A study on Orthocladiinae (Diptera, Chironomidae) of India : the genus Rheocricotopus Thienemann and Harnisch

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A study on Orthocladiinae (Diptera, Chironomidae) of India.
The Genus Rheocricotopus Thienemann and Harnisch

by **P. K. Chaudhuri** and **D. C. Sinharay**

Abstract: Three new species of the genus *Rheocricotopus* Thienemann & Harnisch, *Rheocricotopus himalayensis* n. sp. *R. nemoacrostichalis* n. sp. and *R. valgus* n. sp. are described from the eastern parts of India. A key to the Oriental species is also given herewith.

The genus *Rheocricotopus* was erected by THIENEMANN & HARNISCH (1932). Previously, EDWARDS (1929) treated it as a species group of the genus *Spaniotoma* Philippi. Later, BRUNDIN (1956) reaffirmed the valid generic status of *Rheocricotopus* to be followed by LEHMANN (1969) and other workers, and also fixed *Chironomus effusus* Wülker as the type of the genus. The genus is recognised by the moderately developed antepronotum with small median lobe; AR more or less than 1; short and erect dorsocentrals; wing without macrotrichia and *Orthocladius*-type of venations; fringed squama; anal point with obliquely directed lateral setae and gonostylus mostly with a preapical crista dorsalis and an apical tooth. Prior to this study, five species, *Rheocricotopus godavarius* Lehmann, *R. lobalis* (Johannsen), *R. mediocris* (John.) *R. nepalensis* Lehmann and *R. rigida* (John.) were described from the Oriental region of which none are known to be represented from India.

The terminology and mode of description of the species follow SAETHER (1980), SINHARAY & CHAUDHURI (1979) and CHAUDHURI & GHOSH (1980).

Types are deposited in the British Museum (Nat. Hist.), London, Naturhistorisches Museum, Basel; United States National Museum, Washington and the National Zoological Collections, Calcutta.

1. **Rheocricotopus himalayensis** n. sp. Fig. 1.

♂. Head dark brown in colour. Vertex (Fig. 1a) dark brown with 4–5 (4) postocular and 1 vertical setae. Coronal seta 1 on each side. Clypeus with 8 setae. Maxillary palp (Fig. 1b) brown, palpomere III with a preapical pit bearing 2 sensilla, length ratio of palpomeres from I–V 6:11:21:28:44, L/W ratio 3.5. Eyes hairy, reniform and without dorsal extension. Antennae brown, proximal flagellomeres broader,

flagellomere XIII gradually narrowed down to the apex, length ratio of flagellomeres from I–XIII 5:5:7:8:9:9:10:10:10:10:10:10:10:65, AR 0.63. Tentorium and cibarial pump as in the figure 1c.

Thorax (Fig. 1d) brown to dark brown in colour. Antepronotum with 2 setae on each side. Acrostichals 13–15 (14), dorsocentrals 10–12 (10) in a row and prealars 3. Scutellum with 8 setae in a single row, postscutellum dark brown.

Wing (Fig. 1e): Brachiolum with 1 seta; R with 7–8 setae in the proximal half; C extended beyond R_{4+5}, extension being 0.025 mm long; R_{2+3} meets C midway between R_1 and R_{4+5}; Cu_1 slightly curved and recurved at tip; f-cu distal to r-m, An ends distal to f-cu. Anal lobe rounded. Squama with 5 setae. Haltere brown and knob with 2 setae.

Legs brown in colour. Spur of fore tibiae 0.032 mm long, ratio of length of spur to the apical diameter of fore tibiae 8:8; spurs of mid tibiae equal, 0.012 mm long, ratio of length of spurs to the apical diameter of mid tibiae 3:8; spurs of hind tibiae unequal 0.016, and 0.04 mm long, ratio of length of spurs to the apical diameter of hind tibiae 4:9, 10:9. Hind tibial comb with 11 spicules (0.02 mm–0.04 mm, n = 5). Empodium 0.01 mm long.

