REVUE SUISSE DE ZOOLOGIE, 100 (4) : 829-898; december 1993

The jumping plant-lice of Iran (Homoptera, Psylloidea)

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The jumping plant-lice of Iran (Homoptera, Psylloidea). - The Iranian psyllid fauna is reviewed, based on literature records and extensive collections. The bulk of the material comes from 3 expeditions by the National Museum, Prague to Iran in 1970, 1973 and 1977, and from G. Remaudière who collected in Iran from the 1950's to 1970's. Of the 33 previously recorded species, 28 are substantiated by material, 3 are probably correct but no specimens were available, and 2 records concern a possible misidentification and a wrong citation. The studied material also contains 45 species previously unrecorded from Iran, 11 new species and 8 species which remain unidentified as the material is incomplete. The new species described and illustrated are: *Aphalara loginovae, Colposcenia agnata, Colposcenia cavillosa, Colposcenia paula, Craspedolepta remaudierei, Cacopsylla iranica, Spanioneura persica, Homotoma caroliquarti, Egeirotrioza corporosa, Egeirotrioza gemina,* and *Egeirotrioza justa.* The following synonymies are established: *Diaphorina zygophylli* (= *D. kopetdaghi*, = *D. halimiphylli*, = *D. media*), and *Cyamophila glycyrrhizae* (= *C. eremita*). Three new combinations are proposed: *Egeirotrioza gardneri* (Laing) comb. nov., stat. rev. (from *Phylloplecta*), *E. bifurcata* (Mathur) comb. n. and *E. longiantennata* (Mathur) comb. n. (both from *Trioza*). The biogeographical relationships of nine areas of endemism in Iran are analysed using the method of PAE (with PAUP). The relationships derived from psyllid distributions are compared to mammal data; some methodological aspects are briefly discussed.

Key-words: Psylloidea - Homoptera - Iran - Taxonomy - Biogeography.

INTRODUCTION

Iran is one of the largest Middle Eastern countries with a surface area of 1,648,000 km^2. It has a unique geobotanical position, linking the Irano-Turanian, the Euro-Siberian, the Saharo-Arabian and the Sudanian phytogeographical regions

Manuscript accepted 28.06.1993.

(ZOHARY, 1963). Iran is delimited by the River Aras, the eastern margin of Mesopotamia, the Persian Gulf, the Caspian Sea, the plains of Kara Kum and the mountains of Afghanistan and Baluchistan. Together with Afghanistan and Baluchistan, Iran forms the larger Iranian Plateau, a geomorphological and biogeographical unit. Iran is predominantly mountainous with four-fifths of its surface >1000 m a.s.l. The Elburz Mountains in the North reach 5670 m a.s.l. and in the South the Zagros Mountains, stretching southeastwards from the River Aras to the Persian Gulf, rise over 4500 m a.s.l. Between them are highlands, at an altitude of c. 1000 m a.s.l., subdivided by mountain ranges, and lacking river systems reaching the sea. The Central Plateau is subdivided into two, the Dasht-e-Kavir, a predominantly saline desert, and the Dasht-e-Lut to the South, mainly a sand and gravel desert. Only the short rivers of the border mountains drain to the sea. The lowlands are restricted to narrow fringes along the Caspian Sea and the Persian Gulf and to the Iranian part of the Euphrates delta (figs 1-3) (LAY, 1967; PARSA, 1978; ZOHARY, 1973). Thus, Iran can be subdivided into 5 main sectors: the Caspian, the Armeno-Zagrosian, the Central Iranian, the Khurusanian and the Laro-Baluchistanian sectors (ZOHARY, 1963).

Iran's climate is diverse and strongly influenced by orography. ZOHARY (1973) recognised 8 climatic provinces, ranging from the humid-subtropical Caspian region, the temperate and arid-subtropical mountains and interior, to the tropical Gulf region. Climatic conditions, particularly the amount and seasonal distribution of precipitation, influence the type and species richness of vegetation locally. Most of Iran belongs to the Armeno-Iranian floristic Province of the Irano-Turanian Region with the exception of part of the South Iranian Province of the Sudano-Zambezian Region (ZOHARI, 1973; TAKHTAJAN, 1986). The Armeno-Iranian Province is rich in endemic species in genera such as *Calligonum*, *Atraphaxis*, *Prunus*, *Astragalus*, *Hedysarum*, *Onobrychis*, *Convolvulus*, *Galium*, *Achillea*, *Anthemis* and *Artemisia*. MOBAYEN & TREGUBOV (1970) recognized slightly different floristic regions namely: 1. the Hyrcanian region along the Caspian coast; 2. the Irano-Turanian region covering the whole centre towards the east and west; 3. the Zagros region, and 4. the Khalidjo-Ommanian region. In addition, PARSA (1978) defined the following 9 biotic provinces: Caspian, Elburzian, Azerbaidzhanian, Zagrozian, Suzian, Farsian, Bazmanian, Lutian and Kavirian (fig. 2). Closed, dense forests are restricted and most of the area is covered by steppe vegetation dominated by hemi-cryptophytes (chiefly grasses) and chamaephytes (chiefly dwarf shrubs) or in the deserts, halophytic vegetation (PARSA, 1978; RECHINGER, 1963 ff.).

Steppe and desert plants bear a rich fauna of the highly host-specific jumping plant-lice (Homoptera, Psylloidea). In the Palaearctic this is well-documented for the territory of the former USSR (GEGECHKORI & LOGINOVA, 1990) and Mongolia (KLIMASZEWSKI, 1973; LOGINOVA, 1972b) but there is less information for the Middle East. Species lists, sometimes accompanied by identification keys or species descriptions exist for the following countries: Egypt (SAMY, 1973), Israel (BURCKHARDT & HALPERIN, 1992, and papers cited herein), Turkey (BURCKHARDT & ÖNUÇAR, 1993) and Saudi Arabia (BURCKHARDT, 1986a).

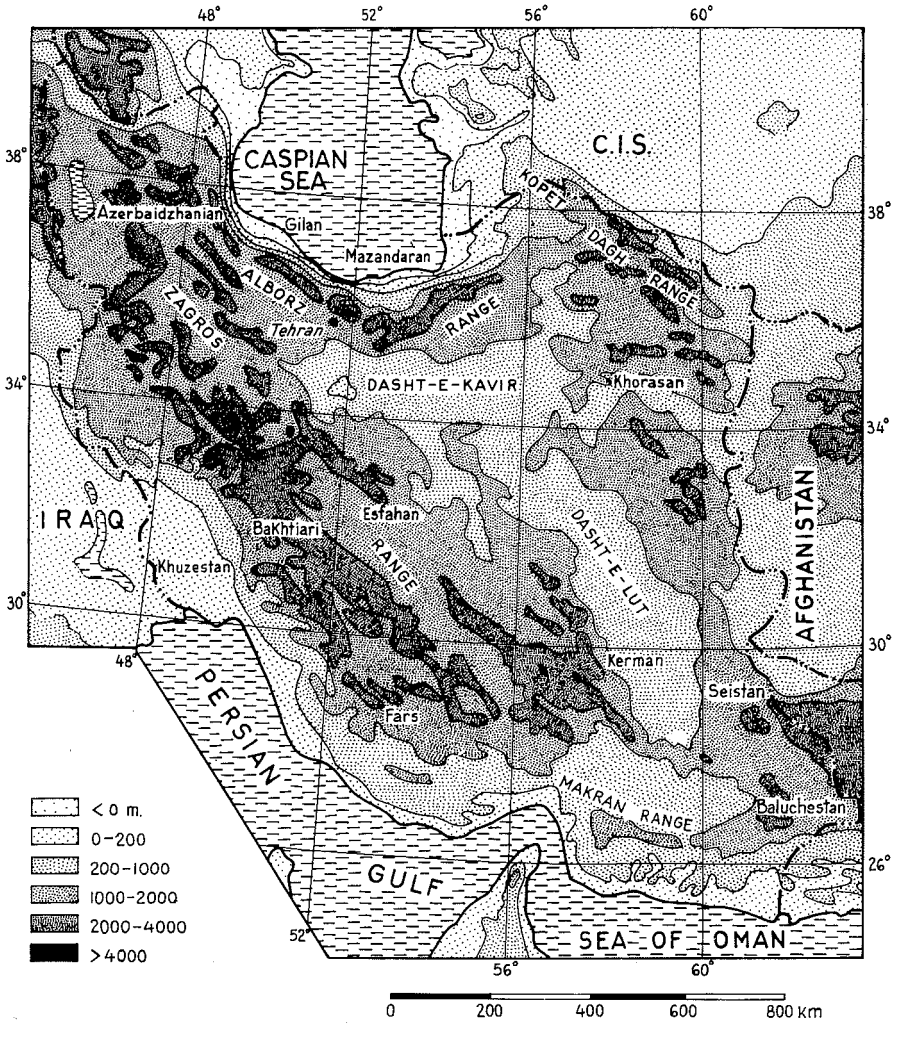
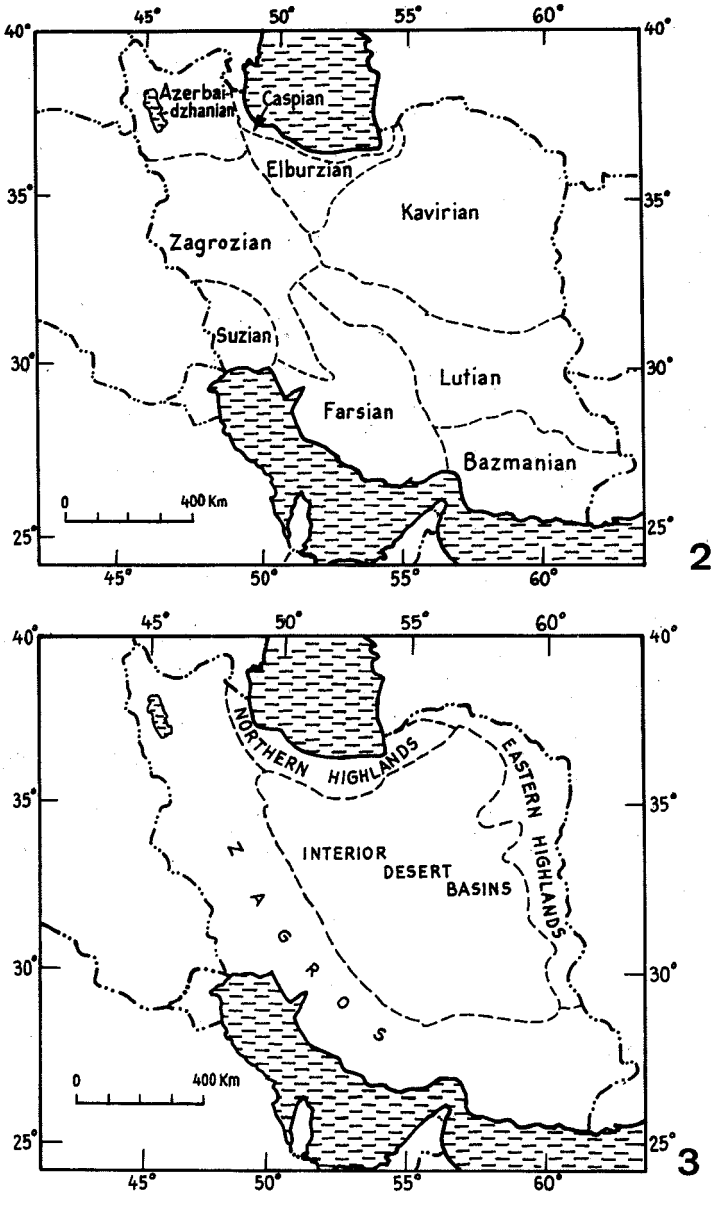


FIG. 1

Relief map of Iran.



FIGS 2, 3

2, Biotic provinces of Iran after PARSA (1978). 3, Physiographic units of Iran.

HISTORICAL ASPECTS

RÜBSAAMEN (1902) first recorded psyllids from Iran when he described galls on *Fraxinus oxyphylla, Populus euphratica* and *P. nigra* f. *pyramidalis*, attributed to *Psyllopsis fraxini* and to three unidentified species of Psylloidea. Later, BERGEVIN (1926) described one of the species on *Populus euphratica* as *Trioza ceardi* based on material from Morocco (not Tunisia as stated by BOSELLI, 1931, and repeated by MATHUR, 1975, and HODKINSON, 1986) and on descriptions by RÜBSAAMEN (1902), HOUARD (1922) and other cited authors.

HESLOP-HARRISON (1949) recorded *Livia juncorum* from Iraq, near the Iranian border, stating that it was likely to occur in Iran. LOGINOVA (1962, 1972a) and MATHUR (1975) list *L. juncorum* from Iran but do not indicate if they have seen material.

DAVATCHI (1958) recorded 4 species collected by himself and G. Remaudière (deposited in the USNM and in the MNHN) from Iran: *Homotoma ficus, Agonoscena* aff. *menozzii, A. targionii* and *Psylla* sp. The specimen referred to *Homotoma ficus* belongs to *H. caroliquarti* sp. n. while the "*Agonoscena targionii*" is *A. pistaciae* (BURCKHARDT & LAUTERER, 1989). The material of "*A.* aff. *menozzii* " is close to *A. bimaculata*. The "*Psylla* sp." could not be traced but is probably *Megagonoscena viridis*.

Loginova recorded or described several species from Iran namely: *Psyllopsis repens* and *P. securicola* (LOGINOVA, 1963); *Colposcenia aliena* (LOGINOVA, 1972b); *Psylla glycyrrhizae* (LOGINOVA & BAEVA, 1972); *Camarotoscena fulgidipennis* (LOGINOVA, 1975a); *Diaphorina tamaricis, D. kopetdaghi, D. enormis, D. luteola, Cyamophila odontopyx, Trioza neglecta* (LOGINOVA, 1978a); and *Caillardia accola* (LOGINOVA, 1978b).

In a study on the ecology and control of pear psyllids, RADJABI & BEHECHTI (1975) recorded *Psylla pyricola* Förster and HODKINSON (1984) listed both *P. pyricola* Förster and *P. vasiljevi* Šulc. These records concern *Cacopsylla bidens* (Šulc) (BURCKHARDT & HODKINSON, 1986; HODKINSON, 1989). GEGECHKORI (1977) and NAEEM & BEHDAD (1988) recorded *Cyamophila astragalicola* (Gegechkori) and *C. dicora* Loginova, both on *Astragalus*. *C. dicora* sensu Naeem & Behdad is identical with *C. astragalicola* but differs from *C. dicora* sensu Loginova in the forewing coloration. Further investigations will decide whether *C. dicora* sensu Loginova is conspecific with *C. astragalicola*. The larvae of *C. astragalicola* secrete a manna-like substance which is collected for preparing candy (NAEEM & BEHDAD, 1988). HODKINSON (1981) described *Trioza trigonica* and HALPERIN *et al.* (1982) recorded *E. straminea* Loginova from Iran. *Trioza chenopodii* Reuter and *T. dichroa* Scott were listed by BURCKHARDT (1986b). Another 9 species were added by GEGECHKORI & LOGINOVA (1990): *Agonoscena pegani, Caillardia robusta, Colposcenia kiritshenkoi, Eremopsylloides amirabilis, Diaphorina propinqua, Euphyllura phillyreae*, a record which is questionable, *Cyamophila coluteae, Cyamophila eremita*, and *Bactericera perrisii*. Finally, BAEVA & ALEKSEEV (1991) described *Brachystetha loginovae* from Soviet and Iranian localities.

MATERIAL AND METHODS

The material comes from two main sources. First, a large mainly unrecorded collection by G. Remaudière which is preserved in the MNHN, USNM, and MHNG. Host information and the presence of larvae make this collection particularly valuable and this material is signified with the letter "R" followed by a collecting number referring to a locality list. Material, unless otherwise stated, is preserved in the MNHN.

The second material was that collected on three expeditions (1970-1977) by the National Museum, Prague. Detailed itineraries, with descriptions of the localities and biotopes, are provided by HOBERLANDT (1974, 1981, 1983). Collection numbers are cited following the museum acronym "NMP". This material was, partly, studied by Loginova.

Morphological terminology follows mainly HODKINSON & WHITE (1979) and WHITE & HODKINSON (1982). Measurements were made from slide mounted material and are in mm. The following abbreviations are used in the descriptions:

Adult:

HW	head width
AL	antenna length (including scape and pedicel)
WL	forewing length
MP	male proctiger length
FP	female proctiger length
PL	male paramere length
AEL	length of distal segment of aedeagus
ALHW	antenna length : head width ratio
FAS	relative length of flagellar segments of antennae from base to apex
LLHW	length of apical two labial segments : head width ratio
TLHW	metatibia length : head width ratio
WLHW	forewing length : head width ratio
WLW	forewing length : width ratio
MPHW	male proctiger length : head width ratio
FPHW	female proctiger length : head width ratio
FPC	female proctiger length : circumanal ring length ratio
FSP	female proctiger length : subgenital plate length ratio

Fifth instar larva:

AL	antenna length (including scape and pedicel)
WL	forewing pad length
BL	body length
CPB	caudal plate breadth
AWL	antenna length : forewing pad length ratio
BBL	body length : breadth ratio
CPR	caudal plate breadth : length ratio

Owing to different ways of transliterating the Farsi to the Latin alphabet, variation is encountered in the nomenclature of locality names from literature records and locality labels. The spelling of places from the literature is cited unchanged. Names for the Prague expeditions material are as on the locality labels. For additional

information, including coordinates and descriptions of biotopes, HOBERLANDT (1974, 1981, 1983) should be consulted. The remaining names are cited according to the Gazetteer of official standard names (ANONYMOUS, 1956) and, where judged useful, map coordinates are added.

Material was examined or is cited from the following collections:

BMNH	=	Natural History Museum, London
MHNG	=	Muséum d'histoire naturelle, Geneva
MMB	=	Moravian Museum, Brno
MNHN	=	Muséum National d'Histoire Naturelle, Paris
NMP	=	National Museum, Prague
R	=	Collection G. Remaudière, in MNHN
USNM	=	United States National Museum (psyllid collection in USDA, Beltsville, MD.)
ZI	=	Zoological Institute, St. Petersburg [Leningrad]

SYSTEMATIC LIST

The classification and sequence of the families and subfamilies adopted here is that proposed by WHITE & HODKINSON (1985) with the family concept of BURCKHARDT (1987). Within families and subfamilies the sequence of genera and species is alphabetical.

KEY TO FAMILIES

1 Antennal flagellar segments flattened bearing long conspicuous bristles (figs 88, 89). Male proctiger distinctly 2-segmented (fig. 92). . . Homotomidae

\- Antennal flagellar segments more or less cylindrical, without dense conspicuous bristles (figs 12, 34, 63). Male proctiger 1-segmented, sometimes indistinctly subdivided. 2

2 Forewings with vein R+M+Cu_1 bifurcating into R and M+Cu_1; if trifurcating then anal break close to apex of vein Cu_{1b} and metabasitarsus with 1 or 2 black spurs. Costal break and/or pterostigma often developed. . . . . Psyllidae

\- Forewings with vein R+M+Cu_1 trifurcating into R, M and Cu_1 or bifurcating into R+M and Cu_1, or R and M+Cu_1; anal break distant from apex of vein Cu_{1b}; costal break and pterostigma always absent. Metabasitarsus without black spurs. . . . . Triozidae

PSYLLIDAE

KEY TO SUBFAMILIES

1 Metacoxae without meracanthus; cavity of trochanter with weakly sclerotised tubercle. . . . . Rhinocolinae

- Metacoxae with horn-shaped meracanthus; cavity of trochanter without tubercle. 2
2 Head with large anterior flattened lobes enclosing median ocellus which is, therefore, visible only in dorsal view, or vertex longer than broad. . . . . Liviinae
- Head different, either regularly rounded anteriorly, or with separated lobes or cones. Median ocellus visible in frontal and/or ventral view; vertex always broader than long. 3
3 Head with genal cones; apical metatibial spurs forming a crown. . . . . Diaphorininae
- Either head without genal cones or apical metatibial spurs grouped. 4
4 Basal metatibial spine absent. Head without conical genal processes; vertex often rectangular and sometimes ending in anterior lobes. Apical metatibial spurs often forming more or less even crown. 5
- Basal metatibial spine usually developed. Apical metatibial spurs always grouped. Vertex trapezoidal; head with genal cones. 7
5 Metabasitarsus without black spurs. . . . . Paurocephalinae
- Metabasitarsus with two black spurs. 6
6 Posterior margin of male proctiger straight or weakly produced but without wing-like processes. Metatibiae short, less than twice as long as both metatarsal segments together. . . . . Pachypsylloidinae
- Posterior margin of male proctiger bearing wing-like processes. Metatibiae long, more than twice as long as metatarsal segments together. . . . . Aphalarinae
7 Metabasitarsus without or with a single black spur, or with two black spurs and then male parameres lamellar with truncate apex, and forewings with long cell m_{1+2} and high cell cu_{1a}. . . . . Arytaininae
- Metabasitarsus always with two black spurs. Male parameres different (fig. 72). Forewings usually with shorter and lower m_{1+2} and cu_{1a} cells. . . . . Psyllinae

APHALARINAE

KEY TO GENERA AND SPECIES

1 Vertex at most half as long as wide, passing smoothly, without distinct transition, into genae. 2
- Vertex more than half as long as wide, anterior margin forming angular or rounded lobes, or humps. 3
2 Pterostigma of forewing relatively long and broad; sometimes a cross-vein rm developed. Thorax in profile stongly arched. On *Haloxylon* spp. and *Hammada* spp. . . . . *Caillardia* Bergevin
(for identification of species cf. LOGINOVA, 1978b)

- Pterostigma of forewings absent. Thorax in profile weakly arched. On *Petrosimonia* spp., *Salicornia* spp., *Salsola* spp. and *Suaeda* spp. ..... *Rhodochlanis bicolor* (Scott)

3 Propleurites divided by diagonal suture into unequal components..... 4

- Propleurites divided by longitudinal suture into subequal components..... 12

4 Head with two flattened, rounded anterior lobes. Apex of vein Rs of forewings bent towards fore margin..... *Colposcenia* 5

- Head rounded anteriorly, vertex passing smoothy into genae. Vein Rs of forewings more or less straight, ending at outer wing margin. ..... *Crastina* 11

5 Apices of veins in forewings along outer margin bearing each a dark conspicuous spot..... 6

- Apices of veins in forewings along outer wing margin light..... 7

6 Posterior lobe of male proctiger relatively narrow at base, widening towards apex. Dorsal margin of female proctiger irregularly concave. On *Tamarix* spp..... *Colposcenia aliena* (Löw)

- Posterior lobe of male proctiger wide at base and tapering towards apex. Dorsal margin of female proctiger sinuous. On *Tamarix* spp. ..... *Colposcenia vicina* Loginova

7 Branches of vein M of forewings more or less straight. Posterior process of male proctiger short and wide. On *Tamarix* spp. ..... *Colposcenia kiritshenkoi* Loginova

- Branches of vein M of forewings distinctly curved. Posterior processes of male proctiger long and narrow..... 8

8 Anterior tubercle of metacoxae large (figs 8, 9, 30). Terminalia as in figs 39, 42, 43, 50..... *Colposcenia agnata* sp. n.

- Anterior tubercle on metacoxae small (figs 31, 32). Terminalia different.... 9

9 Forewing surface flat in apical third; wing relatively long and narrow, with subparallel margins. On *Tamarix* sp.... *Colposcenia elegans* (Bergevin)

- Forewing surface convexly inflated in apical third (fig. 7); wing relatively short and broad, distinctly widening towards apex (figs 28, 29)..... 10

10 Male parameres short, clavate (fig. 51). Forewing pattern strongly constrasted (fig. 28)..... *Colposcenia cavillosa* sp. n.

- Male parameres long, lamellar (figs 52, 53). Forewing pattern relatively homogenous (fig. 29)..... *Colposcenia paula* sp. n.

11 Forewings oblong-oval, with very narrow pterostigma. General body colour orange. On *Myricaria bracteata*. ..... *Crastina myricariae* Loginova

- Forewings trapezoidal, with well-developed pterostigma. General body colour green. On *Tamarix* spp..... *Crastina tamaricina* Loginova

12 Clypeus flat; not visible in profile, hidden by the genae. On *Zygophyllum* spp. and *Halimiphyllum* sp..... *Brachystetha loginovae* Baeva & Alexeev

- Clypeus, in profile, distinctly protruding from genae..... 13

13 Lower head surface, between eyes and antennal insertions with conspicuous tubercle..... *Aphalara* 14

- Tubercles absent from lower head surface between eyes and antennal insertions. ..... *Craspedolepta* 15
14 Clypeus short, pyriform. Forewings less than 2.2 times as long as wide. ..... *Aphalara loginovae* sp. n.
- Clypeus long, tubular. Forewings more than 2.3 times as long as wide. On *Polygonum* spp. ..... *Aphalara polygoni* Förster
15 Forewings with pattern consisting of small brown dots. 16
- Dark forewing pattern absent or consisting of streaks or bands. 18
16 Membrane of forewings without setae. On *Artemisia baldschuanica.* ..... *Craspedolepta tadshikistanica* Baeva
- Membrane of forewings with at least some setae. 17
17 Setae on forewing membrane sparse, shorter than 0.03 mm. On *Artemisia* spp. ..... *Craspedolepta convexa* Baeva
- Setae on forewing membrane dense, longer than 0.10 mm. Possibly on *Artemisia cina.* ..... *Craspedolepta remaudierei* sp. n.
18 Antennae 9-segmented. On *Achillea* spp. ..... *Craspedolepta pontica* Dobreanu & Manolache
- Antennae 10-segmented. On *Achillea* spp. ..... *Craspedolepta bulgarica* Klimaszewski

Aphalara loginovae sp. n. (Figs 10-16)

Description. Adult. Coloration. Dirty yellow; foveal pits, two spots on mesopraescutum and four longitudinal stripes on mesoscutum orange to brown. Antennae with segments 1 and 2 brown, 3-8 yellow, and 9 and 10 dark brown. Lower head surface brown to dark brown. Thorax laterally and abdominal sclerites dark brown. Forewings whitish with semitransparent membrane bearing a dark brown, well-defined pattern consisting of isolated spots and a transverse band near the outer margin (fig. 10); hindwings whitish.

