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INSECTA MATSUMURANA

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STUDIES ON THE APHIDS (HOMOPTERA: APHIDIDAE) FROM NORTH AND NORTH-WEST INDIA, I

By D. N. RAYCHAUDHURI, L. K. GHOSH and S. K. DAS

Research Trips for Forest and Agricultural Insects in the Subcontinent of India (Hokkaidô University, University of Calcutta, and Zoological Survey of India Joint Project) [Grants-in-Aid for Overseas Scientific Survey, Ministry of Education, Japanese Government, 1978, No. 304108; 1979, No. 404307], Scientific Report No. 5.

Abstract

RAYCHAUDHURI, D. N., GHOSH, L. K. and DAS, S. K. 1980. Studies on the aphids (Homoptera: Aphididae) from North and North-West India, I. *Ins. matsum. n. s.* 20: 1–42, 13 figs.

This paper reports 78 aphid species including 6 new ones distributed over 46 genera including 3 new under 6 subfamilies from North and North-West India. Apart from new species and genera 1 species is a new record for India, 9 are for Uttar Pradesh, 1 is for Delhi and 12 are for Himachal Pradesh. Of the collected aphid species oviparous females of 8 species and males of 6 species are reported for the first time.

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****= new record from India; ***= new record from Uttar Pradesh; **= new record from Delhi; *= new record from Himachal Pradesh.

INTRODUCTION

In view of the similarity in insect fauna of Japan and India the Entomological Institute, Faculty of Agriculture, Hokkaidô University and the Entomology Unit, Department of Zoology, Calcutta University had been envisaging for a joint project for collecting agriculture and forest insects of India. This project ultimately materialised in October, 1978 with the collaboration of Zoological Survey of India.

A team drawn from the three organizations made research trips to some areas in north, north-west and south-India, when samples of different groups of insects were collected. The aphid samples (300 from North and North-West and 214 from South India) collected from these areas are with the Entomology Unit, Department of Zoology, Calcutta University for final determination.

Collection from North and North-West India has revealed a total of 78 species

distributed over 46 genera under 6 subfamilies. Of these, 6 species and 3 genera are new to science. Apart from the new species and genera stated above 9 species are newly recorded from Uttar Pradesh, 1 species from Delhi and 12 species from Himachal Pradesh. Out of the collected aphid species have been incorporated descriptions of hitherto unknown oviparous females of 8 species, viz. *Aphis fabae* complex, *Dactynotus fagopyri* Chowdhuri et al., *Macrosiphum* (*Neomacrosiphum*) *pseudogeranii* Chakrabarti and Raychaudhuri, *Macrosiphum* (*Sitobion*) *sikkimensis* Ghosh and Raychaudhuri, *Metopolophium rubi* (Narzikulov), *Metopolophium* sp., *Neoacyrthosiphon* sp., *Eutrichosiphum* (*Paratrichosiphum*) *alnicola* Basu; alate male of 6 species, viz. *Aphis fabae* complex, *Amphorophora ampullata bengalensis* Hille Ris Lambers and Basu, *Impatientinum impatiensae dalhousiensis* Verma, *Macrosiphum* (*Sitobion*) *sikkimensis* Ghosh and Raychaudhuri, *Metopolophium rubi* (Narzikulov), *Metopolophium* sp.; apterous viviparous female of *Stomaphis* sp. and alate viviparous female of *Metopolophium* sp. Specific determination of these two has not been possible because of paucity of comparable material as well as literature.

The aphid material, if not otherwise indicated in the text, were collected by Dr. M. R. Ghosh and Dr. P. K. Mondal and are in the collection of Entomological Institute, Faculty of Agriculture, Hokkaidô University and Aphid Research Unit, Department of Zoology, Calcutta University.

Abbreviations used in the systematic account

Aptera/e: Apterous viviparous female/s
Alata/e: Alate viviparous female/s
b.d.III: Basal diameter of antennal segment III
p.t.: Processus terminalis
u.r.s.: Ultimate rostral segment
h.t.2: 2nd segment of hind tarsus
a.s.: Antennal segment
coll.: Collector
F.T.C.: First tarsal chaetotaxy
M: Media of forewing
H.P.: Himachal Pradesh
U.P.: Uttar Pradesh

Systematics

1. *Aphis fabae* complex (Figs. 1 & 2)

Aphis fabae Scopoli, 1763. Entomologia Carniolica, 136.

Apterous oviparous female (Fig. 1)

Body about 1.11–1.35 mm in length with 0.70–0.81 mm as maximum width. Head light brown and smooth; dorsal cephalic hairs long with acuminate apices, lingest one being about 1.74–2.12×b.d. III. Antennae 6-segmented (in some specimens 5-segmented), about 0.52–0.59×body; flagellum pale to pale brown and imbricated; p.t. about 2.0–2.50×base of segment VI. Rostrum reaching a little beyond midcoxae; u.r.s. about 1.10–1.26×h.t.2 bearing 2 secondary hairs. Abdomen pale; dorsal abdominal hairs long with acute to acuminate apices, longest hair on anterior, 7th and 8th tergites being about 1.50–2.0, 2.33–3.0 and 2.33–3.20 × b.d.III respectively. Siphunculi pale brown, cylindrical, about 0.05–0.08× body and about 0.77–0.87 × thumb-shaped cauda bearing 6–8 hairs. Hind tibiae swollen with numerous pseudosensoria distributed over 0.80 portion from base.

Other characters as in apterae viviparae.

Measurements of one specimen in mm: Length of body 1.08, width 0.69; antenna 0.72, a.s. III: IV:V:VI 0.12: 0.10: 0.10: (0.09+0.21); u.r.s. 0.09; h.t.2 0.08; siphunculus 0.09; cauda 0.10.

Alate male (Fig. 2)

Body about 1.38 mm in length with about 0.60–0.67 mm as the maximum width. Head dark brown. Antennae 6-segmented, concolorous with head, about 0.83–0.92 × body; p.t. about 2.25–2.37 × base of last antennal segment; segment III with 21–28, IV with 23–24 and V with 8–12 round secondary rhinaria distributed irregularly over entire length except the very base. Ultimate rostral segment about 1.18–1.28 × h.t.2 and with 2 secondary hairs. Abdomen pale, with segmentally arranged spinal and marginal dark brown sclerotic patches bearing faint spinular striae; dorsal hairs with acute to acuminate apices, longest hair on anterior, 7th and 8th tergites about 2.0–2.40, 2.0 and 2.80 × b.d.III respectively. Siphunculi short, about 0.07–0.08 × body and about 1.11–1.33 × cauda. Wing venation normal. Other characters as in alate viviparae.

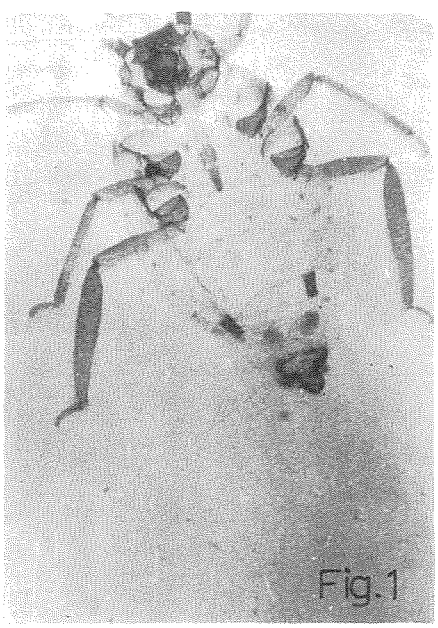


Fig. 1. *Aphis fabae* complex. Apterous oviparous female.
Fig. 2. *Aphis fabae* complex. Alate male.

Measurements of one specimen in mm: Length of body 1.38, width 0.60; antenna 1.15, a.s. III:IV:V:VI 0.24:0.21:0.21: (0.12+0.27); u.r.s. 0.09; h.t.2 0.07; siphunculus 0.10; cauda 0.09.

Collection data: 3 yellowish apterae and 2 alata from *Spiraea bella* (Rosaceae), Chail (H.P.), *c* 2000 m, 27. X. 78; 7 blackish apterae from *Cestrum* sp. (Solanaceae), Mussourie (U.P.), *c* 1600 m, 27. X. 78; 1 blackish aptera, 8 apterae oviparae and 16 nymphs from *Strobilanthes atropurpurens* (Acanthaceae), Mashobra (H.P.), *c* 2250 m, 28. X. 78; 1 brownish aptera, 1 alata and 11 nymphs from *Rhamnus* sp.

(Rhamnaceae), Jakhu (H.P.), *c* 2400 m., 28. X. 78; 4 brownish apterae and 17 nymphs from an unidentified host (Gramineae), Javli (H.P.), *c* 1300 m, 29. X. 78; 8 blackish apterae and 13 nymphs from *Cestrum* sp. (Solanaceae), Kasauli (H.P.), *c* 1850 m, 30. X. 78; 11 brownish apterae, 2 alatae and 8 nymphs from *Anaphalis* sp. (Compositae), Kemphy (U.P.), *c* 1220 m, 4. XI. 78.

Distribution: Virtually cosmopolitan.

2. *Aphis gossypii* complex

Aphis gossypii Glover, 1877. Rept. Comm. Agr. Operations dept. for 1876, 36.

Collection data: 1 yellowish aptera from *Polyalthia* sp. (Anonaceae), Badkhal lake (Haryana), 22. X. 78; 2 brownish apterae from *Tridax procumbens* (Compositae), Badkhal lake (Haryana), 22. X. 78; 13 yellowish green apterae from *Luffa acutangula* (Cucurbitaceae), Badkhal lake (Haryana), 22. X. 78; 3 brownish apterae and 1 alata from unidentified host (Labiatae), Badkhal lake (Haryana), 22. X. 78; 20 brownish apterae and one nymph from an unidentified host (Meliaceae), Badkhal lake (Haryana), 22. X. 78; 6 brownish apterae and 2 nymphs from an unidentified host (Rosaceae), Badkhal lake (Haryana), 22. X. 78; 8 greenish apterae and 9 nymphs from *Cestrum* sp. (Solanaceae), Badkhal lake (Haryana), 22. X. 78; 15 brownish apterae, 2 alatae and 8 nymphs from *Lagerstroemia* sp. (Lythraceae), Delhi, *c* 500 m, 23. X. 78; 1 greenish aptera from *Anaphalis contorta* (Compositae), Solan (H.P.), *c* 1450 m, 25. X. 78; 6 greenish apterae and 1 nymph from *Goldfussia dalhoussiana*, (Acanthaceae), Solan (H.P.), *c* 1450 m, 25. X. 78; 4 greenish apterae and 8 nymphs from *Polygonum* sp. (Polygonaceae), Solan (H.P.), *c* 1450 m, 25. X. 78; 3 greenish apterae from *Prunus* sp. (Rosaceae), Solan (H.P.), *c* 1450 m, 25. X. 78; 1 greenish aptera and 3 nymphs from an unidentified host (Acanthaceae), Solan (H.P.), *c* 1450 m, 26. X. 78; 8 greenish apterae and 12 nymphs from *Polygonum* sp. (Polygonaceae), Kufri (H.P.), *c* 2700 m, 26. X. 78; 5 yellowish green apterae and 11 nymphs from *Anaphalis* sp. (Compositae), Sadhupul (H.P.), *c* 1300 m, 27. X 78; 7 blackish alatae from *Hypericum oblongifolium* (Hypericaceae), Chail (H.P.), *c* 2000 m, 27. X. 78; 2 blackish apterae from *Smilax* sp. (Liliaceae), Sadhupul (H.P.), *c* 1300 m., 27. X. 78; 3 greenish apterae and 9 nymphs from *Polygonum* sp. (Polygonceae), Sadhupul (H.P.), *c* 1300 m, 27. X. 78; 1 blackish alata from *Pyrus* sp. (Rosaceae), Sadhupul (H.P.), *c* 1300 m, 27. X. 78; 20 greenish apterae, 1 alata and 51 nymphs from *Gynura nepalensis* (Compositae), Mashobra (H.P.), *c* 2250 n, 28. X. 78; 8 greenish apterae and 29 nymphs from *Polygonum* sp. (Polygonaceae), Mashobra (H.P.), *c* 2250 m, 28. X. 78; 4 brownish green apterae, 3 alatae and 16 nymphs from *Rhamnus* sp. (Rhamnaceae), Jakhu (H.P.), *c* 2400 m, 28. X. 78; 3 yellowish apterae and 2 nymphs from *Ipomoea* sp. (Convolvulaceae), Dharampur (H.P.), *c* 1500 m, 29. X. 78; 5 greenish apterae and 7 nymphs from *Hibiscus rosasinensis* (Malvaceae), Javli (H.P.), *c* 1300 m, 29. X. 78; 2 greenish apterae and 8 nymphs from *Urtica* sp. (Urticaceae), Dharampur (H.P.), *c* 1500 m, 29. X. 78; 6 greenish apterae, 2 alatae and 8 nymphs from Kasauli (H.P.), *c* 1850 m, 30. X. 78; 7 greenish alatae and 4 nymphs from *Cucurbita* sp. (Cucurbitaceae), Solan (H.P.), *c* 1450 m, 30. X. 78; 1 greenish aptera and 2 alatae from *Pyrus* sp. (Rosaceae), Solan (H.P.), *c* 1450 m, 30. X. 78; 11 pinkish apterae and 17 nymphs from *Duranta* sp. (Verbenaceae), Kasauli (H.P.), *c* 1850 m, 30. X. 78; 4 greenish apterae, 1 alata and 31 nymphs from *Bidens pilosa* (Compositae), Barog (H.P.), *c* 1531 m, 31. X. 78; 3 greenish apterae, 1 alata and 7 nymphs from *Conyza japonica*

(Compositae), Barog (H.P.), *c* 1531 m, 31. X. 78; 5 greenish apterae and 20 nymphs from *Tridax* sp. (Compositae), Barog (H.P.), *c* 1531 m, 31. X. 78; 12 greenish alatae and 10 nymphs from *Origanum vulgaris* (Labiatae), Kufri (H.P.), *c* 2700 m. 31. X. 78; 1 greenish aptera and 29 nymphs from an unidentified host (Myrtaceae), Barog (H.P.), *c* 1531 m, 31. X. 78; 1 greenish alata from *Ageratum conyzoides* (Compositae), Dehradun (U.P.), *c* 825 m, 2. XI. 78; 1 greenish alata from *Ageratum* sp. (Compositae), Mussourie (U.P.), *c* 1600 m, 3. XI. 78; 1 yellowish aptera and 3 nymphs from *Psidium guyava* (Myrtaceae), Dehradun (U.P.), *c* 1825 m, 2. XI. 78; 3 blackish apterae, 1 alata and 9 nymphs from *Rhamnus* sp. (Rhamnaceae), Kemphy (U.P.), *c* 1220 m, 4. XI. 78.

Distribution: Virtually cosmopolitan.

3. *Aphis kurosawai* Takahashi

Aphis kurosawai Takahashi, 1921. Aphididae of Formosa 1:53.

Collection data: 9 greenish apterae from *Artemisia* sp. (Compositae), Kemphy (U.P.), *c* 1220 m, 4. XI. 78.

Distribution: India: Assam, Himachal Pradesh, Sikkim, Uttar Pradesh, West Bengal; China; Japan and Taiwan.

4. *Aphis nasturtii* Kaltenbach

Aphis nasturtii Kaltenbach, 1843. Mon. der Fam. der Pflanzen, 76.

Collection data: 8 brownish apterae and 21 nymphs from *Solanum nigrum* (Solanaceae), Pinjore (Haryana), *c* 600 m, 29. X. 78.

Distribution: India: Arunachal Pradesh, Haryana, Himachal Pradesh, Meghalaya, Nagaland, Sikkim, West Bengal; America; Europe; Middle East and Pakistan.

5. *Aphis ruborum longisetosus* Basu

Aphis ruborum longisetosus Basu, A. N. 1969. Orient. Insects 3(4): 356.

Collection data: 4 yellowish apterae and 15 nymphs from *Rubus ellipticus* (Rosaceae), Solan (H.P.), *c* 1450 m, 25. X. 78; 3 brownish apterae from *Rubus ellipticus* (Rosaceae), Sadhupul (H.P.), *c* 1300 m, 27. X. 78; 2 brownish apterae and 8 nymphs from *Rubus* sp. (Rosaceae), Kasauli (H.P.), *c* 1850 m, 30. X. 78; 1 brownish aptera, 3 alatae and 3 nymphs from *Rubus ellipticus* (Rosaceae), Mussourie (U.P.), *c* 1600 m, 3. XI. 78; 5 brownish apterae and 3 alatae from *Rubus ellipticus* (Rosaceae), Kemphy (U.P.), *c* 1220 m, 4. XI. 78.

Distribution: India: Arunachal Pradesh, Himachal Pradesh, Meghalaya, Nagaland, Sikkim, West Bengal.

6. *Aphis spiraecola* Patch

Aphis spiraecola Patch, 1914. Bull. Maine Agr. Exp. Stn. 233: 270.

