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THREE NEW SPECIES OF GRASSHOPPER (*ORTHOPTERA : ACRIDIDAE*) FROM INDIA

By

H. K. Bhowmik

Zoological Survey of India, Calcutta-16

(With 17 figures and 3 plates)

ABSTRACT

Three new species of grasshopper, viz., Dnopherula (*Aulacobothrus jaganathi* (Subfamily : Gomphocerinae), *Xenocatantops japabandhui* and *Diabolocatantops sukhadae* (Subfamily : Catantopinae), are described from India, with illustrations. Their affinities are also discussed.

Introduction

While working on the grasshopper fauna of India, I have come across with some interesting collections. These were sent to Dr. N. D. Jago, O/C Acridid Taxonomy, of the Tropical Development and Research Institute, London, for confirmation. Dr. Jago has kindly confirmed these three species as new to science, the descriptions of which follow in this communication. The descriptions have been further elaborated with photographic profiles so as to make the identity of the species more authentic. Suitable measurements and affinities of the species are also provided under the heading "Discussion".

The types are with the author which will ultimately be deposited to the national collections of Z. S. I.

Description

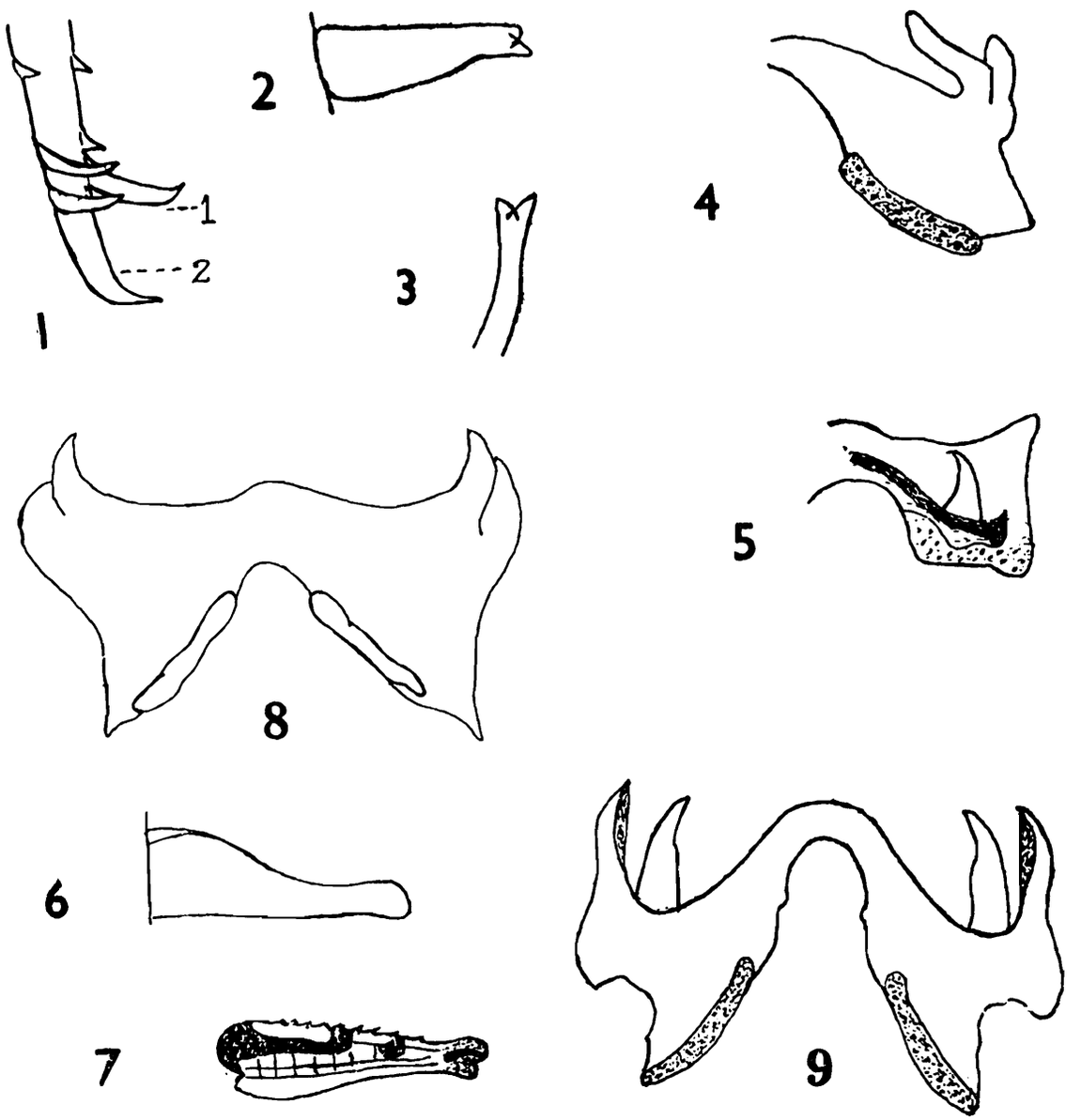
Dnopherula (Aulacobothrus) jaganathi sp. nov. (Fig. 1 ; Plate V, figs 10-11)