Proportions and ratios of leg-segments:

	Fe	Ti	ta_1	ta_2	ta_3	ta_4	ta_5	LR	TR
Fore	45	41	26	17	11	8	5	0.63	
Mid	36	35	19	10	7	5	4	0.54	–
Hind	35	40	21	11	10	5	4	0.51	1.9

Abdomen: Tergum I with cluster of setae on each side, rest of tergites with a few scattered setae. Hypopygium (Fig. 1f). Anal point 0.04 mm long with 3 lateral setae and 1 basal seta on each side. Gonocoxite with a prominent triangular basal lobe having a prominence at the apex. Laterosternite with 2 setae, transverse sternapodeme 0.11 mm long, phallapodeme 0.05 mm long. Aedeagal lobe large, hyaline with blunt apex. Gonostylus with a crista dorsalis and an apical tooth of 0.08 mm long. HR 2.3, HV 4.1.

Body length: 1.63 mm, wing length 1.63 mm (1.46–1.71, n = 7), wing breadth 0.48 mm (0.45–0.53, n = 7).

♀: Unknown.

Material examined: Holotype ♂ (Type no. 55, B.U.Ent.): West Bengal, Kurseong, 12.X.1970, Coll. S. Mukherjee. Paratypes: 7 ♂♂, Tindharia, IX. 1973, Coll. D.C. Sinharay; 6 ♂♂, Ghum, 2.X.1974,

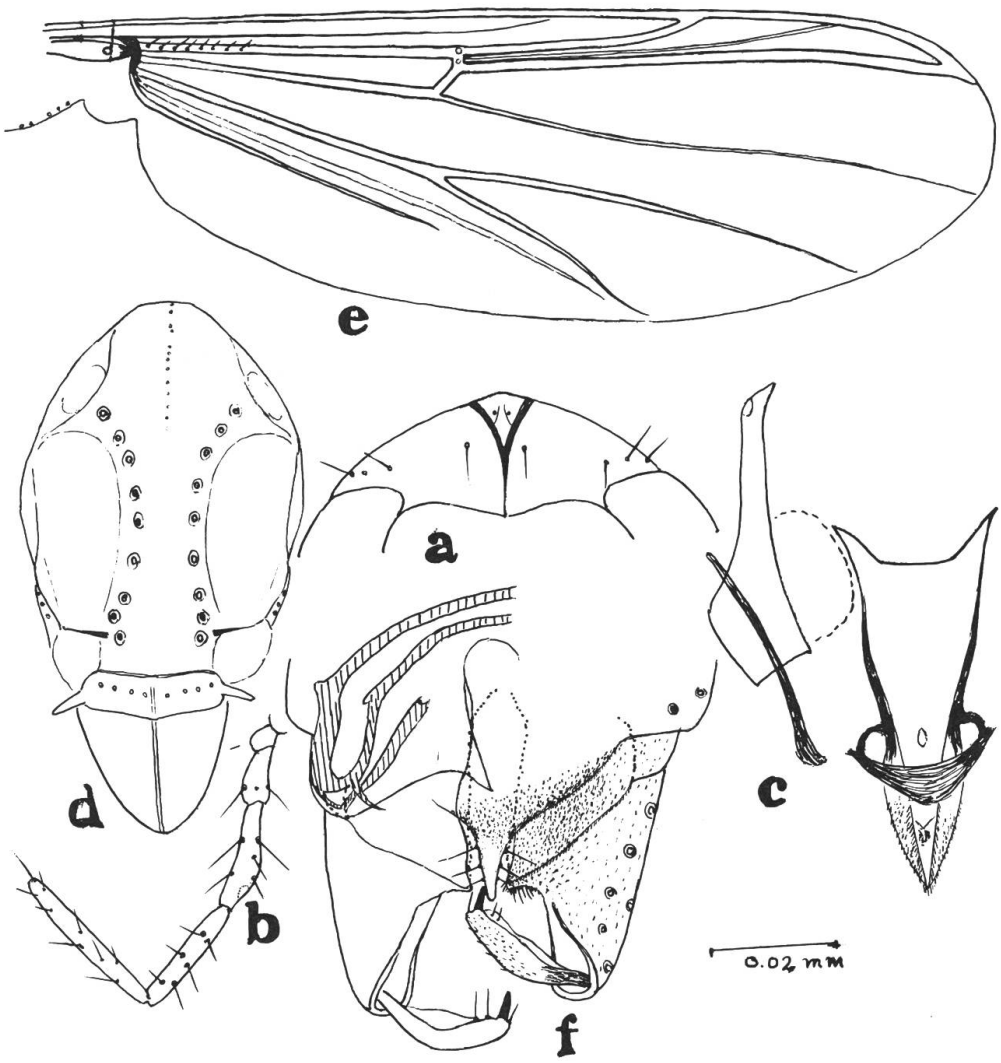

Fig. 1: *Rheocricotopus himalayensis* n.sp. ♂: a, vertex. b, maxillary palp. c, tentorium and cibarial pump. d, thorax. e, wing. f, hypopygium.

