

A Preliminary Account of the Bionomics and Taxonomy of Aphids from Assam

BY

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(With a text-figure)

INTRODUCTION

Assam is bounded on the north by Bhutan and Sikkim, on the south by Burma, on the west by West Bengal and East Pakistan, and on the east by Manipur and Burma. The average temperature varies from 15.6° C. to 21.1° C. throughout the year, while the average monthly rainfall ranges from three inches in January to sixteen inches in July. From the available literature, it is observed that only two species of aphids have so far been recorded from this region, by Buckton² (1896) and van der Goot³ (1916).

The present survey was done in January 1960 and collections were made from Pandu (alt. 200 m.), Gauhati (c. 200 m.), Titabar (c. 200 m.), Tocklai (c. 200 m.), and Shillong (c. 1500 m.). At the time of collection, the temperature of the different places as well as the biology of the various species were also noted. Collections have been made from 43 types of plants.

Altogether 17 species belonging to twelve genera are recorded here, with notes on their biology and catalogue of food plants. Definite identification of five species is not possible at the present moment.

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² Buckton, G. B. (1896) : Notes on two new species of gall forming aphids from north-western Himalayan region. *Ind. Mus. Notes* 4 : 50-51.

³ Goot, P. van der (1916) : Notes on two undescribed aphids from collection of Indian Museum. *Rec. Ind. Mus.* 12(1) : 1-4.

SYNOPSIS OF THE SPECIES

I. Genus *APHIS* L. 1758. Syst. Nat., ed. 10, p. 451.

(1) *A. gossypii* Glov. 1876. Rept. com. Agr. U.S.A. (1877), p. 36.

MORPHOLOGICAL CHARACTERS

Apterous viviparous female. Longest hair on III segment of antenna $\frac{1}{2}$ to $\frac{2}{3}$ basal diameter of the segment. Antennae imbricated, $\frac{1}{2}$ to $\frac{2}{3}$ length of body. Processus terminalis about $2\frac{1}{2}$ times as long as base of segment VI. Rostrum reaches little beyond hind coxae. Hairs on dorsum of abdomen mostly acute. Siphunculi imbricated. Cauda with 6 to 7 hairs. Hairs on 1st tarsal segments 2, 2, 3.

Measurements of one specimen in mm. :

Length of body 2.13

Antennal segments—III : IV : V : VI—0.28 : 0.13 : 0.13 : 0.11 + 0.28

Siphunculus : length 0.36

„ breadth at base, at apex 0.07, 0.06

Breadth at middle of hind tibia 0.04

Alate viviparous female. Longest hair on III segment of antenna $\frac{3}{8}$ th basal diameter of the segment. Antennae imbricated. Processus terminalis $2\frac{1}{8}$ times as long as base of VI. Hairs on dorsum of abdomen like those of apterous form. Siphunculi imbricated. Cauda with 3 to 4 hairs. Hairs on 1st tarsal segments 2, 2, 3.

Measurements of one specimen in mm. :

Length of body 2.1

Antennal segments—III : IV : V : VI—0.28 : 0.12 : 0.12 : 0.11 + 0.24

Siphunculus : length 0.14

„ breadth at base, at apex 0.07, 0.05

Breadth at middle of hind tibia 0.3

LOCALITY AND HOST PLANTS

Pandu (6-i-60): from *Clitoria ternatea*; Shillong (7-i-60, 8-i-60): from *Duranta plumieri*, *Spirea cantonensis*, *Hibiscus rosa-sinensis*, *Helianthus annuus*, *Vitex negundo*; Titabar (16-i-60, 17-i-60); from *Capsicum frutescens*, *Dahlia* sp., *Bougainvillaea* sp., *Hibiscus sabdariffa*, and *Solanum tuberosum*.

Total number of specimens: 47 apterous, 15 alate, and 57 nymphs.

BIOLOGY

The insects were mostly collected from the undersurface of leaves of different physiological ages, except in the case of *Duranta plumieri* where infection was found on the growing region of the stem. In life, the colour of the insects varies from light green to brown. In association with specimens collected from *D. plumieri*, adult coccinellids were noticed.

II. Genus *AULACORTHUM* Mordvilko 1914. Faune de Russie, in Hem. 1, p. 68.

(2) *A. (Neomyzus) circumflexus* (Buck.) 1876. Hille Ris Lambers, D. (1949), *Temminckia* 8, p. 198.

