

## Afrotropical species of the genus *Lichtwardtia* Enderlein (Diptera: Dolichopodidae)

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*L. emelyanovi* sp.n. from Cameroon, *L. hollisi* sp.n. from Kenya, *L. mironovi* sp.n. from Ghana, *L. nikolaevae* sp.n. from Namibia, *L. sukharevae* sp.n. from Botswana and Madagascar and *L. tikhonovi* sp.n. from Angola are described. *L. metallica* (Bezzi), *L. violacea* (Curran), *L. maculata* (Parent), *L. antennata* (Vanschuytbroeck) and *L. wittei* (Vanschuytbroeck) are placed in synonymy to *L. angularis* (Macquart). *L. microlepis* (Parent), *L. kivuensis* (Vanschuytbroeck) and *L. minuta* (Vanschuytbroeck) are placed in synonymy to *L. fractinervis* (Parent). A catalogue and key to Afrotropical species of *Lichtwardtia* are given.

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**Key words.** Diptera, Dolichopodidae, *Lichtwardtia*, Tropical Africa, new species, new synonym, keys.

### Introduction

The genus *Lichtwardtia* Enderlein has Palaetropical area with two Oriental and Australasian and ten (including new) Afrotropical species. Species of *Lichtwardtia* differ from the related genera of the subfamily Dolichopodinae in the complex of characters such as follows: one strong anterior subapical seta is present on the middle and hind femora; the face is slightly narrowed at upper third and somewhat widened towards clypeus; wing vein  $M_{1+2}$  is broken in middle of distal part, joining costal vein just before wing tip, having anteroproximal (basal part of  $M_1$ ) and posterodistal ( $M_2$ ) stublike veins;  $R_{4+5}$  and distal part of  $M_1$  are nearly parallel; arista is long pubescent.

A revised catalogue and key to Afrotropical species of the genus are given in this paper. *L. emelyanovi* sp.n. from Cameroon, *L. hollisi* sp.n. from Kenya,

*L. mironovi* sp.n. from Ghana, *L. nikolaevae* sp.n. from Namibia, *L. sukharevae* sp.n. from Botswana and Madagascar and *L. tikhonovi* sp.n. from Angola are described. *L. metallica* (Bezzi), *L. violacea* (Curran), *L. maculata* (Parent), *L. antennata* (Vanschuytbroeck) and *L. wittei* (Vanschuytbroeck) are placed in synonymy to *L. angularis* (Macquart). *L. microlepis* (Parent), *L. kivuensis* (Vanschuytbroeck) and *L. minuta* (Vanschuytbroeck) are placed in synonymy to *L. fractinervis* (Parent).

Holotypes and paratypes of the new species are deposited in the Natural History Museum in London [NHML] and the R  yal Institute for Natural Sciences, Brussels [RINS]. The other material examined is also kept in the Royal Museum for Central Africa, Tervuren [RMCA], the Hungarian Natural History Museum, Budapest [HNHM], Zoological Museum in Copenhagen [ZMUC] and Lund University, Sweden [Lund].

**List of known species of *Lichtwardtia* Enderlein**

(for references see Dyte, 1975; Dyte and Smith, 1980)

**Genus *Lichtwardtia* Enderlein***Lichtwardtia* Enderlein, 1912: 406. Type-species: *Lichtwardtia formosana* Enderlein, 1912 [= *Dolichopus ziczac* Wiedemann, 1824], by original designation.= *Vaalimymia* Curran, 1926: 398. Type-species: *Vaalimymia violacea* Curran, 1926 [= *Dolichopus angularis* Macquart, 1842], by original designation.*aethiopica* Bezzi, 1906: 297 (*Rhagoneurus*). Eritrea. *angularis* Macquart, 1842: 185 (125) (*Dolichopus*). Senegal; Gambia (!), Nigeria (!), Gabon (!), Uganda (!), Kenya (!), Tanzania (!), Congo (Kinshasa), Zambia (!), South Africa, Swaziland (!), Mozambique.= *metallica* Bezzi, 1908: 380 (*Rhagoneurus*), **syn.n.** Congo (Kinshasa).= *violacea* Curran, 1926: 398 (*Vaalimymia*), **syn.n.** South Africa.= *maculata* Parent, 1936: 322 (*Vaalimymia*), **syn.n.** Congo (Kinshasa).= *antennata* Vanshuylbroeck, 1951: 50 (*Vaalimymia*), **syn.n.** Congo (Kinshasa).= *wittei* Vanshuylbroeck, 1951: 46 (*Vaalimymia*), **syn.n.** Congo (Kinshasa).*emelyanovi* Grichanov, sp.n. Cameroon.*fractinervis* Parent, 1929: 175 [1930: 97] (*Vaalimymia*). Benin; Ghana, Nigeria, Congo (Kinshasa), Uganda (!), Angola (!), Namibia (!), Malawi (!).= *microlepis* Parent, 1939: 274 (*Vaalimymia*), **syn.n.** Ghana.= *kiczensis* Vanshuylbroeck, 1951: 49 (*Vaalimymia*), **syn.n.** Congo (Kinshasa).= *minuta* Vanshuylbroeck, 1951: 51 (*Vaalimymia*), **syn.n.** Congo (Kinshasa).*hirsutisetis* de Meijere, 1916: 229 (*Rhagoneurus*). Ceylon, Java.*hollisi* Grichanov, sp.n. Kenya.*minuscule* Parent, 1934: 134 (*Vaalimymia*). Chad; Tanzania, Ghana (!).*mironovi* Grichanov, sp.n. Ghana.*nigrotorquata* Parent, 1937: 6 (*Vaalimymia*). Congo (Kinshasa).*nikolaevae* Grichanov, sp.n. Namibia.*sukharevae* Grichanov, sp.n. Botswana, Madagascar.*rikhonovi* Grichanov, sp.n. Angola.*ziczac* Wiedemann, 1824: 40 (*Dolichopus*). India, Ceylon, Bangladesh, Thailand, Burma, Malaya, Philippines, Indonesia, China, Taiwan, Bismarck Archipelago, Solomon Islands, Admiralty Islands, Australia, New Caledonia.= *coxalis* Kertész, 1901: 411 (*Rhagoneurus*). Singapore, Malaya.= *formosana* Enderlein, 1912: 407 (*Lichtwardtia*). Formosa.= *polychromus* Loew, 1864: 346 (*Rhagoneurus*). Ceylon.**Descriptions and new records*****Lichtwardtia angularis* (Macquart)**

(Fig. 1)

*Type material examined.* Holotypus, female [red label] / Musée du Congo, Katanga: Kando, 4.IV.1931, G.F. de Witte / R. Det. 3092 / *Vaalimymia maculata* n.sp. Type. O. Parent [RMCA]; holotypus, male [red label] / Congo belge: Uele, Monga (riv. Bili), 450 m, 18.IV au 8.V.1935, G.F. de Witte: 1345 / Coll. Mus. Congo (ex coll. I.P.N.C.B.) / Type [red label] / P. Vanshuylbroeck det. 1950, *Vaalimymia wittei* n.sp. [RMCA]; holotypus, male [red label] / S.L. Edouard: Kitembo (925 m), 4.IV.36, L. Lippens - 60, Parc Nat. Albert / Coll. Mus. Congo (ex coll. I.P.N.C.B.) / Type [red label] / P. Vanshuylbroeck det. 1950, *Vaalimymia antennata* n.sp. [RMCA]; female, Kinshasa, Waelbroeck, 25.5.1899 / *Rhagoneurus metallicus* n.sp. / M. Bezzi - 1908 det. *Rhagoneurus metallicus* / Type [red label; RINS].*Additional material.* 1 male and 1 female, Musée du Congo, S. Afr.: Barberton, 9-6-25 (Munro), Ex coll. Curran / R.Det. 1284 / *Vaalimymia angularis* Macq. (*violacea*), Det. C.H. Curran [RMCA]; 1 female, Musée du Congo: Lubumbashi, Mt. Katanga, 17-VI-20, Dr. M. Bequaert / R.Det. N 1155 / *Vaalimymia violacea*, Det. C.H. Curran [RMCA]; 2 males, Congo Belge: P.N.U., Kankunda (1300 m), 22-24.XI.1947, Mis. G.F. de Witte., 1036a / P. Vanshuylbroeck det. 1952: *Vaalimymia aethiopica* Macq. [RINS]; 2 males, SL Edouard: Eb. Rwindi (1000 m), 9.II.1936, L. Lippens, Parc National Albert, [1 of the males with additional label:] P. Vanshuylbroeck det. 1951: *Vaalimymia microlepis* Parent [RINS]; 1 male, Congo Belge: P.N.A., 19.VII.1954, P. Vanshuylbroeck & H. Synave, 9204/ Massif Ruwenzori, Litongo, 1575 m [RINS]; 1 male, Congo Belge: P.N.A., Vitshumbi (S. Lac Ed.) (S a la lampe), 13.I.1953, J. Verbeke, KEA [RINS]; 4 males, Congo Belge: P.N.G. Miss H. De Saeger, II/gd/10 (II/c/10, II/hc/8), 23.IV.1951 (7.IX.1951, 8.VIII.1952), R(c. H. De Saeger [1 male - Réc. J. Verschuren], 1590 (2391, 3909) [RMCA]; 3 males [in alcohol], Gabon: Ntoun, 1-31.X.1985, A. Pauly r(c., piege lumineux, Coll. R.I.Sc.N.B.; 11 males, 9 females [in alcohol], Gabon: Ntoun, VIII.1985, A. Pauly r(c., fauchoir, Coll. R.I.Sc.N.B.; 6 males, 4 females [in alcohol], Gabon: Ntoun, X.1985, A. Pauly r(c., bac jaune, plantation sur brûles, Coll. R.I.Sc.N.B.; 2 males, Uganda: Katwe, Lac cratère salin, 20.II.1954 [RINS]; 2 males, 2 females, Uganda: Budongo Forest, Nov.

14, 1972, N. Gonget leg. [ZMUC]; 1 female, Tanzania, Uzungwe Mts., Mwanihana Forest above Sanje, 1000 m, 01.VIII.1981, M. Stoltze & N. Scharff leg., Zool. Museum, Copenhagen; 1 male, Gambia: Outside Abuko Nature Reserve at Waterworks, At light, 19.00—22.00, 26.II.1977, Loc. No. 6, UTM 28PCK 214812 / Lund Univ., Syst. Dept., Sweden Gambia/Senegal. Febr.-March 1977, Cederholm - Danielsson - Larsson - Mirestrom - Norling - Samuelsson [Lund]; 1 male, RSA: Cape Prov., Cedarberg, 3 km ESE Kriedowkrans, 32°22'S, 18°59' E, 350 m, 06.X.1994, loc. 10, leg. R. Danielsson [Lund]; 1 male, 1 female, Swaziland: near Milwane Nature Reserve, 26°26' S, 31°11' E, 25.X.1994, loc. 33, leg. R. Danielsson [Lund]; 1 male, Kenya: 9—13.XII.1970, A.E. Stubbs, B.M. 1972-211 / Nairobi, 5500 feet; 1 male, Kenya: 19.XII.1970, A.E. Stubbs, B.M. 1972-211 / Kisumu, 3781 feet [NHML]; 1 male, N. Nigeria: Zaria, Samaru, 4.III.1972, J.L. Musa [NHML]; 1 male, 4 females [on one pin], N. Nigeria: Zaria, Samaru, 11.XI.1970 / J.C. Deeming [NHML]; 1 male (figured), S. Africa: Pirie Dam, II.1944, J. Omer Cooper, B.M. 1948-276 [NHML]; 1 male, N. Rhodesia: Lake Bagweulu dist., IX-XII.1946, M. Steele, B.M. 1947-351.