Structure. Head (fig. 11), from above, slightly wider than pronotum, about as wide as mesoscutum; vertex flat with indented foveal pits, its anterior margin with large tubercle in the middle of each half and a small antero-lateral tubercle on either side. Lower head surface with small lateral tubercles and short, pyriform clypeus. Antennae 10-segmented with a single rhinarium on each of segments 4 to 9; both terminal setae longer than segment 10. Forewings (fig. 10) oval, cell cu_{1a} low, vein Cu_{1a} evenly curved. Surface spinules present in all cells, larger basally than apically, arranged in an irregular hexagonal pattern, covering the whole membrane up to the veins. Terminalia as in figs 13-16. Parameres with large, thumb-like subapical inner process. Distal portion of aedeagus with distal portion widened towards apex. Female terminalia relatively short, dorsal margin of proctiger sinuous.

Measurements. (1♂, 2♀♀). HW 0.73-0.77; AL 0.77-0.78; WL 2.37-2.62; MP 0.21; PL 0.24; AEL 0.21; FP 0.49-0.50; ALHW 1.00-1.03; LLHW 0.24-0.40; TLHW 0.64-0.72; WLHW 3.25-3.50; WLW 2.01-2.12; MPHW 0.28; FPHW 0.63-0.67; FPC 2.43-2.74; FSP 1.23-1.29; FAS 1.0 : 0.4 : 0.5 : 0.4 : 0.4 : 0.4 : 0.4 : 0.4.

Larva unknown.

Holotype ♂, N Iran: Tehran - Evin, Elborz, 1700-2000 m, 9-10.iii.1973 (NMP-123).
Paratypes. Iran: 2♂♂, 6♀♀, same data as holotype (NMP, MHNG)

Comment. *Aphalara loginovae* is similar to *A. grandicula* (GEGECHKORI, 1981) in the short, adpressed clypeus, the relatively wide, semitransparent forewings, the arrangement of the surface spinules, and body dimensions, characters which separate them from other Palaearctic congeners. *A. loginovae* differs from *A. grandicula* as follows: 1. the clypeus is slightly less adpressed in *A. loginovae*; 2. *A. loginovae* has apically more rounded forewings with evenly rounded vein Cu_{1a} which, in *A. grandicula*, are apically more truncate with vein Cu_{1a} irregularly curved (fig. 17); 3. the inner subapical process of the parameres is relatively slender and straight in *A. grandicula* (fig. 18) and broad and weakly curved in *A. loginovae*; 4. the apical dilation of the distal segment of aedeagus is more slender in *A. grandicula* (fig. 19) than in *A. loginovae*; 5. the female terminalia of *A. grandicula* (fig. 20) are much longer than those of *A. loginovae* (fig. 16).

Aphalara polygoni Förster

Material examined. N Iran: 37♂♂, 37♀♀, 10 km S Behshahr, 480 m, 23-24.vi.1977 (NMP-380).

Brachystetha loginovae Baeva & Alekseev (Figs 21-26)

Description. Adult. Coloration. Yellow with indistinct ochreous dorsal patches on thorax. Antennae with apices of segments 4 and 6, and entire segments 8-10 brown to dark brown. Ventral surface of head and thorax, and abdominal tergites light brown in male, yellow to ochreous in female. Female proctiger with light brown patches. Forewings whitish with pattern composed in males of brown maculae as in fig. 21, and in females of light brown weak maculae and mat, dark yellowish bands.

Structure. Similar to *B. zygophylli* Loginova in the shape of the forewings (fig. 21), with a relatively short and high cell cu_{1a}, and a relatively short vertex with short anterior lobes (fig. 22). Terminalia as in figs 23-26. Ventral margin of male subgenital plate weakly curved; parameres with weakly expanded, apical dilatation. Female proctiger with concave dorsal margin, subgenital plate angular ventrally.

Measurements. (1♂, 1♀). HW 0.61-0.63; AL 0.80-0.82; WL 1.86-2.05; MP 0.22; PL 0.23; AEL 0.18; FP 0.55; ALHW 1.29-1.32; LLHW 0.24-0.25; TLHW 0.75-0.78; WLHW 3.05-3.24; WLW 2.09-2.16; MPHW 0.36; FPHW 0.87; FPC 2.98; FSP 1.06; FAS 1.0 : 0.6 : 0.6 : 0.6 : 0.5 : 0.5 : 0.4 : 0.3.

Recorded from Iran: 30-45 km NNE Bazman (BAEVA & ALEKSEEV, 1991).

Material examined. SE Iran: 1♂, 1♀, 30-45 km NNE Bazman, 14.iv.1973 (NMP-163); 1♀, 12 km SSE Bazman, 13.iv.1977 (NMP-160).

Comment. In some specimens the forewings (fig. 21) are narrower and vein Rs less curved than in the original description (BAEVA & ALEKSEEV, 1991). These differences probably reflect individual variation.

Caillardia accola Loginova

Recorded from Iran: E Kerman, source of Hun-i-Kaka, SW Temina (LOGINOVA, 1978b; GEGECHKORI & LOGINOVA, 1990).

Material examined. E Iran: 3♀♀, 25 km NNW Shusf, 6.vi.1977 (NMP-359).

Comment. In the absence of males the material is only provisionally referred to *C. accola.*

Caillardia azurea Loginova

Material examined. Iran: 3♀, Abadeh, Varamin, 20.v.1986, *Haloxylon* (Abai) (BMNH); 1♂, 2♀♀, 143 km SE Tehran, 20.v.1986, *Haloxylon* (Abai) (BMNH).

Caillardia dilatata Loginova

Recorded from Iran: SE Iran, 12 km SSE Bazman; Iranshar (LOGINOVA, 1978a).

Material examined. Iran: E Iran, 1♀, 8.45 km E Hadjiabad, 9.v.1973 (NMP-193).

Caillardia inedita Loginova

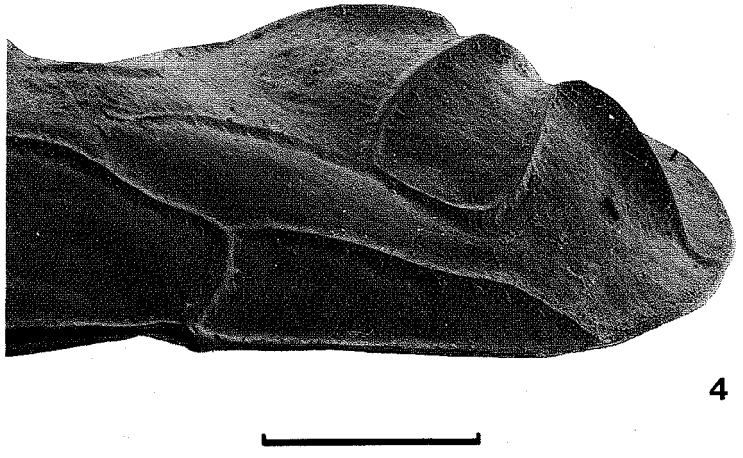
Material examined. Iran: 9♂♂, 8♀♀, 7 larvae, 143 km SE Tehran, 20.v.1986, *Haloxylon* (Abai) (BMNH).

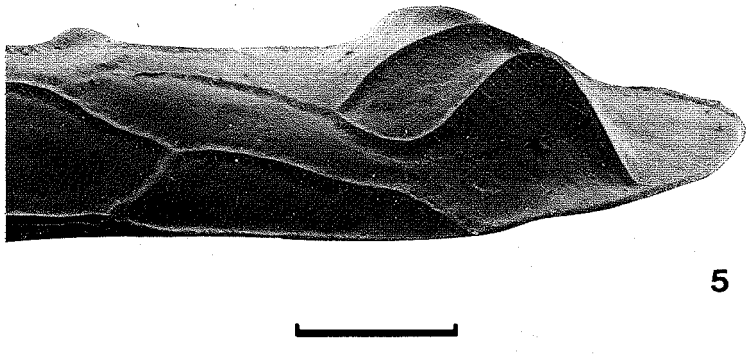
Caillardia robusta Loginova

Recorded from Iran (ZI) (GEGECHKORI & LOGINOVA, 1990).

Colposcenia agnata sp. n. (Figs 4-6, 8, 9, 27, 30, 33, 34, 39, 42, 43, 50)

Description. Adult. Coloration. Light green with whitish and ochreous spots on vertex and pronotum. Antennae green with dark apices on segments 3-8, and ochreous to brown segments 9 and 10. Mesoscutum green with four large longitudinal ochreous stripes. Legs green with yellow dots. Forewings semitransparent basally,



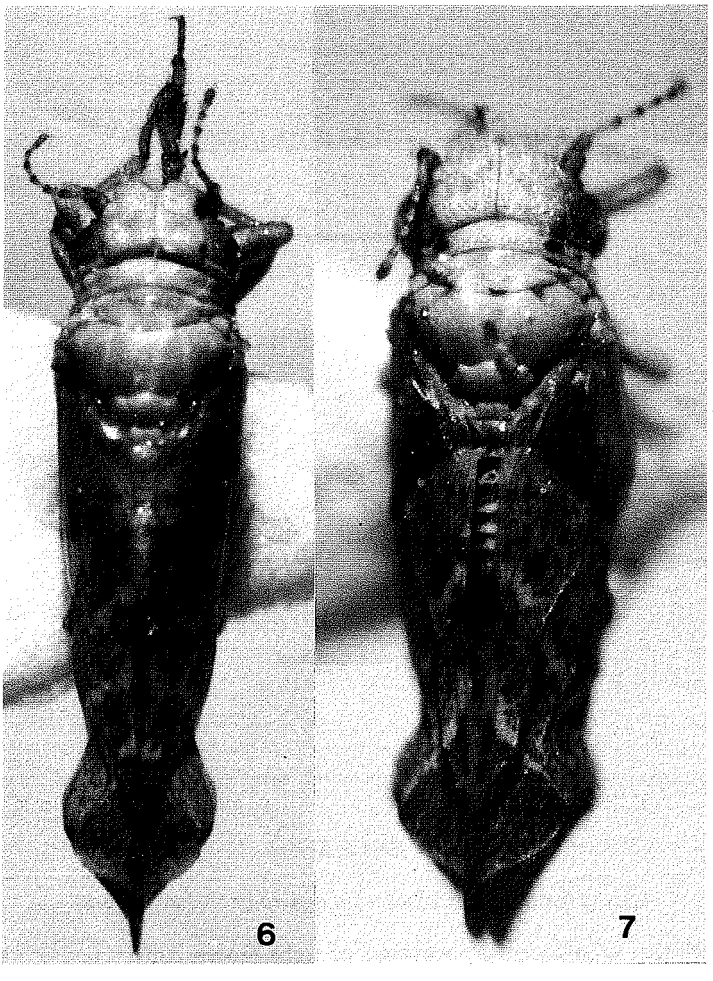


FIGS 4, 5

Apex of forewing of *Colposcenia agnata* (scale bar 300 μm).

otherwise whitish with greenish, ochreous or light brown pattern and scattered dark dots, apices of veins without dark spots (fig. 27); females often with dark brown patch composed of more or less confluent dots stretching between the apical half of veins Rs and M_{3+4}.

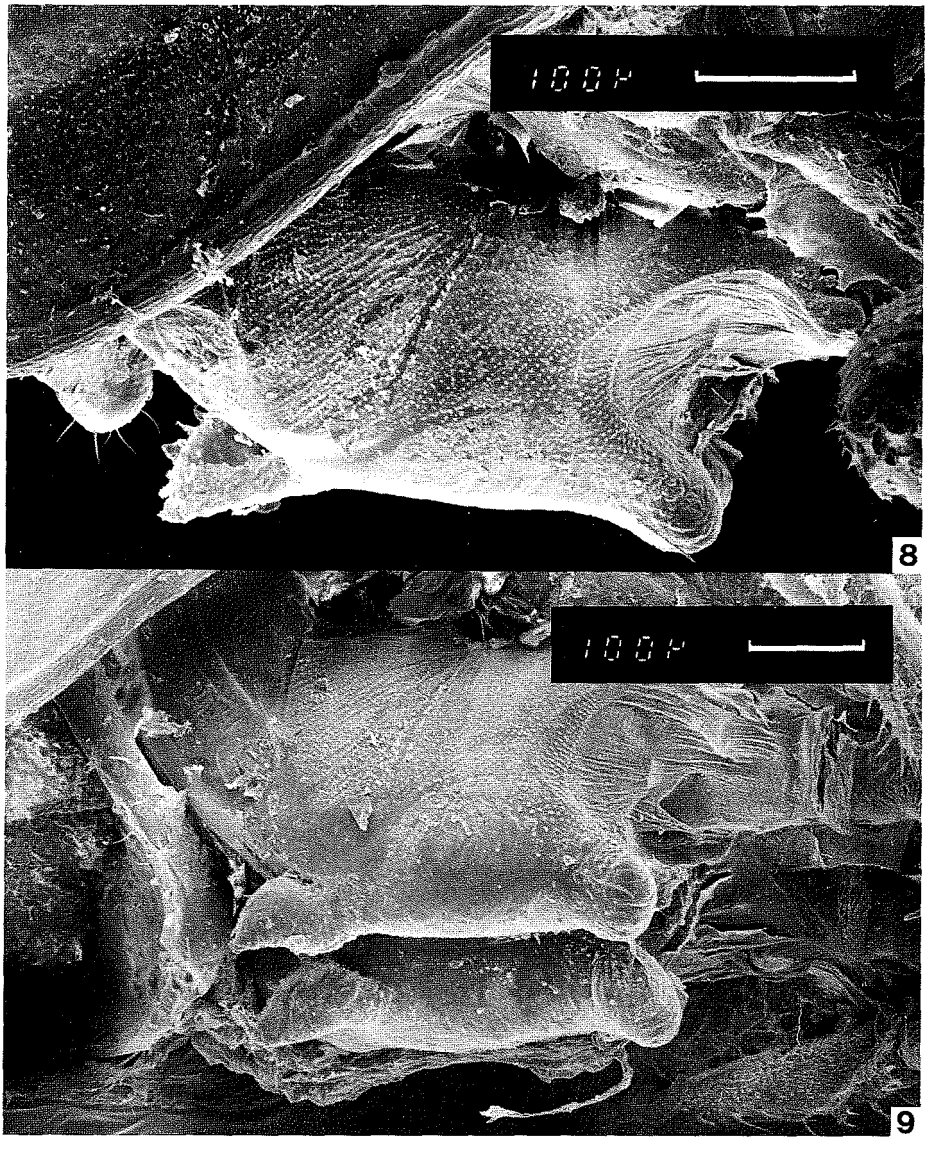
Structure. Head (fig. 33) with flattened vertex bearing indistinctly angular anterior lobes; antero-lateral part of genae between eye margin and antennal insertion forming a relatively large tubercle; surface sculpture consisting of indistinct transverse folds. Antennal segment 10 longer than wide (fig. 34). Forewings (fig. 27) relatively long, widened towards the apex, surface strongly bulged between apical quarter of vein Rs and the middle of vein M_{3+4} (figs 4-6, 27); pterostigma relatively short and massive, vein Rs strongly sinuate, branches of vein M strongly diverging apically, vein Cu_1 relatively straight. Surface spinules small, dense and irregularly spaced, covering all cells up to the veins except for a narrow band in cell c+sc along



FIGS 6, 7

Colposcenia spp., dorsal view; 6, *C. agnata*; 7, *C. cavillosa*.

veins R+M+Cu_1 and R. Metacoxae with large anterior tubercle (figs 8, 9, 30). Terminalia as in figs 39, 42, 43, 50. Processes of male proctiger longer than subgenital plate, slightly widened apically; subgenital plate with distinct posterior tubercle, sparsely setose. Parameres with subapical anterior process, obliquely



FIGS 8, 9

Metacoxae of *Colposcenia agnata*.

truncate apically. Distal portion of aedeagus with small apical dilatation. Dorsal margin of female proctiger evenly concave, shortly setose.

Measurements. (2♂♂, 2♀♀). HW 0.69-0.79; AL 0.76-0.80; WL 2.02-2.60; MP 0.23-0.24; PL 0.24-0.26; AEL 0.26-0.27; FP 0.81-0.82; ALHW 0.96-1.09; LLHW 0.28-0.34; TLHW 0.77-0.82; WLHW 2.88-3.28; WLW 2.57-2.74; MPHW 0.31-0.32; FPHW 1.03-1.04; FPC 3.63-3.70; FSP 1.14-1.17; FAS 1.0 : 0.7 : 0.6 : 0.6 : 0.6 : 0.7 : 0.4 : 0.3.

Larva unknown.

Holotype ♂, SE Iran: 13 km SSE Nikshar, river, 8-9.iv.1973 (NMP-152).

Paratypes. Iran: 3♂♂, 9♀♀, same data as holotype; 2 adults, same data but (ZI); 3♂♂, 1♀, S Iran, 7 km W Kahkom, 27-28.v.1973 (NMP-215); 1 adult, same data but (ZI); 1♂, 6♀♀, SE Iran, Bahu-Kalat, 3-4.iv.1973 (NMP-147); 1♀, S Iran, Irin, 28.iv-6.v.1977 (NMP-320); 27 adults, 140 km S Sirjan [=Sa'idabad], 29°28'N 55°42'E, 26.x.1977 (Sugonaev & Kozlov) (ZI).

Comments. Based on the absence of dark spots at the apices of the forewing veins and the presence of long posterior lobes on the male proctiger, *C. agnata*, *C. cavillosa* sp. n. and *C. paula* sp. n. belong to species group II of LOGINOVA (1974). This includes the West Palaearctic *Colposcenia elegans* (Bergevin), *C. rubricata* Loginova and *C. faceta* Loginova, and the Indian *C. constricta* Mathur. The three new species share the strongly diverging apical branches of vein M with *Colposcenia elegans* (Bergevin), to which they may be closely related. *C. agnata* is characterised by the subapically strongly bulged forewings, the posterior tubercle on the male subgenital plate, the shape of the posterior processes of the male proctiger and the parameres, and the relatively large anterior tubercle on the metacoxae.

Colposcenia aliena (Löw)

Recorded from Iran by LOGINOVA (1972a) and GEGECHKORI & LOGINOVA (1990).

Material examined. Iran: 1 adult, Jarjarud, probably N Tehran, 7.v.1937 (Jenjeurist) (ZI); 42 adults, Tehran to Evin, 17.v.1974, *Tamarix* (Safavi) (ZI).

Colposcenia cavillosa sp. n. (Figs 7, 28, 31, 34, 35, 40, 44, 45, 48, 51)

Description. Adult. Coloration. Pale yellow with two spots on mesopraescutum and four longitudinal stripes on mesoscutum which are darker yellow, in mature specimens also brown spots on pronotum. Apices of antennal segments 3-8 brown, segments 9 and 10 dark brown. Abdominal tergites and parts of terminalia brown. Forewings in basal quarter semitransparent, whitish, otherwise with brown pattern consisting of small dots as in fig. 28; apices of veins without dark spots. Younger specimens without brown patches on thorax and abdomen.

Structure. Head (fig. 35) with flattened vertex, anterior lobes evenly rounded; tubercle between eye and antennal insertion long, slender; surface sculpture present,

relatively indistinct. Antennal segment 10 much broader than long (fig. 36). Forewings (figs 7, 28) short and broad, surface weakly inflated between apical fifth of vein Rs and middle of vein M_{3+4}, pterostigma short, vein Rs strongly sinuous, branches of M strongly diverging apically, vein Cu_{1a} weakly curved. Surface spinules irregularly and densely spaced, covering all cells up to veins, except for narrow stripe in cell c+sc and along veins R+M+Cu_1 and R. Metacoxae with small anterior tubercle (fig. 31). Terminalia as in figs 40, 44, 45, 48, 51. Processes of male proctiger longer than subgenital plate, with transversely rugose microsculpture on the inner surface subapically (fig. 48). Subgenital plate weakly produced posteriorly. Parameres strongly dilated apically, with each an anterior and posterior tooth on the inner surface. Distal portion of aedeagus with relatively large apical dilatation. Dorsal margin of female proctiger irregularly concave, shortly setose.

Measurements. (3♂♂, 3♀♀). HW 0.67-0.78; AL 0.61-0.66; WL 1.56-2.02; MP 0.17-0.19; PL 0.17-0.18; AEL 0.18-0.20; FP 0.69-0.70; ALHW 0.84-0.94; LLHW 0.30-0.36; TLHW 0.64-0.72; WLHW 2.30-2.59; WLW 2.14-2.54; MPHW 0.25-0.29; FPHW 0.90; FPC 2.83-3.44; FSP 1.16-1.17; FAS 1.0 : 0.7 : 0.6 : 0.6 : 0.5 : 0.6 : 0.4 : 0.2.

Larva unknown.

Holotype ♂, S Iran: 57 km S Minab, 22.v.1973 (NMP-206).

Paratypes. Iran: 82♂♂, 45♀♀, same data as holotype; 10 adults, same data but (ZI); 1♂, S Iran, Hassan Langi, 24-25.v.1973 (NMP-211).

Comment. See comments under *C. agnata*. *C. cavillosa* is characterised by the subapically inflated forewings, the relatively broad forewings with characteristic venation, and the structure of the terminalia.

Colposcenia elegans (Bergevin)

Material examined. SE Iran: 2♂♂, Tis, 6-7.iv.1973 (NMP-150).

Colposcenia kiritshenkoi Loginova

Recorded from Iran (ZI) (GEGECHKORI & LOGINOVA, 1990).

Material examined. SW Iran: 3♂♂, 2♀♀, Shushtar, 13.iv.1977 (NMP-287).

Colposcenia paula sp. n. (Figs 29, 32, 37, 38, 41, 46, 47, 49, 52, 53)

Description. Adult. Coloration. Light green with whitish spots on vertex and whitish, narrow longitudinal stripes on thoracic dorsum. Antennae ochreous, with apices of segments 3-8 brown, and entire segments 9 and 10 dark brown. Forewings semitransparent, with indistinctly delimited green spot in cells along outer margin, and scattered brown maculae as in fig. 29.

Structure. Head (fig. 37) with flattened vertex, anterior lobes weakly rounded; tubercle between eye and antennal insertion small, flattened; surface sculpture present, better developed marginally than on disc. Antennal segment 10 much wider than long (fig. 38). Forewings (fig. 29) relatively evenly rounded apically, weakly inflated between apical fifth of vein Rs and middle of vein M_{3+4}, pterostigma short, vein Rs strongly sinuous, branches of M strongly diverging apically, vein Cu_{1a} distinctly curved. Surface spinules irregularly, densely spaced, covering all cells up to veins except for narrow stripe in cell c+sc along vein R+M+Cu_1 and R. Metacoxae with very small anterior tubercle (fig. 32). Terminalia as in figs 41, 46, 47, 49, 52, 53. Processes of male proctiger longer than subgenital plate, with oval, well-defined region apically on the inner surface, which bears a transversely rugose microsculpture (fig. 49). Subgenital plate not produced posteriorly. Parameres lamellar, weakly widened apically with a large antero-apical tooth, and a subapical sclerotised ridge on the inner surface. Distal portion of aedeagus with relatively large apical dilatation. Dorsal margin of female proctiger evenly concave, covered in long setae.

Measurements. (1♂, 2♀♀). HW 0.56-0.69; AL 0.51-0.62; WL 1.38-1.88; MP 0.19; PL 0.22; AEL 0.21; FP 0.55-0.64; ALHW 0.86-1.01; LLHW 0.27-0.33; TLHW 0.67-0.68; WLHW 2.48-2.73; WLW 2.27-2.57; MPHW 0.34; FPHW 0.91-0.93; FPC 2.58-3.18; FSP 1.19-1.21; FAS 1.0 : 0.4 : 0.4 : 0.4 : 0.3 : 0.4 : 0.2 : 0.1.

Larva unknown.

Holotype ♂, S Iran: Bilai, 23-24.v.1973 (NMP-209).

Paratypes. Iran: 1♂, 9♀♀, same data as holotype; 2 adults, same data but (ZI); 1♀, SE Iran, Bahu-Kalat, 3-4.iv.1973 (NMP-147).

Material not included in type series. Iran: 1 damaged adult, same data as holotype.

Comment. See comment under *C. agnata*. Apart from the subapically bulged forewings, *C. paula* is characterised by the shape of the terminalia, particularly of the male, and the forewing venation.

Colposcenia vicina Loginova

Material examined. NE Iran: 2♂♂, 1♀, Hessar, 50 km ESE Nishabur, 12-13.vi.1977 (NMP-364).

Colposcenia sp. A

Material examined. SE Iran: 1♀, Ghasemabad, 10 km Bampur Valley, W Iranshar, 11-12.iv.1973 (NMP-157).

Comment. The single female may represent a new species but male material is required for confirmation.

Craspedolepta bulgarica Klimaszewski

Material examined. N Iran: 7♂♂, 16♀♀, 4 larvae, 20 km E Tehran, 2.v.1966, *Achillea albicaulis* (R-218).

