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HETEROTRIOZA (*HALOTRIOZA*) *SAHLBERGI* IN ITALY, HOST PLANT *ATRIPLEX HALIMUS*

(*Homoptera Psylloidea*)

1. THE GENUS *HETEROTRIOZA* DOBR. & MAN., 1960

Triozidae living on *Chenopodiaceae* are a characteristic group of species, with important peculiarities in common.

BURCKHARDT 1986, in a very condensed work, lists 13 species in this group and hypothesizes a possible synonymy for three of these. It is to be added *portulacoides* CONCI & TAMANINI 1983, as well as a new species reported in the doctorate thesis of RAPISARDA 1987: 328-336, fig. 62.

The specialists do not agree in the generic attribution of these species. BURCKHARDT 1986 ascribes all *Triozidae* living on *Chenopodiaceae*, which he retains monophyletic and homogeneous, to *Trioza sensu lato*, until a world-wide revision of this very large and heterogeneous genus. On the contrary, Gegechkori, Klimaszewski, Lauterer, Loginova and Rapisarda ascribe these species to *Heterotrioza* Dobr. & Man., 1960. We follow this opinion.

CONCI & TAMANINI 1983, describing *Trioza portulacoides*, gave preminent importance to the number of metatibial spurs and described for a part of these species the new subgenus *Halotrioza*. New researches on the group convinced us that *Halotrioza* must ben included in *Heterotrioza*. However, *H. chenopodii* (type species of *Heterotrioza*) and *portulacoides* (type species of *Halotrioza*) have great morphological differences in the shape of the penis and of the female terminalia. Therefore *Heterotrioza* can ben divided in two subgenera, *Heterotrioza* s. str. and *Halotrioza*.

Heterotrioza s. str. might include two species, *chenopodii* and *dichroa*, that have the penis anteriorly distinctly bipartite (*chenopodii*) or with two humps homologous to the two subapical lobes of *chenopodii* (*dichroa*), and almost normal female terminalia.

Halotrioza includes all the other species of *Heterotrioza* for the structure of the penis, different for shape in the various species, but without the two anterior humps, and for the peculiar structure of the female terminalia, with very swollen proctiger, sometimes anteriorly hemispherical, and ending as a «duck bill».

This division needs still the comparative study of some species now only inadequately described.

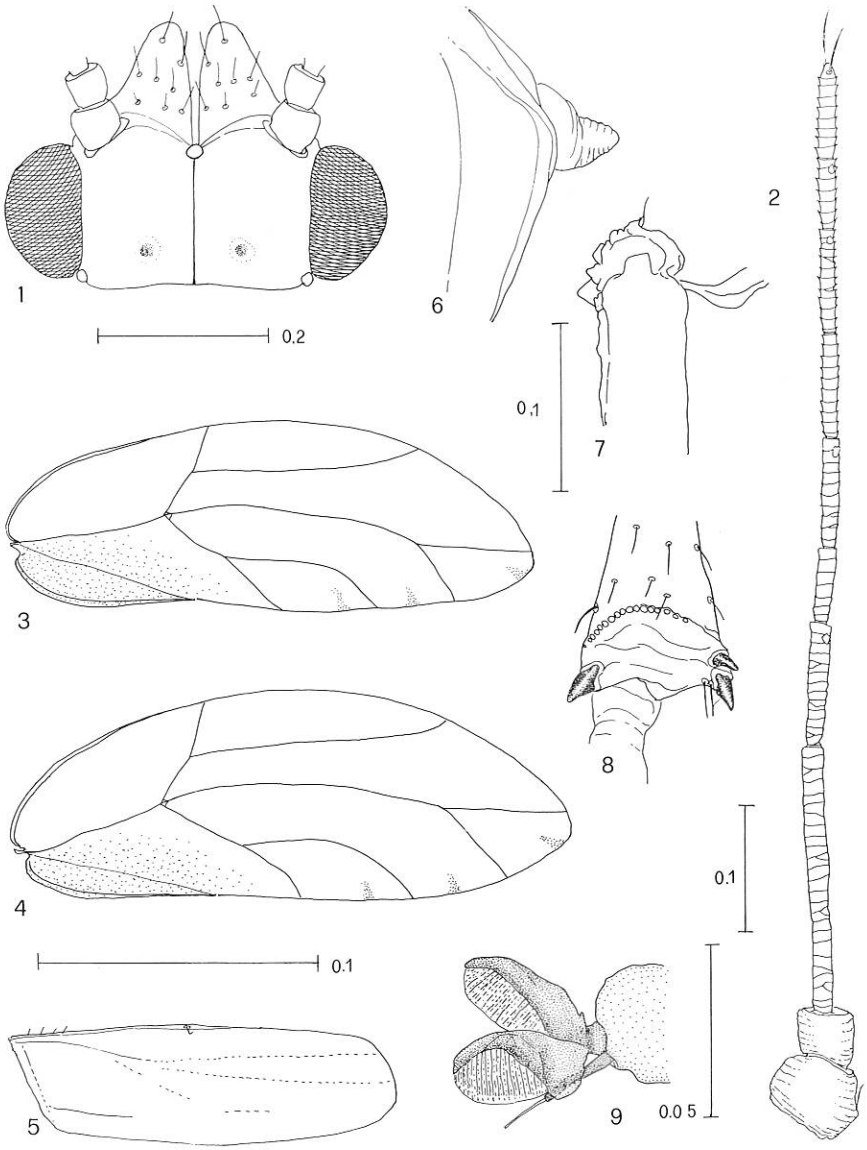
The characters of *Heterotrioza* s. l. were reported by LAUTERER 1982: 150 and by BURCKHARDT 1986: 123 and we do not have to repeat them.

