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## Trioza laserpitii sp. n., a New Central European Psyllid

**(Homoptera, Psyllodea)**

With 25 Figures and 2 Photographs

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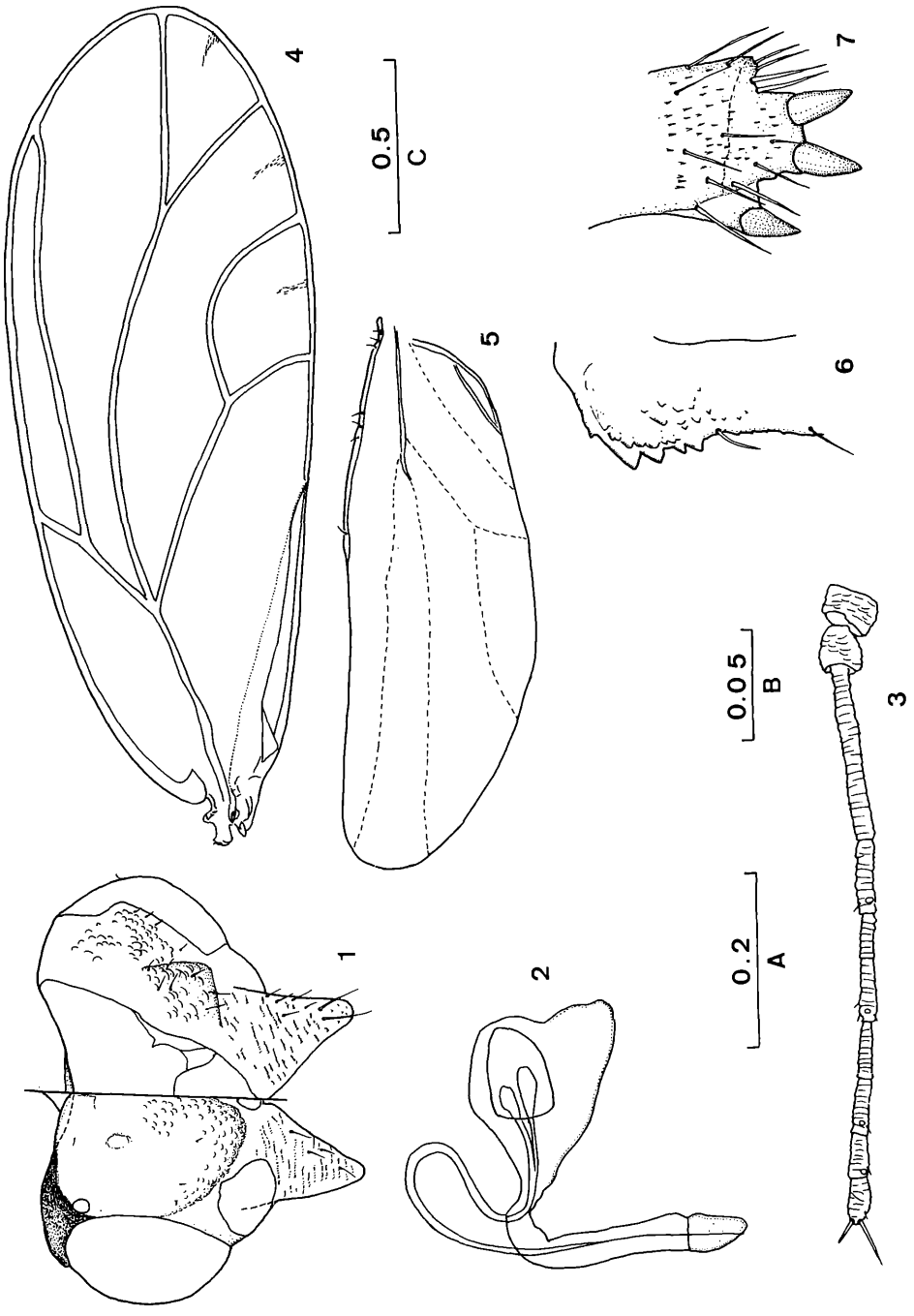
The damage on *Laserpitium latifolium* L. caused by *Trioza laserpitii* sp. n. has been previously recorded in cecidological literature and has been attributed to unknown species of the genus *Trioza* (ROSS, 1922; ROSS & HEDICKE, 1927). In other papers, this damage has been erroneously accounted to *Trioza apicalis* FÖRSTER, 1848 (= *T viridula* auct. nec (ZETTERSTEDT, 1828)) (WAHLGREN, 1934 and 1953; WAGNER & FRANZ, 1961; BUHR, 1964; KLIMASZEWSKI, 1965). Judging from the description and the drawings, the record of *Trioza apicalis* from Roumania by DOBREANU & MANOLACHE (1959 and 1962) concerns also *T. laserpitii* sp. n. For a long time *T apicalis* was thought to be a relatively unspecialized oligophagous species feeding on different genera of Daucaceae. In fact, *T. apicalis* sensu lato is composed of different species, each more or less specialized on one host plant genus, although it seems that in certain conditions the development can be completed on related genera of the main host (LÁSKA, 1974), a phenomenon which is rarely observed in psyllids and which can be explained by the relatively young phylogenetic age of this species complex. Similarly, e. g. LAUTERER (1982) found in laboratory breedings, that *Heterotrioza chenopodii* (REUTER) can complete development on *Beta* and *Spinacia* which do not belong to the common genera of its host plants.

