

Some Acridid Grasshoppers Belonging to Subfamily Cyrtacanthacridinae (Acrididae: Orthoptera) from Pakistan

ANJUM SUHAIL, GHAZALA SUHAIL† AND MUHAMMAD KHALID AL-HARIRI

Central Hi-Tech Laboratory/Department of Entomology, University of Agriculture, Faisalabad-38040, Pakistan

†Department of Biology, Government College for Women, Faisalabad-Pakistan

ABSTRACT

This study includes six acridid species in five genera under the Subfamily Cyrtacanthacridinae, viz., *Patanga succinata* (Johannson), *Schistocerca gregaria* (Froskal), *Anacridium aegyptium aegyptium* (Linnaeus), *A. aegyptium rubrispinum* Bei-Beinko, *Chondracris rosea* De Gree and *Cyrtacanthacris tatarica* (Linnaeus) have been recorded from various localities of Pakistan. The main objective of this study was to explore the grasshopper (locust) species belonging to the Subfamily Cyrtacanthacridinae (Family: Acrididae, Order: Orthoptera) from Pakistan along with new record, measurement of different body parts and habitat.

Key Words: Acridid; Grasshopper; Cyrtacanthacridinae; Pakistan

INTRODUCTION

The Cyrtacanthacridinae is an orthopteran subfamily whose members are mostly called locusts. The term locust is given to the grasshoppers capable of forming large swarms, which invade many countries of the world and cause catastrophic damage and wide spread devastation of almost all types of natural and cultivated vegetation. The subfamily Cyrtacanthacridinae from Sub-Continent have been studied by Kirby (1914), Bie-Bienko and Mischenko (1951), Dirsh and Uvarov (1953), Dirsh (1965) and Uvarov (1966); whereas, Ahmad (1958), Moeed (1971), Perwin and Ahmad (1983), Wagan (1990) and Malik *et al.* (1993) studied and described some species from Pakistan. As no detailed taxonomic work on this subfamily has been done in Pakistan, therefore, the present taxonomic studies were conducted to explore the locust fauna along with its habitat and distribution in Pakistan.

In the present work, six species in five genera viz., *Patanga succinata* (Johannson), *Schistocerca gregaria* (Froskal), *Anacridium aegyptium aegyptium* (Linnaeus), *A. aegyptium rubrispinum* Bei-Beinko, *Chondracris rosea* De Gree and *Cyrtacanthacris tatarica* (Linnaeus) have been recorded from various localities of Pakistan.

Geographically this country is situated in the North-West of South Asia and extends North-South from 24-37 N latitude and 61-75 E longitude comprising of about 59% high mountains and table lands in the North and West, while the remaining 41% is sandy deserts, barren plateau, fertile plains in the middle along with coastal beaches and marshy swamps in the South. It is distributed into four provinces i.e., Punjab, Sindh, Baluchistan and North West Frontier Province (NWFP) with varied types of land, climate and crops.

The collected acridid specimens were killed in a cyanide bottle, pinned and their body parts set on

appropriate setting boards. On drying, these were labeled and mounted in collection boxes. Naphthalene balls were kept in the boxes for the safety of the specimens. A revolving stage and a wild M3B binocular microscope (10X x 6.4X, 10X x 16X, 10X x 40X) were used for identifying the specimens up to the specific level. Deviating characters of these species, if any, from published descriptions by Kirby (1914), Bei-Bienko and Mischenko (1951), Ahmad (1958), Wagan (1990), measurements (max. length "L" and width "W") of various body parts and their collection data, are given in this paper. The meteorological data of the localities for each species are given in Table I.