MORPHOLOGICAL CHARACTERS

Apterous viviparous female. Longest hairs on III segment of antenna $\frac{1}{4}$ basal diameter of the segment. Antennae imbricated, $1\frac{1}{2}$ times as long as body. Processus terminalis $2\frac{5}{7}$ times as long as base of segment VI. Rostrum reaches 2nd coxae. Hairs on dorsum of abdomen with acuminate and blunt apices. Siphunculi long, slender and imbricated. Cauda with 3 to 4 hairs. Hairs on 1st tarsal segments 3, 3, 2.

Measurements of one specimen in mm. :

Length of body 2.37

Antennal segments—III : IV : V : VI—0.61 : 0.47 : 0.40 : 0.30 + 0.82

Siphunculus : length 0.50

„ breadth at base, at apex 0.08, 0.04

Breadth at middle of hind tibia 0.03

LOCALITY AND HOST PLANTS

Shillong (7-i-60): from *Hydrangea hortensis*, *Cestrum* sp., and *Ipomea* sp.

Total number of specimens: 6 apterous and 16 nymphs.

BIOLOGY

The specimens were found to infest the flowers of *Hydrangea hortensis*. Heavy infection was noticed on the young leaves of *Cestrum* and on the undersurface of the matured leaves only of *Ipomea* sp. In living condition the colour of the specimens is green.

III. Genus *CINARA* Curtis 1835. Bri. Entom. 12 (144), no. 576.

(3) *C. (Cinarella) pineus* Mordv. 1895. Hille Ris Lambers, D., 1948, *Trans. R. ent. Soc. London* 99, p. 275.

MORPHOLOGICAL CHARACTERS

Apterous viviparous female. Longest hair on III segment of antenna $2\frac{1}{2}$ times as long as basal diameter of the segment. Antennae $\frac{1}{2}$ length of body. Processus terminalis $\frac{3}{8}$ length of base of VI. Rostrum reaches beyond 3rd coxae. Hairs on dorsum of abdomen long, with acute and acuminate apices. Siphunculi on hairy cones. Cauda helmet-shaped with many long acute hairs.

Measurements of one specimen in mm. :

Length of body 4.3

Antennal segments—III : IV : V : VI—0.71 : 0.32 : 0.40 : 0.22 + 0.08

Diameter of siphunculus 0.7

Breadth at middle of hind tibia 0.1

Alate viviparous female. Longest hair on III segment of antenna $3\frac{1}{2}$ times as long as basal diameter of the segment. Antennae imbricated, $\frac{1}{2}$ length of body. Rostrum reaches beyond 3rd coxae. Hairs on dorsum of abdomen mostly with acute apices. Siphunculi very small, pore-like. Cauda with many long acute hairs.

Measurements of one specimen in mm. :

Length of body (distorted)

Antennal segments—III : IV : V : VI—0.45 : 0.24 : 0.30 : 0.18 + 0.04

Diameter of siphunculus 0.6

Breadth at middle of hind tibia 0.05

LOCALITY AND HOST PLANTS

Shillong (10-i-60): from *Pinus insularis*.

Total number of specimens: 4 apterous, 1 alate, and 20 nymphs.

BIOLOGY

Heavy infestation was noticed on the host plants at the junction of the needles and growing part of the stem. At the time of collection the colour of the specimens was deep brown.

IV. Genus *CAPITOPHORUS* van der Goot 1913. Tijdschr, Ent. 56, p. 84.

(4) *C. hippohaecus* (Walker) 1852, van der Goot, P., 1915. Beitr. Z. Kenntnis. Holl. Blattläuse, pp. 122-125.

MORPHOLOGICAL CHARACTERS

Apterous viviparous female. Longest hair on III segment of antenna $\frac{3}{10}$ basal diameter of the segment. Antennae imbricated, $1\frac{1}{4}$ times as long as the body. Processus terminalis $8\frac{1}{4}$ times as long as base of VI. Rostrum reaches middle coxae. Hairs on dorsum of abdomen capitate. Siphunculi long, slender, imbricated. Cauda with 7 to 10 hairs.

Measurements of one specimen in mm. :

Length of body 2.00

Antennal segments—III : IV : V : VI—0.50 : 0.35 : 0.38 : 0.05. + 1.04

Siphunculus : length 0.6

„ breadth at base, at apex 0.07, 0.03

Breadth at middle of hind tibia 0.03

LOCALITY AND HOST PLANTS

Shillong (8-i-60): from *Polygonum chinense*.

Total number of specimens: 7 apterous, 22 nymphs.

