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BACTERICERA PARASTRIOLA SP. N.,
FROM *SALIX PHYLICIFOLIA*,
LAPPONUM AND *WALDSTEINIANA*, IN SWEDEN AND ITALY
(Homoptera Psylloidea)

Abstract. — *Bactericera parastriola* sp. n., found on *Salix phyllicifolia* and *S. lapponum* in Sweden and on *S. waldsteiniana* in NE Italian Alps, is described. The new taxon was already recognized, but not named, from Poland, Switzerland and Rumania. *B. parastriola* is very similar to *B. striola*, a widespread species in the Palaearctic, and differs above all by the morphology of the parameres. The preimaginal instars are unknown. Thirty-seven figures are provided.

Key words: *Bactericera parastriola*, *B. striola*, *Salix*, Sweden, Italy, *Psylloidea*.

Riassunto. — *Bactericera parastriola* sp. n., da *Salix phyllicifolia*, *lapponum* e *waldsteiniana*, in Svezia e in Italia (Homoptera Psylloidea).

Viene descritta *Bactericera parastriola* sp. n., rinvenuta in Svezia su *Salix phyllicifolia* e *lapponum* e sulle Alpi italiane nord-orientali su *S. waldsteiniana*. Il nuovo taxon era stato da tempo riconosciuto, ma non denominato, per Polonia, Svizzera e Romania. *B. parastriola* è assai simile a *B. striola*, specie ad amplissima distribuzione nella Regione paleartica, da cui differisce soprattutto per la morfologia dei parameri. Gli stadi preimmaginali sono ignoti. Il lavoro è corredato da 37 figure.

1. Introduction.

The taxon here described was already recognized, but not named, by DOBREANU & MANOLACHE (1962: 278, figs. 191-193) who noted separable characters in specimens from Oltina (Rumania) different from the typical *striola*; KLIMASZEWSKI (1964: 49-50, figs. 17-18) observed similar characters in specimens from Poland. Also BURCKHARDT (1983: 76) found this taxon in Switzerland and reported it as « *Trioza (Bactericera)* sp.

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prope *striola* », writing that its description was conditioned by the revision of all the holarctic *Trioza* living on *Salix*. This revision is complex (only the palaearctic species are more than 20); we prefer to name this taxon, upon specimens from Italy and Sweden, and to report here the comparative description with *striola*.

B. striola was described and figured several times, but we prefer to give also new drawings of this species, because they are made by the same hand, and therefore are more clearly comparable.

2. *Bactericera parastriola* sp. n.

2.1. Description.

Both sexes are similar in morphology, coloration and size, but differ in terminalia.

Morphology. Head (fig. 1), in dorsal view, usually with elliptical eyes and wide vertex (in *striola*, fig. 13, the eyes are semispherical, very prominent, and the vertex is narrower). Vertex, in each half, with a round depression and a second smaller and deeper depression. Genal cones inclined downwards from the plane of the vertex with an angle of about 20°. Genal cones smaller than in *striola*, divergent at the base, seldom subparallel for a short distance, with external sides almost straight (the genal cones in *striola* have the apices more rounded and wider, the sides sinuous or concave and the internal sides more divergent). Antennae (fig. 2) short, thin, with proximal segments less wide than in *striola* (fig. 12); rhinaria on the apices of segments I, VI, VIII and IX. Head with hairs more numerous and a little thinner than in *striola*.

Pronotum and mesonotum narrower than the head. Forewing (figs. 3-4) with the basal half distinctly narrower than the apical half. Vein Rs normally distinctly wavy, but sometimes almost straight; the bifurcation of M normally disposed toward the base of the wing regarding the line uniting the Rs apex with the Cu_{1a} apex; but the two last characters are variable, as in *striola*. Form and dimension of the cells m₁ and cu₁ are fairly variable. Membrane without microsculpture, excepted a few small spinulae in the anal zone (which are lacking in *striola*) and the normal radular spinules. Legs as in *striola*; meracanthus as in fig. 7; base of metatibia as in fig. 8; apex of metatibia as in figs. 9-10; tarsus as in fig. 11.

