



## ON SOME COLLECTION OF COLLEMBOLA PRESENT IN THE APTERYGOTA SECTION

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### INTRODUCTION

While going through the collection present in the Apterygota section of National Zoological Collection of Zoological Survey of India, we came across the following collections of collembolan specimens which has not been identified and published so far. From those collections, we have identified 14 species of Collembola under 9 genera distributed over 3 families. There are about 8000 described species of Collembola worldwide (Frans Janssens, 2012). Indian fauna of Collembola represented by 299 species in 103 genera under 19 families (Mandal, 2010). Identification of specimens is done using a phase contrast compound microscope following Christiansen, K.A and Bellinger, P.F., (1998).

Family ENTOMOBRYIDAE Schaffer, 1896

I. Genus *Sinella* Brook, 1882

1. *Sinella montana* Imms, 1912

1912. *Sinella montana* Imms, Proc. Zool. Soc., London: 80-125.

**Diagnosis** : Body length 0.9 mm long. Body coloration white. Eyes and post antennal organ absent. Ant. Ratio as 8:13:13:26. Body clothed with pilose hairs; setae are present. Unguis with two large slender proximal teeth; Relative length index of Abds I: II: III: IV: V: VI=5:11:11:32:7:5. Manubrium: Dentes as 2:3. Mucro with a single stout and prominently curved tooth, and a basal backwardly directed spiniform tooth.

**Material examined** : Pir Panjal, Himalaya expedition, 28.v.1955, Coll. Santokh Singh, 3 exs; Dhroni, Himalaya expedition, 13.vi.1955, Coll. Santokh Singh, 15 exs;

**Distribution** : INDIA: Himachal Pradesh and Uttarakhand.

II. Genus *Seira* Lubbock, 1871

2. *Seira cinerea* Yosii, 1966

1966. *Seira cinerea* Yosii, Kyoto Univ. Sci. Exp. Karakoram and Hindukush, 8: 333-405.

**Diagnosis** : Body length 1.4mm. Ground colour bluish grey, slightly brown with scales. Antennae slightly darker upon proximal two segments. Head coloured ventrally. Th.II anteriorly and Th.III - Abd. II posteriorly with coloured margins. Ant.: Head as 8:3. Ant. Ratio as 25: 38: 35: 65. Scales present from the base until to the middle of Ant. III. Eyes 6+6. Unguis straight, with one inner basal and two inner distal teeth. Unguiculus lanceolate, acute on apex. Tenent hair long, robust and apically dilated. Furcal ratio as 7:8. Manubrium and dentes ventrally scaled and dorsally with many, long, ciliated setae.

**Material examined** : Chandigarh, 10.x.1976, Coll. G.P.Sharma, 3 exs; Ludhiana, Punjab, 15.x.1976, Coll. Dr. Dhaliwal, 1 ex.

**Distribution** : INDIA: Punjab, Maharashtra.

**Remarks** : Yosii (1966) described this species from Malabar hill, Bombay. This species first time recorded from the state of Punjab.

III. Genus *Homidia* Börner, C, 1906

3. *Homidia cingula* (Börner, C, 1906)

1906. *Homidia cingula* Börner, Mitt. Naturhist. Mus. Hamburg., 23: 147-188

1976a. *Homidia cingula* Mitra, Orient. Ins., 10(1): 145-150.

*Diagnosis* : Back ground yellowish. Body not compressed. Dentes with 33 spines. Abdominal segments III and IV with black blue pigmented transverse bands. Apical mucronal tooth smaller than antepical.

*Material examined* : Hasimara, Jalpaiguri dist., West Bengal : 3.xii.1974, Coll.T.Sengupta, 02exs; Kaziranga, Assam; 14.xi.1974, Coll.T.Sengupta, 03exs;Gustia, Howra dist., Coll. N.C.Gayen, 20.iii.1966, 1 exs; Bhadreswar, Hoogly dist., Coll. S.K.Mitra, 26.xii.1965, 3 exs.

*Distribution* : INDIA: Uttar Pradesh, Arunachal Pradesh, Manipur, Sikkim, Mizoram, Nagaland, Orissa and West Bengal.

Family CYPHODERIDAE Börner, 1913

IV. Genus *Delamarerus* Mitra, 1976b

4. *Delamarerus immsi* Mitra, 1976b

1976b. *Delamarerus immsi* Mitra, *Rev. Ecol. Biol. Sol.*, **13**(4): 645-652.

