



Rec. zool. Surv. India : 111(Part-2) : 23-28, 2011

ACRIDOIDEA (ORTHOPTERA : INSECTA) DIVERSITY OF SUR SAROVAR BIRD SANCTUARY, KEETHAM, AGRA (UTTAR PRADESH, INDIA)

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INTRODUCTION

Sur Sarovar Bird Sanctuary is named after the famous poet Surdas. Declared as Bird Sanctuary by the Uttar Pradesh government in 1991, the sanctuary is spread over 713 hectares. A lake having an area of 300 hectares is present in the middle of the sanctuary. The depth of the lake ranges between 5-8 meters. Sur Sarovar Bird Sanctuary is situated on the Agra-Mathura-Delhi National Highway (No. 2), at a distance of 20 kms. from the famous historical city, Agra. This bird sanctuary is situated on the bank of river Yamuna. The sanctuary is located between 77°-26'E to 78°-51'E longitudes and 26°-43'N to 27°-26' N latitudes. The temperature varies from 5°-48° C and the rainfall varies from 517mm to 750 mm. The sanctuary supports 105 species of birds. The vegetation of this zone comprises of grasses, *Eucalyptus*, *Zizypus*, *Delbergia*, *Lantana* etc.

Short-horned grasshoppers are included in the Superfamily Acridoidea. They are moderate in size, but range from less than 10 mm to 65 mm. The form of body shape, head and thorax are diverse; antennae are filiform but sometimes ensiform; tarsi three segmented; hind femora long, slender and thick towards base and adapted for leaping; wings are either fully developed or reduced or absent; forewings in the form of leathery tegmina; hind wings fan like; male external genitalia complex, symmetrical and concealed, when not in use, by the enlarged ninth abdominal sternum (Subgenital plate).

The most notable work on Indian grasshoppers was made by Kirby (1914). He wrote "Fauna of British India, including Ceylon and Burma" Later on Bolivar (1914, 1918), Uvarov (1921, 1923, 1925, 1927, 1929, 1940, 1940a, 1940b, 1942,) have also studied the Orthoptera of Indian subcontinent. Willemese (1955) has studied the

Orthoptera of Indo-Malayan region. Later on Dirsh (1954, 1956, 1958), Dirsh & Uvarov (1953, Banerjee & Kevan (1960), Hollis (1965, 1968, 1971, 1975) Mason (1973) and Ritchie (1981, 1982) have taxonomically revised several genera. Tandon and Shishodia (1969, 1976, 1989) and Shishodia and Tandon (2004) have studied Indian grasshoppers from different states.

The present paper deals with 17 species belonging to 2 families and 17 genera. All the species are reported from the sanctuary for the first time. Three species have been recorded from Uttar Pradesh for the first time. Classification followed here is according to Uvarov (1966) and Shishodia *et. al.* (2010).

ABBREVIATIONS USED

Coll.— Name of the Collector.

SYSTEMATIC ACCOUNT

Order ORTHOPTERA

Superfamily ACRIDOIDEA

Family 1 PYRGOMORPHIDAE

Subfamily ORTHACRIDINAE

Genus 1. *Chrotogonus* Serville, 1839

1. *Chrotogonus (Chr.) trachypterus trachypterus* (Blanchard)

1836. *Ommexechea trachypterus* Blanchard, *Annl. Soc. Ent. France*, 5 : 618.

1959. *Chrotogonus (Chr.) trachypterus trachypterus* : Kevan, *Publcoes cult. Co. Diam, Angola*, No. 43 : 147.

Material examined : Near Sanctuary Main gate, 1 ♂, 5 ♀, 5.ix.2005 (Coll. N. Sharma & party); Near Keetham Lake, 1 ♂, 1 ♀, 4.ix.2005 (Coll. N. Sharma & party); Surdas House, 2 ♂, 5.ix.2005 (Coll. N. Sharma & party).

