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ADDITIONS TO THE SICILIAN PSYLLID FAUNA (Homoptera Psylloidea)

SUMMARY

The occurrence in Sicily of the following species of Homoptera Psylloidea is discussed for the first time: Camarotoscena speciosa (Flor), Lisronia varicicosta (Hodkinson & Hollis), Arytainilla hakani Loginova and Cacopsylla bidens (Sulc). A fifth species, not known in Italy up to now and collected on willows in various Sicilian localities, is here dubiously ascribed to Bactericera silvarnis (Hodkinson). Some taxonomic and biological details are given on the following species of Arytaininae, already directly or undirectly known for the Sicilian fauna: Arytaina africana Heslop-Harrison (previously reported in the Island, under its synonymous Arytaina maculata (Löw) Spanish form), Arytaina adenocarpi Löw (erroneously reported as Arytaina maculata (Löw) Hungarian form) and Livilla siciliensis Hodkinson & Hollis. On the base of recent findings and study of type material, morphological and biological details are given on the latter species, and its true type locality (which was incompletely reported in the original description) is defined.

RIASSUNTO

Nuovi reperti sulla psillidofauna siciliana. Viene commentata per la prima volta la presenza in Sicilia delle seguenti specie di Omotteri Psilloidei: Camarotoscena speciosa (Flor), Lisronia varicicosta (Hodkinson & Hollis), Arytainilla hakani Loginova e Cacopsylla bidens (Sulc). Una quinta specie, fino ad oggi non nota per la fauna italiana e raccolta su salici in varie località siciliane, viene qui attribuita con dubbio a Bactericera silvarnis (Hodkinson). Si forniscono inoltre alcuni approfondimenti tassonomici e biologici sulle seguenti specie di Arytaininae, già direttamente o indirettamente note per la fauna siciliana: Arytaina africana Heslop-Harrison (in precedenza riportata per l'Isola quale Arytaina maculata (Löw) forma spagnola, di cui è sinonimo), Arytaina adenocarpi Löw (già erroneamente indicata come Arytaina maculata (Löw) forma ungherese) e Livilla siciliensis Hodkinson & Hollis. Di quest'ultima specie, sulla base di recenti rinvenimenti e dell'analisi del materiale tipico, viene precisata la località tipica, che era definita in modo controverso nella sua descrizione originale, rispetto alla quale si forniscono anche brevi precisazioni morfologiche e biologiche.

Introduction

During the XV Italian Congress of Entomology, a list was provided with 59 species of Homoptera Psylloidea known at that time for the Sicilian fauna (RAPISARDA, 1988b). Afterwards, little changes have been indirectly made to the above list, due to a different taxonomic arrangement of some species. Among the Aphalaridae, the Sicilian material previously ascribed to Livia crefeldensis Mink has been better determined as L. mediterranea Loginova (RAPISARDA, 1991), while Rhodochlanis hodkinsoni Conci & Tamanini and Strophingia hispanica Hodkinson & Hollis have been respectively synonymized with R. salsolae (Lethierry) (Buckhardt, 1989) and S. proxima Hodkinson & Hollis (Conci et al., 1993). As to the Psyllidae, the louse living on Rhamnus alaternus L., and indicated as Cacopsylla euxina Loginova in the mentioned list, is to be named C. myrthi (Puton), due to synonymy (Burckhardt, 1989; RAPISARDA, 1989). Within the Triozidae, the occurrence in Sicily of Trioza achilleae Wagner (reported in the previous list) has been recently reconsidered, together with the taxonomic arrangement of the whole T. abdominalis Flor complex (Conci et al., 1993).

Further additions have to be made to the previous list as a consequence of recent findings of nine more species in the territory. Some of these records have been already treated in distinct notes; this is the case of *Livilla retamae* (Puton) (Conci & Tamanini, 1988), *Acizzia hollisi* Burckhardt (Conci & Tamanini, 1989), *Heterotrioza concii* Rapisarda (Rapisarda, 1990) and *Trioza soniae* Rapisarda (Rapisarda, 1994). All remaining additions to the present status of the Sicilian psyllid fauna are discussed in the present paper.