Holotype : 1 ♀ ; Balugaon, Puri, Orissa : 30.9.83 ; *H. K. Bhowmik* coll.

Paratypes : 2 ♀ ; same data as for the holotype.

Females : Size moderate. Antenna almost as long as head and pronotum taken together, filiform. Fastigium of vertex broadly angulate at apex, shallowly concave, with a distinct median, transverse sulcus ; lateral carinulae coverging between eyes and prolonged into two parallel but wavy occipital carinulae, reaching pronotum ; median carinula starts beyond transverse sulcus, rather distinct and prolonged up to pronotum. Temporal foveola small, rather shallow, elongate-rhomboidal,

well marginated. Frontal ridge convex, parallel-sided, with or without a little impression after median ocellus ; sparsely punctate. Pronotum rounded anteriorly, distinctly tricarinate ; median carina prominent, straight, crossed by posterior sulcus only, almost at middle ; lateral carinae converge up to 2nd sulcus, then gradually diverge posteriorly up to postero-lateral margin of pronotal disc ; 1st transverse sulcus restricted to lateral lobes, 2nd crosses lateral carinae and impressed on disc but does not cut median carina, 3rd



D. (*A.*) *jaganathi* sp. nov.

Figs. 1-9. 1. Tip of post-tibia showing internal spurs (1 & 2). *X. jagabandhui* sp. nov. 2. Male anal cercus (lateral view). 3. Same, as seen from dorsum. 4. Epishallus, right side, (dorsal view). 5. Same, from ventral side.

D. sukhadae sp. nov. 6. Male anal cercus (lateral view). 7. Inside of post-femur showing colour-pattern 8. Epiphallus, (dorsal view). 9. Same, from ventral side.

sulcus just crosses lateral carinae, 4th clearly impressed and crosses median carina ; metazona deeply impress-punctate, a little shorter than prozona, its posterior margin obtuse angulate ; lateral lobes higher than long with both fore-and hind margins linear. Tegmen as long as apex of post-knee, with rounded apex, costal area a little expanded, with a series of veinlets and a distinct pre-costal vein ; costal vein reaches almost half length of tegmen and subcostal vein up to a little bebind apical end ; subcostal area with a series of oblique veinlets in major portion and with straight veinlets at apical end ; medial area reaching to middle of tegmen, and with a weak intercalated vein ; vanal vein 2 weak but with a series of lateral oblique veinlets. Wing a little shorter than tegmen. hyaline, a little clouded at apex. Posterior tibia shorter than post-femur, with 12 external and 11 internal spines ; outer apical spurs about half in size of inner spurs ; out of two inner spurs upper inner one (no. 2) longest, both of them hook-like. Valves of ovipositor short, somewhat hooked. Mesosternal interspace narrow, lobes much wider than long, with their inner-lower margins obliquely rounded ; metasternal lobes contiguous.

Male : Unknown.

Colouration : General colouration yellowish variegated with brown. Basal half of antennae yellowish, apical half darkish. Lateral pronotal lobes brownish with two to three small yellowish spaces. Eyes brown. Tegmen yellowish with brownish spots—subcostal area with a series of spots, arranged in a longitudinal pattern ; medial and radial areas with 8 dark spots which are gradually small to larger towards apical end. Wing hyaline, a little infumate at apex. Posterior tibia testaceous, with spines tipped with black.