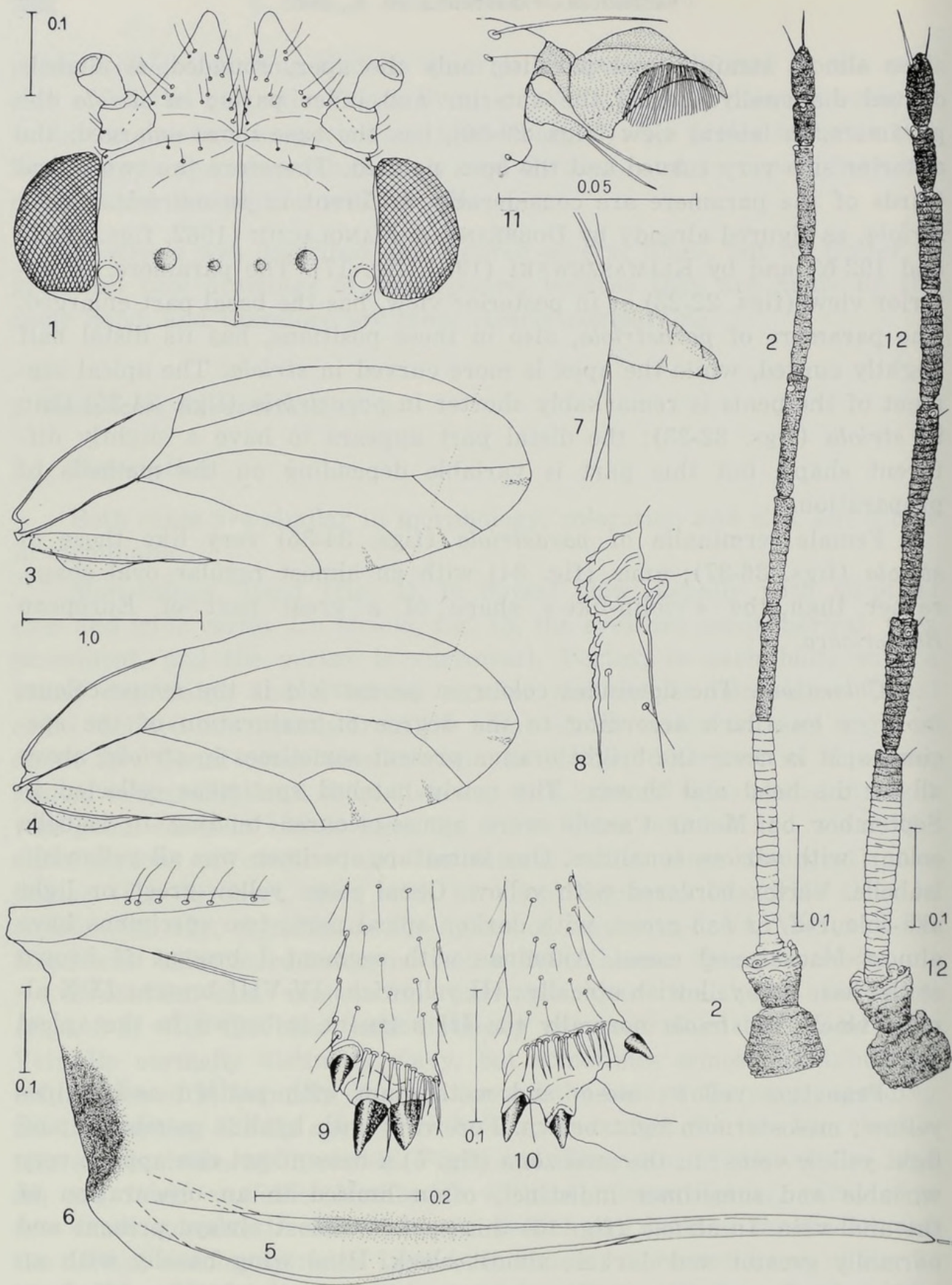
Male terminalia (figs. 17-18) with the proctiger similar to *striola* (fig. 28). Parameres flat, not twisted, in lateral view (figs. 19-21) with slightly enlarged basal part; the remaining part of the paramere has the

sides almost straight and parallel; only the apex, rounded, is slightly curved diagonally toward the anterior and inner parts; in *striola* the paramere, in lateral view (figs. 29-30), has the base more enlarged, the anterior side very curved and the apex pointed. Therefore the two apical thirds of the paramere are considerably different in *parastriola* and in *striola*, as figured already by DOBREANU & MANOLACHE (1962, figs. 190 b' and 192 b') and by KLIMASZEWSKI (1964, fig. 17). The paramere, in anterior view (figs. 22-23) or in posterior view, has the basal part enlarged. The paramere of *parastriola*, also in these positions, has its distal half slightly curved, while the apex is more curved in *striola*. The apical segment of the penis is remarkably shorter in *parastriola* (figs. 24-25) than in *striola* (figs. 32-33); the distal part appears to have a slightly different shape, but this part is variable depending on the methods of preparation.