**Description** (all measurements from a male collected in Parc National Upemba, Congo Belge). Male. General coloration of body bronze-green to black. Frons and face with violet reflection face densely grey pollinose. One short vertical, one short postvertical, a pair of strong ocellar setae presents. Upper postocular setae black; lower postocular white; ventral postcranium with short sparse cilia. Eyes with microscopic hairs; face glabrous. Face the narrowest at upper third, weakly widening towards palpi; ratio of its minimal width to height 13 : 36; clypeus not reaching lower margin of eyes, convex downward. Antenna 1/4 shorter than height of head, mostly yellow to reddish-brown; 1st flagellomere blackish dorsally to mostly black, budlike, subtriangular or trapezoidal, usually 1.5—2 times longer than high, with drawn-out apex, rarely slightly longer than high, acute or right-angular apicodorsally, with short hairs; arista middorsal, black, sparsely pubescent, with hairs twice longer than basal diameter of arista. Length ratio of scape to pedicel to 1st flagellomere to arista, 8 : 6 : 12 : 35. Palpus and proboscis small, black, with short hairs.

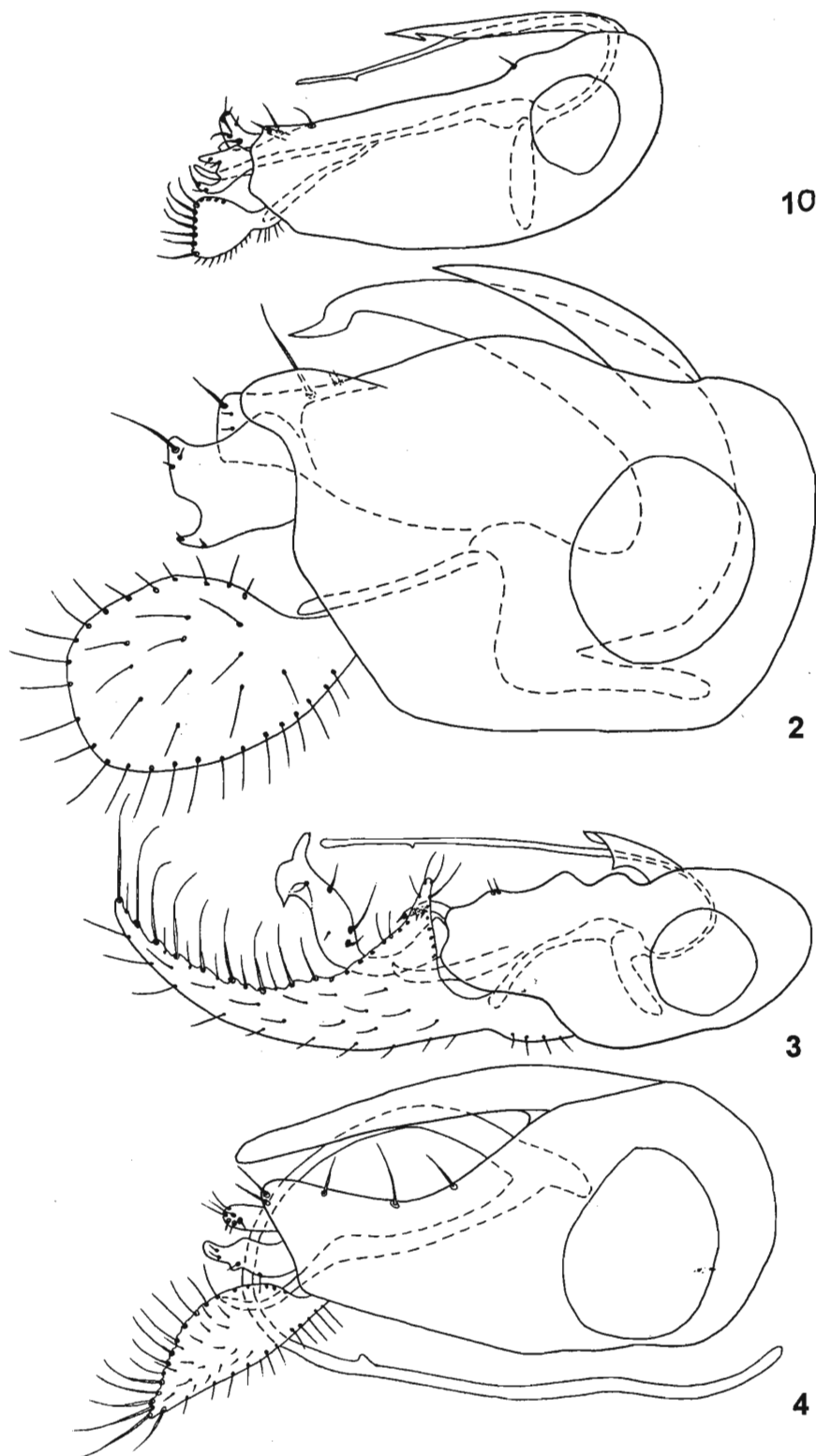
Thorax black, with violet reflection, brownish pollinose; pleura with greenish reflection. 5 strong dorsocentral setae with several hairlike setae in front of the 1st pair, 2 rows of short acrostichals. Propleura with 1 strong black seta and several short hairs. Scutellum with 2 strong setae and 2 very short lateral hairs.

Legs mostly yellow to mostly blackish-brown; fore coxa yellow to brown; other coxae black; femora yellow to brown, sometimes blackish above and

laterally; hind tibia yellow with dark apex or entirely dark-brown; hind tarsus usually entirely brown-black. Femora without long hairs. Fore coxa with black hairs and several short apical setae. Fore tibia with 1 strong and 1 fine dorsal, 1 strong and 1 fine posterodorsal, 1 strong posterior, 2—3 short apical setae. Fore tarsus simple, fore basitarsus with short basoventral seta. Length ratio of fore coxa to femur to tibia to tarsus (segments from first to fifth), 40 : 54 : 54 : 25 : 12 : 9 : 7 : 8. Middle femur with 1 subapical anterior seta. Middle tibia with 2 dorsal, 2 anterodorsal, 1 ventral and 3 apical setae. 1st to 4th segments of middle tarsus each with elongate apicoventral setula. Length ratio of middle coxa to femur to tibia to tarsus (segments from first to fifth), 27 : 77 : 75 : 39 : 20 : 16 : 11 : 8. Hind femur with one subapical anterior seta. Hind tibia with 4 antero-, 4 posterodorsal, 2 ventral, 2 apical setae. Hind basitarsus with 1 short basoventral, 2—3 short apical, 1 strong middorsal setae; 2nd—4th segments simple, with elongate apicoventral setulae. Length ratio of hind coxa to femur to tibia to tarsus (segments from first to fifth), 18 : 75 : 90 : 32 : 37 : 28 : 17 : 12.

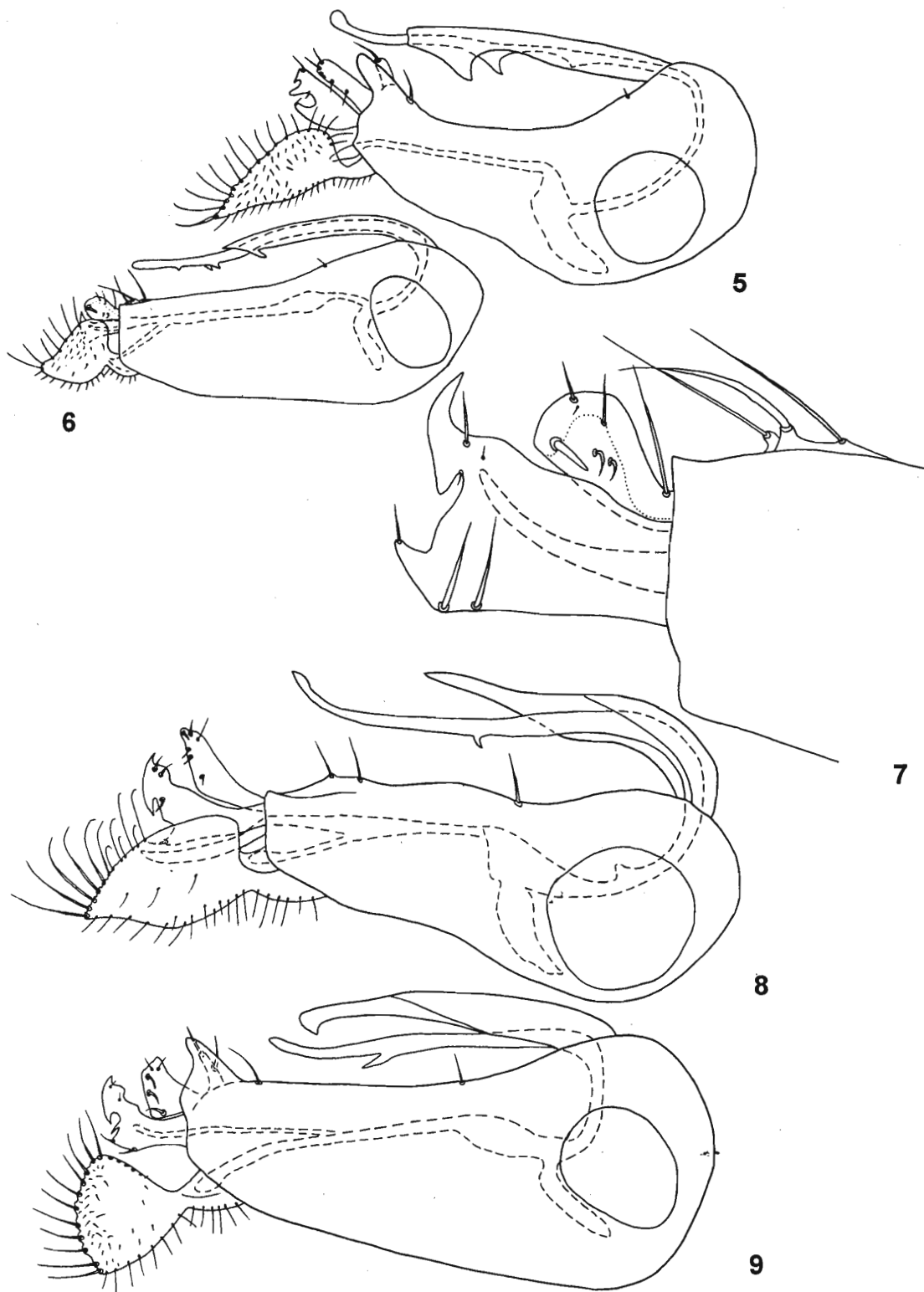
Wing more or less greyish, darkened along costa, with dark spots at crossveins *m-m* and *m-cu*. Costa simple.  $R_1$  reaching to first third of wing.  $R_{2+3}$  and  $R_{4+5}$  straight, parallel at apex. Ratio of part of costa between  $R_{2+3}$  and  $R_{4+5}$  to this between  $R_{4+5}$  and  $M_1$ , 20 : 22.  $M_{1+2}$  broken in middle of distal part, joining costal vein just before wing tip, with antero-proximal (basal part of  $M_1$ ) and posterodistal ( $M_2$ ) stublike veins 1/2 to 2/3 as long as *m-m*.  $R_{4+5}$  and distal part of  $M_1$  weakly divergent or parallel. Crossveins *m-m* and *m-cu* straight, almost perpendicular to corresponding longitudinal veins. Ratio of distal part of  $M_1$  to *m-m* to distal part of  $M_{1+2}$  to *m-cu* to distal part of  $CuA_1$ , 54 : 12 : 35 : 21 : 28. Anal vein distinct, not reaching to wing margin; anal lobe pronounced; anal angle obtuse. Lower calypter brown, with black setae. Halteres brownish-yellow to black-brown.

