NEW OR LITTLE-KNOWN SPECIES OF EXOTIC TIPULIDAE (DIPTERA). X

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The preceding part in this series of papers was published in 1961 (*Proc. R. ent. Soc. Lond.* (B) 30:167-72). I am continuing the consideration of the Pediciine craneflies of the Himalayas by describing a series taken at high altitudes in the Himalaya of Sikkim by the Swiss student of the Trichoptera, Dr. Fernand Schmid. The types of these unusually interesting flies are preserved in my personal collection.

Dicranota (Dicranota) cosymbacantha sp. n.

Size large (wing of male over 10 mm.); general coloration of mesonotum buffy-grey, praescutum with a broad dark brown central stripe and reduced paler brown laterals; knobs of halteres darkened; legs brownish-black; wings brownish-yellow, restrictedly patterned with brown, including the conspicuous stigma; male hypopygium with ventral surface of tergal plate on either side with a sclerotised plate that terminates in a slender spine; interbase a broad yellow plate, its margin with two small spines.

Male

Length about 7.5 mm.; wing 10.5 mm.; antenna about 1.8 mm.

Rostrum and palpi black. Antennae black, relatively long for a member of this group of species; flagellar segments suboval, outer ones more elongate, exceeding their verticils; terminal segment about one-half the penultimate. Head brownish-grey laterally, the low vertical tubercle and centre of posterior vertex darker brown.

Pronotum dark brown, restrictedly paler behind. Mesonotal praescutum light buffy-grey, with a broad dark brown central stripe and reduced paler brown lateral areas; posterior sclerites of notum brownish-yellow, scutal lobes weakly darkened; postnotum and pleura brown. Halteres with stem brownish-yellow, knob darkened. Legs with coxae yellowish-brown, trochanters darker; femora dark brown, somewhat paler basally; tibiae and tarsi brownish-black. Wings brownish-yellow, bases of cells C and Sc slightly more darkened; stigma dark brown, conspicuous; a brown seam over anterior cord, narrower on posterior cord and along vein Cu; a very weak infuscation at origin of Rs; veins dark brown, those of prearcular field paler. Longitudinal veins of outer three-fourths of wing with macrotrichia. Venation: Rs angulated and long-spurred at near one-third the length; a weak crossvein in cell R_3 at near three-fourths the length of cell, possibly adventitious in character; cell M_2 open; m-cu about one-half its length beyond the fork of M.

Abdomen dark brown, outer segments brownish-black. Male hypopygium (fig. 1) with the tergite (t) broad, constricted at near midlength, the lateral lobes conspicuous; central area of posterior border subtruncate, with a small median notch; lobes densely setuliferous and with conspicuous yellow setae of moderate length; ventral surface at point of narrowing with a flattened sclerotised plate that is produced into a long slender spine. Basistyle (b) relatively small, outer apical lobe brownish-yellow, nearly glabrous except at tip, the larger inner apical lobe semioval, with erect black setae; interbase (i) a recurved broadly flattened yellow plate, terminating in a stout spine, with a similar more appressed spine on inner margin at near midlength. Dististyle (d) slender at base, subtriangularly dilated at outer end, the oblique apex with abundant short black setae. Phallosome (p) with the gonapophyses much larger than the aedeagus, narrowed to obtuse tips.

Holotype 3, India: Tangshing, Sikkim, 14,100 feet in Rhododendron association, 6.x.1959 (F. Schmid).

Dicranota (Dicranota) cosymbacantha is quite distinct from other large-sized members of the subgenus, including D. (D.) strepens Alexander, of the western Himalayas, and other species described hereinafter as D. (D.) fastuosa and D. (D.) impotens, all differing in genitalic characters, particularly the tergite and interbase.

Dicranota (Dicranota) impotens sp. n.

Size large (wing 10 mm. or more); general coloration of thorax greyish-brown, praescutum with four black stripes, the intermediate pair barely separated; antennae and legs black; halteres yellow; wings pale yellow, the base clearer yellow, disk with a brown pattern, cell M_2 open; male hypopygium with posterior border of tergite truncate, lateral angles slightly produced; apex of basistyle produced into setiferous inner and outer lobes, the former extended into a yellow blade; dististyle a flattened pale disk with short setae; interbase expanded at base, apex produced into a spine.

Male

Length about 8-8.5 mm.; wing 10-11 mm.; antenna about 1.1-1.2 mm.