Measurements : Body 22-23 ; antenna 6.5-6.75 ; pronotum 4.75-5.0 ; tegmen 17-18 ; post. femur 14.0-14.25 ; post. tibia 11.0-11.5 ; ratio of length / depth of post femur 3.4-3.5.

DISCUSSION

This new species bears very close resemblances to *Aulacobothrus bolivari* Uvarov (1921) described from Chapra (Bihar) and Koilpati (Tamil Nadu) and later recorded from E. Afganistan (Cejhan, 1969). But it is distinguishable by its somewhat larger size, colouration of tegmina (brown spots) and lesser dilatation of medial area with the false vein having transverse veinlets etc.

The species is named after Lord Jaganath of Puri, Orissa.

Xenocatantops jagabandhui sp. nov.

(Figs. 2-5 ; Plate VI, figs. 12-14)

Holotype : 1♂ ; Mandi, Himachal Pradesh ; 19.9.1980 ; *H. K. Bhowmik* coll.

Paratypes : 1♂ ; Mandi, Himachal Pradesh ; 22.9.1980 ; *H. K. Bhowmik* coll. ; 1♀ ; Barchawar, Bilaspur, H. P. ; 2.4.1972 ; M. Chandra coll. ; 5♂, 5♀ ; Mathili, Koraput, Orissa ; 17-19.10.84 ; *H. K. Bhowmik* coll.

Males : Size small. Antenna longer than head and pronotum taken together, filiform. Frontal ridge convex above, beyond median ocellus flat or a little depressed in middle ; parallel sided, sparsely punctate ; lateral carinae almost linear. Interocular distance very narrow, marginated by prolonged lateral