Table I. Meteorological data of the localities

Locality	Latitude	Long.	Altit.	MAT	AP
Badin	24-85N	68-85E	30	26.00	210
Bahawalpur	29-25N	71-40E	115	26.50	162
Bhakkar	31-15N	72-18E	150	26.50	178
Chakwal	32-70N	72-38E	201	22.50	710
Cholistan	28-25N	70-25E	83	26.50	112
D. G. Khan	30-02N	70-40E	125	26.50	165
D. I. Khan	31-50N	70-56E	215	25.00	290
Faisalabad	31-25N	73-06E	214	24.50	350
Hyderabad	25-24N	68-22E	30	26.50	162
Jhang	31-16N	72-20E	153	26.00	178
Jhelum	32-56N	73-43E	233	23.50	800
Kalat	29-05N	66-05E	1937	16.50	240
Karachi	24-54N	67-08E	5	25.50	181
Kharan	32-02N	73-09E	749	21.00	148
Khuzdar	27-47N	66-37E	1140	21.50	240
Kohat	34-01N	71-35E	319	22.50	344
Lorali	30-22N	68-35E	1432	20.00	194
Makran Coast	26-01N	63-09E	89	26.50	198
Multan	30-12N	71-30E	121	26.50	168
Murree	34-10N	73-40E	2300	12.50	1750
Panjgur	26-58N	64-09E	919	23.00	104
Quetta	30-13N	66-57E	1586	15.50	340
Zhob	31-20N	69-27E	1384	19.00	304

Long= Longitude; Altit= Altitude; MAT= Mean annual temperature; AP= Average precipitation

1. Genus *Patanga* Uvarov

Type: *Patanga succinctus* (Johannson)

A single species collected under this genus tallies with the published description of Bei-Bienko and Mishchenko (1951) of this genus, except slight variation in body size given in Table II.

1.1. *Patanga succinata* (Johannson)

Gryllus (Locusta) succinctus Johannson, 1763. *Amoen. Acad.*, 6:398. *Acridium assectator* Fischer, 1846. *Nouv. Mem. Soc. Imp. Nat. Mosco.*, 8: 235. *Cryptacanthacris fisiline* Walker, 1870. *Cat. Derm. Salt. Brit. Mus. (N.H.)*, 3: 564. *Orthacanthacris succinata* Kirby, 1914. *Faun. Brit. Ind. Acrid.*, 227. *Patanga succinata* Uvarov, 1923. *Ann. Mag. Nat. Hist.*,12(9): 364, 366.

Material examined. Cholistan (Bahawalnagar) 1♂ 1♀, 16-IX-99. This locality is the new record for this species. This species has been reported from Karachi (Perwin *et al.* 1983, 1985), Hyderabad (Ahmad, 1980) and Rahim Yar Khan (Malik *et al.*, 1993).

Habitat. It has been collected from scattered wild vegetation on barren land.

Table II. Measurements (mm) of *Patanga succinata* (Johannson)

	Male:1	Female:1	Mean	S.D.
Body (L)	39.50	55.00	47.25	10.96
Pronotum (L)	9.25	11.75	10.50	1.75
Pronotum (W)	6.25	7.50	6.87	0.88
Tegmen (L)	41.50	56.50	49.00	10.60
Tegmen (W)	6.75	8.00	7.37	0.88
Hind femur (L)	23.75	31.50	27.62	5.48
Hind femur (W)	5.00	6.25	5.62	0.88

2. Genus *Schistocerca* Stal

Type: *Schistocerca gregaria* (Forsk.)

A single species recorded under this genus agrees with the published description (Kirby, 1914; Bei-Bienko & Mishchenko, 1951; Dirsh, 1965) of this genus.

2.1. *Schistocerca gregaria* (Forsk.)

Gryllus (Locusta) tatarica Linnaeus, 1758. *Syst. Nat.*, ed.10,1: 432. *Gryllus gregarius* Forskal, 1775. *Descrip. Animal.*, p. 81. *Acridium peregrinum* Olivier, 1804. *Voy. Emp. Ottom.*, 4: 388. *Acridium taticum* Latreille, 1804. *Hist. nat. Ins. Orth.*, 12: 150. *Gryllus rufescens* Thunberg, 1815. *Mem. Acad. Sci. St. Petersb.*, 5: 245.