Distribution : India : Andhra Pradesh, Assam, Bihar, Chhattisgarh, Delhi, Gujrat, Haryana, Himachal Pradesh, Jammu & Kashmir, Madhaya Pradesh, Maharashtra,

Meghalaya, Orissa, Punjab, Rajasthan, Sikkim, Tamil Nadu, Uttarakhand, Uttar Pradesh, West Bengal.

Elsewhere : Afghanistan, Bangladesh, Iran, Nepal, Pakistan.

Remarks : This species is the pest of various types of crops and generally found in dry condition on a bare sandy ground.

Genus 2. *Atractomorpha* Saussure, 1861

2. *Atractomorpha crenulata* (Fabricius)

1793. *Truxalis crenulatus* Fabricius, *Ent. Syst.*, 2 : 28.

1969. *Atractomorpha crenulata*: Kevan and Chen, *Zool. J. Linn. Soc.*, 48 : 187.

Material examined : Surdas House, 2♂, 5.ix.2005 (Coll. N. Sharma & party); Near Sanctuary Main gate, 1♂, 1♀, 5.ix.2005 (Coll. N. Sharma & party); Near Keetham Lake, 2♂, 1♀, 4.ix.2005 (Coll. N. Sharma & party).

Distribution : India : Andaman & Nicobar Islands, Andhra Pradesh, Arunachal Pradesh, Assam, Bihar, Chhattisgarh, Delhi, Goa, Gujrat, Haryana, Himachal Pradesh, Jammu & Kashmir, Jharkhand, Karnataka, Kerala, Lakshadweep Islands, Madhya Pradesh, Maharashtra, Manipur, Meghalaya, Nagaland, Orissa, Punjab, Rajasthan, Sikkim, Tamil Nadu, Tripura, Uttarakhand, Uttar Pradesh, West Bengal.

Elsewhere : Bangladesh, Cambodia, Malaya, Myanmar, Nepal, Pakistan, Sri Lanka, Sumatra, Thailand, Vietnam.

Family 2 ACRIDIDAE

Subfamily ACRIDINAE

Genus 3 *Acrida* Linnaeus, 1758

3. *Acrida exaltata* (Walker)

1859. *Truxalis exaltata* Walker, *Ann. Mag. nat. Hist.*, (3) 4 : 222.

1954. *Acrida exaltata* : Dirsh, *Bull. Soc. Fouad Ent.*, 38 : 149.

Material examined : Surdas House; 2♂, 1♀, 5.ix.2005 (Coll. N. Sharma & party); Near Sanctuary Main gate, 1♀, 5.ix.2005 (Coll. N. Sharma & party); Near Keetham Lake, 2♂, 4.ix.2005 (Coll. N. Sharma & party).

Distribution : India : Andaman & Nicobar Islands, Andhra Pradesh, Arunachal Pradesh, Assam, Bihar, Chhattisgarh, Delhi, Goa, Gujarat, Haryana, Himachal Pradesh, Jammu & Kashmir, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Manipur, Meghalaya, Nagaland, Orissa, Punjab, Rajasthan, Sikkim, Tamil Nadu, Tripura, Uttarakhand, Uttar Pradesh, West Bengal.

Elsewhere : Afghanistan, Bangladesh, Iran, Pakistan, Saudi Arabia, South East Tibet, Sri Lanka, Yemen and West Aden.

Genus 4. *Phlaeoba* Stål, 1860

4. *Phlaeoba infumata* Brunner

1893. *Phlaeoba infumata* Brunner, *Annali Mus. civ. Stor. Nat. Giacomo Doria*, 33 : 124.

1914. *Phlaeoba ifumata* : Kirby, *Fauna Brit. India, Orthopt.*, : 103.

Material examined : Near Sanctuary Main gate, 1♂, 5.ix.2005 (Coll. N. Sharma & party); Near Keetham Lake, 1♂, 1♀, 4.ix.2005 (Coll. N. Sharma & party).

