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MORPHO-BIOLOGICAL OBSERVATIONS ON  
*EGEIROTRIOZA (ASTUTIA) POPULI* (HORVÁTH),  
NEW FOR ITALY  
(*Homoptera Psylloidea*)

ABSTRACT - PEDATA P. A., 1998 - Morpho-biological observations on *Egeirotrioza (Astutia) populi* (Horváth), new for Italy (*Homoptera Psylloidea*).

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*Egeirotrioza (Astutia) populi* (Horváth), an uncommon and little known species, has been found in Southern Italy, Campania, in just one collecting site in Taurasi (Benevento), 400 m. Both adults and pre-imaginal stages have been collected on *Populus alba* L. in the second half of April. Original morphological observations have been conducted on the adults of both sexes. The fifth instar nymph and the gall, which appears to have unique features among those caused by the European *Psylloidea*, have been described for the first time. Twenty-three figures are reported.

KEY WORDS - *Egeirotrioza*, *Psylloidea*, morphology, pre-imaginal stages, Southern Italy.

RIASSUNTO - PEDATA P. A., 1998 - Osservazioni morfo-biologiche su *Egeirotrioza (Astutia) populi* (Horváth), nuova per l'Italia (*Homoptera Psylloidea*).

*Egeirotrioza (Astutia) populi* (Horváth), specie rara e poco nota, è stata reperita in Italia meridionale, Campania, in un unico sito di raccolta a Taurasi (Benevento), 400 m. Sia gli adulti che gli stadi pre-immaginali sono stati raccolti su *Populus alba* L. nella seconda metà di aprile. Sono state compiute osservazioni morfologiche originali sugli adulti di entrambi i sessi. La ninfa di ultima età e la galla, che presenta caratteristiche uniche fra quelle prodotte dagli Psilloidei europei, sono state descritte per la prima volta. Sono riportate 23 figure.

PAROLE CHIAVE - *Egeirotrioza*, *Psylloidea*, morfologia, stadi pre-immaginali, Italia meridionale.

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Lavoro presentato dal Socio accademico Prof. Cesare Conci.

## INTRODUCTION

The family Triozidae comprises about 48 genera, though many of these are still poorly defined (HOLLIS, 1984). At present, the genus *Egeirotrioza*, erected by BOSELLI (1931) for the species *Trioza ceardi* de Bergevin, is considered as valid (LOGINOVA, 1976; HOLLIS, 1984; WHITE & HODKINSON, 1985) and thought to include 18 species (Conci, *pers. com.*).

The diagnostic features originally indicated by BOSELLI (1931) to define *Egeirotrioza*, have been partly recovered by LOGINOVA (1976) in her revision of the genus, dealing with the 11 species since then known, all with Palaearctic distribution and associated to poplar plants. The characters discriminating the genus proposed by LOGINOVA (1976) can be summarised as follows: genal cones with rounded apex and shorter than vertex; vein R usually branching before than M and  $Cu_1$ ; vein  $R_S$  long and sinuous in its distal half, ending beyond the bifurcation of M; cell  $cu_1$  normally larger than  $m_1$ ; hind tibia showing a well developed meracanthus and provided with 3 apical spurs; female genitalia short, with triangular sub-genital plate showing a narrow apex; penis with two hooks directed downwards. The same author also proposed the division of *Egeirotrioza* into two subgenera: subgen. *Egeirotrioza*, including species associated to poplars of the section *Turanga* and characterised by hind tibia provided with a sub-apical spur and penis with apical region triangular, and subgen. *Astutia*, associated to poplars of the section *Populus*, lacking the sub-apical spur and having the apex of penis with a helmet outline.

In their revision of the systematics of Psylloidea, WHITE & HODKINSON (1985) on the basis of observations on pre-imaginal stages of *E. ceardi* var. *euphratica* Boselli, *E. verrucifica* Loginova, and two more undetermined species, indicated the following complex of nymphal characters as distinctive of the genus: lack of unguitactor on tarsal arolium; lack of scales on body margin; lack of truncated secta setae on forewing-pad margin; abdomen margin provided with pointed secta setae, often arranged in a few rows; presence of 1+1 medial meso- and metathoracic sclerites only on each side; anal pore-field comprised of circum-anal pore rings only.