BHOWMIK PLATE V

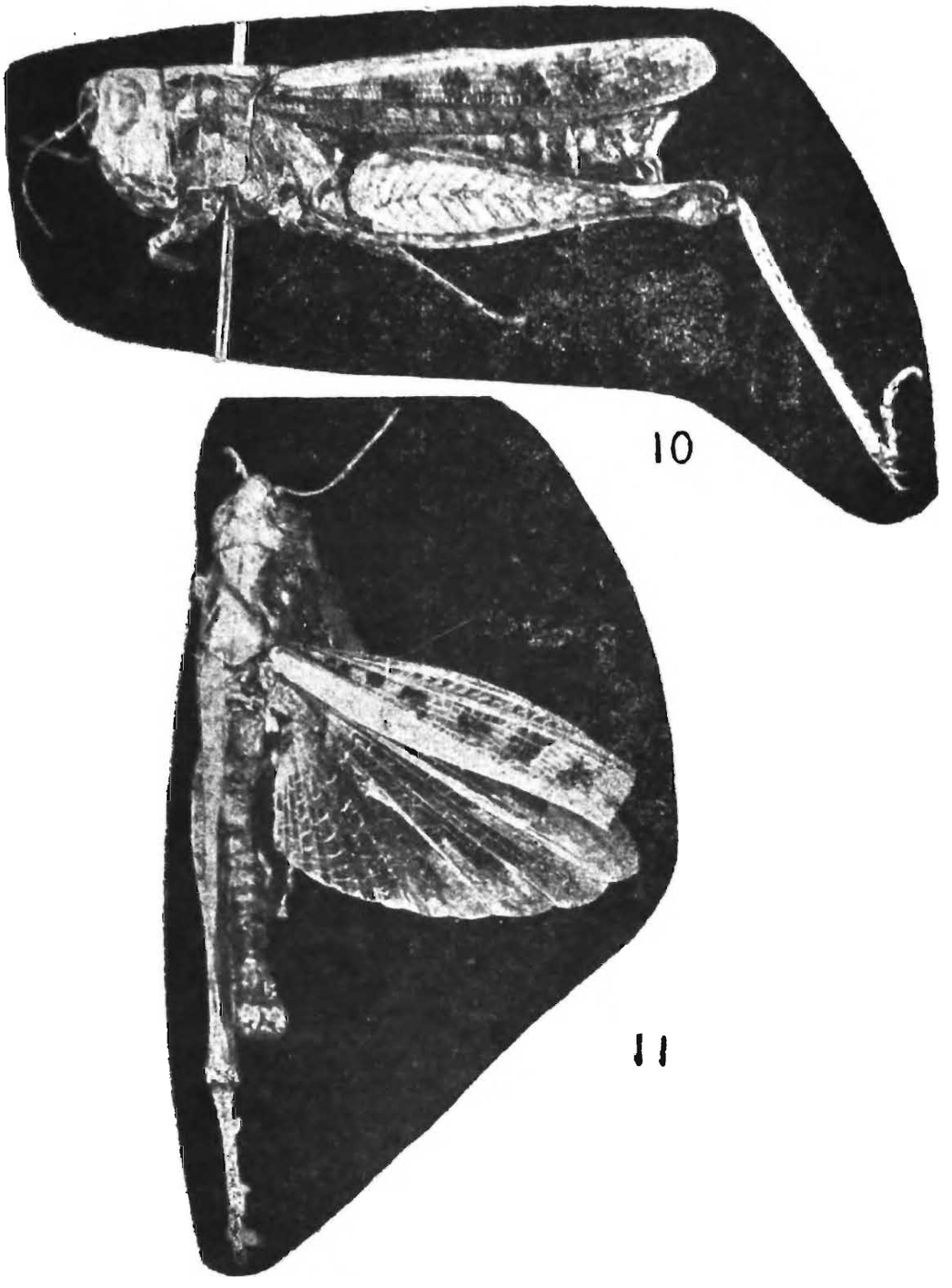


Fig. 10. *D.* (*A.*) *jaganathi*, female (lateral) ... Length of body (in mm) 22
Fig. 11. Same, (dorsal view) 22