Acridium tataricum Serville, 1823. *Ann. Soc. Nat.*, 22: 283. *Acridium flaviventre* Burmeister, 1828. *Handb. Ent.*, 2(2): 631. *Gryllus migratious* Thunberg, 1870. *Mem. Acad. Sci. St-Petersb.*, 5: 244. *Acridium sellatum* Walker, 1877. *Cat. Derm. Salt. Brit. Mus. (N.H.)*, 3: 585. *Acridium (Schistocerca) peregrinum* Stal, 1878. *Recens. Orth.*,1: 65. *Schistocerca peregrina* Brunner, 1882. *Prod. Eur. Orth.*, p.

215. *Schistocerca gregaria* Krauss, 1907. *Denskschr. Akad. Wiss. Wien*, 71(2): 12. *Schistocerca tatarica* Kirby, 1914. *Fauna Brit. Ind. Acrid.*, p. 232. *Schistocerca gregaria Ph. flaviventris* Uvarov, 1923. *Ann. Mag. nat. Hist.*, (9)11: 484. *Schistocerca gregaria Ph. solitaria* Shaw, 1933. *Entomol.*, 66: 176. *Schistocerca gregaria Ph. gregaria* Chopard, 1936. *Mem. Acad. Sci.*, 62: 72. *Schistocerca gregaria Ph. transiens* Chopard, 1936. *Ibid.*, p. 72.

The collected specimens tally with the published description (Kirby, 1914; Bei-Bienko & Mishchenko, 1951; Wagan, 1990) of this species, but in some specimens, the basal half of wings is tinted with yellow and the head and pronotum are with a dorsal yellow band. Slight variation in the body size is also observed given in Table III.

Material examined. Jhang 4♂ 5♀, 5-VII-98; Multan 1♂, 13-XI-98; Kallar Kahar (Chakwal) 1♂ 1♀, 13-IX-98; Kohat 2♀, 13-VII-99; Dera Ghazi Khan 1♂ 2♀, 14-IX-98; Dera Ismail Khan 2♂, 14-VII-99; Lorali 1♂, 17-VIII-98; Kharan 2♂ 3♀, 12-VIII-99; Khuzdar 1♂ 1♀, 13-VIII-98; Cholistan (Bahawalnagar) 2♂ 3♀, 16-IX-98; Makran coast, 1♂ 2♀, 8-IX-98; Bhakkar (Thal) 1♀, 28-X-99.

This species has been collected for the first time from Dera Ismail Khan and Kharan. It is a common species found throughout Pakistan. Earlier, Ahmad (1975-1980) and Perwin *et al.* (1985) reported this species all over Pakistan, Ahmad (1958), Latif *et al.* (1959) and Malik *et al.* (1993) from the Punjab, Khan (1990) from Lasbela (Baluchistan) and Wagan (1990) from Sindh.

Habitat. This species has been collected from the wild vegetation and grasses near rocky areas and cotton and fodder crops.

Table III. Measurements (mm) of *Schistocerca gregaria* (Froskal)

	Male : 16	Female : 20	Mean	S.D.
Body (L)	44.50-47.50	50.00-56.50	49.43	3.05
Pronotum (L)	9.00- 9.50	11.00-11.50	10.29	0.89
Pronotum (W)	6.50- 7.00	9.00- 9.50	8.14	1.17
Tegmen (L)	41.50-52.50	61.50-63.00	56.58	6.67
Tegmen (W)	8.50- 9.25	10.50-11.25	10.10	0.92
Hind femur (L)	24.50-25.00	30.50-31.00	28.11	2.88
Hind femur (W)	4.50- 5.00	6.00- 6.50	5.52	0.75

3. Genus *Anacridium* Uvarov

Type *Anacridium aegyptium* (Linnaeus)

Two species collected in this genus conform to the published description (Bei-Bienko & Mishchenko, 1951; Dirsh, 1965) of this genus. Except slight variation in body size is also observed in each species given in Table IV.I and IV.II.