Coll. P. K. Chaudhuri; 8 ♂♂, Darjeeling, 13–15, III.1977, Coll. S. K. Das Gupta; 2 ♂♂, Kurseong, 18.IX.1978, Coll. P. K. Chaudhuri.

Remarks: This species is present in the montane region of West Bengal in early and late winter seasons. It is named as *Rheocricotopus himalayensis* due to its occurence in the Himalayan range of West Bengal. It shows similarities with *R. nepalensis* Lehmann (1969) in its male hypopygium but by differences of anal point and aedeagal lobe and the presence of setae on the proximal part of R, it can easily be considered as a new species quite separate from *R. nepalensis* Lehmann.

2. **Rheocricotopus nemoacrostichalis** n. sp. Fig. 2.

♂. Head dark brown in colour. Vertex (Fig. 2a) dark brown with 5 postocular and 2 vertical setae. Coronal setae 2 on each side. Clypeus with 8 setae. Maxillary palp (Fig. 2b) brown, palpomere III with a preapical pit bearing 2 sensilla, length ratio of palpomeres from I–V 5:11:19:17:27, L/W ratio 3.2. Eyes hairy, reniform and without dorsal extension. Antennae brown, proximal flagellomeres broader, flagellomere XIII gradually narrowed down to the apex, length ratio of flagellomeres from I–XIII 4:5:6:7:7:7:8:9:10:10:10:10:75, AR 0.81. Tentorium and cibarial pump as in the figure 2c.

Thorax (Fig. 2d) brown to dark brown. Antepronotum with 3–4 setae on each side. Acrostichals 0, dorsocentrals 7–8 (8), prealars 3. Scutellum with 14 setae in two rows, postscutellum dark brown.

Wing (Fig. 2e) hyaline without macrotrichia, margin fringed with alternate short and long setae. Brachiolum with 1 seta; R with 5 setae at its proximad; C extends beyond R_{4+5}, extension being 0.04 mm long; R_{2+3} meets C closer to R_1 at a distance of 0.10 mm from tip of R_1; f-cu slightly distal to r-m; Cu_1 little curved at its distal two-third and recurved at tip; an ends below f-cu. Sensory organ 1 on Fr and 1 on the base of R_1 or at the tip of R. Anal lobe well developed and somewhat projecting. Squama with 14–16 setae. Haltere pale at both stem and knob. VR 1.18, CR 0.93.

Legs brown in colour. Spur of fore tibiae 0.028 mm long, ratio of length of spur to the apical diameter of fore tibia 7:9; spurs of mid tibiae equal to subequal 0.02 and 0.016 mm long, ratio of length of spurs to the apical diameter of mid tibiae 4:9, 5:9; spurs of hind tibiae unequal 0.021 mm and 0.046 mm long, ratio of length of spurs to the apical diameter of hind tibiae 5:11, 13:11. Hind tibiae comb with 9 spicules (0.021 mm–0.045 mm, n = 10). Pulvilli weak. Empodium 0.009 mm long

Proportion and ratios of leg-segments:

	Fe	Ti	ta_1	ta_2	ta_3	ta_4	ta_5	LR	TR
Fore	38	38	20	12	9	6	5	0.52	–
Mid	39	40	20	12	9	7	5	0.50	–
Hind	41	45	25	15	12	8	5	0.56	1.3

Abdomen: Tergites brown to dark brown with setae on dorsolateral region scattered or disposed in longitudinal rows. Hypopygium (Fig. 2f); Anal point 0.045 mm long bearing 3 setae on each side.

Tergum IX with 9–10 setae in a row. Gonocoxite with a prominent triangular blunt basal lobe having 12–14 (12) setae. Laterosternite with 2 setae. Transverse sternapodeme 0.08 mm long, phallapodeme 0.61 mm long. Aedeagal lobe hyaline, wide with rounded apex, base separate. Gonostylus slightly bent at the middle, base narrow and the apex with a prominent crista dorsalis and an apical tooth of 0.01 mm long. HR 3.6, HV 3.1.

Body length 2.5 mm, wing length 1.61 mm (1.44–1.72, n = 10), wing breadth 0.51 mm (0.47–0.56, n = 10).

♀: Unknown.