BHOWMIK PLATE VI

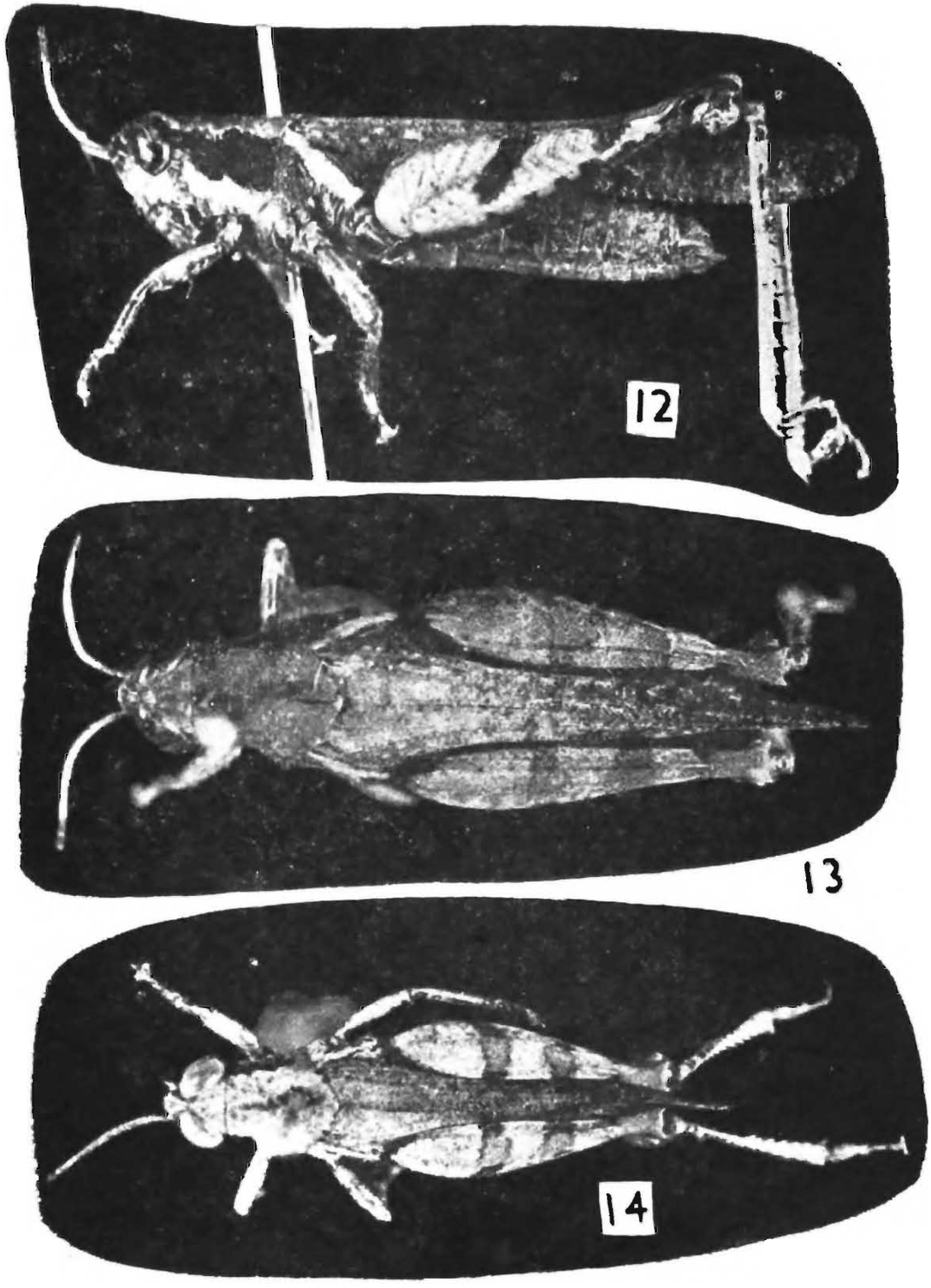


Fig. 12. *X. jagabandhui*, female lateral view 22
Fig. 13. Same, (dorsal view) 22
Fig. 14. Same, male (dorsal view) 16