For the European fauna, the following species within this complex have been described up to now: *T. apicalis* FÖRSTER on *Daucus carota* L., *T pallida* HAUPT on *Anthriscus sylvestris* (L.) HOFFM., and *T. carpathica* DOBREANU & MANOLACHE on *Angelica archangelica* L.

The morphological terminology used follows mainly HODKINSON & WHITE (1979) and WHITE & HODKINSON (1982). The nomenclature of the plant species is according to the „Flora Europaea" (TUTIN et al., 1964–1980).

### Trioza laserpitii sp. n.

Adults Colouration Teneral specimens with head light green, sometimes yellowish green, anterior ocellus yellow to light red brown, posterior ocelli light red brown, compound eyes light grey yellow to ochreous red; clypeus dark brown, apical segment of labium black. Thorax light green, with more or less distinct longitudinal yellowish green stripes on dorsum; legs green to yellow; forewing transparent, surface and marginal spinules dark, veins yellow to ochreous, hindwing clear. Abdomen light green, terminalia light green to yellow, apex of parameres, apical parts of ovipositor and valvula ventralis dark. Overwintered specimens first of the same colouration, light green, gradually changing, during July and August, to uniformly yellow including eyes and ocelli.




Figs. 1–7 *Trioza laserpitii* sp. n., adult. 1: head – 2: clypeus and labium – 3: antenna – 4: forewing – 5: hindwing – 6: base of metatibia – 7: apex of metatibia.
Scales (in mm): A = Figs. 1–3; B = Figs. 6, 7 C = Figs. 4, 5.

Antennal colouration variable: very young males with entirely yellow antennae, only segments 9 and 10 black, in older males and females antennal segments 6 to 8, often also segment 5 brown and 4 light brown; in overwintered specimens segments 4 to 8 dark brown, segment 3, rarely segment 4 light brown, only segments 1 and 2 yellow.