BIOLOGY

The insects were collected from the underside of the mature leaves of the host plant. The insects were light green in colour. This insect was found in association with *Macrosiphum (Sitobion) fragariae* (Wlk.) ?.

V. Genus *LIPAPHIS* Mordv. 1928. in Filip., Insect Key, Moscow, 200.

(5) *L. erysimi* (Kalt.) 1843. Doncaster, J.P., 1954, Proc. R. ent. Soc., London 23 (B), p. 83.

MORPHOLOGICAL CHARACTERS

Apterous viviparous female. Longest hair on III segment of antenna $\frac{3}{8}$ basal diameter of the segment. Antennae imbricated, $\frac{4}{9}$ length of body. Processus terminalis $2\frac{7}{8}$ times as long as base of VI. Rostrum reaches 2nd coxae. Hairs on the dorsum of abdomen mostly acute. Siphunculi slender, imbricated. Cauda with 4 to 5 hairs.

Measurements of one specimen in mm. :

Length of body 2.26

Antennal segments—III : IV : V : VI—0.35 : 0.18 : 0.15 : 0.10 + 0.27

Siphunculus : length 0.23

„ breadth at base, at apex 0.07, 0.03

Breadth at middle of hind tibia 0.04

Alate viviparous female. Longest hair on III segment of antenna $\frac{1}{3}$ basal diameter of the segment. Antennae imbricated. Processus terminalis $2\frac{1}{4}$ times as long as base of VI. Rostrum reaches 2nd coxae. Hairs on dorsum of abdomen with acute and acuminate apices. Siphunculi slightly constricted at apex, imbricated. Cauda with 4 to 5 hairs. Hairs on 1st tarsal segments 3, 3, 2.

Measurements of one specimen in mm. :

Length of body 2.64

Antennal segments—III : IV : V : VI—0.32 : 0.14 : 0.14 : 0.11 + 0.25

Siphunculus : length 0.11

„ breadth at base, at apex 0.03, 0.03

Breadth at middle of hind tibia 0.02

LOCALITY AND HOST PLANTS

Pandu (6-i-60): from *Rhaphanus sativus*, *Brassica oleracea* var. *botrytis*; Shillong (8-i-60): from *Lactusa sativa*; Gauhati (13-i-60):

from *Tropelium majus*; Titabar (17-i-60): from *Brassica rapa*, and *Brassica oleracea* var. *capitata*; Tocklai (18-i-60): from *Ficus heterophylla* and *Calendula*.

Total number of specimens: 9 apterous, 104 alate, and 7 nymphs.

BIOLOGY

The colour of the insects varied from dull green to green or blackish and in all cases only undersides of leaves were infested. The specimens collected from *Brassica rapa* were visited by ants, while in no other case were ants seen.

VI. Genus *LACHNUS* Burmeister 1835. Handbuch der Entom. 2, p. 91.

(6) *Lachnus* sp. A

LOCALITY AND HOST PLANT

Shillong (11-i-60): from *Pyrus khasiana*.

Total number of specimens: 28 apterous and 2 alate.

BIOLOGY

The colour of the insects in life was green. The insects were noticed to attack only the young growing portions of the stem.

(7) *Lachnus* sp. B

LOCALITY AND HOST PLANTS

Titabar (16-i-60): from *Heteropanax fragrans*.

Total number of specimens: 55 apterous.

BIOLOGY

The insects have the same colour as *Lachnus* sp. A, but could be collected only from the underside of the leaves of the tree.

N.B. *Lachnus* sp. A, and sp. B seem to be not only distinct from the rest of the known species of this genus but also specific difference exists between A and B. Due to the lack of material for comparison their specific identification is not possible at the present moment. However, this will be reported on later.

VII. *MACROSIPHUM* Passerini 1874. Glif. afidi, 27.

(8) *Macrosiphum ibarae* Mats. 1917. subsp. *rosaeformis* Das 1918. Matsumara, S., 1917, Jl. Coll. Agr. Sapporo 7, p. 397.

MORPHOLOGICAL CHARACTERS

Apterous viviparous female. Longest hair on III segment of antenna $\frac{1}{3}$ basal diameter of the segment. Antennae imbricated, $\frac{5}{8}$ th

length of body. Processus terminalis $4\frac{1}{2}$ times as long as base of VI. Rostrum reaches almost 2nd coxae. Hairs on dorsum of abdomen with acute, acuminate, and blunt apices. Siphunculi imbricated, except distal $\frac{1}{6}$ - $\frac{1}{7}$ portion which is reticulated. Cauda with 9 to 10 hairs. Hairs on 1st tarsal segments 3, 3, 3.