Distribution : India : Andhra Pradesh, Arunachal Pradesh, Assam, Bihar, Chhattisgarh, Delhi, Goa, Haryana, Himachal Pradesh, Madhya Pradesh, Manipur, Meghalaya, Nagaland, Orissa, Punjab, Rajasthan, Sikkim, Tamil Nadu, Tripura, Uttarakhand, Uttar Pradesh, West Bengal.

Elsewhere : Bangladesh, East Nepal, Hainan Islands, Myanmar, S. China, South and North Malacca, Tennasserim, Yunnan.

Subfamily OEDIPODINAE

Genus 5. *Aiolopus* Fieber, 1853

5. *Aiolopus thalassinus tamulus* (Fabricius)

1798. *Gryllus tamulus* Fabricius, *Ent. Syst., Suppl.* : 195.

1968. *Aiolopus thalassinus tamulus* : Hollis, *Bull. Brit. Mus. nat. Hist. (Ent.)*, 22 (7) : 347.

Material examined : Surdas House, 1♀, 5.ix.2005 (Coll. N. Sharma & party); Near Sanctuary Main gate, 2♂, 1♀, 5.ix.2005 (Coll. N. Sharma & party); Near Keetham Lake, 1♂, 4.ix.2005 (Coll. N. Sharma & party).

Distribution : India : Andaman & Nicobar Islands, Andhra Pradesh, Arunachal Pradesh, Assam, Bihar, Chhattisgarh, Delhi, Haryana, Himachal Pradesh, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Manipur, Meghalaya, Orissa, Punjab, Rajasthan, Tamil Nadu, Tripura, Uttarakhand, Uttar Pradesh, West Bengal.

Elsewhere : Australia, Bangladesh, Borneo, Celebes, China, Hainan, Hong Kong, Indonesia, Japan, Java, Lombok, Malaysia, Myanmar, New Guinea, Pakistan, Papua, Philippines, Singapore, Sri Lanka, Sumatra, Taiwan, Thailand and Timor.

Genus 6. *Oedaleus* Fieber, 1853

6. *Oedaleus abruptus* (Thunberg)

1815. *Gryllus abruptus* Thunberg, *Mem. Acad. Sci. St.-Petersb.*, 5 : 233.

1981. *Oedaleus abruptus* : Ritchie, *Bull. Brit. Mus. nat. Hist. (Ent)*, 42(3) : 104-107.

Material examined : Near Sanctuary Main gate, 1 ♂, 5.ix.2005 (Coll. N. Sharma & party); Surdas House, 1 ♂, 1 ♀, 5.ix.2005 (Coll. N. Sharma & party); Near Keetham Lake, 1 ♂, 4.ix.2005 (Coll. N. Sharma & party).

Distribution : India : Andhra Pradesh, Arunachal Pradesh, Bihar, Chhattisgarh, Delhi, Goa, Haryana, Himachal Pradesh, Jammu & Kashmir, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Manipur, Meghalaya, Orissa, Pondicherry, Punjab, Rajasthan, Sikkim, Tamil Nadu, Tripura, Uttarakhand, Uttar Pradesh and West Bengal.

Elsewhere : Afghanistan, Bangladesh, China, Myanmar, Nepal, Pakistan, Sri Lanka, Taiwan, Thailand and Vietnam.

Genus 7. *Trilophidia* Stål, 1873

7. *Trilophidia annulata* (Thunberg)

1815. *Gryllus annulatus* Thunberg, *Mem. Acad. Sci. St.-Petersb.*, **5** : 234.

1965. *Trilophidia annulata* : Hollis, *Trans. R. ent. Soc. London*, **117**(8) : 251.

Material examined : Near Keetham Lake, 2 ♂, 4.ix.2005 (Coll. N. Sharma & party); Near Sanctuary Main gate, 1 ♂, 1 ♀, 5.ix.2005 (Coll. N. Sharma & party); Surdas House, 2 ♂, 1 ♀, 5.ix.2005 (Coll. N. Sharma & party).