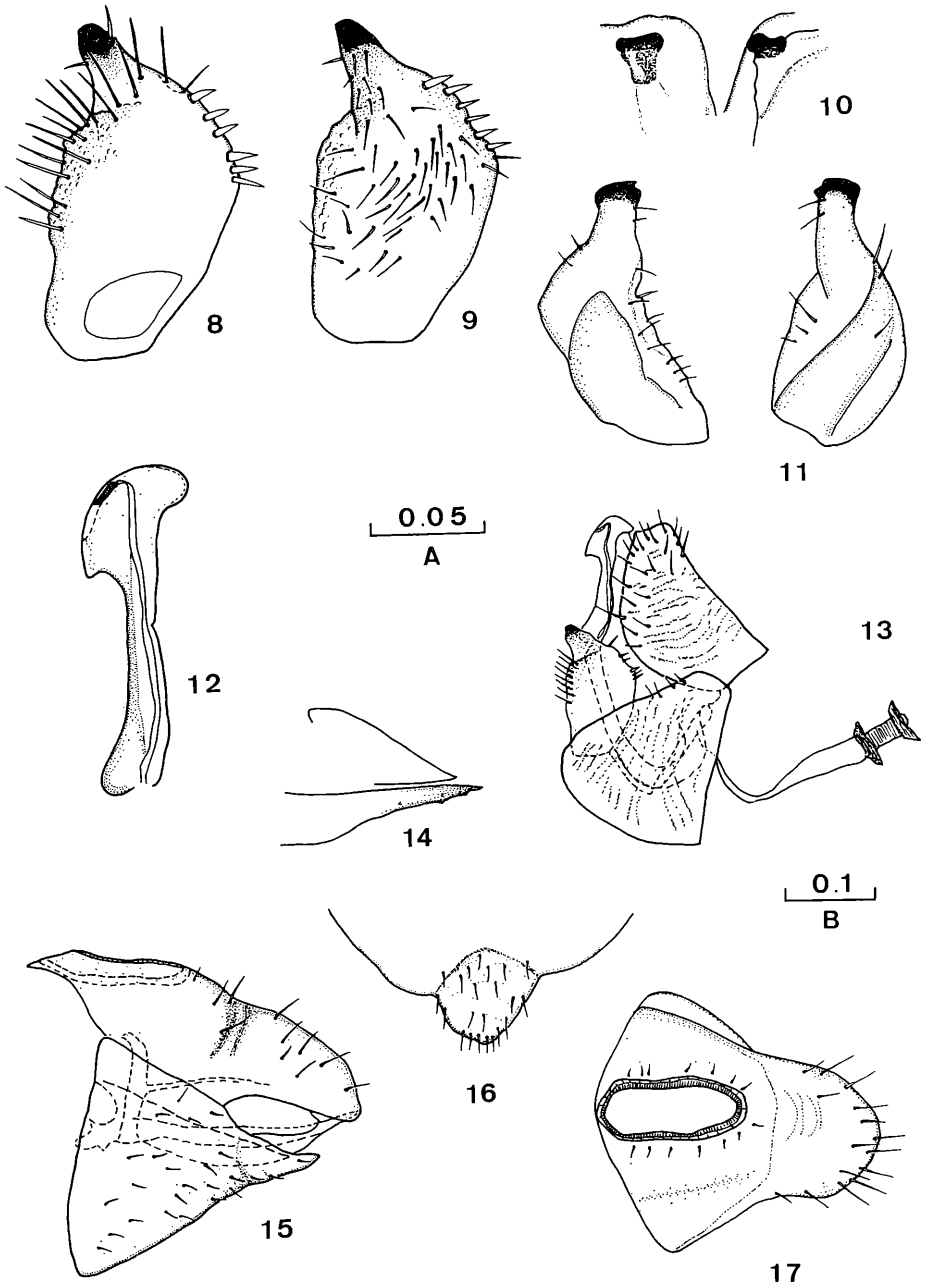
Morphology Head (Fig. 1) slightly narrower than thorax. Vertex flat, between posterior ocelli 1.24–1.52 as broad as long at midline, clearly separated from frons and genae. Genal cones tapering, 0.53–0.72 times as long as vertex at midline, covered with setae and irregular rows of tubercles. Antennae (Fig. 3) ten-segmented, 1.31–1.67 times head width, length of segment three 2.01–2.54 times the length of segment four. Segments 4, 6, 8 and 9 with one rhinarium, apex of segment 10 with two long setae. Clypeus in side view (Fig. 2) cone-shaped, apical two segments of labium 0.41–0.55 times head width.