Abdomen bronze-black, grey pollinose, with black hairs and marginal setae. 8th segment black, with short sparse black hairs. Epandrium of moderate size, elongate-oval, slightly narrowed distad, as long as 4th and 5th tergites combined, black. Hypandrium brown or black, basoventral, 2/3 as long as epandrium, with usually large dorsal or lateral subapical tooth. Aedeagus thin, with dorsal tooth positioned far before apex. Epandrial lobe undeveloped; 3 epandrial setae raising from apicodorsal angle of epandrium. Surstylus light-brown, bilobate; ventral lobe short and broad, subtriangular, with several short distal setae; dorsal lobe of surstylus broad, longer than ventral lobe, with deep distal excavation and 3



Figs 1—4. *Lichtwardtia* spp., hypopygium, lateral view (cercus usually covers surstylus; ventral setae on cercus are not figured).

1, *L. angularis* (Macquart); 2, *L. mironovi* sp.n.; 3, *L. sukharevae* sp.n.; 4, *L. minuscula* (Parent).

Figs 5—9. *Lichtwardtia* spp.

5, *L. emelyanovi* sp.n.; 6—7, *L. hollisi* sp.n.; 8, *L. tikhonovi* sp.n.; 9, *L. fractinervis* (Parent); Angola.  
 5, 6, 8, 9, hypopygium, lateral view (cercus usually covers surstylus; ventral setae on cercus are not figured); 7, surstyli, lateral view.

short and 1 strong setae around excavation. Distal unpaired epandrial process longer than surstylus, flat, broad (lateral view) and rounded at apex. Cercus brownish with black margin, rounded or transverse-oval, with short stem, distinct basoventral angle and straight and curved black cilia half shorter than width of cercus.

Length (mm): body without antennae 3.0–4.5, wing-length 3.0–4.5.

**Diagnosis.** *L. angularis* is quite distinct in wing clearly maculated at  $M_2$  and  $m-cu$ ; 1st flagellomere usually 1.5–2 times longer than high, with drawn-out or acute apex; hind tarsus usually entirely black; distal unpaired epandrial process broad and rounded at apex; cercus rounded or oval, without distinct apex apicodorsally. It has greatly variable colour of legs (from mostly yellow to mostly blackish-brown) and wings, shape and length of the 1st flagellomere. The shape of cercus and apex of hypandrium is also variable to some extent.

**Remark.** The type material examined, specimens determined by Curran and Vanshuytbroeck, and published descriptions of *L. metallica* (Bezzi), *L. violacea* (Curran), *L. maculata* (Parent), *L. antennata* (Vanshuytbroeck) and *L. wittei* (Vanshuytbroeck) have no principal differences from the redescription of holotype *L. angularis* (Macquart) by Parent (1926). Keeping in mind a great variability and wide distribution of the material examined, I synonymized all these species.

**Distribution.** Senegal; Gambia (!), Nigeria (!), Gabon (!), Uganda (!), Kenya (!), Tanzania (!), Congo (Kinshasa), Zambia (!), South Africa, Swaziland (!), Mozambique.

### *Lichtwardtia mironovi* sp.n.

(Fig. 2)

**Holotype.** Male, Ghana: Kwadaso / 10—24.VII. 1965, leg. Endrody-Y. [HNHM].

**Paratypes.** Male with the same label; female, Ghana: Banda-Nkwanta / VII—VIII.1965, leg. Endrody-Y. [HNHM].

**Description.** Male. General coloration of body dark-brown. Frons and face brown-black, grey pollinose. One long vertical, one short postvertical, a pair of strong ocellar setae presents. Upper and lower postocular setae black; ventral postcranium glabrous. Eyes with microscopic hairs; face glabrous. Face almost parallel-sided, slightly narrowed at upper third; ratio of its minimal width to height 12 : 20; epistome twice wider than height of 1st flagellomere; clypeus not reaching lower margin of eyes, slightly convex downward. Antenna entirely orange-brown; 1st flagellomere ovate, as long as high, widest at

base, with widely rounded apex and very short hairs; arista middorsal (most part broken). Length ratio of scape to pedicel to 1st flagellomere, 5 : 4 : 7. Palpus and proboscis small, brown-black, with short hairs.

Thorax brown-black, mesonotum slightly shining, brownish pollinose; pleura grey pollinose. 5 strong dorsocentral setae gradually decreasing anteriorly with several hairlike setae in front of the 1st pair, 2 rows of short acrostichals. Propleura with 1 strong black seta above fore coxa. Scutellum with 2 strong setae.

Legs mostly yellow; fore coxa yellow-brown, middle and hind coxae brown except yellow apex; last segments of tarsi brown. Femora without long hairs. Fore coxa with black hairs and several short apical setae. Fore tibia with 1 short dorsal at upper third, 1 short midventral, 2–3 short apical setae. Fore tarsus simple. Length ratio of fore coxa to femur to tibia to tarsus (segments from first to fifth), 26 : 40 : 38 : 16 : 7 : 9 : 5 : 5. Middle femur with 1 subapical anterior seta. Middle tibia with 3 anterodorsal, 2 posterodorsal, 1 ventral and 3 apical setae. 1st to 4th segments of middle tarsus each with elongate apicoventral setula. Length ratio of middle coxa to femur to tibia to tarsus (segments from first to fifth), 20 : 43 : 50 : 23 : 11 : 9 : 7 : 5. Hind femur with one subapical anterior seta. Hind tibia with 2–3 antero-, 2–3 posterodorsal, 2 short ventral, 2–3 apical setae. Hind basitarsus with 1 short basoventral, 2 short apical, 1 strong middorsal setae; 2nd–4th segments simple, with elongate apicoventral setulae. Length ratio of hind coxa to femur to tibia to tarsus (segments from first to fifth), 12 : 46 : 57 : 18 : 19 : 12 : 7 : 8.

Wing yellowish, slightly infumated along costa, at crossveins  $m-m$  and  $m-cu$ . Costa with long and wide thickening occupying 1st radial cell almost entirely and narrowing gradually towards 1st third of 2nd radial cell.  $R_{2+3}$  and  $R_{4+5}$  straight, parallel at apex. Ratio of part of costa between  $R_{2+3}$  and  $R_{4+5}$  to this between  $R_{4+5}$  and  $M_{1+2}$ , 12 : 13.  $M_{1+2}$  broken in middle of distal part, joining costal vein just before wing tip, with anteroproximal (basal part of  $M_1$ ) and posterodistal ( $M_2$ ) stublike veins 1/2 to 2/3 as long as  $m-m$ .  $R_{4+5}$  and distal part of  $M_1$  distinctly divergent. Crossveins  $m-m$  and  $m-cu$  straight, almost perpendicular to corresponding longitudinal veins. Ratio of distal part of  $M_1$  to  $m-m$  to distal part of  $M_{1+2}$  to  $m-cu$  to distal part of  $CuA_1$ , 37 : 5 : 16 : 13 : 17. Anal vein distinct, not reaching to wing margin; anal lobe narrow; anal angle obtuse. Lower calypter brownish-yellow, with black setae. Halteres dirty-yellow.

Abdomen blackish-brown, slightly shining, with black hairs and marginal setae. 8th segment black, with short sparse black hairs. Epandrium small, shorter than 4th and 5th tergites combined, subrectangular, slightly longer than high, with short liguliform apicoventral prominence, dark-brown. Hypandrium brown,

basoventral, without tooth, pointed at apex, approximately half as long as epandrium. Aedeagus thick, narrowed distad, with strong subapical curvation and pointed apex. Epandrial lobe undeveloped; 1 long and strong and 2 microscopic epandrial setae raising from apicodorsal angle of epandrium. Surstylus light-brown, bilobate; ventral lobe short and broad, subrectangular, with 3 short distal setae; dorsal lobe of surstylus broad, longer than ventral lobe, with deep distal excavation, 1 strong apicoventral and several very short distal setae. Distal unpaired epandrial process very short, hardly visible. Cercus yellow-brown, rounded, without distinct angles, with short black cilia, at most 1/3 as long as diameter of cercus.

Female similar to male except lacking male secondary sexual characters. Arista middorsal, black, sparsely pubescent, with hairs twice longer than basal diameter of arista.

Length (mm): body without antennae 1.8, antenna 0.6, wing-length 1.9, wing-width 0.7, hypopygium 0.5.

Etymology. The species is named for the Russian entomologist, Dr. V. G. Mironov.

*Diagnosis.* *L. mironovi* is the smallest species (body 1.8 mm) and the only species in the genus, having costa with long and broad thickening in basal half of wing.

*Distribution.* Ghana.

### *Lichtwardtia sukharevae* sp.n.

(Fig. 3)

*Holotype.* Male [in alcohol], Botswana, Madiba Secondary School, Mahalapye, Malaise traps, 16-VI-1-VII-1986, M. De Meyer [RINS].

*Paratypes* [mostly in alcohol]. Male in glycerol (figured) with the same label; male, Botswana: Serowe, Malaise trap, II.1986, Forchhammer [RINS]; male, Madagascar: Tam, Morarano-Chrome, 1—15.VIII.1991, A. Pauly, foret, 25 km W. [RINS].