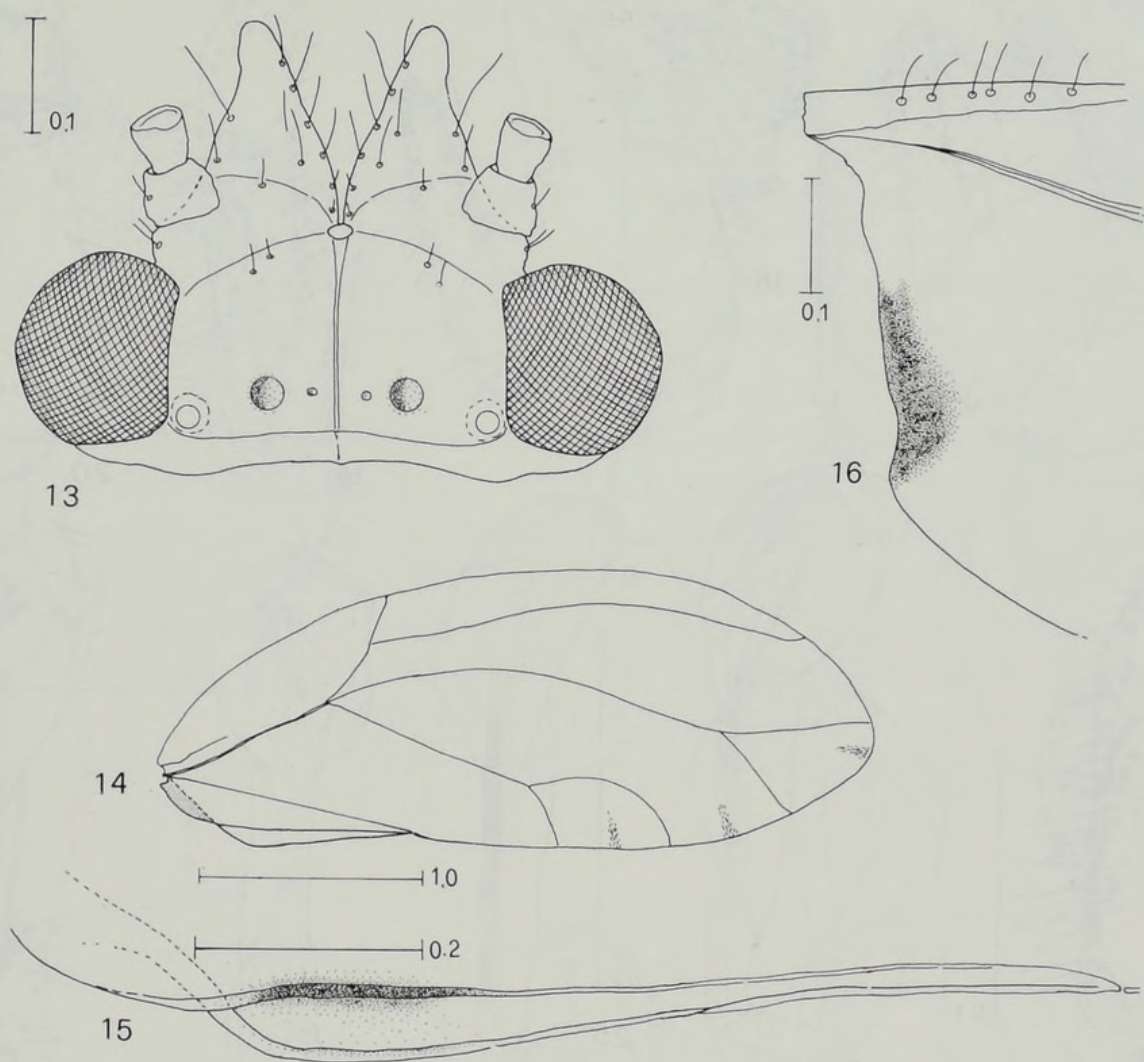
Female terminalia of *parastriola* (figs. 34-35) very like those of *striola* (figs. 36-37); anus (fig. 34) with an almost regular oval shape, rather than the «violin-like» shape of a great part of European *Bactericera*.

Coloration. The dominant colour in *parastriola* is the mouse-colour, more or less dark according to the degree of maturation of the specimens; it is never the bright orange present sometimes in *striola*, above all on the head and thorax. The newly hatched specimens collected in September on Mount Cavallo were mouse-coloured tending to isabella colour, with various tonalities. One immature specimen was all yellowish-isabelle. Vertex bordered with yellow. Genal cones yellow-green or light ash-coloured, or ash-green, with darker apical part; two specimens have almost black genal cones. Antennae with segment I brown; II brown at the base and yellowish apically; III yellowish; IV-VIII brown; IX-X almost black; in *striola* normally the III segment is brown in the apical third.

Pronotum yellow; meso- and metanotum with pattern and stripes yellow; mesosternum light brown. Forewing with hyaline membrane and light yellow veins; in the anal zone (fig. 5) a brown spot can appear very variable and sometimes indistinct, often limited to an obscuration of the anal vein. In *striola* (fig. 15) this spot is almost always present and normally greater and darker, almost black. Hind wing basally with an evident black spot (fig. 6), like the one present in *striola* (fig. 16). Legs light brown; meracanthus white; femora darker. Abdomen ash-coloured, normally dark; a part of the last sternite before the terminalia whitish; border of the sternites and of the pleurites sometimes light; one specimen with green abdomen.



