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New or little-known African Tipulidae in the Staatlichen Museum für Naturkunde in Stuttgart

(Diptera)

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With 6 text figures

In the present paper I am discussing a small series of crane flies that were collected in Ethiopia by friends and collaborators of the State Museum of Natural History in Stuttgart and which were sent to me for naming by my long-time friend and fellow worker on the Tipulidae, Dr. Erwin Lindner. One additional species that was taken in Tanzania in 1959 by Lindner is included. Our knowledge of the Tipulidae of Ethiopia still is very insufficient and it is certain that many further interesting species will be discovered.

The Ethiopian specimens were collected by Willy Richter in 1959, Dr. Friedrich Schäuffele in 1959, Professor Dr. Ernst Schüz in 1967, and by Dr. Karl Wilhelm and Herta Harde in 1968. Two of my former students at the University of Massachusetts, Dr. Marion E. Smith, of the Department of Entomology, in 1964, and Dr. Ashley B. Gurney, of the United States National Museum, Washington, in 1965, made small collections in Ethiopia and generously presented their materials to me for study. Types of the four new species described herein are preserved in the Museum in Stuttgart, with available duplikates placed in the Alexander Collection through the kindness of Dr. Lindner. I very greatly appreciate the privilege of studying the present series of Tipulidae and extend my thanks to Dr. Lindner.

1. Nephrotoma lindneriana sp. n.

General coloration of thorax yellow, patterned with reddish brown and orange, the pleura almost uniformly light yellow; wings faintly suffused, the stigma darker brown; cell M_1 narrowly sessile; abdomen orange, tergites restrictedly patterned with brownish black; male hypopygium with the eighth sternite large, the posterior border broadly rounded, apically with long delicate setae, basal half with two extensive brown areas that are narrowly separated at the midline.

Male. — Length about 14 mm; wing 12,5 mm.

Rostrum and palpi yellow. Antennae with scape light yellow, pedicel pale brown, flagellum brownish black, outer segments broken; basal flagellar segments relatively long, the total antennal length probably about twice the length of head; proximal flagellar segments moderately incised, in length exceeding their longest verticils. Head orange, occipital brand polished, light brown.

Pronotum orange, slightly more darkened laterally. Mesonotal praescutum yellow, with three polished reddish brown stripes, the outer pair curved laterad to the margin; scutum medially light yellow, the lobes almost completely covered by a single blackened area; scutellum, including the parascutella, light brown; postnotal mediotergite clear light yellow anteriorly, posterior third pale reddish brown, pleurotergite pale brown dorsally, the ventral portion light yellow, confluent with a comparable area on the pteropleurite. Pleura almost uniformly light yellow, slightly more orange on sternopleurite and ventral anepisternum. Halteres yellow, knob with extrem base and apex weakly darkened. Legs with coxae and trochanters yellow; femora yellow, apices narrowly brown (only the middle legs present); tibiae yellow, extreme tips more darkened; tarsi brown; claw with an acute spine before midlength. Wings faintly suffused, stigma oval, darker brown, posterior portion with about 18 small trichia; very small vague pale brown clouds over the anterior cord and extreme wing tip; veins brown. About 6 or 7 small trichia in outer end of cell R_5. Venation: Cell M_1 narrowly sessile; cell M_4 long, posterior half more narrowed.

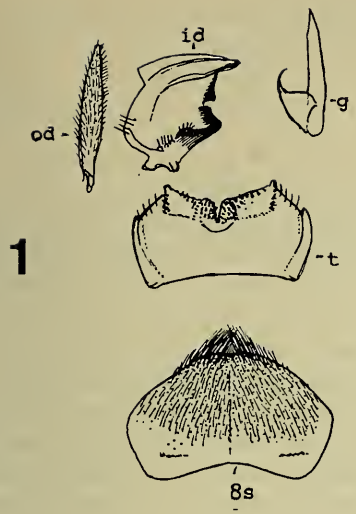
Abdomen orange, first tergite brownish black, tergites two to four with a brownish black subterminal area, not attaining the posterior border on segments three and four, outer tergites yellow; sternites yellow, apically patterned with brown, including two conspicuous areas on basal half of eighth sternite, as shown (Fig. 2); remainder of hypopygium light yellow. Male hypopygium (Fig. 2) with tergite, t, having the lateral lobes at apex produced into a small triangular point, remainder of lobe with groups of small black spicules, arranged about as shown, the anterior series slightly larger and more produced. Dististyles, d, as shown; outer style, od, narrow, the outer fourth very slender; inner style, id, with apex of beak rounded. Eighth sternite, 8s, distinctive, large, its area about four times that of the ninth tergite; yellow, on basal half with two extensive brown areas, as shown, narrowly separated at midline, basally attaining the anterior margins of the plate; posterior border of sternite broadly rounded, not lobed or emarginate, provided with delicate yellow incurved setae, about as shown.

