



On a collection of Acridoidea (Orthoptera) from Ladakh region of Jammu and Kashmir, India

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Abstract

While undertaking the insect survey in the Ladakh region of Jammu and Kashmir State of India, a total of 33 specimens of grasshoppers were collected. The collected materials comprised of 10 species belonging to 8 genera and 04 subfamilies under 02 families of Acridoidea. With the photographs of each species, a key of species is also provided. *Sphingonotus (Sphingonotus) eurasius eurasius* Mistshenko, 1937 is recorded for the first time from the state.

Keywords: Distribution, First Record, Grasshoppers, Himalaya, Locusts

Introduction

Ladakh is one of the three main regions of Jammu and Kashmir state of India. According to Champion and Seth (1968), Ladakh is a dry alpine scrub that completely lacks forest cover, except some species of shrubs, mostly vegetation are Palaearctic and Oriental. Due to its peculiar geographical, topographical and climatic conditions, this region is represented by different types of natural ecosystems which include major wetlands and globally exceptional fauna and flora. The area is a good habitat for flowering and medicinal plants, which attracts the diverse insects. Superfamily Acridoidea is a group of insects like grasshoppers and locusts in the order Orthoptera. In spite of less studied fauna of Orthoptera of Jammu and Kashmir and especially in Ladakh region, some scientific literature such as Balderson and Yin (1991), Reshi and Azim (2008), Reshi *et al.*, (2008) Azim and Reshi (2009, 2010) and Azim *et al.* (2009, 2010) on distribution, diversity and taxonomy of Acridoidea in the state were published. Shishodia *et al.* (2010) reported 77 species in 56 genera belonging to 9 subfamilies of Orthoptera from Jammu & Kashmir. Chandra and Gupta (2013) reported 16 species of Orthoptera as endemic to Jammu and Kashmir. Recently Kumar *et al.*, (2015) compiled the acridid fauna of the state and reported 70 species belonging to 43 genera in 12 subfamilies of Acrididae.

The present paper deals with the distribution localities of acridid species in Ladakh region along with the first record of a species from the state.

Material and Methods

The specimens of grasshoppers were collected from different localities of Ladakh region of Jammu and Kashmir, India during a survey conducted in connection with a major research project entitled “Biodiversity Assessment through long-term monitoring plots in Indian Himalayan Landscape” during 2017. The collection was made with the help of sweeping net and by direct hand picking. For the morphological studies, specimens were relaxed, stretched, pinned and labelled. Identification was done with the help of keys provided by Kumar and Usmani (2014, 2015). Photographs were taken by a Nikon digital camera (D-7000). All the specimens were deposited in the National Zoological Collection of Zoological Survey of India, Kolkata, India (NZSI). All the measurements are in millimetre. The collection localities are given in the Table 1.

Results

Altogether 33 specimens of grasshoppers were collected. Identification of these specimens resulted in the presence

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Table 1. Different collection localities in Ladakh region of Jammu & Kashmir, India

S. No.	District	Localities	Latitude	Longitude	Altitude
1	Kargil	Matayen	34.36914	75.59556	3323
2	Kargil	Sanjak	34.57517	76.52619	2786
3	Kargil	Hagnis	34.47758	76.46936	3345
4	Kargil	Darchiks	34.63364	76.38758	3345
5	Kargil	Parkachik	34.08231	75.97936	3525
6	Kargil	Batalik	34.65439	76.34144	2876
7	Kargil	Tangole	34.058	75.93303	3359
8	Kargil	Minjee	34.48894	76.10322	2796
9	Kargil	Saliskote	34.39903	76.01017	2875
10	Leh	Hanu	34.59111	76.59111	3281
11	Leh	Chilling	34.03706	77.20856	3198
12	Leh	Tsomoriri	32.92069	78.27483	4620
13	Leh	Khardong La	34.33083	77.64897	4700

of 10 species belonging to 8 genera of 4 subfamilies under 2 families of Acridoidea. The maximum numbers of species (7) belong to subfamily Oedipodinae and *Sphingonotus* (*Sphingonotus*) *eurasius eurasius* Mistshenko, 1937 is recorded the first time from the state.

Taxonomic Account

Order ORTHOPTERA Olivier, 1789

Suborder CAELIFERA Ander, 1939

Superfamily ACRIDOIDEA MacLeay, 1821

Family DERICORYTHIDAE Jacobson & Bianchi, 1905

Subfamily CONOPHYMINAE Mistshenko, 1952

1. *Conophyma kashmiricum* Mistshenko, 1950 (Fig. 1)

Materials examined: Kargil, Matayen, 1♂, 2♀, 04.vii.2017. coll. Mohd. Ali.

Diagnosis: Median sized; antennae filiform; fastigium rounded; frontal ridge slightly depressed; dorsum of pronotum with median carina low, crossed by posterior transverse sulcus; prosternal process conical; tegmina and wings absent.

Male: Body: 15.0; Pronotum: 4.0; Hind femur: 10.0; Hind tibia: 8.0. Female: Body: 20.0; Pronotum: 4.5; Hind femur: 12.0; Hind tibia: 9.5.