2. *HETEROTRIOZA (HALOTRIOZA) SAHLBERGI* (SULC, 1913) COMB. N.

2.1. *Introduction*

Trioza sahlbergi was described by SULC (1913: 8-10, pl. 38, figs. 1-6) on four male specimens of Algeria, Clairfontaine, host plant unknown. There are no other notices on this species till 1986, when BURCKHARDT (pp. 121-123, figs. 1-9) adequately redescribed and figured it on 12 males and 14 females from Algeria, Biskra, without indication of host plant (Mus. nat. Hist. nat. Paris), after comparison with Sulc's types in Brno Museum.

RAPISARDA 1987: 334-335 cited the finding of many specimens in Sardegna, collected by him in 1985 and 1986, on *Atriplex halimus*; the same Author ascribed *sahlbergi* to genus *Heterotrioza* and compared them to a species described as new in his thesis and collected in Sicilia also on *Atriplex halimus*. In 1982 and 1987 in Basilicata, also on *Atriplex halimus*, we collected many specimens of a supposed new *Heterotrioza*, which we studied and figured in detail. Aftewards, we carried out a further comparative study on some specimens collected in Sardegna by Tamanini in 1977 (which examen was been not probed), and we examined the work of BURCKHARDT 1986. This study convinced us that the supposed new species of Basilicata was included in the variability of *sahlbergi*.



Heterotrioza sahlbergi, specimens from Basilicata, Cavone Torrent. - Fig. 1: head, male. - Fig. 2: antenna, male. - Fig. 3: forewing, male. - Fig. 4: forewing, female. - Fig. 5: hind wing, female. - Fig. 6: meracanthus, male. - Fig. 7: base of metatibia, male. - Fig. 8: apex of metatibia, male; the yellow hairs are figured only with their pores. - Fig. 9: apex of tarsus, male.

2.2. *Complementary notes on the morphology of the adult*

Our specimens correspond well enough to the diagnosis reported by BURCKHARDT 1986 and therefore we do not repeat their characters. We report only our original drawings and stress the following details:

1) The antennae (fig. 2) have the elements which constitute the segments more prominent in the apical part.

2) The male proctiger, in anterior view (fig. 11) has a different form than in *Trioza* s. str. It will be useful that the form of proctiger in the same view should be examined also in all the other species of *Heterotrioza*, because it can be a good character of generic separation.

3) The parameres in *sahlbergi* (figs. 10, 12-15) have different aspect according to the visual position and result more or less enlarged; the apex, seen under great magnification, has some little teeth curved backwards diagonally. The parameres have a median longitudinal carina (fig. 13) on their internal surface in the apical third.