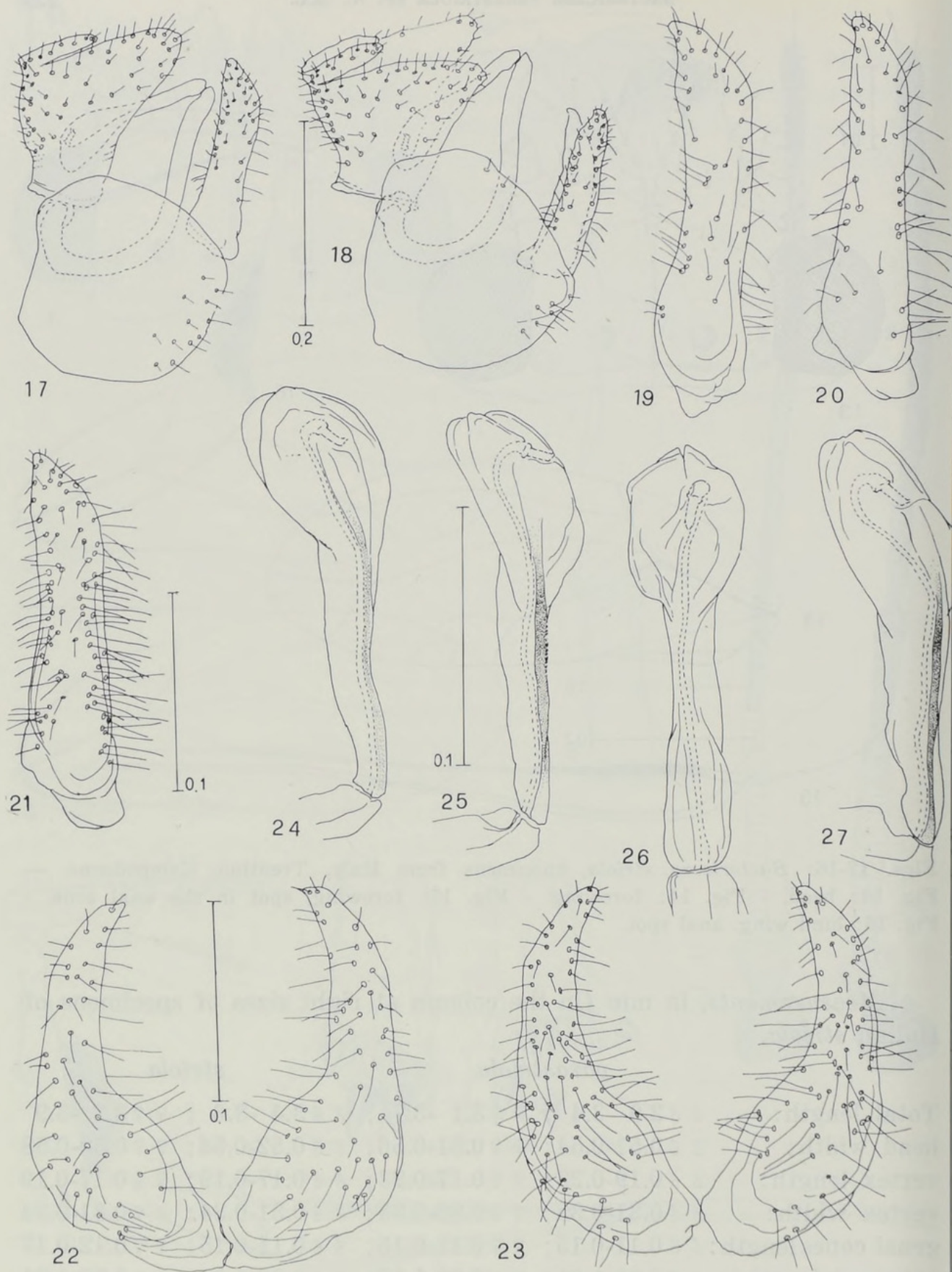
Figs. 1-11: *Bactericera parastriola*, males; specimens from Italy, Friuli-Venezia Giulia, M. Cavallo, except fig. 4, from Sweden. — Fig. 1: head. - Fig. 2: antenna. - Figs. 3-4: forewing; the points indicate the microsculpture. - Fig. 5: forewing, spot in the anal zone. - Fig. 6: hind wing, anal spot. - Fig. 7: meracanthus. - Fig. 8: base of metatibia. - Figs. 9-10: apex of metatibia. - Fig. 11: apex of tarsus with claws. Fig. 12: *Bactericera striola*, specimen from Italy, Trentino, Campodenno, antenna.