Material examined: Holotype ♂ (Type no. 53, B.U.Ent.): West Bengal, Tindharia, 21.XI.1970, Coll. D. C. Sinharay. Paratypes: 10 ♂♂, Darjeeling, 12–15, X.1969, Coll. T. Sharma; 5 ♂♂, Gangtok, 2.IX.1976, Coll. K. Ghosh; 1 ♂, Tura, 12.X.1978, Coll. K. Sinha; 2 ♂♂, Tezpur, 7.X.1979, Coll. S. Das; 4 ♂♂, Tindharia, 4.IX.1978, Coll. S. Sarkar.

Remarks: This species is present in the montane region of West Bengal and Meghalya during winter. On the basis of absence of acrostichal seta on the thorax, the present species is named as *Rheocricotopus nemoacrostichalis*. It bears resemblances with *R. rigida* (Johannsen) in general morphology and *R. linderbergi* Lehmann in male hypopygium and in structure of anal point in particular and gonostylus but its identify as a separate species is possible due to the following combination of characters; I) hyaline wing, II) anal lobe of wing, III) anal point with 3 lateral setae and IV) basal lobe of gonocoxite moderately setaceous.

3. **Rheocricotopus valgus** n. sp. Fig. 3

♂. Head brown in colour. Vertex (Fig. 3a) brown with 3 postocular setae near coronal suture. Coronal setae 2 on each side. Clypeus with 18 setae. Maxillary palp (Fig. 3b) brown, palpomere III with a preapical pit having two sensilla, length ratio of palpomeres I–V 10:14:27:47:75, LW ratio 3.8. Eyes hairy, reniform and without dorsal extension. Antennae brown, proximal flagellomeres cylindrical with two whorls of setae, flagellomere XIII bluntly pointed, length ratio of flagellomeres from I–XIII 7:8:8:9:9:9:9:10:10:10:10:10:130, AR 1.2. Tentorium and cibarial pump as in the figure 3c.

Thorax (Fig. 3d) brown to dark brown. Antepronotum with 3 setae on each side. Acrostichals 12–14 (12), weak extending up to the middle of mesonotum with a gap anteriorly, dorsocentrals 12, prealars