Measurements of one specimen in mm. :

Length of body 3.16

Antennal segments—III : IV : V : VI—0.74 : 0.54 : 0.47 : 0.10 + 0.64

Siphunculus : length 0.84

„ breadth at base, at apex 0.14, 0.04

Breadth at middle of hind tibia 0.04

Alate viviparous female. Longest hair on III segment of antenna $\frac{1}{2}$ basal diameter of the segment. Antennae $1\frac{1}{8}$ times as long as body. Processus terminalis $4\frac{3}{8}$ times as long as base of VI. Rostrum reaches almost 2nd coxae. Hairs on dorsum of abdomen with acute and acuminate apices. Siphunculi twice as long as cauda. Cauda with 15 to 17 hairs.

Measurements of one specimen in mm. :

Length of body 3.1

Antennal segments—III : IV : V : VI—0.85 : 0.71 : 0.58 : 0.05 + 0.92

Siphunculus : length 0.71

„ breadth at base, at apex 0.14, 0.7

Breadth at middle of hind tibia 0.03

LOCALITY AND HOST PLANTS

Shillong (7-i-60 & 9-i-60): from *Hibiscus rosa-sinensis*, *Rosa* spp.

Total number of specimens: 16 apterous and 30 alate.

BIOLOGY

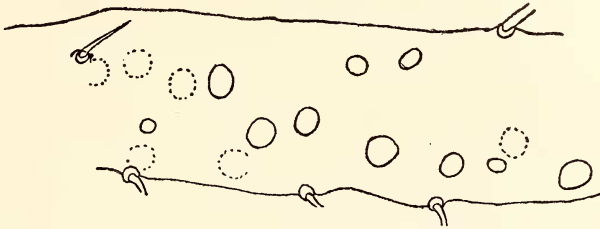
The yellowish-red insects were collected only from the leaves of various physiological stages and the flower buds.

(9) *Macrosiphum (Sitobion) fragariae* (Wlk.)? 1848. Hille Ris Lambers, D., 1939, *Temminckia* 4, p. 113.

MORPHOLOGICAL CHARACTERS

Apterous oviparous female. Body elongated. Abdominal tergite pale in bleached specimen; brownish small muscal platten arranged in longitudinal rows near stigmata. Antennae imbricated, longer than body, IV and V subequal, processus terminalis longest; rhinaria on III absent; longest hair on III with blunt apex, about $\frac{1}{2}$ as long as basal diameter of the segment. Rostrum with rather blunt apex reaching base of 2nd coxae. Hind tibiae much stouter than 1st and 2nd, with numerous small pseudosensoria on basal $\frac{3}{4}$ portion (text-figure). Abdominal hairs with acute and acuminate apices. Siphun-

culi faint brown, with distal $\frac{1}{8}$ portion reticulated, rest very slightly imbricated. Cauda with 11 hairs.



TEXT-FIGURE

Basal portion of hind tibia of *Macrosiphum (Sitobion) fragariae* (Wlk.), showing pseudosensoria

Measurements of one specimen in mm. :

Length of body 1.92

Antennal segments—III : IV : V : VI—0.47 : 0.34 : 0.32 : 0.12 + 0.57

Siphunculus : length 0.47

„ breadth at base, at apex 0.1, 0.04

Breadth at middle of hind tibia 0.03

LOCALITY AND HOST PLANTS

Shillong (8-i-60): from *Polygonum chinense*.

Total number of specimens: 1 apterous.

BIOLOGY

This specimen was green in colour in life and was collected from the underside of the leaves of the host plant along with *Lipaphis erysimi* (Kalt.) and *Myzus persicae* (Sulz.).

N.B. The find of one oviparous female suggests that the specimen visited the plant for the purpose of laying eggs. The host plant can therefore be regarded as a primary host.

(10) *Macrosiphum* sp.

LOCALITY AND HOST PLANTS

Shillong (8-i-60): from *Lactusa sativa*.

Total number of specimens: 1 alate.

BIOLOGY

This specimen is green in colour in life and was collected from the underside of one of the mature leaves of the host plants along with *Myzus persicae* (Sulz.) and *Lipaphis erysimi* (Kalt.).

N.B. Though *Lactusa sativa* has been mentioned as the host

plant, we believe this is probably not the host of the species. It may be that only one alata in course of flight to some other host plant rested over there. Although this specimen seems to be a distinct species, it is premature to name it on only one specimen which is available to us.