New or interesting findings

Camarotoscena speciosa (Flor, 1861)

Populus sp. - Polizzi Generosa (PA), loc. Puccia, m 1000, 14.IX.1981 (1 Q), leg. A. Carapezza.

An Euromiddleasiatic species, living on *Populus* spp. and causing showy galls on these plants, by rolling up the margin of the leaves. Its occurrence in Italy was known till now only in the Northern part of the Country, where the psyllid was recorded since the last century (Ferrari, 1888). Thus, the record for Sicily is the first one of *C. speciosa* for the whole Central and Southern Italy. The life-cycle of this species is not completely understood, at moment; it seems to perform in Italy two yearly generations, overwintering as adult.

Descriptions. Adult: Dobreanu & Manolache (1962: 72-75, figs 34-37);

Hodkinson & White (1979: 22, figs 15-18). Nymph: White & Hodkinson (1982: 15, figs 24-26).

Lisronia varicicosta (Hodkinson & Hollis, 1981)

Cistus salvifolius L. - Vittoria (RG), Pineta, m 100, 3.V.1990 (4 oro, 4 QQ, 2 nymphs), leg. C.R.

Oligophagous on Cistaceae of the genera *Cistus* L., *Helianthemum* Miller and *Tuberaria* (Dunal) Spach and widespread in the Mediterranean Region (Algeria, France, Greece, Israel, Italy, Portugal, Spain, Turkey) (Burckhardt & Lauterer, 1989; Burckhardt & Halperin, 1992; Burckardt & Önucar, 1993). Its occurrence in Italy has been firstly recorded in Liguria, Apulia and Sardinia (Rapisarda, 1987); subsequently, it has been found also in Tuscany, by Prof. C. Conci. It probably has a monovoltine life-cycle and overwinters as egg or nymph, with adults flying in May.

Descriptions. Adult: Hodkinson & Hollis (1981: 66-68, figs 1-14). Nymph: Rapisarda (1987: 62-63, figs 3-4).

Arytaina africana Heslop-Harrison, 1951

Arytaina maculata (Löw, 1886) Spanish form (sensu Hodkinson & Hollis, 1987), Syn.n.

Cytisus villosus Pourret - Longi (ME), Barillà, m 1300, 14.VI.1984 (2 ♂で, 9 ♀♀); Milo (CT), m 650, 29.VI.1984 (2 ♂で, 3 ♀♀), 10.VII.1985 (4 ♂で, 3 ♀♀, 4 nymphs), 22.IV.1986 (1 ♀, 1 nymph); Pedara (CT), Tarderia, m 950, 4.VII.1985 (11 ♂で, 6 ♀♀, 1 nymph), 31.VII.1985 (2 ♀♀); Linguaglossa (CT), Mareneve, m 850, 10.VII.1985 (3 ♂♂, 2 ♀♀), 24.IX.1985 (1 ♂, 3 ♀♀); Randazzo (CT), Monte la Guardia, m 730, 24.IX.1985 (4 ♂♂, 6 ♀♀); Nicolosi (CT), Monte Albano, m 1200, 1.X.1985 (3 ♂♂, 6 ♀♀); Collesano (PA), m 500, 9.VII.1992 (1 ♀); all collected by C.R.

The genus *Arytaina* Förster still has a rather intricate taxonomy, in spite of the recent clarifier contribution given by Hodkinson & Hollis (1987). Within this context, *A. africana* was very poorly known up to the recent redescription by Burckhardt (1989) and has been erroneously recorded for Sicily as «*Arytaina maculata* (Löw) Spanish form» (Rapisarda, 1988a, 1988b), according to both the arrangement by Hodkinson & Hollis (1987) and direct determination by Hollis (*in litteris*, 1st December 1986).

Outside Italy (Southern Regions, Sicily and Sardinia), *A. africana* is also known from Algeria, Lybia and probably Morocco; yet its geographical distribution is to be better understood, under the light of the recent taxonomy. It seems to be monophagous on *Cytisus villosus* Pourret, performing in Sicily two yearly generations and overwintering as egg (RAPISARDA, 1988a).

