* Walker, Cat. Derm. Salt., 5: 824.

1887. *Hedotettix* Bolivar, Ann. Soc. Ent. Belg., 31: 195, 283.

Type: *Acridium* (*Tettix*) *gracile* de Haan

Two species recorded under this genus exactly tally with the published descriptions (Kirby, 1914; Hancock, 1915; Bei-Bienko & Mishchenko, 1951) of this genus.

1. *Hedotettix gracilis* (de Haan)

1842. *Acridium* (*Tettix*) *gracilis* de Haan, Temminck, Verhandel, Orth., pp. 167, 169.

Measurements (mm): 3♂ 5♀

	Male		Female	
	S.D.	Range	Mean	S.D.
B.L	8.0	10.0-11.25	10.75	0.540
A.L	3.5	4.0-4.25	4.125	0.125
H.L	0.75	0.75	0.75	0
P.L	8.5	11.0-15	12.5	1.780
P.W	2.5	3.0	3.0	0
T.L	1.5	2.0	2.0	0
HF.L	5.0	6.0-7.0	6.5	0.408
HF.W	1.75	2.25-2.5	2.417	0.118
HT.L	5.0	4.5-5.0	4.833	0.236
H.L/A.L	0.214	0.176-0.187	0.182	0.006
H.L/P.L	0.088	0.058-0.068	0.061	0.008
P.L/P.W	3.4	3.666-5.0	4.166	0.593
HF.L/T.L	3.333	3.0-3.5	3.25	0.204
HT.L/HF.L	1.0	0.692-0.833	0.746	0.062

B.L.= Body length; A.L.= Antennal length; H.L.= Head length; P.L.= Pronotal length; P.W.= Pronotal width; T.L.= Tegmen length; HF.L.= Hind femur length; HF.W.= Hind femur width; HT.L.= Hind tibia length

Material examined:

Jhang: Athara Hazari 1♂, 11.VI.93; **Layyah:** Karor 1♂ 5♀, 20.III.94; 1♂ 12.VI.94.

Habitat:

These specimens were collected from grasses near the sugarcane fields and along the river bank.

New record:

It has been recorded for the first time from Thal area.

2. *Hedotettix attenuatus* Hancock

1904. *Hedotettix attenuatus* Hancock, spol. Zeyl., 2: 151.

Measurements (mm): 16♂ 19♀

	Male			Female		
	Range	Mean	S.D.	Range	Mean	S.D.
B.L	8.0-8.5	8.25	0.204	9.5-1.5	10.0	0.408
H.L	0.5-0.75	0.583	0.118	0.75-1.0	0.917	0.118
P.L	9.0-9.5	9.25	0.204	11.5-12.25	11.917	0.312
P.W	2.25-2.5	2.333	0.118	2.5-3.0	2.833	0.236
T.L	1.5	1.5	0	2.0	2.0	0
HF.L	5.0-5.5	5.25	0.204	5.5-6.5	6.167	0.471
HF.W	1.75-2.25	2.00	0.204	2.0-2.5	2.250	0.204
HT.L	4.5	4.5	0	4.5-5.0	4.833	0.236
H.L/P.L	0.052-0.081	0.063	0.013	0.061-0.086	0.077	0.011
P.L/P.W	3.8-4.111	3.970	0.129	4.0-4.6	4.228	0.265
HF.L/T.L	3.333-3.666	3.50	0.136	2.75-3.25	3.083	0.236
HT.L/HF.L	0.818-0.9	0.864	0.34	0.769-0.818	0.725	0.023

Material examined:

Bhakkar: Notak 1♂, 30.VIII.94; **Jhang:** Athara Hazari 3♂, 11.VI.93; **Khushab:** Qaidabad 2♀, 2.IX.94; **Layyah:** Karor 9♂ 16♀, 20.III.94; 1♂ 1♀ 12.VI.94.

Habitat:

These specimens have been collected from grasses near sugarcane, sorghum and rice crops.

New record:

It has been collected for the first time from Punjab.

Genus *Formosatettix* Tinkham

1937. *Formosatettix* Tinkham, Trans. nat. Hist. Soc. Formosa, XXVII: 237.