Holotype, ♂, Tanzania. Tanganyika, Kilimandjaro, Kibo, 3570 meters, February 2, 1959 (Erwin LINDNER).

I take unusual pleasure in naming this fly for my dear long-time friend Erwin LINDNER, to whom I am indebted for many favors over the years. The fly is most readily told from other generally similar regional species, such as *Nephrotoma freemani* Alexander, *N. latispina* Alexander, and some others, by the structure and coloration of the male hypopygium, particularly the distinctive eighth sternite.

2. *Nephrotoma schäuffelei* **sp. n.**

Mesonotal praescutum yellow with three polished black stripes, postnotum chiefly light yellow; antennae with flagellum black; knobs of halteres yellow; abdomen yellow, patterned with black, including the eighth segment and ninth



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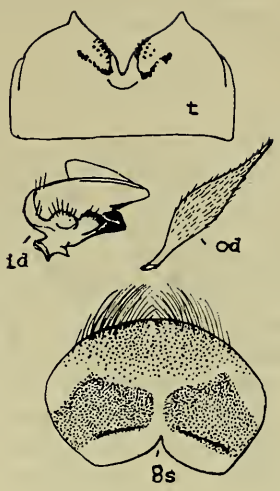

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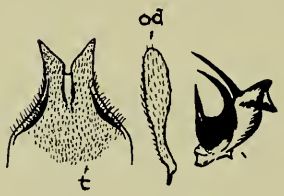

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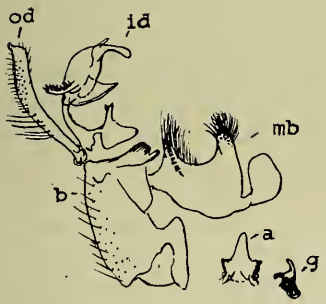

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Fig. 1. *Nephrotoma schäuffelei* sp. n.; male hypopygium.
Fig. 2. *Nephrotoma lindneriana* sp. n.; male hypopygium.
Fig. 3. *Tipula (Acutipula) hardeana* sp. n.; venation.
Fig. 4. *Tipula (Acutipula) hardeana* sp. n.; male hypopygium.
Fig. 5. *Austrolimnophila (Austrolimnophila) tanana* Alexander; male hypopygium.
Fig. 6. *Trentepohlia (Trentepohlia) richteri* sp. n.; venation.
(Symbols: Male hypopygium — a, aedeagus; b, basistyle; g, gonapophysis; id, inner dististyle; mb, middle lobe of basistyle; od, outer dististyle; s, 8th sternite; t, 9th tergite)

tergite, remainder of hypopygium orange; male hypopygium with outer end of eighth sternite gradually narrowed outwardly, apex virtually truncate, with a crest of long black setae, those near midline longer and slightly decussate.

Male. — Length about 10—11 mm; wing 11—11,5 mm; antennae about 4,5—5 mm.

Female. — Length about 13—16 mm; wing 12—14,5 mm.

Frontal prolongation of head orange, nasus long; palpi obscure yellow. Antennae with scape and pedicel light yellow, flagellum black; flagellar segments long, basal enlargements scarcely developed. Head orange, vertical tubercle entire, light yellow; occipital brand plumbeous.