The species belonging to the subgen. *Egeirotrioza*, whose biology is known, develop one generation a year and cause on their hosts either galls on leaves (*E. ceardi* and *E. intermedia* Bajeva), galls on herbaceous shoots (*E. verrucifica*), and callous or crater-like galls on woody twigs (the remaining species). On the contrary the biology of the three species belonging to the subgen. *Astutia* is still largely unknown (LOGINOVA, 1976).

LOGINOVA (1976) assigned to the latter subgenus the species *Egeirotrioza populi* (Horváth), described on adult females found in Hungary on *Populus alba* L. (HORVÁTH, 1915) and whose types have been later considered lost by KLIMASZEWSKY (1967). The report of another female specimen for China by KUWAYAMA & MIYATAKE (1971), whose illustration of forewing added little to the original and scanty description, appears doubtful and requires confirmation. In her revision, LOGINOVA (1976) referred that the species is known only for a male specimen of unspecified origin and reported accurate illustrations of its genitalia and forewing. Eventually, other specimens of both sexes have been recorded for Turkey (BURCKHARDT, 1988), Georgia (GEGECHKORI & LOGINOVA, 1990) and Czech Republic (LAUTERER, 1993), but up to now no detailed morphological data are available for the female.

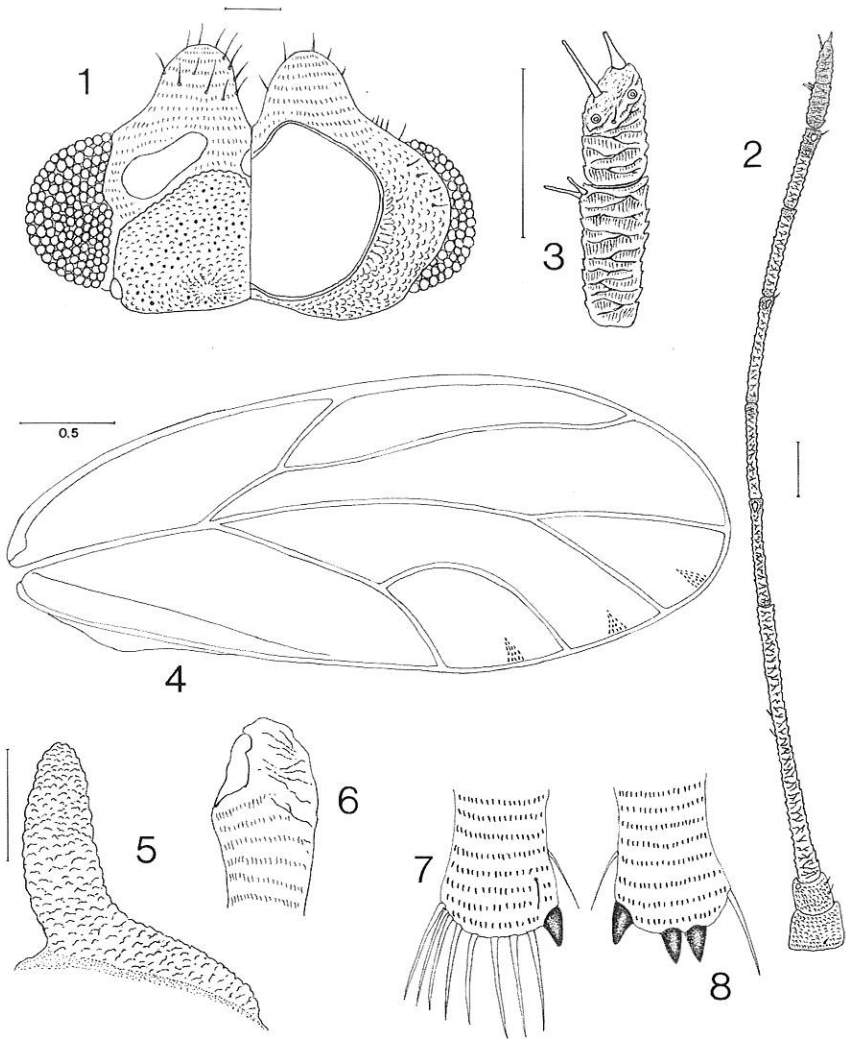
The finding of a small colony of *E. populi* in Campania allowed to carry out some morpho-biological observations on this uncommon species, whose distribution appears wide, although sporadic.