Collection data: 6 yellowish apterae, 1 alata and 4 nymphs from an unidentified host (Asclepiadaceae), Badkhal lake (Haryana), 22. X. 78; 17 greenish apterae, 2 alatae and 6 nymphs from *Bidens pilosa* (Compositae), Solan (H.P.), *c* 1450 m, 25. X. 78; 16 greenish yellow apterae and 13 nymphs from an unidentified host (Compositae), Solan (H.P.), *c* 1450 m, 25. X. 78; 2 greenish apterae, 7 alatae and 7

nymphs from *Morus* sp. (Moraceae), Solan (H.P.), *c* 1450 m, 25. X. 78; 2 greenish apterae and 7 nymphs from an unidentified host (Rosaceae), Solan (H.P.), *c* 1450 m, 25. X. 78; 7 greenish yellow apterae, 5 alatae and 4 nymphs from *Polygonum* sp. (Polygonaceae), Kufri (H.P.), *c* 2700 m, 26. X. 78; 7 greenish apterae and 7 nymphs from *Urtica* sp. (Urticaceae), Kufri (H.P.), *c* 2700 m, 26. X. 78; 1 brownish aptera from *Impatiens* sp. (Balsaminaceae), Sadhupul (H.P.), *c* 1300 m, 27. X. 78; 10 yellowish apterae and 19 nymphs from *Bidens pilosa* (Compositae), Sadhupul (H.P.), *c* 1300 m, 27. X. 78; 10 brownish apterae and 6 nymphs from *Hypericum* sp. (Hypericaceae), Sadhupul (H.P.), *c* 1300 m, 27. X. 78; 2 blackish alatae from *Smilax* sp. (Liliaceae), Sadhupul (H.P.), *c* 1300 m, 27. X. 78; 18 greenish apterae and 7 nymphs from *Pyrus malus* (Rosaceae), Sadhupul (H.P.), *c* 1300 m, 27. X. 78; 4 greenish apterae, 15 alatae and 3 nymphs from *Spiraea bella* (Rosaceae), Chail (H.P.), *c* 2000 m, 27. X. 78; 1 yellowish aptera, 4 alatae and 6 nymphs from *Ficus* sp. (Moraceae), Dharampur (H.P.), *c* 1500 m, 29. X. 78; 12 pale green apterae and 3 nymphs from *Zinnia* sp. (Compositae), Kasauli (H.P.), *c* 1850 m, 30. X. 78; 3 greenish yellow apterae, 1 alata and 3 nymphs from an unidentified host (Gramineae) Kasauli (H.P.), *c* 1850 m, 30. X. 78; 5 yellowish green apterae, 1 alata and 14 nymphs from *Spiraea* sp. (Rosaceae), Kasauli (H.P.), *c* 1850 m, 30. X. 78; 3 greenish alatae and 9 nymphs from *Inula cuspidata* (Compositae), Barog (H.P.), *c* 1531 m, 31. X. 78; 15 pale greenish apterae, 4 alatae and 54 nymphs from *Pyrus malus* (Rosaceae), Barog (H.P.), *c* 1531 m, 31. X. 78; 22 blackish apterae from *Cestrum* sp. (Solanaceae), Barog (H.P.), *c* 1531 m, 31. X. 78; 2 blackish apterae from *Bidens pilosa* (Compositae), Kemphy (U.P.), *c* 1220 m, 4. XI. 78; 3 blackish apterae, 1 alata and 9 nymphs from *Rhamnus* sp. (Rhamnaceae), Kemphy (U.P.), *c* 1220 m, 4. XI. 78; 4 greenish apterae from *Prunus* sp. (Rosaceae), Kemphy (U.P.), *c* 1220 m, 4. XI. 78.

Distribution: India: all over; Africa; Australia; Bermuda Is.; Ceylon; China; Nepal; New Zealand; North America; Pakistan and Syria.

7. *Aphis verbasci* Schrank

Aphis verbasci Schrank, 1801. Fauna Boica, II. Ingtostadt 2: 106.

Collection data: 3 yellowish green apterae and 7 nymphs from *Verbascum thapsus* (Scrophulariaceae), Kufri (H.P.), *c* 2700 m, 31. X. 78.

Distribution: India: Himachal Pradesh, Uttar Pradesh; Europe and Middle East.

8. *Hysteroneura setariae* (Thomas)

Siphonophora setariae Thomas, 1878. Bull. Illinois State Lab. Nat. Hist. 2: 5.

Collection data: 2 dark brown apterae and 4 nymphs from an unidentified host (Gramineae), Badkhal lake (Haryana), 22. X. 78; 3 dark brown apterae and 5 nymphs from *Panicum* sp. (Gramineae), Solan (H.P.), *c* 1450 m, 25. X. 78; 1 brownish aptera and 10 nymphs from *Brachiaria* sp. (Gramineae), Dharampur (H.P.), *c* 1500 m, 29. X. 78; 10 brownish apterae, 1 alata and 7 nymphs from *Cynodon dactylon* (Gramineae), Dharmapur (H.P.), *c* 1500 m, 29. X. 78; 6 brownish apterae, 3 alatae and 20 nymphs from an unidentified host (Gramineae), Dharampur (H.P.), *c* 1500 m, 29. X. 78; 2 brownish apterae, 1 alata and 5 nymphs from an unidentified host (Gramineae), Dehradun (U.P.), *c* 825 m, 2. XI. 78; 2 brownish

apterae and 4 nymphs from an unidentified host (Gramineae), Mussouri (U.P.), *c* 1600 m, 3. XI. 78.

Distribution: India: all over; Africa; America; Japan; Korea; Philippines and Taiwan.

9. *Melanaphis donacis* (Passerini)

Longiunguis donacis Passerini, 1860. Gli Afidi, 309.

Collection data: 14 brownish apterae, 3 alatae and 1 nymph from *Phragmites* sp. (Gramineae), Derhadun (U.P.), *c* 825 m, 2. XI. 78.

Distribution: India: Himachal Pradesh, Meghalaya, Tamil Nadu; and Mediterranean region excepting Africa.

10. *Rhopalosiphum maidis* (Fitch)

Aphis maidis Fitch, 1856. Trans. New York Agr. Soc. 15: 531.

Collection data: 1 brownish aptera from an unidentified host (Gramineae), Dharampur (H.P.), *c* 1500 m, 29. X. 78.

Distribution: Virtually cosmopolitan.

11. *Rhopalosiphum padi* (Linnaeus)

Aphis padi Linnaeus, 1758. Syst. Nat. (10th ed.): 451.

Collection data: 3 greenish apterae, 2 alatae and 4 nymphs from *Canna* sp. (Cannaceae), Mashobra (H.P.), *c* 2250 m, 28. X. 78; 3 brownish green apterae, 1 alata and 4 nymphs from an unidentified host (Cannaceae), Jakhu (H.P.), *c* 2400 m 28. X. 78; 16 brownish apterae, 1 alata and 10 nymphs from *Zea mays* (Gramineae), Solan (H.P.), *c* 1450 m, 1. XI. 78.

Distribution: Virtually cosmopolitan.

12. *Rhopalosiphum rufiabdominalis* (Sasaki)

Toxoptera rufiabdominalis Sasaki, 1899. Rept. Hokkaido Agr. Exp. Stn. 17: 202.

Collection data: 1 greenish aptera and 1 nymph from *Bidens pilosa* (Compositae), Solan (H.P.), *c* 1450 m, 25. X. 78; 1 blackish alata from *Abies* sp. (Pinaceae), Kufri (H.P.), *c* 2700 m, 26. X. 78.

Distribution: Virtually cosmopolitan.

13. *Toxoptera aurantii* (Boyer de Fonscolombe)

Aphis aurantii Boyer de Fonscolombe, 1841. Ann. Ent. Soc. France 10: 178.

Collection data: 1 blackish aptera, 1 alata and 1 nymph from an unidentified host (Rutaceae), Dehradun (U.P.), *c* 825 m, 2. XI. 78.

Distribution: Virtually cosmopolitan.

14. *Amphorophora ampullata bengalensis* Hille Ris Lambers and Basu (Fig. 3)

Amphorophora ampullata bengalensis Hille Ris Lambers and Basu, 1966. Ent. Bericht. 26: 14.

Alate male (Figs. 3 A & B)

Body 2.71–3.14 mm long with 0.99–1.15 mm as its maximum width. Head pale brown, faintly wrinkled; lateral frontal tubercles well developed and diverging; median frontal prominence conspicuous; dorsal cephalic hairs long with blunt to

incrassate apices. Antennae 6-segmented; longer than body, brown excepting segments I, II and the very base of segment III which are paler; segments I and II with spinules on basal half; 40–48, 1–14 and 10–22 round to oval, nonprotuberant secondary rhinaria present on segments III, IV and V respectively; primary rhinaria round and ciliated; p.t. about 3.0 × base of last antennal segment. Rostrum extending a little beyond mid coxae; u.r.s. obtuse, about 1.22–1.30 × h. t.2 and bears 6–7 secondary hairs besides 3 pairs of preapical ones. Abdomen pale; anterior tergites (3–6) with marginal sclerotic patches; dorsal hairs long, with incrassate to acute apices; pre- and post-siphuncular slcerites well developed. Siphunculi 0.17–0.18 × body, pale brown, distinctly clavate beyond apical half, with a few striae before distinct flange. Cauda pale but apex pale brown, broadest at base and narrowed gradually apicad, bearing 10–12 hairs. Legs pale brown to brown; femora brown except pale proximal 0.33 portion and smooth. F.T.C. 3,3,3. Wing-venation normal. Male genitalia well developed.

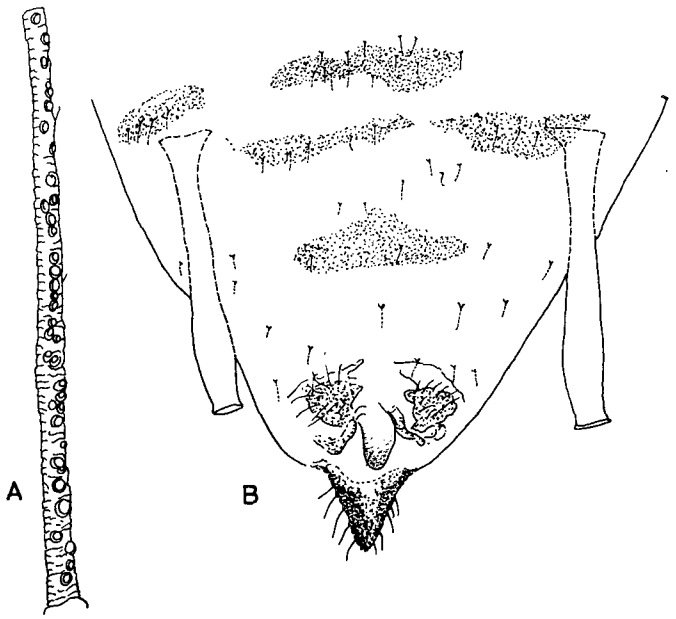


Fig. 3. *Amphorophora ampullata bengalensis* Hille Ris Lambers and Basu. Alate male. A: Antennal segment III. B: Posterior part of the abdomen showing male genitalia.

Measurements of one alate male in mm: Length of body 2.71, width 0.99; antenna 3.42, a.s. III:IV:V:VI 0.91:0.78:0.69: (0.17+0.57); u.r.s. 0.13; h.t.2 0.10; siphunculus 0.46; cauda 0.03.

Collection data: 4 apterae oviparae, 1 alate male and 3 nymphs from an unidentified fern, Mashobra (H.P.), *c* 2250 m, 28. X. 78.

Distribution: India: Arunachal Pradesh, Himachal Pradesh, Meghalaya, Sikkim and West Bengal.

Note: One alate male of this species could also be found in Sikkim in North East India. Description has also been based on the material recorded from Sikkim.

15. *Aspidophorodon harvensis* Verma

Aspidophorodon harvensis Verma 1966. Indian J. Ent. 28: 507.

Collection data: 1 reddish green aptera from an unidentified host, Kufri, (H.P.), *c* 2700 m, 26. X. 78.

Distribution: India: Himachal Pradesh and Jammu and Kashmir state.

16. *Aulacorthum solani* (Kaltenbach)

Aphis solani Kaltenbach, 1843. Mon. der Fam. der Pflanzen, 15.

Collection data: 2 yellowish apterae and 6 nymphs from *Bidens* sp. (Compositae) Solan (H.P.), *c* 1450 m, 25. X. 78; 1 greenish aptera and 3 nymphs from *Chrysanthemum* sp. (Compositae), Chail (H.P.), *c* 2000 m, 27. X. 78; 4 chocolate coloured apterae, 1 alata and 4 nymphs from an unidentified host (Acanthaceae), Jakhu (H.P.), *c* 2400 m. 28. X. 78; 4 pale yellowish apterae, 4 alatae and 14 nymphs from *Consularia* sp. (Compositae), Mashobra (H.P.), *c* 2250 m, 28.X.78; 1 pale green aptera and 1 alata from *Gladiolus* sp. (Iridaceae), Mussourie (U.P.), *c* 2050 m. 3. XI. 78; 1 pale greenish aptera and 2 nymphs from an unidentified host, Kemphy (U.P.), *c* 1220 m, 4. XI. 78.

Distribution: Virtually cosmopolitan.

17. *Brachycaudus helichrysi* (Kaltenbach)

Aphis helichrysi Kaltenbach, 1843. Mon. der Fam der Pflanzen, 102.

Collection data: 4 greenish apterae and 5 nymphs from *Anaphalis cinnamomea* (Compositae), Kufri (H.P.), *c* 2700 m, 26. X. 78; 5 yellowish green apterae and 11 nymphs from *Anaphalis* sp. (Compositae), Sadhupul (H.P.), *c* 1300 m, 27. X. 78; 3 pale green apterae and 18 nymphs from *Chrysanthemum* sp. (Compositae), Sadhupul (H.P.), *c* 1300 m, 27. X. 78; 8 greenish black apterae and 4 nymphs from *Anaphalis* sp. (Compositae), Kasauli (H.P.), *c* 1850 m, 30. X. 78; 17 pale green apterae and 37 nymphs from *Anaphalis* sp. (Compositae), Barog (H.P.), *c* 1531 m, 31. X. 78; 3 greenish apterae and 8 nymphs from *Ageratum* sp. (Compositae), Mussourie (U.P.), *c* 1600 m, 3. XI. 78; 2 greenish apterae and 4 nymphs from *Ageratum conyzoides* (Compositae), Kemphy (U.P.), *c* 1220 m, 4. XI. 78; 1 brownish alata, 3 alate males and 5 nymphs from *Anaphalis* sp. (Compositae), Kemphy (U.P.), *c* 1220 m, 4. XI. 78; 15 brownish apterae, 1 alata and 8 nymphs from *Anaphalis* sp. (Compositae), Kemphy (U.P.), *c* 1220 m, 4. XI. 78; 4 greenish alatae from *Prunus* sp. (Rosaceae), Kemphy (U.P.), *c* 1220 m, 4. XI. 78.

Distribution: Virtually cosmopoliton.

18. *Capitophorus hippophaes javanicus* Hille Ris Lambers

Capitophorus hippophaes javanicus Hille Ris Lambers, 1953. Temminckia 9: 156.

Collection data: 1 pale green aptera and 4 nymphs from *Polygonum* sp. (Polygonaceae), Sadhupul (H.P.), *c* 1300 m, 27. X. 78.

Distribution: India : Arunachal Pradesh, Himachal Pradesh, Manipur, Meghalaya, Sikkim, Uttar Pradesh, West Bengal; Australia; China; Europe; Indonesia; Japan; Korea; New Zealand; Pakistan and Taiwan.

19. *Cavariella aegopodii* (Scopoli)

Aphis aegopodii Scopoli, 1763. Entomologica Carniolica, 137.

Collection data: 1 greenish aptera, 1 alata and 8 nymphs from an unidentified host (Umbelliferae), Kufri (H.P.), *c* 2700 m, 26. X. 78; 1 pale green aptera and 4 nymphs from *Polygonum* sp. (Polygonaceae), Sadhupul (H.P.), *c* 1300 m; 27. X. 78; 10 greenish apterae and 1 nymph from *Salix* sp. (Salicaceae), Mashobra (H.P.), *c* 2250 m; 28. X. 78; 25 greenish apterae and 2 nymphs from *Salix* sp. (Salicaceae), Kasauli (H.P.), *c* 1850 m, 30. X. 78; 28 greenish apterae, 1 alata and 2 nymphs from an unidentified host (Umbelliferae), Mussourie (U.P.), *c* 2050 m, 3. XI. 78; 2 greenish apterae and 2 nymphs from an unidentified host (Umbelliferae), Kemphy (U.P.), *c* 1220 m, 4. XI. 78.

Distribution: India: Arunachal Pradesh, Himachal Pradesh, Jammu and Kashmir state, Manipur, Meghalaya, Uttar Pradesh, West Bengal; America; Australia; Europe; Japan; Korea; Middle East; New Zealand and Rhodesia.