4) The apex of the penis has a very large ductus ejaculatorius and anteriorly is variously enlarged. This shape appears, in our specimens, different from the fig. 7 given by BURCKHARDT 1986: probably it is only a different aspect of the membrane, which are capable of being deformed.

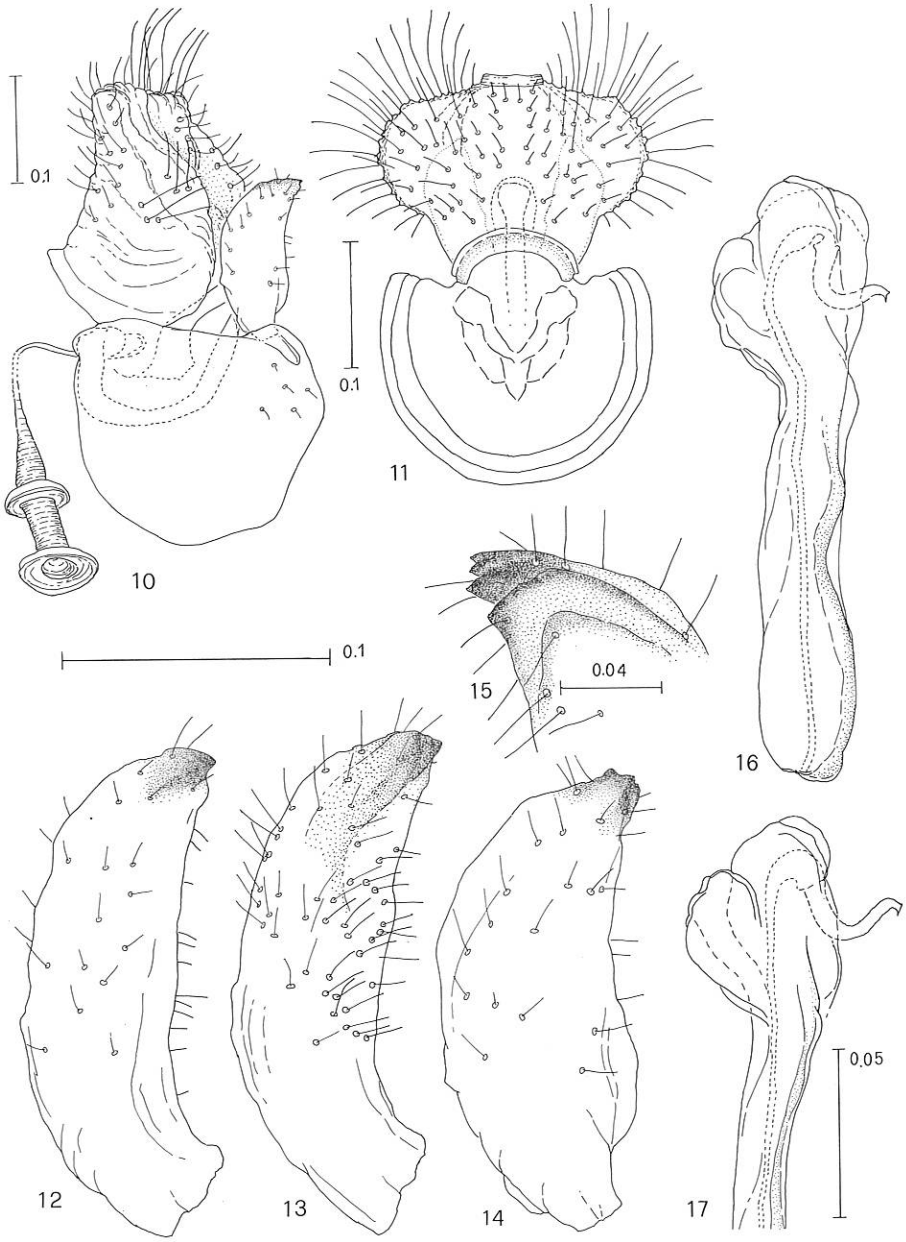
5) The proctiger (fig. 18) and the genital segment (fig. 21) of the female have the typical structure of *H. portulacoides*. The female terminalia, in lateral view, slightly sloping (fig. 19), have their central part rounded and swollen. Also the female genital segment, in lateral view after adequate inclination, appears swollen.