Craspedolepta convexa Baeva

Material examined. Iran: 1♀, Pol-e Veresk, Istgah-e, 35°55'N 52°56'E, 1300 m, 2.vi.1966, *Artemisia chamaemelifolia* (R-227); 2♂♂, 2♀♀, E Iran, Taftan, Tamandan, 2200 m, 18.iv.1973 (NMP-168); 1♀, same but 17-18.iv.1973, 2100 m, (NMP-167); Central Iran, 3♀♀, Qanat Marvan, 22-24.v.1977, 2850 m (NMP-346).

Comment. *Craspedolepta convexa* Baeva and *C. armazhi* Gegechkori share similar wing and genital characters but differ, according to the original descriptions (BAEVA, 1970; GEGECHKORI, 1973), in the narrower forewings and shorter apical process of the female proctiger in *C. convexa*. Differences in the male terminalia given in the original descriptions are more difficult to interpret and require examination of type material. Some specimens of *C. armazhi* examined have possible type status (ZI) but types of *C. convexa* were not available. The material here attributed to *C. convexa* on the basis of the narrow forewings and the relatively short female proctiger, is variable in the extent of the dark forewing pattern, and the size and arrangement of surface spinules.

Craspedolepta pontica Dobreanu & Manolache

Material examined. N Iran: 1♀, Kandavan Pass, 2700-2900 m, S slope, 4- 9.vii.1977 (NMP-395).

Craspedolepta remaudierei sp. n. (Figs 54, 56-59)

Description. Adult. Coloration. Green with indistinct yellow spots on vertex, pronotum yellowish, mesoscutum with indistinct yellow longitudinal bands, abdomen light greenish yellow. Antennae green with dark apices of segments 3-10. Forewings transparent with small brown maculae scattered over most of the wing, with transverse light brown band along outer wing margin and dark brown spot at the base of vein M (fig. 54). Setae on head, body and wings white.

Structure. Dorsal surface of head and thorax, and forewings covered in long conspicuous setae. Forewings (fig. 54) subtrapezoidal, surface spinules present in all cells, irregularly spaced, much denser apically than basally. Terminalia as in figs 56-59. Male parameres broad, weakly curved; inner surface with subapical anterior process and oblique row of tubercles. Female terminalia cuneate.

Measurements. (1♂). HW 0.61; AL 0.55; WL 1.81; MP 0.22; PL 0.24; AEL 0.24; ALHW 0.91; LLHW 0.39; TLHW 0.58; WLHW 2.79; WLW 2.39; MPHW 0.36.

Larva unknown.

Holotype ♂, Central Iran: Kuh-e-Lalehzar, S Kerman, 2800 m, 24-30.v.1977 (NMP-347).

Paratypes. Iran: 1♂, 1♀, Kuh-e-Lalehzar, S Kerman, 26.vi.1955, *Artemisia cina* (R-35) (USNM).

Comments. *C. remaudierei* resembles *C. setosa* (Wagner) in the long setae on the dorsal body surface and forewings but differs in the wing shape and coloration, and the shape of the male and female terminalia.

Craspedolepta tadshikistanica Baeva

Material examined. Central Iran: 18♂♂, 26♀♀, Kuh-e-Lalehzar, S Kerman, 2800 m, 24-30.v.1977 (NMP-347).

Craspedolepta sp. A (Figs 55, 60)

Description. Adult. Coloration. General body coloration yellowish. Forewings semitransparent with brown to dark brown, distinct dots which are confluent along the veins in the apical part of wing (fig. 55).

Structure. Head and body covered in short setae coated in waxy secretions and resembling small scales. A few similar setae also present on forewings, particularly along the veins. Forewings (fig. 55) oblong-oval, without surface spinules. Male unknown. Female terminalia as in fig. 60.

Host plant. *Artemisia herba-alba.*

Material examined. Iran: 2♀♀, 1 larva, S Rafsendjan, 13.ix.1972, *Artemisia herba-alba* (R-250).

Comment. Specimens resemble *C. alevtinae* (Andrianova) in the presence of setae on the body surface and the lack of surface spinules on the forewings but differ in the smaller body size. Without males it is not possible to decide whether this is an undescribed species.

Crastina myricariae Loginova

Material examined. N Iran: numerous ♂♂ and ♀♀, Meygun, N Teheran, 15.xi.1962, *Myricaria germanica* (R-207); 1♂, Meygun, 2000 m, 26.iv.1963 (R-209); 6♂♂, 3♀♀, 6 larvae, Meygun, 2100 m, 15.xi.1962, *Myricaria germanica* (R-213).

Crastina tamaricina Loginova

Material examined. NE Iran: 4♂♂, 12♀♀, Hessar, 50 km ESE Nishabur, 1400 m, 12-13.vi.1977 (NMP-364).

Rhodochlanis bicolor (Scott)

Material examined. Iran: 1♂, Talkh Ab-e Taj od Din [=Talkh Ab-i-Kalat], 32°09'N 49°03'E, 15.v.1966, *Suaeda* (R-221); 1♂, 1♀, 23 miles NE Gonbad-e Kavus, 37°17'N 55°17'E, 50 feet, 5-9.v.1956 (G.B. Vogt-126) (USNM); 2♂♂, 2♀♀, 1 forewing, 12 miles NE Gonbad-e Kavus, 37°17'N 55°17'E, 100 feet, 1-9.v.1956 (G.B. Vogt-159) (USNM); 3♂♂, 2♀♀, Khuzestan, Golestan, Ahwaz, 11.iii.1978, *Suaeda (Schanginia) baccata* (V. F. Eastop) (BMNH); 6♂♂, 3♀♀, same but 15.iii.1978; 3♂♂, 7♀♀, 8 larvae, same but 11-12.iv.1978.

PAUROCEPHALINAE

Camarotoscena Haupt

Comments. A species collected on *Populus nigra* f. *pyramidalis* (RÜBSAAMEN, 1902) and given an Iranian origin by HOUARD (1922) was, judging by Rübsaamen's description and drawings, a *Camarotoscena* sp.

KEY TO SPECIES

1 Forewings transparent without pattern (fig. 61). Male parameres straight in profile, slightly narrowed in the middle; subgenital plate indented posteriorly (figs 64, 65). Female subgenital plate evenly tapered to apex (fig. 67). On *Populus* spp. ..... *Camarotoscena unicolor* Loginova

\- Forewings bearing a dark pattern consisting of small dots. Male parameres curved backwards in profile, not visibly narrowed in the middle. Female subgenital plate abruptly narrowed subapically. 2

2 Surface spinules of forewings large, arranged in short chains of 2-3. On *Populus ?pyramidalis*..... *Camarotoscena fulgidipennis* Loginova

\- Surface spinules of forewings very small, indistinct, irregularly spaced. On *Populus* spp..... *Camarotoscena hoberlandti* Vondráček

Camarotoscena fulgidipennis Loginova

Recorded from Iran: Zergende (LOGINOVA, 1975a; GEGECHKORI & LOGINOVA, 1990).

Material examined. Iran: 1♂, 1♀, Deh Pagah, 30°08'N 52°05'E, 1950 m, 24.x.1967, *Populus nigra* (R-231); 1♀, same but *Salix* sp. (R-232); 4♂♂, 3♀♀, numerous larvae, Karaj, 35°48'N 50°59'E, 28.x.1967, galls on *Populus* sp. (R-234); 1♂, 1♀, 3 larvae, Gatgesar, 37°41'N 49°03'E, 2250 m, 7.ix.1972, *Populus alba* (R-248); 1♂, Khonsar, 33°12'N 50°18'E, 2700 m, 23.xi.1974, *Astragalus* sp. (R-i3986b) (USNM); 4 larvae, Fars, Ardakan, 32°19'N 53°59'E, 10.x.1955, *Populus* (R-33) (USNM); 1♂, 1♀, Tehran, 8.viii.1978, *Populus* sp., galls (S. H. Hodjat) (BMNH).

Camarotoscena hoberlandti Vondráček

Material examined. N Iran: 2♂♂, Tehran, prov. Karadj, 17.vi.1974, *Populus nigra* (Abai) (MMB); 2♂♂, 1♀, Tehran, 8.viii.1978, *Populus* sp., galls (S. H. Hodjat) (BMNH).

Camarotoscena unicolor Loginova (Figs 61-67)

Description. Adult. Coloration. Dorsal surface of head and body evenly brown, ventral surface ochreous. Antennae yellowish with apical two segments brown. Wings

transparent, whitish, veins light ochreous. Younger specimens lighter with less extensive brown colour.

Structure. Head (fig. 62) with fine microsculpture and short setae. Antennae (fig. 63) with subequal terminal setae, both longer than segment 10. Forewings (fig. 61) oblong-oval; surface spinules present in all cells, fine, irregularly spaced, leaving spinule-free stripes along the veins. Veins along nodal line narrower and thinner; costal and anal breaks present. Terminalia as in figs 64-67. Male subgenital plate indented posteriorly. Parameres obliquely truncate with each an anterior and posterior sclerotised tooth apically. Basal portion of aedeagus with transverse folds apically on the inner side.

Measurements. (1♂, 2♀♀). HW 0.59-0.67; AL 0.55-0.62; WL 1.47-1.91; MP 0.21; PL 0.14; AEL 0.18; FP 0.61-0.79; ALHW 0.92-1.03; LLHW 0.24-0.42; TLHW 0.62-0.66; WLHW 2.51-2.83; WLW 2.25-2.59; MPHW 0.35; FPHW 1.03-1.18; FPC 4.25-5.08; FSP 1.45-1.47; FAS 1.0 : 0.3 : 0.3 : 0.3 : 0.3 : 0.4 : 0.2 : 0.1.

Larva unknown.

Material examined. Iran: 1♂, Ahvaz, 31°19'N 48°42'E, 15.v.1977, *Populus diversifolia* (Gharib) (R-306); 4♀♀, same but 10.iv.1978, sweeping (V. F. Eastop) (BMNH); 3♂♂, 3♀♀, same but 11-12.iv.1978, *Populus euphratica*; 1♂, same but 16.iv.1978, *Punica granatum*; 2♂♂, 3♀♀, Khuzestan, Ahvaz, Golestan, 21.iv.1978, *Populus euphratica*, same; 6♂♂, 23♀♀, SW Iran, Shushtar, 13.iv.1977 (NMP-287).

LIVIINAE

KEY TO GENERA AND SPECIES

1 Vertex broader than long. Third antennal segment the longest. On *Olea europaea*. . . . . *Euphyllura straminea* Loginova

\- Vertex longer than broad. Second antennal segment the longest. On *Juncus* spp. . . . . *Livia juncorum* (Latreille)

Euphyllura Förster

Comment. GEGECHKORI & LOGINOVA (1990) mentioned *Euphyllura phillyreae* Förster from Iran referring to LOGINOVA (1972b) which does not list the species! It is thus doubtful whether the species occurs there.

Euphyllura straminea Loginova

Recorded from Iran by HALPERIN *et al.* (1982).

Material examined. Iran: 1♀ (Nuri Mahdi) (BMNH).

Livia juncorum (Latreille)

Recorded from localities in Iraqi Kurdistan by HESLOP-HARRISON (1949) and assumed by him to occur in Iran. LOGINOVA (1962, 1972b) and MATHUR (1975) listed Iran but did not indicate, whether they had seen material.

Material examined. Iran: 1♂, 3♀♀, W Kakan, Kuh-e-Dena, 30°38'N 51°45'E, 2500 m, 25.x.1967, *Scirpus* (R-233); 1♀, N Iran, Rezvandeh, 28.vi.1977 (NMP-389).

RHINOCOLINAE

KEY TO GENERA AND SPECIES

1 Forewings without extensive pattern. Antennae more than 1.5 times head width. On *Pistacia* spp. ..... *Megagonoscena viridis* (Baeva)
- Forewings with dark pattern consisting of dark spots and band forming a zig-zag line along outer margin. Antennae less than 1.2 times head width. . 2
2 Forewings without pterostigma. On *Peganum harmala.* ..... *Agonoscena pegani* Loginova
- Forewings with well-developed pterostigma. 3
3 Dorsal margin of distal portion of aedeagus with distinct incision in basal third. Dorsal margin of female proctiger convex; circumanal ring, in dorsal view, angular apically. On *Pistacia khinjuk* and *mutica.* ..... *Agonoscena bimaculata* Mathur
- Dorsal margin of distal segment of aedeagus concave but without well-defined incision in basal third. Dorsal margin of female proctiger concave; circumanal ring, in dorsal view, oval. On *Pistacia* spp. ..... *Agonoscena pistaciae* Burckhardt & Lauterer

Agonoscena bimaculata Mathur

Recorded from Iran on *Pistacia khinjuk* as "*Agonoscena* aff. *menozzii*" (DAVATCHI, 1958).

Material examined. Iran: 4♂♂, 4♀♀, 8 larvae, Kerman, Sang Bur, 30°00'N, 56°45'E, v.1955, *Pistacia khinjuk* (Davatchi & Remaudière, R-7) (USNM); many larvae, Kerman, Kuh-e Sorkh, 31°19'N 58°44'E, ix.1955, *Pistacia khinjuk* (R-14, R-191) (MNHN, USNM); 1♂, 1♀, Kerman, 15.viii.1959, *Pistacia mutica* (Taghizadeh & Hambleton #60-3119) (USNM); few adults, many larvae, Deh Bakri, SW Bam, 29°03'N 57°56'E, ix.1955, *Pistacia khinjuk* (R-15, R-190) (MNHN, USNM); 1♀, 4 larvae, Baluchistan, 70 km S Khash, 28°14 61°14'E, vi.1955, *Pistacia khinjuk* (R-19) (USNM).

Comments. Iranian specimens differ from type material from Pakistan: Peshawar in the smaller body size, and the smaller number of marginal lanceolate setae on the wing bud in the larvae. They share however the dark wing pattern, the abruptly thickened distal portion of aedeagus and the apically relatively angular

circumanal ring, characters which separate both forms from *A. pistaciae*. More material is required to decide whether they represent clinal variations of the same species.

Agonoscena pegani Loginova

Recorded from Iran (ZI) (GEGECHKORI & LOGINOVA, 1990).

Material examined. Iran: numerous ♂♂, ♀♀ and larvae, Rafsanjan 30°24'N 56°01'E, 13.ix.1972, *Peganum harmala* (R-249).

Agonoscena pistaciae Burckhardt & Lauterer

Recorded from Iran: Kerman (Rafsanjan, Sirjan), Kazvin, Saveh, Yadz (Kermanshah) and Khorassan (Khaf) as *Agonoscena targionii* (Lichtenstein) (DAVATCHI, 1958); and as *A. pistaciae* from Rafsanjan and Sadeghabad (BURCKHARDT & LAUTERER, 1989).

Material examined. Iran: several ♂♂ and ♀♀, 1 larva, 12 km from Zahedan, Balutchistan, v.1955, *Pistacia mutica* (R-4, R-178) (MNHN, USNM); numerous ♂♂, ♀♀ and larvae, Rafsanjan, Kerman, vi.1955, *Pistacia vera* (R-3, R-179) (MNHN, USNM); 2♂♂, 2♀♀, E Iran, same, 22.iii.1973 (NMP-131); many ♂♂ and ♀♀, Kerman, 12.vi.1956, *Pistacia vera* (R. Gardenhire) (USNM); numerous larvae, Gazin, 31°33'N 49°23'E, vi.1955, *Pistacia vera* (Chodjai) (R-2, R-181) (MNHN, USNM); numerous adults, same but 17.viii.1955 (R-11, R-187); 3♂♂, 3♀♀, 4 larvae, 40 km Sanandaj, 35°19'N 47°00'E, 14.viii.1955, *Pistacia mutica* (R-13, R-186) (MNHN, USNM); many adults and larvae, road of Shemshak, N Tehran, ix.1955, *Pistacia vera* (R-12. R-192) (MNHN, USNM); 1♀, 1 larva, 20 km N Bam, 36°58'N 57°59'E, 1955, *Pistacia mutica* (Farehbakhch, R-5) (USNM); many ♂♂, ♀♀ and larvae, Sadeqabad, 27.x.1986, *Pistacia* sp. (BMNH).

Megagonoscena viridis (Baeva)

Material examined. Iran: 3♀♀, 1 larva, Kuh-e-Sardar, 1.vi.1958, *Pistacia vera* (R-196); 2♂♂, 7♀♀, 5 larvae, Firuzabad, 34°21'N 51°16'E, 1.v.1959, *Pistacia mutica* (R-198); 1♂, 1 larva, Zarand, 30°48'N 56°35'E, 10.iv.1958, *Pistacia vera* (Taghizadeh) (USNM).

Comments. DAVATCHI's (1958) records of *Psylla* sp. from Kazvin, Kerman (Rafsanjan) and Teheran (Chahriar) on *Pistacia vera* probably concern *Megagonoscena viridis*.

DIAPHORININAE

KEY TO GENERA AND SPECIES

1 Antennae shorter than head width. ..... *Diaphorina* 2
- Antennae more than 1.5 times head width. ..... *Psyllopsis* 8

2 Genal processes slender, conical, symmetrical, subacute apically, as long as or longer than vertex along mid-line. On *Cordia* spp. ..... *Diaphorina aegyptiaca* Puton

- Genal processes robust, asymmetrical, truncate apically or shorter than vertex along mid-line. 3

3 Genal processes robust, broadly truncate apically. Cell m_{1+2} of forewings broad; distance between the apices of the two M branches only little shorter than the branches. ..... *Diaphorina enormis* Loginova

- Genal processes less robust, rounded or subacute apically. Cell m_{1+2} of forewings elongate; distance of apices of the two M branches much shorter than the branches. 4

4 Forewing pattern consisting of 3 large patches, one forming a long streak from the outer wing margin to the base of cell rs, one a triangular spot at the outer wing margin and one an irregular spot covering mostly cell cu_{1a}. Female subgenital plate with large ventral tubercle. On *Tamarix* sp. ..... *Diaphorina tamaricis* Loginova

- Forewing pattern usually forming a more or less continuous band along the outer wing margin or greatly reduced. Female subgenital plate without ventral tubercle. 5

5 Forewings relatively slender. Female subgenital plate evenly curved ventrally. On *Convolvulus* spp. ..... *Diaphorina chobauti* Puton

- Forewings relatively broad. Female subgenital plate distinctly angular ventrally. 6

6 Forewing pattern dark brown, well-defined, strongly contrasted with white membrane. On *Lycium* spp. ..... *Diaphorina lycii* Loginova

- Forewing pattern lighter, not strongly contrasted with membrane. 7

7 Genal processes about half as long as vertex along mid-line. ..... *Diaphorina luteola* Loginova

- Genal processes longer than half vertex length. On *Zygophyllum* spp. and *Halimiphyllum* spp. ..... *Diaphorina zygophylli* Loginova

8 Forewings with dark brown or black pattern or dark brown to black, well-contrasted veins. Usually (except in teneral specimens) black spots on head and/or thorax. 9

- Forewings yellowish with concolorous veins. Head and thorax without dark pattern. 10

9 Forewings with well-defined dark brown or black pattern. Male parameres forming, in profile, a forward directed triangle. Female proctiger with relatively robust apical process. On *Fraxinus* spp. ..... *Psyllopsis fraxini* (Linnaeus)

- Forewings without distinct dark brown to black pattern. Male parameres, in profile, with anterior lobe and dorsal incision. Female proctiger with slender apical process. On *Fraxinus oxycarpus*. ..... *Psyllopsis repens* Loginova

10 Male parameres, in profile, with both a forward and a backwards-directed

lobe. Female proctiger subacute apically. On *Fraxinus* spp.
..... *Psyllopsis machinosus* Loginova

- Male parameres, in profile, only with anterior lobe. Female proctiger truncate apically. On *Fraxinus oxycarpus*..... *Psyllopsis securicola* Loginova

Diaphorina aegyptiaca Puton

Material examined. Iran: 1♂, 21 km SW Saravan, 29.iii.1973 (NMP-140).

Diaphorina chobauti Puton

Recorded from Iran (ZI) as *D. propinqua* Löw (GEGECHKORI & LOGINOVA, 1990).

Material examined. Iran: 1♀, N Iran, Ahyek, 24.vi.1970 (NMP-30); 1♀, N Iran, Central Elburz, Kahha-ye Tu-Chal, 3600-3900 m, 18-19.vii.1970 (NMP-61); 28♂♂, 21♀♀, N Iran, Wildlife Park Robat-e Quareh Bil, 1000 m, 30.vii.1970 (NMP-78); 1♂, N Iran, Teheran - Evin, Elburz, 1700-2000 m, 9-10.iii.1973 (NMP-123); 2♂♂, 2♀♀, SE Iran, 21 km SW Saráván, 29.iii.1973 (NMP-140); 1♂, 1♀, SE Iran, Zábol, 31.iii.1973 (NMP-142); 1♂, 2♀♀, SE Iran, 40 km Zábol, 31.iii.1983 (NMP-143); 6♀♀, SE Iran, Sekand, 27 km ENE Sarbáz, 31.iii-1.iv.1973 (NMP-144); 3♂♂, 2♀♀, Deh Bakri, SW Bam, 1700-1750 m, 30.iv-1.v.1973 (NMP-186); 30♂♂, 30♀♀, Mian Jangal, 30.v-5.vi.1973 (NMP-223); 1♂, S Iran, Maharlu, 5-6.vi.1973 (NMP-227); 1♂, S Iran, 13 km SSW Yasuj, 1800 m, 12-13.vi.1978 (NMP-239); 1♂, S Iran, Sisakht, Kuh-e-Dena, 2500-3000 m, 13-14.vi.1973 (NMP-241); 1♂, 1♀, S Iran, Komehr, 2000 m, 17.vi.1973 (NMP-246); 34♂♂, 33♀♀, S Iran, 7 km NW Shul, 2100 m, 17.vi.1973 (NMP-247); 5♂♂, 9♀♀, S Iran, 6 km SSE Shul, 2190 m, 17-18.vi.1973 (NMP-248); 1♀, S Iran, 13 km NW Ghaderbad, 2120 m, 21.v.1973 (NMP-253); 1♂, 3♀♀, E Iran, 36 km N Gonabad, 830 m, 7-8.vi.1977 (NMP-316); 1♂, S Iran, Kuh-e Geno Mountains, 400-600 m, 1-4.v.1977 (NMP-321); 8♂♂, 10♀♀, C. Iran, 30 km N Sabzevaran, 1650 m, 17-19.v.1977 (NMP-337); 15♂♂, 10♀♀, C. Iran, Qanat Marvan, 2850 m, 22-24.v.1977 (NMP-345); 25♂♂, 13♀♀, C. Iran, Qanat Marvan, 3000-3100 m, 24.v.1977 (NMP-346); 2♂♂, 2♀♀, C. Iran, Lalehzar, 2800 m, 24-30.v.1977 (NMP-347); 2♂♂, 2♀, NE Iran, 10 km W Sabzevar, 15-16.vi.1977 (NMP-368); 4♂♂, 3♀♀, N Iran, 3 km N Dasht, Golestan forest, 960 m, 18-19.vi.1977 (NMP-375); 3♂♂, 1♀, Golhak, near Tehran, 1700 m, 9-23.vi.1961 (J. Klapperich) (MMP, MHNG); 1 forewing, numerous larvae, Gorogh, E Tehran, 10.x.1955, *Convolvulus* sp. (R-21, R-193) (MNHN, USNM); numerous ♂♂, ♀♀ and larvae, Takht-e-Jamshid, NE Chiraz, 27.iv.1959, *Convolvulus* (R-197); 1♂, Karaj, 1.v.1966, *Artemisia herba-alba* (R-216).

Comments. Adults of *Diaphornia chobauti* Puton, *sensu* BURCKHARDT (1985), vary in the shape and coloration of the forewings and in the shape of the genal processes. Specimens from Gorokh, Takht-e Jamshid, Karadj and Golhak have relatively long genal cones, and forewings with distinct brown pattern and a relatively straight vein C+Sc (as in types of *D. montana* Loginova); specimens from Gonabad and Sabzevar have shorter genal processes and lack a dark, defined forewing pattern (as in types of *D. turanica* Loginova). Iranian larvae differ from North African and Israeli material in the presence of small lanceolate setae on the dorsal surface of head, body and wing pads (BURCKHARDT, 1985). *D. chobauti sensu* BURCKHARDT (1985) may be a complex of closely related species or a single, polymorphic species.

Diaphorina enormis Loginova

Recorded from Iran: S Iran, Makran, Shahva, 12 km NW Minab, 18-19.v.1973 (NMP-202) (LOGINOVA, 1978a).

Material examined. Iran: 1♀, S Iran, 12 km NW Minab, 18-19.1973 (NMP-202).

Diaphorina luteola Loginova

Recorded from Iran: 15 km NE Chah Bahar, 5.iv.1973 (NMP-148); Tis, 6-7.iv.1973 (NMP-150); Iranshahr, 12.iv.1973 (NMP-158) (LOGINOVA, 1978a).

Material examined. Iran: 1♂, 2♀♀, S Iran, Bezan, 15 km NW Furk, 1000-1400 m, 28-29. v.1973 (NMP-218); 4♂♂, 8♀♀, Borozjan, 19.iv.1977 (NMP-299); 1♂, 5♀♀, area around Golshan, 24.iv.1977 (NMP-310); 2♂♂, 6♀♀, Maloo W Bandar Lengeh, 25.iv.1977 (NMP-312); 2♂♂, 5♀♀, Bandar-e-Mahtabi, 26.iv.1977 (NMP-315); 1♂, 6 km W Geno, 400 m, 7-9.v.1977 (NMP-323); 2♀♀, 22 km N Kohnuj, 580 m, 16.v.1977 (NMP-333).

