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Orthotylus (Melanotrichus) riegeri n. sp., a new plant bug from Switzerland (Heteroptera: Miridae: Orthotylinae)

Ralf HECKMANN[1]

Orthotylus riegeri n. sp. from the Canton Thurgau in Switzerland is described and illustrated. The systematic relationship in the genus *Orthotylus* is discussed and the new species is provisionally put in the subgenus *Melanotrichus*. It resembles *Orthotylus flavosparsus* (C. SAHLBERG, 1841) but differs in a variety of features such as ocular index, pilosity, length of the tibiae, coloration of the wing membrane cells, and morphology of the male genitalia.

Keywords: Heteroptera, Switzerland, Thurgau, Miridae, Orthotylinae, *Orthotylus*, *Melanotrichus*, new species.

INTRODUCTION

The genus *Orthotylus* FIEBER, 1858 belongs to the subfamily Orthotylinae VAN DUZEE, 1916, tribe Orthotylini VAN DUZEE, 1916 (KERZHNER & JOSIFOV, 1999). In the Palaearctic, the genus is composed of 9 subgenera (KERZHNER & JOSIFOV, 1999). A key for the 8 European subgenera based on the pilosity of the dorsal side is given by EHANNO & MATOCQ (1990).

In the Orthotylinae, the morphology of the male genitalia is very complex and has a variety of different structures. In the genus *Orthotylus*, the characteristic morphology of the parameres is used mainly for exact determination of the species. The subgenus *Melanotrichus* REUTER, 1875 is distinguished by a primitive character of the male genitalia compared with the other subgenera of *Orthotylus*. In *Melanotrichus*, the right paramere has a simple morphology whereas the left one is more complex and used for determination. In addition, the chitinous bands of the vesica are not ramified and not dentated. This is also considered to be a primitive pattern (WAGNER, 1955, 1973; EHANNO & MATOCQ, 1990).

Species of the subgenus *Melanotrichus* are found all over the world. In America, *Melanotrichus* is considered a genus by most authors (see CARVALHO & CARPINTERO, 1986). For the Palaearctic region, 45 species are described (KERZHNER & JOSIFOV, 1999). Fifteen species are restricted to Asia (WAGNER, 1973, 1978; LINNAVUORI, 1986, 1997; MUMINOV, 1990) and another 26 species are more or less restricted to the Mediterranean region (WAGNER, 1973, 1978). Only the four species *O. flavosparsus* (C. SAHLBERG, 1841), *O. moncreaffi* (DOUGLAS & SCOTT, 1874), *O. rubidus* (PUTON, 1874) and *O. schoberiae* REUTER, 1876 occur in Central Europe. *O. flavosparsus* is a very common species. It lives on Chenopodiaceae and is often found on *Atriplex* in wasteland whereas the other three species are halophilic.