Pronotum light yellow medially, more reddened on sides. Mesonotal praescutum yellow with three broad polished black stripes, lateral pair outcurved almost to margin, posteriorly confluent with the broadly blackened scutal lobes; scutellum light yellow to brownish yellow, parascutella weakly darkened; postnotum light yellow, the dorsal margin of pleurotergite narrowly light brown. Pleura light yellow, conspicuously patterned with two light brown areas, more extensive than the dividing ground line. Halteres with stem brownish yellow, apex of knob light yellow. Legs with coxae and trochanters yellowed; femora yelow, clearer basally, tips broadly dark brown, the amount subequal on all legs; tibiae brown, their apices and the tarsi darker, in some specimens black; claws of male with a conspicuous spur at near midlength. Wings pale brownish yellow, stigma oval, darker brown; veins dark brown. Stigmal trichia about 20 in number; a further group of about 25 in outer end of cell R_5. Venation of outer medial field slightly variable, with cell M_1 short-petiolate to narrowly sessile.

Abdomen orange yellow, patterned with black, including restricted apical areas on tergites two and three, more reduced and vague on four and five; a conspicuous black subterminal ring that includes all of segment seven, much of tergite six and the entire eighth sternite; remainder of hypopygium, including the eighth tergite and all of segment nine orange. The shape and degree of he darkened markings on proximal abdominal segments varies slightly in different individuals Male hypopygium (Fig. 1) with tergite, t, having the posterior border provided with two flattened blades that are armed with characteristic black spinoid setae or pegs, arranged about as shown. Outer dististyle, od, long and narrow; inner style, id, with dorsal crest high, precipitous posteriorly; no armature in region of posterior crest; both the beak and lower beak heavily blackened, as shown. Phallosome with the gonapophysis, g, including a small basal blade that terminates in a very slender curved spine. Eighth sternite, 8s, distinctive, entirely black, outer end a low central lobe that is virtually truncate at apex, provided with a crest of relatively long black setae, as shown, the innermost longer and slightly decussate at the midline.

Holotype, ♂, Ethiopia. Gore, Jlubabor 35° 31' East Longitude, 8° 8' North Latitude, 2007 meters, December 8—23, 1959 (W. Richter). Allotopotype, ♀. Paratopotypes, 1 ♂, 4 ♀♀; paratypes, 1 ♂, 1 ♀, South Ethiopia, Province Sidamo, Jrga Alem, 28° 23' East Longitude, 6° 45' North Latitude, February 12, 1960 (W. Richter).

The species is named for Dr. Fr. Schäuffele, who collected many interesting species of Ethiopian Tipulidae. The most similar species appears to be *Nephro-*

toma thysia Alexander, of Uganda, which differs in details of coloration, especially of the antennae, and in hypopygial structure, as the distinctive eighth sternite.

3. *Tipula (Tipula) abyssinica* Jaennicke

Tipula abyssinica Jaennicke; Abhandl. Senckenb. Gesell., 6: 321; 1867.

In the present materials what appears to represent this species is a small number of both sexes from Addis Abeba, Mount Zuquala, Ethiopia, altitude 30920 meters, December 27, 1959, taken by Richter and Schäuffele. I have seen a further female specimen, taken by Maurice de Rothschild at Addis Abeba in May 1904. This is fully-winged, as are the present materials. It should be noted that a generally similar female specimen with identical data was described as *Tipula (Tipula) rothschildi* Alexander, Bull. Mus. d'Hist. naturelle, 1920: 318, the type being preserved in the Paris Museum. This type specimen is nearly apterous, contrasting markedly with the present fully-winged individuals. The problem as to whether two distinct species are involved, based on degree of wing development, should be further investigated. The two names, *abyssinica* and *rothschildi*, were not included by Mannheims in the list of eight species of African *Tipula (Tipula)* species that were included in his important study of African Tipulidae in Stuttgarter Beiträge zur Naturkunde, Nr. 6; April 1958.

4. *Tipula (Afrotipula) aethiopica* Alexander

Tipula (Afrotipula) aethiopica Alexander; Studia Entomologica, 15: 392—394, fig. 2 (venation), fig. 7 (male hypopygium); August 1972.

Types, ♂♂, Bahar Dar, Lake Tana, Ethiopia, at light, December 6—7, 1964 (Marion E. Smith). Further specimens from the type locality, July 4, 1965 (Ashley B. Gurney); in Alexander Collection.

Present materials: Bahar Dar (type locality), 1 ♂, 17 ♀♀, October 17—20, 1967 (E. Schüz); a single further male, October 21, 1967 (E. Schüz). 17 ♀♀, October 11—30, 1968 (K. W. and H. Harde).