Distribution : India : Andhra Pradesh, Arunachal Pradesh, Assam, Bihar, Chhattisgarh, Delhi, Goa, Haryana, Himachal Pradesh, Jammu & Kashmir, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Manipur, Meghalaya, Nagaland, Orissa, Rajasthan, Sikkim, Tamil Nadu, Tripura, Uttarakhand, Uttar Pradesh and West Bengal.

Elsewhere : Afghanistan, Bangladesh, Borneo, South China, Japan, Hong Kong, Japan, Java, Korea, Malaysia, Mongolia, Myanmar, Nepal, Pakistan, Philippines, Sarawak, Singapore, Sri Lanka, Sumatra, Taiwan, Thailand, Vietnam.

Subfamily HEMIACRIDINAE

Genus 8. *Hieroglyphus* Krauss, 1877

8. *Hieroglyphus nigrorepletus* (Bolivar)

1912. *Hieroglyphus nigrorepletus* Bolivar, *Trab. Mus. Cienc. nat. Madr.*, no. **6** : 56.

1973. *Hieroglyphus nigrorepletus* : Mason, *Bull. Brit. Mus. nat. Hist. (Ent.)*, **28**(7) : 340.

Material examined : Near Sanctuary Main gate, 2 ♂, 1 ♀, 5.ix.2005 (Coll. N. Sharma & party); Surdas House, 1 ♂, 2 ♀, 5.ix.2005 (Coll. N. Sharma & party); Near Keetham Lake, 1 ♀, 4.ix.2005 (Coll. N. Sharma & party).

Distribution : India : Andhra Pradesh, Assam, Bihar, Delhi, Jammu & Kashmir, Karnataka, Madhya Pradesh,

Maharashtra, Orissa, Punjab, Rajasthan, Uttarakhand, Uttar Pradesh and West Bengal.

Elsewhere : Bangladesh and Pakistan.

Subfamily SPATHOSTERNINAE

Genus 9. *Spathosternum* Krauss, 1877

9. *Spathosternum prasiniferum prasiniferum* (Walker)

1871. *Heteracris* (?) *prasinifera* Walker, *Cat. Derm. Salt. Brit. Mus.*, **5** Suppl. : 65.

1936. *Spathosternum prasiniferum prasiniferum* : Tinkham, *Lingman. Sci. Journ. Canton*, **15** : 51.

Material examined : Surdas House, 3 ♂, 2 ♀, 5.ix.2005 (Coll. N. Sharma & party); Near Sanctuary Main gate, 2 ♂, 3 ♀, 5.ix.2005 (Coll. N. Sharma & party); Near Keetham Lake, 2 ♂, 2 ♀, 4.ix.2005 (Coll. N. Sharma & party).

Distribution : India : Andaman & Nicobar Islands, Andhra Pradesh, Arunachal Pradesh, Assam, Bihar, Chhattisgarh, Delhi, Goa, Himachal Pradesh, Jammu & Kashmir, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Manipur, Meghalaya, Mizoram, Nagaland, Orissa, Punjab, Rajasthan, Sikkim, Tamil Nadu, Tripura, Uttarakhand, Uttar Pradesh and West Bengal.

Elsewhere : Bangladesh, Hainan, Myanmar, Nepal, Pakistan, South East China, Sri Lanka, Thailand, Vietnam and West Malaysia.

Subfamily OXYINAE

Genus 10. *Oxya* Serville, 1831

10. *Oxya fuscovittata* (Marschall)

1836. *Gryllus fuscovittatus* Marschall, *Ann. Wien. Mus. Naturg.*, **1** : 211.

1971. *Oxya fuscovittata* : Hollis, *Bull. Brit. Mus. nat. Hist. (Ent.)*, **26**(7) : 289.

Material examined : Near Sanctuary Main gate, 1 ♂, 2 ♀, 5.ix.2005 (Coll. N. Sharma & party); Surdas House, 1 ♂, 1 ♀, 5.ix.2005 (Coll. N. Sharma & party); Near Keetham Lake, 2 ♀, 4.ix.2005 (Coll. N. Sharma & party).