Descriptions. Adult: Hodkinson & Hollis (1987: 13-14 and partly also

16-17, figs 49-50, 71-74, 97, 257-258); Burckhardt (1989: 400-402, figs 13-18). Nymph: undescribed.

Arytaina adenocarpi Löw, 1880

Adenocarpus complicatus (L.) Gay - Sant'Alfio (CT), Giarrita, m 1350, 14.X.1981 (5 or , 5 ♀♀), 16.VII.1990 (8 or , 4 ♀♀, 17 nymphs), 1.VIII.1990 (3 or , 2 ♀♀), 21.X.1990 (2 or , 1 ♀), 19.IV.1991 (5 or , 8 or), 14.IX.1992 (3 ♀♀), leg. C.R.

A strictly oligophagous species, living on plants of the genus *Adenocarpus* DC. and already reported for Sicily under the erroneous name of «*Arytaina maculata* (Löw) Hungarian form». On the contrary, its Italian record by Conci & Tamanini (1984) is to be referred to *Arytaina maculata* (Löw). In addition to Italy, its known distribution involves South France, Portugal and Spain (Hodkinson & Hollis, 1987). In Sicily, *A. adenocarpi* is highly localized in a small area at the Eastern slope of Mount Etna. Its life-cycle is presently under study.

Descriptions. Adult: Hodkinson & Hollis (1987: 13, figs 61-62, 85-87, 99). Nymph: only poorly described by Löw (1880: 553-554).

Arytainilla hakani Loginova, 1972

Teline monspessulana (L.) Koch - Pantelleria (TP), Montagna Grande, m 400, 24.VII.1990 (4 or , 5 99, 6 nymphs), leg. C.R.

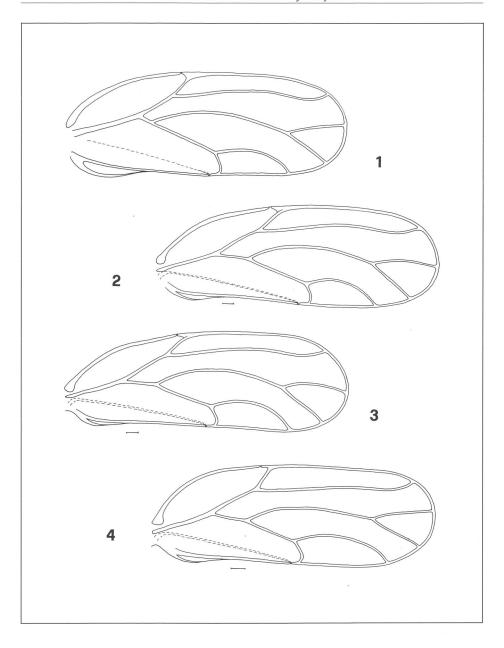
A. hakani is a West Mediterranean psyllid, known from Morocco (Loginova, 1972), Sardinia (Rapisarda, 1987, 1991) and Algeria (Burckhardt, 1989). It is monophagous on *Teline monspessulana* (L.) Koch and probably has a monovoltine life-cycle, overwintering as egg.

Descriptions. Adult: Loginova (1972: 21-22, figs 63-72). Nymph: Rapisarda (1987: 67, fig. 5).

Livilla siciliensis Hodkinson & Hollis, 1987

Genista ephedroides DC. - Isnello (PA), m 650, 9.VII.1992 (22 °°, 26 °°, 6 nymphs), leg. C.R. Generic sweeping - Lipari (ME), Isle of Salina, Sciara Portella, 23.VII.1984 (2 °°, 1, leg. V. D'Urso; Lipari (ME), Isle of Stromboli, San Bartolo, 19.XI.1986 (1 °°, 1 °°), leg. V. D'Urso; Lipari (ME), Isle of Panarea, Sciara Palisi, 20.XI.1986 (1 °°), leg. V. D'Urso.

