

**INDIAN SPECIES OF GENUS *LEVA* BOLIVAR, 1909, AND
SUBGENUS *CHORTHIPPUS* JAGO, 1971, (ORTHOPTERA :
ACRIDIDAE : GOMPHOCERINAE)**

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INTRODUCTION

The genus *Leva* Bolivar, 1909, consists of five valid species in India, of which three species are indigenous. Of these five, four have a restricted distribution in Southern and Western India; only one species, *L. indica*, is found throughout the length and breadth of the country.

The species of this genus are little known and their taxonomy not yet clarified. In this communication, attempts have been made to reexamine the morphology of the available species. *L. cruciata* has been newly recorded from Andhra Pradesh, Orissa and Tripura, and *L. mundus* is reported from Northern India (Punjab) for the first time.

The genus *Chorthippus* Fieber, 1852, is represented in India by two indigenous species and a subspecies of a third species of Russian and Chinese affinity. According to Jago (1971) all of them belong to the largest subgenus - *Chorthippus* (*Chorthippus*), other five subgenera being yet without any representatives in the country. The members of this subgenus have the following combination of characters - antennae often flattened, which are unwidened to slightly and gradually widened apex (but never clubbed nor showing tendency of club - formation), and a distinctly to hardly expanded medial area of ♂ tegmen (medial area not greatly expanded forming a stridulatory speculum), and width of CU₁ area being at least half width of medial area and never occluded. Lastly, their temporal foveolus is at least 3 times longer than deep. Length to depth ratio of post-femur is at least 5.

Indian members of this sub-genus are restricted to the southern slopes of the western Himalayas, all of them being available in the same habitat. Of the two species, one of them, *C. (C.) almoranus*, is described here on the basis of a unique male, and the exotic subspecies, *C. (C.) hammarstroemi hammarstroemi*, is also represented by a few specimens from the same locality in the western Himalayas. Further, more specimens are urgently required and reliable specific identification will only be possible after recordings of their 'songs' have been obtained.

For latest bibliographical references to the members of both the genera, Bhowmik (1985) may be consulted.

SYSTEMATIC ACCOUNT

Order	ORTHOPTERA
Family	ACRIDIDAE
Subfamily	GOMPHOCERINAE
(a) Genus	<i>Leva</i> Bolivar, 1909

Key to Indian species of Leva

1. Lateral carinae in prozona almost parallel-sided up to 3rd sulcus, in metazona strongly divergent.....*indica* Bol., 1909.
Lateral carinae strongly constricted and inflexed in middle of compressed prozona, but divergent in metazona..... 2
2. Frontal ridge distinctly sulcate throughout, convergent near fastigial apex but divergent towards clypeo-frontal suture.....*cruciata* Bol., 1914.
Frontal ridge (between antennae) depressed, plain, subenlarged; impress-punctate, convergent before fastigial apex; hardly sulcate 3
3. Frontal ridge well marginated; reasonably divergent towards clypeo-frontal suture.....*trapezoidalis* Bol., 1914.
Frontal ridge subcarinate; its margins distinct before converging fastigial apex, but towards clypeus obsolete; foveolae narrowly separated from each other..... 4
4. Tegmen shorter than abdomen, having three to four somewhat black spots in medial area; wing a little infuscate apically.....
.....*apicalis* Walk., 1871
Tegmen longer than abdomen having three to four light brown spots in medial area and some vague small spots on radial area; wing entirely hyaline.....*mundus* Walk., 1871

Leva indica (Bolivar, 1909)

1909. *Gymnobothrus indicus* Bolivar, *Bol. Soc. esp. Hist. nat.*, 9 : 295.

Material : 5 ♂♂; Babbili, Vizianagar, A.P.; 18.9.83. 2 ♂♂, 1 ♀; Near Seabeach, Vizak, A.P.; 2.9.83; 1 ♂, 2 ♀, Tikarpara, Dhenkanal, Orissa; 23.9.85. 3 ♂♂; Dhenkikote, Kheonjhar, Orissa; 29.9.83. 2 ♂♂, 1 ♀ Purnakote, Orissa; 17.9.83. 1 ♂; Joshipur, Orissa; 6.10.85. 1 ♂; Angul, Orissa; 13.9.85. All by H.K.Bhowmik.

Remarks : Bhowmik (1986) has given a description of the species. The species shows, however, variability as regards its colour pattern. Apex of post. femur with its knee lobes and base of post. tibia are usually brownish; post. tibia annulated with a pale

ring after brownish base. But the colour spots of tegmina, post-ocular colour bands and dark colour of post. femoral apices may be totally absent. In well preserved specimens, these colour patterns are distinct. Besides, on the basis of the current series the following observations can be made.

Frontal ridge which is convergent towards clypeal end distinctly sulcate in ♂, in ♀, it is, however, less grooved and less divergent (i.e., almost parallel sided). Fastigium of vertex deeply grooved in middle, presenting impression of a transverse furrow; a fine median carinula is detectable from behind fastigial base which extends up to border of pronotum. In posterior tibia, after the dark base, a yellowish ring is evident, remaining portion of it being light brownish. Small and slender habitus.

As a whole, the species is variable and always exhibits certain minor differences from population to population.