20. *Chaetosiphon gracilicornis* David, Rajasingh and Narayanan

Chaetospihon gracilicornis David, Rajasingh and Narayanan, 1970. Orient. Insets 4(4): 402.

Collection data: 22 yellowish green apterae and 9 nymphs from *Rosa* sp. (Rosaceae), Barog (H.P.), *c* 1531 m, 31. X. 78.

Distribution: India: Himachal Pradesh.

21. *Coloradoa rufomaculata* (Wilson)

Aphis rufomaculata Wilson, 1908. Ent. News 19: 261.

Collection data: 8 brownish apterae from *Chrysanthemum* sp. (Compositae), Sadhupul (H.P.), *c* 1300 m, 27. X. 78; 6 greenish apterae and 6 nymphs from *Polygonum* sp. (Polygonaceae), Dehradun (U.P.), *c* 825 m, 2. XI. 78.

Distribution: India: Arunachal Pradesh, Assam, Himachal Pradesh, Meghalaya, Nagaland, Uttar Pradesh, West Bengal; and virtually cosmopolitan.

22. *Dactynotus fagopyri* Chowdhuri, Basu, Chakrabarti and Raychaudhuri (Fig. 4)

Dactynotus fagopyri Chowdhuri, Basu, Chakrabarti and Raychaudhuri, 1969. Orient. Insects 3(1): 85.

Apterous oviparous female (Fig. 4)

Body about 2.92 mm long with 1.47 mm as maximum width. Head dark brown. Antennae 6-segmented: segments I and II concolorous with the head and rest of the flagellum gradually becoming pale brown; segment III with spinular imbrication at base and with 20 protuberant secondary rhinaria distributed irregularly on distal 0.75 portion; p.t. about 5.81 × base of segment VI. Ultimate rostral segment about 1.25 × h.t.2, bearing 6 hairs. Dorsum of abdomen pale, smooth; dorsal hairs on sclerotic bases long and with acute apices, longest one on anterior and 7th tergites about 2.54 and 3.54 × b.d.III respectively. Siphunculi dark brown, cylindrical, about 0.17 × body and about 2.12 × tongue-shaped cauda, bearing 17 hairs. Hind tibiae swollen with numerous pseudosensoria; F.T.C. 4,4,4. Other characters as in apterae viviparae.

Measurements of the specimen in mm: Length of body 2.92, width 1.47; antenna 3.42, a.s. III:IV:V:VI 0.90:0.58:0.55: (0.16+0.93); u.r.s. 0.18; h.t.2 0.15; siphunculus 0.51; cauda 0.24.

Collection data: 2 greenish brown apterae, 1 apterous ovipara and 3 nymphs from an unidentified host, Mussourie (U.P.), *c* 2050 m, 3.XI. 78.

Distribution: India: Himachal Pradesh and Uttar Pradesh.

Note: The species was originally described from apterous viviarous female collected on *Fagopyrum cymosum* at Simla (H.P.). The apterous oviparous female of the species is described for the first time.

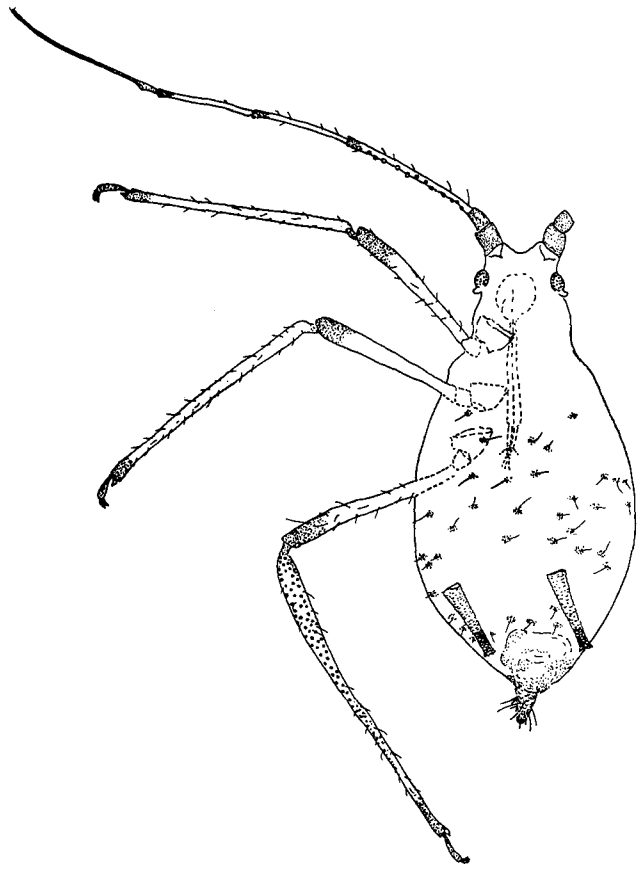


Fig. 4. *Dactynotus fagopyri* Chowdhuri, Basu, Chakrabarti and Raychaudhuri. Apterous oviparous female. Hind tibia showing pseudosensoria.

23. *Dactynotus sonchi* (Linnaeus)

Aphis sonchi Linnaeus, 1767. Syst. Nat. 1(12th ed.): 735.

Collection data: 2 greenish apterae and 5 nymphs from *Sonchus arvensis* (Compositae), Solan (H.P.), *c* 1450 m, 25. X. 78; 1 brownish aptera and 1 nymph from *Sonchus* sp. (Compositae), Dharampur (U.P.), *c* 1500 m, 29. X. 78; 12 brownish apterae and 1 alata from *Tricholepis elongata* (Compositae), Barog (H.P.), *c* 1531 m, 31. X. 78; 10 brownish apterae from *Sonchus* sp. (Compositae), Dehradun (U.P.), *c* 825 m, 2. XI. 78.

Distribution: India: Himachal Pradesh, Manipur, Meghalaya, Sikkim, South India, Uttar Pradesh, West Bengal; Africa; Australia; Egypt; Europe and South America.

24. *Hyperomyzus carduellinus* (Theobald)

Rhopalosiphum corduellinus Theobald, 1915. Bull. Ent. Res. 6: 113.

Collection data: 2 greenish brown apterae, 1 alata and 2 nymphs from *Sonchus arvensis* (Compositae), Solan (H.P.), *c* 1450 m, 25. X. 78; 11 greenish apterae and 5 nymphs from *Sonchus* sp. (Compositae), Solan (H.P.), *c* 1450 m, 25. X. 78; 4 greenish apterae and 2 nymphs from *Sonchus* sp. (Compositae), Solan (H.P.), *c* 1450 m, 25. X. 78; 28 greenish apterae, 2 alatae and 9 nymphs from *Sonchus* sp. (Compositae), Mashobra (H.P.), *c* 2250 m. 28. X. 78; 23 pale green apterae, 3 alatae and 5 nymphs from *Sonchus* sp. (Compositae), Barog (H.P.), *c* 1531 m, 31. X. 78.

Distribution: India: Arunachal Pradesh, Assam, Himachal Pradesh, Jammu and Kashmir state, Manipur, Meghalaya, Nagaland, Sikkim, South India, Uttar Pradesh, West Bengal; Africa; Australia; Fiji, Indonesia; Japan; Nepal; New Zealand and Taiwan.

25. *Hyperomyzus lactucae* (Linnaeus)

Aphis lactucae Linnaeus, 1758. Syst. Nat. (10th ed.): 452.

Collection data: 2 blackish alatae from an unidentified host (Anacardiaceae), Kemphy (U.P.), *c* 1220 m, 4. XI. 78.

Distribution: Virtually cosmopolitan.

26. *Impatientinum impatiensae dalhousiensis* Verma (Fig. 5)

Impatientinum impatiensae dalbhousiensis Verma, 1969. Bull. Ent. 10(1): 102.

Alate male (Fig. 5)

Dorsal cephalic hairs about 0.03 mm long with acuminate apices; flagellum dark except pale base of a.s.III and progressively more imbricated apicad: a.s.III with 41–42 small, round secondary rhinaria on outer margin along the entire length except the very base, IV with 13–17 and V with 12–19 similar rhinaria. Dorsal abdominal hairs about 0.046 mm long with finely drawn out apices, the longest one on anterior tergites being about 1.30 × b.d.III; 6 hairs on 8th tergite with upto about 0.062 mm long and about 1.70 × b.d.III. Siphunculi about 0.15 × body, reticulated over distal 0.27 portion. Cauda dusky, with 6 hairs. Male genitalia well developed, with dark claspers. Other characters as in alate viviparous female.

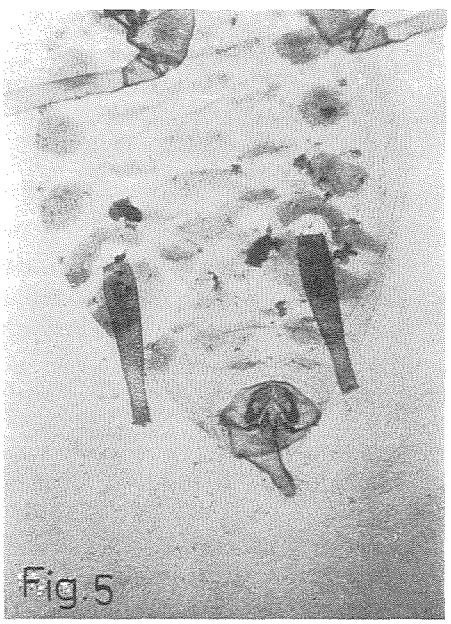


Fig. 5. *Impatientinum impatiensae dalhousiensis* Verma. Alate male.

Measurements of one specimen in mm: Length of body 2.55, width 0.99; antenna broken distally, a.s.III: IV: V: VI 0.74:0.65:0.52: (0.16 +?); u.r.s. 0.13; h.t.2 0.15; siphunculus, 0.39; cauda 0.15.

Collection data: 10 brownish apterae and 2 nymphs from *Impatiens* sp. (Balsaminaceae), Solan (H.P.), *c* 1450 m, 25. X. 78; 14 brownish apterae from *Impatiens* sp. (Balsaminaceae), Chail (H.P.), *c* 2000 m, 27. X. 78; 5 yellowish apterae, 3 alata males and 7 nymphs from *Impatiens* sp. (Balsaminaceae), Jakhu (H.P.), *c* 2400 m, 28. X. 78; 8 brownish apterae, 2 alatae and 13 nymphs from *Impatiens* sp. (Balsaminaceae), Mashobra (H.P.), *c* 2250 m, 28. X. 78; 9 brownish alatae and 1 nymph from *Smilax* sp. (Liliaceae), Solan (H.P.), *c* 1450 m, 30. X. 78.

Distribution: India: Himachal Pradesh, Jammu and Kashmir state and Uttar Pradesh.

Remarks: Verma (1969) described the subspecies from only apterous viviparous females collected in Himachal Pradesh. Chakrabarti et al. (1972) described the alate viviparous female from the area wherefrom they reported the apterae viviparae. The alate male is described here for the first time. The oviparous female is yet unknown.

27. *Indumasonaphis inulae* (Ghosh and Raychaudhuri)

Masonaphis (*Neomasonaphis*) *inulae* Ghosh and Raychaudhuri, 1972. Orient. Insects 6(3): 377.

Collection data: 18 pale green apterae from *Inula cappa* (Compositae), Dharampur (H.P.), *c* 1500 m, 29. X. 78; 4 pale green apterae and 1 alata from an unidentified host, Kasauli (H.P.), *c* 1850 m, 30. X. 78; 2 pale green apterae from an unidentified host, Mussourie (U.P.), *c* 1600 m, 30. X. 78; 4 pale green apterae and 5 nymphs from an unidentified host, Kemphy (U.P.), *c* 1220 m, 4. XI. 78.

Distribution: India: Himachal Pradesh, Meghalaya and Uttar Pradesh.

28. *Liosomaphis atra* Hille Ris Lambers

Liosomaphis atra Hille Ris Lambers, 1966. Tijdschr. Ent. 109(8): 211.

Collection data: 5 greenish apterae and 34 nymphs from *Berberis* sp. (Berberidaceae), Mashobra (H.P.), *c* 2250 m, 28. X. 78.

Distribution: India: Himachal Pradesh, Uttar Pradesh; and Pakistan.

29. *Liosomaphis himalayensis* Basu

Liosomaphis himalayensis Basu, A. N., 1964. J. Linn, Soc. (Zool.) 45(305): 231.

Collection data: 10 greenish apterae, 1 alata and 8 nymphs from *Berberis* sp. (Berberidaceae), Solan (H.P.), *c* 1450 m, 25. X. 78; 9 brownish apterae, 1 alata and 7 nymphs from *Berberis* sp. (Berberidaceae), Solan (H.P.), *c* 1450 m, 25. X. 78; 5 greenish apterae and 55 nymphs from *Berberis* sp. (Berberidaceae), Sadhupul (H.P.), *c* 1300 m, 27. X. 78; 2 reddish green apterae and 17 nymphs from *Berberis* sp. (Berberidaceae), Chail (H.P.), *c* 2000 m, 27. X. 78; 6 greenish apterae and 3 nymphs from *Berberis* sp. (Berberidaceae), Dharampur (H.P.), *c* 1500 m, 29. X. 78; 8 yellowish green apterae and 20 nymphs from *Berberis* sp. (Berberidaceae), Kasauli (H.P.), *c* 1850 m, 30. X. 78; 6 greenish apterae and 10 nymphs from *Berberis* sp. (Berberidaceae), Barog (H.P.), *c* 1531 m, 31. X. 78; 10 greenish apterae from *Berberis* sp. (Berberidaceae), Mussourie (U.P.), *c* 2050 m, 3. XI. 78; 16 greenish apterae and 5 nymphs from *Berberis* sp. (Berberidaceae), Mussourie (U.P.), *c* 1600 m, 3. XI. 78; 13 greenish apterae and 2 nymphs from *Berberis* sp. (Berberidaceae), Kemphy (U.P.), *c* 1220 m, 4. XI. 78.

Distribution: India: Himachal Pradesh, Meghalaya, Uttar Pradesh, West Bengal; and Nepal.

30. *Macrosiphoniella formosartemisiae* Takahashi

Macrosiphoniella formosartemisiae Takahashi, 1921. Aphididae of Formosa 1: 15.

Collection data: 3 brownish apterae and 1 nymph from *Artemisia* sp. (Compositae), Kemphy (U.P.), *c* 1220 m, 4. XI. 78.

Distribution: India: Arunachal Pradesh, Meghalaya and Uttar Pradesh; China; Japan; Korea and Taiwan.

31. *Macrosiphoniella kalimpongense* Basu and Raychaudhuri

Macrosiphoniella kalimpongense Basu and Raychaudhuri, 1976. Orient. Insects 10(2): 299.

Collection data: 11 greenish apterae and 3 nymphs from *Artemisia* sp. (Compositae), Dharampur (H.P.), *c* 1500 m, 29. X. 78; 5 greenish apterae and 3 nymphs, from *Artemisia* sp. (Compositae), Javli (H.P.), *c* 1300 m, 29. X. 78; 1 greenish aptera from *Artemisia* sp. (Compositae), Kemphy (U.P.), *c* 1220 m, 4. XI. 78.

Distribution: India: Himachal Pradesh, Uttar Pradesh and West Bengal.

32. *Macrosiphoniella sanborni* (Gillette)

Macrosiphum sanborni Gillette, 1908. Canad. Ent. 40: 65.

Collection data: 17 blackish apterae and 40 nymphs from *Chrysanthemum* sp. (Compositae), Sadhupul (H.P.), *c* 1300 m, 27. X. 78; 12 blackish apterae and 6 nymphs from *Chrysanthemum* sp. (Compositae), Kasauli (H.P.), *c* 1850 m, 30. X. 78; 1 black aptera and 47 nymphs from *Chrysanthemum* sp. (Compositae), Barog (H.P.), *c* 1531 m, 31. X. 78; 3 blackish apterae and 4 nymphs from *Chrysanthemum* sp. (Compositae), Dehradun (U.P.), *c* 825 m, 2. XI. 78; 2 blackish alatae from *Chrysanthemum* sp. (Compositae), *c* 2050 m, 3. XI. 78.

Distribution: India: all over; and virtually cosmopolitan.

33. *Macrosiphoniella yomogifoliae* (Shinji)

Macrosiphum yomogifoliae, Shinji. 1922. Zool. Mag. 34(407): 788.

Collection data: 2 greenish apterae and 4 nymphs from *Artemisia* sp. (Compositae), Sadhupul (H.P.), *c* 1300 m, 27. X. 78.

Distribution: India: Arunachal Pradesh, Himachal Pradesh, Meghalaya, Sikkim, South India, Uttar Pradesh, West Bengal; China; Japan; Korea; Malaya and Taiwan.

34. *Macrosiphum pachysiphon* Hille Ris Lambers

Macrosiphum pachysiphon Hille Ris Lambers, 1966. Tijdschr. Ent. 109 (8): 213.

Collection data: 2 pinkish apterae and 7 nymphs from *Rubus* sp. (Rosaceae), Jakhu (H.P.), *c* 2400 m, 28. X. 78.

