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# Type Specimens of Drosophilidae (Diptera) in the Naturkundemuseum Stuttgart, with Revisions of *Drosophila testacea* and *D. limbata* v. Roser

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With 5 figures

Summary

A list of the type specimens of Drosophilidae in the Naturkundemuseum Stuttgart is given, lectotypes for *Drosophila ruficeps* von Roser, 1840, (= *Scaptomyza flava* Fallén **nov. syn.**) and *Leucophenga conjuncta* Duda, 1929, are designated. The type specimens of *Drosophila testacea* von Roser, 1840, and *D. limbata* von Roser, 1840, are redescribed in detail.

Zusammenfassung

Die Typen der Drosophilidae im Naturkundemuseum Stuttgart werden aufgelistet und Lectotypen von *Drosophila ruficeps* von Roser, 1840, (= *Scaptomyza flava* Fallén **nov. syn.**) sowie *Leucophenga conjuncta* Duda, 1929, designiert. *Drosophila testacea* von Roser, 1840, und *D. limbata* von Roser, 1840 werden wiederbeschrieben.

## 1. Introduction

The collection of Diptera made by VON ROSER belongs to one of the oldest parts of the insect collections in the Naturkundemuseum Stuttgart. Due to the fact that VON ROSER published lists of the flies in his collection in a journal which was not well known in his time, his descriptions of new species were mostly overlooked. In addition, the descriptions were extremely short and ambiguous. Most of the specimens were not originally labelled except for some type specimens. At some unknown time in the last century printed labels „Württemberg v. Roser" were added. Therefore the identification of type specimens is sometimes difficult.

The first revision of the VON ROSER collection was made by BECKER (1903) who recognised most of the species described by VON ROSER. Further revisions of the Drosophilidae were made by DUDA and BASDEN. DUDA integrated his findings in several publications, especially in the Drosophilidae section of LINDNER's „Fliegen der palaearktischen Region" (1934/35). Some years ago the late E. B. BASDEN entrusted me with notes and drawings made by him during his revision of the VON

ROSER collection; the following redescriptions of *Drosophila testacea* and *D. limbata* are mainly based on his revision, and I fully acknowledge his help. The terminology proposed by MCALPINE (1981) was adopted where appropriate.

Besides the many drosophilids locally collected by Prof. E. LINDNER and his colleagues the flies of two foreign expeditions are now integrated into the collections of the Staatliches Museum für Naturkunde in Stuttgart: one made in South America and checked by DUDA (1929), the other in East Africa studied by BURLA (1957), HACKMAN (1963), and BÄCHLI (1971).

I wish to express my thanks to Dr. H. P. TSCHORSNIG (Stuttgart) for permission to work on the collection as well as for his hospitality and cooperation, and to Dr. B. HERTING (Stuttgart) for his helpful comments on the manuscript. The English text was checked by Mrs. B. ANDREW.

## 2. List of type specimens

For holotypes and lectotypes all labels are mentioned, for paratypes and paralectotypes the data of the labels are abbreviated and/or summarized. The individual labels are separated by *slashes* (/), my comments are given in *square brackets* [].

### 2.1. *Drosophila limbata* von Roser, 1840

Lectotype ♂: *limbata*, m. [v. ROSER's writing] / Württemberg v. Roser [black-edged white label; probably recent] / Typus v. Roser [red ink on similar black-edged white label; recent] / *Dros. limbata* v. Ros. Lectotype (vRos7) Selected by E B Basden 1957 / [Abdomen and left hind leg to pin-mount; left wing and scutellar bristles missing].

1 paralectotype ♂: *Drosophila limbata* v. R. v. Roser / [vRos10].

### 2.2. *Drosophila paucilineata* Burla, 1957

The holotype is missing as well as the preparations of genitalia made by BURLA.