Type: *Formosatettix arisanensis* Tinkham

One species recorded under this genus exactly conforms to the published description (Bei-Bienko & Mishchenko, 1951) of this genus.

1. *Formosatettix larvatus* Bei-Bienko

1951. *Formosatettix larvatus* Bei-Bienko, keys Faun. USSR., p. 285.

Measurements (mm): 8♂ 10♀

	Male			Female		
	Range	Mean	S.D.	Range	Mean	S.D.
B.L	5.0-6.0	5.333	0.471	6.5-7.5	7	0.408
A.L	2.75-3.0	2.875	0.125	3.25-3.5	3.375	0.125
H.L	0.75	0.75	0	0.75-1.0	0.833	0.118
P.L	4.0-5.0	4.417	0.425	6.25-8.0	6.917	0.773
P.W	2.0	2.0	0	2.0-2.5	2.25	0.204
HF.L	3.75-4.0	3.917	0.118	5.0-6.0	5.333	0.411
HF.W	1.5-2.0	1.667	0.236	2.0-2.5	2.167	0.236
HT.L	3.25-3.5	3.333	0.118	3.5-4.25	3.917	0.312
H.L/A.L	0.272-0.6	0.436	0.164	0.214-0.307	0.261	0.047
H.L/P.L	0.15-0.187	0.169	0.019	0.093-0.153	0.122	0.025
P.L/P.W	2.0-2.5	2.208	0.212	2.5-3.555	3.102	0.443
HT.L/HF.L	0.812-0.875	0.851	0.028	0.666-0.85	0.739	0.08

Material examined:

Khushab: Qaidabad 3♂ 9♀, 2.IX.94; **Layyah:** Karor 4♂, 20.III.94; **Muzaffargarh:** Daira Din Panah 1♂ 1♀ 8.IX.93.

Habitat:

It has been collected from grasses near stagnant water.

New record:

This species has been recorded for the first time from Thal as well as Pakistan.

Genus *Paratettix* Bolivar

1838. *Tetrix* Rambur, Faun. Ent. Audalus, 11: 65.

1887. *Paratettix* Bolivar, Ann. Soc. Ent. Belg., 31: 195, 270.

Type: *Paratettix (Tetrix) meridionalis* (Rambur)

One species recorded under this genus exactly conforms to the published descriptions (Kirby, 1914; Hancock, 1915; Bei-Bienko & Mishchenko, 1951) of this genus.

1. *Paratettix nigrescens* Sjostedt

1921. *Paratettix nigrescens* Sjostedt, Kunf. Sevenk. Vet. Handb., 62(3): 15,17.

Measurements (mm): 2♂ 10♀

	Male			Female		
	Range	Mean	S.D.	Range	Mean	S.D.
B.L	6.5-7.25	6.917	0.312	10.0-11.5	10.5	0.707
A.L	3.5	3.5	0	3.5-4.0	3.75	0.250
H.L	0.7-1.0	0.833	0.118	1.0-1.25	1.083	0.118
P.L	9.25-9.5	9.417	0.118	8.75-9.5	12.5	0.408
P.W	2.0-2.5	2.167	0.236	3-3.25	3.167	0.118
T.L	1.5	1.5	0	1.75-2.5	2.00	0.204
HF.L	5.0-5.5	5.25	0.204	6.25-6.9	6.467	0.306
HF.W	1.75-2.0	1.833	0.118	2.25-2.75	2.5	0.204
HT.L	4.5-5.0	4.733	0.205	5-5.9	5.383	0.379
H.L/A.L	0.285	0.285	0	0.25-0.357	0.304	0.054
H.L/P.L	0.078-0.108	0.088	0.014	0.076-0.1	0.386	0.434
P.L/P.W	3.8-4.75	4.392	0.421	3.846-4.0	3.949	0.073
HF.L/T.L	2.833-3.666	3.217	0.342	2.777-3.571	3.266	0.349
HT.L/HF.L	0.857-0.94	0.902	0.034	0.8-0.855	0.832	0.023

Material examined:

Jhang: Mehmood Kot 2♀ 24.IX.93; **Khushab:** Qaidabad 2♀ 2.IX.93; **Layyah:** Karor 2♂ 2♀ 20.III.94; 1♀ 12.VI.94;

Muzaffargarh: Muzaffargarh 3♀ 8.VIII.94.