*Diagnostic characters* : White without any trace of pigment. Antenna/body 20:64. Antennae uniformly clothed with short setae; legs clothed with spiniform, long, ciliated setae; furcula clothed with long plumose scales and setae.; Ratio of antennal segments I-IV 2:8:4:7 Relative length index of Ths. II:III =35:18; Unguis extremely modified in the presence of a large tunica at apex, fringed plate-like structures, originating from the base of each unguis and continuing anteriorly through its outer surface, pairs inner unguis and distal teeth present; unguiculilanceolate without outer winglike- tooth, tenent hairs setaceous; Relative length index of Abds I:II:III:IV:V:VI=8:10:9:73:3:1. Manubrium: Dentes: Mucro as15:7:5. Mucro very long, slender with 2 apical teeth. Body length 1.6.mm.

*Material examined* : Kenduah, Birbhum dist., Coll. A.K.Hazra, 7.xi.1974, 30 exs;

*Distribution* : INDIA: West Bengal, Orissa and Andhra Pradesh. This species first time recorded from the state of West Bengal.

Family PARONELLIDAE Börner, 1913

V. Genus *Salina* MacGillivray, 1894

5. *Salina montana* (Imms), 1912

1912. *Cremastocephalus montanus* Imms, *Proc. Zool. Soc., London*: 80-125.

1957. *Salina montana* Salmon, *Acta. Zool. Cracov.*, **11**(14): 313-362.

1973. *Salina montana* Mitra, *Oriental Insects, Delhi*, **7**(2): 159-202.

*Diagnostic characters* : Coloration: Ground colour of head and body usually white, sometimes pale yellow; tergal margins of Ths. II, III and Abd. I & II edged with violet to blue-black pigment; scattered patches and streaks present dorsally and laterally on Ths. II, III, Abd. I. Clothing: Body clothed with slender acuminate, ciliated macrochaetae interspersed with longer macrochaetae. **Thorax**: relative length index of thoracic segments II: III: 29:17; unguis with paired basal and two distal unpaired teeth on inner margin, unguiculus truncate with a prominent midrib, nondentate; tenent hair long, clavate, finely ciliated, tronchetral organ with c.32 spines; **Abdomen**: Relatively length index of abdominal segments I: II: III: IV: V: VI =13:23:4:79:14:8.5. Manubrium: mucrodens 56:63, mucro short, broad and distinctly lobed into 3 teeth, dental scale appendages large, subequal to mucro. Length (excluding appendages): 2 mm.

*Material examined* : Landsdown, Pauri Garwal dist., Uttarakhand, 5.iii.1965, Coll. S.K.Mitra, 1ex;

*Distribution* : INDIA: Uttarakhand and West Bengal.

6. *Salina yosii* Salmon, 1964

1964. *Salina yosii* Salmon, *Bull. Roy. Soc. N.Z.*, (7) 2: 145-644.

1973. *Salina yosii* Mitra, *Oriental Insects, Delhi*, **7**(2): 159-202.

*Diagnostic characters* : Coloration : General ground colour of body varying from white to pale yellow; symmetrical purple to violet markings present dorsally on thoracic II, III and abdominal segment III. Legs and furca pale yellow and without pigment. Clothing: Body clothed with slender acuminate, ciliated macrochaetae interspersed with longer macrochaetae. **Thorax**: Prothorax reduced, relative length index of thoracic segments II: III: 29:15. Hind tibio-tarsi much longer than the fore and mid ones; unguiculus truncate with a prominent midrib; tenent hair long, clavate, finely ciliated. **Abdomen**: Relatively length index of abdominal segments I: II: III: IV: V: VI =13:26:3:84:14.5:7.5. Manubrium: mucrodens 56:68,

mucro short, broad and distinctly lobed into 3 teeth, dental scale appendages large, subequal to mucro. Length (excluding appendages): 2 mm.

*Material examined* : Wakro, Lohit dist., 4.xii.1969, Coll. J.M.Julka, 3 exs;

*Distribution* : INDIA (Arunachal Pradesh, Orissa, West Bengal); CHINA and THAILAND.

*Remarks* : This species first time recorded from the state of Arunachal Pradesh.

#### 7. *Salina striata* Handschin, 1928

1928. *Cremastocephalus striatus* Handschin, *Treubia*, 10: 245-270.

1929. *Salina striata* Handschin *Rev. Suisse. Zool.*, 36: 229-262.

1961. *Salina striatella* Yosii, *Nature and life in South East Asia*, 1: 171-200.

1973. *Salina striata* Mitra, *Orient. Ins.*, 7(2): 159-202.