Rostrum black, sparsely pruinose; palpi black. Antennae 15-segmented, black throughout; flagellar segments oval, the outer ones short-oval. Head brownish-grey, front and orbits somewhat clearer grey.

Pronotum brownish-grey, darker medially. Mesonotal praescutum greyish-brown, sides light grey, disk with four black stripes, the intermediate pair confluent in front, barely separated behind; posterior sclerites of notum black, sparsely pruinose to appear plumbeous. Pleura dark grey, vaguely more darkened on propleura; ventral sternopleurite and, posteriorly, dorsopleural membrane dark brown. Halteres yellow. Legs with coxae grey, inner faces yellowed; trochanters brownish-yellow; remainder of legs black, femoral bases very narrowly and vaguely more yellowed. Wings with a pale yellow tinge, the prearcular field light yellow, the costal region slightly less so; stigma brown; narrow darker brown seams at origin of R_3 , cord, along veins Cu and 2nd A and less evidently on vein R_5 and outer medial veins, best indicated by a deepening in colour of the veins; remaining veins yellowish-brown to light brown, clear yellow in the brightened areas, including vein Sc. Macrotrichia on longitudinal veins of about the outer three-fourths of wing. Venation: Sc long, Sc_1 ending about opposite the supernumerary cross-vein; R_{2+3+4} short to very short, basal section of R_5 likewise very short; cell M_2 open; m-cu about twice length of oblique basal section of M_{3+4} .

Abdomen dark brown, outer segments darker. Ovipositor with cerci slender, horn-yellow; hypovalvae subequal in length, straight, dark coloured. Male hypopygium (fig. 2) with the tergite (t) narrowed posteriorly, relatively broad, border truncate, lateral lobes low and rounded; ventral surface on either side of narrowed part with an obtuse lobe or flange. Basistyle (b) stout, narrowed outwardly, apex produced into two lobes of distinct shape and vestiture; outer lobe lower, with short dense setae, inner lobe narrowed into a straight yellow glabrous blade, its tip obtuse, lower inner part of lobe swollen, with abundant long setae; interbase (i) a broad-based plate, the outer third narrowed into a gently curved spine. Dististyle (d) single, appearing as a flattened pale disk, tip very obtuse, surface with short setae. Phallosome (p) with the aedeagus very small and slender, the longer and broader gonapophyses slightly divergent, their tips obtuse.

Holotype 3, India: Tangshing, Sikkim, 12,200 feet, in Rhododendron association, 5.x.1959 (F. Schmid). Paratypes: \bigcirc (allotopotype), 2 3 (paratopotypes), pinned with the allotype; \bigcirc , Churong, Sikkim, 12,460 feet, in Rhododendron association, 8.x.1959 (F. Schmid).

Dicranota (Dicranota) impotens is readily told from the two other generally similar species described at this time, D. (D.) cosymbacantha and D. (D.) fastuosa, by the structure of the male hypopygium, especially the tergite, basistyle, interbase and dististyle. All three species occurred in the same general area, being inhabitants of the high-altitude Rhododendron belt of the Himalayas.

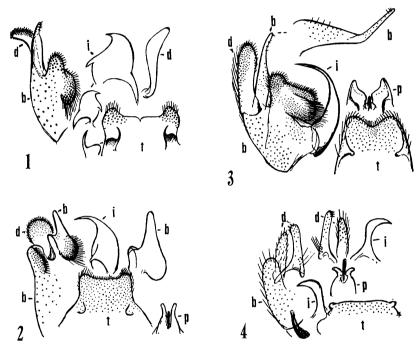
Dicranota (Dicranota) fastuosa sp. n.

Male: length about 9.5-10 mm.; wing 11.5-12 mm.; antenna about 1-1.1 mm.

Female: length about 9-11 mm.; wing 12-13.5 mm.

Characters generally as in *Dicranota* (*Dicranota*) impotens differing especially in the structure of the male hypopygium.