### 2.3. *Drosophila ruficeps* von Roser, 1840

Lectotype ♀: *Scaptomyza rufipes* Meig. v. Roser / *appendiculata ruficeps* / *Scapt. flava* F. Det. Dr. O. Duda / *Scaptomyza flava* (Fln) (= *apicalis* Hdy) det. Basden 1958 / *Drosophila ruficeps* v. R. Lectotype ♀ G. Bächli det. 1988 / [The second label has VON ROSER's handwriting. Even though this label is divergent from other labels of VON ROSER, this specimen is accepted as type specimen and herewith designated as **lectotype.** *D. ruficeps* is a **new synonym** of *Scaptomyza flava* Fallén, 1823].

### 2.4. *Drosophila testacea* von Roser, 1840

Lectotype ♂ and 1 paralectotype ♂ [on one pin]: *testacea*, m. [VON ROSER's writing] / *Drosophila flava* Fll. det. Becker / *testacea* v. R. nec *flava* F. Det. Dr. O. Duda / Typus v. Roser [red ink on black edged white label, recent] / *Dros. testacea* v. Ros syntype (top) and Lectotype (v Ros Nos 1, 2) Selected by E B Basden, 1957 / [Abdomen of vRos1 to pin-mount on separate pin, labelled "*Dros. testacea.* Syntype No 1 det. Basden 1957"].

3 paralectotypes ♂♀ [on one pin]: vRos3 to vRos5 [BASDEN's numbering].

1 paralectotype ♂: v. Roser Württemberg.

### 2.5. *Leucophenga burlai* Bächli, 1971

1 paratype ♂: Msingi 22.–28. I. 1952 D.O.Afrika Exp.

2.6. *Leucophenga capillata* Bächli, 1971

1 paratype ♂: Usangi Pare Geb. 25. V.–8. VI. 1952 D.O.Afrika Exp.
1 paratype ♀: T.T.O.Afrika Marangu 1.–2. III. 1959 LINDNER leg. 5. III.

2.7. *Leucophenga conjuncta* Duda, 1929 (nec Duda, 1924)

Lectotype ♂: Tapikiolé-Arg. XII. 25-I. 26 Lind D. Chaco-Exped / Type / *Leucophenga conjuncta* ♂ Duda det. / Hololectotype vid. Bächli, '67 No. 4871 ♂ / [**lectotype** by present designation. The correct name of this species is *Leucophenga chaco* Wheeler, 1968].
9 paralectotypes ♂♀: same locality.

2.8. *Leucophenga dudai* Bächli, 1971

1 paratype ♂: O.Afrika, T.T.Marangu 1.-20. März 1959 LINDNER leg. 17. III.

2.9. *Leucophenga paracuthbertsoni* Bächli, 1971

1 paratype ♀: Makoa T.T.O.Afr. 6. IV. 1959. LINDNER leg.

2.10. *Leucophenga perargentata* Bächli, 1971

2 paratypes ♂♀: O.Afrika, T.T.Marangu 1.–20. März 1959 LINDNER leg.

2.11. *Rhinoleucophenga flaviceps* Duda, 1929

Holotype ♀: Sa. Rosita. Chiq 1–3. X. 26. Lind. D. Chaco-Exped / Type / R. Flügel phot. / *Rhinoleucophenga stigma flaviceps* n. v. Type ♀ Duda 1929 / *Rhinoleucoph. flaviceps* D. Holotype ♀ G. Bächli det. 1988 / [*R. flaviceps* is considered to be a synonym of *Rhinoleucophenga stigma* Hendel, 1917. The type locality was cited by DUDA as "60 km nördl. San José de Chiquitos, Bolivia"].

2.12. *Rhinoleucophenga punctulata* Duda, 1929

Holotype ♂: Sa. Rosita. Chiq 1-3. X. 26. Lind. D. Chaco-Exped / Type / *Rhinoleucophenga* n. sp. *punctulata* Duda ♀ Type Duda 1929 / *Rhinoleucoph. punctulata* D. Holotype ♂ G. Bächli det. 1988 / [The type locality was cited by DUDA as "60 km nördl. San José de Chiquitos, Bolivia"].

2.13. *Rhinoleucophenga subradiata* Duda, 1929

Holotype ♂: S. José de Chiq IX. 26. Lindner D. Chaco-Exped / Type / *Rhinoleucophenga subradiata* n. sp. Type ♂ Duda 1929 / *Rhinoleucoph. subradiata* D. Holotype ♂ G. Bächli det. 1988.