VIII. Genus *MYZOCALLIS* Passerini 1860. Gli. afidi, 28.

(11) *M. bambusifoliae* (Tak.) Takahashi, R., 1931, Aph. Formosa, pt. 6, p. 84.

MORPHOLOGICAL CHARACTERS

Alate viviparous female. Longest hair on III segment of antenna $\frac{1}{4}$ basal diameter of the segment. Antennae imbricated. Hairs on dorsum of abdomen long and acute. Siphunculi small, imbricated. Cauda with many hairs. Hairs on 1st tarsal joints 5, 3, 3.

Measurements of one specimen in mm. :

Length of body 2.6

Antennal segments—III : IV : V : VI :—0.54 : 0.26 : 0.26 : 0.20 + ?

Siphunculus : length 0.09

„ breadth at base, at apex 0.08, 0.05

Breadth at middle of hind tibia 0.04

LOCALITY AND HOST PLANTS

Shillong (7-i-60): from *Phyllostacus manii*.

Total number of specimens: 4 alate and 40 nymphs.

BIOLOGY

The insects were red and were found to attack only the undersides of young leaves.

IX. *MYZUS* Passerini 1860. Gli. afidi, 27.

(12) *M. persicae* (Sulzer) 1776. Buckton, G. B., 1875, Mono. Brit. Aphids, pt. 1, p. 178.

MORPHOLOGICAL CHARACTERS

Apterous viviparous female. Longest hair on III segment of antenna $\frac{1}{2}$ basal diameter of the segment. Antennae imbricated, $\frac{4}{5}$ th length of body. Processus terminalis about 4 times as long as basal part of VI. Rostrum reaches 2nd coxae. Hairs on dorsum of abdomen with acute and acuminate apices. Siphunculi long, slender, imbricated. Cauda with 5 to 6 hairs.

Measurements of one specimen in mm. :

Length of body 2.68

Antennal segments—III : IV : V : VI—0.40 : 0.36 : 0.27 : 0.12+0.50

Siphunculus : length 0.51
 ,, breadth at base, at apex 0.11, 0.05
 Breadth at middle of hind tibia 0.03

Alate viviparous female. Longest hair on III segment of antenna $\frac{1}{3}$ basal diameter of the segment. Antennae nearly $\frac{5}{8}$ length of body. Processus terminalis twice as long as base of VI. Rostrum reaches 2nd coxae. Hairs on dorsum of abdomen, with acute or acuminate apices. Siphunculi swollen towards apex. Cauda with 5 to 6 hairs. Hairs on the 1st tarsal joints 3, 3, 3.

Measurements of one specimen in mm. :

Length of body 2.35
 Antennal segments—III : IV : V : VI—0.51 : 0.48 : 0.28 : 0.14+0.30
 Siphunculus : length .40
 ,, breadth at base, at apex, at middle 0.07, 0.05, 0.02
 Breadth at middle of hind tibia 0.04

LOCALITY AND HOST PLANTS

Pandu (6-i-60): from *Beta vulgaris*, *Brassica oleracea* var. *capitata*, *B. rapa*, *Duranta plumieri*, *Rhaphanus sativus*; Shillong (8-i-60): from *Oxalis trifolia*, *Hibiscus rosa-sinensis*, *Lactusa sativa*, *Petunia* sp., *Pyrus communis*, *Solanum* sp.; Titabar (17-i-60): from *Brassica rapa*.

Total number of specimens: 19 apterous, 21 alate, and 35 nymphs.

BIOLOGY

All the insects collected from the different plants were green and attacked only the undersides of leaves. The infestation was comparatively heavy on *Rhaphanus sativa* and *Beta vulgaris*. The specimens collected from *Brassica rapa* were visited by ants.

X. Genus *RHOPALOSIPHUM* Koch 1856. Die Pflazenläuse Aphiden 1, p. 13.

(13) *Rhopalosiphum rufiabdominalis* (Sasaki) 1899. Doncaster, J. P., 1956, Bull. Ent. Res. 47, p. 741.

MORPHOLOGICAL CHARACTERS

Alate viviparous female. Longest hair on III segment of antenna $1\frac{1}{3}$ times as long as basal diameter of the segment. Antennae long, imbricated. Processus terminalis $4\frac{1}{2}$ to 6 times as long as base of V. Rostrum reaches almost 2nd coxae. Hairs on dorsum of abdomen with acute and acuminate apices. Siphunculi imbricated. Cauda with many hairs.