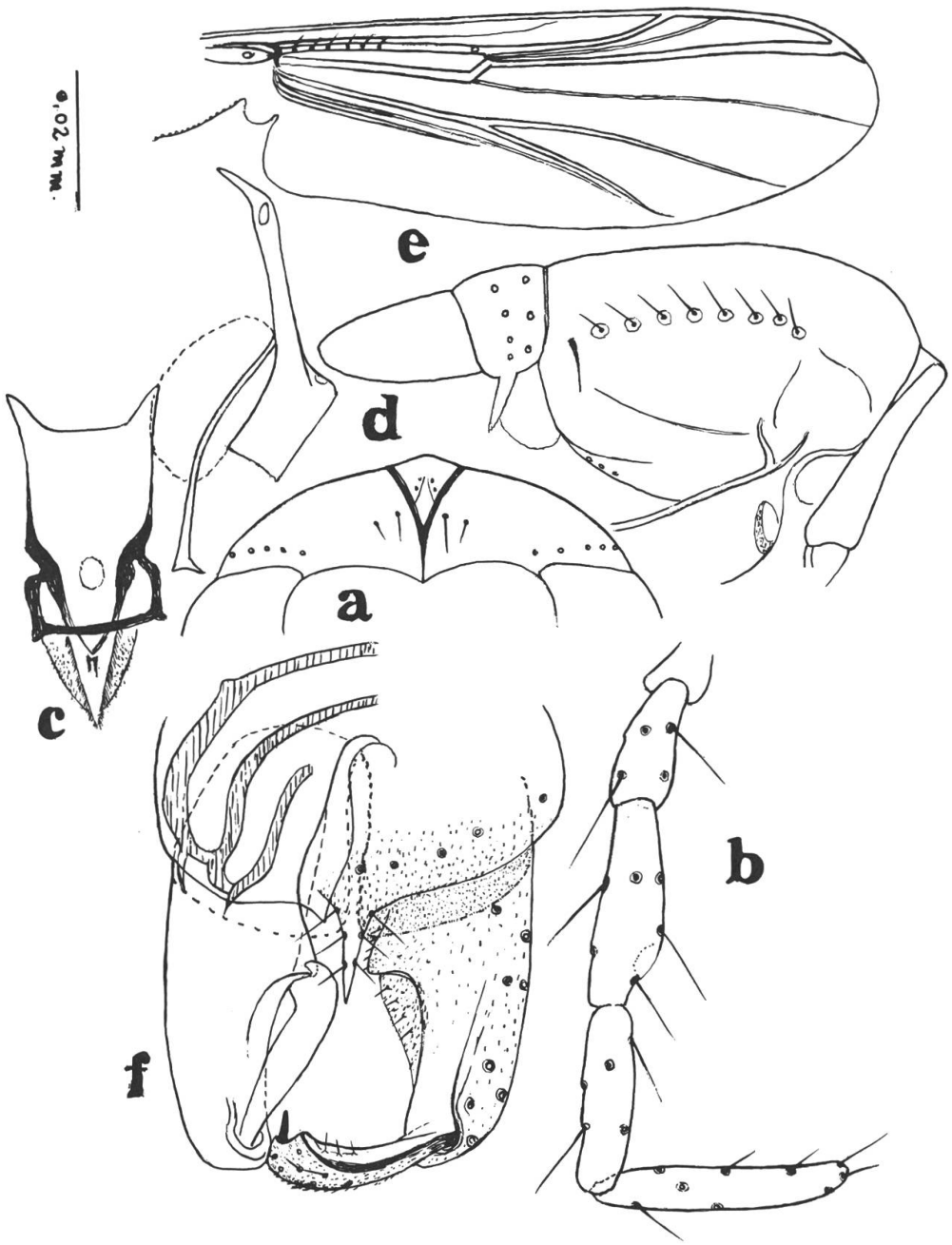

Fig. 2: *Rheocricotopus nemoacrostichalis* n. sp. ♂: a, vertex. b, maxillary palp. c, tentorium and cibarial pump. d, thorax. e, wing. f, hypopygium.

3. Scutellum with 10 setae in a transverse row, postscutellum dark brown.

Wing (Fig. 3e) strongly built, fringed with setae. Brachiolum with 1 seta; R without seta; C strongly extended beyond R_{4+5}, extension being 0.12 mm long; R_{2+3} parallel to R_{4+5} and meets C in the middle of

R_1 and R_{4+5}; Cu_1 slightly curved at its distal two-third and recurved at tip; an ends distal to f-cu. Sensory organ 1 on Fr at the base of R_1. Anal lobe developed and broadly rounded. Squama with 9 setae. Haltere yellow. VR 1.18, CR 0.98.

Legs: Femora of fore legs (Fig. 3f) with light brown band at its distal one-third. Spur of fore tibiae 0.062 mm long, ratio of length of spur to the apical diameter of for tibiae 15:12; spurs of mid tibiae equal, 0.021 mm long, ratio of length of spur to the apical diameter of mid tibia 5:12; spurs of hind tibiae unequal 0.020 mm and 0.057 mm long, ratio of length of spurs to the apical diameter of hind tibiae 5:14:14:14. Hind tibial comb with 12 spicules (0.029 mm–0.049 mm). Pulvilli well developed. Empodium 0.045 mm long.

Proportion and ratios of leg segments:

	Fe	Ti	ta_1	ta_2	ta_3	ta_4	ta_5	LR	TR
Fore	55	64	60	32	25	18	8	0.93	–
Mid	50	48	32	14	10	5	4	0.66	–
Hind	55	64	42	21	17	9	6	0.65	2.0

Abdomen: Tergites I, II and anterior part of tergum V pale brown, tergites IV and VIII brown, rest of tergites dark brown forming band, setae on tergites uniformly distributed on tergites. Anal point 0.049 mm long with 4–5 setae on each side and 1 seta at the base. Gonocoxite with a prominent triangular basal lobe bearing 3–4 setae. Laterosternite with 3 setae, transverse sternapodeme 0.09 mm long, phallapodeme 0.06 mm long. Aedeagal lobe triangular and stout. Gonostylus club shaped with a prominent crista dorsalis and apical tooth 0.016 mm long. HR 2.2, HV 3.4

Body length 3.26 mm, wing length 1.95 mm (1.82–2.01, n = 8), wing breadth 0.62 mm (0.60–0.65, n = 8) mm.