#### MORPHOLOGY

*Adult* - Both sexes are similar in body colour and morphology, with the exception of genitalia; data in parentheses referable to the single male specimen studied. Body pale green, with the last rostral segment, tarsi, distal part of VII and VIII and whole IX and X antennal segments blackish. Forewing membrane transparent.

Head (Fig. 1) with vertex twice as broad as long; coronal suture complete; vertex with clear microsculpture and short setae. Genal cones short and rounded, 0.6-0.8 times as long as vertex length, slightly divergent and directed downwards. Antennae (Fig. 2) ten-segmented, over twice as long as head width, with rhinaria at the apex of IV (but in one case an additional one was found near the middle of this segment), VI and VIII antennal segments; IX and X segments both provided with two truncated setae, 0.29-0.36 and 0.18-0.21 times (IX) and 0.34-0.70 and 0.24-0.41 times (X) as long as the respective segment (Fig. 3); X segment obliquely truncated at the apex and provided with two pore-like sensillar structures. Ultimate rostral segment 0.11-0.12 times as long as head width.

Thorax with pronotum nearly as broad as head, mesopraescutum bell-shaped, with maximum width 0.67-0.75 times as broad as pronotum and 0.52-0.60 times as broad as mesoscutum. Mesoscutum separated from mesoscutellum by a weak suture.



Figs. 1-8 - *Egeirotrioza populi*, adult female. 1: head, dorsal (left) and ventral (right) view; 2: antenna; 3: IX and X antennal segments; 4: forewing; 5: meracanthus; 6: base of metatibia; 7: apex of metatibia, outer view; 8: apex of metatibia, inner view (scale lines represent 0,1 mm, unless otherwise specified).

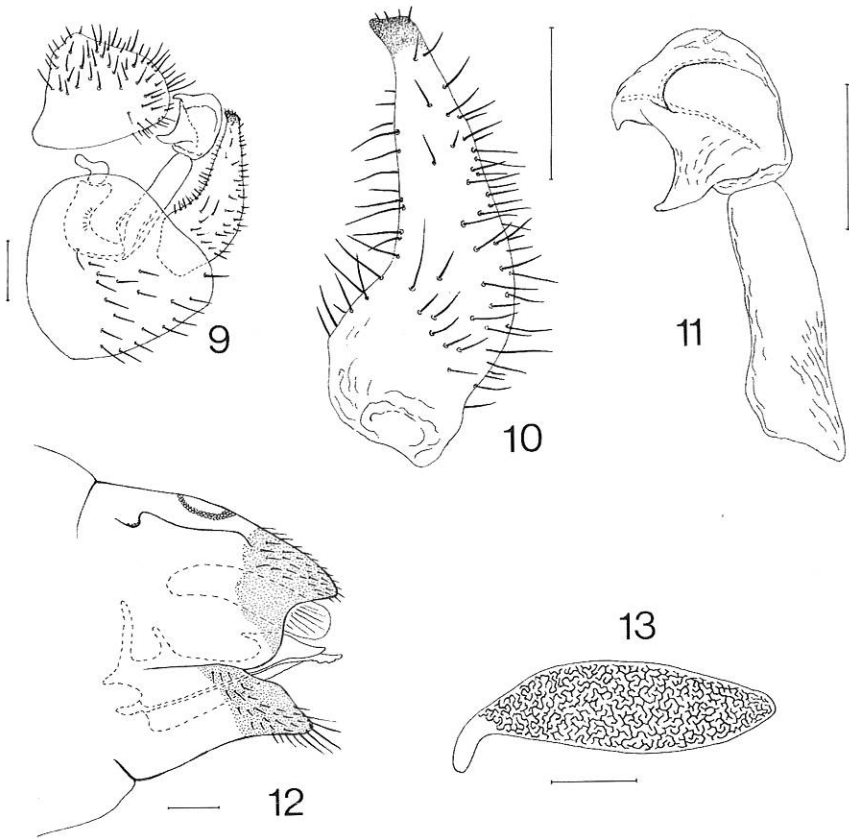
Forewing (Fig. 4) elliptical and rather rounded at apex, even though in the male specimen it is slightly pointed, 4.8-5.1 (4.7) times longer than head width and 2.4-2.6 (2.8) times longer than its maximum width. Pterostigma and costal break wanting. Vein  $R_5$  sinuous, 1.20-1.24 (1.14) times longer than M and ending beyond its bifurcation. Vein  $M_{1+2}$  0.53-0.61 (0.68) times as long as M. Cell  $m_1$  value (*sensu* HOLLIS, 1984) equal to 1.67-2.02 (2.01); cell  $cu_1$  basally 1.08-1.28 (1.40) times as wide as high; cell  $c_1$  value (*sensu* HOLLIS, 1984) equal to 1.03-1.29 (1.47).  $Cu_{1b}$  vein 0.63-0.68 (0.56) times as long as  $Cu_1$ . Surface spinules completely covering all the cells and reaching the veins; radular spinules present in cells  $m_1$ ,  $m_2$  and  $cu_1$  and distributed with a triangular pattern.