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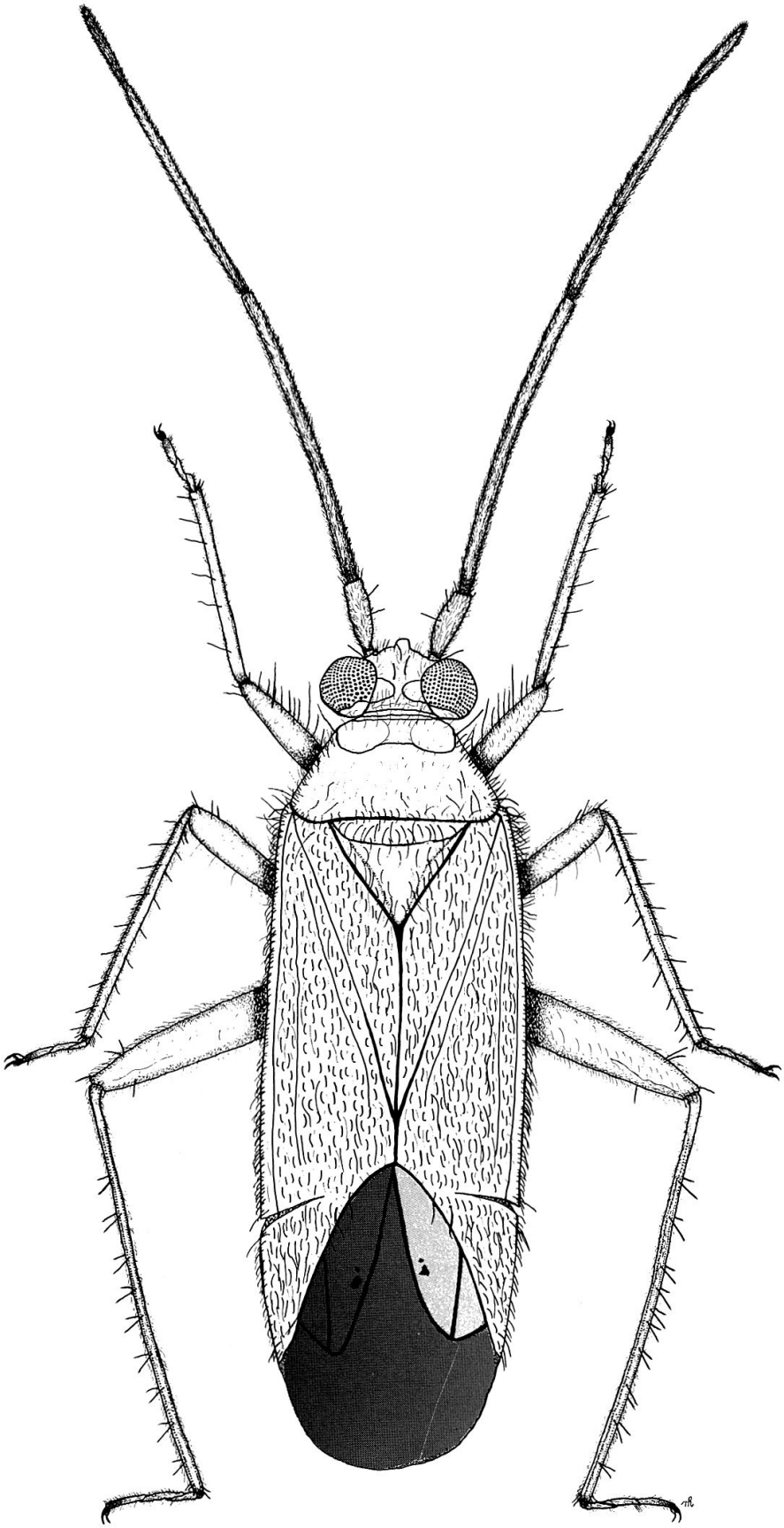

Fig. 1: Habitus: *Orthotylus riegeri* n. sp. (holotype): Body length: 4.4 mm.

DESCRIPTION

Orthotylus (Melanotrichus) riegeri n. sp.

Material examined: Holotype ♂ and one ♂ paratype, found on Krillberg, Wängi (south of Frauenfeld) in Thurgau, Switzerland. Collected in a light trap August 24th, 1997, by Andreas KOPP (Wängi), in coll. Ralf HECKMANN (Konstanz, Germany). Females have not been found.

The following measurements are reported for the holotype, followed by measurements for the paratype in parentheses. Measurement relations are averaged.

Differential diagnosis: The newly described species is the largest of the subgenus and its habitus resembles *O. flavosparsus* but without the greenish coloured cells of the wing membrane. The pattern of colourless or greenish spotted cells is sometimes observed in east Mediterranean specimens of *O. flavosparsus* (C. RIEGER, pers. comm.). Unique to the subgenus is the small ocular index (smaller than 1, Fig. 2), short black setae lying close to the surface and the absence of white scale hairs. The length ratio of hind tibia to hind tarsus is about 5 whereas it is 4 in *O. flavosparsus* and 3 in *O. moncreaffi*, *O. rubidus,* and *O. schoberiae*. The male genitalia (Figs 3 and 4) show some characteristics of *Melanotrichus* but differ from all known species. The right paramere of the new species has no setae whereas the other four species do. The left paramere of *O. flavosparsus* is distally as broad as long whereas in the new species it is much longer than broad and spoon-shaped. The sensorial process in the new species is much smaller and smoother than in *O. flavosparsus* where it is broad and toothed. The hypophysis of the new species forms a tube, in *O. flavosparsus* a simple hook. The parameres are illustrated showing the largest lateral extension (Figs 4.1, 4.2, 4.4 and 4.5). Vesical bands of *O. flavosparsus* are twice as long and much broader than in the new species where there is a much more pronounced asymmetry (Figs 4.3 and 4.6.).

Description: ♂ Holotype (Fig. 1) and ♂ paratype: Macropterous, elongate, body 3.2 x longer than wide. Green colour after death fading to light yellowish green especially on head, pronotum and scutellum. Pubescence consisting mainly of short black setae lying close to the surface and longer and thinner semi-erect light hairs.