*Description.* Male. Frons metallic blue; face with brown ground colour. One strong vertical, one short postvertical, a pair of strong ocellar setae present. Upper postocular setae black; lower postocular setae white; ventral postcranium with several cilia. Eyes with microscopic hairs; face glabrous. Face the narrowest in middle, weakly widening towards palpi; ratio of its minimal width to height 10 : 35; clypeus nearly reaching lower margin of eyes, convex downward. Antenna nearly equal in length to height of head, yellow-orange; 1st flagellomere brownish dorsally, as long as high, rounded, with rounded apex and short hairs; arista middorsal, black, sparsely pubescent. Length ratio of scape to pedicel to 1st

flagellomere to arista, 5 : 5 : 10 : 30. Palpus and proboscis small, yellow, with short hairs.

Mesonotum metallic blue-green; pleura dark-brown. 6 strong dorsocentral setae gradually decreasing anteriorly with several hairlike setae in front of the 1st pair, 2 rows of acrostichals. Propleura with 1 strong black seta and several short hairs. Scutellum with 2 strong setae and 2 microscopic lateral hairs.

Legs mostly yellow; fore coxa entirely yellow, middle coxa mostly brown, hind coxa brown externally, all tarsi brown from tip of basitarsus; hind tibia brownish at apex; hind basitarsus mostly yellow. Femora without long hairs. Fore coxa with black hairs and several apical setae. Fore tibia with short setae: 1 or 2 anterodorsal, 1 posterodorsal, 1 posterior, 2 apical setae in addition to long fine apicoventral seta half as long as basitarsus. Fore tarsus simple. Length ratio of fore coxa to femur to tibia to tarsus (segments from first to fifth), 35 : 50 : 50 : 26 : 12 : 10 : 7 : 7. Middle femur with 1 subapical anterior seta. Middle tibia with 4 anterodorsal, 2 posterodorsal, 1 ventral and 5 apical setae. 1st to 3rd segments of middle tarsus each with elongate apical setulae. Length ratio of middle coxa to femur to tibia to tarsus (segments from first to fifth), 28 : 61 : 66 : 33 : 16 : 12 : 10 : 8. Hind femur with one subapical anterior seta. Hind tibia with 3—4 antero-, 3—4 posterodorsal, 2 short ventral, 3 apical setae. Hind basitarsus with 1 strong dorsal at apical third, 1 short basoventral and 1 short apicoventral setae; 4th segment in apical half and 5th segment flattened and slightly dilated. Length ratio of hind coxa to femur to tibia to tarsus (segments from first to fifth), 22 : 65 : 77 : 35 : 37 : 25 : 15 : 9.

Wing weakly infumated in anterior half, without spots. Costa with punctiform ventral thickening at  $R_1$ .  $R_1$  reaching to first third of wing.  $R_{2+3}$  and  $R_{4+5}$  almost straight, parallel at apex. Ratio of part of costa between  $R_{2+3}$  and  $R_{4+5}$  to this between  $R_{4+5}$  and  $M_{1+2}$ , 22 : 10.  $M_{1+2}$  broken in middle of distal part, joining costal vein just before wing tip, with very short anteroproximal (basal part of  $M_1$ ) and posterodistal ( $M_2$ ) stublike veins.  $R_{4+5}$  and distal part of  $M_1$  parallel. Crossvein  $m-m$  oblique;  $m-cu$  slightly convex, almost perpendicular to adjacent longitudinal veins. Ratio of distal part of  $M_1$  to  $m-m$  to distal part of  $M_{1+2}$  to  $m-cu$  to distal part of  $CuA_1$ , 47 : 7 : 28 : 22 : 25. Anal vein distinct, not reaching to wing margin; anal lobe pronounced; anal angle obtuse or nearly right. Lower calypter yellow, with black setae. Halteres yellow.

Abdomen green-brown, with black hairs and short marginal setae. 8th segment black, with short sparse black hairs. Epandrium of moderate size, as long as 4th and 5th tergites combined, elongate-oval, nar-

rowed distally, twice longer than high, with sinuate ventral margin (lateral view), brown. Hypandrium light-brown, raising at basal 1/3 of epandrium, very short, 1/3 as long as epandrium, with middorsal tooth. Aedeagus thin and long, with small dorsal tooth positioned far before apex. Epandrial lobe undeveloped; 2 short epandrial setae raising from dorsal side of epandrium subapically. Surstylus yellow, bilobate; ventral lobe short, digitiform, curved dorsad, with 2 medial and 1 apical short setae; dorsal lobe of surstylus undulate, ribbon-like, broad, very long, half as long as cercus, bilobate at apex, with 2 strong ventral and several very short lateral setae in third quarter. Distal unpaired epandrial process short, narrow, with pointed apex. Cercus longer than epandrium, elongate-triangular, yellow, with brown distal and basoventral tapering apices and curved, pedunculate ventrally cilia equal in length to medial width of cercus.

Female unknown.

Length (mm): body without antennae 2.9 (holotype), 2.6—3.4, antenna 0.7, wing-length 2.9 (holotype), 2.6—3.4, wing-width 0.9, hypopygium 1.3.

*Etymology.* The species is named for the Russian entomologist, Dr. I. L. Sukhareva.

*Diagnosis.* The new species is easily distinguished by last two segments of hind tarsus dilated; cercus subtriangular, longer than epandrium, with long pointed apex; short hypandrium and long surstylus. Paratype from Madagascar has 1st flagellomere largely brown in distodorsal half.

*Distribution.* Botswana, Madagascar.

### *Lichtwardtia minuscula* (Parent)

(Fig. 4)

*Material examined.* 2 males, Ghana: Kumasi, 1—25.VI.1965, leg. Endrody-Y. [HNHM]; 2 males, 1 female, Ghana: Banda-Nkwanta / VII-VIII.1965, leg. Endrody-Y. [figured]; 2 females, Ghana: Kwadaso / 10—24.VII.1965, leg. Endrody-Y.; 1 female, Ghana: Northern Reg., Yendi / 10—24.VII.1965, leg. Endrody-Y. [HNHM].

*Diagnosis.* *L. minuscula* is characterised by the following characters. Face densely white pollinose. Wing hyaline. Distal part of  $M_{1+2}$  (from *m-cu* to *m-m*) 1.5 times longer than *m-cu* and 2/3 as long as distal part of  $M_1$  (from *m-m* to *C*). Hind basitarsus with 1 reduced dorsal seta, at most 1/4 as long as basitarsus. Epandrium of moderate size, elongate, swollen basally, narrow distally, twice longer than high, with concave ventral margin (lateral view). Hypandrium simple, basoventral, nearly as long as epandrium, without tooth. Aedeagus thin and long, with small dorsal tooth positioned at middle of full

length of epandrium. Epandrial lobe undeveloped; 3 strong epandrial setae raising from dorsal side of epandrium in apical third; 2 epandrial setae positioned on apicoventral prominence. Surstylus bilobate; ventral lobe short, digitiform, rounded at apex, with several short apical and subapical setae; dorsal lobe of surstylus somewhat longer and wider than ventral, broad at base, narrowed at apex, half as long as cercus, with 2 dorsal and 2 subapical short setae. Distal unpaired epandrial process very narrow, nearly as long as surstylus. Cercus 1/3 as long as epandrium, twice longer than wide, elongate-oval, with acute distodorsal apex and long ventral cilia, of which apical cilia equal in length to medial width of cercus. Size 2.25 mm

*Distribution.* Chad; Tanzania, Ghana (!).

### *Lichtwardtia emelyanovi* sp.n.

(Fig. 5)

*Holotype.* Male, B. Cameroons: Kumba, 26.X.1949, H. Oldroyd, B.M. 1950-2 [NHML].

*Description.* Male. Frons metallic black-violet; face densely silvery-white pollinose, slightly shining blue under antennae, with brown ground colour. One strong and long vertical, one short postvertical, a pair of strong ocellar setae present. Upper postocular setae black; lower postocular setae white; ventral postcranium with short sparse cilia. Eyes with microscopic hairs; face glabrous. Face the narrowest at upper third, weakly widening towards palpi; ratio of its minimal width to height 9 : 38; clypeus not reaching lower margin of eyes, convex downward. Antenna yellow-orange; 1st flagellomere brown dorsally, as long as high, subtriangular, right-angular apicodorsally, with short hairs; arista middorsal, black (2nd segment broken). Length ratio of scape to pedicel to 1st flagellomere, 9 : 6 : 10. Palpus and proboscis small, yellow, with short light hairs.

Mesonotum metallic greenish-blue, brownish pollinose; pleura greenish-black, whitish pollinose. 5 strong dorsocentral setae gradually decreasing anteriorly with several hairlike setae in front of the 1st pair, 2 rows of acrostichals. Propleura with 1 strong black seta and several short hairs. Scutellum with 2 strong setae and 2 very short lateral hairs.

Legs including coxae mostly yellow; middle coxa with brown external spot, apical segments of tarsi brown. Femora without long hairs. Fore coxa with black hairs and several apical setae. Fore tibia with short setae: 1 anterodorsal, 1 posterodorsal, 1 posterior, and 3 apical setae. Fore tarsus simple, fore basitarsus with short basoventral seta. Length ratio of fore coxa to femur to tibia to tarsus (segments from first to fifth), 36 : 57 : 59 : 26 : 14 : 11 : 9 : 9.



Middle femur with 1 subapical anterior seta. Middle tibia with 3 anterodorsal, 2 posterodorsal, 1 ventral and 4—5 apical setae. 1st to 3rd segments of middle tarsus each with elongate apical setulae. Length ratio of middle coxa to femur to tibia to tarsus (segments from first to fifth), 27 : 75 : 85 : 40 : 21 : 17 : 10 : 11. Hind femur with one subapical anterior seta. Hind tibia with 2—3 antero-, 2 posterodorsal, 2 short ventral, 2—3 apical setae. Hind tarsus simple. Hind basitarsus with short setae: 1 basoventral, 1 apicoventral and 1 stronger middorsal setae. Length ratio of hind coxa to femur to tibia to tarsus (segments from first to fifth), 22 : 73 : 95 : 32 : 34 : 22 : 15 : 11.

Wing evenly greyish, without spots. Costa simple.  $R_1$  reaching to first third of wing.  $R_{2+3}$  and  $R_{4+5}$  almost straight, parallel in apical half. Ratio of part of costa between  $R_{2+3}$  and  $R_{4+5}$  to this between  $R_{4+5}$  and  $M_{1+2}$ , 23 : 13.  $M_{1+2}$  broken in middle of distal part, joining costal vein just before wing tip, with anteroproximal (basal part of  $M_1$ ) and posterodistal ( $M_2$ ) stublike veins 1/2 to 4/5 as long as  $m-m$ .  $R_{4+5}$  and distal part of  $M_1$  parallel. Cross-veins  $m-m$  and  $m-cu$  straight, perpendicular to corresponding longitudinal veins. Ratio of distal part of  $M_1$  to  $m-m$  to distal part of  $M_{1+2}$  to  $m-cu$  to distal part of  $CuA_1$ , 62 : 7 : 21 : 20 : 23. Anal vein distinct, not reaching to wing margin; anal lobe pronounced; anal angle obtuse. Lower calypter yellow, with black setae. Halteres yellow.