Metatibia 0.85-0.89 (0.93) times as long as head width and provided with a well developed meracanthus (Fig. 5), lacking both mid tibial spur and basal swelling (Fig. 6), with a crown of long setae (Fig. 7) and 2+1 black apical saltatorial spurs on the opposite side (Fig. 8), although one female presented on one metatibia two spurs only, and another female showed an additional spur, less developed and sclerotized.

Male terminalia (Fig. 9) with proctiger 0.27 times as high as head width; parameres (Fig. 10) 1.38 times longer than proctiger height, slender and curved forward; ultimate segment of aedeagus (Fig. 11) 0.39 times as long as head width, with apex articulated with the lower portion of the segment and provided with two couples of hooks.

Female terminalia (Fig. 12) short and lacking any clear sclerified plates, as well as the whole abdomen; proctiger dorsally convex, provided with relieves evident in living specimens only, and ending with a kind of beak; sub-genital plate ventrally concave. Proctiger 0.79-0.84 times as long as head width. Anal pore 0.15-0.17 times as long as the proctiger.

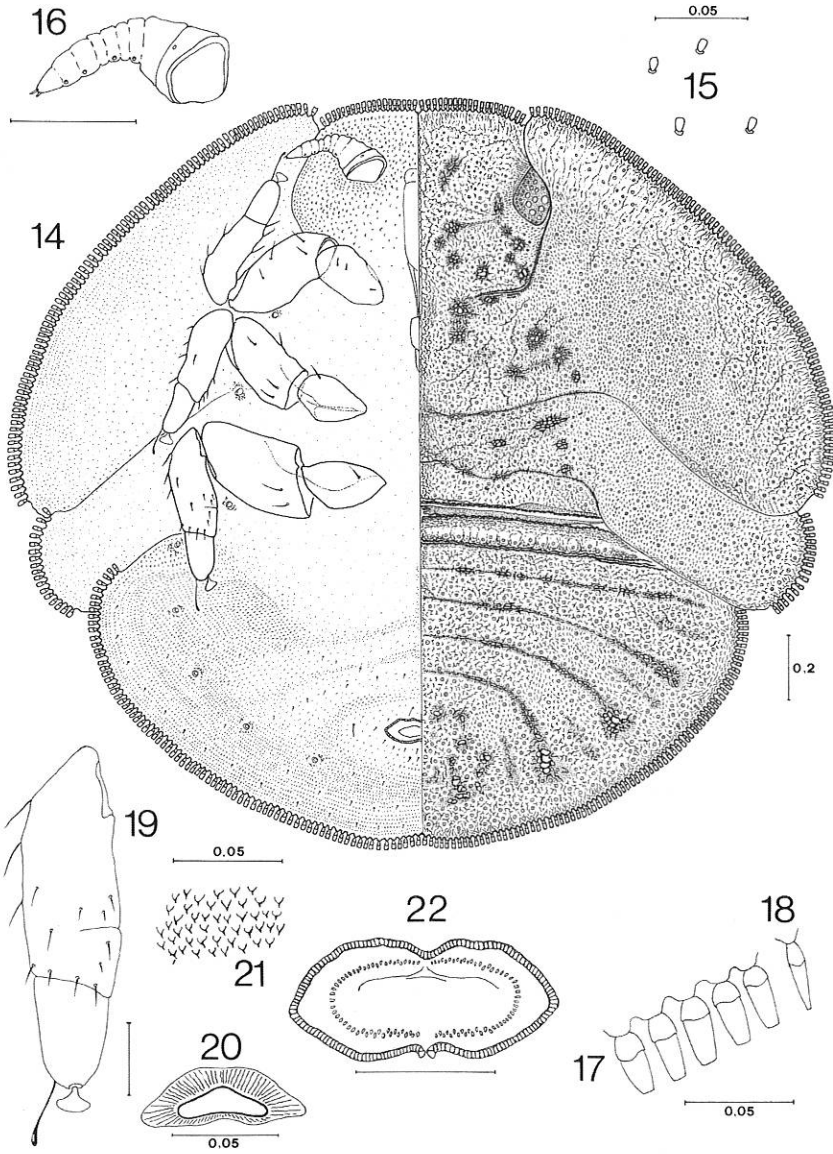
Total body length: male 3.61 mm; females 3.76-3.80 mm; Head width: male 0.78 mm; females 0.78-0.82 mm; Vertex length: male 0.22 mm; females 0.24-0.28 mm; Vertex width: male 0.45 mm; females 0.47-0.50 mm; Genal cones length: male 0.15 mm; females 0.16-0.20 mm; Antennal length: male 1.80 mm; females 1.60-1.76 mm; Ult. rostral segment length: male 90  $\mu$ ; females 90-100  $\mu$ ; Forewing length: male 3.70 mm; females 3.95-4.15 mm; Forewing width: male 1.34 mm; females 1.60-1.66 mm; Metatibia length: male 0.73 mm; females 0.70-0.71 mm; Male proctiger height: 0.21 mm; Paramere length: 0.29 mm; Ult. segm. of aedeagus length: 0.31 mm; Female proctiger length: 0.65-0.66 mm; Female anal pore length: 100-110  $\mu$ .



Figs. 9-12 - *Egeirotrioza populi*, adult. 9: male genitalia; 10: paramere, inner view; 11: ultimate segment of aedeagus; 12: female terminalia; Fig. 13: ovarian egg (scale lines represent 0,1 mm).

*Egg* - The ovarian eggs (Fig. 13) have chorion thoroughly sculptured and are 0.34-0.36 mm long, excluding the stalk (which is long about 0.05 mm) and 0.11-0.14 mm wide. Unfortunately, we did not see any mature egg.

*Fifth Instar Nymph* - The nymph dorsum is largely green or olive green, with brown strips on wing pads and in other parts of the body in relation with a honeycombed sculpture, distributed as later on specified (Fig. 23); venter straw yellow with blackish tarsi. Marginal fringe silky and about 0.05 times as wide as the maximum body length. Gen-



Figs. 14-22 - *Egeirotrioza populi*, fifth instar nymph. 14: general aspect, ventral (left) and dorsal (right) view; 15: dorsal setae; 16: antenna; 17: marginal seta-setae; 18: marginal seta-seta, in profile; 19: hind tibio-tarsus; 20: arolium; 21: marginal ventral sculpture; 22: circum-anal pore rings (scale lines represent 0,1 mm, unless otherwise specified).