Habitat:

These specimens have been collected from grasses near rice sorghum and sugarcane crops.

New record: It has been recorded for the first time from Thal.

Genus *Euparatettix* Hancock

1904. *Euparatettix* Hancock, Spol. Zeyl., 11: 145.

Type: *Euparatettix* (*Paratettix*) *personatus* (Bolivar)

One species recorded under this genus entirely tallies with the published descriptions (Hancock, 1912, 1913, 1915; Kirby, 1914; Bei-Bienko & Mishchenko, 1951) of this genus.

1. *Euparatettix variabilis* (Bolivar)

1887. *Paratettix personatus* Bolivar, Ann. Soc. Ent. Belg., 31: 276.

Measurements (mm): 17♂ 22♀

	Male			Female		
	Range	Mean	S.D.	Range	Mean	S.D.
B.L	6.25-7.5	6.688	0.480	8.75-10.5	9.583	0.717
A.L	3.0-3.5	3.25	0.25	4.0-4.5	4.25	0.25
H.L	0.75-1.0	0.813	0.108	0.75-1.0	0.917	0.118
P.L	9.0-11.0	10.125	0.740	11.0-12.0	11.417	0.425
P.W	2.0-2.75	2.25	0.306	2.75-3.0	2.917	0.118
T.L	1.5-1.8	1.638	0.139	1.5-2.0	1.667	0.236
HF.L	5.5-5.9	5.225	0.390	2.75-6.25	6	0.204
HF.W	1.9-2.25	2.038	0.129	2.25-2.5	2.417	0.118
HT.L	4.25-5.0	4.563	0.272	5.0-5.25	5.117	0.103
H.L/A.L	0.25-0.285	0.238	0.013	0.166-0.25	0.208	0.042
H.L/P.L	0.068-0.095	0.08	0.01	0.066-0.090	0.08	0.01
P.L/P.W	3.818-5.0	4.552	0.462	3.666-4.090	3.919	0.182
HF.L/T.L	2.777-3.371	3.204	0.247	3.0-4.166	3.666	0.499
HT.L/HF.L	0.847-0.9	0.874	0.026	0.8-0.913	0.854	0.046

Material examined:

Bhakkar: Notak 1♂, 30.VIII.94; **Jhang:** Mehmood Kot 2♂ 1♀ 24.IX.93; **Khushab:** Qaidabad 3♂ 2♀ 2.IX.94; **Layyah:** Karor 10♂ 12♀, 20.III.94; 1♂, 12.VI.94; **Sargani:** 3♀ 24.VIII.93; **Muzaffargarh:** Daira Din Panah 2♀, 8.IX.93; Muzaffargarh 2♀ 8.VIII.94.

Habitat:

These specimens have been collected from the grasses near sugarcane, sorghum and rice crops as well as river and canal banks.

New record:

It has been recorded for the first time from Thal area.

Genus *Ergatettix* Kirby

1873. *Tettix* Walker, Cat. Derm. Salt. Brit. Mus., 5: 825.

1912. *Euparatettix* Hancock, Mem. Dept. Agric. Ind., 4: 153-156.

1914. *Ergatettix* Kirby, Faun. Brit. Ind. Acrid., p. 69.

1915. *Indatettix* Hancock, Rec. Ind. Mus., 11: 127-132.

Type: *Ergatettix* (*Tettix*) *dorsiferus* (Walker)

One species under this genus exactly tallies with the published descriptions (Kirby, 1914; Hancock, 1915) of this genus.

1. *Ergatettix crassipes* (Hancock)

1912. *Euparatettix crassipes* Hancock, Mem. Dept. Agric. Ind., pp. 153-157.