Table IV.I. Measurements (mm) of *Anacridium aegyptium aegyptium* (L)

	Male : 22	Female : 22	Mean	S.D.
Body (L)	45.00-45.50	63.50-66.75	54.84	9.47
Pronotum (L)	9.75-10.50	14.00-15.00	12.26	2.11
Pronotum (W)	6.00- 6.50	8.25- 9.00	7.75	1.44
Tegmen (L)	49.00-50.50	60.00-65.25	54.56	9.53
Tegmen (W)	7.50- 8.00	10.50-11.50	9.38	1.55
Hind femur (L)	23.00-23.50	30.00-31.00	26.86	3.58
Hind femur (W)	4.75- 5.25	6.00- 6.50	5.67	0.59

Table IV.II. Measurements (mm) of *A. aegyptium rubrispinum* Bei-Bienko

	Male: 13	Female : 15	Mean	S.D.
Body (L)	44.00-45.00	62.25-63.50	54.58	8.89
Pronotum (L)	10.00-11.25	14.50-15.25	13.05	2.00
Pronotum (W)	7.00- 7.25	9.50-10.25	8.63	1.33
Tegmen (L)	49.50-51.00	66.00-67.50	59.22	7.93
Tegmen (W)	7.75- 8.25	10.50-11.25	9.44	1.32
Hind femur (L)	23.25-24.00	31.50-32.50	28.25	3.96
Hind femur (W)	4.50- 5.25	6.25- 6.50	5.78	0.66

3.1. *Anacridium aegyptium aegyptium* (Linnaeus)

Gryllus (Locusta) aegyptium Linnaeus, 1764. Mus. Ludov. Ulric., p. 138. *Gryllus lineola* Fabricius, 1781. Species Ins., 1: 365. *Acrydium lineola* Olivier, 1791. Ency. Meth. Hist. Nat., 6: 221. *Gryllus nubecula* Thunberg, 1815. Mem. Acad. Sci. St-Petersb., 5: 238. *Podium appulum* Costa, 1836. Faun. Reg. Nap. Ortott., p. 44. *Podisma campanum* Costa, 1836. Ibid., p. 47. *Acridium tataricum* Burmeister, 1838. Handb. Ent., 2: 632. *Acridium indecisum* Walker, 1870. Cat. Derm. Salt. Brit. Mus. (N.H.), 3: 585. *Acridium albidiferum* Walker, 1870. Ibid., 4: 627. *Acridium aegyptium* Stal. 1873. Recens Orth., 1: 63. *Cyrtacanthacris aegyptius* Karsch, 1893. Berl. Ent. Z., 38: 88, 89. *Locusta aegyptia* Werner, 1908. Zool. Jb. (Syst.), 27: 123. *Orthacanthacris aegyptia* Kirby, 1910. Syn. Cat. Orth., 3(2): 444. *Orthacanthacris indecisa* Kirby, 1910. Ibid., p.445. *Anacridium aegyptium* Uvarov, 1923. Bull. Ent. Res., 14: 36.

Flamiruizia stuardol Libermann, 1943. Rev. Soc. ent. Argent., 11: 401. *Anacridium aegyptium aegyptium* Bei-Bienko, 1951. Keys Faun. USSR., 38: 245.

Material examined. Faisalabad 1♂ 2♀, 5-VI-98; 2♂, 6-III-98; Bahawalpur 2♂ 3♀, 18-IX-98; Cholistan (Bahawalnagar) 4♂ 5♀, 16-IX-99; Kharan 5♂ 4♀, 12-VIII-98; Khuzdar 3♂ 2♀, 13-VIII-99; Panjgur 2♂ 2♀, 10-VIII-98; Badin (Tharparkar) 1♀, 14-X-98; Jhelum 1♂ 1♀, 3-IV-98; Kalat 1♂, 17-VIII-98. Makran coast 1♀, 8-IX-99; Bhakkar (Thal) 1♂ 1♀, 28-X-99.