5. *Tipula (Actutipula) hardeana* **sp. n.**

Size large (wing 19 mm or more); antennae of male with flagellum uniformly brown or brownish black, in female, more yellowed, with bases of flagellar segments slightly darkened; mesonotal praescutum yellow, with four light gray stripes that are narrowly bordered by brown, posterior sclerites of notum and the pleura chiefly yellowed; halteres and basal segments of legs yellowed, outer segments dark brown to black; wings whitened, attractively patterned with brown; basal abdominal segments yellowed, outer segments light brown; male hypopygium with posterior end of tergite produced into two flattened blades; inner dististyle bearing three long black spines.

Male. — Length about 20—22 mm; wing 19—20 mm; antennae about 4—4,5 mm.

Female. — Length about 23 mm; wing 19 mm; antennae about 3 mm.

Frontal prolongation of head yellow, nasus pale brown; palpi light brown. Antennae of male with scape and pedicel yellow, flagellum uniformly brown, outer segments more brownish black; longest flagellar verticils slightly exceeding

the segments. In female, antennae yellow, the proximal six or seven flagellar segments slightly bicolored, yellow, the small basal enlargements weakly darkened, outer segments uniformly dark brown. Head above brownish yellow to darker brown, light brown or yellowed adjoining the eyes; central area of anterior vertex with a pale brown triangular area.

Cervical region yellow. Pronotum yellow, weakly infuscated medially. Mesonotal praescutum yellow with four light gray stripes that are narrowly bordered by brown, the intermediate stripes in the holotype paler posteriorly; scutum yellowed medially, lobes with a single large gray triangular area that is restrictedly bordered by darker; scutellum light yellow, median area with paired pale brown posterior areas; postnotum yellow, mediotergite vaguely patterned with pale reddish areas on either side, pleurotergite with an extensive slightly elevated longitudinal area, more silvery, bordered by reddish. Pleura chiefly yellowed, vaguely patterned with brown, especially dorsally, dorsopleural membrane clear yellow. Halteres with stem brown, knob yellow. Legs with coxae and trochanters yellow; femora yellow, tips with coxae and trochanters yellow; femora obscure yellow, tips relatively narrowly dark brown to brownish black; remainder of legs dark brown to brownish black, outer tarsal segments black. Wings attractively patterned, withened, with brown clouds at wing base and in outer radial cells; stigma darker brown; paler brown areas over the cord in bases of outer radial cells, narrow darker clouds at origin of Rs and along cord and on veins comprising cell 1st M_2 and the fork of M_{1+2}; outer wing cells paler brown, darker in the outer radial field; outer medial cells weakly darkened; apex of cell R_5 and bases of cells M_1, 2nd M_2 and M_3 whitened, behind confluent with an inner white band that extends from the stigmal region over the cord into the base of cell M_3; outer ends of both Anal cells, especially 1st A, with paler brown clouds; veins brown. Venation as shown (Fig. 3).

Abdominal tergites medium brown, segment one and base of two more yellowed; intermediate tergites and extreme lateral borders narrowly yellowed; proximal five sternites light yellow, outer segments and hypopygium light brown; the enlarged hypopygium light brown, tergite and inner styles blackened. Male hypopygium (Fig. 4) with posterior border of tergite, t, produced, outer end divided into two flattened blades, their apices obliquely truncated. Outer dististyle, od, relatively small, stem slender, outer blade long-oval; inner style, id, distinctive, outer margin with three long black spines, the lower pair with a common base, outer spine slightly longer and more erect. Region of ninth sternite at base near midline with two groups of long blackened spinoid setae.

Holotype, ♂, Ethiopia, Gore, Jlubabor, 35° 31' East Longitude, 8° 8' North Latitude, 2007 meters, December 8'—23, 1959 (W. Richter). Allotype, ♀, Bahar Dar, October 15, 1968 (K. W. and H. Harde). Paratopotype, one ♂, with holotype.

This attractive species is named for Dr. K. W. and Mrs. H. Harde who collected the allotype specimen and numerous other Ethiopian Tipulidae. The fly is most readily distinguished by the structure of the inner dististyle of the hypopygium, as described and figured, in conjunction with the shape and vestiture of the ninth tergite. There are no generally similar regional species.