*Diagnostic characters* : Coloration: Head and body white pale yellow to white in colour, head capsule with a medial dirty brown patch. Antennal segment I with a bluish longitudinal basal streak and another distal blue black pigmented patch. Clothing: Body sparsely clothed with short, ciliated acuminate microchaetae interspersed with flexed macrochaetae. Head: Pear shaped dorsally, frontal spine present 1+1; ocelli 8+8. Thorax: Relative length index of thoracic segments II: III=15:9. Legs similar, unguis slightly curved with paired basal and single unpaired distal teeth on inner margin. Abdomen: Abdominal segments I: II: III: IV: V: VI=8:14:3:41:7:3; Ventral tube well developed. Manubrium: mucrodens 28:33, mucro short, broad, prominently lobed into three teeth, median sometimes truncated tooth; dental scale appendages subequal to mucro with faint longitudinal striations. Body length: 3 mm

*Material examined* : Robbers cave, Dehradun dist., 4.ii.1964, Coll. S.K.Mitra, 1 ex.

*Distribution* : INDIA: Arunachal, Assam, Meghalaya, Nagaland, Uttarakhand and Nilgiri Hills.

#### VI. Genus *Dicranocentroides* Imms, 1912

#### 8. *Dicranocentroides salmoni* Mitra, 1975

1957. *Dicranocentroides fasciculatus* Salmon, *Acta, Zool. Cracov.*, 11(14): 313-362.

1957. *Handschinphysa crassicornis* Sensus Salmon, *ibid.*

1975. *Dicranocentroides salmoni* Mitra, *Rec.Zool. Surv. India*. 71: 57-95.

*Diagnostic characters* : Coloration: Extremely variable colour pattern. Pigmented; thoracic II and abdominal segment III with median pigmentation extending laterad, abdominal segment IV with two transverse bands. Clothing: Body clothed with scales and ciliated obliquely truncated macrochaetae (brush setae) present on head, thoracic II III and abdominal segments I,II; segment IV with posterior-median and of V,VI acuminate, ciliated setae, III with 2 median macrochaetae on each side and IV with 16 macrochaetae at the middle. Head : Pear shaped when viewed from above; ocellar field dark 1+1 each with 8 ocelli in two longitudinal rows. Antennae subequal to the length of head and body; ratio of length of antennal segments I-IV 20:19.5:14:25. Thorax: Relative length index of thoracic segments II: III=14:10. Legs similar; tibio-tarsi anteriorly segmented with 6-7 lateral spine like setae; unguis elongate, unguiculus lanceolate; tenent hair long and clavate. Abdomen: Relative length index of segments I:II:III:IV:V:VI 7:7:4:37:4:2; ventral tube long, rami of reticulum each with 4 teeth. Manubrium : mucrodens 28 :40; each dentes armed with a row of stout spines of more than three fourth of its length and transiting into stiff ciliated setae; mucro large with 6 teeth. Body length 2.3 mm.

*Material examined* : Shillong Peak, Meghalaya, 26.xi.1974, Coll.T. Sengupta, 03exs; Songsak, Garo Hills, Meghalaya, 20.xi.1974, Coll.T. Sengupta, 05exs;

*Distribution* : INDIA: Arunachal, Assam, Manipur, Mizoram, Meghalaya, Nagaland and Sikkim.

#### 9. *Dicranocentroides flavescens* Yosii, 1966

1966. *Dicranocentroides fasciculatus* f. n. *flavescens* Yosii, *Res. Kyoto Univ. Sci. Exped. Karakoram and Hindukush*, 1955, 8: 333-405.

1975. *Dicranocentroides flavescens* Mitra, *Rec. Zool. Surv. India*, 71: 57-95.

*Diagnostic characters* : Coloration: Body pale yellow to brownish generally without dark patches; tergal margins margins of abdomen III and IV with faint bluish pigment having a dark characteristic patch on vertex in between two ocellar

fields; antenna without pigment. Head: Pear shaped when viewed from above; 1+1 dark ocellar field, each with 8 ocelli in two longitudinal parallel rows. Antennae subequal to body; relative length index of antennal segments is I-IV: 15:17:12:19. Thorax: Relative length index of thoracic segments II: III 14:8.5. Legs similar; unguis little curved with paired external basolateral teeth; unguiculus lanceolate, acuminate usually with 2 outer teeth. Abdomen: Relative length index of abdominal segments I: II: III: IV: V: VI 5:6:4:39:5.5:2; ventral tube long with protrusible vesicles retracted. Manubrium: mucrodens 28:38; dentes armed with two closely apposed rows of spines on inner margin; mucro large, parallel sided with 6 teeth. Body length 2-3.5mm.

*Material examined* : Hasimara, Jalpaiguri dist., West Bengal: 3.xii.1974, Coll.T.Sengupta, 01ex;

*Distribution* : INDIA: Manipur, Maharashtra, Mizoram, Nagaland, Sikkim, Tripura, Arunachal Pradesh, Uttar Pradesh and West Bengal; NEPAL.