All above localities are the new record for this species. Earlier, this species has been reported from Quetta,

Pishin and Karachi by Dirsh and Uvarov (1953), Faisalabad by Ahmad (1958) and Latif *et al.* (1959) and from Chiniot by Malik *et al.* (1993).

Habitat. This species has been collected from the rocky areas and barren lands having the scattered vegetation of herbs and shrubs near maize, cotton and sorghum fields.

3.2. *Anacridium rubrispinum* Bei-Bienko

Anacridium aegyptium rubrispinum Bei-Bienko, 1948. Doklady AN SSSR, LX, 3: 499. *Anacridium rubrispinum* Dirsh and Uvarov, 1953. Eos., 15: 50.

Material examined. Dera Ghazi Khan 1♀, 18-X-99, 1♂ 1♀, 13-V-98; Bahawalpur 2♀, 18-IX-98; Kharan 2♂ 3♀, 12-VIII-98; Khuzdar 2♂ 2♀, 13-VIII-98; Multan 1♂, 14-VI-98; Makran coast 1♂ 1♀, 8-IX-99; Bhakkar (Thal) 1♂, 28-X-99; Zhob 1♀, 18-VIII-98; Lorali 1♂ 1♀, 17-VIII-98; Dera Ismail Khan 1♂ 1♀, 19-VIII-98; Kohat 2♂ 1♀, 16-IX-99; Hyderabad 1♂, 12-X-98; Badin (Tharparkar) 1♀, 14-X-98. This species has been collected for the first time from N.W.F.P. (Kohat and Dera Ismail Khan). Earlier, this species has been reported by Dirsh and Uvarov (1953) from Quetta, Pishin, Tharparkar and Karachi, Baloch (1966) from Hyderabad, Ahmad (1975-80) from Thatta, Perwin *et al.* (1983) from Karachi, Perwin *et al.* (1985) and Wagan (1990) from Sindh and Malik *et al.* (1993) from the Punjab provinces.

Habitat. It is a common species, collected from the rocky areas and barren lands having scattered vegetation of herbs and shrubs near maize, sorghum and cotton fields.

4. Genus *Chondracris* Uvarov

Type: *Chondracris rosea* (De Geer)

A single species recorded of this genus tallies with the published description (Bei-Bienko, 1951; Dirsh, 1965) of this genus.

4.1. *Chondracris rosea* (De Geer)

Acridium roseum De Geer, 1773. Mem. Hist. Ins., 3: 488. *Gryllus flavicornis* Fabricius, 1787. Mant. Insector., 1: 237. *Cyrtacanthacris lutescens* Walker, 1870. Cat. Derm. Salt. Brit. Mus. (N.H.), 3: 566. *Cyrtacanthacris fortis* Walker, 1870. Ibid., p. 567.

Acridium flavicorne Shiraki, 1910. Acrid. Jap., p. 64. *Cyrtacanthacris rosea* Kirby, 1914. Faun. Brit. Ind. Acrid., pp. 230, 231. *Chondracris rosea* Uvarov, 1924. Ann. Mag. Nat. Hist., 9 (14): 106, 108.

It entirely tallies with the published description of Bei-Bienko and Mishchenko (1951) of this species.

Material examined. Murree 1♂, 30-VII-98; Chakwal 1♂, 20-VII-99. It has been recorded for the first time from Chakwal. Earlier, Malik *et al.* (1993) recorded this species from Murree.

Habitat. Two male specimens have been collected from maize fields (Table V).

Table V. Measurements (mm) of *Chondracris rosea* De Gree

	Male : 2	Mean	S.D.
Body (L)	49.00-49.50	49.25	0.35
Pronotum (l)	13.75-14.25	14.00	0.35
Pronotum (W)	7.50- 8.00	7.75	0.35
Tegmen (L)	45.50-45.75	45.62	0.17
Tegmen (W)	9.00- 9.50	9.25	0.35
Hind femur (L)	17.00-17.50	17.25	0.35
Hind femur (W)	4.00- 4.25	4.12	0.17

5. Genus *Cyrtacanthacris* Walker

Type: *Gryllus (Locusta) ranaceus* Stoll

A single species collected in this genus completely agrees with the published description (Kirby, 1914; Dirsh, 1965) of this genus, except slight variation in body size given in Table VI.