♀. Similar to male with usual sex differences. Antenna (Fig. 3h) brown to dark brown, length ratio of flagellomeres from I–V 20:16:16:15:40, AR 0.59. Genitalia (Fig. 3j–k): Notum 0.14 mm long. Gonocoxite with 14–16 setae. Tergite IX with a caudomedian prominence bearing 17 setae. Seminal capsule (Fig. 3l) equal, spherical and moderately sclerotized measuring 0.093 mm by 0.084 mm.

Body length 2.77 mm, wing length 2.28 mm, wing breadth 0.62 mm.

Material examined: Holotype ♂ (Type no. 54, B.U.Ent.): West

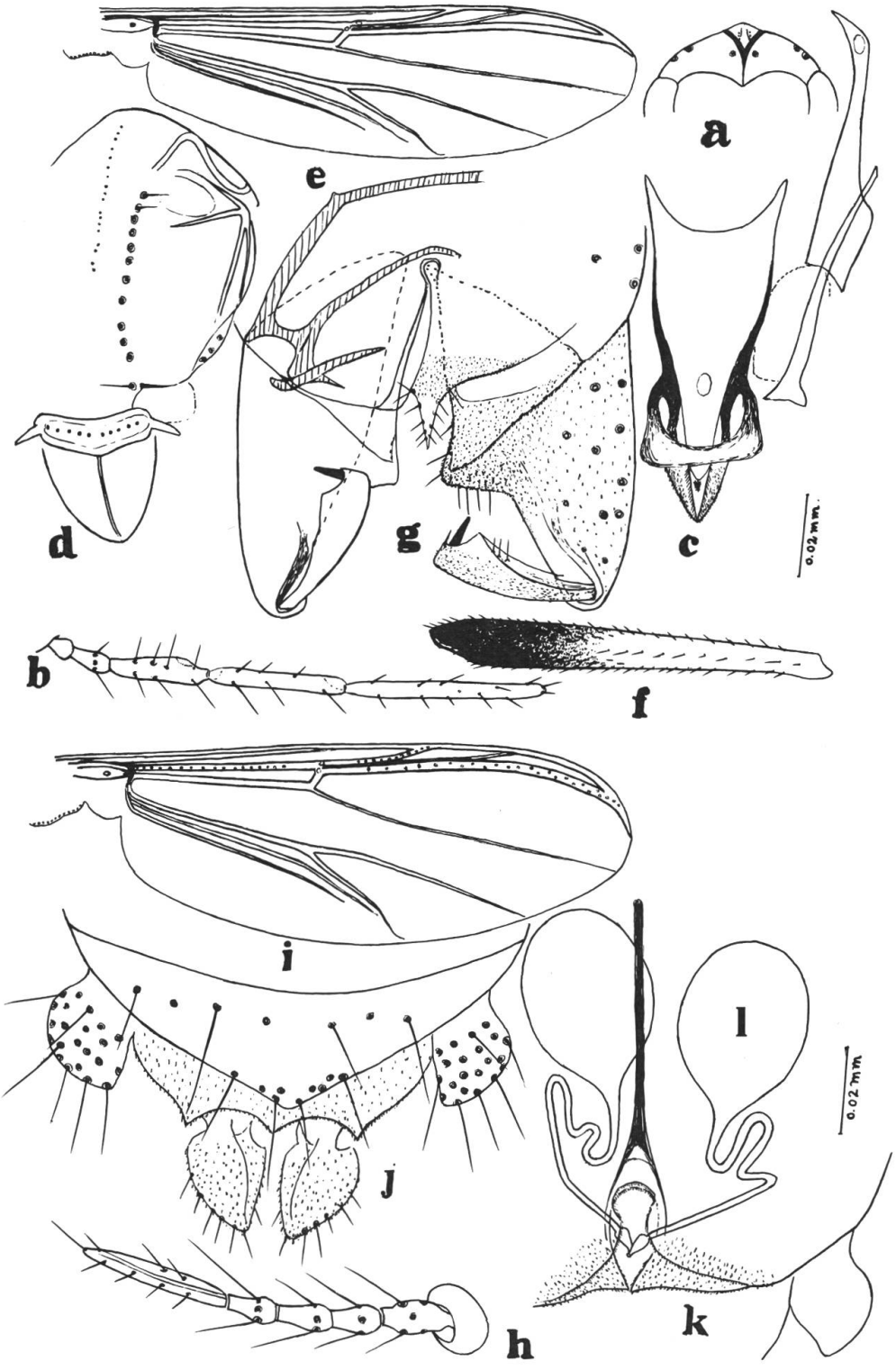

Fig. 3: *Rheocricotopus valgus* n. sp.: a–g. ♂: a, vertex. b, maxillary palp. c, tentorium and cibarial pump. d, thorax. e, wing. f, femur of fore leg. g, hypopygium; h–l. ♀: h, antenna. i, wing. j–k, genitalia. l, seminal capsule.