Measurements of one specimen in mm. :

Length of body (distorted)
 Antennal segments—III : IV : V—0.54 : 0.17 : 0.10+0.51

Siphunculus : length 0.21
 „ breadth at base, at apex 0.07, 0.04
 Breadth at middle of hind tibia 0.04

LOCALITY AND HOST PLANTS

Shillong (11-i-60): from *Pyrus communis*.

Total number of specimens: 1 alate.

BIOLOGY

The colour of the insect was green at the time of collection and the collection was a mixed one, consisting of *Myzus persicae* (Sulz.) and *Aphis gossypii* Glov. amongst others.

N.B. From the find of only one alate it is doubtful whether *Pyrus communis* can be regarded as one of the host plants. Generally the species attacks the graminaceous plants.

XI. Genus *TOXOPTERA* Koch 1856. Die Pflazenläuse Aphiden, Heft. 8, p. 253.

(14) *Toxoptera aurantii* (Boyer) 1841. Koch C., 1856, Die Pflazenläuse Aphiden, p. 254.

MORPHOLOGICAL CHARACTERS

Apterous viviparous female. Longest hair on III segment of antenna $\frac{2}{3}$ basal diameter of the segment. Antennae imbricated, $\frac{9}{10}$ th length of body. Processus terminalis $4\frac{1}{2}$ times as long as base of VI. Rostrum reaches just beyond 2nd coxae. Hairs on dorsum of abdomen with acuminate apices. Siphunculi tapering towards apex. Cauda with 15 to 17 hairs. Hind tibiae with stridulatory organs (spines) in row.

Measurements of one specimen in mm. :

Length of body 1.85
 Antennal segments—III : IV : V : VI—0.32 : 0.28 : 0.25 : 0.13+0.58
 Siphunculus : length 0.27
 „ breadth at base, at apex 0.05, 0.02
 Breadth at middle of hind tibia 0.02

LOCALITY AND HOST PLANTS

Shillong (7-i-60): from *Hibiscus rosa-sinensis*; Titabar (16-i-60): from *Ailanthus* sp., *Camellia sinensis*, *Litsea salicifolia*; Tocklai (18-i-60): from *Ficus heterophylla*.

Total number of specimens: 48 apterous, 3 alate, and 68 nymphs.

BIOLOGY

The insects were black in colour. This species was noticed to attack the buds and young leaves surrounding the buds. In so far as

the leaves are concerned, the insects were noticed both on the upper as well as on the lower side. The insects were noticed to be myrmecophilous.

(15) *Toxoptera citricidus* (Kirk.) 1907. Eastop, V.F., 1952, Entom. 85, pp. 57-61.

MORPHOLOGICAL CHARACTERS

Apterous viviparous female. Longest hair on III segment of antenna, almost equal to basal diameter of the segment. Antennae less than $\frac{1}{2}$ length of body. Processus terminalis $4\frac{1}{2}$ times as long as base of VI. Rostrum reaches just beyond 2nd coxae. Hairs on dorsum of abdomen mostly acute. Siphunculi imbricated. Cauda with 15 to 20 hairs. Hind tibiae with stridulatory organs.

Measurements of one specimen in mm.:

Length of body 2.42

Antennal segments—III : IV : V : VI—0.30 : 0.20 : 0.17 : 0.08+0.35

Siphunculus : length 0.24

„ breadth at base, at apex 0.08, 0.05

Breadth at middle of hind tibia 0.05

LOCALITY AND HOST PLANTS

Titabar (17-i-60): from *Citrus grandis*.

Total number of specimens: 21 apterous and 11 nymphs.

BIOLOGY

The insects were reddish-brown in colour at the time of collection and were found to infest the underside of the leaves of citrus.

(16) *Toxoptera odinae* (van der Goot) 1917. Eastop, V. F., 1952, Entom. 85, pp. 57-61.

MORPHOLOGICAL CHARACTERS

Apterous viviparous female. Longest hair on III segment of antennae $2\frac{1}{2}$ times as long as basal diameter of the segment. Antennae $\frac{5}{8}$ th the length of body. Processus terminalis $2\frac{1}{2}$ times as long as base of VI. Rostrum reaches just beyond 2nd coxae. Hairs on dorsum of abdomen with acute apices. Siphunculi short, cylindrical, imbricated. Cauda with 8 to 9 hairs. Hind tibiae with stridulatory organs.