Diaphorina lycii Loginova

Material examined. Iran: 5♀♀, NE Iran, Kuh-e-Binauld, Southern slope, 15 km NE Nishobur, 1600-2300 m, 13-15.vi.1977 (NMP-165); 2♂♂, 1♀, S Iran, 15 km NW Miandangal, 5.vi.1973 (NMP-224); 1♀, S Iran, 15 km SE Taheri, 22-23.iv.1977 (NMP-307); 1♂, 1♀, C. Iran, Qanat Marvan, 2850 m, 22-24.v.1977 (NMP-345); 2♀♀, C. Iran, Qanat Marvan, 3000-3100 m, 24.v.1977 (NMP-346); 1♀, C. Iran, Kuh-e-Lalehzar, Northern slope, 3200-3800 m, 24-30.v.1977 (NMP-348); 1♀, C. Iran, Shahdad, 570 m, 31.v-1.vi.1977 (NMP-353); 8♂♂, 15♀♀, E Iran, 17 km N Nehbandan, 1250 m, 5-6.vi.1977 (NMP-358); 9♂♂, 14♀♀, E Iran, 25 km NNW Shusf, 6.vi.1977 (NMP-359); 5♂♂, 6♀♀, E Iran, 36 km N Gonobad, 830 m, 7-8.vi.1977 (NMP-361); 37♂♂, 59♀♀, C. Iran, Gowk, 31.v.1977 (NMP-362); 1♀, NE Iran, 5 km W Sabzevar, 16.vi.1977 (NMP-369); 1♂, N Iran, 3 km N Dasht Golestan forest, 960 m, 18-19.vi.1977 (NMP-375).

Diaphorina tamaricis Loginova

Recorded from Iran: Sistan, Kolodez Cha-i-Novar, 6-8.viii.1898 (Zarudnyi); N Iran, Tehran-Evin, 1700 m, 13.iii.1973, garden (NMP-124); E Iran, Dowlatabat, 8-9.v.1973 (NMP-192); S Iran, 15 km NW Mian Jangal, 5.vi.1973 (NMP-224) (LOGINOVA, 1978a; GEGECHKORI & LOGINOVA, 1990).

Material examined. Iran: 1♀, SW Iran, Mollasani, 45 km NW Ahwaz, 13-14.iv.1977 (NMP-288); 1♀, SW Iran, 34 km SE Omidiyen, 16-17.iv.1977 (NMP-292).

Diaphorina zygophylli Loginova

Diaphorina zygophylli LOGINOVA, 1978a: 44. Holotype ♂: C.I.S.: Kirgizia, nr Zhekaftar, foothills of Chatkalskoy Chain, 19.iv.1966 (ZI), examined.

Diaphorina kopetdaghi LOGINOVA, 1978a: 40. Holotype ♂: C.I.S.: Turkmeniya, Kopedag, dam of river Arvaz, 30 km SE Baharden, 18.vi.1972 (Loginova) (ZI), examined. Syn. n.

Diaphorina halimiphylli LOGINOVA, 1978a: 42. Holotype ♂: C.I.S.: Tadzhikistan, Koktau Chain, 800 m, Aktau Mountains, 25 km NW Kurgan-Tyube, 20.vi.1964 (Sugonyaev) (ZI), examined. Syn. n.

Diaphorina media BAEVA, 1978: 40. Holotype ♂: C.I.S.: Usbekistan, nr Sairob rd to Gagrisyabe, 20.v.1964 (V. Baeva) (ZI) examined. Syn n.

Recorded from Iran: E Iran, 70 km NW Bam, Khatunabad, 15.iv.1973 (NMP-179) as *D. kopetdaghi* (LOGINOVA, 1978a; GEGECHKORI & LOGINOVA, 1990).

Material examined. Iran: 1♂, 1♀, Kerman, Sang Bur, 30°00'N 56°45'E, vi.1955, *Zygophyllum eurypterum* (Davatchi & Remaudière, R-8) (USNM); 1♂, 1♀, Kerman, ix.1955, *Salicornia* sp. (R-20) (USNM); 2♂♂, 4♀♀, Shiraz S Yasuj, pass at 2400 m, 21.ix.1974, *Astragalus* sp. (R-i3965) (USNM);

Comments. Examination of the types of *Diaphorina zygophylli* Loginova, *D. halimiphylli* Loginova, *D. kopetdaghi* Loginova and *D. media* Baeva has shown that the four taxa are conspecific and they are synonymised.

Psyllopsis fraxini (Linnaeus)

Recorded from Iran: SE Iran, Kerman, 2000 m, vi.1892 (RÜBSAAMEN, 1902).

Comment. This record needs verification.

Psyllopsis machinosus Loginova

Material examined. Iran: 1♀, Varamin, 15.v.1959, *Fraxinus* sp. (Safavi) (USNM).

Psyllopsis repens Loginova

Recorded from Iran: Kerman, v.1928 (Siyazov) (LOGINOVA, 1963, 1968; GEGECHKORI & LOGINOVA, 1990).

Material examined. Iran: 1♂, 1♀, Garmsar, 35°20'N 52°13'E, 15.xi.1962, *Fraxinus* (R-208).

Psyllopsis securicola Loginova

Recorded from Iran: Kerman, v.1928 (Siyazov) (LOGINOVA, 1963; GEGECHKORI & LOGINOVA, 1990).

Material examined. Iran: 1♂, Varamin, 15.v.1959, *Fraxinus* sp. (Safavi) (USNM).

PACHYPSYLLOIDINAE

KEY TO GENERA AND SPECIES

1 Pterostigma of forewings narrower at base than adjacent portion of cell r_1. On *Calligonum* sp. ..... *Eremopsylloides amirabilis* Loginova
- Pterostigma of forewings as wide as or wider at base than adjacent portion of cell r_1. On *Calligonum* spp. .... *Pachypsylloides errator* Loginova

Eremopsylloides amirabilis Loginova

Recorded from Iran (ZI) (GEGECHKORI & LOGINOVA, 1990).
Material examined. SE Iran: 1♂, 30 km N Bampur, 12-13.iv.1973 (NMP-159).

Pachypsylloides errator Loginova

Material examined. E Iran: 1♀, 25 km NNW Shusf, 6.vi.1977 (NMP-359).
Comment. A single female is provisionally attributed to *P. errator*, a species which strongly resembles *P. reverendus* Loginova.

ARYTAININAE

KEY TO SPECIES

1 Genal cones about as long as vertex along mid-line. Distal segment of aedeagus with large apical hook. 2
- Genal cones about half to three quarters vertex length along mid-line. Distal segment of aedeagus rounded apically or with small hook (in *C. astragalicola*). 3
2 The shorter of the two terminal setae on antennal segment 10 very short, about as long as wide. On *Colutea* spp. .. *Cyamophila coluteae* (Baeva)
- The shorter of the two terminal setae on antennal segment 10 distinctly longer than wide at base. On *Halimodendron halodendron*. ..... *Cyamophila oshanini* (Loginova)
3 Forewings with dark spots along outer margin in the middle of cells m_{1+2}, m_{3+4}, and cu_{1a}, sometimes very faint. Male parameres with strongly developed posterio-apical tooth. Distal segment of aedeagus with weakly curved, apical portion which is little dilated. Dorsal margin of female proctiger almost straight, apex evenly tapered. Vertex flattened. On *Glycyrrhiza* spp. ..... *Cyamophila glycyrrhizae* (Becker)

- Forewings without dark spots along outer margin in the middle of the cells. Male parameres with weakly developed posterio-apical tooth. Distal segment of aedeagus with small apical hook. Dorsal margin of female proctiger sinuous. Vertex with strongly indented pits or raised anterior tubercles. On *Astragalus* spp. ..... *Cyamophila astragalicola* (Gegechkori)

Cyamophila astragalicola (Gegechkori)

Recorded from Iran: Khonsar, 15.viii.1974, *Astragalus* sp. (Safavi); v.1974, *Astragalus* sp. (Lansar) as *Cyamophila astragalicola* (GEGECHKORI, 1977; GEGECHKORI & LOGINOVA, 1990); recorded from Iran as *Cyamophila dicora* Loginova by NAEEM & BEHDAD (1988).

Material examined. Iran: 1♀, S Iran, 13 km SSW Yasuj, 1800 m, 12-13.vi.1973 (NMP-239); 33♂♂, 29♀♀, S Iran, Zagros, Yasuj, 16.vi.1973 (NMP-243); 2♀♀, S Iran, 27 km E Yasuj, 2650 m, 16.vi.1973 (NMP-244); 3♂♂, 6♀♀, S Iran, 7 km NW Shul, 2100 m, 17.vi.1973 (NMP-247); 3 5th instar larvae, Firuzabad, 28°50'N 52°36'E, 2.v.1959, *Astragalus* (R-199); 6♂♂, 6♀♀, E Garmandar, 40 km NE Tehran, 3000 m, on snow, 13.xi.1962 (R-206); 1♂, 20 km W Shiraz, 22.x.1967, *Astragalus* (R-229); 2♂♂, 2♀♀, 4 larvae, Khonsar, 33°12'N 50°18'E, Esfahan, x.1972, *Astragalus adscendens* (R-251); many ♂♂, ♀♀ and larvae, same but 2700 m, 23.ix.1974, *Astragalus* sp. (R-i3986a); many ♂♂ and ♀♀, same but x.1972, *Astragalus adscendens* (Sanei & Lessani) (USNM); 20♂♂, 20♀♀, same but 22.x.1984 (A. Naeem) (MHNG); 3♂♂, 1♀, same but 10.xii.1982, *Astragalus adscendens* (A. Naeem) (BMNH); 2 larvae, Daran, 32°59'N 50°24'E, 2500 m, 23.ix.1974, *Astragalus* sp. (R-i3984b) (USNM); 1♂, 1♀, Kashan, 33°59'N 51°29'E, x.1978, *Astragalus* sp. (J. Onillon) (USNM).

Comments. The specimens from Esfahan, previously identified as *C. dicora*, show the characteristic, entirely brownish forewings of *C. astragalicola* and are therefore identified as such. The forewings of type material of *C. dicora* from Tadzhikistan, by contrast, bear distinct apical brown patches. The terminalia and head structure of *C. astragalicola* and *C. dicora* are similar and both develop on *Astragalus*. Without revising the genus, it is not possible to judge the taxonomic significance of these differences.

Cyamophila coluteae (Baeva)

Recorded from Iran (GEGECHKORI & LOGINOVA, 1990).

Material examined. Iran: 2♂♂, 1♀, E Iran, Taftan, Tamandan, 2100 m, 17-18.iv.1973 (NMP-167); 1♂, S Iran, SSW Yasuj, 1800 m, 12-13.vi.1973 (NMP-239); 4♂♂, 10♀♀, SW Iran, Pol-e Tang, 60 km NW Andimeshk, 10-11.iv.1977 (NMP-284); 6♂♂, 1♀, C. Iran, Qanat Marvan, 2800 m, 22-24.v.1977 (NMP-345); 2♂♂, 4♀♀, C. Iran, Qanat Marvan, 3000-3100 m, 24.v.1977 (NMP-346); 1♂, C. Iran, Lalehzar, 2800 m, 24-30.v.1977 (NMP-347); 1♀, N Iran, 3 km N Dasht, Golestan forest, 960 m, 18-19.vi.1977 (NMP-375); 7♂♂, 4♀♀, 9 5th instar larvae, 140 km W Bojnurd, 37°28'N 57°19'E, 26.v.1966, *Colutea* (R-224).

Cyamophila glycyrrhizae (Becker)

Psyllodes glycyrrhizae BECKER, 1864: 486. Lectotype ♂: C.I.S.:Russia, Sarepta, *Glycyrrhiza glabra* (Becker) (ZI), examined.

Cyamophila eremita LOGINOVA, 1978a: 88. Holotype ♂: C.I.S.: Turkmeniya, Farab at Amudarya, 25.iv.1912 (Golbek) (ZI), examined. Syn. n.

Recorded from Iran: Village Tamin nr mountains of Kuh-e-Taftan, Kerman, 24.viii.1898 (Zarudnyj) as *Psylla glycyrrhizae* (LOGINOVA & BAEVA, 1972); NW Iran, Qazvin, 24.vi.1970 (NMP-29); N Iran, Teheran-Evin, garden on 1700 m, 13.ii.1970 (NMP-124); SW Iran, Shiraz (North), 4.vii.1973 (NMP-42); Shiraz (West), 4.vii.1973 (NMP-43); S Iran, 10 km W Shiraz, 8.vi.1973 (NMP-228); Fasa, 9.vii.1970 (NMP-50); Mian Jangal, 5.vi.1973 (NMP-224); Kamalabad, 5.vi.1973 (NMP-225); 7 km NW Kuhenjan, 5.vi.1973 (NMP-226); 29 km E Yasuj, 2300 m, 16-17.vi.1973 (NMP-245); E Iran, Rafsanjan, 26-28.iv.1973 (NMP-181); Deh Bakri, 1700-1750 m, 30.iv-3.v.1973 (NMP-186); Mohammadabad, 1600 m, 3-5.v.1973 (NMP-187); Kurdistan pers., Shakhlawa (Kálalová-DiLotti); Kurdistan, Badawa Erbil, 31.vi. (Kálalová-DiLotti) as *Cyamophila odontopyx* (LOGINOVA, 1978a); as *C. eremita* by GEGECHKORI & LOGINOVA (1990) (ZI); HODKINSON & HOLLIS (1987).

Material examined. Iran: 1♀, E Iran, Taftan, 2100 m, 20.iv.1973 (NMP-167); 10♂♂, 19♀♀, E Iran, Bam, 24-25.iv.1973 (NMP-177); 90♂♂, 104♀♀, E Iran, Rafsanjan, 26-28.iv.1973 (NMP-181); 11♂♂, 11♀♀, E Iran, Deh Bakri, 1750 m, 30.iv-3.v.1973 (NMP-186); 1♂, 1♀, E Iran, Mohammadbad, 1600 m, 3-5.v.1973 (NMP-187); 3♂♂, 1♀, E Iran, 33 km W Sabzvaran, 1100 m, 6-7.v.1973 (NMP-189); 1♀, E Iran, Banue - Charehar, 1800-2000 m, 8.v.1973 (NMP-191); 1♂, 1♀, S Iran, 5 km E Furk, 900 m, 28.v.1973 (NMP-217); 1♂, 1♀, S Iran, Korsiah, 29-30.v.1973 (NMP-220); 52♂♂, 52♀♀, S Iran, Mian Jangal, 3.v-5.vi.1973 (NMP-223); 1♂, 1♀, S Iran, 7 km NW Kuhenjan, 5.vi.1973 (NMP-226); 1♀, S Iran, Maharlu, 5-6.vi.1973 (NMP-227); 3♀♀, S Iran, 10 km W Shiraz, 8.vi.1973 (NMP-228); 7♂♂, 7♀♀, S Iran, 29 km E Yasuj, 2300 m, 16-17.vi.1973 (NMP-245); 2♂♂, 1♀, C. Iran, Qanat Marvan, 2850 m, 22-24.v.1977 (NMP-345); 1♂, C. Iran, Kuh-e Lalehzar, Northern slope, 3200-3800 m, 24-30.v.1977 (NMP-348); 1♂, 1♀, NE Iran, Kuh-e Binolud, Southern slope, 15 km NE Nishabur, 1600-2300 m, 13-15.vi.1977 (NMP-365); 13♂♂, 10♀♀, NE Iran, Assadli, 30 km S Bojnurd, 1970 m, 17-18.vi.1977 (NMP-374); 4♂♂, N Iran, 3 km N Dasht, Golestan forest, 960 m, 18-19.1977 (NMP-375); 13♂♂, 1♀♀, N Iran, 8 km NE Zairan, 2400 m, 10-16.vii.1977 (NMP-400); 1♂, 2♀♀, Kurdistan pers., Shokhlawa (Kálalová-DiLotti) (ZI); 1♂, several ♀♀, many young instar larvae, Baluchestan, Gavater, 35°09'N 61°31'E, vi.1955, *Glycyrrhiza glabra* (R-18, R-183) (MNHN, USNM); 3♂♂, Takht-e Jamshid, 29°57'N 52°52'E, 4.v.1959, *Carex* sp. (R-201); many ♂♂, ♀♀ and larvae, Varamin, 35°20'N 51°39'E, 9.v.1954, *Glycyrrhiza glabra* (R-202); 1♂, 1♀, Dehkhvareqan [=Azar Shahr], 37°45'N 45°59'E, viii.1972, *Heliotropium* sp. stem and leaves (CIE) (BMNH).

Comment. Morphologically the type material of *Cyamophila eremita* falls within the range of variation found in *C. glycyrrhizae*, and the two are synonymised.

Cyamophila oshanini (Loginova)

Material examined. Iran: 1♂, SW Iran, Bidruyeh, 36 km NNW Andimeshk, 440 m, 11-12.iv.1977 (NMP-285); 11♂♂, 9♀♀, NE Iran, Hassar, 50 km ESE, Nishabur, 1400 m, 12-13.vi.1977 (NMP-364).

PSYLLINAE

KEY TO GENERA AND SPECIES

1 Forewings rhomboidal (figs 75, 76). Genal processes short, broad, irregularly rounded; head covered in long setae (figs 77, 79).
..... *Spanioneura persica* sp. n.

- Forewings oblong-oval (fig. 68). Genal processes longer, slender, conical; head without long setae (fig. 69). ..... *Cacopsylla* 2
2 Surface spinules of forewings densely spaced at 2-10 µ intervals. On *Prunus* spp. ..... *Cacopsylla pruni* (Scopoli)
- Surface spinules more or less evenly spaced at about 20 µ intervals, forming rhomboids, squares, or irregular transverse rows. 3
3 Upper surface spinules of forewings covering the whole of cell c+sc, apart from narrow stripes along the veins, in other cells forming broad fields, which taper apically towards outer wing margin; spinules present in cell rs proximal to bifurcation of vein R; forewing without dark contrasting patch along vein Cu_{1b}. On *Pyrus* spp. ..... *Cacopsylla pyrisuga* (Förster)
- This combination of characters absent. 4
4 Surface spinules present in all cells forming broad fields; apart from narrow stripes along the veins, covering the whole surface of cell c+sc; spinules present in basal part of cell rs proximal to bifurcation of vein R; fields in apical part not tapering towards wing margin. On *Salix* spp. ..... *Cacopsylla saliceti* (Förster)
- This combination of characters absent. 5
5 Forewings with dark spots along outer margin and with infuscate membrane around vein Cu_{1b} contrasting from adjacent area. On *Crataegus* spp. ..... *Cacopsylla crataegi* (Schrank)
- Forewing pattern different; membrane adjacent to vein Cu_{1b} light or concolorous with sourrounding area. 6
6 Forewings with brown spot on apex of clavus, strongly contrasting with surrounding area. On *Pyrus* spp. 7
- Forewings without brown, strongly contrasting spot on apex of clavus. 11
7 Parameres sickle-shaped. Female proctiger in profile with strong constriction in the middle. ..... *Cacopsylla pyri* (Linnaeus)
- Paramere in profile lamellar. Female proctiger cuneate. 8
8 Parameres with forward-directed apical tooth; fore margin constricted in basal third. Dorsal segment of aedeagus with weakly curved apical dilatation. Female proctiger often clearly exceeding subgenital plate. ..... *Cacopsylla permixta* Burckhardt & Hodkinson
- Parameres with one or two inwardly directed points, fore margin not constricted. Distal segment of aedeagus with apical dilatation distinctly curved. Female proctiger only slightly exceeding subgenital plate. 9
9 Paramere apex with two inwards directed teeth. Genal processes relatively robust. ..... *Cacopsylla bidens* (Šulc)
- Paramere apex with one inwards directed blunt tooth. Genal processes relatively slender. 10
10 Forewings with brown veins. ..... *Cacopsylla pyricola* (Förster)
- Forewings with whitish veins. ..... *Cacopsylla notata* (Flor)

11 Forewings (fig. 68) parallel-sided, broadest in the middle. ..... *Cacopsylla iranica* sp. n.
- Forewings widening towards apical quarter. On *Rhamnus* spp. 12
12 Male parameres in profile narrowly lamellar. Female proctiger truncate apically. ..... *Cacopsylla suturalis* (Horvath)
- Male parameres in profile broadly oval. Female proctiger pointed apically. ..... *Cacopsylla incerta* (Loginova)

Cacopsylla bidens (Šulc)

Recorded from Iran (BURCKHARDT & HODKINSON, 1986).

Material examined. Iran: 1♂, Karaj, cotton field (M. Chojaï) (NMP); 7♀♀, same but viii.1960, *Pyrus* sp. (MNHN); 1♂, 1♀, Azerbaijan, Rezaiyeh, 37°33'N 45°04'E, 8.viii.1955, *Pyrus communis* (R-23) (USNM); 6 larvae, Tehran, 9.v.1955, *Pyrus* sp. (R-26) (USNM).

Cacopsylla crataegi (Schrank)

Material examined. Iran: 2♂♂, 1♀, 1 5th instar larva, Pol-e-Sefid, 36°06'N 53°01'E, 500 m, 1.vi.1966, *Crataegus* sp. (R-226).

Cacopsylla incerta (Loginova)

Material examined. Iran: 1♂, E Dasht Nazir, 36°25'N 51°26'E, 1250 m, 10.xi.1967, *Artemisia absinthium* (R-246).

Cacopsylla iranica sp. n. (Figs 68-74)

Description. Adult. Coloration. Head and thorax reddish brown with fine yellow or whitish pattern. Antennae ochreous, with dark apices on segments 4, 6 and 8, segments 9 and 10 entirely dark. Tibiae dirty yellow. Forewings membranous, transparent, irregularly yellowish with concolorous veins. Abdomen light green.

Structure. Head (fig. 69) slightly wider than mesothorax, weakly inclined from longitudinal body axis; genal processes slightly shorter than vertex along mid-line, blunt apically. Terminal setae on antennal segment 10 (fig. 70) subequal. Forewings (fig. 68) elongate with narrowly rounded outer margin; surface spinules absent apart from cell cu_{1b} and along outer margin in cells rs, m_{1+2}, m_{3+4}, cu_{1a} and at base of rs; surface spinules in cell cu_{1b} relatively large and irregularly spaced. Metatibiae with very small basal spine and 1+3+1 apical spurs, metabasitarsus with 2 black spurs.

Genitalia as in figs 71-74. Male proctiger weakly sinuous in profile; paramere lamellar with sinuous fore margin and strongly sclerotised, inward and forward-directed apical tooth; distal portion of aedeagus with flattened, slightly curved apical dilatation. Dorsal margin of female proctiger irregularly convex.

Measurements. (1♂, 1♀). HW 0.58-0.62; AL 0.55-0.59; WL 1.33-1.55; MP 0.22; PL 0.24; AEL 0.22; FP 0.61; ALHW 0.94-0.97; LLHW 0.39-0.41; TLHW 0.53-0.55; WLHW 2.32-2.47; WLW 2.15-2.57; MPHW 0.39; FPHW 0.97; FPC 4.13; FSP 1.74.

Larva unknown.

Holotype ♂, S Iran: 13 km NW Ghaderabad, 2120 m, 26.vi.1973 (NMP-253).

Paratypes. Iran: 38♂♂, 38♀♀, same data as holotype; 4♀♀, S Iran, Mian Jangal, 3.v-5.vi.1973 (NMP-223); 1♀, C. Iran, Qanat Marvan, 3000-3100 m, 24.v.1977 (NMP-246).

Comments. *Cacopsylla iranica* belongs to the complex of species developing on *Rhamnus* and *Cerasus* as defined by LOGINOVA (1975b). It is closest to *C. kopetdaghi* (Loginova) from which it differs in the reddish and green body coloration, the slightly stouter genal processes, the shorter antennae, the narrower, yellowish forewings lacking dark spots in the middle of the cells along the outer wing margin, and the shorter female terminalia.

Cacopsylla notata (Flor)

Material examined. Iran: 1♂, 3♀♀, 16 5th instar larvae, 30 km S Yasuj, 1900 m, 26.x.1967, *Pyrus* sp. (R-234).

Comments. The Iranian specimens differ from Mediterranean material in the presence of dark veins on the forewings of adults, in the somewhat narrower apical dilatation of the distal segment of aedeagus, and in the lack of marginal capitate setae on the caudal plate in the larvae. The dark veins could result from storage in alcohol.

Cacopsylla permixta Burckhardt & Hodkinson

Material examined. Iran: many ♂♂, ♀♀ and 5th instar larvae, Hajjiabad, near Garmsar, 35°20'N 52°13'E, 8.v.1966, *Pyrus* sp. (R-219); 1♂, 4♀♀, 1 5th instar larva, Khoshbeylagh Pass, S Gonbad-e-Kavus, 2000 m, 29.v.1966, *Acer cinerascens* (R-225).

Comment. In Iranian material the lateral capitate setae on the larval caudal plate are longer than in specimens described by BURCKHARDT & HODKINSON (1986).

Cacopsylla pruni (Scopoli)

Material examined. N Iran: 1♂, 1♀, 20 km NNE Khalkhal, 2160 m, 29.vi-1.vii.1977 (NMP-391); 3♂♂, 3♀♀, Mazandaran, Now Shahr, 36°39'N 51°31'E, 23.iii.1978, *Prunus spinosus* (V. F. Eastop) (BMNH).

Comment. Iranian specimens differ from Central European material in the dark pattern of the forewings which forms a well-defined band along the outer wing margin.

Cacopsylla pyri (Linnaeus)

Material examined. NW Iran: 1♂, 10 km NW Zanjan, 4-5.vii.1973 (NMP-264).

Cacopsylla pyricola (Förster)

Material examined. Iran: 1♀, Karaj, 35°48'N 50°59'E, 11.xi.1962, *Pyrus* sp. (R-205); 1♀, Tehran Evin, 4.xi.1967, *Pyrus communis* (R-242).