Abdomen green-black, whitish pollinose, with black hairs and marginal setae. 8th segment black, with short sparse black hairs. Epandrium of moderate size, slightly longer than 4th and 5th tergites combined, elongate, swollen basally, narrow in distal half, twice longer than high, with strongly concave ventral margin (lateral view) and digitiform apicoventral projection, brown-black. Hypandrium dark-brown, basoventral, 2/3 as long as epandrium, with large subapical dorsal tooth. Aedeagus thin and long, with large dorsal tooth positioned far before apex and additional small tooth beyond middle of full length of aedeagus. One small epandrial seta at base of hypandrium; another strong seta positioned just before epandrial lobe. Epandrial lobe digitiform, with short apical seta. Surstylus dark-yellow, bilobate; ventral lobe digitiform, straight, with several apical and dorsal short setae; dorsal lobe of surstylus broad, slightly longer than ventral, 1/3 as long as cercus, with three distal projections as figured, 1 apicoventral and 2 very short distal setae around deep distal emargination. Distal unpaired epandrial process short, narrow, hardly visible. Cercus yellow, broadly black in apical angle, elongate, 1/3 as long as epandrium, nearly twice longer than wide, with acute distodorsal apex and straight and curved black cilia half as long

as width of cercus.

Female unknown.

Length (mm): body without antennae 2.6, wing-length 3.0, wing-width 1.0, hypopygium 0.9.

*Etymology.* The species is named for the Russian entomologist, Dr. V. A. Emelyanov.

*Diagnosis.* The new species is close to *L. minuscula* in densely white pollinose face, hyaline wing; hind basitarsus with 1 reduced dorsal seta, at most 1/3 as long as basitarsus. *L. emelyanovi* differs in somewhat larger size, distal part of  $M_{1+2}$  equal in length to  $m-cu$  and 1/3 as long as distal part of  $M_1$  and characters of hypopygium. Hypandrium with large subapical dorsal tooth. Aedeagus with large dorsal tooth positioned far before apex and additional small tooth beyond middle of full length of aedeagus. One small epandrial seta at base of hypandrium; another strong seta positioned just before epandrial lobe. Epandrial lobe digitiform, with short apical seta. Distal unpaired epandrial process short, narrow, hardly visible.

*Distribution.* Cameroon.

### *Lichtwardtia hollisi* sp.n.

(Figs 6, 7)

*Holotype.* Male, Kenya (28): Kakamega forest, c. 5,000', 18—19.VII.1974, D. Hollis / B.M. 1974-528 [NHML].

*Description.* Male. Frons metallic-blue, brownish pollinose; face with metallic-blue reflection under antenna and brownish clypeus, densely silvery-white pollinose. One strong vertical, one short postvertical, a pair of strong ocellar setae present. Upper postocular setae black; lower postocular white; ventral postcranium with sparse black and white cilia. Eyes with microscopic hairs; face glabrous. Face the narrowest at upper third, distinctly widening towards palpi; ratio of its minimal width to height 12 : 53; clypeus reaching lower margin of eyes, convex downward. Antenna as long as height of head, yellow-brownish; 1st flagellomere brown dorsally, elongate-triangular, 1.5 times longer than high, acute apicodorsally, with short hairs; arista middorsal, black, sparsely pubescent, with hairs 2—3 times longer than basal diameter of arista. Length ratio of scape to pedicel to 1st flagellomere to arista, 14 : 6 : 22 : 50. Palpus and proboscis small, yellow-brownish, with short black hairs.

Mesonotum metallic dark-blue-green, brownish pollinose; pleura green-black, whitish pollinose. 5 strong dorsocentral setae gradually decreasing anteriorly with several hairlike setae in front of the 1st pair, 2 rows of acrostichals. Propleura with 1 strong black seta above fore coxa and several short hairs.

Scutellum with 2 strong setae and 2 very short lateral hairs.

Legs mostly yellow; fore coxa yellow, middle coxa brown with yellow apex, hind coxa yellow with brown external spot, apical segments of fore and middle tarsi brownish, hind tarsus brown from tip of basitarsus. Femora without long hairs. Fore coxa with black hairs and several long apical setae. Fore tibia with 1 strong and 1 fine anterodorsal, 1 strong and 1 fine posterodorsal, 1 strong posteroventral, 3 strong apical setae and dorsal row of elongated setulae in apical half. Fore tarsus simple, fore basitarsus with short basoventral seta. Length ratio of fore coxa to femur to tibia to tarsus (segments from first to fifth), 60 : 92 : 88 : 47 : 25 : 17 : 12 : 11. Middle femur with 1 subapical anterior seta. Middle tibia with 4 dorsal or anterodorsal, 2 posterodorsal, 1 ventral and 5 apical setae. 1st to 4th segments of middle tarsus each with elongate apical setulae. Length ratio of middle coxa to femur to tibia to tarsus (segments from first to fifth), 55 : 118 : 136 : 70 : 32 : 24 : 19 : 10. Hind femur with one subapical anterior seta. Hind tibia with 4 antero-, 3 posterodorsal, 2 ventral, 2 apical setae. Hind basitarsus with 1 short basoventral, 2—3 short apical, 1 strong middorsal setae; 2nd—3rd segments with elongate apicoventral setulae. Length ratio of hind coxa to femur to tibia to tarsus (segments from first to fifth), 45 : 125 : 150 : 51 : 53 : 31 : 22 : 13.

Wing evenly brownish. Costa with punctiform posteroventral thickening just before  $R_1$ .  $R_1$  reaching to first third of wing.  $R_{2+3}$  and  $R_{4+5}$  straight, slightly divergent at apex. Ratio of part of costa between  $R_{2+3}$  and  $R_{4+5}$  to this between  $R_{4+5}$  and  $M_{1+2}$ , 42 : 23.  $M_{1+2}$  broken in middle of distal part, joining costal vein just before wing tip, with anteroproximal (basal part of  $M_1$ ) and posterodistal ( $M_2$ ) stublike veins 1/2 as long as or equal to  $m-m$ .  $R_{4+5}$  and distal part of  $M_1$  parallel. Crossveins  $m-m$  and  $m-cu$  straight, almost perpendicular to corresponding longitudinal veins. Ratio of distal part of  $M_1$  to  $m-m$  to distal part of  $M_{1+2}$  to  $m-cu$  to distal part of  $CuA_1$ , 92 : 15 : 58 : 42 : 42. Anal vein distinct, almost reaching to wing margin; anal lobe well developed; anal angle obtuse. Lower calypter yellow, with black setae. Halteres yellow.

Abdomen metallic bronze-green to black, grey pollinose, with black hairs and marginal setae. 8th segment black, with sparse black hairs. Epandrium elongate, 1/3 longer than 4th and 5th tergites combined, more than twice longer than high, slightly narrowed distad, with almost right-angular apicoventral angle, black-brown. Hypandrium brown, basoventral, half as long as epandrium, with large subapical dorsal tooth. Aedeagus thin and long, with dorsal tooth positioned not far before apex and

additional pair of teeth before the first tooth. One small epandrial seta at base of hypandrium; 3 strong pedunculate setae positioned just before apicoventral angle. Epandrial lobe undeveloped. Surstylus light-brown, bilobate; ventral lobe broad, widely rounded at apex, with 1 long basoventral, 2 apicoventral, 2 curved midlateral setae and thick apicodorsal spine directed basad; dorsal lobe of surstylus broad, longer than ventral, half as long as cercus, with apicoventral and apicodorsal pointed projections and shallow distal emargination as figured, 1 subapical ventral, 1 apical dorsal and 2 strong subapical lateral. Distal unpaired epandrial process long, narrow, nearly as long as surstylus. Cercus yellow, narrowly brown along margin, rounded ventrally, with distinct distodorsal apex and straight and curved black cilia shorter than diameter of cercus.

Female unknown.

Length (mm): body without antennae 4.2, antenna 1.2, wing-length 5.0, hypopygium 1.6.

*Etymology.* The species is named for the collector, Dr. D. Hollis.

*Diagnosis.* The new species is characterised by the following characters. Face densely silvery-white pollinose; 1st flagellomere 1.5 times longer than high; wing evenly greyish; fore tibia with one strong and long posterior seta, at least twice longer than diameter of tibia; hind basitarsus with 1 strong dorsal seta, half as long as basitarsus; hypandrium with dorsal subapical tooth; apicoventral epandrial lobe undeveloped, with epandrial setae raising from epandrium; ventral lobe of surstylus broad, with long basoventral seta and long thick apical spine directed basad; distal unpaired epandrial process narrow and pointed at apex; cercus with distinct distodorsal apex.

*Distribution.* Kenya.

### *Lichtwardtia tikhonovi* sp.n.

(Fig. 8)

*Holotype.* Male, Angola (A2): Rocadas, R. Cunene, 19—22.II.1972 / Southern African Exp. B.M. 1972-1.

*Description.* Male. Frons metallic-blue, slightly brownish pollinose; face with brown ground colour, densely silvery-white pollinose. One strong vertical, one shorter postvertical, a pair of strong ocellar setae present. Upper postocular setae black; lower postocular white; ventral postcranium with several white cilia. Eyes with microscopic hairs; face glabrous. Face almost parallel-sided, slightly narrowed at upper third; ratio of its minimal width to height 10 : 26; clypeus not reaching lower margin of eyes, convex downward. Antenna slightly shorter than height of head, mostly yellow; 1st flagellomere brown

Middle femur with 1 subapical anterior seta. Middle tibia with 3 anterodorsal, 2 posterodorsal, 1 ventral and 4—5 apical setae. 1st to 3rd segments of middle tarsus each with elongate apical setulae. Length ratio of middle coxa to femur to tibia to tarsus (segments from first to fifth), 27 : 75 : 85 : 40 : 21 : 17 : 10 : 11. Hind femur with one subapical anterior seta. Hind tibia with 2—3 antero-, 2 posterodorsal, 2 short ventral, 2—3 apical setae. Hind tarsus simple. Hind basitarsus with short setae: 1 basoventral, 1 apicoventral and 1 stronger middorsal setae. Length ratio of hind coxa to femur to tibia to tarsus (segments from first to fifth), 22 : 73 : 95 : 32 : 34 : 22 : 15 : 11.

Wing evenly greyish, without spots. Costa simple.  $R_1$  reaching to first third of wing.  $R_{2+3}$  and  $R_{4+5}$  almost straight, parallel in apical half. Ratio of part of costa between  $R_{2+3}$  and  $R_{4+5}$  to this between  $R_{4+5}$  and  $M_{1+2}$ , 23 : 13.  $M_{1+2}$  broken in middle of distal part, joining costal vein just before wing tip, with anteroproximal (basal part of  $M_1$ ) and posterodistal ( $M_2$ ) stublike veins 1/2 to 4/5 as long as  $m-m$ .  $R_{4+5}$  and distal part of  $M_1$  parallel. Cross-veins  $m-m$  and  $m-cu$  straight, perpendicular to corresponding longitudinal veins. Ratio of distal part of  $M_1$  to  $m-m$  to distal part of  $M_{1+2}$  to  $m-cu$  to distal part of  $CuA_1$ , 62 : 7 : 21 : 20 : 23. Anal vein distinct, not reaching to wing margin; anal lobe pronounced; anal angle obtuse. Lower calypter yellow, with black setae. Halteres yellow.