The occurrence in Sicily of *L. siciliensis* has been stated in its original description (Hodkinson & Hollis, 1987) and was therefore reported in Rapisarda's (1988b) list. Nevertheless, the Sicilian type locality of this species, simply reported in the original description as «Palermo c. 750 m», was almost controversely defined, since the town of Palermo lies at the sea level. For this reason, in order to re-find this species, correctly defining its type



Figs 1-4 — Forewings of Livilla species (maculae and spinulations omitted); 1-3, L. siciliensis; 4, L. maculipennis. 1, redrawn from Hodkinson & Hollis (1987); 2, male paratype, on Genista sp., Sicily, Palermo, c. 30 Km S Cefalù, 8 Km S Isnello, c. 750 m, 28.V.1979, leg. D. & S. Sutton; 3, male, on Genista ephedroides, Sicily, Palermo, Isnello, 650 m, 9.VII.1992, leg. C. Rapisarda; 4, male paratype, on Genista sp., Spain, Huelva, 20 Km S Almonte, 13.VI.1977, leg. D. Hollis.

locality and possibly acquiring useful data on its biology, recent researches have been carried out in several areas, located in the whole Province of Palermo and at nearly the mentioned altitude. This led to collect, in July 1992, the specimens from Isnello, whose adults were found not completely corresponding to the original description and drawings of *L. siciliensis*. In particular, they agree with the above description in general body dimensions and shape of male genitalia, though differing in forewing structure, especially in the length of vein M + Cu (figs 1 and 3), which is indicated as an important character to separate *L. siciliensis* from *L. maculipennis* Hodkinson & Hollis (Hodkinson & Hollis, 1987: 22).

A study of a few type specimens (2 $\circ \circ$ and 2 $\circ \circ$) of L. siciliensis, carried out thank to the kindness of Mr D. Hollis (The Natural History Museum - London), allowed to clarify the problem. The above slide-mounted type material of L. siciliensis is labelled «Palermo, c. 30 km S Cefalù, 8 km S Isnello, c. 750 m, 28.V.1979, D. & S. Sutton», and this obviously coincide with the biotope where L. siciliensis has been recently collected by me, that is the only one in the Madonie Mts. (Province of Palermo) where Genista ephedroides grows (Pignatti, 1982). Thus, the big cliff near Isnello, nearly completely covered by the mentioned endemic plant, is to be considered as the correct type locality of L. siciliensis. Secondly, there is a perfect similarity between the specimens collected by me at Isnello and the type material, yet they all differ from the original description of L. siciliensis, for having a longer common stem between veins M and Cu. Therefore, a slightly aberrant specimen (not occurring in the series kindly loaned by Mr Hollis) has been probably used in the original description, for both forewing drawing and construction of key to species. Thus, L. siciliensis must be considered as having a normal M + Cu vein, not substantially differing from that one of L. maculipennis (figs 2-4).

As to biological aspects, an undetermined species of *Genista* was known to be host plant of *L. siciliensis*, according to the original description. The present Sicilian finding of both adults and nymphs of the psyllid allows to complete such data, by indicating *Genista ephedroides* DC. as the primary host of the species. This plant is endemic to Italy (Tutin *et al.*, 1968; Pignatti, 1982), where it grows in some areas of Sardinia (Gallura, Iglesiente), Sicily (Madonie Mts., near Isnello), local coastal zones of the Region Campania (Cilento, near Ascea and Pisciotta), Eolian and Ponzian Islands. *Livilla hollisi* Rapisarda was found in Sardinia on the same plant.

Descriptions. Adult: Hodkinson & Hollis (1987: 32, figs 131 (erroneous), 132, 209-211, 273). Nymph: undescribed.

Cacopsylla bidens (Sulc, 1907)

Pyrus communis L. - Biancavilla (CT), La Feliciosa, m 1100, 11.VIII.1989 (1 ♀), 15.VI.1990 (1 ♀); Nicolosi (CT), m 950, 9.VII.1991 (2 ♀♀); all collected by C.R.