Family ACRIDIDAE MacLeay, 1821

Subfamily MELANOPLINAE Scudder, 1897

2. *Dicranophyma babaulti* Uvarov, 1925 (Fig. 2)

Materials examined: Kargil, Saliskote, 1♂, 05.ix.2017 coll. Mohd. Ali.

Diagnosis: Medium sized; antennae somewhat compressed; fastigium of vertex forming distinct angle with frontal ridge; frontal ridge flat; dorsum of pronotum with median carina low, crossed by posterior sulcus; prosternal process transverse; tegmina lateral.

Male: Body: 13.25; Pronotum: 2.55; Tegmina: 2.46; Hind femur: 7.72; Hind tibia: 6.6.

Subfamily CALLIPTAMINAE Jacobson, 1905

3. *Acorypha glaucopsis* (Walker, 1870) (Fig. 3)

Materials examined: Kargil, Matayen, 1♂, 1♀, 04.vii.2017; Minjee, 1♀, 06.ix.2017; Leh, Hanu, 1♀, 20.ix.2017 coll. Mohd. Ali.

Diagnosis: Medium sized; antennae filiform; fastigium of vertex with longitudinal concavity; frontal ridge flat; dorsum of pronotum with median carina distinct, crossed by three transverse sulci; prosternal process cylindrical; tegmina and wings fully developed.

Male: Body: 19.5; Pronotum: 4.5; Tegmina: 16.0; Hind femur: 12.5; Hind tibia: 9.5.

Female: Body: 32.0; Pronotum: 7.0; Tegmina: 23.5; Hind femur: 17.5; Hind tibia: 15.0.

Subfamily OEDIPODINAE Walker, 1871

4. *Bryodema luctuosa inda* Saussure, 1884 (Fig. 4)

Materials examined: Leh, Khardong La, 1♂, 28.vii.2017; Tsomoriri, 2♂, 31.vii.2017; 1♀, 01.viii.2017 coll. Mohd. Ali.

Diagnosis: Large sized; antennae filiform; fastigium of vertex narrowing apically; frontal ridge impressed; dorsum of pronotum with median carina distinct, crossed by two transverse sulci; tegmina long, apex rather broad, roundly truncate, sometimes brachypterous in female.

Male: Body: 30.0; Pronotum: 8.5; Tegmina: 38.0; Hind femur: 19.0; Hind tibia: 14.0. Female: Body: 34.0; Pronotum: 10.0; Tegmina: 21.0; Hind femur: 19.5; Hind tibia: 15.0.

5. *Sphingonotus (Sphingonotus) eurasius eurasius* Mistshenko, 1937 (Fig. 5)

Materials examined: Kargil, Hagnis, 1♀, 21.ix.2017 coll. Mohd. Ali.

Diagnosis: Small to medium sized; antennae filiform; fastigium of vertex slightly concave; frontal ridge flat; dorsum of pronotum saddle-shaped, median carina linear, crossed by two transverse sulci; tegmina fully developed, apex narrow; hind wings with a dark transverse band.

Female: Body: 25.0; Pronotum: 5.0; Tegmina: 24.5; Hind femur: 14.0; Hind tibia: 10.0.

6. *Sphingonotus (Sphingonotus) rubescens fallax* Mishchenko, 1937 (Fig. 6)

Materials examined: Kargil, Darchiks, 1♀, 08.ix.2017 coll. Mohd. Ali.

Diagnosis: Small to medium sized; antennae filiform; fastigium of vertex slightly concave; frontal ridge flat; dorsum of pronotum saddle-shaped, median carina linear, crossed by two transverse sulci; tegmina fully developed, apex narrow; hind wings without any band.

Female: Body: 26.0; Pronotum: 6.0; Tegmina: 29.5; Hind femur: 14.0; Hind tibia: 12.0.

7. *Aiolopus simulatrix simulatrix* (Walker, 1870) (Fig. 7)

Materials examined: Kargil, Saliskote, 2♂, 05.ix.2017 coll. Mohd. Ali.

Diagnosis: Medium sized; antennae filiform; fastigium of vertex elongate-angular; frontal ridge flat; pronotum slightly tectiform, median carina weak, crossed by posterior transverse sulcus only; tegmina and wings fully developed.

Male: Body: 15.0; Pronotum: 3.0; Tegmina: 12.0; Hind femur: 11.0; Hind tibia: 8.0.

8. *Locusta migratoria migratoria* (Linnaeus, 1758) (Fig. 8)

Materials examined: Leh, Chilling, 2♂, 18.vii.2017; Kargil, Tangole, 2♂, 2♀, 23.viii.2017; Saliskote, 2♂, 2♀, 05.ix.2017; Minjee, 1♂, 06.ix.2017; Leh, Hanu, 1♀, 20.ix.2017 coll. Mohd. Ali.

Diagnosis: Large sized; antennae filiform; fastigium of vertex slightly concave with obtuse apex; frontal ridge flat; pronotum strongly tectiform, median carina equally raised in prozona and metazona, slightly excised at posterior transverse sulcus; tegmina and wings fully developed.