Antennae and legs black; antennae very small, flagellar segments short-oval, with short verticils. Mesonotal praescutum with three black stripes, the central stripe not divided. Wings with base strongly yellowed; dark areas much as in *impotens* but broader and paler; stigma yellow. Male hypoygium (fig. 3) with the tergite (t) long, slightly narrowed outwardly, posterior border with a shallow V-shaped or U-shaped notch; margin of ventral surface on either side with a small lobe, somewhat as in *impotens*, not developed into a spine as in *cosymbacantha*. Basistyle



Figs. 1-4.—Male hypopygium of: (1) Dicranota (Dicranota) cosymbacantha sp. n.; (2) Dicranota (Dicranota) impotens sp. n.; (3) Dicranota (Dicranota) fastuosa sp. n.; (4) Dicranota (Paradicranota) pretiosa sp. n. (b, basistyle; d, dististyle; i, interbase; p, phallosome; t, tergite.)

(b) with distinctive lobes, the outer a long yellow blade that narrows to the subacute tip, and the inner large, trilobulate, with abundant setae, these short and stout on the outer lobules, long and yellow on the oval cephalic one. Interbase (i) a long gently curved rod, broad at base, narrowed very gradually to the acute tip, the general appearance and size somewhat like the outer apical lobe of the basistyle. Dististyle (d) a long dusky blade with a concentration of short setae near apex. Phallosome (p) with the aedeagus very small, blackened, the yellow apophyses much larger, roughly subtriangular in outline.

Holotype 3, India: Churong, Sikkim, 12,460 feet, in Rhododendron association, 8.x.1959 (F. Schmid). Paratypes: \bigcirc (allotopotype), pinned with type; (paratopotype), sex uncertain, pinned with type; $1 \ 3$, $1 \ 7$, Tangshing, Sikkim, 12,200 feet, in Rhododendron association, 5.x.1959.

Dicranota (Paradicranota) pretiosa sp. n.

Size small (wing of male about 5.5 mm.); general coloration of mesonotum brown, praescutum with four stripes, pleura grey; antenna of male long; male hypopygium without spinulose points on either basistyle or dististyles; interbase a powerful rod, beyond midlength bent into an acute beak.

Male.

Length about 5.5 mm.; wing 5.5 mm.; antenna about 1.8 mm.

Rostrum short, brownish-grey, palpi black. Antennae of male moderately long, black throughout, 13-segmented; flagellar segments subcylindrical, much longer than the verticils, with abundant shorter setae; terminal segment about one-half the penultimate. Head large, brownish-grey; anterior vertex broad.

Prothorax brown. Mesonotal praescutum light brown, with four stripes, the intermediate pair paler brown than the brownish-black lateral pair; scutum light brown, each lobe with two confluent brownish-black areas; posterior sclerites of notum brownish-grey, parascutella darkened. Pleura and pleurotergite grey; dorsopleural membrane dark. Halteres darkened, especially the knobs, base of stem narrowly reddened. Legs with coxae long, brownish-grey; trochanters brown; remainder of legs relatively short and stout, brownish-black, femoral bases obscure yellow, narrower on the fore pair; setae of legs short and inconspicuous. Wings brownish-yellow, restrictedly patterned with darker, including the stigma. Venation as in the subgenus, with a supernumerary cross-vein in cell R_1 and with cell M_1 lacking.

Abdomen, including hypopygium, dark brown; outer segments brownish-black. Male hypopygium (fig. 4) with the central area of tergite (t) broad, posterior margin nearly truncate, lateral angles produced into small pale fleshy lobes. Interbase (i) of the basistyle (b) a powerful rod narrowed at midlength, the outer end produced into a slender acute beak; apical lobe of basistyle low and rounded, with delicate elongate setae. Two dististyles (d), the outer pale, with numerous short setae on outer three-fourths, inner style a little longer, tip obtuse, mesal face at base with a few long setae. Phallosome (p) with the apophyses small, pale; aedeagus slender, blackened.

Holotype 3, India: Taling, Sikkim, 13,800 feet, in Rhododendron association, 21.vi.1959 (F. Schmid).

The present record is the first for any species of the subgenus *Paradicranota* from the Indian subregion. The lack of spinules on the lobes of the basistyle of the male hypopygium is noteworthy.

Dicranota (Rhaphidolabis) akshobya sp. n.

Size medium (wing of male over 6 mm.); general coloration light grey, the praescutum with three darker brownish-grey stripes; knobs of halteres large, weakly infuscated; legs dark brown, femoral bases restrictedly yellowed; wings whitish, more yellowed at base; R_{2+3+4} present; male hypopygium with the interbase a large irregular plate, at apex with a strongly recurved blade; dististyle unusually large.