6) Ovipositor and valvulae as in figs. 22-24.

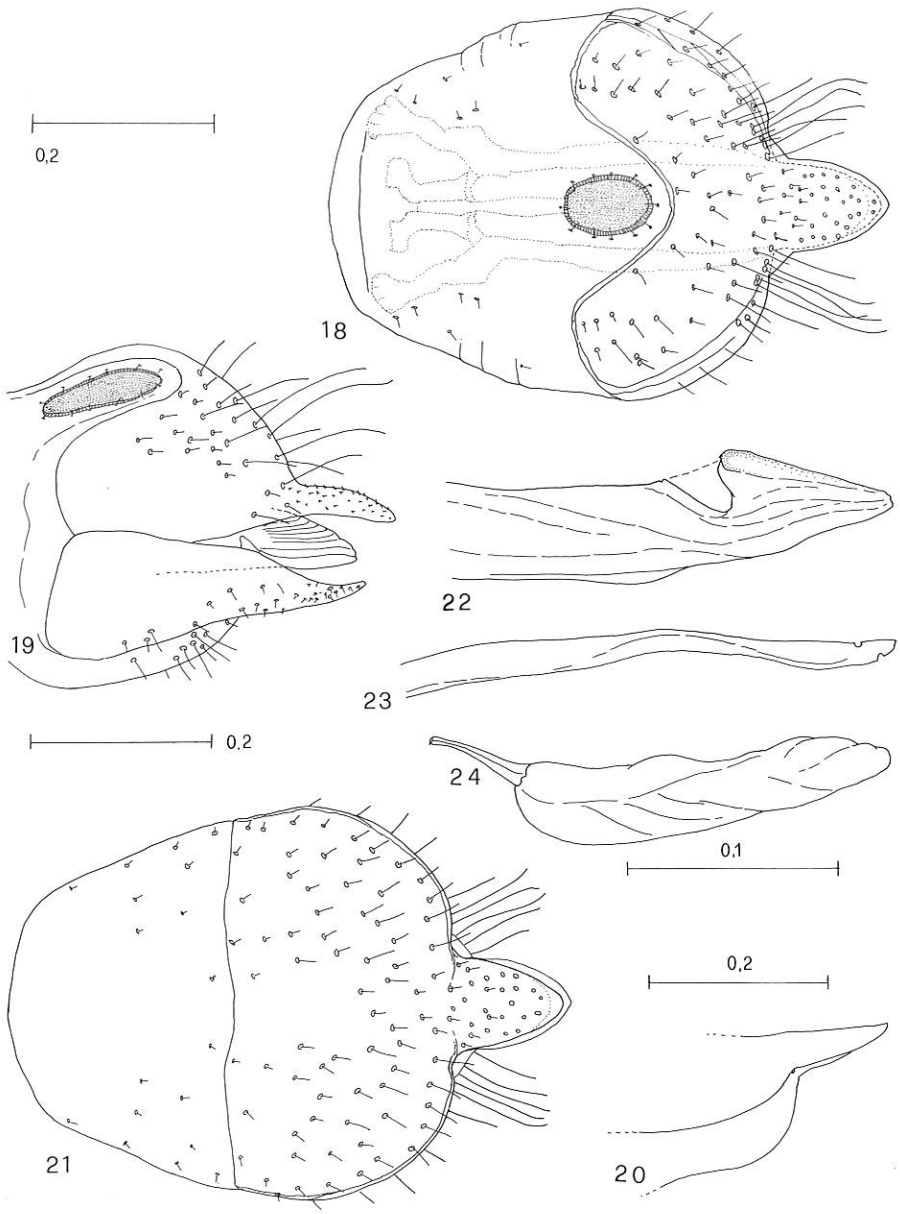
7) The *coloration* corresponds with BURCKHARDT's description. The abdomen in living specimens is light green or whitish green, with brown terminalia in the females.