Comment. These two females are only provisionally assigned to *C. pyricola.*

Cacopsylla pyrisuga (Förster)

Material examined. Iran: many 5th and 4th instar larvae, Elburz, 2300 m, 20.vii.1955, *Pyrus syriacus* (R-22, R-185) (USNM).

Cacopsylla saliceti (Förster)

Material examined. Iran: 1♀, C. Iran, Lalehzar, 2800 m, 24-30.v.1977 (NMP-347).

Comment. The identification of the specimen is provisional and males are required to confirm it.

Cacopsylla suturalis (Horvath)

Material examined. Iran: 4♂♂, 2♀♀, 1 adult without abdomen, S Iran, Zagros, Sísakht, 2400 m, 13-15.vi.1973 (NMP-240); 2♂♂, 1♀, C. Iran, Qanat Marvan, 3000-3100 m, 24.v.1977 (NMP-346); 2♀♀, C. Iran, Lalehzar, 2800 m, 24-30.v.1977 (NMP-347); many ♂♂ and ♀♀, Fars, Kuh-e-Dena, 3300 m, ix.1955, *Ferula* sp. (R-189) (MNHN, USNM, MHNG).

Comment. The Iranian specimens differ from Yugoslavian material in the absence of a brown marginal band and surface spinules on the forewings. Similar differences are found in the closely related *C. incerta* (Loginova).

Cacopsylla sp. A

Material examined. N Iran: 2♀♀, E Elburz, Gaduk Pass, 2200 m, 2.viii.1970 (NMP-82).

Comment. The two females may be an undescribed species. They are characterised by forewings with long branches of the veins M and Cu_1, a long vein R_1, a short pterostigma, and a short vein $M+Cu_{1a}$. Similar venational characters are present in *Cacopsylla fasciata* (Löw), *C. sarmatica* (Löw), *C. zaicevi* (Klimaszewski) and *C. junatovi* (Loginova) to which the Iranian specimens may be related. Males, larvae and host data are needed to identify this material.

Psylla sp. A

Material examined. Iran: 5♀♀, N Iran, W Elburz, Kalardasht Plain NE Rudbarak, 12.viii.1970 (NMP-90).

Comment. The specimens belong probably to an undescribed species but males are needed for formal description.

Spanioneura persica sp. n. (Figs 75, 77, 78, 80, 82, 84, 85)

Description. Adult. Coloration. Head dirty yellowish above, light greenish yellow underneath. Antennae yellow, with segments 4 to 9 bearing dark brown apices, segment 10 black. Thorax light yellowish to straw-coloured, with broad darker longitudinal stripes on mesopraescutum and mesoscutum. Legs yellowish to greenish. Forewings whitish; veins in basal half indistinctly brownish, veins in apical half and fore margin whitish to greenish; apices of veins Rs, M_{1+2}, M_{3+4}, Cu_{1a}, Cu_{1b} with dark brown to black spots; apices of cells m_{1+2}, m_{3+4}, and cu_{1a} with light brown, indistinct patch; membrane transparent to whitish opaque. Abdomen light greenish.

Structure. Head from above (fig. 77) about as wide as thorax, in profile strongly inclined from longitudinal body axis; covered in long setae. Genal processes short, broad, irregularly rounded. Antennae 10-segmented, filiform, bearing a subapical rhinarium on each of segments 4, 6, 8 and 9; segment 10 with two subequal setae which are both shorter than the segment (fig. 78). Thorax moderately arched above, sparsely covered in long setae. Propleurites higher than wide; epimeron and episternum subequal in surface, narrowly elongate. Forewing (fig. 75) narrowly oval, apex asymmetrical and irregularly rounded; veins bearing conspicuous setae; costal break present, pterostigma short and small; cell m_{1+2} long, vein M_{3+4} sinuous; vein Cu_{1a} gently curved; surface spinules sparsely covering membrane, arranged in irregular transverse rows or rhomboids, leaving broad spinule-free stripes along the veins; reduced or entirely absent in cell r_1. Hindwing membranous, almost as long as forewings. Metatibia with basal spine and 1+3+1 apical spurs; metabasitarsus with 2 black spurs. Genitalia as in figs 80, 82, 84, 85. Male proctiger simple, hind margin weakly produced, shortly setose; subgenital plate densely setose latero-apically. Parameres lamellar, obliquely truncate and heavily sclerotised apically, with antero-apical tooth. Distal segment of aedeagus straight with irregularly oval apical dilation. Female terminalia long, dorsal margin of proctiger indistinctly concave in the middle, apex blunt.

Measurements. (1♂, 1♀). HW 0.87-0.88; AL 1.11-1.16; WL 2.74-2.89; MP 0.50; PL 0.47; AEL 0.30; FP 1.51; ALHW 1.25-1.33; LLHW 0.55-0.59; TLHW 0.66-0.67; WLHW 3.16-3.27; WLW 2.91-3.02; MPHW 0.57; FPHW 1.71; FPC 5.27; FSP 1.44; FAS 1.0 : 0.9 : 0.7 : 0.9 : 0.9 : 0.8 : 0.4 : 0.4.

Larva and host plant unknown.

Holotype ♂, S Iran, Zagros, Yasuj, 16.vi.1973 (NMP-243).

Paratypes. Iran, 1♂, 4♀, 1 adult without abdomen, same data as holotype; 2♂, 4♀, E Iran, Deh Bakri, SW Bam, 1700-1750 m, 30.iv-3.v.1973 (NMP-186); 1♂, C. Iran, Qanat Marvan, 2850 m, 22-24.v.1977 (NMP- 345).

Comments. *Spanioneura persica* is closely related to *S. turkiana* (KLIMASZEWSKI & LODOS, 1977) (figs 76, 79, 81, 83) from which it differs in: 1. the slightly longer setae on head, thorax and forewings; 2. the somewhat more massive genal processes; 3. the forewing coloration, which is yellowish to ochreous, with indistinct dark spots at the apices of the veins in *S. turkiana*, and whitish with indistinct brown patches in the cells along the outer wing margin and dark with well-contrasted spots on the apices of the veins in *S. persica*; 4. the slightly smaller body dimensions; 5. the longer cell m_{1+2} and the more sinuous vein M_{3+4} of the forewings (in *S. turkiana* vein M_{3+4} is evenly curved); 6. the broader spinule-free stripes along the veins in the forewings, and the mostly bare cell r_1; 7. the shorter and somewhat thicker male parameres.

Spanioneura turkiana and *persica* are probably not closely related to the type species *S. fonscolombii* Förster. However, without larvae and host data it is not possible to examine the phylogenetic relationships of this group, and we adopt the tentative classification proposed by HODKINSON & HOLLIS (1987).

The relationships between Turkish *Spanioneura turkiana* (Klimaszewski & Lodos) and *S. pechai* (Klimaszewski & Lodos) are discussed by BURCKHARDT & ÖNUÇAR (1993).

HOMOTOMIDAE

KEY TO SPECIES

1 Vertex with well-defined dark pattern. Antennal segments relatively short and wide (fig. 88); segment 9 light. Male paramere relatively straight (fig. 93). Possibly on *Ficus* spp. . . . . *Homotoma caroliquarti* sp. n.

\- Vertex without well-defined dark pattern. Antennal segments relatively long and narrow (fig. 89); segment 9 dark. Male paramere distinctly bent backwards. On *Ficus carica*. . . . . *Homotoma ficus* (Linnaeus)

Homotoma caroliquarti sp. n. (Figs 86-88, 90-94)

Description. Adult. Coloration. Pale yellowish. Head with well-defined transverse brown stripe along anterior margin and with brown margin of antennal

insertion. Antennal segments 1 to 9 straw-colored, segment 10 slightly darker, rhinaria with dark brown margin; flagellar setae almost black strongly contrasting with underlying colour. Forewing hyaline, veins yellow, with indistinct light brown pattern consisting of a narrow band along vein M_{1+2} and spots around the apices of veins Cu_{1a}, Cu_{1b} and the clavus. Metacoxae reddish to brownish dorsally.

S t r u c t u r e . Head (fig. 87), from above, concave anteriorly bearing relatively large, apically pointed genal processes. Antennae (fig. 88) with laterally flattened flagellomeres; scape with large ventral tubercle; length to width ratio of segments in lateral view as follows (from segments 1 to 10): 1.0, 0.8, 2.5, 1.8, 1.3, 1.8, 1.5, 1.6, 1.5, 1.6 (same values for *H. ficus*: 1.2, 1.0, 3.3, 2.2, 1.8, 1.8, 1.6, 1.4, 1.5, 0.9); relative length of flagellar segments from base to apex as follows: 1.0 : 0.6 : 0.4 : 0.5 : 0.4 : 0.4 : 0.3 : 0.1 (same values for *H. ficus*: 1.0 : 0.6 : 0.5 : 0.4 : 0.4 : 0.3 : 0.3 : 0.1); ultimate antennal segment with one long pointed and one short, apically truncate terminal seta. Thorax weakly arched, pronotum without anterior projections. Forewings (fig. 86) transparent, subacute apically, relatively evenly curved anteriorly, veins R and $M+Cu_1$ separated; Rs long, almost straight, reaching wing margin in apical half of wing; M_{3+4} 1.6-2.0 times as long as M_{1+2} (1.2-1.5 in *H. ficus*) which reaches wing margin anterior to apex; cell cu_{1a} large, clavus ending adjacent to apex of Cu_{1b}; radular areas diffuse. Metatibiae with basal spine and 0 + 6 apical spurs; metabasitarsus with 2 spurs. Genitalia as in figs 90-94. Lateral lobes of ♂ proctiger well-developed, anal tube of moderate length; paramere relatively straight and slender, inner surface with short, anterior sclerotised ridge; basal aedeagal segment curved and moderately expanded in apical half. Dorsal margin of ♀ proctiger concave distal to circumanal ring.

Measurements. (1♂, 1♀). HW 0.84-0.86; AL 1.56-1.62; WL 3.68-3.91; MP 0.36; PL 0.25; AEL 0.32; FP 0.71; ALHW 1.85-1.89; LLHW 0.54; TLHW 0.76-0.78; WLHW 4.37-4.56; WLW 2.54-2.63; MPHW 0.43; FPHW 0.83; FPC 5.11; FSP 1.03.

Larva unknown.

Recorded from Iran: Kerman as *Homotoma ficus* (DAVATCHI, 1958); examination of this material (USNM) showed that this concerns *H. caroliquarti*.

Holotype ♂, Iran: Kerman, 50 km W Rafsanjan, vi.1955, *Ficus* sp. (R-180) (MNHN).

Paratypes. Iran: 11♂♂, 6♀♀, same data as holotype (MNHN, USNM, MHNG); 1♂, 1♀, same data as holotype but on *Pistacia khinjuk* (R-182) (MNHN, USNM); 1♂, 130 km E Shahabad, 34°06'N 46°31'E, 1200 m, 28.x.1967, *Quercus persica* (R-236); 1♂, Estahbanat, 100 km E Chiraz, 5.iv.1972, *Ficus carica* (Safavi) (MMB).

Afghanistan: 3♂♂, 6♀♀, Nuristan, Bashgultal, 1100 m, 17.iv.1953 (J. Klapperich) (NMP).

Pakistan: 1♂, Kashmir, Indus Valley, Sasli, 50 km W Gilgit, 1300 m, 18.viii.1970 (O. Štěrba) (WP-11) (MMB); 3♂♂, 2♀♀, Kashmir, Karakoram, Haramosh Range, N slope of Haramosh, end of Kutwal Valley, alpine meadows, 18.ix.1970 (O. Štěrba) (WP-15) (MMB); 1♂, Kashmir, Gilgit, park, 26.ix.1970, light trap (O. Štěrba) (WP-18) (MMB).

Comments. The forewing venation of *H. caroliquarti* is of the "*Homotoma*" type (HOLLIS & BROOMFIELD, 1989). Based on forewing venation, the antennal and the genital morphology, *H. caroliquarti* is closest related to *H. ficus* (including *H. viridis* Klimaszewski) from which it differs in the following features: 1. presence of a well-defined dark pattern on the vertex; 2. antennal segment 9 light; 3. genal processes

longer and more pointed; 4. antennal segments in lateral view relatively wider than in *H. ficus*; 5. scape with larger apical tubercle ventrally; 6. setae on antennae thicker and darker; 7. forewing more evenly curved anteriorly; 8. vein M_{1+2} relatively shorter compared to M_{3+4}; 9. vein Rs straighter; 10. male paramere straighter; 11. cell m_{1+2} longer and narrower.

H. caroliquarti is named after Charles IV of Luxemburg, Roman Emperor, King of Bohemia, called "pater patriae", and founder of the Charles University in Prague. He was the first author who published (in 1346) entomological observations in Czech.

Homotoma ficus (Linnaeus) (Fig. 89)

Material examined. Iran: 2♀♀, S Iran, Central Elburz Mazar Chay, S Amol, 400 m, 23-24.vii.1970 (NMP-69); 2♂♂, S Iran, Mian Jangal, 30.v-5.vi.1973 (NMP-223); 1♂, 1♀, S Iran, 7 km NW Kuhenjan, 5.vi.1973 (NMP-226); 8♂♂, 16♀♀, S Iran, 5-6.vi.1973 (NMP-227); 2♂♂, 3♀♀, S Iran, Kushk N Masírí, 1800 m, 12.vi.1973 (NMP-237); 1♀, S Iran, 48 km N Masírí, 2230 m, 12.vi.1973 (NMP-238); 1♂, S Iran, Dasht-e-Arjan, 1700 m, 9.vi.1973 (NMP-320).

Comment. The record from Iran: Kerman (DAVATCHI, 1958) concerns *H. caroliquarti*.

TRIOZIDAE

KEY TO GENERA AND SPECIES

1 Outer apical metatibial spur on a large claw-like tubercle (fig. 102). ..... *Egeirotrioza* 2
- Outer apical metatibial spur not on large claw-like tubercle. 5
2 Forewings angular apically (fig. 95). Possibly on *Populus diversifolia*. ..... *Egeirotrioza corporosa* sp. n.
- Forewings rounded apically (figs 96, 97). 3
3 Male parameres lamellar. Female subgenital plate irregularly tapered apically but not ending in parallel-sided process. On *Populus* spp. ..... *Egeirotrioza ceardi* (Bergevin)
- Male parameres bifid (figs 113, 114). Female subgenital plate (figs 119, 121) ending in parallel-sided process. 4
4 Forewings broadly rounded apically (fig. 96). Male parameres with relatively narrow basal portion (fig. 113). Female proctiger with a truncate, heavily sclerotised apex (fig. 119). ..... *Egeirotrioza gemina* sp. n.
- Forewings narrowly rounded apically (fig. 97). Male parameres with relatively broad basal portion (fig. 114). Female proctiger with a subacute, not particularly heavily sclerotised apex (fig. 121). On *Populus diversifolia*. ..... *Egeirotrioza justa* sp. n.
5 Metatibiae with 1+3 black apical spurs. ..... *Trioza* p. p. 6

- Metatibiae with 1+2 black apical spurs. 8
6 Vein Rs of forewings short, concavely curved towards fore margin. On *Galium* spp. . . . . *Trioza galii* Förster
- Vein Rs of forewings long, sinuous. 7
7 Forewings, apart from radular spinules, without surface spinules in apical half. On *Urtica* spp. . . . . *Trioza urticae* (Linnaeus)
- Forewings with surface spinules in apical half. On *Rumex* spp. . . . . *Trioza rumicis* Löw
8 Genal processes shorter than half vertex length. 9
- Genal processes longer than half vertex length. 14
9 Antennal segments 4-7 light with dark brown to black apex. . . . . *Paratrioza* 10
- Antennal segments 4-7 entirely dark brown to black. . . . . *Bactericera* p. p. 11
10 Male parameres obliquely truncate apically. Female subgenital plate pointed apically. On *Lycium ruthenicum*. . . . . *Paratrioza lycii* Loginova
- Male parameres pointed apically. Female subgenital plate truncate apically. On *Lycium depressum*. . . . . *Paratrioza petiolata* Loginova
11 Antennal segment 3 much thicker than remainder of flagellomeres. On *Artemisia* spp. . . . . *Bactericera perrisii* Puton
- Antennal segment 3 not strongly thickened. 12
12 Forewings narrow, widest in the middle, vein Rs weakly sinuate. Male proctiger, in profile, angular posteriorly; parameres slender in apical half; apex of distal aedeagal segment short and thick. Probably on *Daucus carota*. . . . . *Bactericera trigonica* Hodkinson
- Forewings broad, widest in apical third; vein Rs strongly sinuous. Male proctiger, in profile, rounded posteriorly; parameres broad and truncate apically; apex of distal aedeagal segment more slender. 13
13 Genal processes, in general, slender. Male parameres, in profile, broad with horizontally truncate apex; base of distal aedeagal segment long, apical dilatation globular. *Allium* spp., possibly polyphagous. . . . . *Bactericera tremblayi* (Wagner)
- Genal process, in general, broadly rounded. Male parameres, in profile, slightly more slender and obliquely truncate apically; base of distal aedeagal segment short, apical dilatation oblong. Polyphagous. . . . . *Bactericera nigricornis* (Förster)
14 Cell m_{1+2} of forewings very large, much larger than cell cu_{1a}. Female proctiger with long, upturned apical process which is much longer than subgenital plate. On *Elaeagnus angustifolia*. 15
- Cell m_{1+2} of forewings about as large as or smaller than cell cu_{1a}. Female proctiger without long, upturned apical process. 17
15 Forewings blunt apically. . . . . *Trioza elaeagni* Scott
- Forewings acute apically. 16

16 Posterior lobes of male proctiger large, semicircular. Female proctiger with long dorsal setae ending almost at apex of proctiger. ..... *Trioza neglecta* Loginova

\- Posterior lobes of male proctiger narrow. Female proctiger with long dorsal setae ending at the middle of apical proctigal process. ..... *Trioza magnisetosa* Loginova

17 Vein Rs of forewings long and distinctly sinuous... *Bactericera* p. p..... 18

\- Vein Rs of forewings relatively short, straight or curved towards fore margin..... *Trioza* p. p..... 20

18 Surface spinules of forewings present in all cells. On *Salix* spp. ..... *Bactericera albiventris* (Förster)

\- Surface spinules of forewings absent from apical cells..... 19

19 Antennal segments 4-8 entirely dark brown to black. On *Salix* spp. ..... *Bactericera striola* (Flor)

\- Antennal segments 4-8 light, with at most dark apices. On *Ligularia thomsonii*..... *Bactericera ligulariae* (Baeva)

20 Branching of vein M of forewings distal to line between apices of veins Rs and Cu_1..... 21

\- Branching of vein M of forewings proximal to or on line between apices of veins Rs and Cu_1. On *Berberis* spp..... 24

21 Antennal segments 4 and 5 dark brown, strongly contrasted with light segment 3. Large species. On deciduous *Quercus* spp... *Trioza remota* Förster

\- Antennal segments 4 and 5 light to ochreous, not strongly contrasted with light segment 3. Small species..... 22

22 Male parameres with backwards directed sclerotised apex; distal segment of aedeagus with two long tubular processes. Third antennal segment long. On Chenopodiaceae..... *Trioza chenopodii* Reuter

\- Male parameres with forwards directed sclerotised apex; distal segment of aedeagus with two tubercles. Third antennal segment short..... 23

23 Male parameres obliquely truncate so that highest point is at posterior margin; sclerotised end tube of ductus ejaculatorius short, weakly curved. On *Atriplex tatarica*..... *Trioza dichroa* Scott

\- Male parameres obliquely truncate so that highest point is at anterior margin; sclerotised end tube of ductus ejaculatorius long, strongly sinuous. On *Eurotia ceratoides*..... *Trioza eurotiae* Loginova

24 Male parameres with one apical tooth. Female proctiger globular. ..... *Trioza scottii* Löw

\- Male parameres with two apical teeth. Female proctiger cuneate. ..... *Trioza berbericola* Loginova

Bactericera albiventris (Förster)

Material examined. Iran: 1♀, S Iran, 13 km SSW Yasuj, 1800 m, 12-13.vi.1973 (NMP-239); 5♂♂, 7♀♀, N Iran, Shahi. 24.vi.1977 (NMP-381); 7♂♂, 9♀♀, N Iran, Hashtgerd,

10.vii.1977 (NMP-399); 1 ♀, N Iran, 8 km NE Zairan, 2400 m, 10-16.vii.1977 (NMP-400); 1 ♂, 1 ♀, Fasham, N Tehran, 2000 m, 4.xi.1955, *Prunus domestica* (R-194); 3 5th instar larvae, Varamin, S Tehran, 6.xi.1965, *Salix* (R-212); 6 ♂♂, 2 ♀♀, 3 5th instar larvae, Roudak, N Tehran, 3.xi.1967, *Salix* (R-241); 4 ♂♂, 2 ♀♀, 17 5th instar larvae, Gach Sar, N Karaj, 2230 m, 9.xi.1967, *Salix* sp. (R-243); 1 ♂, 2 ♀♀, same but *Prunus domestica* (R-244); 2 ♂♂, 1 ♀ (teneral), same but 1770 m, *Salix purpurea* (R-245).

Bactericera ligulariae (Baeva)

Material examined. Iran: 10 ♂♂, 11 ♀♀, 1 adult without abdomen, N Iran, C. Elburz, Kuhha-ye Tu Chal, 3600-3900 m, 18-19.vii.1970 (NMP-61); 4 larvae, Elburz, Gatgere, E Gach Sar, 14.viii.1955, *Ligularia persica* (R-34) (USNM).

Comment. The larvae are provisionally assigned to *B. ligulariae* on the basis of their host plant. Larvae found together with adults are needed to confirm the identification.

Bactericera nigricornis (Förster)

Material examined. Iran: 1 ♂, 2 ♀♀, E Iran, 1700 m, Máhán, 23-24.iii.1973 (NMP-61); 1 ♀, N Iran, C. Elburz, Gazanak, Haraz Chay, 1400 m, 20-21.vii.1970 (NMP-63); 2 ♀♀, E Iran, Taftan, Tamandan, 2100 m, 20.iv.1973 (NMP-167); 1 ♀, S Iran, Mian Jangal, 30.v-5.vi.1973 (NMP-223); 1 ♀, S Iran, 10 km W Shiraz, 8.vi.1973 (NMP-228); 1 ♂, 1 ♀, S Iran, 48 km N Masírí, 2230 m, 12.vi.1973 (NMP-238); 4 ♂♂, 1 ♀, S Iran, 13 km SSW Yasuj, 1800 m, 12-13.vi.1973 (NMP-239); 3 ♂♂, S Iran, Zagros, Sísakht, 2400 m, 13-15.vi.1973 (NMP-240); 2 ♂♂, 5 ♀♀, S Iran, Sísakht, Dean, 2500-3000 m, 13-14.vi.1973 (NMP-241); 1 ♂, NE Iran, Assadii, 30 km S Bojnurd, 17-18.vi.1977 (NMP-374); 1 ♂, 1 ♀, Fasa, 28°56'N 53°42'E, 9.ix.1967 (Minessian) (NMP); 5 ♂♂, Hamadan, 34°48'N 48°30'E, 1966, yellow pan tray (Klett) (R-214, R-215); 6 ♂♂, same but 15.v.1966 (R-222); 1 ♂, 30 km S Darreh Gaz, 37°27'N 59°07'E, Northern slope, 1300 m, 18. v.1966, *Rosa* sp. (R-223); 10 ♂♂, 3 ♀♀, Khuzestan, Dezful, 32°23'N 48°24'E, iii-iv.1978, yellow trays (V. F. Eastop) (BMNH); 9 ♂♂, Khuzestan, Ramin, iv.1978, yellow tray, same; 1 ♀, Shushtar, 32°03'N 48°51'E, 25.iii-iv.1978, yellow trays, same; 1 ♀, Now Shahr, 36°39'N 51°31'E, iv.1978, yellow tray (S. H. Hodjat) (BMNH); 1 ♂, 1 ♀, Borujen, 31°59'N 51°18'E, Konark, 30°40'N 51°20'E, viii.1985, potato field (CIE) (BMNH).

Comment. Most of the Iranian specimens have a light antennal segment 3. This form was originally described as *B. brassicae* (Vasiljev) (HODKINSON, 1981).

Bactericera perrisii Puton

Recorded from Iran (ZI) (GEGECHKORI & LOGINOVA, 1990).

Material examined. Iran: 1 ♂, NW Iran, Qazvin, 24.vi.1970 (NMP-29); 2 ♂♂, 9 ♀♀, S Iran, 33 km S Sabzevaran, 17.v.1977 (NMP-335).

Bactericera striola (Flor)

Material examined. Iran: 1 ♂, 1 ♀, 5 5th instar larvae, Gach Sar, 36°07'N 51°19'E, 1770 m, 9.xi.1967, *Salix purpurea* (R-245).

Comment. The two adult specimens lack the dark clavus in the forewing.

Bactericera tremblayi (Wagner)

Material examined. Iran: 1♀, E Garmandar, 40 km NE Tehran, 13.xi.1962, on snow (R-206); 2 teneral ♂♂, many 5th instar larvae, Karaj, 35°48'N, 50°59'E, 1967, *Allium cepa* (Esmaeli) (R-228).

Bactericera trigonica Hodkinson

Recorded from Iran: Tehran; Ahvaz (HODKINSON, 1981).

Material examined. Iran: 1♀, N Iran, C. Elburz Kandavan Valley, 2545 m, 10-11.viii.1970 (NMP-86); 2♀♀, N Iran, C. Elburz, Kandavan Pass, 3000 m, 11.viii.1970 (NMP-87); 16♂♂, 38♀♀, N Iran, Kandavan Pass, S slope, 2700-2900 m, 4-9.vii.1977 (NMP-395); 5♂♂, 3♀♀, Tehran, v.1971, *Nasturtium* sp. (CIE) (BMNH); 3♂♂, same but on vegetables; 1♂, same but vii.1978, water trap (S. H. Hodjat); 1♂, Ahvaz, 2-4.ii.1978, yellow tray (V. F. Eastop), same.