As far as presently known, *C. bidens* is the most rare among the pearfeeding psyllids occurring in Italy, having it been recorded only in Trentino-Alto Adige and in Sicily. In the latter Region, its occurrence has been already indicated as *Cacopsylla* (*Hepatopsylla*) sp. (Rapisarda & Siscaro, 1990), being confirmed here. It is widespread from Central Asia to Central and Southern Europe (through Iran, Caucasus, Ucraina and Israel), as far as France (Hodkinson, 1984; Buckhardt & Hodkinson, 1986), and seems to be seriously harmful in Central Asia (Lauterer, 1979). Yet it is of negligible economic importance in the European environments, where pear orchards are mainly injuried by other psyllids (i.e. *Cacopsylla pyri*). According to the literature, *C. bidens* performs 3-7 yearly generations, overwintering as adult on its host plants.

Descriptions. Adult: Burckhardt & Hodkinson (1986: 125, figs 5-6, 14, 21, 28-29, 34, 42-43). Nymph: not yet morphologically defined, according to Burckhardt & Hodkinson (1986: 125, fig. 51).

Bactericera (?) silvarnis (Hodkinson, 1974)

Salix pedicellata Desf. - Castiglione di Sicilia (CT), River Alcantara, m 350, 10.VII.1985 (1 \circ , 2 \circ); Bronte (CT), River Simeto, m 550, 24.IX.1985 (1 \circ , 1 \circ), 9.XI.1989 (5 parasitized nymphs); Fondachelli (ME), m 900, 10.X.1987 (1 \circ , 7 nymphs); all collected by C.R. Salix sp. - Calatabiano (CT), Mouth of River Alcantara, sea level, 22.VI.1990 (1 \circ), leg. C.R. Generic sweeping - Adrano (CT), River Simeto, m 350, 12.II.1986 (1 \circ), leg. C.R.

The above Sicilian specimens are dubiously assigned here to a rather controverse and still intricately defined species. All the adults collected in Sicily fall within characters reported in the literature for *B. silvarnis* (this is also confirmed by comparing the above Sicilian material with British specimens of the latter species); on the contrary, final instar nymphs differ from *B. silvarnis* in chaetotaxy, especially the number of marginal sectasetae (HSS = 18-24, FWSS = 43-56, HWSS = 5-8, ASS = 45-52).

In order to correctly determine the Sicilian material, a better taxonomic understanding of the Ponto-Mediterranean species of the *Bactericera curvatinervis* (Förster) group would be desirable, at least as regards those species with dark genal cones, as *B. silvarnis* itself, *B. melanoparia* (Loginova), from the ex European USSR, Caucasus, Kazakhstan, Kirgizstan, Tadzikistan, Uzbekistan, or *B. daghestanica* (Gegechkori), from Caucasus, whose relationships are not easy to enucleate from their descriptions.

B. silvarnis has been originally described as a subspecies of Bactericera

curvatinervis (Hodkinson, 1974) and recently raised to specific rank (Ossian-Nilsson & Hodkinson, 1987). It is reported from Algeria (1 female), France (1 female), Great Britain (Burckhardt, 1989) and dubiously from Czechoslovakia (Lauterer, 1977); it was not known in the Italian fauna up to now. According to the literature, it is strictly oligophagous on Salicaceae of the genus *Salix* L., but no satisfactory biological data are presently available to completely define its life-cycle.

Descriptions. Adult: Hodkinson (1974: 82-83, figs 27-30). Nymph: White & Hodkinson (1982: 44, figs 140, 167); Ossiannilsson & Hodkinson (1987: 261). Due to uncertainty of its determination, a morphological description of the Sicilian material is given below.

ADULT (figs 5-12). General colouration of the body creamy-yellow; the oldest specimens are slightly brownish at the dorsum of both thorax and abdomen.

Head with well developed and dark brown genal cones, which are slightly divergent, directed downwards and apically rounded. Vertex 1.65-1.95 times as wide as its length. Antennae 1.85-2.40 long as the head width, with cream coloured segments 1st-3rd and brown segments 4th-10th; apical rhinaria at the segments 4th, 6th, 8th, 9th; a blunt apical and a pointed subapical setae are inserted at the segment 10th. Mouth parts cream coloured, with brown ultimate rostral segment, which is 0.19-0.22 times as long as the head width.