6. *Limonia (Dicranomyia) tipulipes* (Karsch)

Dicranomyia tipulipes Karsch; Entomol. Nachricht., 12: 51; 1886.

The type was from Angola; widely distributed in south and eastern Africa, including the outlying islands.

Southwest Ethiopia: Gamu-Gofa, Konso, 37° 23' East Longitude, 5° 16' North Latitude, 1010 meters, March 29, 1960 (W. Richter).

7. *Limonia (Rhipida) miosema* Speiser

Limonia miosema Speiser; Kilimandjaro — Meru Expedition, Diptera, 4, Orthorapha Nematocera, pp. 50—51; 1909.

Limonia (Rhipidia) miosema Alexander; Ruwenzori Expedition, Tipulidae, p. 217; 1956.

Type from Kilimandjaro, September 26, 1905. Widespread in tropical and southern Africa.

Ethiopia: Gore, Jlubabar, 35° 31' East Longitude, 8° 8' North Latitude, 2007 meters, December 8—23, 1959 (W. Richter).

8. *Limonia (Rhipidia) seydeli* Alexander

Limonia (Rhipidia) seydeli Alexander; Ruwenzori Expedition, Tipulidae, pp. 218—220, fig. 70 (♂ hypopygium); 1956.

Type from Elisabethville, Belgian Congo (Zaire), November—December 17—31, 1932 (Charles Seydel). Ethiopia: Bahar Dar, Lake Tana, October 30, 1968 (K. W. and H. Harde).

9. *Limonia (Limonia)* near *nyasaensis* (Alexander)

Limnobia nyasaensis Alexander; Ann. Mag. Nat. Hist., (9) 6: 10—11; 1920.

Type from Mount Mlanje, Nyasaland, January 20—24, 1913 (S. A. Neave).

South and East Africa. Ethiopia: Bahar Dar. Lake Tana, October 22, 1967 (E. Schüz).

10. *Helius (Helius) bifurcus* Alexander

Helius (Helius) bifurcus Alexander; Ruwenzori Expedition, Tipulidae, pp. 249—250, fig. 103 (venation), fig 108 (♂ hypopygium); 1956.

Types from Uganda and Kenya. Southwest Ethiopia: Jimma, 36°, 49' East Longitude, 7° 39' North Latitude, 1779 meters, January 5—29, 1960 (W. Richter). West Ethiopia: Western Gore, Gumara Ufer, 35° 30' East Longitude, 8° 10' North Latitude, December 19, 1959 (W. Richter and Fr. Schäuffele)

11. *Austrolimnophila (Austrolimnophila) tanana* Alexander

Austrolimnophila (Austrolimnophila) tanana Alexander; Studia Entomologica, 15: 405—406, fig. 17 (venation); 1972.

Type, ♀, from Bahar Dar, Lake Tana, Ethiopia, July 4, 1965 (A. B. Gurney). The previously unknown male sex is described here as allotype.

Male. — Length about 11 mm; wing 10 mm; antenna about 2,5 mm.

Female. — Length about 11,5 mm; wing 11,5 mm.

Allotype, ♂, Ethiopia, Gore, Jlubabor, 35° 31' East Longitude, 8° 8' North Latitude, December 8—23, 1959 (W. Richter).

Male generally as in the holotype female as described. Antennae moderately long, yellow basally, outer segments brown; flagellar segments elongate, exceeding the verticils. Vertex gray, more yellowed posteriorly.

Pronotum light yellow. Mesonotal praescutum yellowed anteriorly, posterior two-thirds with a pale brown central stripe, lateral stripes brownish black, crossing the suture onto the scutal lobes; scutellum brownish black; postnotum and pleura light yellow. Legs with femora light yellow, tips brownish black; tibiae and tarsi brown. Wings as in the holotype, pale brown, prearcular and costal fields yellow; no distinct stigmal darkening; veins medium brown. Wings with venation as in the holotype but with the basal deflection of R_5 distinctly preserved, nearly as long as r-m.

Abdominal tergites yellow, the narrow posterior borders vaguely more reddened; basal sternites light yellow, each with a conspicuous marginal brown spot on either side; outer three segments dark brown, the hypopygial dististyles yellowed. Male hypopygium (Fig. 5) very complex in structure, as in the species group. Outer dististyle, od, slender, nearly parallel-sided, at outer apical angle with a small lobule; inner style, id, narrowed beyond base, the outer two-thirds dilated, irregular in conformation, as shown, terminating in a slender rod. Basistyle, b, with the ventromesal lobe, mb, very large, in size nearly equalling the body of the style, its outer margin produced into two lobes that bear conspicuous brushes of setae, as shown. Aedeagus, a, and gonapophyses, g, very small.