Male

Length about 6-6.2 mm.; wing 6.3-7 mm.; antenna about 1-1.1 mm.

Rostrum and palpi black. Antennae 15-segmented, relatively long, black throughout; flagellar segments oval, outer ones progressively shorter, terminal segment short-oval. Head grey.

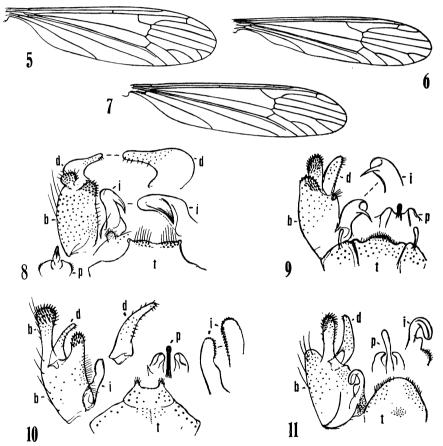
Prothorax light grey. Mesonotum light grey, praescutum with three darker brownish-grey stripes, the broad central one slightly divided at posterior end; scutual lobes darkened. Pleura almost uniformly light grey, ventral sternopleurite slightly darker, dorsopleural membrane buffy. Halteres with stem yellow, knob large, weakly infuscated. Legs with coxae light brown, sparsely pruinose, lower face more yellowed; trochanters brownish-yellow; femora dark brown, bases restrictedly yellow; tibiae and tarsi dark brown. Wings whitish, prearcular field light yellow, stigma barely indicated; veins light brown, pale yellow in the brightened areas. Macrotrichia of veins relatively long, especially on outer veins, on Sc extending basad to h, on M, Cu and anals almost to the arculus. Venation: Sc long, Sc_1 ending some distance beyond fork of R_{2+3+4} , the latter about twice r-m; basal section of R_5 distinct; Rs short, weakly angulated before midlength; m-cu about one-third its length beyond the fork of M.

Abdomen dark greyish-brown, outer segments slightly darker. Male hypopygium (fig. 8) with posterior border of tergite (t) broadly produced, the apex of the lobe truncate, its margin more thickened, fringed with long yellow setae; tergal arms possibly not developed, in the slide mounts of the holotype, on either side a detached oval setuliferous lobe with its intermediate part convexly rounded may represent the outer part of the tergite. Basistyle (b) stout, both terminal

lobes small and rounded, the outer one with setae, inner lobe with the armature consisting of small spiculose points; interbase (i) a large irregular yellow plate, its apex with a strongly recurved blade, the tip acute. Dististyle (d) unusually large, much exceeding in size the lobes of the basistyle, appearing as a nearly glabrous yellow blade, narrowed into a long beak with the tip obtuse. Phallosome (p) with the gonapophyses broadly flattened.

Holotype &, India: Yugang, Sikkim, 5,700 feet, 14.v.1959 (F. Schmid). Paratype &, Selep, Sikkim, 7,000 feet, 27.vii.1959 (F. Schmid).

Dicranota (Rhaphidolabis) akshobya is most readily told from the numerous generally similar regional species by the structure of the male hypopygium, particularly the tergite, interbase and dististyle. In the size and structure of the interbase the fly suggests species such as D. (R.) balarama Alexander but is amply distinct.



Figs. 5-11.—(5-7) Venation of: (5) Dicranota (Rhaphidolabis) kaliya sp. n.; (6) Dicranota (Rhaphidolabis) stenostyla sp. n.; (7) Dicranota (Rhaphidolabis) vishnu sp. n. (8-11) Male hypopygium of: (8) Dicranota (Rhaphidolabis) akshobya sp. n.; (9) Dicranota (Rhaphidolabis) kaliya sp. n.; (10) Dicranota (Rhaphidolabis) stenostyla sp. n.; (11) Dicranota (Rhaphidolabis) vishnu sp. n. (b, basistyle; d, dististyle; i, interbase; p, phallosome; t, tergite.)

Dicranota (Rhaphidolabis) kaliya sp. n.

Size relatively large (wing of male 7 mm. or more); general coloration grey, praescutum and scutal lobes patterned with black; antennae and legs black, halteres dusky; wings suffused with brown, patterned with darker brown, including a conspicuous seam from the stigma back along the cord; R_{2+3+4} subequal to basal section of R_5 ; male hypopygium with the tergite produced into a broad central lobe, lateral arms pale, clavate; interbase a large flattened structure, its outer end semicylindrical, produced into a slender spine.