Head (Fig. 2): Green, proximal margin with a slight keel and a row of long setae distal to the keel. Additional long setae at the margins of the eyes near the

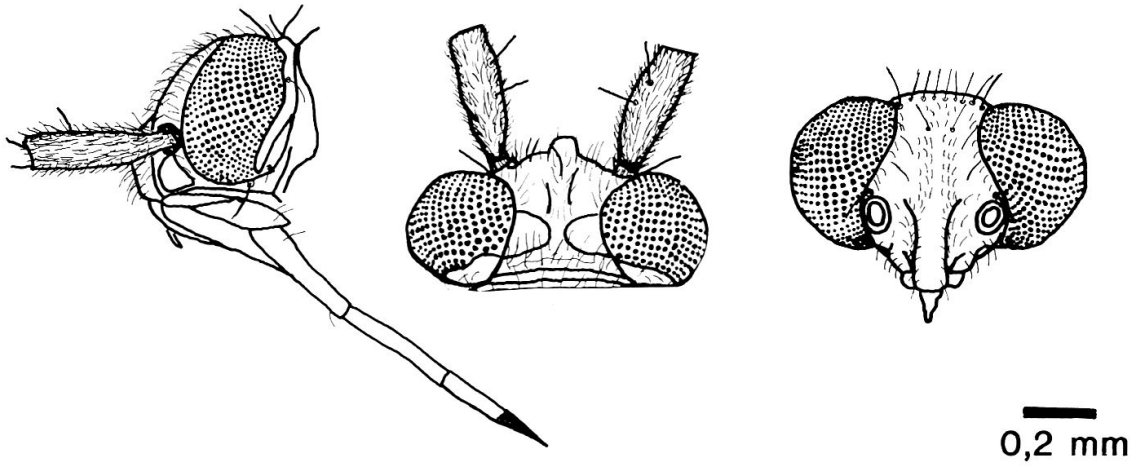

Fig. 2: Head of *Orthotylus riegeri* n. sp. (holotype) in lateral, dorsal and frontal views.

base of the antennae. Head sparsely covered with thin light hairs. Width of head, 0.84 mm (0.80 mm). Width of vertex, 0.25 mm (0.26 mm). Eyes very large. Width vertex/width eye (ocular index) = 0.85 (0.96). Antennae greenish yellow, third segment progressively darker from proximal to distal, fourth segment dark-brown to black, first segment with two or three long setae medio-dorsally. Length of antennae 3.8 mm (0.86 x body-length) covered with semierect thin short light hairs. Segment I, 0.4 mm (0.38 mm), segment II, 1.68 mm (1.55 mm); segment III, 1.3 mm (1.2 mm); segment IV, 0.5 mm (0.45 mm). Segment I : II : III : IV = 1 : 4 : 3.1 : 1.2. Segment I/width of head = 0.49. Segment II/width of pronotum = 1.45. Rostrum greenish yellow, segments III and IV light yellowish brown and apical half of segment IV dark-brown to black. Segments I and II with light setae. Length of rostrum 1.25 mm, reaching to posterior margin of middle coxae. Segment I, 0.37 mm (0.35 mm); segment II, 0.4 mm (0.43 mm); segment III, 0.32 mm (0.3 mm); segment IV, 0.32 mm (0.3 mm).

Pronotum: Green, distally fading to light yellowish green after death, dorsal surface sparsely covered with semi-erect thin light hairs and some thicker and shorter black setae at proximal margin. Lateral margins densely covered with erect light and dark hairs and long setae at the angles. Width of pronotum 1.13 mm (1.07 mm), length 0.50 mm (0.48 mm), width/length = 2.24.

Scutellum: Green convex covered with all three types of hairs denser at the edges, base of scutellum fading to light yellowish green after death, width/length = 1.3.

Hemelytra: uniformly green, covered with short black setae lying close to the surface and longer, thinner semi-erect light hairs. At the outer edge of the exocorium, the light hairs are erect and arranged more densely. A small, hairless band lies medially to them. Veins of the cells of the wing membrane are dark-green. The wing-membrane is smoky grey, fields of membrane cells somewhat lighter. The larger cell has one or two dark-green spots near the medial margin.

Ventral side: Pleura without hairs except a few light setae at margins. Ventral side of abdomen sparsely covered with short light hairs lying close to the surface.