Table VI. Measurements (mm) of *Cyrtacanthacris tatarica* (Linnaeus)

	Male:1	Female : 3	Mean	S.D.
Body (L)	39.00	51.00-52.50	48.62	6.44
Pronotum (L)	9.75	13.00-13.50	12.31	1.72
Pronotum (W)	6.25	9.50-10.00	8.81	1.72
Tegmen (L)	38.00	54.00-55.50	50.31	8.21
Tegmen (W)	6.25	8.50- 9.25	8.12	1.29
Hind femur (L)	22.75	31.00-32.00	29.31	4.39
Hind femur (W)	5.25	7.00- 7.50	6.75	0.88

5.1. *Cyrtacanthacris tatarica* (Linnaeus)

Gryllus (Locusta) tataricus Linnaeus, 1758. Syst. Nat., ed. 10, 1: 432. *Gryllus tataricus* Fabricius, 1775. Syst. Ent., p.289. *Gryllus (Locusta) ranaceus* Stoll, 1813. Spect. Saunt., p.30. *Acridium ranaceus* Burmeister, 1838. Handb. Ent., 2(2): 630. *Acridium tataricum* Burmeister, 1838. Ibid., p. 632. *Acridium aeruginosum* Burmeister, 1838. Ibid., p. 630. *Acridium ruficorne* Serville, 1838. Hist. nat. Ins., p. 643. *Cyrtacanthacris concisa* Walker, 1970. Cat. Derm. Salt. Brit. Mus. (N.H.), 3: 560. *Cyrtacanthacris inficita* Walker, 1870. Ibid., p. 565. *Cyrtacanthacris subliturata* Walker, 1870. Ibid., p. 565. *Cyrtacanthacris internexa* Walker, 1870. Ibid., 4: 613. *Cyrtacanthacris compta* Walker, 1870. Ibid., p. 613. *Cyrtacanthacris ranacea* Walker, 1870. Ibid., 3: 556. *Cyrtacanthacris tataricus* Rehn, 1901. Proc. Acad. Nat. Sci. Philad., 53: 376. *Acridium tataricus* Rehn, 1901. Canad. Ent., 33: 121. *Cyrtacanthacris tatarica* Kirby, 1902. Trans. Ent. Soc. Lond., p. 102. *Acridium concisum* Finot, 1907. Ann. Sco. Ent. Fr., 76: 332. *Acridium comptum* Finot, 1907. Ibid., p. 332. *Cyrtacanthacris aeruginosa* Karny, 1907. Akad. Wiss. Wien, 116: 304. *Acridium (Cyrtacanthacris) tataricum*

Sjostedt, 1909. Wiss. Erg. Zool. Exped., 7: 184, 187. *Acridium compta* Innes, 1912. Bull. Soc. Ent. Egypt, 2(4): 99. *Locusta tatarica* Rehn, 1914. Wiss. Ergebn. Dtsch. Zent. Afr. Exped., 5(1): 108. *Schistocerca tatarica* Brunner, 1920. Ann. Carneg. Mus., 13: 107. *Cyrtacanthacris tatarica tatarica* Kevan, 1950. Ent. Mmon. Mag., 86: 317.

Material examined. Bahawalpur 2♀, 18-IX-99 Cholistan (Bahawalnagar) 1♂, 16-IX-99; Dera Ghazi Khan 1♀, 18-V-98.

All above localities are the new record for this species. Earlier, Ahmad (1958) and Latif *et al.* (1959) collected it from Faisalabad, Perwin *et al.* (1983, 1985) from Karachi and Malik *et al.* (1993) from Jhang.

Habitat. It has been found in scattered vegetation of grasses, herbs and shrubs near cotton fields.

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