Male: Body: 30.0; Pronotum: 7.0; Tegmina: 32.0; Hind femur: 19.0; Hind tibia: 16.0. Female: Body: 37.0; Pronotum: 8.0; Tegmina: 40.0; Hind femur: 23.0; Hind tibia: 20.0.

9. *Oedipoda himalayana* Uvarov, 1925 (Fig. 9)

Materials examined: Kargil, Parkachik, 1♀, 22.viii.2017; Leh, Hanu, 1♀, 20.ix.2017 coll. Mohd. Ali.

Diagnosis: Small to medium sized; antennae filiform; fastigium of vertex concave, apex obtuse; frontal ridge sulcate; pronotum tectiform, median carina strongly raised in prozona and moderately raised in metazona, deeply excised at posterior transverse sulcus; tegmina fully developed; hind wings with dark bands narrow.

Female: Body: 22.0; Pronotum: 5.0; Tegmina: 23.0; Hind femur: 15.0; Hind tibia: 11.0.

10. *Oedipoda miniata miniata* (Pallas, 1771) (Fig. 10)

Materials examined: Kargil, Batalik, 1♀, 16.ix.2017; Sanjak, 1♀, 19.ix.2017 coll. Mohd. Ali.

Diagnosis: Small to medium sized; antennae filiform; fastigium of vertex concave, apex obtuse; frontal ridge sulcate; pronotum tectiform, median carina strongly raised in prozona and moderately raised in metazona, deeply excised at posterior transverse sulcus; tegmina fully developed; hind wings with dark band wide.

Female: Body: 24.0; Pronotum: 6.0; Tegmina: 21.0; Hind femur: 14.0; Hind tibia: 11.0.

Key to species

(Edited from Kumar and Usmani, 2014 and 2015)

- 1. Tegmina and wings rudimentary or fully developed... **2**
 - Tegmina and wings completely absent or hardly perceptible..... **Conophyma kashmiricum** Mistshenko, 1950
- 2. Tegmina and wings fully developed..... **3**
 - Tegmina flap like lateral **Dicranophyma babaulti** Uvarov, 1925
- 3. Prosternal process usually absent, if present, body strongly elongate and antennae ensiform; hind tibia without external apical spine **4**
 - Prosternal process present; hind tibia with or without external apical spine..... **Acorypha glaucopsis** (Walker, 1870)
- 4. Pronotum with median carina crossed by one transverse sulcus or not crossed at all **7**
 - Pronotum with median carina crossed by two transverse sulci **5**
- 5. Body medium to small size; tegmina with apex narrow; pronotum saddle-shaped, apex rounded..... **6**

- Body large and robust; tegmina with apex broad; pronotum slightly convex, apex angular **Bryodema luctuosa inda** Saussure, 1884
- 6. Wings with a dark transverse band..... **Sphingonotus (Sphingonotus) eurasius eurasius** Mistshenko, 1937
 - Wings without dark transverse band..... **Sphingonotus (Sphingonotus) rubescens fallax** Mishchenko, 1937
- 7. Pronotum with median carina well developed..... **8**
 - Pronotum with median carina weak **Aiolopus simulatrix simulatrix** (Walker, 1870)
- 8. Median carina of pronotum strongly raised in prozona and moderately in metazona; deeply excised by posterior transverse sulcus..... **9**
 - Median carina of pronotum equally raised in prozona and metazona; slightly excised by posterior transverse sulcus **Locusta migratoria migratoria** (Linnaeus, 1758)
- 9. Tegmina with apical half hyaline; hind femur with inner surface of inferior side never blackish; wings with dark bands narrow **Oedipoda himalayana** Uvarov, 1925
 - Tegmina with only apex hyaline; hind femur with inner surface of inferior side black; wings with dark band wide..... **Oedipoda miniata miniata** (Pallas, 1771)

Acknowledgements

The authors are highly thankful to the Director, Zoological Survey of India, Kolkata for providing necessary facilities and encouragements. We wish to extend our gratitude to the Ministry of Environment Forest and Climate Change, New Delhi for providing financial assistance for a large grant research project (Ref. No. NMHS/LG-2016/0011) entitled “Biodiversity Assessment through long-term monitoring plots in Indian Himalayan Landscape”.

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Plate 1



10 mm

1. *Conophyma kashmiricum*
Mistshenko, 1950



10 mm

2. *Dicranophyma babaulti*
Uvarov, 1925



10 mm

3. *Acorypha glaucopsis*
(Walker, 1870)



10 mm

4. *Bryodema luctuosa inda*
Saussure, 1884

Plate 2



10 mm

5. *Sphingonotus (Sphingonotus) eurasius eurasius* Mistshenko, 1937



10 mm

6. *Sphingonotus (Sphingonotus) rubescens fallax* Mishchenko, 1937



10 mm

7. *Aiolopus simulatrix simulatrix* (Walker, 1870)



10 mm

8. *Locusta migratoria migratoria* (Linnaeus, 1758)

Plate 3



10 mm

9. *Oedipoda himalayana*
Uvarov, 1925



10 mm

10. *Oedipoda miniata miniata*
(Pallas, 1771)