Distribution : India : Andhra Pradesh, Arunachal Pradesh, Assam, Bihar, Chhattisgarh, Delhi, Goa, Himachal Pradesh, Jammu & Kashmir, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Manipur, Meghalaya, Nagaland, Orissa, Rajasthan, Sikkim, Tamil Nadu, Tripura, Uttarakhand, Uttar Pradesh and West Bengal.

Elsewhere : Afghanistan, Bangladesh, Nepal, Pakistan and USSR.

Subfamily CALLIPTAMINAE

Genus 11. *Acorypha* Krauss, 1877

11. *Acorypha glaucopsis* (Walker)

1870. *Caloptenus glaucopsis*, Walker, *Cat. Derm. Salt. B.M.* **iv** : 702.

2009. *Acorypha glaucopsis*, Hemp, *Jour. Orth. Res.*, **18**(2) : 197.

Material examined : Near Sanctuary Main gate, 2♂, 5.ix.2005 (Coll. N. Sharma & party).

Distribution : India : Andhra Pradesh, Bihar, Chhattisgarh, Delhi, Himachal Pradesh, Jammu & Kashmir, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Rajasthan, Tamil Nadu and Uttarakhand.

Elsewhere : Iran and Saudi Arabia.

Remarks : This species is rare and has been recorded for the first time from Uttar Pradesh.

Subfamily EYEPREPOCNEMIDINAE

Genus 12. *Heteracris* Walker, 1870

12. *Heteracris pulchra* (Bolivar)

1902. *Euprepocnemis pulchra* Bolivar, *Annls. Soc. ent. France*, **70** : 630.

1958. *Heteracris pulchra* : Dirsh, *Tijdschr. Ent.*, **101** : 54.

Material examined : Near Sanctuary Main gate, 2♂, 3♀, 5.ix.2005 (Coll. N. Sharma & party); Near Keetham Lake, 1♂, 1♀, 4.ix.2005 (Coll. N. Sharma & party).

Distribution : India : Andhra Pradesh, Bihar, Delhi, Orissa, Tamil Nadu, Uttarakhand, Uttar Pradesh and West Bengal.

Elsewhere : Sri Lanka.

Remarks : The species has been recorded for the first time from Uttar Pradesh.

Genus 13. *Eyprepocnemis* Fieber, 1853

13. *Eyprepocnemis alacris alacris* (Serville)

1839. *Acridium alacre* Serville, *Hist. Nat. Ins. Orth.*, : 682.

1958. *Eyprepocnemis alacris alacris* : Dirsh, *Proc. R. ent. Soc. London*, (B) **27**(3-4) : 40.

Material examined : Near Keetham Lake, 1♂, 2♀, 4.ix.2005 (Coll. N. Sharma & party); Near Sanctuary Main gate, 1♀, 5.ix.2005 (Coll. N. Sharma & party).

Distribution : India : Haryana, Andhra Pradesh, Arunachal Pradesh, Assam, Bihar, Chhattisgarh, Delhi, Goa, Himachal Pradesh, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Manipur, Meghalaya, Orissa, Punjab, Rajasthan, Sikkim, Tamil Nadu, Tripura, Uttarakhand, Uttar Pradesh and West Bengal.

Elsewhere : Afghanistan, Bangladesh, Iran, Iraq, Pakistan and Sri Lanka.

Subfamily CATANTOPINAE

Genus 14. *Choreodocus* Bolivar, 1914

14. *Choreodocus robustus* (Serville)

1839. *Acridium robustus* Serville, *Ins. Orth.*, 647.

1921. *Choreodocus robustus* : Uvarov, *Trans. ent. Soc. Lond.* (69) : 109.

Material examined : Surdas House, 1♂, 2♀, 5.ix.2005 (Coll. N. Sharma & party); Near Sanctuary Main gate, 1♂, 2♀, 5.ix.2005 (Coll. N. Sharma & party); Near Keetham Lake, 2♂, 1♀, 4.ix.2005 (Coll. N. Sharma & party).