Bengal, Darjeeling, 17.XI.1974, Coll. S. K. Das Gupta; Allotype ♀: data same as holotype. Paratypes: 3 ♂♂, Shillong, 2.X.1976, Coll. K. Sinha; 3 ♂♂, 2 ♀♀, Gangtok, 18.X.1978, Coll. S. Pradhan; 7 ♂♂, Darjeeling, 3–4, III.1977, Coll. P. K. Chaudhuri; 6 ♂♂, 2 ♀♀, Kurseong, 6. III.1972, Coll. D. C. Sinharay.

Remarks. The present species was collected from the hilly regions of Assam, Sikkim and West Bengal during the winter season. It is named as *Rheocricotopus valgus* n. sp. due to the colour band at the distal part of fore femur. It resembles *R. mediocris* (Johannsen) in its colour pattern of leg, wing and abdomen and *R. foveatus* Edwards from France in certain features of the male hypopygium but it can be distinguished from the above by, I) colour band on fore femur, II) setae on anal point, III) colour pattern of the abdomen, IV) yellow haltere and V) structure of crista dorsalis.

Key to male adults of the Oriental species of Rheocricotopus Thienemann & Harnisch

1. Squama without fringe. **R. godavarius** Lehmann
   Squama with a fringe 2
2. Crista dorsalis absent 3
   Crista dorsalis present 4
3. Gonocoxite lobe membranous. Wing without anal lobe. Mesonotum without vitta. **R. nepalensis** Lehmann
   Gonocoxite lobe rounded. Wing with a well developed anal lobe. Mesonotum with vitta. 5
4. Scutellum with a single row of setae. Acrostichals present. Anal lobe rounded. An ends distal to f-cu 6
   Scutellum with two rows of setae. Acrostichals absent. Anal lobe projecting. An ends below f-cu. **R. nemoacrostichalis** n. sp.
5. Gonocoxite lobe with a hook shaped apex. Gonostylus usual. f-cu distal to r-m. **R. lobalis** (Johannsen)
   Gonocoxite lobe without hook. Gonostylus slender or small. f-cu proximal to r-m 7
6. Fore femur with no colour band. Anal point with 3 setae. R with setae at the base. **R. himalayensis** n. sp.
   Fore femur with colour band. Anal point with 4–5 setae. R without seta. **R. valgus** n. sp.

7. Abdomen pale with dark brown margin. Gonocoxite with triangular lobe; gonostylus slender with broad apex.
R. rigida (Johannsen)
Abdomen dark brown with yellow margin. Gonocoxite with lobe as long as broad; gonostylus of usual form.
R. mediocris (Johannsen)

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Bibliography

BRUNDIN, L. (1956): *Zur Systematik der Orthocladiinae (Diptera: Chironomidae)*. Rept. Inst. Freshwater Res., Drottingholm, *37:* 5–185.

CHAUDHURI, P.K. & GOSH, M. (1980): *The Orthocladinae (Diptera: Chironomidae) from India. Genus Cricotopus v. d. Wulp.* Aquatic Ins. *2 (3):* 147–152.

EDWARDS, F.W. (1929): *British non-biting midges (Diptera: Chironomidae)*. Trans. R.Ent. Soc. Lond. *77:* 279–430.

LEHMANN, V.J. (1969): *The European species of the genus Rheocricotopus Thienemann and Harnisch and three new species of this genus from the Orientalis (Diptera: Chironomidae)*. Arch. Hydrobiol. *66 (3):* 348–381.

SAETHER, O. (1980): *Glossary of chironomid morphology terminology (Diptera: Chironomidae)*. Ent. Scand., Suppl. *14:* 5–51.

SINHARAY, D.C. & CHAUDHURI, P.K. (1979): *Parametriocnemus brundini n. sp. and P. subnubilus n. sp. (Diptera: Chironomidae) from India.* Ent. Scand., Suppl. *10:* 119–123.

THIENEMANN, A. & HARNISCH, O. (1932): *Chironomiden-Metamorphosen. IV. Die Gattung Cricotopus v. d. Wulp.* Zool. An. *99:* 135–143.

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