2.14. *Scaptomyza cochleata* Burla, 1957

Holotype ♂: Kibo West 2800 m 17.–22. IV 1952 D.O.Afrika Exp / 14. 1. Typus ♂ *Scaptomyza cochleata* n. sp. H. Burla det. / [The preparations of genitalia made by BURLA are missing].
3 paratypes: ♂♀: same locality.

## 3. Revision of *Drosophila testacea* von Roser

The lectotype specimen was compared with the descriptions of VON ROSER (1840:62) „testacea, m. (flavae similis, capite concolore.)", BECKER (1903:58) and DUDA (1934:53). The following description of the lectotype is supplementary to that of DUDA (1934).

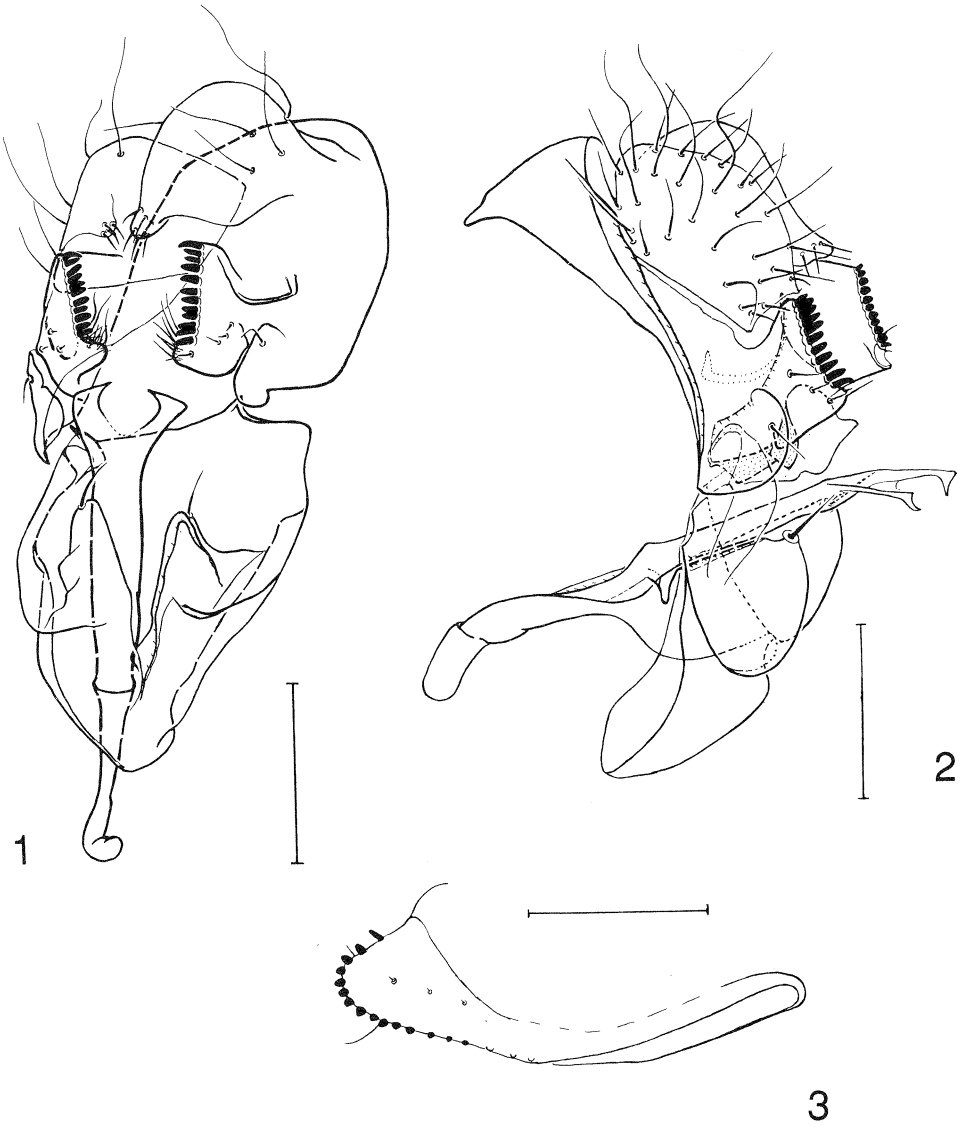
Head: Slightly wider than thorax. Frons broader than long (0.30 : 0.19 mm), half head width, yellow to rich tawny orange. 7 short interfrontal hairs in centre below.