Male

Length about 6-6.5 mm.; wing 7-7.8 mm.; antenna about 1.3-1.4 mm.

Rostrum and palpi black. Antennae 15-segmented, black throughout; flagellar segments oval, verticils short. Head dark grey.

Pronotum dull black. Mesonotum grey, praescutum with three blackened stripes, centres of scutal lobes similarly blackened; posterior sclerites darker grey. Pleura plumbeous grey. Wings (fig. 5) suffused with brown, patterned with darker brown, broadest in stigmal region and over the cord, more narrowly seamed at origin of Rs, R_2 and the outer medial forks; further narrow darkened seams along veins Cu and R_6 ; prearcular field light yellow; basal parts of cells C and Sc weakly darkened, less so before the stigma; veins brown, yellowed in the prearcular field. Macrotrichia of veins relatively short, on longitudinal veins beyond general level of origin of Rs; further trichia on outer ends of anal veins, especially 2nd A. Venation: $Sc \log_2 Sc_1$ ending some distance beyond fork of the short R_{2+3+4} , this subequal to or shorter than the basal section of R_5 ; Rs variable in length, shortest in a paratype as figured, longer in the holotype; m-cu from about one-half to nearly its own length beyond fork of M.

Abdomen brownish-black. Male hypopygium (fig. 9) with the tergite (t) large, transverse, posterior border with a broad relatively low central lobe that is fringed with short setae, sublateral parts of posterior border with less conspicuous glabrous lobes, the outermost bearing a small pale club. Basistyle (b) stout, with two terminal lobes that bear numerous short blackened spicules, outer lobe shorter and broader; interbase (i) a large flattened structure, semicylindrical on outer end, the lower angle farther produced into a slender spine. Dististyle (d) subequal in size to the inner lobe of basistyle, more flattened, with a few microscopic pale punctures, the lower and apical margins with longer setae. Phallosome (p) with aedeagus small, blackened, gonapophyses broader and lower.

Holotype 3, India: Tsomgo, Sikkim, 12,500 feet, in Rhododendron association, 26. viii. 1959 (F. Schmid). Paratopotypes, 2 3.

Dicranota (Rhaphidolabis) kaliya is quite distinct from other generally similar regional members of the subgenus in its patterned wings and structure of the male hypopygium, particularly the distinctive interbase. The wing pattern is much less intense than in D. (R.) fascipennis (Brunetti), which is the most conspicuously patterned regional species of Rhaphidolabis.

Dicranota (Rhaphidolabis) stenostyla sp. n.

Allied to serrulifera; size medium (wing 6 mm.); general coloration dark brown, the three praescutal stripes darker; antennae relatively long; wings slightly infuscated, Rs angulated at near one-third its length, R_{2+3+4} shorter than the transverse basal section of R_5 ; male hypopygium with the tergite narrowed outwardly, the apex broadly notched; interbase with about 15 or 16 small recurved teeth; dististyle narrowed outwardly, tip obtuse.

Male

Length about 5 mm.; wing 6 mm.; antenna about 1.8 mm.

Rostrum and palpi black. Antennae 15-segmented, relatively long; flagellar segments long-suboval with long erect setae additional to the slightly longer verticils. Head dark brown.

Thorax dark brown; praescutum with three brownish-black stripes that are poorly evident against the ground, scutal lobes similarly darkened; pleurotergite and ventral sternopleurite darker. Halteres dusky, knob infuscated. Legs with coxae dark brown, trochanters more yellowish-brown; remainder of legs brownish-black to black. Wings (fig. 6) relatively narrow, slightly infuscated, the stigma still darker; veins brown. Macrotrichia of veins abundant but relatively short on Rs and all longitudinal veins beyond; further extensive series of trichia on outer ends of veins Sc, M, Cu and anals. Venation: Sc long, Sc_1 ending beyond one-third the length of vein R_{2+3} ; R_2 oblique, longer than R_{1+2} ; Rs relatively long, angulated at about one-third the length; R_{2+3+4} shorter than the transverse basal section of R_5 ; basal section of M_{1+2} very short to virtually lacking; m-cu at about two-thirds its length beyond fork of M.