Abdomen green-black, whitish pollinose, with black hairs and marginal setae. 8th segment black, with short sparse black hairs. Epandrium of moderate size, slightly longer than 4th and 5th tergites combined, elongate, swollen basally, narrow in distal half, twice longer than high, with strongly concave ventral margin (lateral view) and digitiform apicoventral projection, brown-black. Hypandrium dark-brown, basoventral, 2/3 as long as epandrium, with large subapical dorsal tooth. Aedeagus thin and long, with large dorsal tooth positioned far before apex and additional small tooth beyond middle of full length of aedeagus. One small epandrial seta at base of hypandrium; another strong seta positioned just before epandrial lobe. Epandrial lobe digitiform, with short apical seta. Surstylus dark-yellow, bilobate; ventral lobe digitiform, straight, with several apical and dorsal short setae; dorsal lobe of surstylus broad, slightly longer than ventral, 1/3 as long as cercus, with three distal projections as figured, 1 apicoventral and 2 very short distal setae around deep distal emargination. Distal unpaired epandrial process short, narrow, hardly visible. Cercus yellow, broadly black in apical angle, elongate, 1/3 as long as epandrium, nearly twice longer than wide, with acute distodorsal apex and straight and curved black cilia half as long

as width of cercus.

Female unknown.

Length (mm): body without antennae 2.6, wing-length 3.0, wing-width 1.0, hypopygium 0.9.

*Etymology.* The species is named for the Russian entomologist, Dr. V. A. Emelyanov.

*Diagnosis.* The new species is close to *L. minuscula* in densely white pollinose face, hyaline wing; hind basitarsus with 1 reduced dorsal seta, at most 1/3 as long as basitarsus. *L. emelyanovi* differs in somewhat larger size, distal part of  $M_{1+2}$  equal in length to  $m-cu$  and 1/3 as long as distal part of  $M_1$  and characters of hypopygium. Hypandrium with large subapical dorsal tooth. Aedeagus with large dorsal tooth positioned far before apex and additional small tooth beyond middle of full length of aedeagus. One small epandrial seta at base of hypandrium; another strong seta positioned just before epandrial lobe. Epandrial lobe digitiform, with short apical seta. Distal unpaired epandrial process short, narrow, hardly visible.

*Distribution.* Cameroon.

### *Lichtwardtia hollisi* sp.n.

(Figs 6, 7)

*Holotype.* Male, Kenya (28): Kakamega forest, c. 5,000', 18—19.VII.1974, D. Hollis / B.M. 1974-528 [NHML].

*Description.* Male. Frons metallic-blue, brownish pollinose; face with metallic-blue reflection under antenna and brownish clypeus, densely silvery-white pollinose. One strong vertical, one short postvertical, a pair of strong ocellar setae present. Upper postocular setae black; lower postocular white; ventral postcranium with sparse black and white cilia. Eyes with microscopic hairs; face glabrous. Face the narrowest at upper third, distinctly widening towards palpi; ratio of its minimal width to height 12 : 53; clypeus reaching lower margin of eyes, convex downward. Antenna as long as height of head, yellow-brownish; 1st flagellomere brown dorsally, elongate-triangular, 1.5 times longer than high, acute apicodorsally, with short hairs; arista middorsal, black, sparsely pubescent, with hairs 2—3 times longer than basal diameter of arista. Length ratio of scape to pedicel to 1st flagellomere to arista, 14 : 6 : 22 : 50. Palpus and proboscis small, yellow-brownish, with short black hairs.

Mesonotum metallic dark-blue-green, brownish pollinose; pleura green-black, whitish pollinose. 5 strong dorsocentral setae gradually decreasing anteriorly with several hairlike setae in front of the 1st pair, 2 rows of acrostichals. Propleura with 1 strong black seta above fore coxa and several short hairs.

apicodorsally, subtriangular, slightly longer than high (14 : 12), acute apicodorsally, with short hairs; arista middorsal, black, sparsely pubescent, with hairs 2—3 times longer than basal diameter of arista. Length ratio of scape to pedicel to 1st flagellomere to arista, 9 : 6 : 14 : 45. Palpus and proboscis small, yellow-brownish, with short black hairs; palpus white pollinose.

Mesonotum metallic dark-blue-green, brownish pollinose; pleura green-black, whitish pollinose. 5 strong dorsocentral setae gradually decreasing anteriorly with several hairlike setae in front of the 1st pair, 2 rows of acrostichals. Propleura with 1 strong black seta above fore coxa and several short hairs. Scutellum with 2 strong setae and 2 very short lateral hairs.

Legs mostly yellow; fore coxa yellow with grey reflection, middle and hind coxae brown; tarsi brown from tip of basitarsus. Femora without long hairs. Fore coxa with black hairs and several long apical setae. Fore tibia with 1 strong and 2 fine anterodorsal, 1 strong and 1 fine posterodorsal, 1 strong and 1 fine posteroventral, 3 apical setae and dorsal row of elongated setulae in apical half. Fore tarsus simple, fore basitarsus with short basoventral seta. Length ratio of fore coxa to femur to tibia to tarsus (segments from first to fifth), 50 : 76 : 75 : 40 : 16 : 14 : 11 : 11. Middle femur with 1 subapical anterior seta. Middle tibia with 4 anterodorsal, 2 posterodorsal, 1 ventral and 5 apical setae. 1st to 4th segments of middle tarsus each with elongate apical setulae. Length ratio of middle coxa to femur to tibia to tarsus (segments from first to fifth), 40 : 100 : 103 : 54 : 26 : 23 : 16 : 15. Hind femur with one subapical anterior seta. Hind tibia with 4 antero-, 4 posterodorsal, 2 ventral, 2 apical setae. Hind basitarsus with 1 short basoventral, 2—3 short apical, 1 strong middorsal setae; 2nd—3rd segments with elongate apicoventral setulae. Length ratio of hind coxa to femur to tibia to tarsus (segments from first to fifth), 27 : 103 : 117 : 42 : 46 : 33 : 22 : 16.

Wing evenly brownish, almost hyaline along posterior margin. Costa simple.  $R_1$  reaching to first third of wing.  $R_{2+3}$  and  $R_{4+5}$  almost straight, nearly parallel at apex. Ratio of part of costa between  $R_{2+3}$  and  $R_{4+5}$  to this between  $R_{4+5}$  and  $M_{1+2}$ , 29 : 18.  $M_{1+2}$  broken in middle of distal part, joining costal vein just before wing tip, with anteroproximal (basal part of  $M_1$ ) and posterodistal ( $M_2$ ) stublike veins 2/3 as long as or equal to  $m-m$ .  $R_{4+5}$  and distal part of  $M_1$  parallel. Crossveins  $m-m$  and  $m-cu$  straight, almost perpendicular to corresponding longitudinal veins. Ratio of distal part of  $M_1$  to  $m-m$  to distal part of  $M_{1+2}$  to  $m-cu$  to distal part of  $CuA_1$ , 62 : 10 : 40 : 27 : 32. Anal vein distinct, almost reaching to wing margin; anal lobe well developed; anal angle obtuse. Lower calypter yellow, with black setae. Halteres yellow.

Abdomen metallic bronze-green, grey pollinose, with black hairs and marginal setae. 8th segment black, with sparse black hairs. Epandrium elongate, twice longer than high, distinctly narrowed distad, with right apicoventral angle. Hypandrium basoventral, 2/3 as long as epandrium, broad, narrowed in apical half, with pointed apex, without dorsal tooth. Aedeagus thin and long, with strong dorsal tooth positioned far before apex. One strong epandrial seta at middle of epandrium; 2 other strong setae positioned at distal 1/6 of epandrium. Epandrial lobe undeveloped. Surstylus bilobate; ventral lobe broadened in middle, narrowed basally and distally, acute at apex, with several short subapical setae; dorsal lobe of surstylus broad, longer than ventral, half as long as cercus, with 2 short apicoventral, 1 distal and 1 apicodorsal setae and shallow distal excision as figured. Distal unpaired epandrial process long, narrow, with pointed apex, longer than surstylus. Cercus 1/3 as long as epandrium, 1.5 times longer than wide, with long stem, acute distodorsal apex and curved black ventral cilia nearly as long as width of cercus.

Female unknown.

Length (mm): body without antennae 3.7, antenna 0.9, wing-length 3.8, hypopygium 1.15.

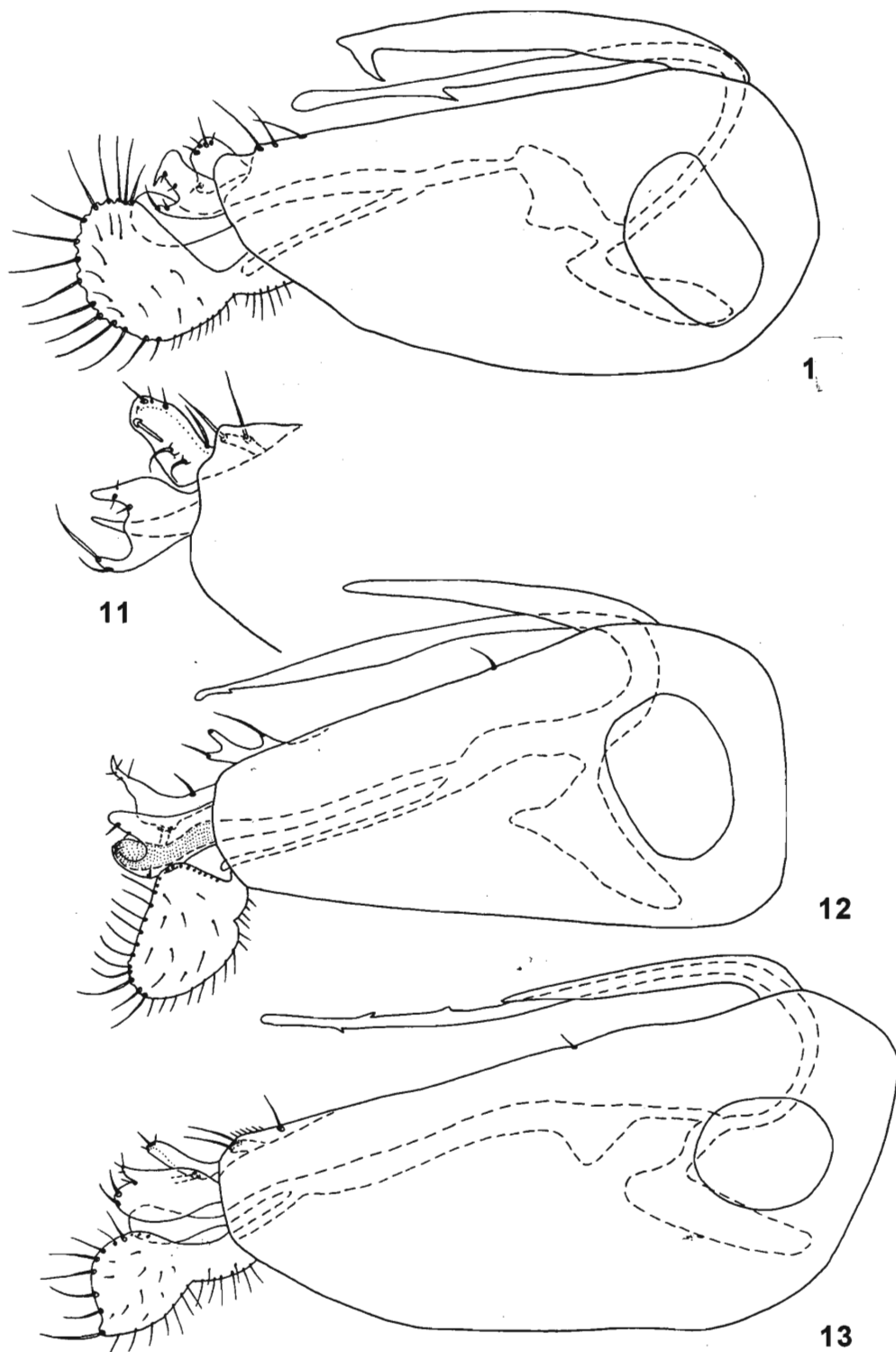
*Etymology.* The species is named for the Russian entomologist, Dr. V. V. Tikhonov.