Distribution: India: Arunachal Pradesh, Himachal Pradesh, Manipur, Meghalaya, Sikkim, Uttar Pradesh, West Bengal; and Pakistan.

35. *Macrosiphum pseudogeranii* Chakrabarti and Raychaudhuri

Macrosiphum geranii Chowdhuri, Basu, Chakrabarti and Raychaudhuri, 1969. Orient. Insects 3(1): 89.

Macrosiphum pseudogeranii Chakrabarti and Raychaudhuri, 1974. Ibid. 8(3): 303.

Apterous oviparous female

Body about 3.45 mm in length with 1.72 mm as maximum width. Head pale. Antennae 6-segmented, brownish, about 1.28 × body; p.t. about 6.78 × base of segment VI, segment III with 10–12 non-protuberant secondary rhinaria arranged in a row. Ultimate rostral segment about 1.2 × h.t.2. Abdominal dorsum pale; longest dorsal hair on anterior, 7th and 8th tergites about 2.5, 2.08 and 2.08 × b.d.III respectively. Siphunculi brownish cylindrical, with apical 0.32 portion reticulated with isodiametrical cells; about 0.21 × body and about 2.41 × thumb-shaped cauda bearing 16 hairs. Hind tibiae swollen and with numerous pseudosensoria distributed over basal 0.61 portion. Other characters as in apterae viviparae.

Measurements of the apterous oviparous female in mm: Length of body 3.45, width 1.72; antenna 4.44; a.s. III:IV:V:VI 0.97:0.82:0.72: (0.19+1.29); u.r.s. 0.18; h.t.2 0.15; siphunculus 0.75, cauda 0.31.

Collection data: 1 greenish apterous ovipara from *Polygonum* sp. (Polygonaceae), Kufri (H.P.), *c* 2700 m, 26. X. 78.

Distribution: India: Himachal Pradesh.

Note: The species is so far known from its type locality (H.P.) and the description was based only on apterous viviparous female. The hitherto unknown apterous oviparous morph is described for the first time.

36. *Macrosiphum rosae* (Linnaeus)

Aphis rosae Linnaeus, 1758. Syst. Nat. 1(10th ed.): 452.

Collection data: 2 greenish apterae and 8 nymphs from *Rosa* sp. (Rosaceae), Sadhupul (H.P.), *c* 1300 m, 27. X. 78; 12 reddish apterae, 2 alatae and 18 nymphs from *Rosa* sp. (Rosaceae), Mashobra (H.P.), *c* 2250 m, 28. X. 78.

Distribution: India: Arunachal Pradesh, Assam, Himachal Pradesh, Manipur, Meghalaya, Sikkim, South India, Uttar Pradesh, West Bengal; and virtually cosmopolitan.

37. *Macrosiphum* (*Sitobion*) *indicum* (Basu)

Sitobion indicum Basu, A. N. 1964. J. Linn. Soc. (Zool.) 45 (305): 203.

Collection data: 7 greenish apterae, 1 alata and 7 nymphs from *Ipomoea* sp. (Convolvulaceae), Solan (H.P.), *c* 1450 m, 25. X. 78; 2 brownish apterae from an unidentified host (Gramineae), Dharampur (H.P.), *c* 1500 m, 29. X. 78; 2 brownish apterae, 1 alata and 5 nymphs from an unidentified host (Gramineae), Dehradun (U.P.), *c* 825 m, 2. XI. 78; 1 brownish aptera and 3 nymphs from an unidentified host (Gramineae), Kemphy (U.P.), *c* 1220 m, 4. XI. 78.

Distribution: India: Arunachal Pradesh, Himachal Pradesh, Meghalaya, Sikkim, Uttar Pradesh and West Bengal.

38. *Macrosiphum* (*Sitobion*) *miscanthi* Takahashi

Macrosiphum miscanthi Takahashi, 1921. Aphididae of Formosa 1: 8.

Collection data: 1 greenish brown aptera and 7 nymphs from *Panicum* sp. (Gramineae), Solan (H.P.), *c* 1450 m, 25. X. 78; 3 greenish apterae and 8 nymphs from an unidentified host (Gramineae), Solan (H.P.), *c* 1450 m, 25. X. 78; 2 greenish alatae and 4 nymphs from *Smilax* sp. (Liliaceae) and *Ranunculus* sp. (Ranunculaceae), Solan (H.P.), *c* 1450 m, 25. X. 78; 1 greenish aptera and 7 nymphs from an

unidentified host (Gramineae), Sadhupul (H.P.), *c* 1300 m, 27. X. 78; 2 brownish apterae and 6 nymphs from an unidentified host (Gramineae), Dharampur (H.P.), *c* 1500 m, 29. X. 78; 1 brownish black aptera, 4 alatae and 8 nymphs from *Smilax* sp. (Liliaceae), Kasauli (H.P.), *c* 1850 m, 30. X. 78; 2 greenish alatae and 3 nymphs from *Rosa* sp. (Rosaceae), Dehradun (U.P.), *c* 825 m, 2. XI. 78.

Distribution: India: Arunachal Pradesh, Assam, Bihar, Himachal Pradesh, Manipur, Meghalaya, Nagaland, Sikkim, Uttar Pradesh, West Bengal; Australia; China; England and Taiwan.

39. *Macrosiphum (Sitobion) rosaeiformis* Das

Macrosiphum rosaeiformis Das, 1918. Mem. Indian Mus. 6(4): 158.

Collection data: 4 brownish alatae from *Smilax* sp. (Liliaceae), Solan (H.P.), *c* 1450 m, 25. X. 78; 3 greenish brown apterae, 1 alata and 14 nymphs from *Rosa* sp. (Rosaceae), Solan (H.P.), *c* 1450 m, 25. X. 78; 7 greenish apterae, 1 alata and 1 nymph from *Apluda mutica* (Gramineae), Sadhupul (H.P.), *c* 1300 m, 27. X. 78; 5 reddish apterae, 8 alatae and 7 nymphs from *Rosa* sp. (Rosaceae), Chail (H.P.), *c* 2000 m, 27. X. 78; 5 greenish apterae and 8 nymphs from *Rosa* sp. (Rosaceae), Chail (H.P.), *c* 2000 m, 27. X. 78; 7 greenish apterae and 2 nymphs from *Rosa* sp. (Rosaceae), Kasauli (H.P.), *c* 1850 m, 30. X. 78; 8 greenish apterae and 2 nymphs from *Cestrum* sp. (Solanaceae), Kasauli (H.P.), *c* 1850 m, 30. X. 78; 1 greenish aptera, 1 alata and 1 nymph from *Rosa* sp. (Rosaceae), Barog (H.P.), *c* 1530 m, 31. X. 78; 5 greenish apterae and 2 nymphs from *Rosa* sp. (Rosaceae), Mussourie (U.P.), *c* 1600 m, 3. XI. 78.

Distribution: India: Arunachal Pradesh, Assam, Bihar, Himachal Pradesh, Manipur, Meghalaya, Nagaland, Sikkim, South India, Uttar Pradesh, West Bengal; Nepal and Pakistan.

40. *Macrosiphum (Sitobion) sikkimensis* Ghosh and Raychaudhuri (Figs. 6, A & B)

Macrosiphum (Sitobion) smilacicola sikkimensis Ghosh and Raychaudhuri, 1968. Ann. Ent. Soc. Amer. 61(3): 753.

Apterous oviparous female (Fig. 6A)

Body elongated, about 2.55–3.15 mm long with 1.23–1.65 mm as its maximum width. Head brown. Antennae 6-segmented, about 1.04–1.21 × body; segment III with 1–2 secondary rhinaria near base and with spatulate hairs which are about 0.45–1.2 × b.d. III; p.t. about 5.8–6.8 × base of segment VI. Rostrum hardly reaches hindcoxae; u.r.s. obtuse, about 0.75–0.88 × h.t.2 and with 4 secondary hairs. Dorsum of abdomen with segmentally arranged brownish pleural patches; dorsal hairs on sclerotic patches, hairs on anterior, 7th and 8th tergites about 1.09–1.27, 1.27–1.60 and 1.45–1.90 × b.d.III respectively. Siphunculi dark brown with both ante- and postsiphuncular sclerites, about 0.20–0.28 × body and about 1.28–1.60 × cauda bearing 8–10 hairs. Hind tibiae swollen with numerous pseudosensoria (Fig. 6A). F.T.C. 3,3,3. Other characters as in apterae viviparae.

Measurements of one specimen in mm: Length of body 2.55, width 1.23; antenna 2.95, a.s. III:IV:V:VI 0.81:0.67:0.49: (0.16+0.96); u.r.s. 0.10; h.t.2 0.13; siphunculus 0.63; cauda 0.40.

Alate male (Fig. 6B)

Body about 2.25–2.55 mm long with 0.75–1.05 mm as the maximum width. Head brown. Antennae dark brown, 6-segmented, about 1.44–1.67 × body; segment

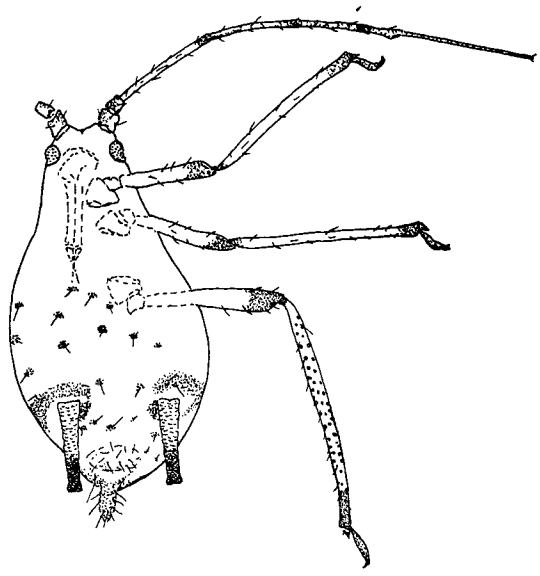


Fig. 6A. *Macrosiphum* (*Sitobion*) *sikkimensis* Ghosh and Raychaudhuri. Apterous oviparous female. Hind tibia showing pseudosensoria.

III with 78–98, segment IV with 26–41, segment V with 20–22 secondary rhinaria distributed irregularly over entire length; p.t. about 7.3–8.1 × base of segment VI. Ultimate rostral segment about 0.68–0.72 × h.t.2. Dorsum of abdomen with pleural and marginal sclerotic patches on each of abdominal segments 1–7 besides irregularly shaped spinal patches on these segments, 8th tergite without any patch; dorsal hairs long and fine, those on anterior, 7th and 8th tergites about 1–1.1, 1.3–1.6 and 1.2–1.4×b.d. III respectively. Siphunculi cylindrical, about 0.16–0.17 × body and about 2.30–2.60 × cauda bearing 7 hairs. Other characters as in alate viviparous females.

Measurements of one specimen in mm: Length of body 2.25, width 0.75; antenna 3.76, a.s. III:IV:V:VI 0.85:0.72:0.61:(0.16+1.21); u.r.s. 0.37; h.t.2 0.54; siphunculus 0.39; cauda 0.15.

Collection data: 6 brownish alatae, 2 alate males and 3 apterae oviparae from an unidentified host (Liliaceae), Solan, (H.P.), *c* 1450 m, 30. X. 78.

Distribution: India: Himachal Pradesh, Meghalaya, Sikkim and West Bengal.

Note: This species was described from eastern Himalayan region from alate viviparous female (Ghosh and Raychaudhuri, 1968). But find of this species in Himachal Pradesh extends the knowledge of its distribution. The sexuales are described here for the first time. The find of both alate male and apterous oviparous female along with also parthenogenetic morph (alate viviparous female) from the higher elevations hints at the possibility of leading holocyclic life cycle of the species in the Himalayan belt of the Indian subregion.

41. *Metopolophium graminum*, sp. nov. (Figs. 7, A-C)

Apterous viviparous female

Body oval, pale, about 2.01–2.58 mm long with about 0.90–1.29 mm as

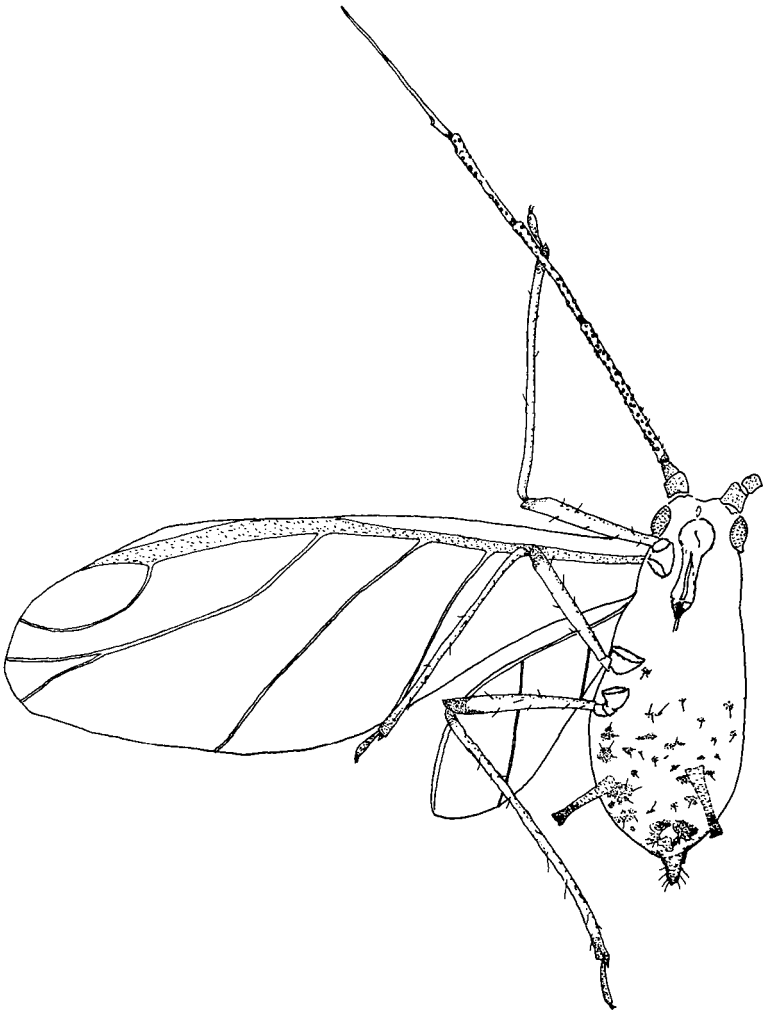


Fig. 6B. *Macrosiphum* (*Sitobion*) *sikkimensis* Ghosh and Raychaudhuri. Alate male. Posterior portion of the abdomen showing male genitalia.

maximum width. Head (Fig. 7A) pale, hairs on vertex about 0.01 mm long with acuminate apices; lateral frontal tubercles well developed, median frontal prominence also developed. Antennae (Fig. 7B) about 0.6 × body, paler on segments I, II, III and basal half of IV, rest of the flagellum dark brown; basal two segments slightly wrinkled and flagellum gradually more distinctly imbricated apicad with base of III slightly swollen; segment III with 3–8 round secondary rhinaria arranged in a row over basal 0.7 portion; p.t. about 2.2–2.9 × base of segment VI and shorter than segment III; flagellar hairs sparse, with acute to acuminate apices, about 0.006–0.01 mm long, longest one about 0.44 × b.d.III. Rostrum extending just past the fore coxae; u.r.s. 0.6–0.7 × h.t.2 and with 2–4 secondary hairs. Abdominal tergum pale, corrugated; anterior dorsal hairs bluntish, upto about 0.012 mm long and about 0.44 × b.d.III; 8th tergite apparently with 2

hairs which are about 0.55 × b.d.III. Siphunculi (Fig. 7C) pale, cylindrical, imbricated, about 0.13–0.15 × body and 1.40–1.70 × cauda, with 1 or 2 striae just before poorly developed apical flange. Cauda a little dusky, thick, elongate, with a slight median constriction and bears about 7 hairs. Legs pale to pale brown; femora smooth dorsally with sparse imbrications and fine spinules ventrally towards the inner margin at least on distal half; tibiae a little darker than femora, with the apices more darkened; *F.T.C. 3,3,3.*

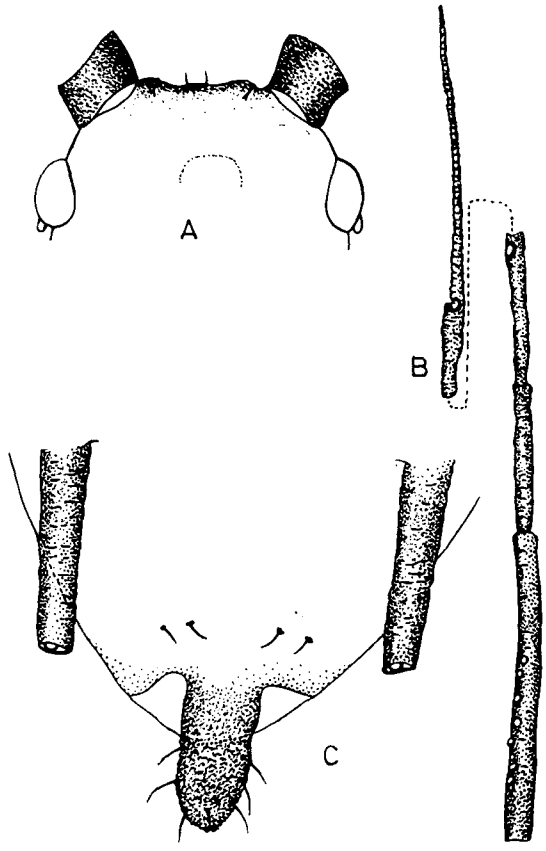


Fig. 7. *Metopolophium graminum*, sp. nov. A: Head. B: Antenna. C: Posterior portion of abdominal dorsum.