Thorax of typical *Trioza* form. Forewing (Fig. 4) membranous, 2.40–2.67 times as long as broad, 4.52–5.17 times head width. Venation triozine, vein $R_s$ only weakly sinuous, cutting costal margin distal to branching of vein M. Basal width to height ratio of cell $cu_{1a}$ 1.16–1.69. Upper surface spinules present in all cells, in distal cells more or less regularly spaced with a distance about 10–20 $\mu$m (4 adjoining spinules forming the edges of a rhombus or quadrat), in proximal cells somewhat closer and less regular, arranged rather in transverse rows; with narrow free stripes along veins. Lower surface spinules present only in the distal part of cell $r_s$. Marginal spinules present in cells $m_{1+2}$, $m_{3+4}$ and $cu_{1a}$. Hindwing (Fig. 5) membranous, of the generic type, costal setae grouped. Metacoxae with well developed meracanthi. Metatibiae 0.75–0.88 times head width, with several basal spines (Fig. 6) and 3 thick black apical spines (Fig. 7), basal metatarsus without spines. Abdomen lacking diagnostic features except for terminalia.

Male proctiger (Fig. 13) somewhat bulged in the middle, covered with long setae mainly in apical and posterior part and with irregular rows of tubercles. Subgenital plate triangular in side view, and covered with tubercles similarly as proctiger. Parameres (Figs. 8–11, 13) short, 0.65–0.85 times the length of proctiger. Caudal and distal margin of the broader basal two third on outer side with long setae, upper anterior margin with several shorter and stouter setae (Fig. 8). Inner side of basal part with long setae mainly in center and upper anterior part (Fig. 9). Apical third forming a process directed inwards and posteriad. Upper margin with a sclerotized tooth which, in lateral projection, is hidden behind the paramere projection and thus invisible (Figs. 8 and 9); it is visible in a more anterolateral view (DOBREANU & MANOLACHE, 1962, Figs. 245 a'' and a'''). Dorsal and posterior view as in Figs. 10 and 11. Apical part of the aedeagus (Fig. 12) 0.69–0.87 times proctiger length, dilated apically. Sclerotized end tube of the ductus ejaculatorius short, straight and situated in the middle of the dilated part.

Female proctiger (Figs. 15 and 17) slightly constricted behind perianal pore ring, apex rounded, covered with long setae, length of dorsal margin 0.72–0.79 times head width. Perianal pore ring with two unequal rows of pores. Subgenital plate (Figs. 15 and 16) edge-shaped in side view, 0.70–0.88 times the length of the proctiger, apex somewhat constricted. Valvula ventralis (Fig. 14) with several teeth.

Measurements Head width ♂ 0.45–0.50 mm, ♀ 0.46–0.50 mm. Antennae length ♂ 0.65–0.77 mm, ♀ 0.63–0.79 mm. Forewing length ♂ 2.14–2.42 mm, ♀ 2.29–2.47 mm. Male proctiger length 0.17–0.19 mm. Paramere length 0.12–0.14 mm. Length of the apical portion of the aedeagus 0.13–0.15 mm. Length of the dorsal margin of the ♀ proctiger 0.35–0.40 mm.




Figs. 8–13. *Trioza laserpitii* sp. n., male. 8: paramere, inner view – 9: paramere, outer view – 10: parameres, dorsal view – 11: parameres, posterior view – 12: apical portion of aedeagus – 13: male terminalia, lateral view. Figs. 14–17: *Trioza laserpitii* sp. n., female. 14: ovipositor and valvula ventralis – 15: terminalia, lateral view – 16: subgenital plate, ventral view – 17: proctiger, dorsal view.
Scales (in mm) A = Figs. 8–12, 14; B = Figs. 13, 15–17.