eral shape strongly rounded (Fig. 14). Body length: 2.07-2.25 mm; body breadth 2.28-2.50 mm; body breadth:body length ratio equal to 1.05-1.11. Dorsal surface strongly sclerotized, except between the thorax and abdomen, and showing simple spatulate setae (Fig. 15), about 5  $\mu$  long, sparsely distributed amid a vermicular sculpture and a series of honeycomb sculptured areas with the following distribution: cephalo-prothorax 10+10; mesothorax 8+8; metathorax 4+4; abdomen with four narrow stripes, parallel-sided with the body segmentation, with the addition of a fifth caudal area arranged in a complex way.

Cephalo-prothorax dorsally provided with a single, wide sclerite; antennae (Fig. 16) 0.30-0.32 mm long, composed of three effective segments, the last one showing an apparent division in eight sub-segments, not reaching the body margin and provided with two stout setae at the apex of the last segment; rhinaria present on IV, VI, VIII and IX apparent segments. Last two rostral segments 0.11-0.13 mm long. Head margin provided with 20-23 truncated and flattened sectasetae on each side, 30-36  $\mu$  long (Figs. 17 and 18).

Thorax with wing-pad sclerites fused with the median ones; forewing-pads 1.30-1.48 mm long, with humeral lobe exceeding the cephalic margin. Antennal length:forewing-pad length ratio equal to 0.20-0.24. Forewing and hindwing-pad margins provided respectively with 89-100 and 15-20 sectasetae, similar to those along the cephalic margin, though slightly shorter, measuring 25-33  $\mu$ . A vesicular structure, lengthened and with tuberculated surface, is present between thorax and abdomen. Legs lacking claws and provided with a long simple seta at the apex of each tarsus; hind legs with a sign of tibial division (Fig. 19). Arolium fan-shaped and lacking unguitactor (Fig. 20).

Abdomen wide, with 55-78 sectasetae on each side, longer near the hindwing-pads (28-35  $\mu$ ) and decreasing in length moving towards the anal region (25-30  $\mu$ ). Shorter sectasetae are rarely present not far from the body margin. Caudal plate 0.75-0.85 mm long and 1.55-1.94 mm wide; caudal plate breadth:length ratio equal to 2.05-2.28.

Ventral surface membranous and lacking any clear sclerification, provided with microsculpture, more densely distributed in the antennal and anal regions, composed of microtubercles, replaced by microspines close to the abdomen margin (Fig. 21). Setae sparse and short, longer in the anal region. Anal pore (Fig. 22) completely ventral, surrounded by two simple circum-anal pore rings: the outer one, comprising 83-97 sub-rectangular pores on each side, is 170-190  $\mu$  wide; the inner one is not always clearly discernible.

Respiratory system with eight pairs of ventral spiracles.





Fig. 23 - *Egeirotrioza populi*, fifth instar nymph on its host.

## BIOLOGY

Both adults and nymphs have been collected on *Populus alba*, which is thus confirmed as the primary host of *E. populi*. Pre-imaginal stages develop into crater-like galls with slightly raised borders caused on the young woody twigs. Collecting data suggest a monovoltine behaviour, with nymphs overwintering into the galls and adult emergence occurring in the second half of April.

## DISTRIBUTION

*Central Hungary* - Bugacz. Leg. G. Horváth. 20.V.1898, unspecified number of female specimens on *P. alba* (HORVÁTH, 1915).

*China* (?) - Shansi: Taihuaichen-Chenhaissu. Leg. K. Yasumatsu. 1.VI.1942, 1 female. (KUWAYAMA & MIYATAKE, 1971).

*Turkey* - Kars, m 1600. Leg. C. Besuchet, I. Löbl and D. Burckhardt. 16.VI.1986, 1 female (BURCKHARDT, 1988).

*Georgia* - Unspecified number of specimens (GEGECKKORI & LOGINOVA, 1990).

*Czech Republic* - Southern Moravia: Dolnomoravský úval Basin. Leg. P. Lauterer. 1.VI.1980, 3 males and 1 female. (LAUTERER, 1993).