Measurements of the holotype in mm: Length of body 1.86, width 0.90; antenna 1.26, a.s.III: IV:V:VI 0.36:0.18:0.18: (0.11+0.32) u.r.s. 0.07; h.t.2 0.10; siphunculus 0.26; cauda 0.18.

Collection data: Holotype; Greenish apterous viviparous female from an unidentified host (Gramineae), Simla (H.P.), *c* 2100 m, 13. XII. 73, coll. L. K. Ghosh; paratype: 4 apterae, data same as for holotype; 2 greenish apterae and 15 nymphs from an unidentified host (Gramineae), Mashobra (H.P.), *c* 2250 m, 28. X. 78.

Distribution: India; Himachal Pradesh.

Remarks: The present material resembles *Acyrthosiphon* (*Metopolophium*) *chandrani* David and Narayanan 1968, in having similar ratio of ultimate rostral

segment to second joint of hind tarsus and first tarsal chaetotaxy besides slightly swollen base of antennal segment III in apterous viviparous females, but can be distinguished by shorter antenna, shorter siphunculi and more caudal hairs. Moreover, host-plant association is different since this species infests plants of gramineae. Combination of all the morphological characters taken together with host association justifies the erection of the new species. *Metopolophium graminum*, sp. nov. also differs from *Acyrthosiphon* (*Metopolophium*) *simlaensis* Chakrabarti et al. 1974 in the much shorter ultimate rostral segment bearing a few secondary hairs (8 in *simlaensis*).

42. *Metopolophium rubi* (Narzikulov) (Fig. 8)

Acyrthospihon rubi Narzikulov, 1957. Ent. Obozr. 36(3): 673.

Apterous oviparous female

Body elliptical, about 2.10–2.7 mm long with 1.05–1.14 mm as its maximum width. Head pale brown, frons smooth; dorsal cephalic hairs about 0.05 mm long and about as long as b.d.III. Antennae concolorous with head except more darkened segment VI, about 1.10–1.32 × body, imbricated, flagellar hairs short with incrassate apices, longest one on segment III about 0.64 × its basal diameter; segment III with 2–5 small round secondary rhinaria near base; p.t. about 4 × base of segment VI. Ultimate rostral segment reaches beyond hind coxae, with 4 secondary hairs. Abdominal dorsum pale, without any sclerite; dorsal hairs short to long (about 0.02–0.03 mm) with rather blunt apices; 4 hairs on 8th tergite upto about 0.05 mm long and about 0.4 × b.d.III. Siphunculi pale brown, about 0.25 × body, imbricated, with a few transverse striae before well-developed flange, about 2.5 × cauda bearing 10 hairs. Hind tibiae swollen with numerous small round pseudosensoria over entire length excepting the very base and apical 0.18 portion. Femora with a few small round sensoria like structure near base. Other characters as in apterae viviparae.

Measurements of one apterous oviparous in mm: Length of body 2.10, width 1.05; antenna 2.70, a.s.III:IV:V:VI 0.65:0.49:0.40: (0.16+0.75); u.r.s. 0.14; h.t.2 0.13; siphunculus 0.54; cauda 0.22.

Alate male (Fig. 8)

Body elongate, about 2.89–3.09 mm long with 1.05–1.14 mm as its maximum width. Head brown, slightly wrinkled; frons smooth; dorsal cephalic hairs about 0.046 mm long and about 0.35 × b.d.III. Antennae concolorous with head, segments I and II wrinkled, segment III brown, imbricated with 43–48 strongly protuberant secondary rhinaria distributed over its entire length excepting the very base, segment V with 12 secondary rhinaria. Abdomen pale with segmental dorsal and marginal sclerites, dorsal sclerites sometimes appearing as transverse bars; tergites 6, 7 and 8 with broken sclerites; 4 hairs on 8th tergite, about 1.4 × b.d.III. Siphunculi slender, imbricated, about 0.19 × body and about 3.2 × cauda bearing 8 hairs. Claspers well developed. Wing venation normal. Other characters as in alate viviparous female.

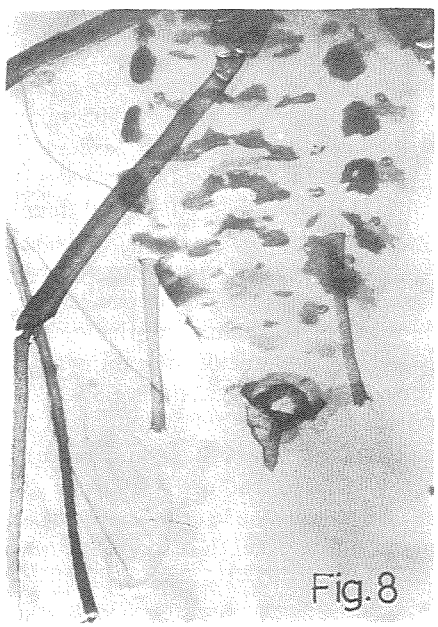
Measurements of one alate male in mm: Length of body 2.89, width 1.05; antenna 4.39, a.s. III:IV:V:VI 1.02:0.82:0.75: (0.19+1.39); u.r.s. 0.15; h.t.2 0.14; siphunculus 0.58; cauda 0.22.

Collection data: 1 aptera from *Rubus* sp. (Rosaceae), Simla (H.P.), *c* 2100 m, 18.V.70, coll. K. Narayanan; 5 apterae, 3 apterae oviparae and 1 alate male from

Rubus ellipticus (Rosaceae), Kalpa (H.P.), *c* 2170 m, 26. X. 76, coll. A. N. Chowdhuri; 7 greenish apterae and 4 nymphs from *Rubus ellipticus* (Rosaceae), Solan (H.P.), *c* 1450 m, 25. X. 78; 12 reddish green apterae and 16 nymphs from *Desmodium* sp. (Leguminosae), Kufri (H.P.), *c* 2700 m, 26. X. 78; 7 pinkish apterae and 8 nymphs from *Polygonum* sp. (Polygonaceae), Kufri (H.P.), *c* 2700 m, 26. X. 78; 2 pinkish aptera ovipara and 2 alate males from *Rubus ellipticus* (Rosaceae), Kufri (H.P.), *c* 2700 m, 26. X. 78.

Distribution: India: Himachal Pradesh, Sikkim, West Bengal; Bhutan and U.S.S.R.

Note: Sexuales of this species were hitherto unknown from India.



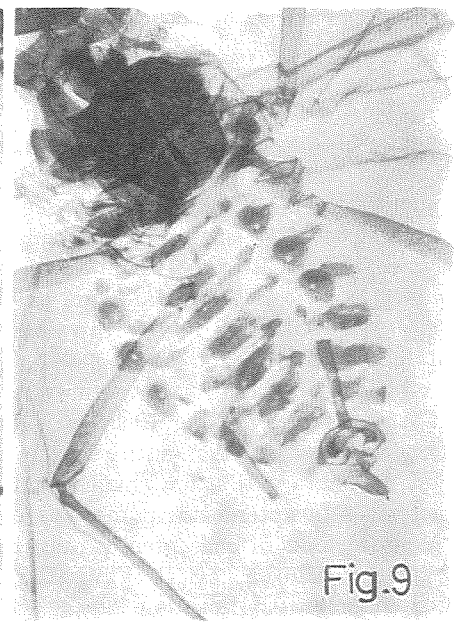


Fig. 8. *Metopolophium rubi* (Narzikulov). Alate male.
Fig. 9. *Metopolophium* sp. Alate male.

43. *Metopolophium sonchifoliae*, sp. nov.

Apterous viviparous female

Body broadly spindle-shaped, 2.67–2.94 mm long with maximum width 1.05–1.35 mm near middle of abdomen. Head pale yellow, dorsally wrinkled; dorsal hairs on the vertex with bluntish apices and atmost 0.036 mm long; lateral frontal tubercles well developed, diverging and smooth. Antennae 6-segmented, concolorous with head except brownish apex of segment V and whole of segment VI, about 1.2 × body; segment I faintly imbricated, with 5–7 small hairs, segment II similarly imbricated with 3–7 similar hairs; flagellum progressively more distinctly imbricated towards apex; segment III with 3–6 small round secondary rhinaria near base; longest hair on segment III about 0.3 × its basal diameter; segment IV about 1.4 × segment V; p.t. about 5 × base of segment VI and a little longer than segment III. Rostrum extends upto mid coxae; u.r.s. about 0.14 mm long and about 1.1 × h.t.2

and with 8–10 rather small and fine secondary hairs. Abdominal tergum sclerotic, pale to brownish yellow, with brownish muscle plates, slightly wrinkled; hairs on anterior abdominal tergites short with somewhat bluntish apices, longest being about 0.015 mm and about 0.41 × b.d.III; 7 hairs on 8th tergite with bluntish apices, these being upto about 0.052 mm and nearly as long as b.d.III. Siphunculi concolorous with head, slenderly elongate, cylindrical with expanded base and slightly widened apex, nearly smooth to faintly imbricated and usually with a few coalescing striae below the small but distinct apical flange. Cauda a little darker than siphunculi, elongated with blunt apex, constricted near middle, about 0.4 × siphunculi and with 8–12 long and fine hairs. Legs long, brownish yellow with the apices of tibiae and tarsi blackish; F.T.C. 3,3,3.

Measurements of the holotype in mm: Length of body 2.67, width 1.20; antenna 3.26, a.s. III:IV:V:VI 0.87:0.61:0.45: (0.18+0.92); u.r.s. 0.14; h.t.2 not discernible; siphunculus 0.74; cauda 0.29.

Alate viviparous female

Antennal segment III with 29–34 small, oval secondary rhinaria distributed over almost entire length excepting the paler and more imbricated base. Forewing with M twice-branched. Other characters much like apterae viviparae.

Measurements of the specimen in mm: Length of body 2.70, width 1.05; antenna ?, a.s.III 0.76 (rest broken); u.r.s. 0.14; h.t.2. 0.13; siphunculus 0.65; cauda 0.30.

Collection data: Holotype: Greenish apterous viviparous female, from *Sonchus* sp. (Compositae), Simla (H.P.), *c* 2100 m, 31. V. 69, coll. L. K. Ghosh; paratype: 2 apterae viviparae, 1 alate vivipara, data same as for holotype; 5 greenish apterae from an unidentified host (Rosaceae), Solan (H.P.), *c* 1450 m, 25. X. 78.

Distribution: India: Himachal Pradesh.

Remarks: V.F. Eastop, London, when requested for comments on this species, wrote "I did not think I had seen this species before. If you are describing it, strongly sclerotic dorsum should be mentioned.... I have seen what appears to be another apparently undescribed *Acyrthosiphon* (*Metopolophium*) from *Sonchus* in the Himalayas, but in that species the dorsum is almost smooth, the hind tarsi are longer than ultimate rostral segment and the processus terminalis is shorter than most of the malvae group". In view of the above comments, the new species is erected.

44. *Metopolophium* (*Microlophium*) *rubifoliae* Raychaudhuri, Ghosh and Basu

Metopolophium (*Microlophium*) *rubifoliae* Raychaudhuri, Ghosh and Basu. 1975. Proc. zool. Soc. Calcutta 28: 126.

Collection data: 2 pinkish green apterae and 9 nymphs from *Potentilla nepalensis* (Rosaceae), Kufri (H.P.), *c* 2700 m, 26. X. 78.

Distribution: India: Himachal Pradesh, Nagaland and Sikkim.

45. *Metopolophium* sp. (Fig. 9)

Alate viviparous female

Body about 2.53–2.73 mm long with 1.0–1.06 mm as its maximum width. Head pale brown, lateral frontal tubercles and median frontal prominence well developed; dorsal cephalic hairs short with incrassate apices. Antennae 6-segmented, about 0.7–0.8 × body, bearing short and stout hairs, longest one on

segment III about 0.5–0.8 × b.d. III; flagellum gradually more distinctly imbricated apicad; segment III with 21–25 circular secondary rhinaria somewhat irregularly arranged on the outer margin of segment, p.t. about 3.3–3.4 × base of last antennal segment. Rostrum reaching half way to mid coxae; u.r.s. with blunt apex, about 0.65–0.68 × h.t.2 and bears 4 secondary hairs. Abdominal dorsum pale with faint sclerotic spinal, pleural and marginal patches upto segment 5; dorsal hairs short to long with blunt to incrassate apices but those on 8th tergite long and fine. Siphunculi pale brown, cylindrical, with an apical flange, about 0.11–0.13 × body and about 1.53–1.76 × elongated cauda which bears 7–8 hairs. Legs pale brown except distal portion of tibiae which is darker. F.T.C. 3,3,3. Wing venation normal.

Measurements of one alate viviparous female in mm: Length of body 2.62, width 1.06; antenna 2.08, a.s.III:IV:V:VI 0.63:0.34:0.28: (0.15+0.51); u.r.s. 0.34; h.t.2 0.51; siphunculus 0.34; cauda 0.22.

Alate male (Fig. 9)

Head brown and smooth. Antennae 6-segmented (one side broken after 3rd segment), brown, about 1.01 × body; segment III with 46–52 secondary rhinaria distributed over entire length, segment IV with none and segment V with 4–7 secondary rhinaria on apical half; p.t. about 3.36× base of the segment VI. Ultimate rostral segment about 0.69 × h. t. 2. Abdominal dorsum with well-developed brown sclerotic spinal, pleural and marginal patches on tergites 1–7. Siphunculi brown. Claspers well developed. Other characters as in alate viviparous female.

Measurements of the alate male in mm: Length of body 2.41; width 0.97; antenna 2.46; a.s.III:IV:V:VI 0.75: 0.46:0.37: (0.16+0.55); u.r.s. 0.34; h.t.2 0.49; siphunculus 0.34; cauda 0.22

Apterous oviparous female

Body about 2.07 mm long and about 1.0 mm as its maximum width. Head pale and smooth; dorsal cephalic hairs with incrassate apices. Antennae 6-segmented; about 0.68 × body; segments I and II pale, rest pale brown; segment III with 1–2 small circular secondary rhinaria near base on outer margin. Rostrum reaching mid coxae, about 0.82 × h.t.2 bearing 4 secondary hairs. Abdominal dorsum pale and smooth. Siphunculi cylindrical, pale brown with distinct apical flange, about 0.14 × body and about 1.53 × cauda. Legs pale brown; hind tibiae swollen bearing numerous pseudosensoria throughout the length but more closely packed on apical 0.75 portion.

Measurements of the apterous oviparous female in mm: Length of body 2.07, width 1.0; antenna 2.07, a.s. III:IV:V:VI 0.42:0.21:0.21: (0.10+0.33); u.r.s. 0.34; h.t.2 0.52; siphunculus 0.30; cauda 0.19.

Collection data: 5 greenish alatae, 1 alate male, 1 apterous ovipara and 3 nymphs from *Rubus* sp. (Rosaceae), Jakhu (H.P.), *c* 2400 m, 28. X. 78.

Remarks: In view of not having apterous viviparous female and having only alate viviparous females in the collection it has not been possible to identify the material upto species level. However, occurrence of sexuals alongwith viviparae (alatae) suggests the possibility of completion of holocyclic life cycle.

46. *Micromyzodium strobilanthi* Ghosh

Micromyzodium strobilanthi Ghosh, L.K., 1970. Orient. Insects 4(4): 435.

Collection data: 1 greenish black aptera from *Ruellia tuberosa* (Acanthaceae),

Sadhupul (H.P.), *c* 1300 m, 27. X. 78.

Distribution: India: Himachal Pradesh.

47. *Myzaphis rosarum* (Kaltenbach)

Aphis rossrum Kaltenbach, 1843. Mon. der Fam. der Pflanzen 101.

Collection data: 25 pale greenish apterae and 3 alate from *Rosa* sp. (Rosaceae), Kasauli (H.P.) *c* 1850 m. 30. X. 78.

Distribution: India: Himachal Pradesh, Uttar Pradesh; Europe; New Zealand and North America.

48. *Myzus dycei* Carver

Myzus dycei Carver, 1961. Proc. R. Ent. Soc. London (B) 30: 69.