Bactericera sp. A

Material examined. Iran: 4 ♂♂, N Iran, C. Elburz, Kuhha-ye Tu Chal, 3600-3900 m, 18-19.vii.1970 (NMP-61).

Comment. This probably undescribed species is close to *B. seselii* (Loginova) from which it differs in the less curved arched fore margin of the forewings, the darker body coloration and the obliquely truncate parameres which taper regularly in *B. seselii*. Without more material, it is not possible to determine this material.

Egeirotrioza Boselli

Comments. *Egeirotrioza* Boselli is heterogeneous in respect of adult and larval morphology and LOGINOVA (1976) subdivided it into the two subgenera, *Egeirotrioza* with 8 species and *Astutia* Loginova with 3 species. The former group is linked to host species of the subgenus *Turanga*, the latter develop on species of the subgenus *Populus*. MATHUR (1975) recorded *E. ceardi* (as *Trioza ceardi*) from Iraq, Pakistan and Tunisia, discussed the questionable synonymy of *Phylloplecta gardneri* Laing (with *E. ceardi*), and described two poplar feeding triozids from Pakistan: *Trioza bifurcata* and *T. longiantennata*.

According to LOGINOVA (1976), the subgenus *Egeirotrioza* is characterised by the presence of an apical metatibial process which bears one of the apical spurs (fig. 102) and the two subapical ventral teeth on the distal portion of the aedeagus. These characters are shared by *Trioza bifurcata* and *T. longiantennata*, which are closely related to other poplar feeding triozids. They are therefore transferred to *Egeirotrioza*: as *Egeirotrioza bifurcata* (Mathur) comb. n. and *E. longiantennata* (Mathur) comb. n.

In the absence of type material, MATHUR (1975) accepted HESLOP-HARRISON's (1946) synonymy of *Phylloplecta gardneri* with *E. ceardi*, but pointed out the striking

differences in the forewings shown in the descriptions of LAING (1930) and LOGINOVA-DUDYKINA & PARFENTIEV (1958). Examination of the types of *P. gardneri* (India: Punjab, Ghazighat, Multan, ex leaf galls on *Populus euphraticus* (R. N. Mathur) (BMNH)) confirmed the differences from *E. ceardi* mentioned by MATHUR (1975). In addition to the apically pointed forewings (rounded in *E. ceardi*), *P. gardneri* differs in the slightly larger body dimensions; in the antennal segment 3 which is about 3 times as long as segment 4 (2 times in *E. ceardi*); the male proctiger (fig. 108) which is evenly rounded posteriorly in basal half (concavely angular in *E. ceardi*); in the apically blunter female proctiger (fig. 117) and possibly also in the wider male parameres (fig. 112). The head (fig. 104) and aedeagus (fig. 99) are similar in the two species. These differences suggest that *P. gardneri* is a species distinct from *E. ceardi* and following new combination is proposed: *Egeirotrioza gardneri* (Laing) comb. n., stat. rev.

The subgenus *Egeirotrioza* comprises three species with lamellar parameres (*E. ceardi*, *E. gardneri* and *E. intermedia*), one species with quadrate parameres (*E. rufa*), and the remainder with more or less distinctly bifid parameres, having a shorter anterior and a longer posterior arm. This last group is again subdivided into a group with a rounded outer wing margin (*E. nigracapitata*, *E. verrucifera* and *E. cerina*), and one with a distinctly angular outer wing margin (*E. maculosa* and *E. gracilis*). *E. bifurcata* and *E. longiantennata* are, based on these characters, closest related to *E. maculosa* and *E. gracilis* from which they differ in the relatively longer anterior arm of the parameres.

RÜBSAAMEN (1902) described galls and larvae from *Populus euphratica* in Iran which he attributed to two unidentified species of Psylloidea. One was described by BERGEVIN (1926) as *Trioza ceardi*, the other is probably also referable to *Egeirotrioza* but more material is needed. Apart from *E. ceardi*, there are three new species represented in the Iranian material.

Egeirotrioza ceardi (Bergevin)

Recorded from Iran: SE Iran, Kerman, District Sirjan, Cheirabad, 30.ix.1892; Seidabad, 29°30'N 55°30'E, 30.ix.; Sarvestan, 9.x. (RÜBSAAMEN, 1902; HOUARD, 1922; BERGEVIN, 1926).

Material examined. Iran: many larvae and galls, Kerman, Kavir-e-Namak-e-Sirjan, W Sirjan, ix.1955, *Populus euphratica* (R-25, R-188) (MNHN, USNM); galls and 1st instar larvae, Saadatabad, N Shiraz, 12.iii.1967, *Populus diversifolia* (= *P. euphratica*) (R-203); several 5th instar larvae, 40 km N Dezful, 32°23'N 48°24'E, 28.x.1967, *Populus diversifolia* (R-235); 5♂♂, 3♀♀, Khuzestan, Ahvaz, Golestan, 25.ii.1978, *Populus euphratica* (V.F. Eastop) (VFE-15866) (BMNH).

Egeirotrioza corporosa sp. n. (Figs 95, 98, 102, 103, 107, 111, 115, 116)

Description. Adult. Coloration. Similar in both sexes. Head and thorax above light orange-yellowish, genal processes, lower head surface and thorax laterally and ventrally yellow. Antennae yellow, with segments 9 and 10 dark brown to black. Legs

yellow. Forewings membranous, transparent; veins yellow, membrane almost colourless. Hindwings whitish. Abdomen, depending on age, entirely greenish or yellowish, or with orange-yellowish dorsum.

Structure. Head (fig. 103), from above, slightly narrower than thorax; foveae forming very fine pits; genal processes conical, well-developed, blunt apically. Third antennal segment 2.9-3.8 times as long as segment 4. Forewing (fig. 95) narrow, outer margin angular; vein Rs almost straight, hardly curved towards fore margin in apical third. Metatibia with 1 + (1+2) apical spurs (fig. 102); outer spur on distinct process. Terminalia as in figs 98, 107, 111, 115, 116. Male proctiger with long narrow apical tube, broadly bulged posteriorly; paramere with a narrow, long, straight anterior process, and a long, apically weakly widened, slightly anteriorly curved posterior process; distal portion of aedeagus with two large ventral subapical hooks and a large triangular dorsal process; sclerotised end-tube of ductus ejaculatorius short, straight. Female proctiger with weakly convex dorsal margin, subacute, not particularly sclerotised apically; subgenital plate with short apical process; valvula ventralis with several large, strongly sclerotised teeth ventrally.

Measurements. (2♂♂, 2♀♀). HW 0.67-0.81; AL 1.25-1.48; WL 3.71-3.97; MP 0.37-0.39; PL 0.39-0.40; AEL 0.33-0.37; FP 0.54-0.56; ALHW 1.62-1.96; LLHW 0.40-0.44; TLHW 0.72-0.79; WLHW 4.86-4.93; WLW 2.77-2.93; MPHW 0.49-0.51; FPHW 0.67-0.72; FPC 4.24-4.54; FSP 1.68-1.73.

Larva unknown.

Holotype ♂, Iran: S Iran, 15 km NW Mian Jangal, 3.vi.1973 (NMP-224).

Paratypes. Iran: 12♂♂, 31♀♀, 1 adult without abdomen, same data as holotype; 6 adults, same data but (ZI); 2♂♂, 3♀♀, N Iran, Tehran - Evin, 1700 m, 13.iii.1973, garden (NMP-124); 2 adults, same data but (ZI); 1♀, SW Iran, Shushtar, 13.iv.1977 (NMP-287); 2♂♂, 2♀♀, Khuzestan, Ahvaz, 11-12.iv.1978, *Populus euphratica* (V. F. Eastop) (BMNH); 1♀, same but Golestan, 21.iv.1978.

Comment. Based on the bifid parameres and the apically pointed forewings, *E. corporosa* is closely related to *E. maculosa*, *E. gracilis*, *E. bifurcata* and *E. longiantennata*. It differs from the latter two species in the longer genal processes, from *E. bifurcata* and *E. maculosa* in the shorter female terminalia with a shorter apical process of the subgenital plate, and from *E. gracilis* in the posteriorly more produced male proctiger, and the longer anterior arm on the parameres. All the material at hand of *E. corporosa* is light coloured without dark patches or marks as described for *E. longiantennata*, *E. maculosa* and *E. gracilis*. More material is needed to judge if colour differences are constant.

Egeirotrioza gemina sp. n. (Figs 96, 100, 105, 109, 113, 118, 119)

Description. Adult. Coloration. Similar in both sexes; light yellowish, vertex and thoracic dorsum straw-coloured. Antennae yellow with light brown segments 9 and 10. Legs yellow, slightly darker that thorax laterally and ventrally. Forewings yellowish, membrane and veins concolourous; hindwings whitish, transparent. Abdomen depending on age greenish or yellowish.

Structure. Head (fig. 105), from above, slightly narrower than thorax; foveae forming coarse, deep pits; genal processes conical, well-developed; subacute apically. Third antennal segment 2.7-2.9 times as long as segment 4. Forewing (fig. 96) elongate, broadly rounded apically; veins Rs weakly sinuous; vein Cu_{1a} evenly curved in basal half. Metatibia with 1+3 or, rarely, 1+2 or 2+3 apical spurs; outer spur on distinct process. Terminalia as in figs 100, 109, 113, 118, 119. Male proctiger without apical tube and relatively straight posteriorly; paramere with short anterior arm and long, apically widened posterior arm which is weakly curved backwards; distal portion of aedeagus with two short ventral subapical hooks, weakly concave along dorso-apical margin; sclerotised end tube of ductus ejaculatorius short, straight. Female proctiger weakly sinuous dorsally, truncate and heavily sclerotised apically; subgenital plate with long apical process; valvula ventralis with a pair of indistinct ventral teeth; dorsal margin of valvula dorsalis weakly concave.

Measurements. (1♂, 1♀). HW 0.73-0.82; WL 3.14-3.60; MP 0.43; PL 0.43; AEL 0.38; FP 0.78; LLHW 0.34-0.35; TLHW 0.92-1.06; WLHW 4.28-4.36; WLW 2.27-2.41; MPHW 0.58; FPHW 0.94; FPC 4.70; FSP 1.33.

Larva unknown.

Holotype ♂, Iran: S Iran, 15 km NW Mian Jangal, 5.vi.1973 (NMP-224).

Paratypes. Iran: 4♂♂, 3♀♀, same data as holotype; 3 adults, same data but (ZI).

Comment. Based on the apically rounded forewings and the bifid parameres *E. gemina* is related to *E. nigracapitata*, *E. verrucifera*, *E. cerina*, and *E. justa* sp. n. described below. It differs from them in the apically truncate female proctiger and the very short anterior arm of the male paramere. Additionally it is separated from *E. justa* in the dark-yellow, apically broadly rounded forewings which are almost colourless and narrowly rounded in *E. justa*. Vein Cu_{1a} is more evenly rounded in the basal half in *E. gemina* than in *E. justa*.

Egeirotrioza justa sp. n. (Figs 97, 101, 106, 110, 114, 120, 121)

Description. Adult. Coloration. Similar in both sexes; greenish or light yellowish with slightly darker, straw-coloured vertex and thoracic dorsum. Antennae yellow with light brown segments 9 and 10. Legs yellow. Forewings transparent, whitish; veins slightly darker and more yellowish than membrane. Hindwings whitish. Abdomen light greenish or yellowish.

Structure. Head (fig. 106), from above, narrower than thorax; foveae forming coarse, deep pits; genal processes conical, well-developed, blunt apically. Third antennal segment 2.5 times as long as segment 4. Forewings (fig. 97) oblong-oval, narrowly rounded apically; vein Rs weakly sinuous, vein Cu_{1a} angularly rounded in basal half. Metatibia with 1+3 or, rarely 2+3 apical spurs; outer spur on distinct process. Terminalia as in figs 101, 110, 114, 120, 121. Male proctiger without apical tube, with almost straight posterior margin; paramere with a short anterior and a long apically strongly dilated posterior arm which is weakly curved backwards; distal

portion of aedeagus with a pair of short subapical, ventral teeth, and an almost straight apico-dorsal margin; sclerotised end tube of ductus ejaculatorius short, straight. Female proctiger with weakly convex dorsal margin, subacute and not heavily sclerotised apically; subgenital plate with long apical process; valvula ventralis with a pair of indistinct ventral teeth; dorsal margin of valula dorsalis strongly concave.

Measurements. (1♂, 1♀). HW 0.65-0.70; AL 1.06; WL 2.87-3.08; MP 0.44; PL 0.42; AEL 0.31; FP 0.50; ALHW 1.63; LLHW 0.42; TLHW 0.94-1.06; WLHW 4.40-4.43; WLW 2.51-2.52; MPHW 0.68; FPHW 0.72; FPC 4.74; FSP 1.20.

Fifth instar larva. Coloration (material preserved in alcohol). Dorsal surface ochreous with light brown thorax and two longitudinal stripes on abdomen. Eyes dark. Ventral surface yellow.

Structure. Oval in out-line, flattened and relatively ridgid dorsally, convex and soft ventrally. Fore margin of head with 1 dense, regular and 1-3 sparse, irregular rows of sectasetae. Antennae curved, indistinctly 6 to 7-segmented with 4 rhinaria, segment 3 large, strongly narrowing to apex. Humeral lobes on forewing pads pointed, long and narrow, reaching level of anterior half of eyes. Sectasetae of wing pads and abdominal margin forming a regular row of dense setae and a band of irregularly scattered setae. Tarsal arolium longer than claws, simple triangular, without pedicel or visible unguitractor. Outer circumanal pore ring consisting of a single row of pores. Ventral surface covered in very long simple setae.

Measurements. (2 larvae). AL 0.28-0.30; WL 1.01-1.11; BL 1.59-1.92; CPB 1.01-1.22; AWL 0.25-0.29; BBL 1.23-1.25; CPR 1.78-1.83.

Holotype ♂, Iran: S Iran, 15 km NW Mian Jangal, 5.vi.1973 (NMP-224).

Paratypes. Iran: 1♂, 2♀♀, 1 adult without abdomen, same data as holotype; 2 adults, same data but (ZI); 1♀, Ahwaz, 15.v.1977, *Populus diversifolia* (Gharib) (R-306).

Iraq: 1♂, Mosul, 1.vi.1968, *Populus euphratica* (H. E. Knopf) (BMNH); 1♀, same but 25.v.1968, ex galls on *Populus euphratica*; 1♀, Ninevah, Hammam-Al-Alil, 16.iv.1975, on current year's shoots of *Populus euphratica* (A. Al-Kinany) (BMNH).

Material not included in type series. Iran: many 5th instar larvae, Ahwaz, 15.v.1977, *Populus diversifolia* (Gharib) (R-306).

Comment. Adults of *E. justa* are similar to *E. nigracapitata*, *E. verrucifera*, *E. cerina* and *E. gemina* in the apically rounded forewings and the bifurcate male paramere but differ in the apically narrower forewings, the apically more dilated posterior arm of the paramere, and details of the male and female terminalia (see comments to *E. gemina*).

The larva is similar to *E. longiantennata* in the general body form, the long humeral lobes on the forewing pads and the simple circum anal ring. It differs in the slightly shorter humeral lobes and the shorter marginal sectasetae which form, in addition to the dense regular row, 1-3 sparse irregular rows.

Paratrioza lycii Loginova

Material examined. Iran: 3♀♀, NW Iran, Maku, 19-20.vi.1970 (NMP-25); 1 ♂, 110 km E Mashhad, 34°48'N 48°30'E, 13.v.1966, *Zygophyllum eurypterum* (R-220).

Paratrioza petiolata Loginova

Material examined. Iran: 1 ♀, SE Iran, Ghasemabad, Bampur Valley, 10 km E Bampur, W Iranshahr, 11-12.iv.1973 (NMP-157).

Trioza berbericola Loginova

Material examined. Iran: 5♂♂, 4♀♀, C. Iran, Quanat Marvan, 2850 m, 24-25.v.1977 (NMP-345).

Trioza chenopodii Reuter

Recorded from Iran (LAUTERER, 1982; BURCKHARDT, 1986b).

Material examined. Iran: 25♂♂, 41♀♀, SW Iran, Shushtar, 13.iv.1977 (NMP-287); 1♂, 1♀, Khuzestan, Ahvaz, 17.ii.1978, sweeping (V. F. Eastop) (BMNH); 5♂♂, 7♀♀, same but 26.ii.1978, *Chenopodium* sp. or *Atriplex* sp.; 2♂♂, 3♀♀, same but 10.iv.1978, sweeping; many ♂♂, ♀♀ and 5th instar larvae, Ahvaz, 25. xii.1963, *Beta vulgaris* (Chodjaï) (R-210) (MNHN, USNM); 1♂, Shiraz, Minassian, 13.x.1967 (NMP).

Comment. The material from Ahvaz constitutes the first record of *T. chenopodii* f. *autumnalis* from *Beta vulgaris* in nature, though the species was bred before, under laboratory conditions on *Beta* (LAUTERER, 1982). LAUTERER & ŠRÁMKOVÁ (1983) considered the possible pest status of this species on sugar beet.

Trioza dichroa Scott

Recorded from Iran (BURCKHARDT, 1986b).

Material examined. Iran: 4♂♂, 3♀♀, Khuzestan, Ahvaz, Golestan, 25.ii.1978, *Chenopodium* sp. or *Atriplex* sp. (V. F. Eastop) (BMNH); 5♂♂, 2♀♀, same but 12.iv.1978, *Atriplex* sp.

Trioza elaeagni Scott

Material examined. Iran: 1♂, S Iran, Kushk, N Masírí, 1800 m, 12.vi.1973 (NMP-237); 1♂, 1♀ (teneral), many 5th instar larvae, N Iran, Tehran, 1955, *Elaeagnus* sp. (R-177); 4♂♂, 3♀♀, many 5th instar larvae, 50 km W Shiraz, 22.x.1967, *Elaeagnus* sp. (R-230).

Trioza eurotiae Loginova

Material examined. Iran: 3♂♂, 5♀♀, Zardband, N Karaj, 15.x.1955, *Kochia cana* (R-211).

Comment. As in *T. chenopodii* and *dichroa*, the autumnal generation of *T. eurotiae* is characterised by shorter forewings and greyish general body coloration.

Trioza galii Förster

Material examined. Iran: 1♂, 2♀♀, Hamadan, 34°48'N 48°30'E, 15.v.1966, yellow pan tray (Klett) (R-222).

Trioza magnisetosa Loginova

Material examined. Iran: 4♂♂, 2♀♀, NW Iran, Marand, 20.vi.1970 (NMP-26); 2♂♂, 2♀♀, Taftan, Tamadan, 2100 m, 20.iv.1973 (NMP-167); 1♂, E Iran, Mohammadabad, 1600 m, 3-5.v.1973 (NMP-187); 2♂♂, 2♀♀, S Iran, Zagros, Yasuj, 16.vi.1973 (NMP-243).

Trioza neglecta Loginova

Recorded from Iran: NW Iran, Maku, 19.iv.1970 (NMP-25) (LOGINOVA, 1978a; GEGECHKORI & LOGINOVA, 1990).

Material examined. Iran, 3♂♂, NW Iran, Maku, 19-20.vi.1970 (NMP-25); 1♂, S Iran, Zagros, Yasuj, 16.vi.1973 (NMP-243).

Trioza cf. **remota** Förster

Material examined: Iran: 1 4th instar larva, 15 km NW Khorramabad, 33°30'N 48°20'E, 1650 m, 29.x.1967, *Quercus persica* (= *Quercus brantii* Lindley) (R-238); 1♀, same but 25 km W Khorramabad, 30.x.1967 (R-240).

Comments. The material at hand is insufficient for a definitive identification. It is possible that the specimens do not belong to the two described European oak-feeding triozids: *Trioza remota* Förster and *Trioza ilicina* (de Stefani). *Quercus brantii* is a deciduous shrub or small tree confined to E and SE Anatolia, the Syrian Desert, N Iraq, W and S Iran (HEDGE & YALTIRIK, 1982).

Trioza rumicis Löw

Material examined. Iran: many ♂♂, ♀♀ and larvae, road Gash Sar, N Karaj, 1900 m, 7.ix.1972, *Rumex scutatus* (R-247).

Trioza scottii Löw

Material examined. Iran: 2♂♂, many exuviae of 5th instar larvae, road of Shemshak, N Tehran, 2000 m, 4.xi.1955, *Berberis integerrima* (R-195); 1♂, Rudak, N Tehran, 2.v.1966, *Berberis* sp. (R-217).

Trioza urticae (Linnaeus)

Material examined. Iran: 11♂♂, 13♀♀, N Iran, 6 km E Zibar, 24-26.vi.1977 (NMP-382); 1♂, 3♀♀, 10 km N Polur, 35°52'N 52°03'E, 2850 m, 1.v.1962 (R-204); 2♂♂, 2♀♀, Now Shahr, 36°39'N 51°31'E, v.1978 (J. H. Hodjat) (BMNH); 1♂, same but 21.iii.1978, *Urtica dioica* (V. F. Eastop); 1♂, 3♀♀, same but, Mazandran, Now Shahr, 22-25.iii.1978, sweeping.

Trioza spp.

Comment. The following three lots of material represent additional species but cannot be identified in the absence of the taxonomically relevant males.

Material examined. Iran: 1♀, 2 larvae, 50 km SE Kerman, 20.vi.1955, *Hertia intermedia* (R-184) (MHNG, USNM).

Iran: 1♀, E Iran, Deh Bakri, 1700-1750 m, 30.iv-3.v.1973 (NMP-126); 1♀, C. Iran, Lalehzar, 2800 m, 24-30.v.1977 (NMP-347) .

Iran: 1♀, S Iran, Zagros, Yasuj, 16.vi.1973 (NMP-243).

BIOGEOGRAPHY

BACKGROUND

An aim of historical biogeography is the study of area interrelationships. These can be investigated with the techniques of cladistic biogeography (NELSON & PLATNICK, 1981; HUMPHRIES & PARENTI, 1986; HUMPHRIES, 1992) or panbiogeography (CRAW, 1988, 1989). The area relationships are derived from taxon cladograms in cladistic biogeography and from tracks, joining plotted distributions of taxa, in panbiogeography (BASTOW WILSON, 1991). In both approaches, most information is drawn from taxa endemic to the areas under consideration. However, in practice taxa often occur in more than one area. Different statistical methods exist to measure the degree of similarity among areas on the basis of number of shared taxa, but, as they are phenetic, they are of little use in investigating historical aspects. ROSEN (1985, 1988) introduced a parsimony analysis of endemicity (PAE) in which, by analogy with cladistic analysis, the shared presence (synapomorphies) of taxa (characters) is used to formulate hypotheses of historical relationships (phylogenies) of areas (taxa). This approach was used by CRACRAFT (1991) to analyse Australian areas of endemism on the basis of vertebrate distributions. ROSEN (1988) stressed that this method was experimental and CRACRAFT (1991) discussed its merits and limitations.

For continents or other large geographical units, the degree of endemism is often sufficiently high to use the methods of cladistic biogeography or panbiogeography. For smaller geographical units, such as Iran, this is often not possible due to the very low degree of endemism. Here we use PAE.

AREAS

PARSA (1978) subdivided Iran into nine biotic provinces (fig. 2), but without giving much detail on the criteria he chose for delimiting the areas. They correspond partly with the physical-geographical areas proposed by PETROV (1955). The geographical/geological (=historical) character makes these subdivisions useful units for analysis in historical biogeography and they are adopted here. Based on the study of the Iranian rodent fauna NERONOV (1976) proposed a similar zonation. For the following analyses 6 additional areas outside Iran were added: Turkey, the territory South of the Caucasus of the former USSR, Central Asia (Tadzhikistan, Uzbekistan and Kazakhstan), Afghanistan/Pakistan, the Arabian Peninsula, and Palestine (Israel, Lebanon and Syria). Mesopotamia was excluded owing to a lack of records.

TECHNIQUES

The presence/absence of species, genera, subfamilies and families in each of the 9 biotic Iranian provinces and the 6 regions outside Iran was coded in a matrix for analysis with PAUP 3.0 (SWOFFORD, 1989). The most parsimonious trees were selected using the heuristic search algorithm. Trees were rooted with an artificial "outarea" lacking taxa (Lundberg rooting).

Three sets of data were analysed:

Analysis 1: All species, genera, subfamilies and families known from Iran (= 131 taxa) with their occurrences in each of the areas inside Iran (fig. 122).

Analysis 2: Same taxa but with their occurrences in all of the areas inside and outside Iran (fig. 124).

Analysis 3: All known psyllid taxa occurring in the 9 areas within and the 6 areas outside Iran (= 492 taxa). The information is taken from following sources: BURCKHARDT & ÖNUÇAR (1993) (Turkey), GEGECHKORI & LOGINOVA (1990) (South Caucasus and Central Asia), HODKINSON (1986) (Afghanistan/Pakistan), BURCKHARDT (1986a) (the Arabian Peninsula) and BURCKHARDT & HALPERIN (1992) (Palestine). These sources were supplemented by material deposited in the MHNG (fig. 125).

For comparison the distributions of mammals were analysed based on the data in MISONNE (1960) using the classification of NOWAK (1991) (fig. 123).

DISCUSSION

Analysis 1 yielded 3 trees with following informations: tree length = 197, consistency index excluding uninformative characters = 0.504, retention index = 0.400. A strict consensus tree is illustrated in fig. 122. Analysis 2 yielded 1 tree (fig. 124) with following informations: tree length = 312, consistency index excluding uninformative characters = 0.389, retention index = 0.486. Analysis 3 yielded 9 trees with following informations: tree length = 743, consistency index excluding

uninformative characters = 0.472, retention index = 0.499. A strict consensus tree is illustrated in fig. 125. The analysis of the mammal data yielded 2 trees with following informations: tree length = 358, consistency index excluding uninformative characters = 0.495, retention index = 0.548. A strict consensus tree is illustrated in fig. 123.