Mid orbital is midway between the upper and lower orbitals (if anything slightly nearer to lower one), and almost in line with them. A row of 4 – 5 very fine fronto-orbital hairs down from midorbital. Ocellar triangle darkened, equilateral, reaching half-way down frons. Ocelli equidistant, colourless. A few fine hairs are on ocellar patch. Fronto-orbital plates reach just beyond end of ocellar triangle. Carina well projecting, broad, curving down to the lower facial margin (not undercut nose-like), flat on surface. Occiput convex in centre, concave behind inner edge of eye, with irregular 1 – 2 rows of hairs leading down to a weak postgenal bristle in rear part of gena. Gena yellow, smooth, shiny. At narrowest (0.05 mm, at lowest point of eye), two-thirds width of 3rd antennal joint and one-eighth eye-height. Eyes longer than wide (0.46 : 0.39 mm), longest diameter vertical, narrowing at bottom, rounded in front, a little produced behind above mid line. Eye-pile short, dark. Two weak vibrissae (0.14 mm), equal in length, characteristically set close together (as close or closer than the two lowest orbitals) and lying parallel (not diverging as in other species), the lower one slightly behind the upper. Parafacialia at narrowest barely an eye-facet wide. The face is rather shrunken and the facets slightly overlap edge of face. Antennae: 3rd joint 1.7 times longer than wide, darkened (in some lights appearing darkest on anterior edge); 2nd joint with two short bristles, the upper (0.09 mm) diverging from centre, the lower (0.05 mm) pointing forwards and nearer middle of face. Inside of these are about 6 very short hairs. Arista with 4 upper and 3 lower rays, the longest ray a little longer than vibrissae. End fork (0.09 mm) about as long as palp bristles. 8 – 9 short hairs on inside of arista up to fork. The upper rays frequently curve forwards. One lower ray is within basal half, the other in distal half. Palpi broad, semispatulate, with 3 – 5 longish (0.09 mm) hairs on outer edge at tip and with lower side of palpi hairy. Clypeus and proboscis yellow to brownish, the former about half width of face.

Thorax: In the immature type specimen the whole thorax is unicolorous yellow, with some greyish micropubescence. Scutellum shiny. Prosternum dull, bare.
Thorax bristles. Black, but in some lights these and the hairs appear reddish as described by DUDA. Two characteristic hairlike pre-sutural acrostichals (0.16 – 0.18 mm) at middle of prescutum, placed at, or very near, the end of the 2nd and 5th rows of the 6 acrostichal rows. They slope backwards, slightly diverge, and are slightly S-curved (viewed from the right). In the related species *D. putrida* Sturtevant these two prominent acrostichals are shorter and less elevated from surface of notum. Scutellars equidistant; apicals (0.43 mm) crossed, laterals (0.40 mm) slightly converging; tips of apicals reach far beyond tips of laterals. Three katepisternals (0.21, 0.12, 0.36 mm), set more or less equidistant, the posterior one lower than the others.

Abdomen: Slightly narrower than thorax, yellow, shining, with greyish pubescence in certain lights and with indistinct brownish marks (undeveloped hind bands).
Terminalia. The lectotype was not dissected, but in other VON ROSER specimens the following characters were observed: ♂: Gonopod with a row of 11 – 12 primary teeth on inner edge (Figs. 1, 2) and 3 – 4 small spines (secondary teeth) in a curved row near lower edge. Epandrium without bristles except of one or two at toe. ♀: Oviscape small, rounded, with minute even spinules (Fig. 3).