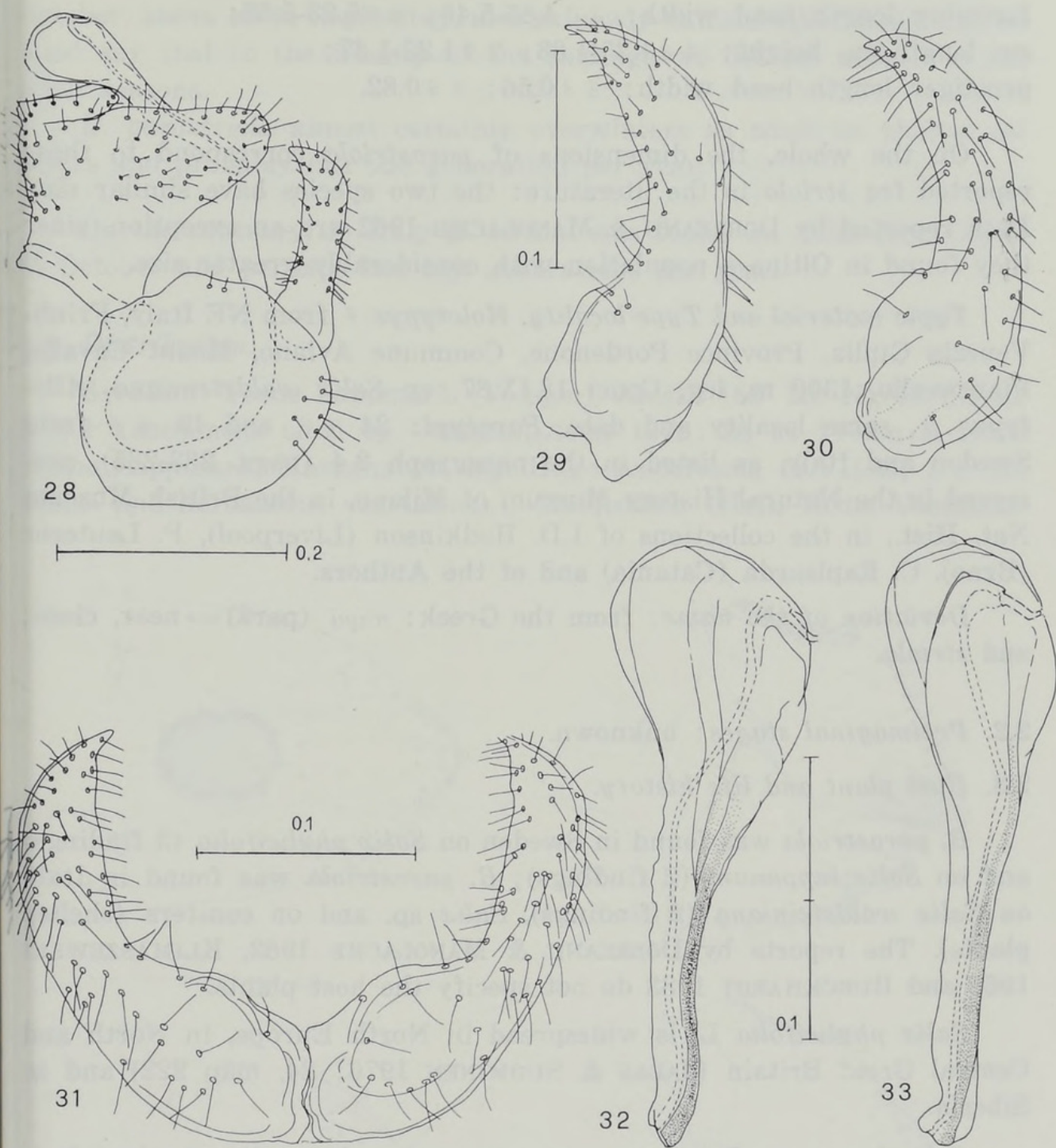
Figs. 13-16: *Bactericera striola*, specimens from Italy, Trentino, Campodenno. — Fig. 13: head. - Fig. 14: forewing. - Fig. 15: forewing, spot in the anal zone. - Fig. 16: hind wing, anal spot.

Measurements, in mm (in the column at right sizes of specimens of Italian *striola*.

	<i>parastriola</i>	<i>striola</i>
Total length:	♂ ♂ 2.9 -3.4 ; ♀ ♀ 3.1 -3.7 ;	♂ ♂ 3.4 -3.6 ; ♀ ♀ 3.2 -3.9
Head width:	♂ ♂ 0.51-0.54; ♀ ♀ 0.51-0.56;	♂ ♂ 0.52-0.54; ♀ ♀ 0.50-0.58
Vertex length:	♂ ♂ 0.19-0.23; ♀ ♀ 0.17-0.23;	♂ ♂ 0.17-0.19; ♀ ♀ 0.17-0.19
Vertex width:	♂ ♂ 0.31-0.33; ♀ ♀ 0.33-0.35;	♂ ♂ 0.31-0.34; ♀ ♀ 0.31-0.34
Ogenal cones length:	♂ ♂ 0.11-0.15; ♀ ♀ 0.11-0.15;	♂ ♂ 0.11-0.15; ♀ ♀ 0.12-0.17
Antennal length:	♂ ♂ 0.90-1.01; ♀ ♀ 0.90-1.17;	♂ ♂ 0.98-1.09; ♀ ♀ 0.98-1.01
Forewing length:	♂ ♂ 2.58-2.78; ♀ ♀ 2.74-2.98;	♂ ♂ 2.70-3.11; ♀ ♀ 2.76-3.13
Forewing width:	♂ ♂ 0.98-1.19; ♀ ♀ 1.09-1.17;	♂ ♂ 1.09-1.17; ♀ ♀ 1.05-1.29
Cu ₁ length:	♂ ♂ 0.43-0.59; ♀ ♀ 0.43-0.59;	
Cu ₁ height:	♂ ♂ 0.23-0.35; ♀ ♀ 0.31-0.35;	
Last segment of penis length:	0.17-0.18	0.22-0.25