*Diagnosis.* *L. tikhonovi* is similar to *L. hollisi* in almost all respects except as noted. 1st flagellomere as long as high. Epandrium elongate, twice longer than high, distinctly narrowed distad, with right apicoventral angle. Hypandrium 2/3 as long as epandrium, broad, narrowed in apical half, with pointed apex, without dorsal tooth. Aedeagus thin and long, with strong dorsal tooth positioned far before apex. One strong epandrial seta at middle of epandrium; 2 other strong setae positioned at distal 1/6 of epandrium. Surstylus with ventral lobe broadened in middle, narrowed basally and distally, acute at apex, with several short subapical setae; dorsal lobe of surstylus with 2 short apicoventral, 1 distal and 1 apicodorsal setae and shallow distal excision as figured.

*Distribution.* Angola.

### *Lichtwardtia fractinervis* (Parent) (Figs 9—11)

*Type material examined.* Holotypus male [red label] / Congo belge: Uele, Monga, 450 m, 18.IV au 8.V.1935, G.F. de Witte: 1335 / Coll. Mus. Congo (ex coll. I.P.N.C.B.) / Type [red label] / P. Vanschuytbroeck det. 1950, *Vaalimya minuta* n.sp. [RMCA]; Holotypus female [red label] / Congo belge: Kivu,

Figs 10—13. *Lichtwardtia* spp.

10—11, *L. fractinervis* (Parent), Congo (Kinshasa); 12, *L. nigrotriquata* (Parent); 13, *L. nikolaevae* sp.n. 10, 12, 13, hypopygium, lateral view (cercus usually covers surstylus; ventral setae on cercus are not figured); 11, surstyli, lateral view.

Rutshuru, 1285 m, 22.V au 4.VI.1934, G.F. de Witte: 427 / Coll. Mus. Congo (ex coll. I.P.N.C.B.) / Type [red label] / P. Vanshuylbroeck det. 1950, *Vaalimya kicuensis* n.sp. [RMCA].

**Additional material.** 1 male, Congo Belge: Eala, III.1936, J. Ghesquiere / R. Mus. Hist. Nat. Belg. 10482 / *Vaalimya fractinervis* Par., O. Parent / O. Parent det. 1936: *Vaalimya fractinervis* Par.; 2 males, Congo Belge: P.N.G., Miss H. De Saeger, II/gd/4, 5.VII.1951 [figured] [&] 8.V.1952, H. De Saeger, 2052 [&] 3449 [RMCA]; 11 males, Congo Belge: P.N.G. Miss H. De Saeger, II/HD/8 [II/gc/8; II/gc/9; II/gd/4; II/gd/10; II/dd/9; II/fd/17; Pidigala; Mabanga; Dedegwa], 3.VIII.1951 [28.IX.1951, 23.IV.1952, 21.V.1952, 7.VII.1952, 9.VII.1952, 10.VII.1952, 8.VIII.1952, 29.IX.1952], H. De Saeger, 2195, 2481, 3358, 3499, 3758, 3763, 3765, 3909, 3923, 4103 [RMCA]; 1 male, Uganda: Segibwa Falls, E.G. Gibbins, B.M. 1938-142 / Attracted by human faeces, 29.III.1935; 1 male, Uganda: Ruwenzori Range, Bundibugyo, 3440 ft., 22.VIII—3.XI.1952, D.S. Fletcher / Ruwenzori Exped. B.M. 1952-566; 4 males, Uganda: Ruwenzori Range, Semliki Forest, 2850 ft., 22.VIII—3.XI.1952, D.S. Fletcher / Ruwenzori Exped. B.M. 1952-566; 1 male, S.W. Africa (W43), Onguma Fm., 55 mls NW Tsumeb, 17—19.II.1972 / Southern African Exp. B.M. 1972-1; 4 males, Angola (A11): Bruco, 26.II—2.III.1972 / Southern African Exp. B.M. 1972-1 / [1 male with additional label:] Malaise trap; 10 males [figured], Angola (A2): Rocadas, R. Cunene, 19—22.II.1972 / at light / Southern African Exp. B.M. 1972-1; 1 male, Angola (A37): 5 mls NE Negola, 25.III.1972 / at light / Southern African Exp. B.M. 1972-1; 2 males, N. Nigeria: Zaria, Samaru, 2.IX.1971, J.C. Deeming [NHML]; 1 male, N. Nigeria: Niger Prov., Kurmi, 55 miles S. of Kontagora, 28.VII.1971, J.C. Deeming [NHML]; 1 male, Nyasaland, W.J. Gray, B.M. 1958-588 / C.A.S., Mazabuka, 1.II.55, on lab. window.

**Description.** (All measurements from a male collected in Parc National Garamba, Congo Belge, 5.VII.1951). Male. Frons metallic blue, brownish pollinose; face with yellowish-silvery or light-golden (rarely brownish) pollination; epistome has brown, clypeus yellow or brown ground colour. One strong vertical, one short postvertical, a pair of strong ocellar setae present. Upper postocular setae black; lower postocular setae white; ventral postcranium with short sparse cilia. Eyes with microscopic hairs; face glabrous. Face the narrowest at upper third, weakly widening towards palpi; ratio of its minimal width to height 10 : 40; clypeus nearly reaching lower margin of eyes, convex downward. Antenna as long as height of head, yellow-orange; 1st flagellomere brownish dorsally, as long as high, sometimes 1.5 times longer than high, narrowed apicad, rounded or right-angular apicodorsally, with short hairs; arista middorsal, black, sparsely pubescent, with hairs twice

longer than basal diameter of arista. Length ratio of scape to pedicel to 1st flagellomere to arista, 10 : 7 : 14 : 44. Palpus and proboscis small, yellow to brown, with short light hairs.

Mesonotum metallic bluish-green, brownish pollinose; pleura greenish-black, whitish pollinose. 5 strong dorsocentral setae gradually decreasing anteriorly with several hairlike setae in front of the 1st pair, 2 rows of short acrostichals. Propleura with 1 strong black seta and several short hairs. Scutellum with 2 strong setae and 2 very short lateral hairs.

Legs mostly yellow; fore coxa yellow, middle coxa mostly brown, hind coxa mostly brown or yellow with brown external spot, apical segments of fore tarsus brown; middle tarsus black from tip of basitarsus, hind tibia entirely and hind tarsus in basal half yellow, sometimes hind tibia in apical 1/4 or 1/5 and hind tarsus entirely black. Femora without long hairs. Fore coxa with black hairs and several apical setae. Fore tibia with 1 strong and 1 fine anterodorsal, 1 strong and 1 fine posterodorsal, 1 short posteroventral, 3 strong apical setae. Fore tarsus simple, fore basitarsus with short basoventral seta. Length ratio of fore coxa to femur to tibia to tarsus (segments from first to fifth), 44 : 65 : 65 : 34 : 17 : 15 : 11 : 10. Middle femur with 1 subapical anterior seta. Middle tibia with 3 anterodorsal, 2 posterodorsal, 1 ventral and 3 apical setae. 1st to 3rd segments of middle tarsus each with elongate apical setula. Length ratio of middle coxa to femur to tibia to tarsus (segments from first to third), 40 : 88 : 97 : 50 : 34 : 22. Hind femur with one subapical anterior seta. Hind tibia with 3—4 antero-, 2—3 posterodorsal, 2 short ventral, 2—3 apical setae. Hind basitarsus with 1 short basoventral, 1 strong middorsal setae. Length ratio of hind coxa to femur to tibia to basitarsus, 30 : 84 : 97 : 40.

Wing evenly greyish, without spots. Costa with punctiform thickening at  $R_1$  or simple.  $R_1$  reaching to first third of wing.  $R_{2+3}$  and  $R_{4+5}$  almost straight, parallel at apex. Ratio of part of costa between  $R_{2+3}$  and  $R_{4+5}$  to this between  $R_{4+5}$  and  $M_{1+2}$ , 25 : 21.  $M_{1+2}$  broken in middle of distal part, joining costal vein just before wing tip, with anteroproximal (basal part of  $M_1$ ) and posterodistal ( $M_2$ ) stublike veins 1/2 to 2/3 as long as  $m-m$ .  $R_{4+5}$  and distal part of  $M_1$  parallel. Crossveins  $m-m$  and  $m-cu$  nearly straight, almost perpendicular to corresponding longitudinal veins. Ratio of distal part of  $M_1$  to  $m-m$  to distal part of  $M_{1+2}$  to  $m-cu$  to distal part of  $CuA_1$ , 60 : 9 : 32 : 22 : 25. Anal vein distinct, not reaching to wing margin; anal lobe pronounced; anal angle obtuse. Lower calypter yellow, with black setae. Halteres yellow.