8) The *measurements* correspond enough with those reported by BURCKHARDT 1986; we report measurements of our specimens from Basilicata; in mm:

total length: males 2.0-2.1; females 2.1-2.5;
head width: males 0.40-0.43; females 0.43-0.47;
vertex length: males 0.18-0.19; females 0.19-0.20;
vertex width: males 0.23-0.25; females 0.25-0.27;
genal cones length: males 0.14-0.15; females 0.14-0.16;
antennal length: males 0.74-0.78; females 0.71-0.84;
forewing length: males 1.56-1.80; females 1.96-2.04;
forewing width: males 0.58-0.66; females 0.71-0.78;
proctiger length: males 0.23-0.25;
parameres length: 0.16-0.19;
distal part of penis length: 0.20-0.23.



Heterotritoza sahlbergi, male, specimens from Basilicata, Cavone Torrent. - Fig. 10: terminalia. - Fig. 11: proctiger, anterior view. - Fig. 12: left paramere, outer surface. - Fig. 13: right paramere, inner surface. - Fig. 14: paramere, posterior view. - Fig. 15: apex of the paramere, interior view, with higher magnification. - Figs. 16-17: penis, from two specimens.



Heterotrioza sahlbergi, female, specimens from Basilicata, Cavone torrent. - Fig. 18: proctiger, dorsal view. - Fig. 19: terminalia, lateral view. - Fig. 20: subgenital plate, lateral-oblique view, schematic. - Fig. 21: genital segment, seen from below. - Fig. 22: ovipositor. - Fig. 23: valvula ventralis. - Fig. 24: valvula lateralis.

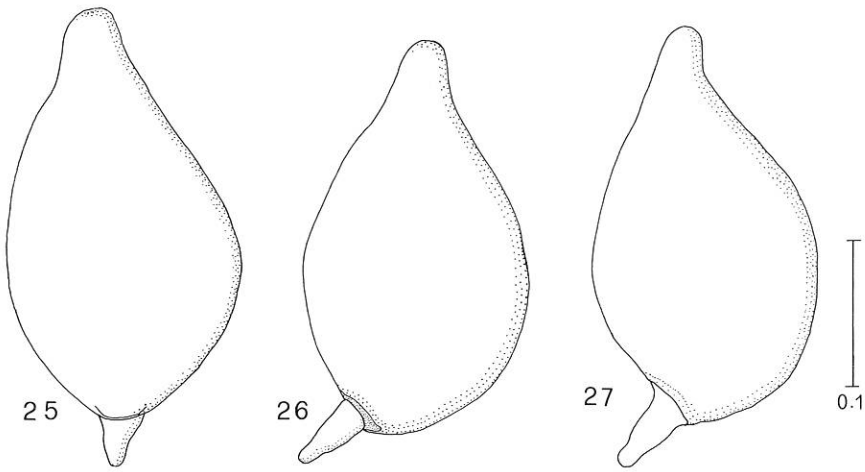
Ratios:

total length/head width: males 4.5-5.0; females 5.0-5.3;
antennal length/head width: males 1.7-1.9; females 1.5-1.8;
forewing length/forewig width: males 2.6-2.9; females 2.5-2.7;
forewing length/head width: males 3.7-4.2; females: 4.1-4.5.

2.3. *Preimaginal stages*

Nymphs unknown.

The egg (figs. 25-27) has a primitive form (type I of LOGINOVA 1979) as in other *Heterotrioza*. It is inflated, with a short stalk at the base and without micropyle. The egg is 0.30-0.32 mm long (with the stalk) and 0.14-0.15 mm wide.



Heterotrioza sahlbergi, specimens from Basilicata, Cavone Torrent. - Figs. 25-27: eggs.

2.4. *Host plant and life history*

All seven Italian findings are from *Atriplex halimus* L., of the family *Chenopodiaceae*, an halophilous erect stout perennial shrub, with woody stems of 40-200 cm; this plant is easy to recognize for the silvery-white leaves and grey-yellowish bark. *Atriplex halimus* is present in South

Europe, West Asia and North and South Africa, mainly near the sea. In Italy this plant lives in the Southern regions and in the isles, but has been naturalized also in other zones.

As regarding the life history, the Italian findings happened in May-June and August-September. We do not know other biological data.