BHOWMIK PLATE VII

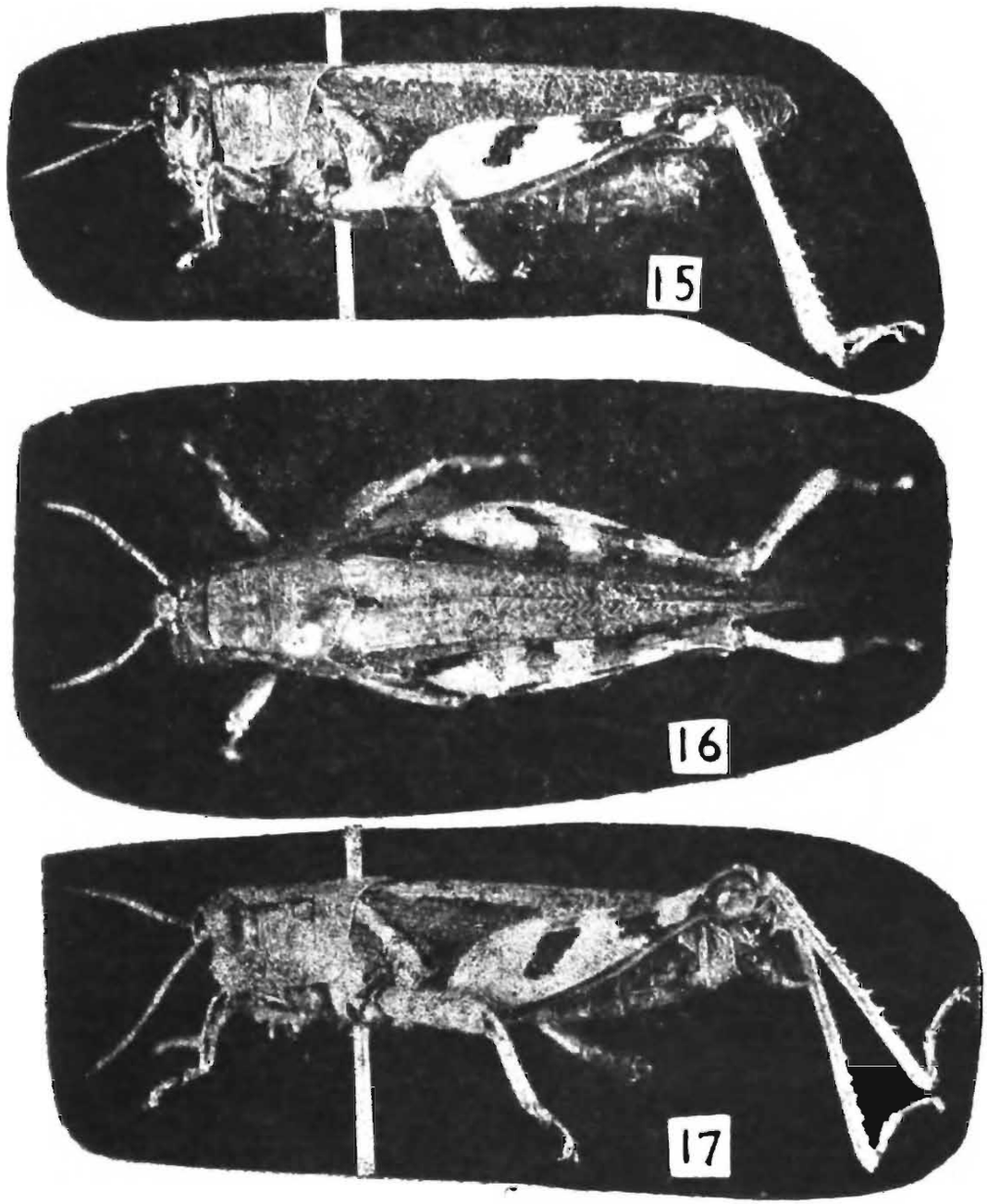


Fig. 15. *D. sukhadae*, female (lateral view) 27
Fig. 16. Same, (dorsal view) 27
Fig. 17. Same, male (lateral view) 20

carinulae of fastigium of vertex. Head very small ; eyes very prominent, projecting and almost border pronotum. Pronotum with only a weak median carina, crossed by usual three transverse sulci ; prozona longer than metazona, both densely but finely punctured. Tegmen exceeds posterior knee. Anal cercus gradually conical, a little incurved, apex showing little bifurcate texture (figs 2, 3). Epiphallus as figured (4, 5). Posterior femur stout, with length to depth ratio 3.3-3.4, strongly attenuated at apex ; posterior tibia a little shorter than post. femur, pilose, with 9 to 10 internal and 8 external spines.

Females : Very similar to males except larger in size. Ratio of length to depth of post. femur 2.5-3.1. Supra anal plate somewhat tongue-shaped, with a median sulcation at basal area. Valves of ovipositor short, curved. Anal cercus conical.

Colouration : General colouration pale brownish with yellow stripes. Most characteristic one is post ocular dark-brown band which prolonged behind over superior part of lateral lobes of pronotum up to posterior sulcus, slightly bordered with yellow above and below ; posterior femur testaceous externally, with two oblique black bands, paler on upper surface of which, on external side, larger one at middle, obsolete near lower carinula, smaller one near apex, stretched between upper and lower carinulae and lower outer carinula with 6 to 8 black spots ; lower marginal area indistinct brownish ; inner side of post. femur red with three small black markings, besides, incomplete black ring at base of posterior knee ; of three markings, one is on upper basal lobe, other two in continuation of oblique bands. Posterior tibia red-rose, with one small black spot near base, and a little further off three spots, almost in a linear fashion.

Measurements : Body ♂ 16-17, ♀ 19-23 ; antenna ♂ 6.5-7, ♀ 7.5-8 ; pronotum ♂ 4-4.25, ♀ 5-5.5 ; tegmen ♂ 15. 5-16, ♀ 19-22 ; post. femur ♂ 10-11, ♀ 11.5-14 ; depth of post. femur ♂ 3-3.25, ♀ 4-4.5 ; post. tibia ♂ 8.5-9, ♀ 10-12.

Discussion

Dr. Jago, who has confirmed the identification of the species opines that this interesting new species is near to *X. karnyi* (Kirby, 1907), known from the entire India except eastern India. In fact, the shape of male cercus as well as male genitia are very akin to *X. karnyi* (for compassion vide Jaco, 1982, figs. 59 and 73). Ratio of length to depth of post. femur in males of the new species is less than 3.4 which brings it again closer to *X. brachycerus* (Willemse, 1932), recorded from China, Taiwan, Bhutan, Sikkim, Nepal and N. India, while the new species resembles *X. henryi* (Bolivar, 1918), known so far from western and southern India and Northern Burma, in its red inner femoral area as well as hind tibia and with a clearly bifurccate male cercus. The species is, howerer, unique in having the characteristic colour patterns of lateral pronotal lobes and that of external posterior femoral ones.