Measurements (mm): 4♂ 22♀

	Male			Female		
	Range	Mean	S.D.	Range	Mean	S.D.
B.L	5.5-6.0	5.750	0.204	6.0-7.5	6.750	0.612
A.L	3.0-3.25	3.089	0.118	3.5	3.5	0
H.L	0.75	0.75	0	0.75-1.0	0.833	0.118
P.L	8.0-8.5	8.167	0.236	8.75-9.5	9.083	0.312
P.W	2.0-2.25	2.083	0.118	2.25-2.5	2.333	0.118
T.L	1.25-1.5	1.417	0.118	1.25-1.5	1.333	0.118
HF.L	4.0-4.25	4.167	0.118	4.5-4.75	4.583	0.118
HF.W	1.5	1.5	0	1.75-2.0	1.883	0.103
HT.L	3.0-3.25	3.083	0.118	4.0-4.25	4.083	0.118
H.L/A.L	0.23-0.25	0.243	0.009	0.214-0.285	0.250	0.036
H.L/P.L	0.088-0.093	0.091	0.002	0.078-0.114	0.092	0.016
P.L/P.W	3.555-4.25	3.935	0.287	3.8-4.0	3.896	0.082
HF.L/T.L	2.666-3.4	2.766	0.314	3.0-3.8	3.467	0.340
HT.L/HF.L	0.705-0.764	0.740	0.025	0.842-0.944	0.891	0.042

Material examined:

Bhakkar: Notak 4♂ 19♀, 30.VIII.94; **Khushab:** Qaidabad 1♀, 2.IX.94; **Layyah:** Karor 1♀, 20.III.94; **Muzaffargarh:** Sultan Colony 1♀, 8.VIII.94.

Habitat:

These specimens have been collected near the sugarcane fields.

New record:

It has been recorded for the first time from Thal area.

REFERENCES

- Ahmad, H., 1977. Key characters of major taxonomic groups of grasshoppers (Acridoidea: Saltatoria) of the South Asia subcontinent and some species of Pamphagidae and Pyrgomorphidae of Pakistan. *Agric. Pak.*, 28: 178-87.
- Ahmad, F.U., 1975-1980. Survey of grasshoppers in arid and semi-arid regions of Pakistan. *Final Tech. Rept. PL-480 Project No. PK-ARM-20 (FG-Pa-212)*, pp. 500.
- Bei-Bienko, G.Y. and L.L. Mishchenko, 1951. *Locusts and Grasshoppers of USSR and Adjacent Countries*, Part I & II, pp. 400. S. Monstons, Jerusalem.
- Hancock, J.L., 1912. Tetriginae (Acridiinae) in the Agricultural Research Institute, Pusa, Bihar, with description of new species. *Mem. Dept. Agric., India*, 4: 131-60.
- Hancock, J.L., 1913. Tetriginae (Acridiinae). *Rec. Ind. Mus.*, 8: 311-5.
- Hancock, J.L., 1915. Indian Tetriginae (Acridiinae). *Rec. Ind. Mus.*, 11: 55-132.
- Kirby, W.F., 1914. *The Fauna of British India including Ceylon and Burma-Orthoptera (Acrididae)*, p. 276. Taylor and Francis, London.
- Moeed, A., 1971. Key to the identification of grasshoppers belonging to family Tetrigidae and subfamilies Acridinae and Oedipodinae of Hyderabad and adjoining areas. *Sindh Univ. Res. J.*, 5: 79-92.
- Pajni, H.R. and A. Shalla, 1983. A report on the short horned grasshoppers of Chandigarh and the surrounding areas (Acridoidea: Orthoptera). *Res. Bull. Panjab Univ., India*, 34: 1-6.
- Suhail, A., M. Yousuf and G. Suhail, 1994. Grasshoppers (Orthoptera) of Pakistan. *Pakistan Entomol.*, 16: 67-74.
- Tandon, S.K. and M.S. Shishodia, 1987. The Acridoidea (Insecta: Orthoptera) of Goa. *Rec. Zool. Surv. India*, 72: 295-307.
- Wagan, M.S. and D.K.McE. Kevan, 1992. Studies on some Tetrigidae (Orthoptera) from India, Pakistan and Sri Lanka. *Trop. Zool.*, 5: 167-94.

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