Measurements of one specimen in mm.:

Length of body 3.28

Antennal segments—III : IV : V : VI—0.35 : 0.24 : 0.27 : 0.12+0.33

Siphunculus : length 0.10

„ breadth at base, at apex 0.08, 0.04

Breadth at middle of hind tibia 0.03

Alate viviparous female. Longest hair on III segment of

antennae twice as long as basal diameter of the segment. Antennae long, imbricated. Processus terminalis $2\frac{1}{2}$ times as long as base of VI. Rostrum reaches 2nd coxae. Hairs on dorsum of abdomen with acute and acuminate apices. Siphunculi cylindrical, imbricated. Cauda with 7 hairs. Hind tibiae with stridulatory organs.

Measurements of one specimen in mm. :

Length of body (distorted)

Antennal segments—III : IV : V : VI—0.28 : 0.20 : 0.21 : 0.11+23

Siphunculus : length 0.10

„ breadth at base, at apex 0.10, 0.05

Breadth at middle of hind tibia 0.02

LOCALITY AND HOST PLANTS

Shillong (9-i-60): from *Viburnum fœtidum*.

Total number of specimens: 26 apterous, 1 alate, and 10 nymphs.

BIOLOGY

The colour of the insects was bottle green. The undersides of the apical leaves and the growth parts of the stem were attacked by the species.

XII. Genus *TUBEROLACHNUS* Mordvilko 1908. Ann. Mus. Zool. Acad., St. Petersburg 13, p. 374.

(17) *Tuberolachnus saligna* (Gmelin) 1788. Takahashi, R., 1931, Aph. Formosa, pt. 6, p. 21.

MORPHOLOGICAL CHARACTERS

Apterous viviparous female. Longest hair on III segment of antenna $\frac{4}{5}$ th basal diameter of the segment. Antenna $\frac{3}{10}$ th length of body. Processus terminalis $\frac{1}{2}$ base of VI. Rostrum reaches beyond 3rd coxae. Hairs on dorsum of abdomen with acute and acuminate apices. Siphunculi small, ring-like, on hairy cone. Cauda helmet-shaped with many fine hairs.

Measurements of one specimen in mm. :

Length of body 3.78

Antennal segments—III : IV : V : VI—0.40 : 0.17 : 0.18 : 0.14+0.07

Diameter of siphunculus 0.03

Breadth at middle of hind tibia 0.11

Alate viviparous female. Longest hair on III segment of antenna $\frac{2}{3}$ basal diameter of the segment. Antennae $\frac{2}{7}$ th length of body. Processus terminalis $\frac{2}{3}$ th base of VI. Rostrum reaches 3rd coxae. Hairs on dorsum of abdomen like those in apterae. Siphunculi ring-like. Cauda helmet-shaped.

Measurements of one specimen in mm. :

Length of body : 4.1

Antennal segments—III : IV : V : VI—0.51 : 0.18 : 0.18 : 0.14+0.05

Breadth of siphunculus (distorted)

Breadth at middle of hind tibia 0.07

LOCALITY AND HOST PLANTS

Shillong (9-i-60): from *Salix babylonica*.

Total number of specimens: 15 apterous, 1 alata, and 23 nymphs.

BIOLOGY

The insects were jet black in colour. The bare woody stem was noticed to be heavily infested with the insect.

CONCLUSION

The aphids, collected from a few places in Assam and so far identified, reveal seventeen species from forty-three host plants. These seventeen species are distributed over twelve genera, while the recorded species of the Indian plains are restricted to a much smaller number of genera. Mordvilko's¹ (1908) supposition about the origin of Aphids in temperate countries can perhaps be supported from the find of these different genera from Assam which can definitely be regarded as a temperate zone in India.

So far only two male and one oviparous female aphids have been recorded from high altitudes in India. In addition to them an oviparous female of *Macrosiphum (Sitobion) fragariae* (Wlk.)? is reported.

We believe that further survey of Assam will reveal many new interesting features about aphids.

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¹ Mordvilko, A. (1908) : Tableaux pour servir à la détermination des groupes et des genres des Aphides. *Ann. Mus. Zool. Acad. Sc. Petersburg* 13 : 374.