Early stages Egg (Fig. 25) Asymmetrically prolonged oval in shape, with dorsal side more convex, the ventral one just slightly so, almost flat. Basal part provided with a short (0.04 mm) basal pedicel, declined at an angle of about 25° from the longitudinal axis of the egg. The pedicel is wholly inserted in the leaf tissue of the host plant. Close above the insertion of the pedicel, the ventral side of the egg bears a minute tubercular enlargement, apparently serving to increase the stability of the laid egg. The egg including the pedicel is 0.56–0.60 mm in length and 0.19 in maximum breadth.

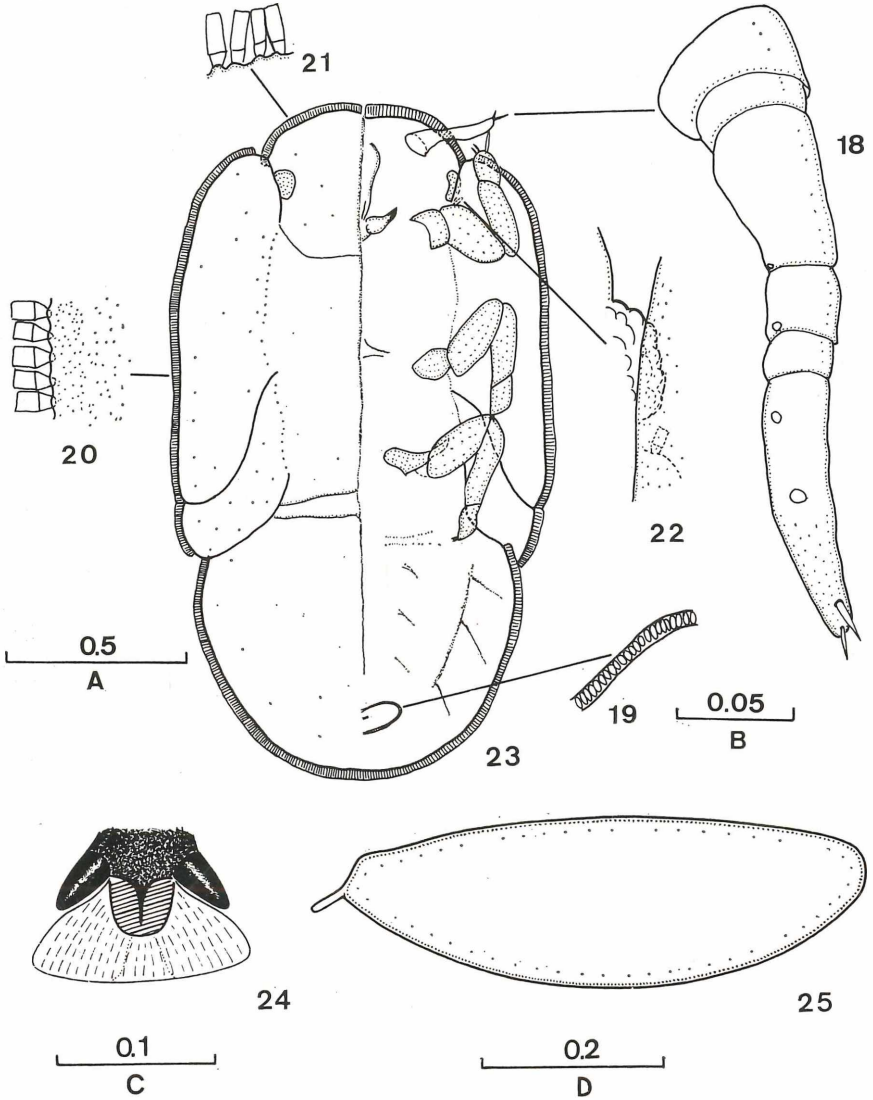
Last nymphal instar Colouration Body whitish to pale green or yellow; compound eyes, apical antennal segment and apex of labium dark.