Collection data: 21 dark green apterae, 2 alatae and 4 nymphs from *Urtica* sp. (Urticaceae), Sadhupul (H.P.), *c* 1300 m, 27. X. 78; 19 greenish apterae from *Urtica* sp. (Urticaceae), Solan (H.P.), *c* 1300 m, 27. X. 78.

Distribution: India: Arunachal Pradesh, Himachal Pradesh, Megalaya, Sikkim, West Bengal; Australia; China; Japan and Nepal.

49. *Myzus obtusirostris* David, Narayanan and Rajasingh

Myzus obtusirostris David, Narayanan and Rajasingh, 1971. Orient. Insects 5(4): 563.

Collection data: 4 blackish apterae and 3 nymphs from *Apluda mutica* (Gramineae), Sadhupul (H.P.), *c* 1300 m, 27. X. 78.

Distribution: India: Himachal Pradesh, Meghalaya and Uttar Pradesh.

50. *Myzus ornatus* Laing

Myzus ornatus Laing, 1932. Ent. Mon. Mag. 68: 52.

Collection data: 4 yellowish apterae, 1 alata and 11 nymphs from an unidentified host (Gramineae), Jakhu (H.P.), *c* 2400 m, 28. X. 78; 4 brownish green apterae, 3 alatae and 16 nymphs from *Rhamnus* sp. (Rhamnaceae), Jakhu (H.P.), *c* 2400 m, 28. X. 78; 7 yellowish green apterae and 2 nymphs from *Clinopodium umbrosum* (Labiatae), Kufri (H.P.), *c* 2700 m, 31. X. 78; 6 pale greenish apterae and 4 nymphs from *Rhamnus nepalensis* (Rhamnaceae), Kufri. (H.P.), *c* 2700 m, 31. X. 78; 27 blackish green apterae and 10 nymphs from *Galium verum* (Rubiaceae), Kufri (H.P.), *c* 2700 m, 31. X. 78.

Distribution: India: all over; and virtually cosmopolitan.

51. *Myzus persicae* (Sulzer)

Aphis persicae Sulzer, 1776. Abgekurg, gesch. Ins., 105.

Collection data: 2 light greenish apterae from *Bidens pilosa* (Compositae) Solan (H.P.), *c* 1450 m, 25. X. 78; 7 greenish apterae and 34 nymphs from *Mirabilis jalapa* (Nyctaginaceae), Solan (H.P.), *c* 1450 m, 25. X. 78; 5 pale greenish apterae and 5 nymphs from *Buddleja* sp. (Loganiaceae), Chail (H.P.), *c* 2000 m, 27. X. 78; 14 greenish apterae and 3 nymphs from *Urtica* sp. (Urticaceae), Kasauli (H.P.), *c* 1850 m, 30. X. 78.

Distribution: India: all over and virtually cosmopolitan.

52. *Neoacyrthosiphon* sp.

Apterous oviparous female

Body oval, about 2.82 mm long with its maximum width 1.35 mm near middle of abdomen. Head pale, smooth, with distinct lateral frontal tubercles; median frontal prominence low; dorsal cephalic hairs with blunt apices. Antennae 6-segmented, about 0.73 × body; flagellum pale brown, imbricated, more so apicad; secondary rhinaria absent; primary rhinaria ciliated; flagellar hairs blunt or with incrassate apices, the longest one on segment III about as long as b.d.III. Rostrum reaching beyond midcoxae; u.r.s. with 2 secondary hairs, about 1.02 × h.t.2. Midthoracic furca sessile, with separate arms. Abdominal dorsum pale, smooth with short and stout hairs having incrassate to blunt apices, the longest one on anterior, 7th and 8th tergites about 1.0, 1.33 and 2.22 × b.d.III respectively. Siphunculi cylindrical with slightly swollen distal portion, indistinct flange and bearing spinular transverse striae, about 0.31 × body and about 3.33 × tongue-shaped cauda bearing 12 hairs. Legs brown, smooth, hind tibiae bearing numerous pseudosensoria distributed over entire length except very base and apex. F.T.C. 3,3,3; 2nd segment of hind tarsus with spinules.

Measurements of one specimen in mm: Length of body 2.82, width 1.35; antenna 2.08, a.s. III:IV:V:VI 0.54:0.36:0.37: (0.21+0.42); u.r.s. 0.13; h.t.2 0.13; siphunculus 0.90; cauda 0.27.

Collection data: 1 pale green apterous ovipara from an unidentified host, Kufri (H.P.), *c* 2700 m, 26. X. 78.

Note: Specific determination has not been possible because of having only one specimen at the disposal.

53. *Neomyzus circumflexus* (Buckton)

Siphonophora circumflexa Buckton, 1876. Monograph of the British Aphides 1: 130.

Collection data: 3 greenish apterae and 13 nymphs from *Dahlia* sp. (Compositae), Chail (H.P.), *c* 2000 m, 27. X. 78; 21 pale yellowish apterae and 23 nymphs from unidentified host (Solanaceae), Chail (H.P.), *c* 2000 m 27. X. 78.

Distribution: India: Arunachal Pradesh, Assam, Bihar, Himachal Pradesh, Manipur, Meghalaya, Nagaland, Sikkim, South India, Uttar Pradesh, West Bengal; Bengal; and virtually cosmopolitan.

Genus *Pilorostris*, gen. nov.

Median frontal prominence weekly developed; frons nearly smooth. Antennae 6-segmented, longer than body, with up to 10 secondary rhinaria on segment III of apterae. Eyes with ocular tubercles. Ultimate rostral segment with parallel sides, more than 2 × h.t.2 and with many small secondary hairs. Spiracles reniform. Abdominal dorsum pale brown and smooth; dorsal hairs with spatulate apices. Siphunculi subcylindrical, faintly imbricated and with a weekly developed flange. Cauda dark, elongate, with about 7 hairs. Legs pale brown except darker distal half of femora, apices of tibiae and tarsi. F.T.C. 3,3,3.

Type-species: *Pilorostrsis simlaensis*, sp. nov.

Distribution: India.

Remarks: Present material in having median frontal prominence, much too hairy ultimate rostral segment, tuberculate secondary rhinaria and subcylindrical

siphunculi, do not fit with any known genus of the tribe Macrosiphini and as such a new genus is erected to accommodate this new species.

54. *Pilorostris simlaensis*, gen. et sp. nov. (Figs. 10, A–E)

Apterous viviparous female

Body elliptical about 2.10–2.31 mm long with 0.75–0.90 mm as maximum width. Head (Fig. 10A) smooth and pale, median frontal prominence ill developed; dorsal cephalic hairs with spatulate apices, upto about 0.044 mm long. Antennae (Fig. 10 B) 6-segmented, about 1.3 × body; segments I and II dark, a little wrinkled on inner side; flagellum pale except the apices of segments III, IV and distal half of segment V and whole of segment VI which are darker; segment III with 3–8 tuberculate secondary rhinaria on basal 0.35–0.50 portion which is incrassate and dusky; very base of segment III with fine imbrications, rest of the segment smooth, segment IV very sparsely imbricated, other segments of flagellum progressively more distinctly imbricated; p.t. about 6.0–7.0 × base of segment VI and distinctly longer than segment III; flagellar hairs sparse, spatulate, the longest one on segment III being subequal to b.d.III. Eyes large with distinct occular tubercles. Rostrum reaches hind coxae; u.r.s. elongate with parallel sides, 2.10–

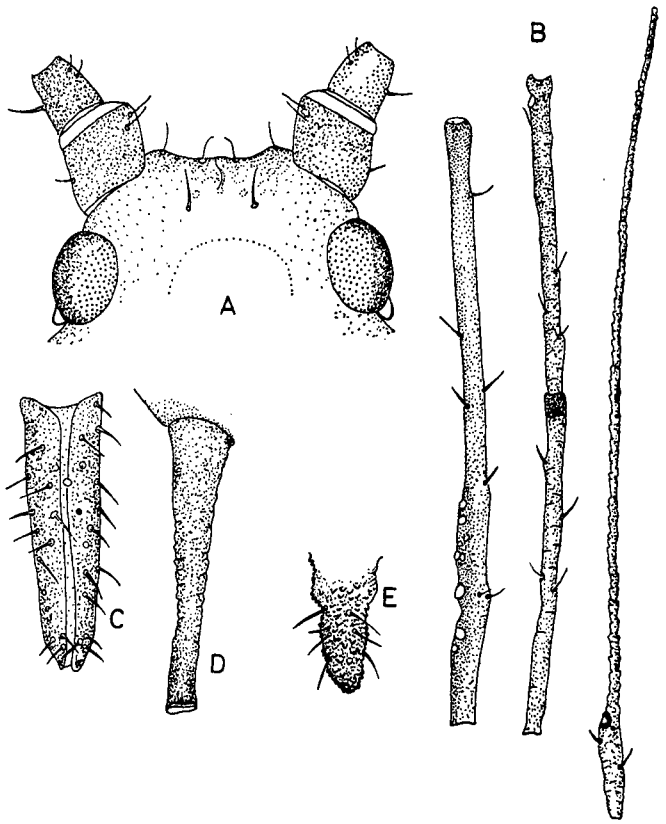


Fig. 10. *Pilorostris simlaensis*, gen. et sp. nov. Apterous viviparous female.
A: Head. B: Antennal segments 3–6. C: u.r.s. D: Siphunculus. E: Cauda.

2.50 × h.t.2 with about 19–24 small secondary hairs (Fig. 10C). Mesosternal furca with a basal stout stem. Abdominal dorsum medially pigmented and pale marginally, dorsal hairs spatulate, longest one on anterior tergites upto about 0.056 mm long and about 1.7–2.0 × b.d.III; 4 hairs on 8th tergite about 0.06 mm long and about 2 × b.d.III. Siphunculi (Fig. 10D) pale with the apex pigmented, subcylindrical, sparsely imbricated, about 0.14–0.19 × body and about 1.60–1.80 × cauda. Cauda (Fig. 10E) dark, elongate, thick with a slight constriction at basal 0.40 portion and with 7 hairs. Legs pale brown except distal half of femora, apices of tibiae and whole of tarsi which are darker; femora smooth; femoral hairs with bluntish apices, tibial hairs at base with bluntish to spatulate apices and those towards apex with slightly bluntish to acuminate apices; F.T.C. 3,3,3.

Measurements of the holotype in mm: Length of body 2.10, width 0.99; antenna 2.85, a.s.III: IV:V:VI 0.72:0.41:0.40: (0.13+0.87); u.r.s. 0.19; h.t.2 0.09; siphunculus 0.36; cauda 0.22.

Alate viviparous female

Body about 1.98–2.40 mm long. Head pigmented; dorsal cephalic hairs upto about 0.036 mm long. Antennal segment III with 30–36 small, round secondary rhinaria scattered almost over entire length except the very base. Anterior dorsal hairs upto about 0.03 mm long and a little longer than b.d.III; longest hair on 8th tergite about 0.036 mm long. Siphunculi pigmented, paler towards base. Media of the forewing twice-branched. Rest of the characters as in apterae viviparae.

Measurements of one specimen in mm: Length of body 1.98, width 0.75; antenna 2.55, a.s.III: IV:V:VI 0.62; 0.36:0.39: (0.13+0.92); u.r.s. 0.18; h.t.2 0.11; siphunculus 0.28; Cauda 0.18.

Collection data: Holotype: Greenish apterous viviparous female from *Strobilanthes dalhousianus* (Acanthaceae), Mashobra (H.P.), *c* 2250 m, 17. X. 74, coll. L. K. Ghosh; paratypes: 3 apterous viviparous females and 2 alate viviparous females, data same as for the holotype; 8 apterous viviparous females, 9 alate viviparous females and 12 nymphs from *Conyza stricta* (Compositae), Kufri (H.P.), *c* 2700 m, 26. X. 78.

Distribution: India: Himachal Pradesh.

Genus *Senisetotarsaphis*, gen. nov.

Head smooth. Antennae 6-segmented, dark, flagellum imbricated; segment III with strongly protuberant irregularly scattered secondary rhinaria over entire length. Rostrum reaches fore coxae; ultimate rostral segment with about 8 secondary hairs. Abdominal dorsum with pleural and spinal sclerites forming dorsal patches; dorsal abdominal hairs moderately long and fine. Siphunculi slender, cylindrical, imbricated, with distinct preapical flange. Cauda elongate, triangular, with 10 hairs. Legs pale brown except the apices of femora, tibiae and whole of tarsi which are darker; first tarsal segments with 6 hairs. Wing venation normal; hind wing with 2 oblique veins.

Type-species: *Senisetotarsaphis jakhuesnsis*, sp. nov.

Distribution: India.

Remarks: The present material do not fit into any genus of the tribe Macrosiphini because of presence of 6 hairs on first tarsal segment of all legs, strongly protuberant secondary rhinaria and comparatively short siphunculi. Hence a new

genus, *Senisetotarsaphis*, is erected with the new species *jakhuensis*.

55. *Senisetotarsaphis jakhuensis*, gen. et sp. nov.

Alate viviparous female (Figs. 11 A-F)

Body elongated (Fig. 11A), about 1.84 mm long with 0.82 mm as maximum width near the middle of abdomen. Head dark brown with smooth lateral frontal tubercles, dorsal cephalic hairs fine, about 0.22–0.30 mm long, about 1.0–1.3 × b.d.III. Antennae (Fig. 11B) 6-segmented, about 0.96 × body; nearly con-

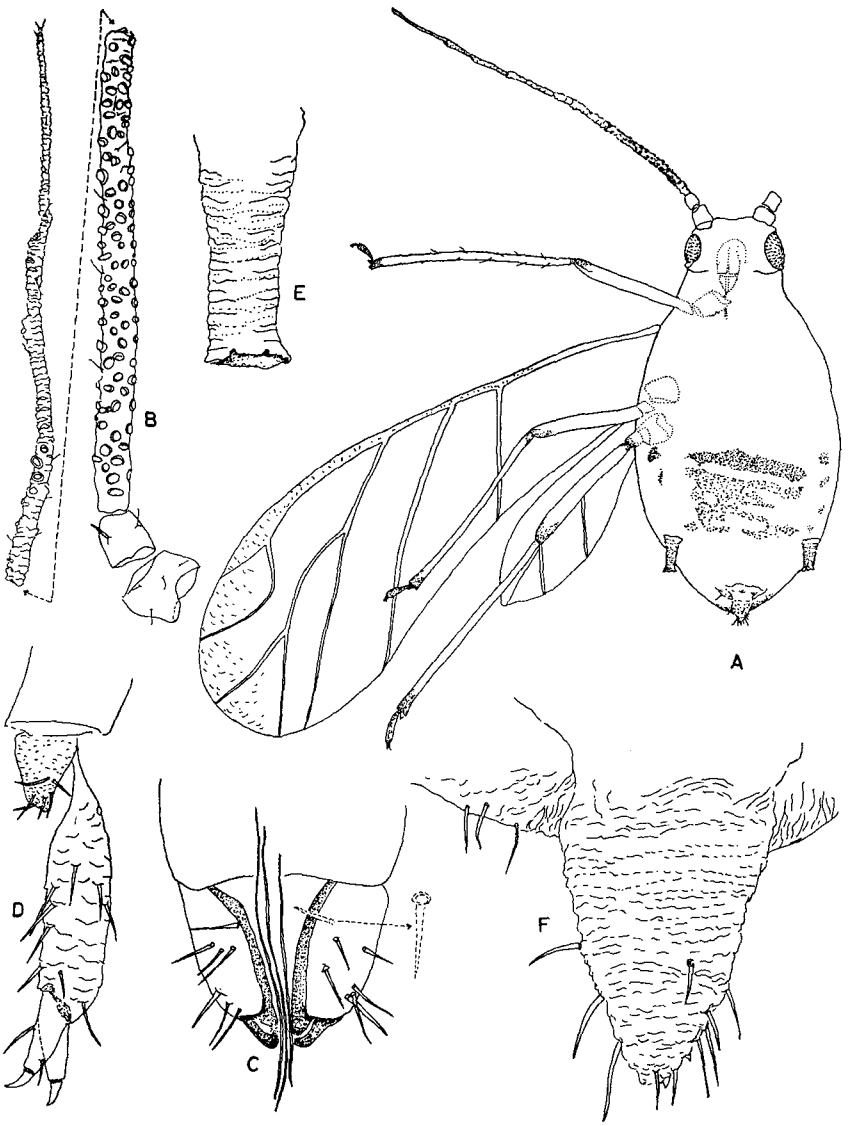


Fig. 11. *Senisetotarsaphis jakhuensis*, gen. et sp. nov. Alate viviparous female.
A: Whole body. B: Antenna. C: u.r.s. D: Tarsi. F: Siphunculus. F: Cauda.

colorous with head; flagellum smooth on segment III, rest gradually more distinctly imbricated apicad; segment III with 76–87 round strongly protuberant secondary rhinaria distributed irregularly over its entire length except the pale base, segment IV with 2–6 similar secondary rhinaria distributed over distal 0.66 portion; primary rhinaria on segment V and VI ciliated; p.t. about 2.75 × base of segment VI and about 0.44 × segment III; flagellar hairs sparse, small, about 0.01 mm long with fine apices, longest hair on segment III about 0.5 × its basal diameter. Rostrum reaching fore coxae; u.r.s. (Fig. 11C) somewhat bluntish, about 0.77 × h.t. 2, bearing about 8 secondary hairs. Eyes with distinct ocular tubercles. Thorax dark. Abdominal dorsum pale with broken brownish spinal and pleural sclerites, spinal ones caudad fused posteriorly to form a broad median somewhat trapezoidal patch, postsiphuncular scleroties distinct, segment 7 with an indistinct transverse band; dorsal hairs moderately long with fine apices, those on anterior tergites about 0.018 mm long and about 0.83 × b.d.III; hairs on 7th tergite 0.021 mm long and about 1 × b.d.III, 8th tergite with 2 hairs and these about 0.03 mm long, about 1.16 × b.d.III. Siphunculi (Fig. 11E) cylindrical, brownish, about 0.07 × body and 0.86 × cauda, imbricated with distinct preapical flange. Cauda (Fig. 11F) elongated, brownish and with 10 hairs. Legs pale brown except the dark brown apices of femora, tibiae and tarsi (Fig. 11D). First tarsal chaetotaxy 6,6,6. Wing-venation normal.