Figs. 17-27: *Bactericera parastricola*, males, specimens from Italy, Friuli-Venezia Giulia, M. Cavallo, and from Sweden. — Fig. 17: terminalia, Italy. - Fig. 18: terminalia, Sweden, Lappmark. - Fig. 19: left paramere, outer surface, Italy. - Fig. 20: idem, Sweden, Härjedalen. - Fig. 21: right paramere, inner surface, Italy. - Fig. 22: parameres, anterior aspect, Italy. - Fig. 23: idem, Sweden. - Figs. 24-26: penis, from different specimens, Italy. - Fig. 27: penis, Sweden.



Figs. 28-33: *Bactericera striola*, males, specimens from Italy, Trentino, Campodenno, except fig. 33, from Sweden. — Fig. 28: terminalia. — Fig. 29: left paramere, outer surface. — Fig. 30: right paramere, inner surface. — Fig. 31: paramere, anterior aspect. — Figs. 32-33: penis.

Ratios:

total length/head width: ♂♂ 6.07-6.69; ♀♀ 6.13-6.76;
 genal cones length/vertex length: ♂♂ 0.65-0.80; ♀♀ 0.66-0.86;
 antennal length/head width: ♂♂ 1.64-2.00; ♀♀ 1.57-1.96;
 forewing length/forewing width: ♂♂ 2.34-2.80; ♀♀ 2.40-2.71;

forewing length/head width: ♂♂ 4.85-5.46; ♀♀ 5.23-5.53;
cu₁ length/cu₁ height: ♂♂ 1.25-1.83; ♀♀ 1.22-1.87;
proctiger length/head width: ♂♂ 0.56; ♀♀ 0.82.

On the whole, the dimensions of *parastriola* correspond to those reported for *striola* in the literature: the two species have similar size. Data reported by DOBREANU & MANOLACHE 1962 are an exception, since they found in Oltina a population with considerably greater size.

Typic material and Type locality. *Holotypys* ♂ from NE Italy, Friuli-Venezia Giulia, Province Pordenone, Commune Aviano, Mount Cavallo, Piancavallo, 1300 m, leg. Conci 18.IX.87, on *Salix waldsteiniana*. *Allotypus* ♀, same locality and date. *Paratypi*: 24 ♂♂ and 19 ♀♀ from Sweden and Italy, as listed in the paragraph 2.4 (pags. 233-235), preserved in the Natural History Museum of Milano, in the British Museum Nat. Hist., in the collections of I.D. Hodgkinson (Liverpool), P. Lauterer (Brno), C. Rapisarda (Catania) and of the Authors.

Deviation of the name: from the Greek: παρά (pará) = near, close; and *striola*.

2.2. *Preimaginal stages:* unknown.

2.3. *Host plant and life history.*

B. parastriola was found in Sweden on *Salix phylicifolia* (3 findings) and on *Salix lapponum* (2 findings); *B. parastriola* was found in Italy on *Salix waldsteiniana* (2 findings), *Salix* sp. and on conifers (shelter plants). The reports by DOBREANU & MANOLACHE 1962, KLIMASZEWSKI 1965 and BURCKHARDT 1983 do not specify the host plants.

Salix phylicifolia L. is widespread in North Europe, in North and Central Great Britain (JALAS & SUOMINEN 1976: 24, map 222) and in Siberia.

Salix lapponum L. is a species with a very large distribution; it is widespread in the North of Europe, Asia and America, and it is present also in Scotland, France, Central and Oriental Europe (JALAS & SUOMINEN 1976: 41, map 251). *Salix lapponum* is host plant also of *Cacopsylla propinqua* Schäfer.

Salix waldsteiniana Willd. is endemic to Europe and lives on Central and Eastern Alps and on a part of Balkans (JALAS & SUOMINEN 1976: 39, map 248; in Italy it lives between 1300 and 2300 m.

The life history of *B. parastriola* is scarcely known. The adults were found at the end of June and in July in Sweden; in Italy, in August-