Forewings transparent, with basally brown C + Sc vein and an almost smoky colouration along the A vein. Forewing length / head width ratio: 5.00-5.55 in males, 4.80-5.35 in females; forewing length / maximum width (about at the middle of the wing) ratio: 2.58-2.81 in males, 2.48-2.58 in females. Pterostigma and costal break wanting. Vein Rs sinuous, variable in length, so that the vein M bifurcation may hyghly vary in relation to the line connecting the apex of veins Rs and Cu_{1a}. Cell m_1 value: 1.20-1.50 in males, 0.85-1.40 in females. Vein M_{1+2} 0.30-0.45 times as long as the M. Cell cu₁ always smaller than m_1 , almost variable in shape, 1.45-2.30 times as wide as its height; Cu_{1b}/Cu₁ ratio equal to 0.10-0.28; Cu_{1b}/ M_{3+4} ratio: 0.30-0.55; cell cu₁ value ranging from 1.90 to 2.35 in males and from 1.65 to 3.90 in females. Spinules occurring only in a small area posterior to vein Cu₂. Radular spinules in cells m_1 , m_2 and cu₁.

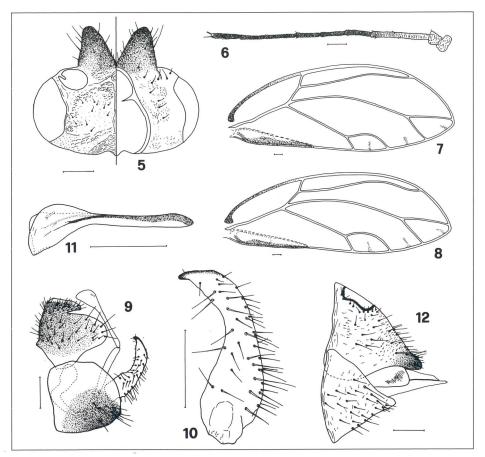
Fore- and midlegs brown, except ventral face of femora and the basal portion of the dorsal one, which are creamy-yellow. Hindlegs entirely creamy-yellow. Metatibiae 0.97-1.21 times as long as the head width, each one with 3(1+2) saltatorial spurs.

Male proctiger 0.35-0.40 times as high as the head width, with two lobiform projections directed backwards. Parameres lamellar shaped, 0.95-1.10 times as long as the proctiger height. Ultimate segment of aedeagus with no abnormal swelling.

Female genitalia with proctiger 0.65-0.75 times as long as the head width, with an almost straight dorsal profile, showing only a small, subapical concavity. Subgenital plate much shorter than the proctiger. Anal pore 0.25-0.30 times as long as the proctiger.

Measurements:

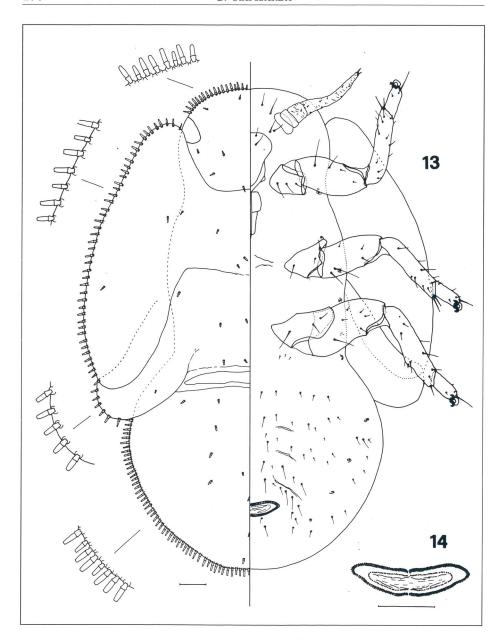
- 1) Head width: OO 0.53-0.58 mm; QQ 0.51-0.55 mm;
- 2) Vertex length: σσ 165-190 μ; QQ 170-195 μ;
- 3) Vertex width: σσ 315-350 μ; QQ 295-340 μ;
- 4) Genal cones length: σσ 165-185 μ; QQ 140-165 μ;
- 5) Antennal length: 00 1.09-1.30 mm; QQ 1.00-1.13 mm;
- 6) Ult. rostral segm. length: σσ 105-120 μ; QQ 105-120 μ;
- 7) Forewing length: or 2.75-3.02 mm; QQ 2.65-2.92 mm;