Legs: Green and very long. Coxae have only light setae standing most densely at the anterior margin of the fore coxae. Femora sparsely covered with thin light hairs lying close to the surface. Same hair type dorsally and ventrally but more densely arranged and standing semi-erect. Additional setae around the distal end of all femora. Two thin light setae on ventral distal end of hind femora as long as width of femora, 4 to 6 on middle femora and 12 to 14 on fore femora arranged in two rows ventrally. Tibiae densely covered with short, thin, light hairs lying semi-erect in two rows pointing laterad and posteriad. Fore tibia bears four to six brown erect spines somewhat longer than diameter of tibiae pointing anterio-laterad. Middle tibia bears 15 to 20 spines arranged in three rows pointing anterio-laterad and posteriad, hind tibia bears about 30 spines arranged in the same pattern as on middle femora. One row of very small dark tubercules laterally on fore tibia, two rows on middle and hind tibia. Tarsi (Fig. 4.7) covered with thin light erect hairs. Distal half of segment three dark-brown. Claws dark-brown, with small pseudaroliae and with long curved aroliae diverging proximally and converging distally (Orthotylinae-type). Length of fore femora, 0.99 mm (0.93 mm); middle-femora, 1.05 mm (1.0 mm); hind-femora, 1.50 mm (1.48 mm). Length of fore tibia, 1.1 mm (1.1 mm); middle tibia 1.42 mm (1.38 mm); hind tibia, 2.45 mm (2.4 mm). Length of fore tarsus 0.36 mm (0.35 mm); middle tarsus, 0.4 mm (0.39 mm); hind tarsus 0.5 mm (0.48 mm). Hind tibia 5 x as long as hind-tarsus.