Legs: Unicolorous yellow or yellow-brown, only last tarsal segment of all legs somewhat darkened. 1st coxa with 2 bristles on outer edge at distal third, the lower one the longer, and 2 – 3 weaker ones across bottom edge, and with about 6 very short hairs on face at distal half. 2nd coxa with 2 strong straighter bristles above




Figs. 1–3. *Drosophila testacea*. - 1. Male terminalia (vRos1), lateroventral aspect, hairs on cerci are mostly omitted; – 2. Male terminalia (vRos6), lateral aspect; – 3. Oviscape (vRos3). – Scales: 0.1 mm.

(0.16 – 0.18 mm) and 3 – 4 thinner back-curved ones below. 3rd coxa with thick bristle (0.11 mm) on outer edge. 1st and 2nd trochanters each with a small spine (0.05 mm). 3rd trochanter with a few fine hairs (up to 0.11 mm). 1st femur with a triangle of 3 fine bristles posteroventrally at base (the 2 most basal ones being very fine), 2 postero-dorsal ones in distal two-fifths, and 2 – 4 posteroventral ones (0.16 – 0.17 mm) at distal third. One of the last is always longer than the others and longer than femur diameter. The other bristles mentioned are about equal to or a little shorter than widest part of femur. Tibiae: Dorsal preapicals on all three legs, the

hind one the longest (0.09 – 0.10 mm). A strong ventral apical on mid tibia (0.10 – 0.11 mm), and an indistinct one (part of terminal fringe) on first tibia. Tarsal joints of foreleg short-haired. Mid tarsi below with rows of minute spinules, about 4 arranged around the end of each segment. Hind metatarsus ventrally with an outer fringe, the thick hairs longest basally, decreasing distally. 1st metatarsus longer than next 2 joints together; 2nd and 3rd metatarsi practically as long as all remaining joints.

Wings: Length 2.75 mm. Quite clear, slightly brownish tinged. Veins yellow-brown. Crossveins rather clear but posterior ones slightly infuscate. The posterior crossvein lies just before mid point of 2nd costal section. $r_{4+5}$ ends at wing tip, which is rather rounded. The stronger costal fringe extends one-third the distance between $r_{4+5}$ and $m_1$. Alula broad (0.32 mm long, 0.11 mm wide), broadly rounded at end, with a long fringe (0.04 – 0.06 mm). Only one real spine (0.09 mm) at upper edge of subcostal break, though the end hair of the lower row is enlarged to represent a second weaker spine. Anterior calypter short and thick, slightly broadened below, with dark pubescence. The subalar sclerite lying against base of basicosta very small, indistinct, yellow.

## 4. Revision of *Drosophila limbata* von Roser

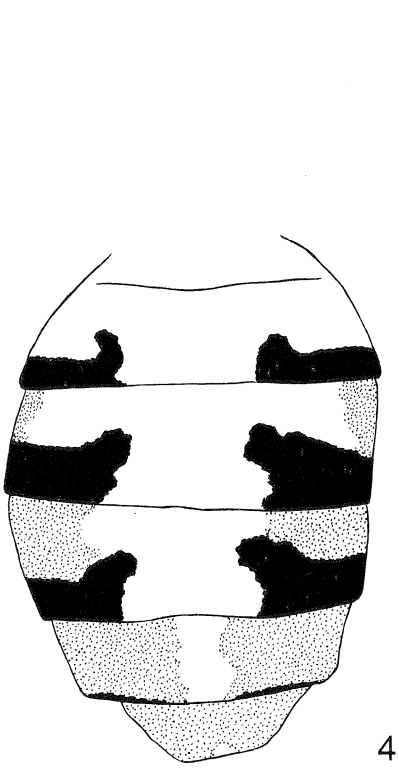
The lectotype specimen was compared with the descriptions of VON ROSER (1840:62) "*limbata*, m. (testacea, abdomine fusco, medio rufo.)", BECKER (1903:58) and DUDA (1935:86).