#### VII. Genus *Callyntrura* Börner, C, 1906

##### 10. *Callyntrura variabilis* Mitra, 1974

1974. *Callyntrura variabilis* Mitra, *Rev. Ecol. Biol. Sol.*, **11**(3): 397-439.

*Diagnosis* : General ground colour of body yellow to brown with variable dark blue black patches, antennae yellowish to dirty brown. Body clothed with scales and flexed setae; 8+8 ocelli in pigmented ocellar fields. Relative length index antennal segments I-IV 18:17:11:27. Relative length index of thoracic segments II: III=42:25. Relative length index of abdominal segments I: II: III: IV: V: VI = 17:24:8:94:10:4; ventral tube moderately long. Manubrium: mucro dens=23:29.5; mucro with six teeth; dental scale appendage absent. Body length (excluding appendages) 2 mm.

*Material examined* : Madarihat, Jalpaiguri dist., West Bengal, Coll.T.Sengupta, 04exs;

*Distribution* : INDIA: West Bengal, Uttar Pradesh and Uttarakhand.

##### 11. *Callyntrura lineata* (Parona, 1892) Yosii, 1961

1892. *Entomobrya lineata* Parona, *Atti. Soc. Ital., Milano*, **34**: 132-135.

1912. *Paronella borneri* Imms, *Proc. Zool. Soc. London*, pp. 80-125, new synonymy.

1912. *Paronella phanolepis* Imms, *ibid*, pp. 80-125, new synonymy

1957. *Handschinphysa lineata* Salmon, *Acta. Zool. Cracov.*, **11**(14): 313-362.

1961. *Callyntrura lineata* Yosii, *Nature and life in Southeast Asia*, **1**: 171-200.

1974. *Callyntrura (Handschinphysa) lineata* Mitra, *Rev. Ecol. Biol. Sol.*, **11**(3): 397-439.

*Diagnostic characters* : Coloration : Body pale yellow with variable purple to blue black pigment; head with or without pigment thoracic I,II and abdominal segments I,II,III. Pigmented with purple to blue black pigment laterally or entirely. **Clothing**: Head, body and appendages clothed with setae and pseudoscales; macrochaetae flexed, obliquely truncated and ciliated (brush setae) setae on thoracic II, III and abdominal segments I, II, III. Antennae and legs clothed with darker, acuminate, ciliated setae. Head: Pear shaped, frontal spines 4+4 present; ocelli, 8+8. Head / Ant I = 28/27; ratio of length of antennal segments I-IV 28:28:18:48; apex segment IV with a conspicuous sense knob encircled with setae. Thorax: Relative length index of thoracic segments II: III 52:22; unguis elongate, little curved, unguis with paired inner and 2 distal unpaired teeth; unguiculus lanceolate; tenent hair clavate. Abdomen: Relative length index of the segments 13:24:8:130:12:5; rami of retinaculum each with 4 teeth. Manubrium: mucrodens 110:148; dentes stout; mucro plump with 6-9 teeth. Body length 2.5 - 4mm.

*Material examined* : Kansrao, Dehradun dist., Uttarakhand, Coll. S.K.Mitra, 2exs; Nagalhat Nullah, Dehradun dist., Uttarakhand, Coll. S.K.Mitra, 7exs; Narendra Nagar, Tehri Garhwal dist., 23.ii.1965, Coll. S.K.Mitra, 10 exs.

*Distribution* : INDIA: Manipur, Tripura and Uttarakhand.

##### 12. *Callyntrura vestita* (Handschin, 1925)

1925. *Microphysa vestita* Handschin, *Treubia*, **6**: 225-270; 1928, *Treubia*, **10**: 225-270

1957. *Handschinphysa vestita* Salmon, *Acta. Zool. Cracov.*, **11** (14): 313-362

1974. *Callyntrura (Handschinphysa) vestita* Mitra, *Rev. Ecol. Biol. Sol.*, **11**(3): 397-439

*Diagnostic characters* : Coloration: Unique in colour pattern and usually without any variation;

body green in fresh, pale yellow in spirit dark purple to blue black patches covering head, thoracic II,III and abdominal segments I,II,III. Clothing: Body clothed with flexed macrochaetae, acuminate, nonflexed setae and scales. Head: Pear shaped with 4+4 dark frontal spines; ocelli 8+8. Antennae subequal or little longer than body, ratio of length of antennal segments I-IV 43:40:27:60. Thorax: Relative length index of thoracic segments II: III 63:31; unguis straight, little curved apically with inner, paired basal teeth reduced, single unpaired tooth small; external basolateral teeth large; unguiculilanceolate. Abdomen: Relative length index of abdominal segments I: II: III: IV: V: VI 18:31:14:172:22:9; rami of retinaculum each with 4 teeth. Manubrium: mucrodens =45:53; mucro usually with 6 teeth, dental scale appendages small. Body length 2-2.5 mm.