*Italy* - Campania: Taurasi (Benevento), m 400. Leg. P. A. Pedata. 30.IV.95, 1 male and 3 females on *P. alba*; 18.IV.1996, 13 fifth instar nymphs on the same host.

## DISCUSSION

The present finding enlarges towards South-West the distribution area of *E. populi*, up to now not reported for Italy (CONCI *et al.*, 1996). The male specimen studied has shown genital and wing features in strict agreement with the figures reported by LOGINOVA (1976), except for the wing apex, apparently closer to the pointed wing of *E. gegechkorii*, though it should be stressed the relative variability of this character. On the contrary, more important is the shape of cell c+sc, which appears larger and more elongated in *E. populi* in comparison with *E. gegechkorii* (Rapisarda, *pers. com.*).

In contrast with the complex of nymphal features applied by WHITE & HODKINSON (1985) to characterise the genus *Egeirotrioza*, the nymphs of *E. populi* have shown, in particular, the presence of truncated sectasetae along the margin of forewing-pads and the lack of pointed sectasetae along abdomen margin. Moreover, it appears noteworthy the lack of claws on nymph legs.

Finally, it should be stressed that *E. populi* is the only European Psyllid whose pre-imaginal stages cause galls on the host twigs (Conci, *pers. com.*).

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#### REFERENCES

- BOSELLI F. B., 1931 - Studii sugli Psyllidi (*Homoptera: Psyllidae* o *Chermidae*). X. Istituzione di un nuovo genere e descrizione di *Egeirotrioza* Cearidi (De Bergevin) *euphratica* n. var., Triozina galligena su *Populus euphratica* in Mesopotamia. *Boll. Lab. Zool. Gen. e Agr. Portici*, 24 (1929-31): 267-278.
- BURCKHARDT D., 1988 - Angaben zur Psyllidenfauna der Nordosttürkei (Homoptera: Psylloidea). *Mitt. Entom. Gesellschaft Basel*, 38: 31-44.
- CONCI C., RAPISARDA C. & TAMANINI L., 1996 - Annotated Catalogue of Italian Psylloidea. Second part (*Insecta Homoptera*). *Atti Acc. Rov. Agiati, a. 245* (1995) (*Series VII*) 5 B: 5-207.
- GEGECHKORI A. M. & LOGINOVA M. M., 1990 - The Psyllids (Homoptera, Psylloidea) of USSR (an annotated check list). *Akademii Nauk Gruzinskoi SSR*, Menziereba: 164 pp. [in Russian].
- HOLLIS D., 1984 - Afrotropical jumping plant lice of the family Triozidae (Homoptera: Psylloidea). *Bull. Br. Mus. Nat. Hist. (Ent.)*, 49: 1-102.
- HORVÁTH G., 1915 - Magyarországi új Psyllida. *Ann. Mus. Nat. Hungar.*, 13: 190.
- KLIMASZEWSKI S. M., 1967 - New data on the jumping plant-lice (Homoptera: Psylloidea) occurring in Mongolia. *Ann. Univ. Mariae Curiae-Skolodowska (Sec. C. Biologia)*, 21: 1-11.
- KUWAYAMA S. & MIYATAKE Y., 1971 - Psyllidae from Shansi, North China (Hemiptera). *Mushi*, 45: 51-58.
- LAUTERER P., 1993 - Notes on the bionomics and occurrence of some Psyllids (Homoptera, Psylloidea) in Czechoslovakia and the Balkan peninsula. *Acta Mus. Moraviae, Sci. nat.*, 77: 147-156.

- LOGINOVA M. M., 1976 - Psyllids of the genus *Egeirotrioza* (Homoptera, Triozidae). *Zool. Zh.*, 55: 1318-1328 [in Russian].
- WHITE I. M. & HODKINSON I. D., 1985 - Nymphal taxonomy and systematics of the Psylloidea (Homoptera). *Bull. Br. Mus. Nat. Hist. (Ent.)*, 50: 153-301.

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