Morphology Habitus (Fig. 23) of typical *Trioza* form. Antennae (Fig. 18) 6-segmented with one rhinarium on segments 3 and 4 and two on segment 6, apically with two setae. Body hardly segmented. Dorsum with weakly developed median longitudinal ridge. Perianal pore ring (Fig. 19) consisting of a simple row of pores. Setae on body surface except of sectasetae and those on antennae and legs wanting, surface covered with minute tubercles (fig. 20). Marginal sectasetae (Figs. 20 and 21) standing close together; chaetotaxy as follows: Head with 74–82 sectasetae; prothorax on each side with one very small sectaseta more or less hidden under the forewing bud (Fig. 22); each forewing bud with 103–112; each hindwing bud with 16–18; abdomen with 169–180; which makes a total of 483–524 sectasetae for the whole body. Arolium (Fig. 24) like a flat, broad disc section, with slightly rounded sides, very much like that of *T. apicalis* but somewhat narrower. Body length 1.80 mm (1.75–1.84); forewing-pad length 1.03 mm (0.97–1.06); outer circumanal ring breadth 0.23 mm; antenna length forewing-pad length ratio 0.31; body breadth length ratio 0.63; caudal plate breadth length ratio 1.20.

Lower instars Resembling fifth instar except for the general characters typical of each instar in the family *Triozidae*.

Bionomics The species is univoltine. Both sexes overwinter as adults on conifers *(Picea abies, Pinus silvestris, P. mugo)*. The bionomics was studied by the second author in Slovakia. There the invasion of the host plants apparently takes place in late June, depending on elevation and exposition of habitat. Last overwintered specimens were found in the first decade of August (6 Aug.) at which time still ovipositing females as well as already dead individuals were observed on the host plant. The eggs are laid singly on the lower surface of the leaves, usually at distances not shorter than 2 mm. In the last decade of June (25 June), numerous eggs with embryos showing advanced development were found; on 2 July, single 1st and 2nd instar nymphae. In mid-July (15 July), several 1st and numerous 2nd and 3rd instar nymphae were found; in early August (6 Aug.), all developmental stages: eggs, very abundant nymphae of all instars (5th instar still somewhat less abundant) and the first newly emerged male. In the first decade of September (7–11 Sept.), infrequent 4th instar nymphae and masses of 5th instar nymphae were observed; the emergence of adults attained its maximum; in breedings from nymphae, also parasitic *Hymenoptera* emerged.

Description of the deformation on the host plants *Laserpitium latifolium*: The feeding of the nymphs sitting on the lower leaf surface causes a decolouration of smaller or larger areas, visible on both surfaces of the leaf (Photos 1 + 2). We have not observed a real deformation of the leaf, at most the leaf forms a slight bulge or pickle, in which the nymph is sitting. WAHLGREN (1953) and BUHR (1964) described on this plant similar deformations as on *L. siler*.




Figs. 18–24. *Trioza laserpitii* sp. n., last instar nymph. 18: antenna – 19: perianal pore ring – 20: sectasetae of forewing bud – 21: sectasetae of head – 22: eye and sectaseta of prothorax – 23: general dorsal (left) and ventral (right) aspect – 24: arolium with claws. Fig. 25. *Trioza laserpitii* sp. n., egg, lateral view.
Scales (in mm): A= Fig. 23; B = Figs. 18–22; C = Fig. 24; D = Fig. 25.

*Laserpitium siler*: The nymphs live on the lower surface of the leaf and cause there a simple undulation or distortion or the formation of tubercles (THOMAS, 1875; LÖW, 1888; SCHLECHTENDAL, 1891; KIEFFER, 1901; HOUARD, 1909; ROSS & HEDICKE, 1927; BUHR, 1964).

*Laserpitium krapfii*: Similar deformation as on *L. siler* (MARIANI, 1907; HOUARD, 1909).

Photo 1 (on the left). *Laserpitium latifolium*, leaves damaged by *Trioza laserpitii* sp. n. – Photo 2 (on the right). General view of an undergrowth of *Laserpitium latifolium* infested by *Trioza laserpitii* sp. n. (Photos D. BURCKHARDT)

*Laser trilobum*: Similar deformation as on *L. siler* (SCHLECHTENDAL, 1890; KIEFFER, 1901; HOUARD, 1909; BUHR, 1964).