Lava cruciata Bolivar, 1914

1914. *Lava cruciata* Bolivar, *Trab. Mus. Cienc nat Madr.* 20 : 65.

Material : 4 ♀♀, Dhenkikote, Orissa; 1.10.85. 1 ♀, Balugaon, Puri, Orissa 30.9.83. 1 ♀, Sea beach, Vizak, A.P.; 2.9.83. 1♀; Araku Valley, A.P.; 7.9.83. 4 ♀♀; Tripurah state (different localities); 7 - 22.2.83.

Remarks : The species was described from India oriental (t.c.) and is known from Karnatak (Mysore), T.N. (Coimbatore) and Sri Lanka. The present localities are, therefore, new records for it.

The specimens before me agree well with known descriptions. It is very close to *L. indica* in its colour pattern, this being particularly true of specimens from Tripurah; Oriyan material is more testaceous in appearance. Morphologically the species differs from *L. indica* in the following main characters :

Lateral carinae of pronotum more incurved in middle, narrowest part being in between 1st and 2nd sulci; pale in appearance and cruciform in shape after 3rd sulcus, cruciform mark is of dumbel-shaped. Precostal area of tegmen, beside a false vein, with a few transverse veinlets; costal area with 8 to 9 oblique veinlets; cubital area with a somewhat false intercalated vein in proximal quarter. Bigger in size than *L. indica*.

Measurement : (♀ only)

Body	13 - 17.5
Antenna	5.5 - 6
Pronotum	3.23 - 3.5
Tegmen	12 - 12.5
Post. femur	8.5 - 9.5
Post. tibia	8 - 9

Leva mundus (Walker, 1871)

1871. *Stenobothrus mundus* Walker, *Cat. Derr. Salt. Br. Mus.*, 5 (suppl) : 79.

Material : 1 ♂, 3 ♀♀; Hoshiarpur, Punjab; 8 - 11.10.82; H.K.B. coll.

Remarks : The species is generally known from Bombay (Maharashtra). The present locality is a new record from Northern India.

The specimens in hand completely tally with the known account, specially with the generic characters of *Stenohippus*. However, the species is unique in having the following salient features—frontal ridge convex at superior part; from below middle ocellus deplanate, with bounding carinulae somewhat recognizable, but not sulcate in true sense. Lateral carinae of pronotum may be missing in between 2nd and 3rd sulci or indistinct; on metazona it is very weak and fine.

Measurements : (♀ only)

Body	16 - 16.5
Antenna	6.5 - 7
Pronotum	3.25 - 3.5
Tegmen	16 - 16.5
Post. femur	14 - 14.5
Post. tibia	7.5

(b) Genus *Chorthippus* Fieber, 1852

Subgenus *Chorthippus (Chorthippus)* Jago, 1971

Key to Indian species of the subgenus

- Length of separate middle segments of antenna in ♂ twice, in ♀ 1.25 - 1.5 times greater than greatest width. Medial field wide in both sexes, its greatest width in ♂ twice, in ♀ 1.5 times greater than greatest width of cubital area.....*hummarstroemi hummarstroemi* Miram, 1906
Separate middle segments in ♂ more than twice, in ♀, more than 1.5 times. Medial field not more than 1.25 to 1.5 times wider, in both sexes, than width of cubital field..... 2
- Hairy species. Antenna short, thick, scarcely longer than head and pronotum, middle segments not more than twice as long as wide. Tegmen longer reaches apex of supra-anal plate; medial field scarcely wider than cubital area which is crossed by irregular veinlets. Lateral carinae strongly raised, angularly incurved in middle of prozona. Posterior margin of metazona obtuse angular.....*almoranus* Uvarov, 1942

Not hairy. Antenna longer than head and pronotum, slender, segments elongate in middle. Tegmen extending a little beyond post. knees; medial field fairly wider, with regular cross-veinlets, cubital area slightly narrower than medial area and similar having regular cross-veinlets. Lateral carinae roundly inflexed (with a tendency to become angular) in prozona. Fastigium of vertex elongate-parabolic, with subacute apex. Posterior border of matazona rounded.....
.....*indus* Uvarov, 1942

***Chorthippus (Chorthippus) indus* Uvarov, 1942**

1942. *Chorthippus indus* Uvarov, *Eos.* 18 : 88-89. fig.2.

Material : 6 ♂♂, 7 ♀♀ (and 4 nymphs), Manali (different localities as Vsist, Dhungri, Rohtang Pass) H.P.; 25 - 27.9.80; H.K.B. coll. 3 ♂♂; Solan, H.P.; 20.4.77; J.M. Julka and P. Halder coll.

Remarks : The species was described from western parts of Pakistan and the western Himalayas, and seems to be abundant in its distributional ranges.

The present series from the upper H.P. completely agrees with the original description including figure and measurement given by Uvarov (op.cit).

***Chorthippus (Chorthippus) hammarstroemi hammarstroemi* (Miram 1906)**

This subspecies has already been reported earlier (Bhowmik & Halder, 1983).

SUMMARY

Three species of the genus *Lava* and two species of the subgenus *Chorthippus* have been studied, with discovery of new records of distribution for two species of the former genus. Practical keys to the species and subspecies of involved genera are given.

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