*Material examined* : Lopchu Tea Estate, Darjeeling dist., W.B., 20.x.1967, Coll. G.Topal, 1 ex; Shillong Peak, Meghalaya, 17.viii.1965, 1 ex; Gorubathan, W.B., 10.xii.1973, Coll. G.K.Srivastava, 3 exs.

*Distribution* : INDIA: Assam, Manipur, Meghalaya and Nagaland West Bengal; INDONESIA.

#### VIII. Genus *Yosiia* Mitra, 1967

##### 13. *Yosiia dehradunia* Mitra, 1967

1967. *Yosiia dehradunia* Mitra, *Proc. Zool. Soc. Calcutta*, **20**: 43-47.

*Diagnostic characters* : Coloration: Pale yellow with dust of blue pigment over the body and a pair of dark blue-black patches one on each side on abdominal segments III and IV. Clothing: Scales absent; head and body clothed with setae, mostly ciliated; longer setae broad, cylindrical and blunt or slender acuminate; setae arising in clusters from the cervix and decumbent on posterior margin of head, similar setae also present anteriorly on mesotergum, head capsule and body. Head: Pear-shaped; ocelli 8+8 in pigmented ocellar fields each group of 8 ocelli arranged in two longitudinal parallel rows. Thorax: Segment I reduced; the relative length index of segments II: III= 23:11. Legs similar; each tibio-tarsus with two large tibio-tarsal lobes; unguiculus of the "truncate" type; trochanteral organ with 24 short spines. Abdomen:

Relative length index of segments I:II:III: IV :V:VI = 6:15:4:67:9:6; Ventral tube short, anterior face with 4+4 long ciliated setae; rami of tenaculum each with 4+4 teeth; dens and manubrium subequal, dens crenulated; mucro vestigial; dental scale appendages greatly enlarged, dorsal in relation to dens and with longitudinal striations. Body length 1.14 mm.

*Material examined* : Daitari, Keonjhor dist., Orissa, 23.xi.1967, Coll. G.Topal, 9 exs; Joynagar, Agartala, Tripura, 30.x.1974, Coll. M.S.Shishodia, 2 exs; Golapbag, Burdwan dist., W.B., 3.v.1971, Coll. B.Bhattacharyya, 5 exs.

*Distribution* : Orissa, West Bengal, Sikkim, Tripura and Uttarakhand.

#### IX. Genus *Idiomerus* Imms, 1912

##### 14. *Idiomerus pallidus* Imms, 1912

1912. *Idiomerus pallidus* Imms, *Proc. Zool. Soc., London*: 80-125.

1990. *Idiomerus pallidus* Mitra, *Rec. zool. Surv. Ind.*, **86**: 69-82.

*Diagnosis* : Ground colour of body yellow with variable bluish black pigment, head capsule pigmented anteriorly, body clothed with flexed macrochaetae, head pear shaped, longer than broad; 8+8 ocelli; Th.II prominently humped posteriorly, degree of prominence varies with the age of individuals; relative length of Th.II: III= 18: 5; Unguis slightly curved with paired inner basal and single distal unpaired teeth, external basal teeth well developed; unguiculilanceolate, relative length index of Abds.I:II :III: IV :V:VI = 4:8:4:40:9:3; ventral tube long, relative length index of manubrium: dentes=30:40, dentes not crenulated, with two closely apposed rows of spines, dental scale appendage absent; mucrones short, broad with six teeth. Body length excluding appendages: 3-4 mm.

*Material examined* : From the side of a hill stream, Venkolla, Quilon dist., Kerala, 14.xii.1976, Coll. S.K.Mitra, 8 exs.

*Distribution* : INDIA:Kerala.

#### SUMMARY

The present paper deals with 14 species of Collembola under 9 genera distributed over 3 families.

## ACKNOWLEDGEMENT

We are grateful to the Director, Dr. K. Venkatraman, Director, Zoological Survey of India, Kolkata for kind encouragement and laboratory facilities. Authors are indebted to Dr. A.K.Hazra,

Emeritus Scientist, Zoological Survey of India, Kolkata for confirming the identification of some species of Collembola. We are also thankful to Dr. A. Bal, Scientist-E & Divisional In Charge, Entomology(B)division.

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