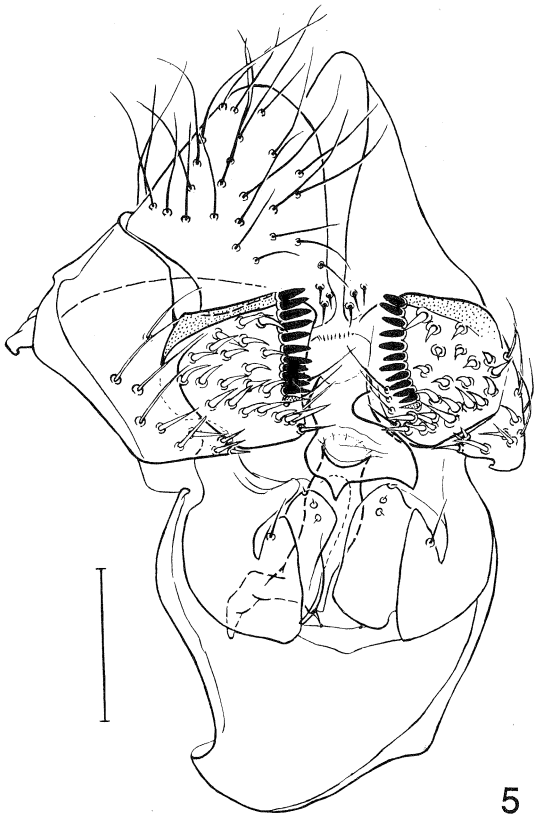
Head: Wholly yellow except ocellar patch, eyes, 3rd antennal joint and fronto-orbital plates; vibrissal angles brownish. Same width (0.89 mm) as thorax (at noto-pleural callus). Frons yellow, subshiny. At centre, 1/2 width of head and broader than long (0.43 : 0.28 mm). Ocelli equidistant. Ocellar patch brown, sub-shiny, with 6 fine hairs behind the 2 ocellars. Ocellar triangle not clearly defined. Fronto-orbital plates yellow-brown, paler than ocellar patch, subshiny, the ends diverging own width from eye and reaching more than half-way down frons. Face, with lower facial margin, quite shiny, longer than wide between vibrissae (0.42 : 0.32 mm). Carina subshiny, well developed, rather broad, evenly broadening below, in side view rounded at end and sloping to lower facial margin (not undercut noselike), lighter yellow than frons, ending level with eyebottom. Clypeus shiny, half width of lower facial margin. Eyes roundish (0.47 mm high; 0.32 mm wide), narrowing at bottom, light brownish red, covered rather sparsely with pilosity, about 1 hair between every 2 – 3 facets. Parafacialia at narrowest about 1.5 eye facets wide. Gena shining, yellow, broad, at narrowest wider than 3rd antennal joint. 13 interfrontal hairs, short (0.05 mm), in lower half of frons, most pointing inwards and downwards, a few outer ones point inwards and upwards. 4 fronto-orbital hairs, short (0.05 – 0.06 mm), descending from mid-orbital, pointing outwards and upwards. Occiput yellow, flat, barely concave behind inner edge of eye, with a large patch of short hairs in lower centre. 2 vibrissae, the lower one more than half as long as upper. Palpi yellow, about 2 1/2 times as long as broad, with 1 strong subterminal bristle (0.11 mm) and 1 – 3 weaker hairs on ventral edge. The palpi do not have the same appearance of hairinesss as in *D. transversa*, the small hairs being quite short and sparser. Subvibrissal hairs weak (0.05 – 0.06 mm), the last one tending to be longer (0.10 mm). Postocular hairs single rowed, with a few extra at top, and running down to about 4 very irregular rows of weak hairs on rear gena. 2 strong postgenals

(0.11 mm) at bottom rear of postgena. Antennae: 2nd joint with 2 strong bristles, a longer slightly diverging upper one (0.10 mm) and a lower one (0.07 mm) slightly nearer centre of head and directed forwards. Between them a very short hair and on inner side about 15 similar hairs of which the 5 or 6 at lower inner corner are paler and slightly longer. 3rd joint 1.5 times as long as wide, short-haired, the hairs about same length as eye-pilosity, slightly but distinctly darker than 2nd joint. Arista is a little more than twice the length of 3rd joint. 4 upper and 2 or 3 lower rays, the longest (0.19 mm) longer than bottom orbital, end fork fairly long (0.09 mm). Postverticals (0.21 mm) converge. Ocellars (0.30 mm) diverge (at about 55°). Orbitals [0.26 (top), 0.05, 0.18 mm], mid one slightly nearer bottom one than top one. Distance of top orbital from bottom orbital: 0.06 mm; from inner vertical: 0.12 mm.