Measurements of the holotype in mm: Length of body 1.84, width 0.82; antenna 1.78; a.s. III:IV:V:VI 0.75:0.24:0.19: (0.12+0.33); u.r.s. 0.31; h.t.2 0.40; siphunculus 0.13; cauda 0.15.

Collection data: Holotype: Greenish alate viviparous female from *Rubus* sp. (Rosaceae), Jakhu (H.P.), *c* 2400 m, 28. X. 78; paratype: 1 greenish alate viviparous female from an unidentified host, Simla (H.P.), *c* 2100 m, 10. XI. 74, coll. L. K. Ghosh.

Distribution: India: Himachal Pradesh.

56. *Sinomegoura photiniae* (Takahashi)

Acyrthosiphon photiniae Takahashi, 1936. Lingnan Sci. J. 15(4): 600.

Collection data: 3 brownish apterae and 3 nymphs from *Celtis* sp. (Ulmaceae), Javli (H.P.), *c* 1300 m, 28. X. 78.

Distribution: India: Himachal Pradesh, Meghalaya, Sikkim, West Bengal; China and Japan.

57. *Tricaudatus polygoni* (Narzikulov)

Rhopalosiphoninus polygoni Narzikulov, 1953. Izv. Ofd. Estestv. Nauk. A. N. Tadz. SSR 4: 62.

Collection data: 1 yellowish aptera, 1 alata and 1 nymph from *Polygonum barbatum* (Polygonaceae), Solan (H.P.), *c* 1450 m, 25. X. 78; 5 reddish apterae, 6 alatae and 10 nymphs from *Polygonum* sp. (Polygonaceae), Kufri (H.P.), *c* 2700 m, 26. X. 78; 3 alatae and 4 nymphs from *Strobilanthus atropurpurens* (Acanthaceae), Mashobra (H.P.), *c* 2250 m, 28. X. 78; 8 pale greenish apterae, 4 alatae and 9 nymphs from *Polygonum* sp. (Polygonaceae), Mashobra (H.P.), *c* 2250 m, 28. X. 78.

Distribution: India: Arunachal Pradesh, Himachal Pradesh, Meghalaya, Sikkim, Uttar Pradesh, West Bengal; Japan; Java; Korea; Taiwan and U.S.S.R.

58. *Vesiculaphis verbasci* Chowdhuri, Basu, Chakrabarti and Raychaudhuri

Vesiculaphis verbasci Chowdhuri, Basu, Chakrabarti and Raychaudhuri, 1969. Orient. Insects 3(1): 90.

Collection data: 2 brownish green alatae from *Rhamnus* sp. (Rhamnaceae), Mussourie (U.P.), *c* 2050 m, 3. XI. 76.

Distribution: India: Arunachal Pradesh, Himachal Pradesh, Manipur, Meghalaya, Nagaland, Sikkim, Uttar Pradesh and West Bengal.

59. *Chaitophorus pakistanicus* Hille Ris Lambers

Chaitophorus pakistanicus Hille Ris Lambers, 1966. Tijdschr. Ent. 109: 200.

Collection data: 6 greenish apterae and 8 nymphs from *Salix* sp. (Salicaceae), Solan (H.P.), *c* 1450 m, 25. X. 78; 28 greenish apterae, 8 alatae and 9 nymphs from *Salix* sp. (Salicaceae), Dharampur (H.P.), *c* 1500 m, 29. X. 78.

Distribution: India: Assam, Himachal Pradesh, Jammu and Kashmir state; and Pakistan.

60. *Machilaphis machili* (Takahashi)

Phyllaphis machili Takahashi, 1928. Trans. nat. Hist. Soc. Formosa 18(96): 146.

Collection data: 1 green aptera, 1 alata and 2 nymphs from an unidentified host, Mussourie (U.P.), *c* 2050 m, 3. XI. 78.

Distribution: India: Himachal Pradesh, Meghalaya, Uttar Pradesh; Japan and Taiwan.

61. *Shivaphis celti* Das

Shivaphis celti Das, 1918. Rec. Indian Mus. 6(4): 246.

Collection data: 16 pale green apterae and 3 alatae from *Celtis* sp. (Ulmaceae), Barog (H.P.), *c* 1531 m, 31. X. 78.

Distribution: India: Himachal Pradesh, Jammu and Kashmir state, Manipur, Meghalaya, Sikkim and West Bengal; Japan; Korea; Pakistan; Ceylon and Taiwan.

62. *Tinocallis kahawaluokalani* (Kirkaldy)

Myzocallis kahawaluokalani Kirkaldy, 1907. Proc. Hawaii ent. Soc. 1: 101.

Collection data: 11 alatae and 2 nymphs from *Lagerstroemia indica* (Lythraceae), Delhi, *c* 500 m, 23. X. 78.

Distribution: India: Assam, Himachal Pradesh, South India, West Bengal; North America; Hawaii; Japan and Taiwan.

63. *Eutrichosiphum* (*Eutrichosiphum*) *tapatii* Mondal, Chatterjee and Raychaudhuri

Eutrichosiphum (*Eutrichosiphum*) *tapatii* Mondal, Chatterjee and Raychaudhuri, 1979. Entomon 4(1): 77.

Collection data: 2 pale green apterae and 8 nymphs from *Quercus* sp. (Fagaceae), Kemphy (U.P.), *c* 1220 m, 4. XI. 78.

Distribution: India: Himachal Pradesh, Sikkim and Uttar Pradesh.

64. *Eutrichosiphum* (*Neoparatrichosiphum*) *khasyanum* (Ghosh and Raychaudhuri)

Paratrichosiphum (*Neoparatrichosiphum*) *khasyanum* Ghosh and Raychaudhuri, 1962. J. Asiatic Soc. 4(3 and 4): 108.

Collection data: 2 cream coloured apterae and 4 nymphs from *Quercus* sp. (Fagaceae), Barog (H.P.), *c* 1531 m, 31. X. 78.

Distribution: India: Arunachal Pradesh, Himachal Pradesh, Meghalaya and Uttar Pradesh.

65. *Eutrichosiphum* (*Paratrichosiphum*) *alnicola* (Basu)

Paratrichosiphum alnicola Basu, A. N., 1967. Bull. Ent. 8(2): 14.

Alate oviparous female

Body about 2.2–2.4 mm long with 0.82–1.02 mm as maximum width. Head pale brownish, smooth, bearing long dorsal haris with acuminate apices. Antennae 6-segmented, about 0.72–0.79 × body, flagellar hairs long and fine, longest one on segment III being about 4.71–5.99 × b.d.III; segment III with 10–13 round secondary rhinaria distributed in a row over almost entire length; p.t. about 1.69–1.76 × base of segment VI. Rostrum reaching hind coxae; u.r.s. (4+5) long and pointed, about 1.41–2.18 × h.t.2; rostral segment IV with 14 secondary hairs. Dorsum of abdomen wrinkled with a median consolidated patch extending over 2nd–4th tergites, besides irregular patches on tergite 1 and on margins of these segments, segment 5 with a distinct patch spinally in between siphunculi. Siphunculi long, cylindrical, about 0.42–0.44 × body, covered with numerous long and fine hairs and indistinct flange. Legs pale brown except distal portion of femora and tibiae which are slightly darker; hind tibiae with at most 2 pseudorhinaria-like structure. Subgenital plate densely hairy.

Measurements of one alate oviparous female in mm: Length of body 2.38, width 0.87; antenna 1.72, a.s. III:IV:V:VI 0.52:0.24:0.28:(0.19+0.33); u.r.s. 0.17; h.t.2 0.12; siphunculus 1.0.

Collection data: 2 greenish apterae from *Quercus* sp. (Fagaceae), Solan (H.P.), *c* 1450 m, 25. X. 78; 7 brownish alate oviparae and 5 nymphs from *Quercus* sp. (Fagaceae), Mashobra (H.P.), *c* 2250, 28. X. 78; 2 pale green apterae from *Quercus* sp. (Fagaceae), Solan (H.P.), *c* 1450 m, 30. X. 78.

Distribution: India: Himachal Pradesh, Sikkim and West Bengal.

Note: Basu (1967) originally described the species from Darjeeling, India, from apterae and alatae infesting on *Alnus nepalensis*. The hitherto unknown oviparous morph is described from *Quercus* sp. collected from northwest Himalaya.

66. *Eutrichosiphum* (*Paratrichosiphum*) *neoalnicola*, sp. nov. (Figs. 12, A–G)

Apterous viviparous female

Body elongate, about 1.66–2.10 mm long with 0.78–0.99 mm as its maximum width. Head (Fig. 12A) pale brown to dark brown, dorsal cephalic hairs long, about 0.135 mm long and about 3.4 × b.d.III. Antennae (Fig. 12B) 6-segmented, concolorous with head, about 0.5–0.6 × body; segment III faintly imbricated; p.t. about 1.3–1.6 × base of segment VI and about 0.7 × segment III; flagellar hairs mostly long with incrassate apices, longest one on segment III about 2.6 × b.d.III. Rostrum reaches almost upto middle of 2nd abdominal segment; rostral segments 4+5 (Fig. 12C) about 2.1–2.5× h.t.2, segment 4 about 7.5–8.5 × segment 5 with 10

secondary hairs. Eyes large with distinct ocular tubercles. Margin of pro-, meso- and metathoracic segments with fine spinules dorsally. Abdomen brownish, sclerotic and slightly wrinkled dorsally, ventrally with spinules only marginally, dorsal hairs (Figs. 12E & F) of various lengths, long hairs thick with both fine and furcated apices, longest hair on anterior abdominal tergites about 3.0–3.5 × b.d.III and shortest one about 1.0–1.5 × the mentioned diameter, 8th tergite with 2 fine hairs. Siphunculi brown (Fig. 12 D), elongate, spindle-shaped, without reticulation but with spinules all over, 0.27–0.32 × body, about 3.1–4.7 × its maximum width; width at base about 2.5 at middle about 3.2 and at apex about 1.8 × middle width of hind tibiae; siphuncular hairs numerous with finely drawn out apices, longest hair being about 2 × basal width of siphunculi and upto about 6 × b.d.III. Cauda obtusely conical with about 6 hairs. Legs concolorous (Fig. 12G) with head except for darker tibiae and tarsi; femora smooth, with hairs having fine apices; tibial hairs also with fine apices but the four apical tibial ones thick and stout; F.T.C. 7,7,7.

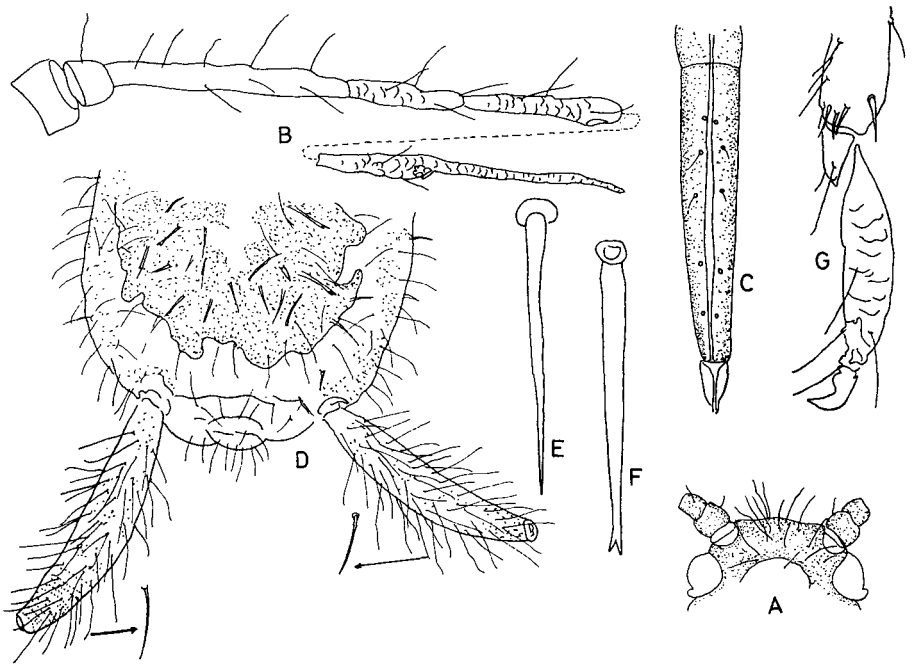


Fig. 12. *Eutrichosiphum* (*Paratrichosiphum*) *neoalnicola*, sp. nov. Apterous viviparous female. A: Head. B: Antenna. C: u.r.s. D: Posterior portion of abdomen. E & F: Dorsal hairs. G: Hind tarsi with portion of tibia.

Measurements of the Holotype in mm: Length of body 1.66, width 0.78; antenna 0.97; a.s.III:IV:V:VI 0.27:0.26:0.14: (0.13+0.19); u.r.s. 0.19; h.t.2 0.07; siphunculus 0.54.

Collection data: Holotype; apterous viviparous female from *Quercus* sp. (Fagaceae), Nagwain (H.P.), *c* 1830 m, 7. VII. 70, coll. S. K. Sen; paratypes: 2 apterous viviparous females, data same as for the holotype; 1 apterous viviparous female from *Quercus* sp. (Fagaceae), Narkanda (H.P.), *c* 2700 m, 27. IX. 74; 2 green-

ish apterous viviparous females from *Quercus* sp. (Fagaceae), Solan (H.P.), *c* 1450 m, 25. X. 78.

Distribution: India: Himachal Pradesh.

Remarks: The new species *Eutrichosiphum* (*Paratrichosiphum*) *neoalnicola* comes close to *P. alnicola* Basu in most of the characters but differs from it in having shorter p.t. (about 1.4–1.6 × base of a.s. VI vs. 1.9–2.2 × in *alnicola*); shorter flagellar hairs (longest one on segment III about 2.5–3.0 × b.d.III vs. 3.8–4.0 × in *alnicola*), stouter siphunculus (3.3–5.0 × its maximum diameter vs. 5.6–5.9 in *alnicola*) and more secondary hairs on rostral segment 4.

67. *Astegopteryx minuta* (van der Goot)

Oregma minuta van der Goot, 1917. Contrib. Faune Indes neerl. 1(3): 201.

Collection data: 7 brownish alatae from an unidentified host (Gramineae), Dehradun (U.P.), *c* 825 m, 2. X. 78.

Distribution: India: Arunachal Pradesh, Himachal Pradesh, Manipur, Meghalaya, Nagaland, Sikkim, Uttar Pradesh, South India, West Bengal; and Japan.

68. *Ceratovacuna lanigera* Zehntner

Ceratovacuna lanigera Zehntner, 1897. Meded. Proefs. Java ns. 37: 29.

Collection data: 33 brown apterae and 31 nymphs from an unidentified host (Gramineae), Solan (H.P.), *c* 1450 m, 25. X. 78; 4 brownish apterae and 4 nymphs from an unidentified host (Gramineae), Dehradun (U.P.), *c* 825 m, 2. XI. 78.

Distribution: India: Assam, Himachal Pradesh, Sikkim, Tripura, Uttar Pradesh, West Bengal; Ceylon; Indonesia; Japan and Philippines.

69. *Pseudoregma bucktoni* Ghosh, Pal and Raychaudhuri

Oregma bambusae Buckton, 1893. Indian Mus. Notes 3: 87.

Collection data: 16 black apterae and 3 alatae from *Bambusa* sp. (Gramineae), Dehradun (U.P.), *c* 825 m, 2. XI. 78.

Distribution: India: Himachal Pradesh, Manipur, Meghalaya, Sikkim, South India, West Bengal; Ceylon; Taiwan and Vietnam.

Pseudothoracaphis, gen. nov.