Distribution : India : Arunachal Pradesh, Andhra Pradesh, Assam, Himachal Pradesh, Manipur, Meghalaya, Nagaland, Sikkim, Tripura and West Bengal.

Elsewhere : Bangladesh.

Genus 15. *Paraconophyma* Uvarov, 1921

15. *Paraconophyma scabra* (Walker)

1870. *Caloptenus scaber* Walker, *Cat. Derm. Salt. Brit. Mus.*, **4** : 707.

1921. *Paraconophyma scabra* : Uvarov, *Ann. Mag. nat. Hist.*, (9) **7** : 500, 501.

Material examined : Near Keetham Lake, 2♂, 4.ix.2005 (Coll. N. Sharma & party).

Distribution : India : Bihar, Delhi, Himachal Pradesh, Jammu and Kashmir, Karnataka, Manipur, Rajasthan, Tamil Nadu, Uttarakhand and West Bengal.

Remarks : The species is a rare species in Uttar Pradesh.

Genus 16. *Diabolocatantops* Jago, 1984

16. *Diabolocatantops innotabilis* (Walker)

1870. *Acridium innotabile* Walker, *Cat. Derm. Salt. Brit. Mus.*, **4** : 629.

1953. *Catantops pinguis innotabilis* : Dirsh and Uvarov, *Tijdsch. Ent.*, **96**(3) : 233.

1984. *Diabolocatantops innotabilis*, Jago, *Trans. Amer. Entomol. Soc.*, **110**(3) : 371.

Material examined : Surdas House, 1♂, 5.ix.2005 (Coll. N. Sharma & party); Near Sanctuary Main gate, 1♂, 2♀, 5.ix.2005 (Coll. N. Sharma & party); Near Keetham Lake, 2♀, 4.ix.2005 (Coll. N. Sharma & party).

Distribution : India : Haryana, Andhra Pradesh, Arunachal Pradesh, Assam, Bihar, Chhattisgarh, Delhi, Goa, Himachal Pradesh, Jammu & Kashmir, Karnataka, Kerala, Lakshadweep Island, Madhya Pradesh, Maharashtra, Manipur, Meghalaya, Nagaland, Orissa, Rajasthan, Sikkim, Tamil Nadu, Tripura, Uttarakhand, Uttar Pradesh and West Bengal.

Elsewhere : Afghanistan, Bangladesh, Borneo, Cambodia, China, Hong Kong, Indo-China, Japan, Java, Korea, Malaysia, Myanmar, Nepal, New Guinea, Pakistan, Philippines, Sri Lanka, Sumatra, Tibet and Thailand.

Genus 17. *Xenocatantops* Dirsh and Uvarov, 1953

17. *Xenocatantops karnyi* (Kirby)

1910. *Catantops karnyi* Kirby, *Syn. Cat. Orthopt.*, **3** : 483.

1982. *Xenocatantops karnyi* : Jago, *Trans. Am. ent. Soc.*, **108**(3) : 455.

Material examined : Near Sanctuary Main gate, 2 ♀, 5.ix.2005 (Coll. N. Sharma & party); Near Keetham Lake, 1 ♂, 4.ix.2005 (Coll. N. Sharma & party).

Distribution : India : Andhra Pradesh, Arunachal Pradesh, Assam, Chhattisgarh, Delhi, Himachal Pradesh, Maharashtra, Orissa, Tamil Nadu, Tripura, Uttarakhand and Uttar Pradesh.

Elsewhere : Nepal.

Remarks : The species has been recorded for the first time from Uttar Pradesh.

ACKNOWLEDGEMENTS

Author is thankful to the Director, Zoological survey of India, Kolkata and Dr. T. K. Pal, Officer Incharge, Entomology Division A and Field Survey Division, ZSI for all sorts of facilities in connection with this survey. My sincere thanks are also to Dr S.K. Mondal, Assistant Zoologist, for helping in the completion of the manuscript.

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