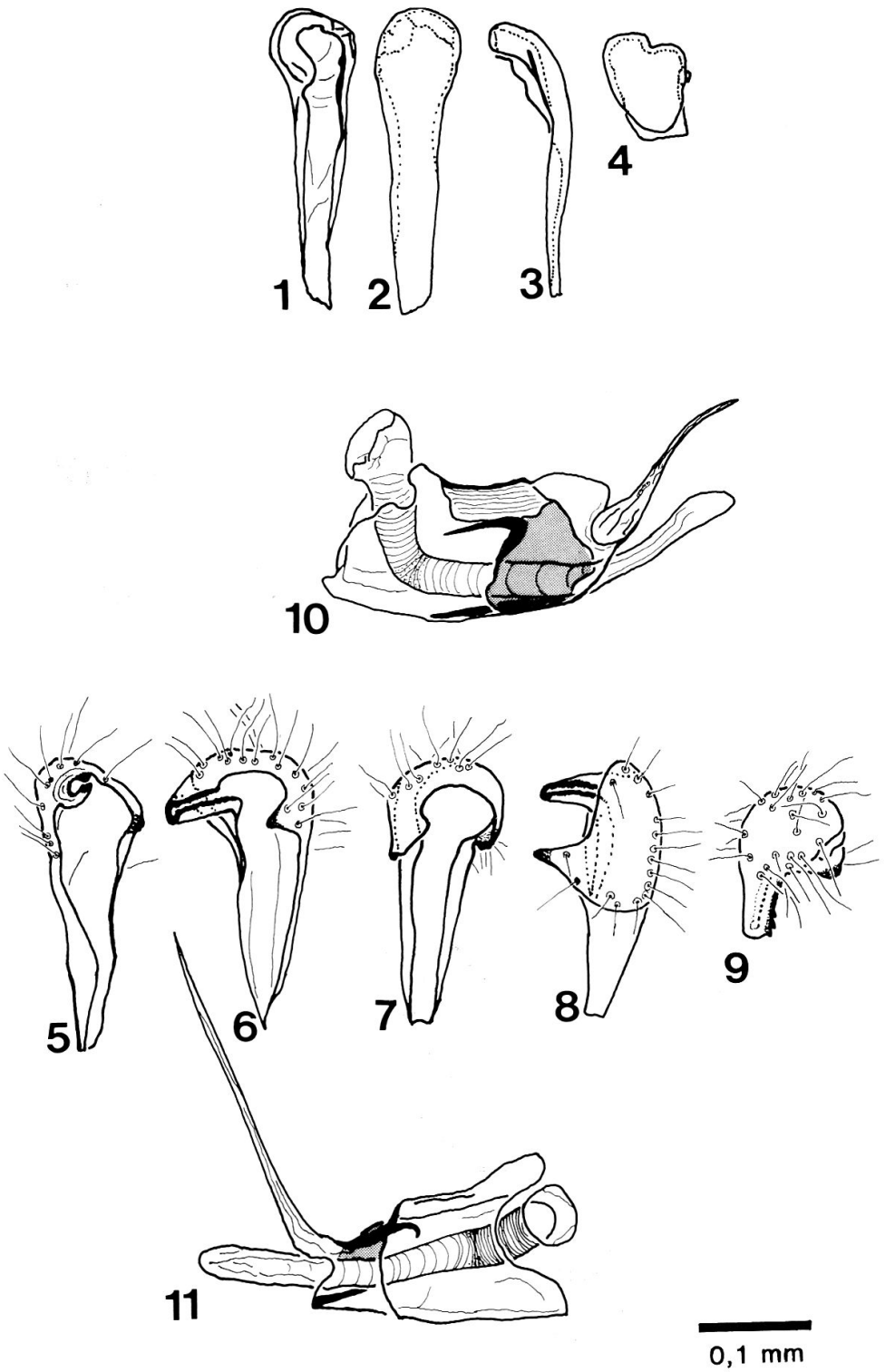

Fig 3: Male genitalia of *Orthotylus riegeri* n. sp. (holotype): Orientations in relation to the long axis of the animal. 1–4: right paramere in various views. 1 = inside from cranio-medial, 2 = back side from caudo-lateral, 3 = from the left side, 4 = top, from dorsal. 5–9: left paramere in various views. 5 = inside from cranio-medial, 6 = long axis of the paramere turned 45° to the left side in relation to 5 (showing the hypophysis forming a tube on the left side and the sensorial process on the right), 7 = long axis of the paramere tipped about 30° towards viewer, 8 = long axis of the paramere tipped about 30° towards viewer and turned 90° to the left side, 9 = top, from dorsal (hypophysis left and sensorial process right). 10–11: phallus and vesica in normal position. 10 = lateral view from the left, spiculum pointing toward the viewer. 11 = dorsal view, spiculum pointing caudally to the left.