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FOOD PLANT CATALOGUE

FOOD PLANT	NAME OF APHID
1. <i>Acronychia laurifolia</i>	<i>Macrosiphum</i> sp.
2. <i>Ailanthus</i> sp.	<i>Toxoptera aurantii</i> (Boyer)
3. <i>Oxalis trifolia</i>	<i>Myzus persicae</i> (Sulz.)
4. <i>Beta vulgaris</i>	<i>Aphis gossypii</i> Glov. <i>Myzus persicae</i> (Sulz.)
5. <i>Bougainvillea</i> sp.	<i>Aphis gossypii</i> Glov.
6. <i>Brassica oleracea</i> var. <i>capitata</i>	<i>Lipaphis erysimi</i> (Kalt.)
7. <i>B. oleracea</i> var. <i>botrytis</i>	<i>Lipaphis erysimi</i> (Kalt.) <i>Myzus persicae</i> (Sulz.)
8. <i>Brassica rapa</i>	<i>Lipaphis erysimi</i> (Kalt.) <i>Myzus persicae</i> (Sulz.)
9. <i>Calendula</i> sp.	<i>Lipaphis erysimi</i> (Kalt.)
10. <i>Camellia sinensis</i>	<i>Toxoptera aurantii</i> (Boyer)
11. <i>Capsicum frutescens</i>	<i>Aphis gossypii</i> Glov.
12. <i>Cestrum</i> sp.	<i>Aulacorthum (Neomyzus) circumflexu</i> (Buck.) <i>Myzus persicae</i> (Sulz.)
13. <i>Citrus grandis</i>	<i>Toxoptera citricidus</i> (Kirk.)
14. <i>Clitoria ternata</i>	<i>Aphis gossypii</i> Glov.
15. Coranaceae N.O.	<i>Aulacorthum circumflexus</i> (Buck.)
16. <i>Dahlia excelsa</i>	<i>Aphis gossypii</i> Glov.
17. <i>Dryopteris</i> sp.	<i>Aphis gossypii</i> Glov.
18. <i>Duranta plumieri</i>	<i>Myzus persicae</i> (Sulz.)
19. <i>Eupatorium adenophorum</i>	<i>Lipaphis erysimi</i> (Kalt.)
20. <i>Ficus heterophylla</i>	<i>Toxoptera aurantii</i> (Boyer)
21. <i>Helianthus annuus</i>	<i>Aphis gossypii</i> Glov.
2. <i>Heteropanax fragrans</i>	<i>Lachnus</i> sp.

FOOD PLANT	NAME OF APHID
23. <i>Hibiscus rosa-sinensis</i>	<i>Aphis gossypii</i> Glov. <i>Macrosiphum (Sitobion) ibarae</i> Mats.
24. <i>Hibiscus sabdariffa</i>	<i>Aphis gossypii</i> Glov.
25. <i>Hydrangea hortensis</i>	<i>Aulacorthum (Neomyzus) circumflexus</i> (Buck.)
26. <i>Ipomea</i> sp.	<i>Aulacorthum (Neomyzus) circumflexus</i> (Buck.)
27. <i>Lactusa sativa</i>	<i>Lipaphis erysimi</i> (Kalt.) <i>Myzus persicae</i> (Sulz.)
28. Liliaceae N.O.	<i>Aphis gossypii</i> Glov.
29. <i>Litsea salicifolia</i>	<i>Toxoptera aurantii</i> (Boyer)
30. <i>Phyllostacus manii</i>	<i>Myzocallis bambusifoliae</i> Tak.
31. <i>Pinus insularis</i>	<i>Cinara (Cinarella) pineti</i> Mordv.
32. <i>Polygonum chinense</i>	<i>Capitophorus hippoaeus</i> (Koch) <i>Macrosiphum (Sitobion) fragariae</i> (Wlk.)?
33. <i>Pyrus communis</i>	<i>Myzus persicae</i> (Sulz.)
34. <i>Pyrus khasiana</i>	<i>Lachnus</i> sp.
35. <i>Rhaphanus sativus</i>	<i>Lipaphis erysimi</i> (Kalt.) <i>Myzus persicae</i> (Sulz.)
36. <i>Rosa</i> sp.	<i>Macrosiphum (Sitobion) ibarae</i> Mats.
37. <i>Salix babylonica</i>	<i>Tuberolachnus saligna</i> (Gmelin)
38. <i>Solanum tuberosum</i>	<i>Aphis gossypii</i> Glov.
39. <i>Solanum</i> sp.	<i>Myzus persicae</i> (Sulz.)
40. <i>Solanum melongena</i>	<i>Aphis gossypii</i> Glov.
41. <i>Tropelium majus</i>	<i>Myzus persicae</i> (Sulz.)
42. <i>Viburnum foetidum</i>	<i>Toxoptera odinae</i> (v.d.G.)
43. <i>Vitex negundo</i>	<i>Aphis gossypii</i> Glov.