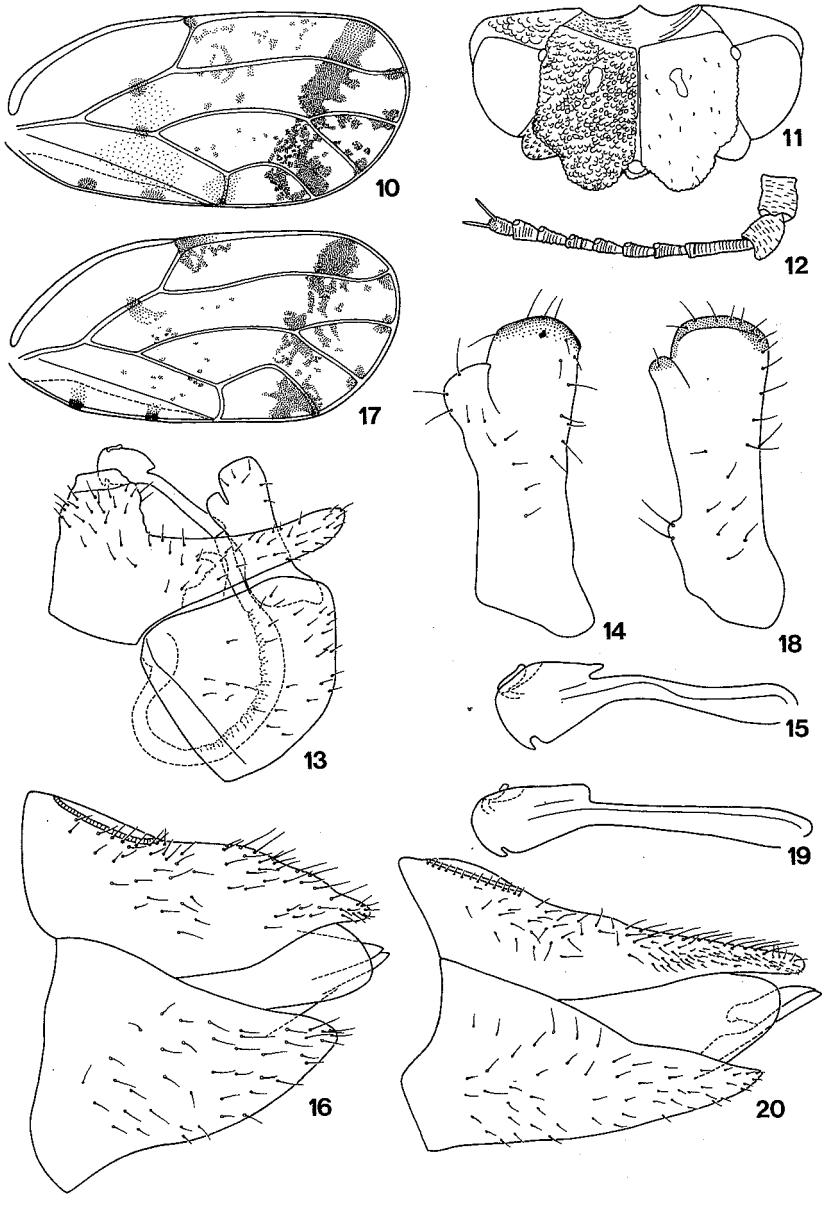
In all three cladograms derived from psyllid data (figs 122, 124, 125) the Caspian and Azerbaidzhanian regions occupy a relatively basal position; in analysis 2 they even form a monophyletic group. This is mainly due to the small number of species known from these areas. Similarly the sister group relationships of the South Caucasus and Central Asia is probably a result of the much better knowledge of the psyllid faunas of these areas compared to others; the number of recorded taxa is almost twice that known from Iran as a whole. The close relationships of the Elburzian and Lutian regions in all three analyses, grouped together with Turkey, South Caucasus and Central Asia in analyses 2 and 3 may indicate true historic relationships. The position of the remaining areas varies greatly in the three analyses and there is no congruence between any of them and the mammal cladogram (fig. 123).

The discrepancies between the four cladograms suggest that the psyllid data are insufficient. The PAE (performed with PAUP) is strongly dependant on similar levels of faunistic knowledge among the different regions which are compared. This is because shared absence of taxa is equally weighted as shared presence of taxa. In biogeography absence is however not "homologous", as it can be due to different histories. 1. A taxon may be lacking in an area because its ancestors did not inhabit the area. 2. A taxon may be lacking from an area even though ancesters occured there, as the species became extinct. 3. A taxon may occur in an area but has not yet been dicovered. Cladistic biogeography and panbiogeography are more robust as they depend only on presence of taxa.

Another problem is the delimitation of areas of endemism which could be solved with a better knowledge of the detailed distribution of all analysed taxa.

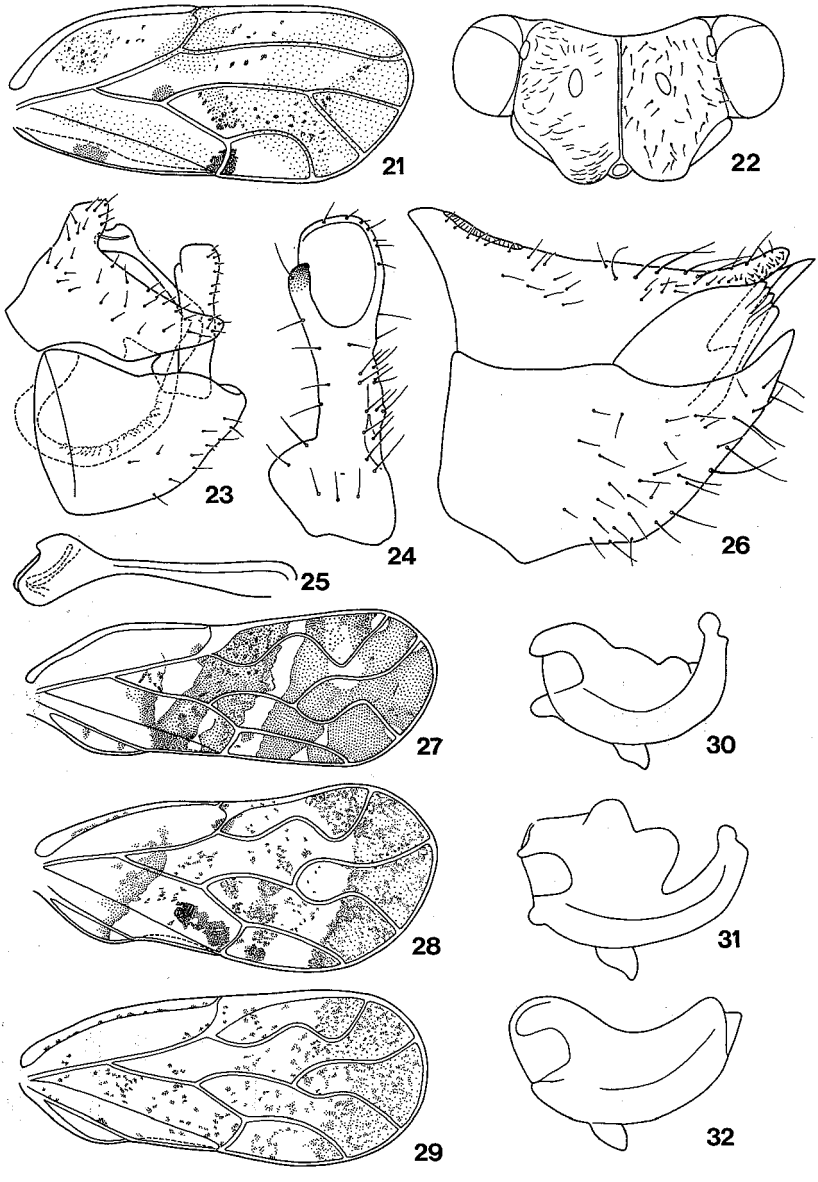
ACKNOWLEDGEMENTS

We thank G. Remaudière (MNHN), D. Hollis (BMNH), I. Kerzhner (ZI), L. Russell (USNM) and J. Dlabola (NMP) for the loan of material, and I. D. Hodkinson (JMUL), G. Remaudière, L. Russell and S. H. Hodjat (Tehran) for comments on material, localities and/or the manuscript draft. We are grateful to G. Roth (MHNG) for inking the drawings, to A. Scherrer (MHNG) for the diagrams and to J. Wüest (MHNG) for preparing the SEM pictures. The stay of the junior author at the MHNG, where parts of the study were prepared, was partly funded by a grant from the Swiss National Science Foundation (Coopération avec des Etats de l'Europe de l'Est; grant no 70TK-031544) which is gratefully acknowledged.



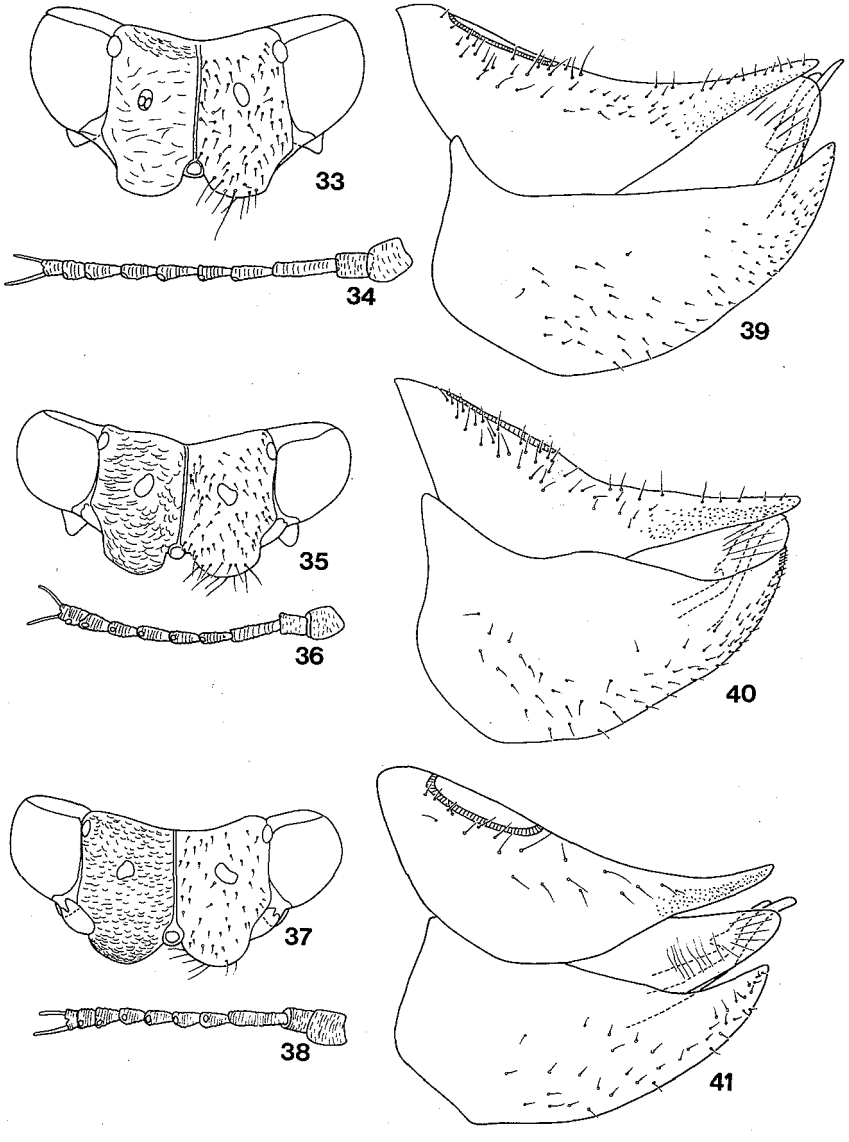
FIGS 10-20

Aphalara spp.; 10-16, *A. loginovae*; 17-20, *A. grandicula*. 10, 17, Forewing; 11, head, dorsal view: 12, antenna; 13, male terminalia in profile; 14, 18, inner aspect of male paramere; 15, 19, distal portion of aedeagus; 16, 20, female terminalia in profile.



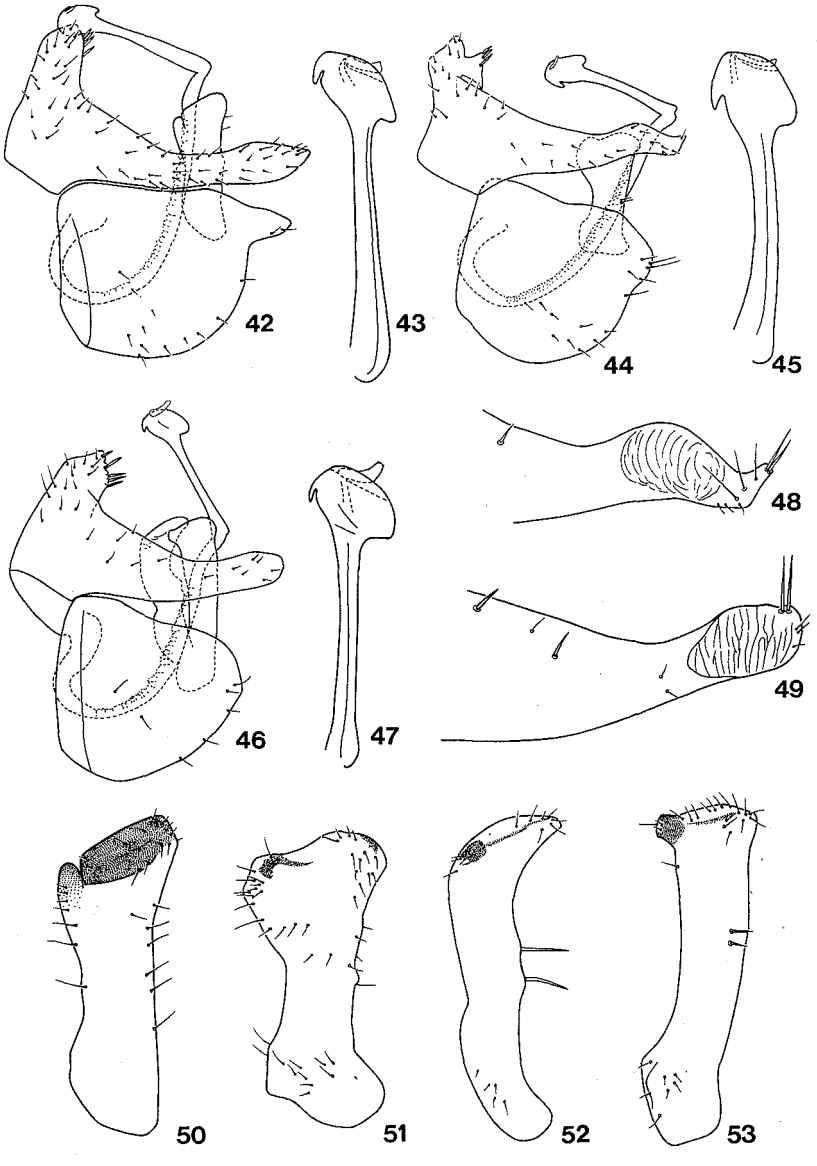
FIGS 21-32

21-26, *Brachystetha loginovae*; 27-32, *Colposcenia* spp.; 27, 30, *Colposcenia agnata*; 28, 31, *C. cavillosa*; 29, 32, *C. paula*. 21, 27-29, Forewing; 22, head, dorsal view; 23, male terminalia, in profile, 24, inner aspect of male paramere; 25, distal portion of aedeagus; 26, female terminalia, in profile; 30-32, metacoxae.



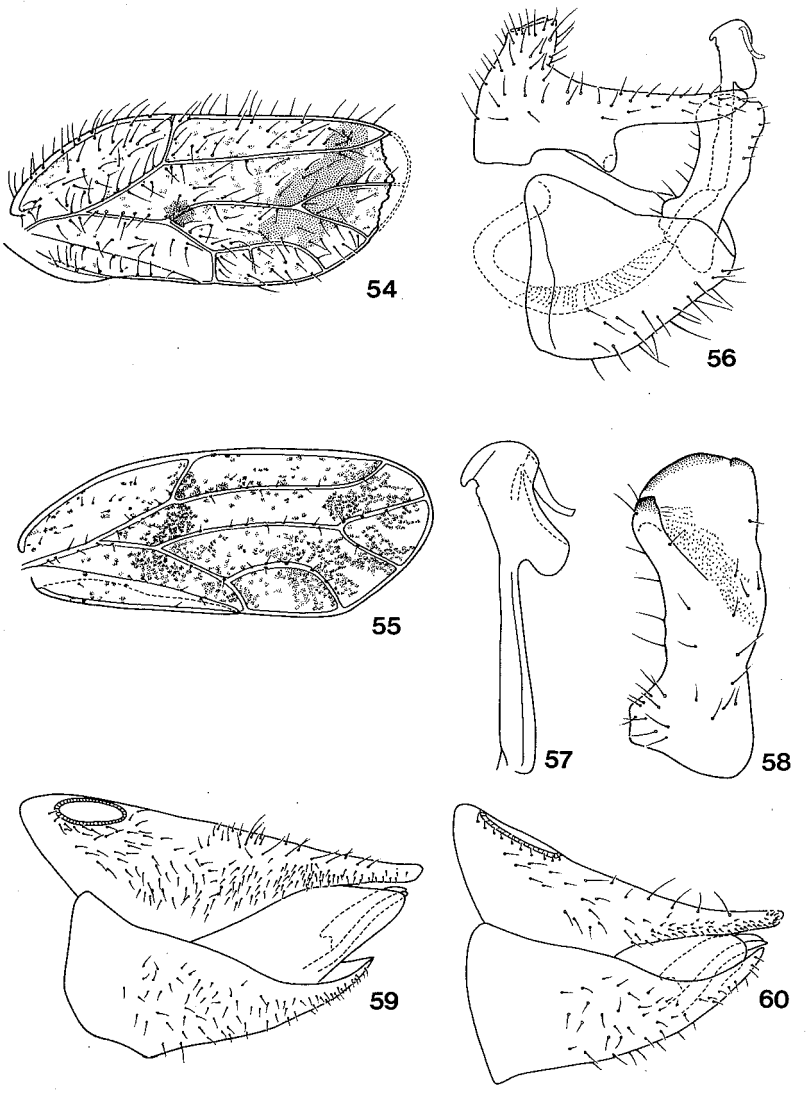
FIGS 33-41

Colposcenia spp.; 33, 34, 39, *C. agnata*; 35, 36, 40, *C. cavillosa*; 37, 38, 41, *C. paula*. 33, 35, 37, Head, dorsal view; 34, 36, 38, antenna; 39-41, female terminalia, in profile.



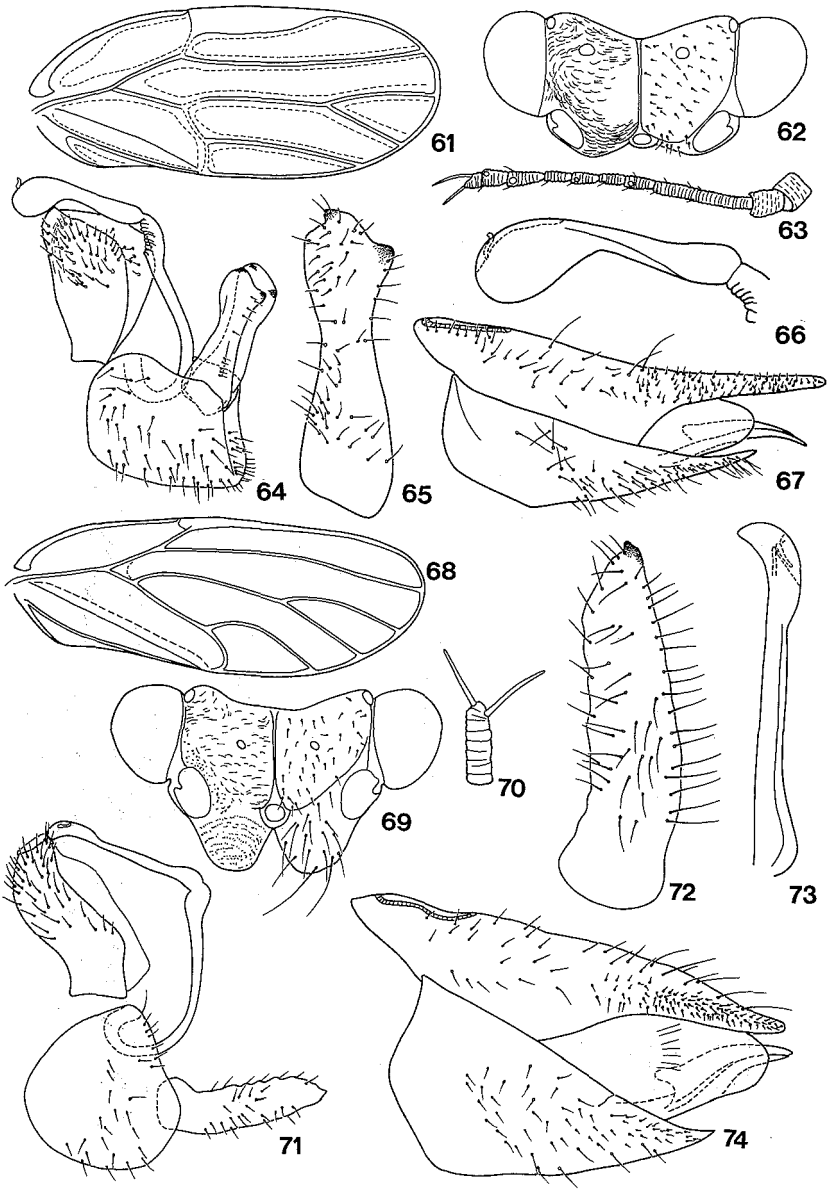
FIGS 42-53

Colposcenia spp.; 42, 43, 50, *C. agnata*; 44, 45, 48, 51, *C. cavillosa*; 46, 47, 49, 52, 53, *C. paula*. 42, 44, 46, Male terminalia, in profile; 43, 45, 47, distal portion of aedeagus; 48, 49, apex of inner surface of posterior lobes of male proctiger; 50-52, inner surface of male paramere; 53, male paramere, antero-interior view.



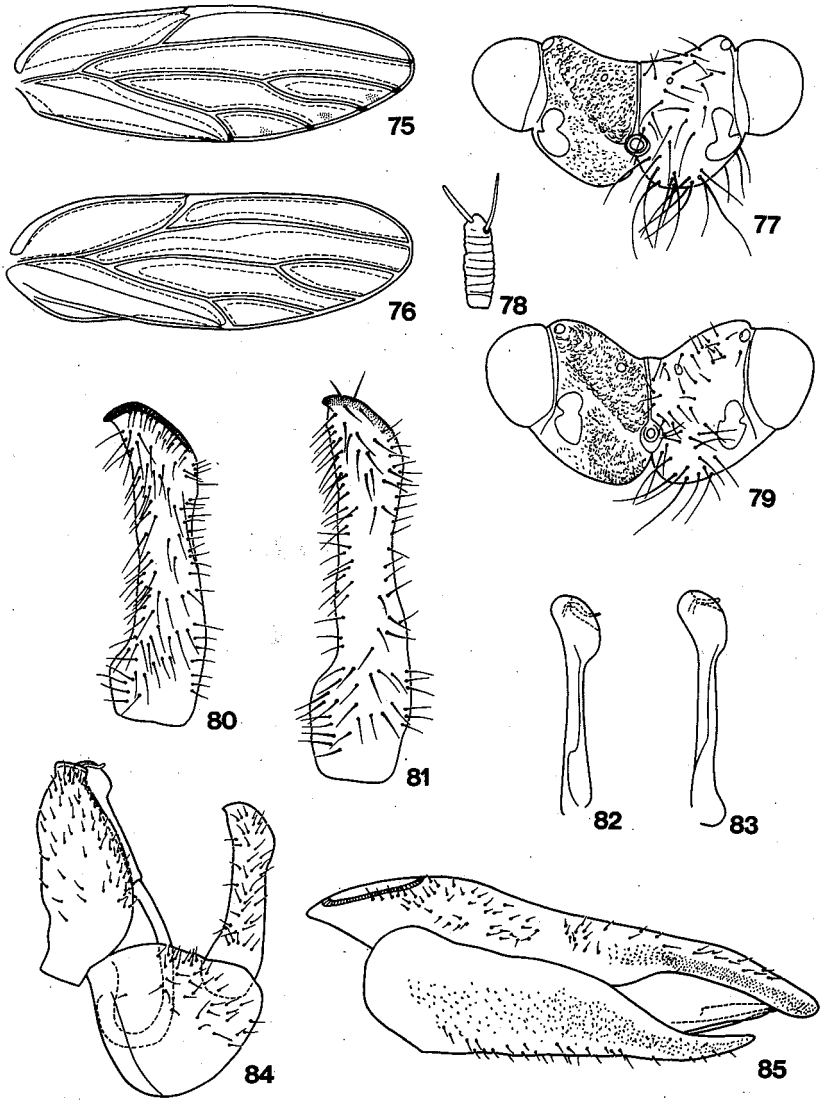
FIGS 54-60

Craspedolepta spp.; 54, 56-59, *C. remaudierei*; 55, 60, *Craspedolepta* sp. A. 54, 55, Forewing; 56, male terminalia, in profile; 57, distal portion of aedeagus; 58, inner surface of male paramere; 59, 60, female terminalia, in profile.