MARCHAL 1897: 22 and HOUARD in some works (we mention only 1908: 392, n. 2209, figs. 655-656, and 1912: 62-63, figs. 128-131) report the finding of deformations on *Atriplex halimus* in Algeria and Tunisia, caused by a «Psyllide». These galls consist in leaves distorted, twisted and bent towards the upper surface, on the apex of branches. It is possible that these deformations are caused by *H. sahlbergi*. We did not observed galls, but never nymphs.

2.5. *Distribution*

South Italy, Basilicata, Province Matera, Commune Pisticci, sides of Cavone river, near the bridge of the state road n. 106, leg. Conci and Tamanini 24.V.82, 2 males, 1 female; idem, 18-19.VI.87, 23 males, 28 females.

Sardegna, Province Cagliari, Commune Cagliari, locality Stagnone, leg. C. Rapisarda 14.V.85, 2 males and 17 females; Cagliari, leg. S. Barbagallo 1.V.86, 1 male; Cagliari, Stagno Santa Gilla, leg. C. Rapisarda 20.V.86, 2 males and 2 females; Commune Quartu Sant'Elena, Stagno Simbirizzi, leg. Tamanini 4.IX.77, 12 males, 14 females; Commune Iglesias, San Benedetto, leg. Tamanini 22.VIII.77, 1 male, 1 female.

All the reported localities are near the sea and near sea-level, except San Benedetto, which is in an inland zone at 460 m a.s.l. All the Italian findings were made on *Atriplex halimus*.

On the whole, *H. sahlbergi* in Italy was found only in one restrict zone of Basilicata and in two zones of Sardegna, with 7 findings, between sea level and 460 m, in May-June and August-September, in 43 males and 63 females, always on *Atriplex halimus*.

Before our findings, *H. sahlbergi* was known only from Algeria: Clairfontaine (type locality) (SULC 1913) and Biskra (BURCKHARDT 1986). If the galls reported by MARCHAL 1897 and by HOUARD 1908, 1912, are from *H. sahlbergi*, the species is present also in Tunisia.

2.6. *Affinities*

H. sahlbergi is very similar to the new *Heterotrioza* reported by RAPISARDA in his doctorate thesis (1987: 328-336, fig. 62). *H. sahlbergi* appears to be also very similar to *H. kasachstanica* (Loginova, 1964), from Kazakhstan, and to *H. narynica* Loginova, 1978, from Kirghizistan, both living on *Atriplex cana*, perennial undershrub with silvery-white leaves, characteristic of semideserts of the Central Asia; these two taxa look much alike and perhaps are conspecific, according to BURCKHARDT 1986.

3. ACKNOWLEDGEMENTS

We thank Dr. C. Rapisarda (Catania) for the kind communication of the data of the specimens which he collected in Sardegna and Dr. C. Violani (Milano) for his valuable co-operation in the English translation.

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RIASSUNTO – Heterotrioza (Halotrioza) sahlbergi *in Italia, da* Atriplex halimus (Homoptera Psylloidea).

Gli AA dividono il genere Heterotrioza *nei due sottogeneri* Heterotrioza s. str. (*con le due specie* chenopodii *e* dichroa) *ed* Halotrioza *(con le rimanenti specie). Si esamina l'*Heterotrioza (Halotrioza) sahlbergi, *recentemente rinvenuta in Italia (Basilicata e Sardegna) sulla Chenopodiacea arbustiva e alofila* Atriplex halimus, *e se ne riportano disegni di alcuni interessanti caratteri morfologici e dell'uovo.* H. sahlbergi *è molto simile a* H. kasachstanica (*Log., 1964*) *ed a* H. narynica *Log., 1978.*

SUMMARY – The aa split the genus Heterotrioza *in the two subgenera* Heterotrioza s. str. (*with the two species* chenopodii *and* dichroa) *and* Halotrioza (*with the remaining species*). *They consider* Heterotrioza (Halotrioza) sahlbergi, *recently collected in Italy (Basilicata and Sardegna) on the halophilous shrub* Atriplex halimus (*family* Chenopodiaceae) *and they report the drawing of some interesting morphological peculiarities and of the egg.* T. sahlbergi *is very similar to* H. kasachstanica (*Log., 1964*) *and to* H. narynica *Log., 1978.*

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