Abdomen, including hypopygium, brownish-black. Male hypopygium (fig. 10) generally as in *diprion* or *pristis*, that is, with two unusually large apical lobes on basistyle and with the interbase serrulate, differing especially in the structure of the tergite, interbase and dististyle. Ninth tergite (t) narrowed outwardly, terminating in two small lobes that are separated by a broad notch,

the margin truncate, lobes with numerous relatively short setae. Basistyle (b) with outer apical lobe expanded at apex, with numerous small spinoid setae; interbase (i) a flattened blade, with 15 or 16 very small teeth on margin, the outer ones small and ill-defined, intermediate teeth larger, somewhat recurved. Dististyle (d) broadest at base, narrowed outwardly, especially on outer third, tip obtusely rounded. Phallosome (p) with aedeagus slender, slightly expanded at apex; apophyses appearing as large flattened plates, their margins inrolled.

Holotype 3, India: Tsomgo, Sikkim, 12,500 feet, in Rhododendron association, 26. viii. 1959 (F. Schmid). Paratopotype, sex uncertain, pinned with type.

The three regional species, Dicranota (Rhaphidolabis) diprion Alexander, D. (R.) pristis Alexander and D. (R.) stenostyla, all are readily separable among themselves by marked differences in structure of the male hypopygium, especially the tergite, interbase and dististyle.

Dicranota (Rhaphidolabis) vishnu sp. n.

Size large (wing of male 10 mm.); general coloration of thorax light grey, praescutum with four very distinct dark brown stripes; antennae 15-segmented, black; legs black, fore femora with bases narrowly yellowed; wings strongly tinged with brownish-yellow, restrictedly patterned with darker brown, especially on the cord; R_{2+3+4} present; male hypopygium with posterior border of tergite strongly convexly rounded, without lateral arms; outer lobe of basistyle without blackened spinoid setae; interbase a strongly recurved yellow rod, tip obtuse and microscopically serrulate.

Male

Length about 9 mm.; wing 10 mm.; antenna about 1.2 mm.

Rostrum and palpi black. Antennae 15-segmented, short, black throughout; flagellar segments oval, the outer ones progressively shorter. Head buffy-brown, darker medially above.

Pronotum brownish-grey. Mesonotum light grey, praescutum with four very distinct dark brown stripes, the intermediate pair narrowly separated; scutal lobes and a central vitta on scutellum paler brown. Pleura clear light grey; dorsopleural membrane buffy-brown. Halteres brownish-yellow, stem clearer yellow. Legs with coxae light grey; trochanters obscure yellow; remainder of legs black, fore femora narrowly yellowed at bases. Wings (fig. 7) strongly tinged with brownish-yellow, prearcular field more yellowed, costal area slightly darkened; stigma darker brown; still darker seams over cord and veins Cu and 2nd A; veins light brown, darker in the patterned areas, Sc and prearcular veins yellowed. Veins of outer two-thirds of wing with relatively short macrotrichia. Venation: Sc long, Sc_1 ending beyond fork of R_{2+3+4} , the latter nearly twice the basal section of R_5 ; m-cu more than one-half its length beyond fork of M.

Abdomen light brown, terminal segments dark brown to brownish-black. Male hypopygium (fig. 11) with the tergite (t) large, narrowed very gradually outwardly, posterior border broadly obtuse. On either side fringed with short spinoid setae, these lacking on the mid-area; no evident lateral tergal arms. Basistyle (b) with outer apical lobe low and obtuse, with dense velvety setulae and normal setae, lacking spinoid setae or spicules, as common in the genus; inner apical lobe elongate, with blackened spinoid setae on outer fifth; interbase (i) a strongly recurved yellow rod or blade, the tip obtuse, very microscopically serrulate, margins smooth, base slightly dilated. Dististyle (d) subequal in size to inner apical lobe of basistyle, appearing as a flattened yellow blade, narrowed very gradually outwardly, apex with a few small spicules. Phallosome (p) with aedeagus longer than the gonapophyses, appearing as a club but not capitate.

Holotype 3, India: Chumzomoi Choka, Sikkim, 11,800 feet, in Rhododendron association, 8. vii. 1959 (F. Schmid). Paratopotype, sex uncertain.

Dicranota (Rhaphidolabis) vishnu is quite distinct from other large members of the subgenus, including D. (R.) princeps Alexander. The structure of the male hypopygium, especially the basistyle and interbase, is distinctive.

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