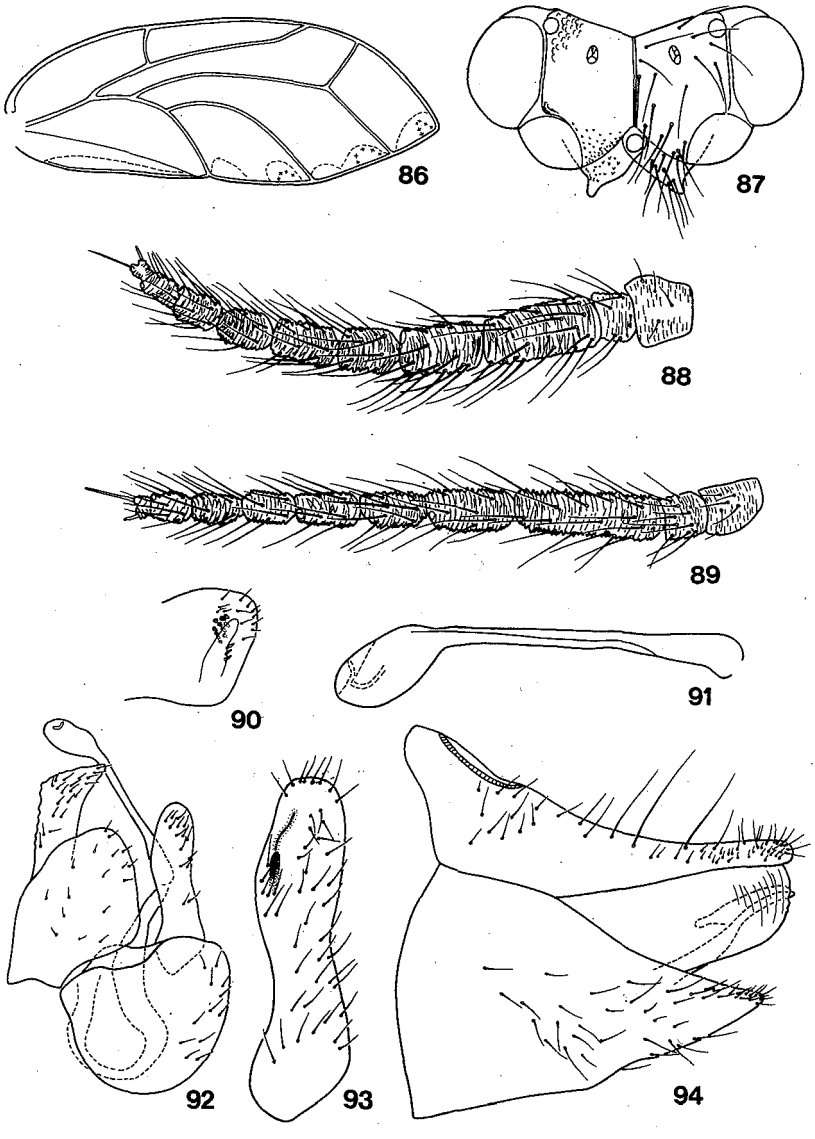
FIGS 61-74

61-67, *Camaroscena unicolor*; 68-74, *Cacopsylla iranica*. 60, 68, Forewing; 62, 69, head, dorsal view; 63, antenna; 64, 71, male terminalia, in profile; 65, 72, inner surface of male paramere; 66, 73, distal portion of aedeagus; 67, 74, female terminalia, in profile; 70, antennal segment 10.



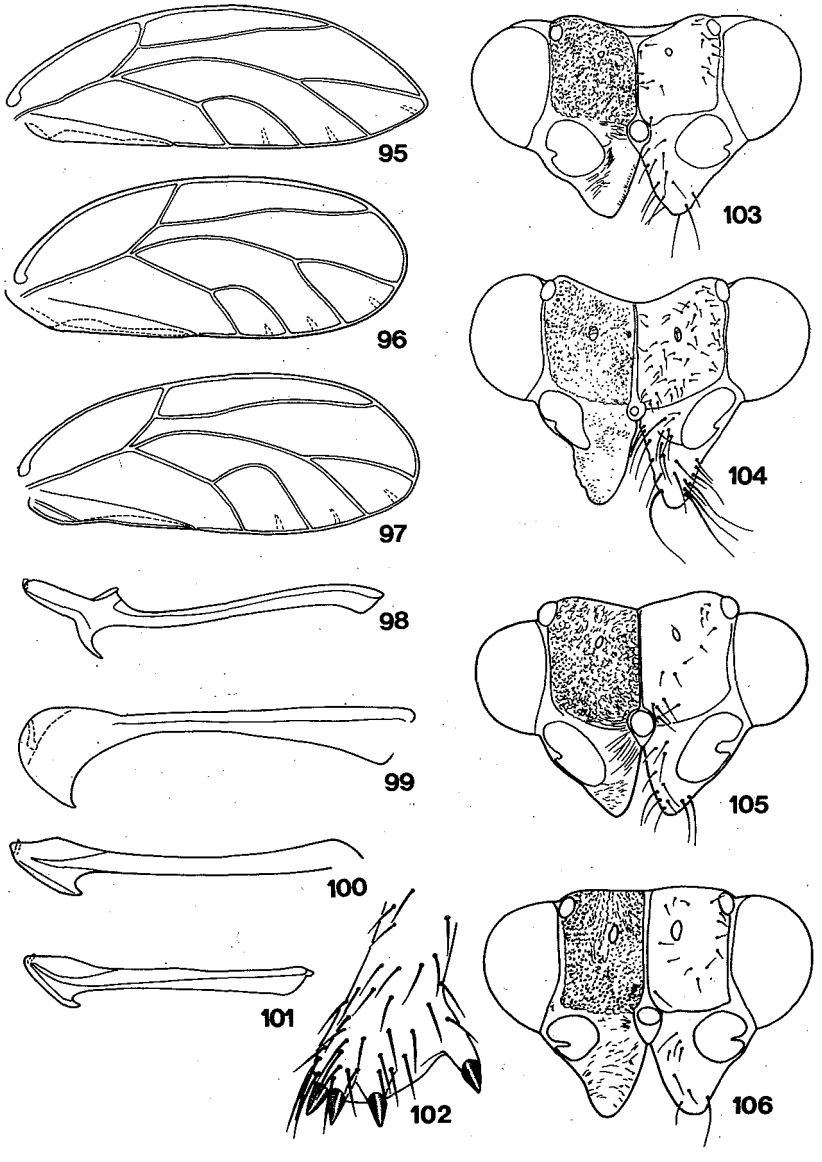
FIGS 75-85

Spanioneura spp.; 75, 77, 78, 80, 82, 84, 85, *S. persica*; 76, 79, 81, 83, *S. turkiana*. 75, 76, Forewing; 77, 79, head, dorsal view; 78, antennal segment 10; 80, 81, inner surface of male paramere; 82, 83, distal portion of aedeagus; 84, male terminalia, in profile; 85, female terminalia, in profile.



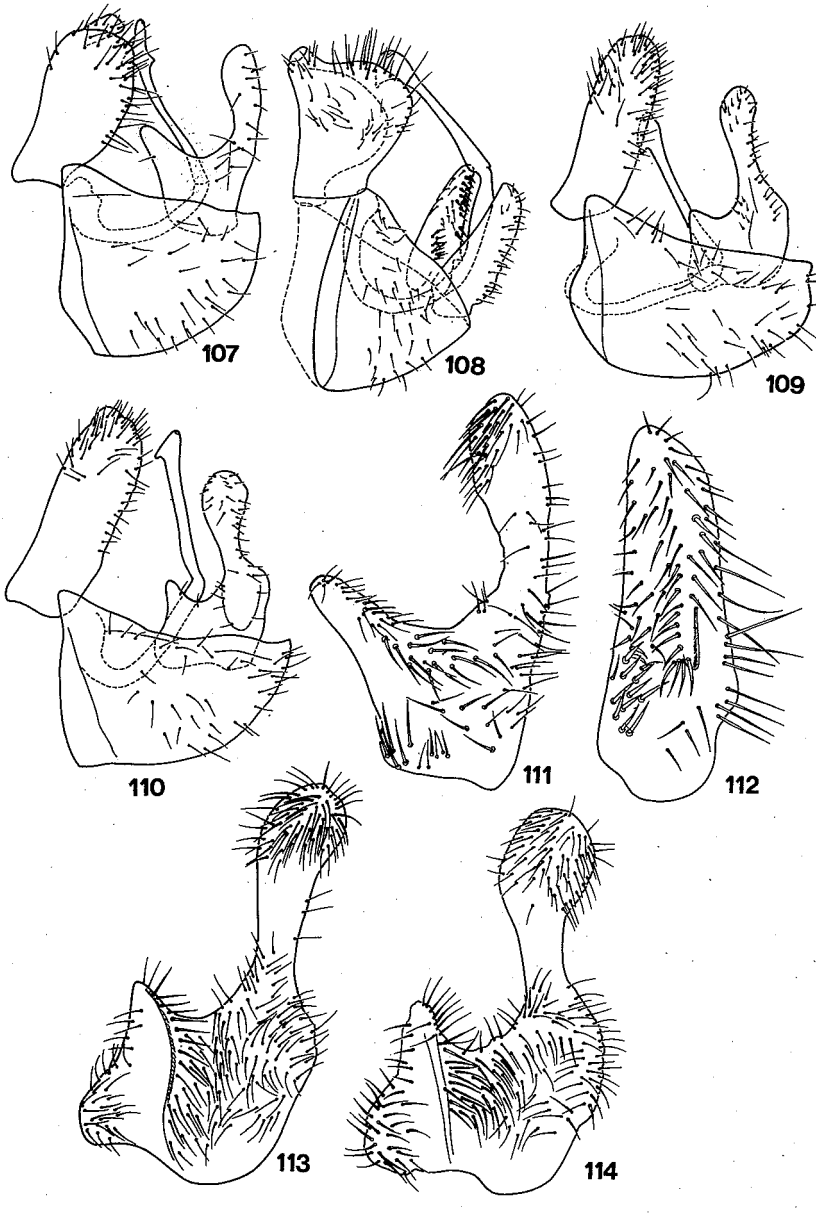
FIGS 86-94

Homotoma spp.; 86-88, 90-94, *H. caroliquarti*; 89, *H. ficus*. 86, Forewing; 87, head, dorsal view; 88, 89, antenna; 90, inner surface of posterior lobe of male proctiger; 91, distal portion of aedeagus; 92, male terminalia, in profile; 93, inner surface of male paramere; 94, female terminalia, in profile.



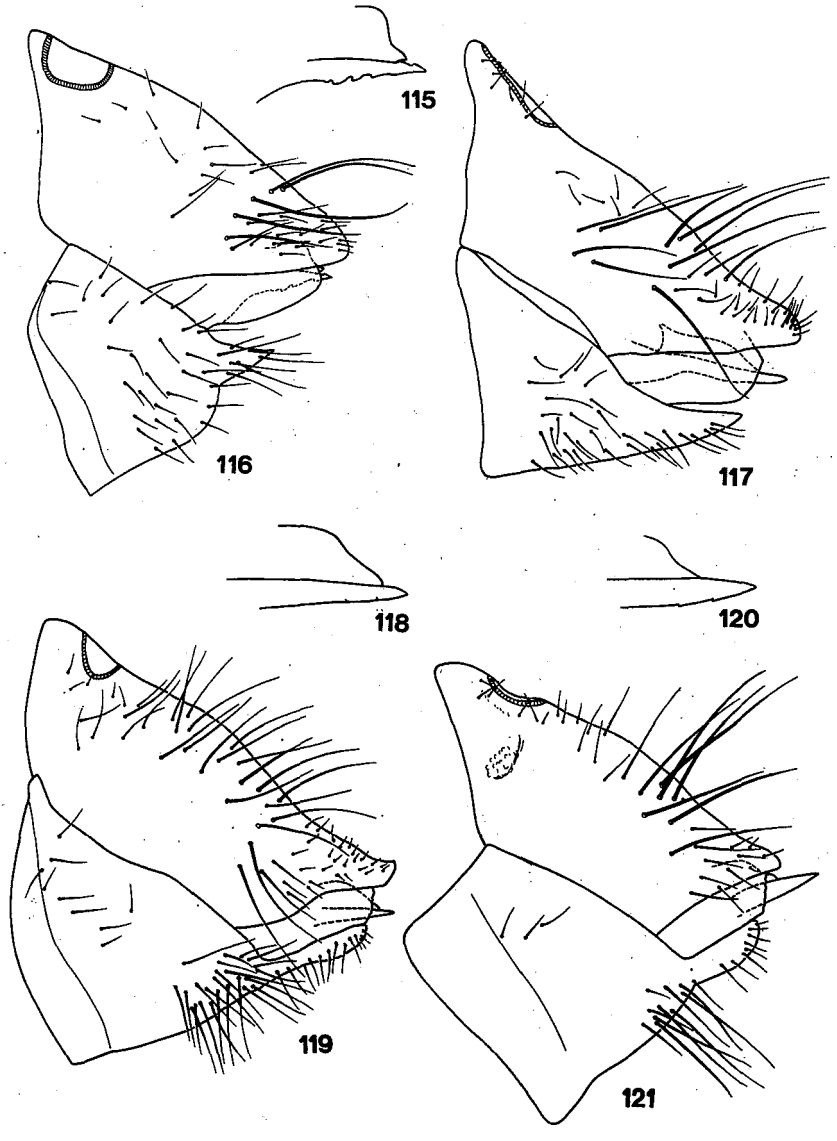
FIGS 95-106

Egeirotrioza spp.; 95, 98, 102, 103, *E. corporosa*; 96, 100, 105, *E. gemina*; 97, 101, 106, *E. justa*; 99, 104, *E. gardneri*. 95-97, Forewing; 98-101, distal portion of aedeagus; 102, apex of metatibia; 103-106, head, dorsal view.



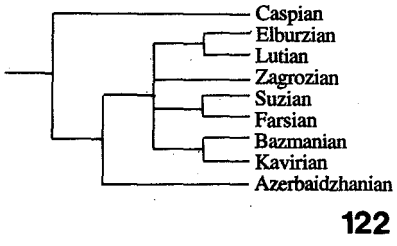
FIGS 107-114

Egeirotrioza spp.; 107, 111, *E. corporosa*; 108, 112, *E. gardneri*; 109, 113, *E. gemina*; 110, 114, *E. justa*. 107-110, Male terminalia, in profile; 111-114, inner surface of male paramere.



FIGS 115-121

Egeirotrioza spp.; 115, 116, *E. corporosa*; 117, *E. gardneri*; 118, 119, *E. gemina*; 120, 121, *E. justa*. 115, 118, 120, valvulae 1 and 2; 116, 117, 119, 121, female terminalia, in profile.



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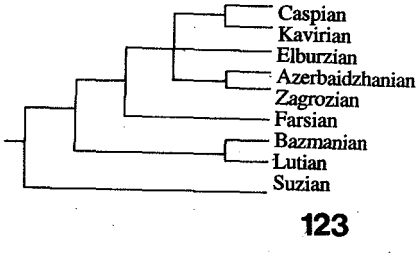

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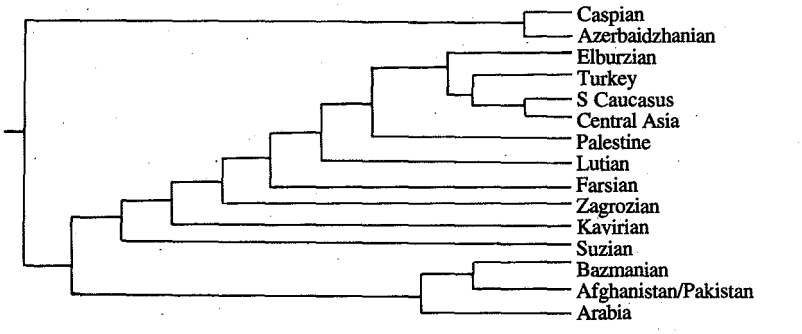

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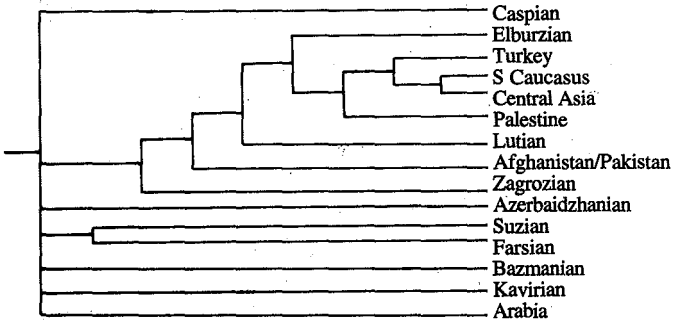

125

FIGS 122-125

Cladograms for 9 areas of endemism in Iran and 6 regions outside Iran (see text for details); 122, analysis 1: all psyllid taxa from Iran; 123, mammal distributions in Iran according to MISONNE (1960) and NOWAK (1991); 124, analysis 2: psyllid taxa from Iran with their occurrences inside and outside Iran; 125, analysis 3: all psyllid taxa from the Middle East.

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APPENDIX 1.

Host plant list of Iranian psyllids.

Agonoscena bimaculata Mathur	*Pistacia khinjuk, P. mutica* (Anacardiaceae)
Agonoscena pegani Loginova	*Peganum harmala* (Zygophyllaceae)
Agonoscena pistaciae Burckhardt & Lauterer	*Pistacia atlantica, P. mutica, P. palaestina, P. terebinthus, P. vera* (Anacardiaceae)
Aphalara loginovae sp. n.	unknown
Aphalara polygoni Förster	*Polygonum tomentosum, P. amphibium, P. hydropiper, P. lapathifolium, P. persicariae* (Polygonaceae)
Bactericera albiventris (Förster)	*Salix* spp. (Salicaceae)
Bactericera ligulariae (Loginova)	*Ligularia thomsonii* (Asteraceae)
Bactericera nigricornis (Förster)	polyphagous
Bactericera perrisii Puton	*Artemisia* spp. (Asteraceae)
Bactericera striola (Flor)	*Salix* spp. (Salicaceae)
Bactericera tremblayi (Wagner)	*Allium* spp. (Liliaceae), possibly polyphagous
Bactericera trigonica Hodkinson	probably *Daucus carota* (Apiaceae)
Brachystetha loginovae Baeva & Alexeev	*Zygophyllum* sp., *Halimiphyllum* sp. (Zygophyllaceae)
Cacopsylla bidens (Šulc)	*Pyrus communis, P. pyraster, P. syriaca* (Rosaceae)
Cacopsylla crataegi (Schrank)	*Crataegus* spp. (Rosaceae)
Cacopsylla incerta (Loginova)	*Rhamnus* spp. (Rhamnaceae)

Cacopsylla iranica sp. n.	unknown
Cacopsylla notata (Flor)	*Pyrus communis, P. amygdaliformis, P. elaeagnifolia* (Rosaceae)
Cacopsylla permixta Burckhardt & Hodkinson	*Pyrus communis, P. elaeagnifolia, P. salicifolia* (Rosaceae)
Cacopsylla pruni (Scopoli)	*Prunus* spp. (Rosaceae)
Cacopsylla pyri (Linnaeus)	*Pyrus communis, P. elaeagnifolia* (Rosaceae)
Cacopsylla pyricola (Förster)	*Pyrus communis, P. pyraster* (Rosaceae)
Cacopsylla pyrisuga (Förster)	*Pyrus communis, P. amygdaliformis, P. salicifolia* (Rosaceae)
Cacopsylla saliceti (Förster)	*Salix* spp. (Salicaceae)
Cacopsylla suturalis (Horvath)	*Rhamnus* spp. (Rhamnaceae)
Caillardia accola Loginova	*Haloxylon persicum* (Chenopodiaceae)
Caillardia azurea Loginova	*Haloxylon aphyllum, H. persicum* (Chenopodiaceae)
Caillardia dilatata Loginova	*Hammada elegans, H. salicornia, H.* sp. (Chenopodiaceae)
Caillardia inedita Loginova	*Haloxylon aphyllum, H. persicum* (Chenopodiaceae)
Caillardia robusta Loginova	*Haloxylon persicum, H. annodendron* (Chenopodiaceae)
Camarotoscena fulgidipennis Loginova	*Populus* ? *pyramidalis* (Salicaceae)
Camarotoscena hoberlandti (Vondráček)	*Populus* spp. (Salicaceae)
Camarotoscena unicolor Loginova	*Populus diversifolia, P. pruinosa* (Salicaceae)
Colposcenia agnata sp. n.	unknown
Colposcenia aliena (Löw)	*Tamarix* spp. (Tamaricaceae)
Colposcenia cavillosa sp. n.	unknown
Colposcenia elegans (Bergevin)	*Tamarix* sp. (Tamaricaceae)
Colposcenia kiritshenkoi Loginova	*Tamarix smyrnensis, T. ramosissima* (Tamaricaceae)
Colposcenia paula sp. n.	unknown
Colposcenia vicina Loginova	*Tamarix hispida, T. ramosissima* (Tamaricaceae)
Craspedolepta bulgarica Klimaszewski	*Achillea* spp. (Asteraceae)
Craspedolepta convexa Baeva	*Artemisia glandulifera, A. kochiiformis* (Asteraceae)
Craspedolepta pontica Dobreanu & Manolache	*Achillea* spp. (Asteraceae)
Craspedolepta remaudierei sp. n.	possibly *Artemisia cina* (Asteraceae)
Craspedolepta tadzhikistanica Baeva	*Artemisia baldschuanica* (Asteraceae)
Crastina myricariae Loginova	*Myricaria bracteata* (Tamaricaceae)
Crastina tamaricina Loginova	*Tamarix ramosissima, T. smyrnensis* (Tamaricaceae)
Cyamophila astragalicola (Gegechkori)	*Astragalus* sp. (Fabaceae)
Cyamophila coluteae (Baeva)	*Colutea* spp. (Fabaceae)
Cyamophila glycyrrhizae (Becker)	*Glycyrrhiza glabra, G. uralensis* (Fabaceae)
Cyamophila oshanini (Loginova)	*Halimodendron halodendron* (Fabaceae)
Diaphorina aegyptiaca Puton	*Cordia* spp. (Ehretiaceae)
Diaphorina chobauti Puton	*Convolvulus* spp. (Convolvulaceae)
Diaphorina enormis Loginova	unknown
Diaphorina luteola Loginova	unknown
Diaphorina lycii Loginova	*Lycium* spp. (Solanaceae)
Diaphorina tamaricis Loginova	*Tamarix* sp. (Tamaricaceae)
Diaphorina zygophylli Loginova	*Zygophyllum* spp., *Halimiphyllum* spp. (Zygophyllaceae)
Euphyllura straminea Loginova	*Olea europaea* (Oleaceae)

Eremopsylloides amirabilis Loginova	*Calligonum* sp. (Chenopodiaceae)
Egeirotrioza ceardi (Bergevin)	*Populus pruinosa, P. diversifolia* (Salicaceae)
Egeirotrioza corporosa sp. n.	possibly *Populus diversifolia* (Salicaceae)
Egeirotrioza gemina sp. n.	unknown
Egeirotrioza justa sp. n.	*Populus diversifolia* (Salicaceae)
Homotoma caroliquarti sp. n.	possibly *Ficus* sp., *F. carica* (Moraceae)
Homotoma ficus (Linnaeus)	*Ficus carica* (Moraceae)
Livia juncorum (Latreille)	*Juncus* spp. (Juncaceae)
Megagonoscena viridis (Baeva)	*Pistacia mutica, P. palaestina, P. terebinthus, P. vera* (Anacardiaceae)
Pachypsylloides errator Loginova	*Calligonum caput-medusae, C. arborescens* (Chenopodiaceae)
Paratrioza lycii Loginova	*Lycium ruthenicum* (Solanaceae)
Paratrioza petiolata Loginova	*Lycium depressum* (Solanaceae)
Psyllopsis fraxini (Linnaeus)	*Fraxinus* spp. (Oleaceae)
Psyllopsis machinosus Loginova	*Fraxinus* spp. (Oleaceae)
Psyllopsis repens Loginova	*Fraxinus oxycarpa* (Oleaceae)
Psyllopsis securicola Loginova	*Fraxinus oxycarpa* (Oleaceae)
Rhodochlanis bicolor (Scott)	*Petrosimonia* spp., *Salicornia* spp., *Salsola* spp., *Suaeda* spp. (Chenopodiaceae)
Spanioneura persica sp. n.	unknown
Trioza berbericola Loginova	*Berberis vulgaris, B. orientalis, B. iberica* (Berberidaceae)
Trioza chenopodii Reuter	*Atriplex* spp., *Beta* sp., *Chenopodium* spp., *Halimione* sp., *Spinacia* sp. (Chenopodiaceae)
Trioza dichroa Scott	*Atriplex tatarica* (Chenopodiaceae)
Trioza elaeagni Scott	*Elaeagnus angustifolia* (Elaeagnaceae)
Trioza eurotiae Loginova	*Eurotia ceratoides* (Chenopodiaceae)
Trioza galii Förster	*Galium* spp. (Rubiaceae)
Trioza magnisetosa Loginova	*Elaeagnus angustifolia* (Elaeagnaceae)
Trioza neglecta Loginova	*Elaeagnus angustifolia* (Elaeagnaceae)
Trioza remota Förster	deciduous *Quercus* spp. (Fagaceae)
Trioza rumicis Löw	*Rumex scutatus, R. alpestris* (Polygonaceae)
Trioza scottii Löw	*Berberis* spp. (Berberidaceae)
Trioza urticae (Linnaeus)	*Urtica* spp. (Urticaceae)