Other regional species of the genus having very complex male hypopygia include *Austrolimnophila (Austrolimnophila) diffusa* Alexander, Uganda; *A. (A.) hoogstraali* Alexander, Kenya; *A. (A.) phantasma* Alexander, Kenya; *A. (A.) praepostera* Alexander, Uganda; and some others. These are described and discussed in two papers by the writer, Ruwenzori Report, pp. 263—276; 1956, and Studia Entomologica, 15: 402—405; 1972.

12. *Austrolimnophila (Austrolimnophila) cladu roneura* (Speiser)

Limnophila cladu roneura Speiser; Kilimandjaro — Meru Expedition, Diptera, 4, Orthorapha Nematocera, pp. 52—53, fig. 9 (hypopygium); 1909.

Type male, Kibonoto, Kilimandjaro, July 6, 1905. One male, Kilimandjaro S. W., 3500 meters, February 1—4, 1959 (Erwin Lindner).

13. *Conosia irrorata intermedia* Alexander

Conosia irrorata intermedia Alexander; Studia Entomologica, 15: 412; 1972.

Type from Murchison Falls, Victoria Nile, Uganda, November 18, 1964 (Marion E. Smith).

Ethiopia: Gore, Jlubabor, 35° 31' East Longitude, 8° 8' North Latitude, June—July 1967 (W. Richter). Bahar Dar, October 20, 1967 (E. Schüz).

14. *Trentepohlia (Trentepohlia) richteri* **sp. n.**

Head and thoracic dorsum chiefly brown, pleura more yellowed; halteres and legs yellow; wings whitened, with a conspicuous brown pattern, including reticulated areas before and beyond the cord, wing apex broadly pale.

Male. — Length about 6,5 —7 mm; wing 6—7 mm.

Female. — Length about 7,5 mm; wing 7 mm.

Rostrum and palpi black. Antennae with scape and pedicel black, flagellum obscure yellow, outer segments more darkened. Head light brown.

Cervical region and pronotum dark brown. Mesonotal praescutum obscure yellow medially, this color extended posteriorly to the postnotum; praescutum with a capillary light brown central stripe, and slightly broader sublateral and marginal markings, the former crossing the suture onto the scutal lobes; median region of scutum obscure yellow; scutellum pale brown, postnotum darker brown. Pleura yellowed. Halteres light yellow. Legs yellow, the outer tarsal segments slightly infuscated. Wings (Fig. 6) with the ground whitened, prearcular and costal areas slightly more yellowed; a conspicuous reticulated brown pattern, forming two separate groups before and beyond the cord, the broad dividing area slightly constricted in the medial field; before the cord the darkenings include narrow bands in cell R_1 and outer end of cell M, with more extensive areas at midlength of cell R and especially in cell M, including restricted darkenings in bases of the Anal cells; beyond the cord the darkened pattern is more regularly reticulated, forming a continuous narrow inner band that crosses the wing from the stigmal area and R_1 to the posterior margin at near midlength of vein M_3; the darker pattern beyond the cord encloses about 10 rounded and oval areas that are subequal in area to the darkened ground; wing apex broadly pale; veins light brown in the darkened areas, yellow in the ground. Venation about as shown.

Abdomen black, proximal four tergites with disks obscure yellow, basal five sternites similarly obscure yellow.

Holotype, ♂, Ethiopia. Gore, Jlubabor, 35° 31' East Longitude, 8° 8' North latitude, 2007 meters, Decemeber 8—23, 1959 (W. Richter). Allotopotype, ♀. Paratype, ♂, in Alexander Collection.

This attractive species is named in honor of W. Richter who has collected several new and rare Tipulidae in Ethiopia. Other related African species that have a somewhat comparable wing pattern include especially *Trentepohlia (Trentepohlia) jacobi* Alexander, Cameroun, and *T. (T.) joana* Alexander, Nigeria, both differing in the nature and distribution of the wing pattern.

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