Material examined: Holotypus: Male, Czechoslovakia, N Slovakia, Belanské Tatry Mts., S slopes between Dolina Sedmich prameňov Valley and Tatranská Kotlina village, 1000–1300 m, bred from nymph on *Laserpitium latifolium* growing in thin forest, 7. ix. 1967 (LAUTERER).

Paratypes: Czechoslovakia: ibid., adults collected from *L. latifolium* and bred from nymphs, 7.–11. ix. 1967, 51 ♂♂, 46 ♀♀ (LAUTERER). Belanské Tatry Mts.: Dolina Sedmich prameňov Valley, meadow on avalanche trough, 1300 m, 9. ix. 1957, 1 ♂, 1 ♀ (HOFFER); ibid., alpine meadow in the direction to Skalné vrata Rocks, 1350–1650 m, 28. vi. 1972, 2 ♂♂ (LAUTERER); Mt. Bujačí vrch, 1500–1900 m, from *Pinus mugo*, 16. ix. 1958, 1 ♂ (HOFFER); pathway in thin forest between Mt. Kobylí vrch and Faixova louka Saddle, 1100 m, from *L. latifolium*, 6. viii. 1967, 8 ♂♂, 13 ♀♀ (LAUTERER); forest undergrowth between Tatranská Kotlina village and Šumivý prameň Spring, 850–950 m, from *L. latifolium* (partly bred from nymphs), 7. ix. 1967, 2 ♂♂, 3 ♀♀ (LAUTERER). Liptovské Hole Mts.: alpine meadows between Tatliakova chata Hut and Mt. Volovec, 1400–1550 m, 14. viii. 1959, 1 ♀ (LAUTERER). Malá Fatra Mts.: Stankovany, Mt. Šip, S slopes, 800–1000 m, from *L. latifolium*, 2. vii. 1972, 3 ♀♀ (LAUTERER). Velká Fatra Mts.: Ružomberok, Mt. Malinô Brdo, 1000 m, from *L. latifolium*, 15. vii. 1979, 2 ♂♂, 2 ♀♀ (LAUTERER); ibid., 13. vi. 1982, 74 ♂♂, 66 ♀♀ (LAUTERER & JANÍČEK). Chočské pohorie Mts.: S slopes between Valaská Dubová and Mt. Velký Choč, 800–900 m, from *L. latifolium*, 12. vi. 1982, 16 ♂♂, 32 ♀♀ (LAUTERER

& JANÍČEK). Helvetia FR, Vallon des Morteys, 1450 m, from *Chaerophyllum* sp., 5. vii. 1980, 1 ♂ (BURCKHARDT); same data, 1600 m, from *Rhamnus alpina*, 1 ♀ (BURCKHARDT). VD, Vallon des Ciernes Picat, under Mt. Dent des Bimis, 1450 m, from *L. latifolium*, 21. ix. 1980, 1 ♀ (BURCKHARDT); same data, 28. ix. 1980, 3 ♂♂, 2 ♀♀ (BURCKHARDT). SO, Chluser Roggen, 740 m, from *Picea abies*, 19. v. 1980, 1 ♀ (BURCKHARDT). GR, Unterengadin upon Ramosch, 1320 m, from *Picea abies* and *Pinus silvestris*, 25. v. 1980, 3 ♂♂, 8 ♀♀ (BURCKHARDT); same data, 1600–1650 m, 8 ♂♂, 23 ♀♀ (BURCKHARDT); same data, 1160 m, 24. v. 1980, 1 ♀ (BURCKHARDT). VS, Binntal, 1500 m, from *Laserpitium siler*, 26. ix. 1980, 1 ♀ (BURCKHARDT). Austria Almkogel bei Klein Reifling, from *L. latifolium*, 16. ix. 1943, 2 ♀♀ (FRANZ).