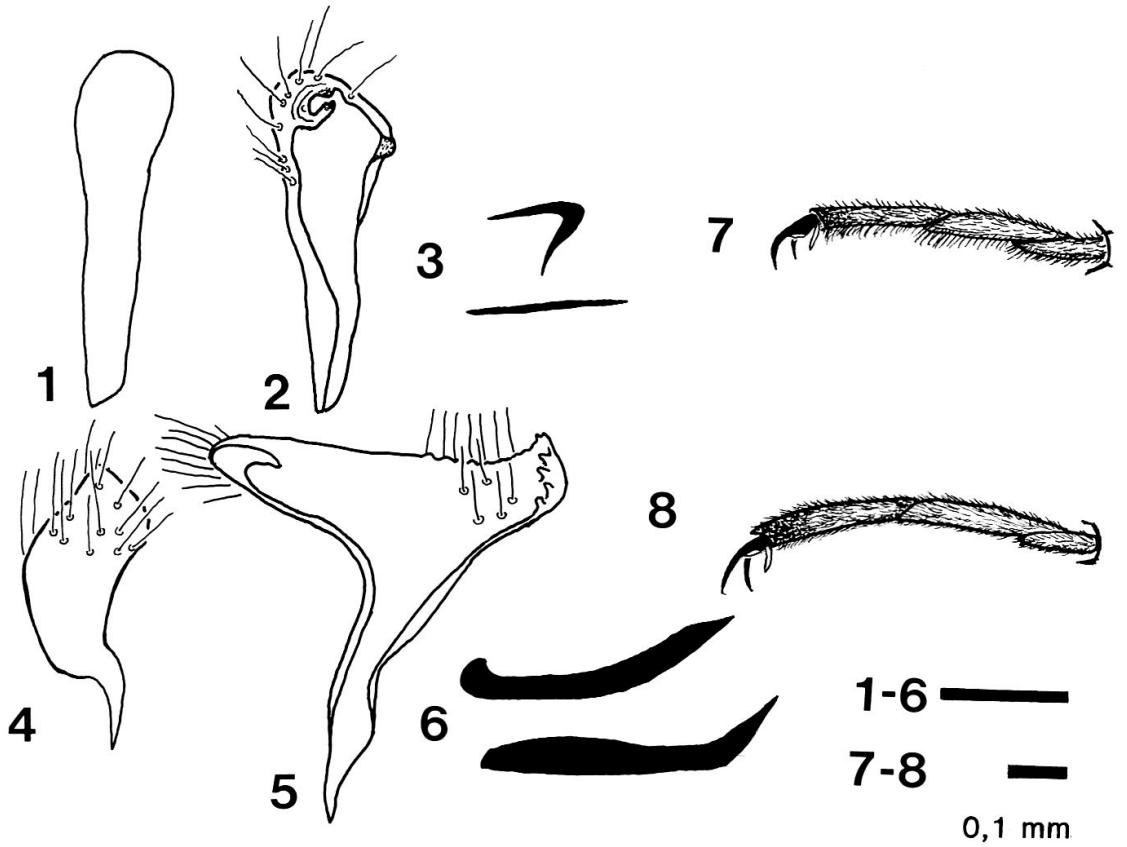

Fig 4: Male genitalia and tarsus. Orientations in relation to the long axis of the animal. 1, 2, 3 and 7: *Orthotylus riegeri* n. sp. 4, 5, 6 and 8: *Orthylus flavosparsus*. 1 and 4: right paramere in situ, genital segment viewed from caudo-lateral (back side of the paramere). 2 and 5: left paramere in situ, genital segment viewed from cranio-medial (inside of the paramere). 3 and 6: vesical bands viewed from lateral, above = left band, below = right band. 7 and 8: hind tarsi.

Genital structures (Fig. 3): Right paramere (Fig. 3.1 – 3.4) elongated and spoonshaped, without setae. Left paramere (Fig. 3.5 – 3.9) more complex, triangular and spoonshaped, apical part covered with long thin setae, hypophysis rolled up forming a small tube, sensorial process pointing parallel to tube. Phallus simple and elongated. Vesica (Fig. 3.10 and 3.11) with an apical spiculum as long as phallus more or less extending to side. Wall of vesica with left band of boomerang shape and right band more or less straight both unbranched and smooth.

Measurements: total length 4.4 mm (4.3 mm); maximal width of elytra 1.5 mm.

Etymology: I am happy to dedicate this species to Dr. Christian RIEGER who introduced me to this interesting group of insects and kindled my enthusiasm for true bugs. He is an indefatigable explorer and outstanding connoisseur of the hemipterous fauna of Europe and especially of Baden-Württemberg.

Classification: The systematic position of the new species is not definitely established. The morphology of claws and male genitalia put the species undoubtedly into the subfamily Orthotylinae. The habitus and the male genitalia place it most likely in the genus *Orthotylus*. Since *Orthotylus* contains a very diverse pool of often rearranged subgenera (KERZHNER & JOSIFOV, 1999), it cannot be ruled out that the species is a member of a new subgenus. At present, I consign the species to *Melanotrichus*, in spite of its lack of white scale hairs, the presence of short black setae lying close to the surface and the asymmetric morphology of the vesical bands.

These three morphological features have not been observed in any *Melanotrichus*. The main arguments in support of this classification are the morphology of the parameres, which most closely resemble those of *Melanotrichus* and the fact that the vesical bands are neither branched nor dentated.

To accomodate the new species in the determination key of the Euro-Mediterranean species of the subgenus *Melanotrichus* (WAGNER, 1973: p. 221), the key should be supplemented as follows:

8 (15) Halbaufgerichtete Haare der Oberseite weiss, weissgelb oder hellbraun.

8a (8b) Das Rostrum erreicht die Mittelhüften. Anliegende Haare schwarz. Scheitel beim ♂ schmaler als das Auge. ..... ***O. (M.) riegeri*** HECKMANN

8b (8a) Das Rostrum erreicht die Hinterhüften. Anliegende Haare hell. Scheitel beim ♂ mindestens 1.6 x so breit wie das Auge.

9 (10) unverändert weiter.

ZUSAMMENFASSUNG

Orthotylus riegeri n. sp. aus dem Kanton Thurgau in der Schweiz wird beschrieben und abgebildet. Die systematische Stellung in der Gattung *Orthotylus* wird diskutiert und die neue Art voläufig zur Untergattung *Melanotrichus* gestellt. Der Habitus ähnelt *Orthotylus flavosparsus* (C. SAHLBERG, 1841), aber unterscheidet sich in einigen Merkmalen wie Ocularindex, Behaarung, Länge der Tibien, Färbung der Flügelmembranzellen und in der Morphologie der männlichen Genitalien.

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For critically reading the manuscript I thank Dr. Ernst HEISS (Innsbruck, Austria). I am grateful to the following people at the University of Konstanz, Germany: Prof. Dr. Wolfram KUTSCH and Prof. Dr. Werner RATHMAYER, for the use of the microscopic and graphic equipment; Christine DITTRICH, for technical support; Mary CAHIL, for correcting the English text.

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