Figs 5-12 — Bactericera (?) silvarnis, adult from Sicily. 5, head, dorsal (left) and ventral view; 6, antenna; 7, forewing with shorter Rs vein (male, on Salix pedicellata, Bronte, m 550, 24.IX.1985); 8, the same with longer Rs vein (male, on S. pedicellata, Fondachelli, m 900, 10.X.1987); 9, male genitalia, lateral view; 10, male paramere, inner view; 11, apical segment of aedeagus; 12, female terminalia, lateral view. Scale lines = 0.1 mm.

- 8) Forewing width: 00 0.98-1.13 mm; QQ 1.05-1.17 mm;
- 9) Metatibia length: 00 0.54-0.66 mm; QQ 0.52-0.65 mm;
- 10) Male proctiger height: 190-215 μ;
- 11) Paramere length: 205-230 μ ;
- 12) Ult. segm. of aedeagus length: 195-220 μ ;
- 13) Female proctiger length: 335-390 μ;
- 14) Female anal pore length: 105-115 μ.

FIFTH INSTAR NYMPH (figs 13-14). Pale yellow in colour and almost elongate in shape. Body length: 1.79-1.96 mm; body breadth: 1.29-1.41 mm; body breadth / body length ratio (BBBL) equal to 0.70-0.75. Several truncate sectasetae (smaller than the marginal ones) are not very densely scattered on the dorsal surface of the body and wing pads.



Figs 13-14 — Bactericera (?) silvarnis, final instar nymph from Sicily. 13, general aspect, dorsal (left) and ventral view; 14, anal pore with circumanal rings. Scale lines = 0.1 mm.

Cephalo-prothorax with antennae three-segmented, 0.30-0.35 mm long, protruding from the body edge with more than the distal half. Mouth parts almost uniformly coloured as the rest of the body; total length of last two segments of the rostrum equal to 160-175 μ . Head margin with 18-24 truncate sectasetae per each side.

Forewing pads 1.01-1.14 mm long, with humeral lobes nearly reaching the anterior margins of compound eyes. Antennal length/forewing pad length ratio (AWL): 0.27-0.34. Margin of each forewing pad with 43-56 truncate sectasetae. Similar setae also on hindwing pad margin, arranged 5-8 per each pad. Legs with no remarkable characters. Tarsal arolia almost rounded.

Abdomen with dorsal caudal plate 0.68-0.75 mm long and 0.93-1.00 mm wide; caudal plate breadth/length ratio (CPR) equal to 1.31-1.40. Abdomen margin with 45-52 truncate sectasetae inserted per each side. Anal pore entirely ventral, surrounded by two simple rings of circumanal pores, of which the outer one is 200-235 μ wide.

Respiratory system with nine pairs of ventral spiracles.

CONCLUSIVE REMARKS

The above considerations let us to conclude how 68 psyllid species are presently known in Sicily, this being one of the highest numbers among all the Italian Regions, after Trentino-Alto Adige, Piemonte, Veneto, Friuli-Venezia Giulia, Liguria and Lombardia. Most of the Sicilian species belong to the family Psyllidae (29 species), followed by Aphalaridae (19) and Triozidae (18); the family Homotomidae is represented by only 2 species, such as in the whole Italian fauna. In relation to the plants which occur in the Sicilian flora, and their possible trophic relations with psyllid species, further faunistic studies on this topic shall very likely allow to find some more species in this Region, probably leading to a nearly 20% increment of the local psyllid fauna.

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