Material not included in the type series Czechoslovakia N Slovakia, Nízké Tatry Mts.: Demänovská dolina Valley, left side-valley of a brooklet, S slopes of Mt. Siná, 800–1100 m, from *L. latifolium*, 7. vii. 1974, numerous eggs (LAUTERER). Malá Fatra Mts.: Stankovany, Mt. Šip, S slopes, 900–1000 m, from *L. latifolium*, 25. vi. 1971, numerous eggs (LAUTERER); same data, 2. vii. 1972, eggs and single 1st and 2nd instar nymphae. Velká Fatra Mts.: Ružomberok, Mt. Malinô Brdo, 1000 m, 15. vii., *L. latifolium*, numerous eggs, several 1st and numerous 2nd and 3rd instar nymphae (LAUTERER); ibid., 13. vi. 1982, numerous eggs (LAUTERER & JANÍČEK). Belanské Tatry Mts.: pathway in thin forest between Mt. Kobylí vrch and Faixova louka Saddle, 1100 m, from *L. latifolium*, 6. viii. 1967, numerous eggs and larvae of all instars (LAUTERER); S slopes between Dolina Sedmich prameňov Valley and Tatranská Kotlina village, 1000–1300 m, 7 ix., *L. latifolium*, numerous 5th and 4th instar nymphae (LAUTERER). Helvetia VD, Vallon des Ciernes Pictat, under Dents des Bimis, 1450 m, from *L. latifolium*, 20. and 28. ix. 1980, several nymphae (BURCKHARDT). VS, Binntal, 1500 m, from *L. siler*, 26. ix. 1980, 1 nymph (BURCKHARDT). Austria Almkogel bei Klein Reifling, from *L. latifolium*, 16. ix. 1943, 2 adults without terminalia (FRANZ).

The material is deposited in the collections of the Moravian museum, Brno; Entomologisches Institut, ETH-Zentrum, Zürich; Naturhistorisches Museum, Wien; R. JANÍČEK, Brno; Liverpool Polytechnic (Coll. Dr. I. D. HODKINSON), Liverpool; Staatliches Museum für Tierkunde, Dresden; Uniwersytet Slaski (Coll. Prof. Dr. habil. S. M. KLIMASZEWSKI), Katowice.

Distribution The species occurs locally but is widespread in Central Europe. Material from Czechoslovakia (locus typicus), Switzerland and Austria has been examined. DOBREANU & MANOLACHE (1959 and 1962) record this species from Roumania under the name *Trioza apicalis*. The records of deformation on *Laserpitium latifolium*, *L. siler*, *L. krapfii* and *Laser trilobum* suggest the occurrence of this species in Italy (MARIANI, 1907), the former Germany (ROSS, 1922), Poland (KLIMASZEWSKI, 1965) and also Northern Europe, Sweden (WAHLGREN, 1934 and 1953).

Discussion *Trioza laserpitii*, belonging to the *T. apicalis* group, can be separated from other species of this complex by the morphology of male and female terminalia. Further, it differs from other species of this group at first sight by relatively longer and stouter forewings and darker colouration of antennae, namely of 4th to 8th articles. A detailed discussion as well as keys for the determination are provided in a revision of this group by the first author (BURCKHARDT, in prep.).

Records of leaf deformation on *Laserpitium krapfii* and *Laser trilobum*, published by various authors as caused by *Trioza* sp., are attributed here provisionally to *T. laserpitii*, since all material for this study was bred from *L. latifolium* and *L. siler* or collected on conifers; further investigations are needed to confirm these plants as the hosts of *T. laserpitii*.

**Summary**

*Trioza laserpitii* sp. n. from *Laserpitium latifolium* L. is described and illustrated. The new species belonging to the *Trioza apicalis* group is characterized by the morphology of male and female terminalia, and its host plant. Bionomics, early stages and the deformation of the host plant are described.

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