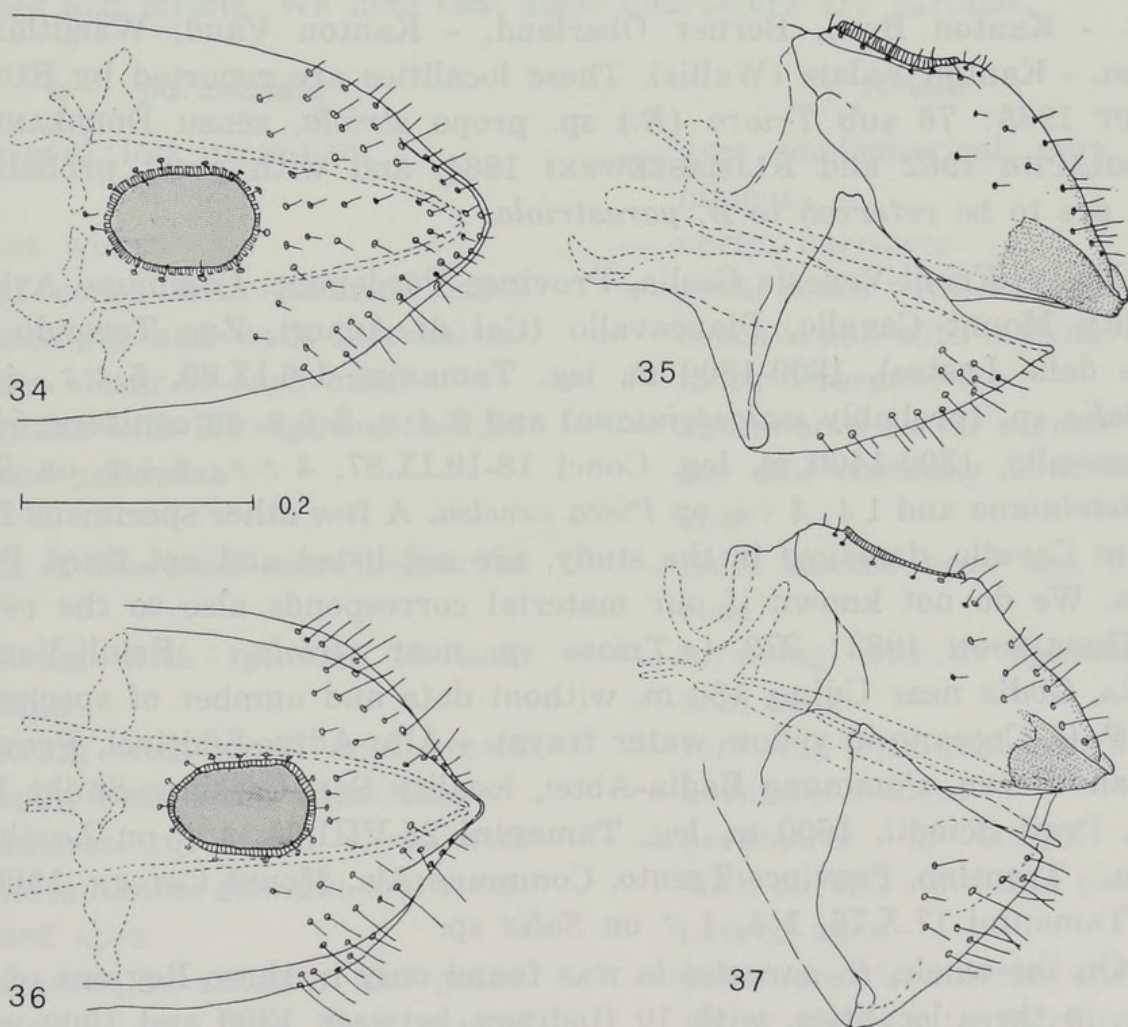
October, above all in September, also as newly hatched specimens; but we must say that in the locality of the findings we did not search in the other seasons.

B. parastriola almost certainly overwinters as adult on shelter conifers and probably has one generation per year.

On the contrary, in Italy *B. striola* was found on *Salix* from April to October and perhaps has two generations per year.

2.4. Distribution.

Sweden. Torne Lappmark (T. Lpm), Abisko (68° lat. N), 13.VII.55, 2 ♂♂ (specimens cited by OSSIANNILSSON 1972: 95 as *Trioza striola*); Torne Lappmark, Masugnsbyn, leg. Hugo Andersson, 18.VII.55, 1 ♂ (in grass- and herbaceous vegetation). - Härjedalen (Hrj), Hede, Vemdals-



Figs. 34-35: *Bactericera parastriola*, female, specimen from Sweden, Härjedalen. — Fig. 34: proctiger, dorsal view. - Fig. 35: terminalia, lateral view.
Figs. 36-37: *Bactericera striola*, female, specimen from Italy, Trentino, Campodenno. — Fig. 36: proctiger, dorsal view. - Fig. 37: terminalia, lateral view.

kalet, 15.VII.62, 7 ♂♂, 1 ♀, on *Salix phylicifolia*; idem 28.VI.63, 1 ♀ on *Salix phylicifolia*; Härjedalen, Hovda-tr., 17.VII.62, 1 ♀ on *Salix lapponum*; Härjedalen, Hede, Sandviken, 20.VII.62, 1 ♂, 1 ♀ on *Salix phylicifolia*. All material was collected by F. Ossiannilsson, except the specimen from Masugnsbyn. All the above-mentioned specimens are fixed as Paratypes; not Paratypes are: 1 ♀ from Hrj, Hede, Vemdalsskalet, 15.VII.62 from *Salix lapponum*, and 1 ♀ from the same locality, 28.VI.63 from *Salix phylicifolia*, damaged in the study.