The male genitalia and male cercus are also distinctive from all known species of the genus.

The species is named after author's late father.

Diabolocatantops sukhadae sp. nov.
(Figs. 6-9 ; Plate VII, figs. 15-17)

Holotype : 1 ♂ ; Dhungri, Manali, Kulu,

Himachal Pradesh ; 27.9.1980 ; *H. K. Bhowmik* coll.

Paratype : 6♀ ; same data as for the holotype.

Male : Size small. Antenna slightly shorter than head and pronotum taken together, strongly built, 23 segmented, filiform. Frontal ridge almost parallel-sided except above ocellum where it is a little expanded, convex ; below ocellus shallowly sulcated ; sparsely punctured. Pronotum with a very weak median carina, crossed by 3 well defined sulci, almost parallel-sided in prozonal area, a little expanded in metazona, lateral carinae feebly indicated ; lateral lobes typical. Tegmen exceeds tip of post-knee. Prosternal spine short, obtuse ; mesosternal lobes separated by narrow interspace ; metasternal lobes contiguous. Supra-anal plate tongue-shaped, with a deep median, longitudinal sulcation ; anal cercus as figured (6). Epiphallus as shown in figure (8, 9). Posterior femur moderately stout, its ratio of length to depth 3.66 ; post. tibia slightly shorter than post. femur, with 9 external and 11 internal spines.

Females : Very similar to male except larger in size. Expansion of frontal ridge, above ocellum, more pronounced. Posterior tibia with 8 to 10 external and 11 internal spines. Anal cercus short, straight, conical. Valves of ovipositor curved. Ratio of length to depth of post. femur 3.76 to 4.

Colouration : General body colouration brownish ; legs specially posterior legs yellowish. Posterior femur with two characteristic black bands, 1st band oblique and extends a little more of middle of extero-median area, pale on upper carina, 2nd one in form of an incomplete ring extending from outer inner carinula to interior inner carinula. Inner side of post. femur yellowwish ; with an oblique band, on inner side which forms a pattern (fig. 7) : it crosses upper carinula about its middle, runs forward as a stripe up to upper basal lobe. Beside, these two bands, sides of post. knee also more or less spotted with black. Lower marginal area somewhat dark-brownish. Post-tibia testaceous with black tipped spines. Pronotum with its lateral lobes unicolourous, brownish except a very thin, irregular dark-brown post-ocular band running along super margin of lobe and edge of pronotal disc up to hind sulcus ; sometimes this band very insignificant and difficult to detect.

Measurement : Body ♂ 20, ♀ 25-27 : antenna ♂ 6. 5, ♀ 7-7. 5 ; poronotum ♂ 5, ♀ 6.5-7 ; tegmen ♂ 15, ♀ 21-22 ; post. femur ♂ 11, ♀ 14-15 ; depth of post-femur ♂ 3, ♀ 3.5-4 ; post-tibia ♂ 9.5, ♀ 12-12.5.

DISCUSSION

The genus *Diabolocatantops* Jago, 1984, has several species known from Madagascar and that *D. pulchellus* (Walker, 1870) and *D. consobrinus* (Karny, 1907) are two species in the new genus from India, though the latter is currently known only from the type.

The present species is more akin to *D. consobrinus* than *D. pulchellus* and can be at once separated from the latter species which has "wing iridescent hyaline, brick-red towards the base along the veins", and "a moderately broad blackish band runs behind the eye to the extremity of the deflexed lobes" and by its bigger size (37 mm). The new species has, on the other hand, hyaline wings, with a little infumation

at apices (no distinct coloration) and the post ocular band running along up to hind sulcus, is very thin, irregular and often hard to detect. These features with its body size, again, however, brings the species very close to *D. consobrinus*. Only a critical and careful study can differentiate them.

In *D. consobrinus* the lateral lobes of the pronotum unicolourous, that means, there is no colour stripe as noticed in other two Indian species. The oblique band of post. femur "very slightly extending into the externo-median area, and all carinae specially the lower ones, spotted with black" in *consobrinus*, whereas in the new species, the oblique stripe exceeds more than the middle of medial area (and also having a colour design in the inner side) and all the carinae are spotless (unicoloruous with other yellowish parts of the femur).

The species is named after author's mother.

Acknowledgements

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