Thorax: Scutum and scutellum yellow-brown, inconspicuously grey-dusted, shining. Scutellum slightly broader (between top basal corners) than long (0.43 : 0.39 mm). Dorsum with a thin dark central line and one either side down dorso-central area and a fifth on right side. Pleura and metanotum (below scutellum) darker brown, quite heavily grey-dusted. Prosternum matt, bare, yellow, whitish dusted. Thoracic spiracles: anterior one elongate, with short, very thick-set hairs; posterior one rounded, with longer, more open fringe. Halteres yellow-brown.
Thorax bristles. Most mesonotal bristles are obscured by the pin. 3 katepisternals (0.29, 0.18, 0.46 mm). A line of 6 – 8 short hairs runs halfway down from mid katepisternal to a pair of sternal hairs, one of which is much stronger than the other (0.16 : 0.09 mm). Just in front of and below anterior katepisternal is a very short hair. Also on katepisternum, in line between sternal hairs and base of 1st coxa, is a row of 4 very fine hairs. No hairs on proepisternum above front coxa.

Abdomen: (Fig. 4, and as noted before dissecting): As wide as thorax, tergites 2 – 6 about equal in length. Tergites 1 – 4 shining though covered with micropubescence; tergites 5 and 6 above glossy and without pubescence, broadly pubescent at their sides and narrowly across base of tergite 5. Brown, extensively yellow at base and broadly yellow down centre of 2 – 5. The yellow stripe through tergites 3 and 4 is about 1/3 of the width of the (dry) abdomen, and narrows posteriorly, with the brown's increasing in area; tergite 2 is more widely yellow, the gap being almost as broad as scutellum. Dark brown hind bands (probably faded from black) on tergites 2 – 5, with lighter, tan area in front reaching to fore edge of tergites. The bands extend from side edges (where they are narrowed, as mentioned by DUDA) and are broadly interrupted medially on tergites 2 – 5. The hind bands are more or less straight-edged in front but at their inner ends they broaden anteriorly. Their width is about 1/4 the length of the tergite on tergite 2; about 1/3 – 1/2 the length on tergites 3 and 4; but narrower on tergite 5. The tan area in front of the bands is confined to the side edges on tergite 2 (the hind bands here extending much farther inwards) but is nearly coextensive with the bands on tergites 3 and 4. Tergite 6 is wholly tan with a palish tip. Sternites yellow-brown, broad, squarish, gradually increasing in size to the 4th, the biggest, with the hairs on each of first 3 longer at sides, and posteriorly, but more evenly short on 4th. In recent specimens the abdomen is of variable colour, from yellowish to brown-black, the darker ones having the best developed hind bands and tan areas, but all having the yellowish central area which is broad on tergite 2 and distinctly narrowing backwards to tergite 5, whereas in *D. kuntzei* the yellowish central band is narrow and nearly parallel-sided (BÄCHLI & BURLA 1985).
Terminalia. ♂: Surface of gonopod characteristically covered with thick sharp spines





Figs. 4–5. *Drosophila limbata*. – 4. Abdominal pattern of the lectotype, – 5. Male terminalia of the lectotype, lateroventral aspect. – Scale: 0.1 mm (fig. 5).

(„secondary teeth", Fig. 5). These spines are mostly a trifle longer than the row of primary teeth on inner edge of gonopod. 12 primary gonopod teeth, 18 secondary gonopod teeth, 4 long hairs on epandrium.