To sum up, *B. parastriola* in North and Central Sweden was found in 5 localities, from the end of June to July, with 11 ♂♂ and 6 ♀♀, on *Salix phylicifolia* and *lapponum*.

Poland. The species would have been found in Poland, according to KLIMASZEWSKI 1964: 49-50, but there is no specification of locality. Klimaszewski does not mention this « form » in his subsequent works.

Switzerland. Kanton Graubünden, Engadin. - Kanton Schwyz, Rigi. - Kanton Bern, Berner Oberland. - Kanton Vaud, Waadtländer Alpen. - Kanton Valais (Wallis). These localities are reported by BURCKHARDT 1983: 76 sub *Trioza* (*B.*) sp. prope *striola*, sensu DOBREANU & MANOLACHE 1962 and KLIMASZEWSKI 1964, and with great probability they are to be referred to *B. parastriola*.

Italy. Friuli-Venezia Giulia, Province Pordenone, Commune Aviano, locality Mount Cavallo, Piancavallo (Col di Arneri, Zuc Torondo and Colle delle Lastre), 1300-1800 m, leg. Tamanini 1-6.IX.80, 5 ♂♂, 4 ♀♀ on *Salix* sp. (probably *waldsteiniana*) and 2 ♂♂, 3 ♀♀ on conifers; idem, Piancavallo, 1300-1400 m, leg. Conci 18-19.IX.87, 4 ♂♂, 4 ♀♀ on *Salix waldsteiniana* and 1 ♂, 4 ♀♀ on *Picea excelsa*. A few other specimens from Mount Cavallo, damaged in the study, are not listed and not fixed Paratypes. We do not know if our material corresponds also to the report by HODKINSON 1983: 279 (« *Trioza* sp. near *striola* »: Friuli-Venezia Giulia, Godia near Udine, 130 m, without data and number of specimens, leg. P. G. Coceano in yellow water trays). - Alto Adige-Südtirol, Province Bolzano-Bozen, Commune Badia-Abtei, locality San Cassiano-Sankt Kasian, Prati Sciadii, 1600 m, leg. Tamanini 25.VIII.65, 1 ♂ on *Larix decidua*. - Trentino, Province Trento, Commune Ala, Mount Carega, 1900 m, leg. Tamanini 17.X.76, 1 ♂, 1 ♀ on *Salix* sp.

On the whole, *B. parastriola* was found only in three Regions of NE Italy, in three localities, with 10 findings, between 1300 and 1900 m, in August-October, with 14 ♂♂ and 16 ♀♀, on *Salix waldsteiniana*, *Salix* sp. and on conifers. Therefore in Italy *B. parastriola* is rare and much localized. *B. striola*, on the contrary, was found in 7 Regions of North and

Central Italy, in 30 localities, with 40 findings, between 50 and 1750 m, with about 150 specimens, on *Salix* spp., sometimes *elaeagnos* and *purpurea* (April-October) and on conifers (November-February) (CONCI & TAMANINI, in press).

Rumania. Dobrugea, Oltina. The report by DOBREANU & MANOLACHE 1962: 278 as « *Trioza striola*, specimens of Oltina » are to be referred to *parastriola*.

The reported localities are only a sketch of the true areal of *B. parastriola*. Only the examination of material of the old *B. striola*, a species with very large distribution from Europe to Japan, will fix the true distribution of these two species.

2.5. Affinities.

We report here the principal distinctive characters between *parastriola* and *striola*. We note that some characters are variable.

parastriola

striola

eyes oval, less prominent

— eyes semispherical, very prominent

vertex wider

— vertex narrower

genal cones with external sides straight and with internal sides closer to each other

— genal cones with external sides concave and with internal sides more divergent

antennae with III segment thinner and yellowish

— antennae with III segment larger and normally with brown apex

hairs of the head more numerous

— hairs of the head less numerous

forewing with spinulae in anal zone

— forewing without spinulae in anal zone

forewing with small anal brown spot, sometimes indistinct

— forewing with anal brown spot normally evident

parameres, in lateral view, with sides almost straight and rounded apex

— parameres, in lateral view, with curved sides and pointed, curved apex

parameres, in anterior and posterior view, with less curved apex

— parameres, in anterior and posterior view, with more curved apex

penis with terminal segment shorter (mm 0.18).

— penis with terminal segment longer (mm 0.25).

Regarding the relationships between *B. parastricola* and the other congeneric species of the Western Palaearctic living on *Salix*, if we consider as an important character the « presence or absence » of spinulae on the forewing, *parastricola* is in a intermediate position between the two groups, because it has only few spinulae, limited to the anal region.

Also if we consider the character « presence or absence » of the dark spot in the anal zone of the forewing, *parastricola* has an intermediate position, because of the variability in dimensions and intensity of this spot.

Acknowledgement. — We thank Prof. P. Paiero, of the Istituto di Selvicoltura, University of Padova, for the botanical determination of the *Salix* of M. Cavallo.

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