Body semioval, strongly sclerotized, dark brown. Eyes 3-faceted. Antennae 3-segmented. Prosoma and abdominal segments (2–7) completely separated; submarginal hairs on prosoma and fused abdominal segments absent; dorsal hairs minute. Dorsum of prosoma wrinkled and sculptured but without pustules (Fig. 13 A); submarginal area appears reticulated, posteromesial hairs on prosoma and abdomen absent. Rostrum short; u.r.s. with blunt apex and without any secondary hair. Abdominal segments (2–7) much less wrinkled than prosoma; 8th tergite with 2 spine-like hairs. Cauda knobbed. Subanal plate bilobed. Legs normal with claws; dorsoapical hairs on 2nd tarsal segments with expanded apices.

Type-species: *Pseudothoracaphis himachali*, sp. nov.

Distribution: India.

Remarks: The new genus approaches *Allothoracaphis* Takahashi (1958) in the presence of 3-segmented antennae and claws on legs and in the absence of siphunculi

and submarginal setae on fused abdominal segments but differs from the latter in not having long submarginal setae on prosoma as found in *Allothoracaphis* Takahashi.

70. *Pseudothoracaphis himachali*, gen. et sp. nov. (Figs. 13, A–C)

Apterous viviparous female

Body (Fig. 13A) dark brown, about 1.45–1.60 mm long with about 1.05–1.15 mm as its maximum width. Eyes 3-faceted. Antennae 3-segmented, about 0.09–0.1 mm long. Prosoma and abdominal segments (2–7) separated, submarginal hairs on prosoma and fused abdominal segments (2–7) absent. Dorsum of prosoma wrinkled and corrugated but without distinct tubercles, marginally indistinctly reticulated. Rostrum short, u.r.s. (Fig. 13B) about 1.45 × h.t.2 and without any secondary hairs. Abdominal segments less wrinkled than prosoma and without submarginal hairs; 8th tergite with 2 spiny hairs, these being about 0.01–0.02 mm long. Siphunculi absent. Cauda knobbed, wider than long, with many hairs, subanal plate bilobed. Legs normal with claws (Fig. 13C); dorsoapical hairs on 2nd tarsal segment with expanded apices.

Measurements of the holotype in mm: Length of body 1.60, width 1.05; antenna 0.09; u.r.s. not visible, h.t.2 0.04; cauda 0.03.

Collection data: Holotype: Apterous viviparous female from *Ilex* sp. (Aquifoliaceae), Kufri (H.P.), *c* 2700 m, 31. X. 78; paratypes: 31 apterae, collection

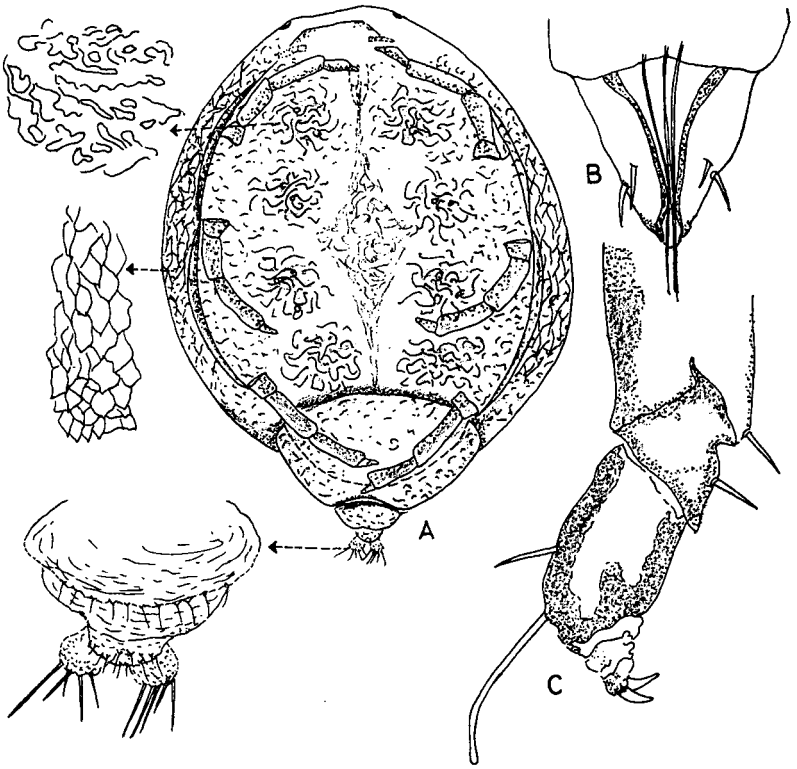


Fig. 13. *Pseudothoracaphis himachali*, gen. et sp. nov. Apterous viviparous female. A: Whole body. B: u.r.s. C: Hind tarsi.

data same as for the holotype; 40 apterae from *Quercus* sp. (Fagaceae), Mashobra (H.P.), *c* 2250 m, 28. X. 78.

Distribution: India: Himachal Pradesh.

71. *Reticulaphis distylli rotifera* Hille Ris Lambers and Takahashi

Reticulaphis distylli rotifera Hille Ris Lambers and Takahashi, 1959. Tijdschrift Ent. Deel. 102: 12.

Collection data: 18 blackish apterae from *Quercus* sp. (Fagaceae), Mashobra (H.P.), *c* 2250 m, 28. X. 78.

Distribution: India: Himachal Pradesh; and Indonesia.

72. *Lachnus tropicalis* (van der Goot)

Pterochlorus tropicalis van der Goot, 1916. Rec. Indian Mus. 12(1): 3.

Collection data: 8 brownish apterae, 2 alatae and 34 nymphs from *Quercus* sp. (Fagaceae), Solan (H.P.), *c* 1450 m, 25. X. 78; 2 brownish apterae and 11 nymphs from *Quercus* sp. (Fagaceae), Mashobra (H.P.), *c* 2250 m, 28. X. 78; 13 blackish apterae from *Pyrus malus* (Rosaceae), Dehradun (U.P.), *c* 825 m, 2. XI. 78.

Distribution: Virtually cosmopolitan.

73. *Nippolachnus bengalensis* Basu and Hille Ris Lambers

Nippolachnus bengalensis Basu and Hille Ris Lambers, 1968. Ent. Bericht. 28: 9.

Collection data: 2 brownish apterae and 3 nymphs from *Quercus* sp. (Fagaceae), Solan (H.P.), *c* 1450 m, 25. X. 78.

Distribution: India: Himachal Pradesh and West Bengal.

74. *Nippolachnus eriobotryae* Basu and Hille Ris Lambers

Nippolachnus eriobotryae Basu and Hille Ris Lambers, 1968. Ent. Bericht. 28: 11.

Collection data: 5 brownish apterae from *Quercus* sp. (Fagaceae), Solan (H.P.), *c* 1450 m, 30. X. 78.

Distribution: India: Himachal Pradesh and West Bengal.

75. *Nippolachnus piri* Matsumura

Nippolachnus piri Matsumura, 1917. J. Coll. Agric. Tohoku Imp. Univ. 7(6): 382.

Collection data: 9 greyish brown apterae from *Quercus* sp. (Fagaceae), Barog (H.P.), *c* 1531 m, 31. X. 78.

Distribution: India: Himachal Pradesh, Meghalaya, West Bengal; Japan; Korea and Taiwan.

76. *Stomaphis* sp.

Apterous viviparous female

Body nearly oval, about 4.5 mm long with 2.34 mm as maximum width near the middle of abdomen. Head dark brown; frons smooth; dorsal cephalic hairs long and fine, about 0.83–1.5 × b.d.III. Antennae 6-segmented, about 0.38 × body, dark borwn except segment II and basal half of segment III which are pale; p.t. about 0.42 × base of segment VI; hairs on segment III about 0.04–0.15 mm long, longest one being about 0.92–3.07 × b.d.III. Rostrum extending beyond body, rostral segments 4+5 about 0.69 mm long and about 1.58 × h.t.2,

segment 5 with about 18 secondary hairs, segment 4 about 3.18 × segment 5. Abdominal dorsum pale, with numerous hairs these about 0.06–0.11 mm long, longest one being about 1.37–2.38 × b.d.III; 7th and 8th tergites with dorsal transverse brown patches; 8th tergite with about 14 hairs, longst one being about 6.15 × b.d.III. Siphunculi pore-like situated on dark brown hairy cones. Cauda dark, broadly rounded. Subanal plate broader than long, legs dark brown except basal 0.5 portion of femora which is pale; tibiae brownish black with numerous short to long hairs; outer margin of first tarsal segments longer than the dorsal diameter of the segment (about 1.6 ×).

Measurements of the apterous viviparous female in mm: Length of body 4.50, width 2.34; antenna 1.74, a.s. III:IV:V:VI 0.57:0.25:0.30: (0.21+0.09); u.r.s. 0.62; h.t.2. 0.43; cauda 0.12.

Collection data: 1 brownish aptera from *Cedrus deodara* (Coniferae), Kufri (H.P.), *c* 2700 m, 31. X. 78.

Remark: The specimen examined does not agree with any of the species dealt with by Takahashi (1960) in his review of the genus. Following Eastop (1958) the specimen comes close to *Stomaphis longirostris* Fabricius. Due to paucity of literature and comparable material specific determination of the single specimen has not been possible.

77. *Eriosoma lanigerum* (Hausmann)

Aphis lanigerum Hausmann, 1802. Illiger's Mag. Insekts. 1: 440.

Collection data: 21 mealy covered brownish apterae from *Pyrus malus* (Rosaceae), Chail (H.P.), *c* 2000 m, 27. X. 78.

Distribution: India: Himachal Pradesh, Meghalaya, South India, Uttar Pradesh; and virtually cosmopolitan.

78. *Epipemphigus imaicus* (Cholodkovsky)

Pemphigus imaicus Cholodkovsky, 1912. Rev. Russ. Ent. 12: 495.

Collection data: 4 apterae and 15 nymphs from *Pyrus malus* (Rosaceae), Mashobra (H.P.), *c* 2250 m, 28. X. 78.

Distribution: India: Himachal Pradesh, Uttar Pradesh; and Pakistan.

Discussion

The collection data reveal that maximum concentration of species is noticed in altitude ranging between 600 m and 1500 m, i.e., in areas enjoying subtropical to warm temperate climate. The same distributional pattern can be observed in other parts of India.

From the list of reported species it is apparent that the subfamily Aphidinae is the most predominating group. The world record also exhibits the same picture. The phenomenon of polyphagism is very well marked among some species of this submfaily, e.g., *Aphis fabae* complex, *Aphis gossypii, Aphis spiraecola, Toxoptera aurantii,* etc. Preponderance of Palaearctic species is also obvious, though some species like *A. gossypii, A. spiraecola* and a few others are cosmopolitan in distribution. It may also be pointed out that nearly 50% of such species are also found in Japan. At the generic level such examples are numerous. The commonness as revealed here is because of the location of area surveyed in compara-

tively higher altitude where subtropical to temperate climate exists and which forms transition area between Oriental and Palaearctic realms. The endemicity of area and also of other similar areas in India is no less pronounced.

Countries in the Palaearctic realm including Japan enjoying warm temperate to temperate climate are well known for the prevalence of sexual forms of aphids which are usually less preponderant in an aphid colony because of the perpetuation of parthenogenetic viviparity. In this context position of India in respect of areas situated in higher altitudes and enjoying subtropical to warm temperate climate is not very different since through the present work sexuals of 11 species out of a total collection of 78 species are reported.

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References

Basu, A. N. 1967. One new genus and seven new species of aphids from Darjeeling district, West Bengal (Homoptera: Aphididae). Bull. Ent. 8(2): 14.

Chakrabarti, S., Ghosh, A. K. et Raychaudhuri, D. N. 1971. New records of aphids (Insecta: Homoptera) from Uttar Pradesh, India. Sci. Cult. 37(5): 247–248.

Chakrabarti, S., Ghosh, A. K. et Raychaudhuri, D. N. 1972. A new genus, a new species and further records of aphids (Homoptera: Aphididae) from the Kumaon Hills, Northwest Himalaya, India. Orient. Insects 6(3): 387–400.

Chakrabarti, S., Ghosh, A. K. et Raychaudhuri, D. N. 1974. Some new aphids (Homoptera: Aphididae) from Himachal Pradesh, India. Orient. Insects 8(4): 522.

David, S. K. et Narayanan, K. 1968. Three new species of Aphids from South Western Himalaya in India. Bull. Ent. 9(2): 99–103.

Eastop, V. F. 1958. A study of Aphididae (Homoptera) of East Africa (H.M.S.O. London): 126.

Ghosh, A. K. et Raychaudhuri, D. N. 1968. Aphids (Insecta: Homoptera) of Sikkim. Proc. zool. Soc. Calcutta 21: 179–195.

Takahashi, R. 1958. *Thoracaphis* and some related new genera of Japan. Ins. Mats. 22(1/2): 7–14.

Takahashi, R. 1960. *Stomaphis* of Japan (Aphididae, Homoptera). Bull. Univ. Osak. Pref., Ser. B. 10: 1–8.

Verma, K. D. 1965. Additions to the Aphid fauna of North West India. Sci. Cult. 31: 389.

Verma, K. D. 1969. A new genus and three new species of aphids from N.W. India (Homoptera: Aphididae), Pt. 3. Bull. Ent. 10(2): 134–140.

Appendix

Consideration of the aphid fauna of India in relation to that of Japan

By D. N. Raychaudhuri

Recording of the aphids from the Indian subregion can be traced back to late nineteenth century when Cotes and Buckton reported a few species from Assam in North-East India and from Dehradun in North-West India respectively. It was Das, who for the first time in the early part of the present century provided a comprehensive account of the aphids of Lahore (now in Pakistan).

However, in the middle of this century the aphidological works in politically divided India gained momentum through the works of A. N. Basu, S. K. David and his co-workers, D. N. Raychaudhuri and his co-workers and K. D. Verma. Through these works about 700 species of aphids under about 200 genera in seven subfamilies are now known to occur in India. Among the different subfamilies the members of Aphidinae appear most predominant while those of Anoeciinae the least. In Aphidinae again the aphids of the tribe Macrosiphini occur in maximum number. Genus wise break-up of the different species available in India reveals that majority of them have origin in Palaearctic parts of the world and on the contrary, species wise break-up reveals that nearly 50% of the species are endemic.

India having a vast area is ecologically diverse with low lands and high mountains and enjoys different climates, viz., arid, semiarid, tropical, subtropical, warm temperate, cool temperate, and arctic. Careful consideration of region wise distribution in India of the aphids found there reveals that great diversity and abundance of aphid fauna occur in the hilly terrains of the country where subtropical to warm temperate climate exists and which represent the transition area between Oriental and Palaeartic realms. This possibly explains the find of Palaearctic genera as stated above. Among the areas enjoying subtropical to warm temperate climate in the country diversity and concentration of aphids are more pronounced in North-East Indian states. This is an all likeness due to high amount of rain fall and gradual northward increase in altitude which in turn tell upon the temperature. Among the northeastern states as well as others situated in higher altitudinal areas in India maximum concentration and diversity of aphid species can be observed in altitudes ranging between 600–1500 m approx. Such availability and preponderance of aphids in this altitudinal stratum can be looked upon as formation of smaller ecological niches even in areas enjoying subtropical to warm temperate climate.

Comparison of Indian aphids at generic level with those of east Asiatic countries reveals that India and other east Asiatic countries share quite a large number of common genera, even though a few countries like Indoensia and Malaysia enjoy tropical climate. In this connection it must be emphasised that countries like Taiwan, Japan proper (Honshu, Kyushu and Shikoku Islands) and Korea have in common quite a large proportion of the genera available in India. The reason for such commonness may be the prevalence of warm temperate climate in these countires. Information about the aphid fauna of these countries can be found from the works of van der Goot on Indonesian fauna, of Takahashi on Malaysian, Siamese,

Taiwanese and Japanese fauna, of Okajima, Matsumura, Shinji, Miyazaki, Higuchi and Aoki on Japanese fauna, of Paik on Korean fauna, of Sczelegiewicz on Vietnamese fauna and of Tao on Taiwanese aphids.

Among the above named workers Higuchi and Miyazaki have provided a tentative list of the aphids available in Japan. From these it is observed that about 830 species under nearly 202 genera occur there. Subsequent to the above work Miyazaki from Japan described 3 new genera, 13 new species and made 26 new records of aphids under the tribe Macrosiphini and Higuchi from Japan described 2 new genera, 9 new species and made 7 new records of aphids of the subfamily Callipterinae. After Miyazaki and Higuchi, Aoki described 3 new species and made one new record under the subfamily Pemphiginae. Thus the total number of genera and species now known to exist in Japan stands at about 207 and 889 respectively. Comparing Japan with India in respect of aphid genera and species it appears that these two countries are in close approximation. Notwithstanding about it must be borne in mind that quite a large number of genera more particularly the primitive ones under Anoeciinae, Greenideinae, Hormaphidinae and Pemphiginae though common to these countries the species available show only a little similarity. This commonness is, in all likeness, because of Japan's connection with the continental shelf of Asia and prevalence of warm temperate climate there. However, further explorations will expand our existing knowledge about the closeness of India and Japan in respect of the aphid fauna.