Legs: Unicolorous yellow. Last tarsal joint of all legs brown. 1st coxa with 2 strong bristles (0.16 mm) in distal third, 4 – 5 long hairs across bottom, and about 8 hairs on face, the latter being longer than normal. 2nd coxa with 2 strong (0.21 mm) curved bristles on upper outer edge and 2 – 3 finer ones below, as well as a few shorter hairs. 3rd coxa with 1 strong straight bristle (0.12 mm) on outer edge and a thinner and longer curved one (0.15 mm) on inner corner. 1st and 2nd trochanter with a short weak spine on upper corner. 3rd trochanter with longer hairs (up to 0.14 mm). 1st femur plump (0.14 mm in diameter); near its base with a triangle of 3 fine hair-like bristles of subequal length, the lowest one being the longest. The 3 – 4 strong ventral (slightly dorso-ventral) bristles in distal two-thirds up to 0.18 mm long. 3 dorsolateral weak bristles equally spaced, a postero-dorsal one (0.14 mm) in the distal quarter, and about 2 similar ones more laterally. 2nd and 3rd femora short-haired, bare posteriorly, the hairs of the lower rows are longer, especially on 2nd femur. Tibiae: One dorsal preapical, slightly increasing in length from 1st to 3rd leg (0.09 : 0.12 mm); mid one thick. A strong ventral apical on mid tibia (0.14 mm), and

a rudimentary one on 1st tibia. 1st tarsi dorsally with 4 – 6 long (0.07 – 0.09 mm) curved hairs in all joints except in basal half of metatarsus. These hairs are little but decidedly longer than the similar hairs in ♂ *D. transversa*. 2nd and 3rd tarsi evenly short-haired, the 3rd metatarsus with a postero-ventral row of longer hairs.

Wings: Length 3.40 mm. Brownish tinged, with colourless areas at base. Veins yellow-brown. The anterior and posterior crossveins narrowly shaded and identical in pattern with *D. kuntzei;* the shading of the posterior crossvein more or less parallel-sided (about 0.06 mm), rather wider around anterior crossvein (0.11 mm). Posterior crossvein just in front of mid position of 2nd costal-section. Veins $r_{4+5}$ and $m_1$ slightly diverging at ends. Only 1 strong bristle at 2nd costal break (0.12 mm). The stronger costal fringe extends exactly half-way between ends of veins $r_{2+3}$ und $r_{4+5}$. Subalar sclerite small, inconspicuous. Anterior calypter short, slightly curving, dark pubescent.

## 5. Reverences


BÄCHLI, G. (1971): *Leucophenga* und *Paraleucophenga* (Diptera Brachycera) Fam. Drosophilidae. – Explor. Parcs natn. Upemba, **71**, 192 pp; Bruxelles.

BÄCHLI, G. & BURLA, H. (1985): Diptera Drosophilidae. Insecta Helvetica Fauna, **7**, 116 pp. Schweiz. ent. Ges.; Zürich.

BECKER, T. (1903): Die Typen der v. ROSER'schen Dipteren-Sammlung in Stuttgart. Diptera cyclorrhapha schizophora. Muscaria holometopa. (Muscidae acalypterae). – Jh. Ver. vaterl. Naturk. Württ. **59**: 52–66; Stuttgart.

BURLA, H. (1957): Ostafrikanische Drosophiliden (Dipt.). – Jh. Ver. vaterl. Naturk. Württ. **112**: 36–49; Stuttgart.

DUDA, O. (1929): Die Ausbeute der deutschen Chaco-Expedition 1925/26 (Diptera). VI. Sepsidae, VII. Piophilidae, VIII. Cypselidae, IX. Drosophilidae und X. Chloropidae. – Konowia **8**: 33–50; Wien.

– (1934/35): Drosophilidae. – *In:* E. LINDNER (ed.): Die Fliegen der paläarktischen Region, **58g:** 1–64 (1934), 65–118 (1935); Stuttgart.

HACKMAN, W. (1963): Ostafrikanische Curtonotiden und Drosophiliden (Dipt.). – Stuttg. Beitr. Naturk. **104**: 1–4; Stuttgart.

MCALPINE, J. F. (1981): Morphology and terminology – adults. – *In:* J. F. MCALPINE et alii: Manual of Nearctic Diptera **1**: 9–63. – Agriculture Canada Monograph No. 27; Ottawa.

VON ROSER, C. (1840): Erster Nachtrag zu dem im Jahre 1834 bekannt gemachten Verzeichnisse in Württemberg vorkommender zweiflügliger Insekten. – Correspondenzbl. k. württ. landw. Ver. **1840**: 49–64; Stuttgart.



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