Abdomen green-black, whitish pollinose, with black hairs and marginal setae. 8th segment black, with short sparse black hairs. Epandrium usually large,

elongate, as long as 2nd to 5th tergites combined, often much smaller, more than twice longer than high, slightly narrowed distad, with more or less distinct apicoventral prominence, brown-black. Hypandrium dark-brown, basoventral, more than half as long as epandrium, with rounded or pointed apex and subapical dorsal tooth. Aedeagus thin and long, with dorsal tooth positioned far before apex. One small epandrial seta at base of hypandrium; another strong seta positioned just before epandrial lobe. Epandrial lobe digitiform, usually concealed, with 1 apical and 1 middorsal setae. Surstylus dark-yellow, bilobate; ventral lobe broad, widely rounded at apex, with 1 not very long basoventral, 2—3 short apicoventral, 2 curved midlateral setae and thick apicodorsal spine directed basad; dorsal lobe of surstylus broad, longer than ventral, nearly as long as cercus, with apicoventral and apicodorsal projections of various shape and deep distal emargination as figured, 2—3 short subapical ventral, 1 apical and 1 subapical strong setae. Distal unpaired epandrial process long, narrow, nearly as long as surstylus. Cercus yellow, narrowly black along margin, regularly subtriangular, with long stem and straight and curved black cilia half as long as diameter of cercus.

Length (mm): body without antennae 2.7—3.2, antenna 0.9, wing-length 2.9—3.4, wing-width 1.1, hypopygium 1.4.

**Diagnosis.** *L. fractinervis* is characterised by the following characters. Face with yellowish-silvery or light-golden (rarely brownish) pollination; 1st flagellomere as long as high, sometimes 1.5 times longer than high, rounded or right-angular apicodorsally; wing evenly greyish; fore tibia with one short, though strong posterior seta, slightly longer than diameter of tibia; hind basitarsus with 1 strong dorsal seta, half as long as basitarsus. Epandrium usually large; hypandrium with dorsal subapical tooth; apicoventral epandrial lobe digitiform, with 1 apical and 1 middorsal setae; ventral lobe of surstylus broad, with not very long basoventral seta and thick apical spine directed basad; distal unpaired epandrial process narrow and pointed at apex; cercus regularly subtriangular.

**Remark.** The type material examined and published descriptions of *L. microlepis* (Parent), *L. kivuensis* (Vanschuytbroeck) and *L. minuta* (Vanschuytbroeck) have no principal differences from the descriptions of female holotype and male *L. fractinervis* by Parent (1930, 1937), as well as from male [RINS] determined by Parent as *Vaalimya fractinervis*. Keeping in mind a great variability and wide distribution of the material examined, I synonymized all these species.

**Distribution.** Benin; Ghana, Nigeria, Congo (Kinshasa), Uganda (!), Angola (!), Namibia (!), Malawi (!).

### *Lichtwardtia nigrotorquata* (Parent)

(Fig. 12)

**Type material examined.** Holotypus female [red label] / Congo Belge: Eala, 19-XI-1936, J. Ghesquiere / R. Mus. Hist. Nat. Belg. 10482 / O. Parent det. 1937: *Vaalimya nigrotorquata* Par. / Type [red label] / cf. Bul. Mus. Hist. Nat. Belg., XIII, 18 (1937), p. 6, pl. 2,3, fig. 18,19 [RINS]; paratype male [without abdomen], Congo-belge: Eala, VIII-1936, J. Ghesquiere / R. Mus. Hist. Nat. Belg. 10482 / *Vaalimya nigrotorquata*, Type, n.sp., O. Parent / O. Parent det. 1936: *Vaalimya nigrotorquata*, n.sp., O. Parent [RINS].

**Additional material.** 2 males, Congo Belge: P.N.G., Miss H. De Saeger, II/fd/17 [&] II/fd/4, 9.VII.1951 [figured] [&] 18.VI.1951, H. De Saeger, 2056 [&] 1943 [RMCA].

**Diagnosis.** *L. nigrotorquata* is similar to *L. fractinervis* in almost all respects except as noted. Epistome entirely metallic bluish-green; clypeus weakly pollinose. Epandrium large, elongate, nearly twice longer than high, distinctly narrowed distad, with rounded apicoventral angle. Hypandrium basoventral, more than half as long as epandrium, gradually narrowed distad, with pointed apex, without dorsal tooth. Aedeagus thin and long, with small dorsal subapical tooth. One small epandrial seta at base of hypandrium; another strong pedunculate seta positioned just before epandrial lobe. Epandrial lobe prominent, bifurcated, bearing 2 short apical setae. Surstylus bilobate; ventral lobe broad in middle, narrowed basally and distally, pointed at apex, with 1 short basoventral, 4 very short subapical and 2 short midlateral setae; dorsal lobe of surstylus broad, as long as ventral, 2/3 as long as cercus, with apicoventral and apicodorsal projections bearing very short setae and deep distal emargination as figured. Distal unpaired epandrial process long, broad, with rounded apex, nearly as long as surstylus. Cercus suboval, slightly longer than wide, with short stem and straight and curved black cilia 1/3 as long as width of cercus.

**Distribution.** Congo (Kinshasa).

### *Lichtwardtia nikolaevae* sp.n.

(Fig. 13)

**Holotype.** Male, S.W. Africa (30), Ameib Farm, 19 mls NW Karibib; 31.I—2.II.1972 / Southern African Exp. B.M. 1972-1 [NHML].

**Description.** Male. Frons metallic blue, slightly pollinose; face entirely silvery-white pollinose; epistome brown, with metallic green reflection under antennae; clypeus with yellow or brown ground colour. One strong vertical, one short postvertical, a pair of strong ocellar setae presents. Upper post-



cular setae black; lower postocular setae white; ventral postcranium with sparse cilia. Eyes with microscopic hairs; face glabrous. Face the narrowest at upper third, weakly widening towards palpi; ratio of its minimal width to height 12 : 35; clypeus not reaching lower margin of eyes, convex downward. Antenna as long as height of head, yellow-orange; 1st flagellomere brownish apically and dorsally, as long as high, right-angular apicodorsally, with short hairs; arista middorsal, black, sparsely pubescent, with hairs 2-3 times longer than basal diameter of arista. Length ratio of scape to pedicel to 1st flagellomere to arista, 8 : 6 : 10 : 38. Palpus and proboscis small, brown, with short light hairs; palpus whitish pollinose.

Mesonotum metallic greenish-violet, brownish pollinose; pleura greenish-black, whitish pollinose. 5 strong dorsocentral setae gradually decreasing anteriorly with several hairlike setae in front of the 1st pair, 2 rows of short acrostichals. Propleura with 1 strong black seta and several short hairs. Scutellum with 2 strong setae.

Legs mostly yellow; fore coxa reddish-yellow, middle coxa brown, hind coxa mostly reddish-brown with yellow apex, apical segments of fore tarsus brown; middle and hind tarsi black from tip of basitarsus, hind tibia darkened at apex. Femora without long hairs. Fore coxa with black hairs and several apical setae. Fore tibia with 1 strong but short anterodorsal, 2 fine posterodorsal, 1 short posteroventral, 3 apical setae. Fore tarsus simple, fore basitarsus with short basoventral seta. Length ratio of fore coxa to femur to tibia to tarsus (segments from first to fifth), 37 : 58 : 55 : 30 : 14 : 10 : 7 : 8. Middle femur with 1 subapical anterior seta. Middle tibia with 2 anterodorsal, 3 posterodorsal, 1 anteroventral and 5 apical setae. 1st to 3rd segments of middle tarsus each with elongate apical setula. Length ratio of middle coxa to femur to tibia to tarsus (segments from first to fifth), 25 : 75 : 82 : 43 : 20 : 16 : 11 : 10. Hind femur with one subapical anterior seta. Hind tibia with 3 antero-, 2 posterodorsal, 2 short ventral, 2—3 apical setae. Hind basitarsus with 1 short basoventral, 1 short apicoventral and 1 strong middorsal setae. Length ratio of hind coxa to femur to tibia to tarsus (segments from first to fifth), 22 : 78 : 80 : 32 : 37 : 21 : 14 : 11.

Wing evenly greyish, without spots. Costa simple.  $R_1$  reaching to first third of wing.  $R_{2+3}$  and  $R_{4+5}$  almost straight, parallel at apex. Ratio of part of costa between  $R_{2+3}$  and  $R_{4+5}$  to this between  $R_{4+5}$  and  $M_{1+2}$ , 20 : 15.  $M_{1+2}$  broken in middle of distal part, joining costal vein just before wing tip, with anteroproximal (basal part of  $M_1$ ) and posterodistal ( $M_2$ ) stublike veins  $1/2$  as long as or equal to  $m-m$ .  $R_{4+5}$  and distal part of  $M_1$  parallel.

Crossveins  $m-m$  and  $m-cu$  nearly straight, almost perpendicular to corresponding longitudinal veins. Ratio of distal part of  $M_1$  to  $m-m$  to distal part of  $M_{1+2}$  to  $m-cu$  to distal part of  $CuA_1$ , 62 : 6 : 32 : 21 : 33. Anal vein distinct, not reaching to wing margin; anal lobe pronounced; anal angle obtuse. Lower calypter yellow, with black setae. Halteres yellow.

Abdomen green-black, whitish pollinose, with black hairs and marginal setae. 8th segment black, with short sparse black hairs. Epandrium large, elongate, twice longer than high, distinctly narrowed distad, with rounded apicoventral angle. Hypandrium basoventral, nearly half as long as epandrium, thin, with pointed apex, without dorsal tooth. Aedeagus thin and long, with small dorsal and 2 ventral teeth positioned far before apex. One small epandrial seta at middle of epandrium; another strong seta and several microscopic hairs positioned just before epandrial lobe. Epandrial lobe concealed, digitiform, bearing 2 apical setae. Surstylus bilobate; ventral lobe narrow, digitiform, rounded at apex, with 2 basolateral and 3 short apical setae; dorsal lobe of surstylus broad, longer than ventral,  $2/3$  as long as cercus, with several very short apicoventral and 2 stronger apicodorsal setae and shallow distal incision as figured. Distal unpaired epandrial process long, broad, with rounded apex, nearly as long as surstylus. Cercus rounded ventrally, longer than wide, with long wide stem, distinct distodorsal apex and straight black cilia half as long as width of cercus.

Female unknown.

Length (mm): body without antennae 2.6, antenna 0.7, wing-length 3.1, wing-width 1.1, hypopygium 1.1.

*Etymology.* The species is named for the Russian entomologist, Dr. Z. V. Nikolaeva.

*Diagnosis.* Habitus of *L. nikolaevae* is similar to *L. fractinervis* in almost all respects except morphology of hypopygium.  $CuA_1$  1.5 times longer than  $m-cu$ . Epandrium with rounded apicoventral angle. Hypandrium nearly half as long as epandrium, thin, with pointed apex, without dorsal tooth. Aedeagus with small dorsal and 2 ventral teeth positioned far before apex. Epandrial lobe bearing 2 apical setae. Surstylus with ventral lobe narrow, digitiform, rounded at apex, with 2 basolateral and 3 short apical setae; dorsal lobe of surstylus  $2/3$  as long as cercus, with several very short apicoventral and 2 stronger apicodorsal setae and shallow distal incision as figured. Distal unpaired epandrial process long, broad, with rounded apex, nearly as long as surstylus. Cercus rounded ventrally, longer than wide, with distinct distodorsal apex.

*Distribution.* Namibia.



### Key to Afrotropical species of *Lichtwardtia* (males)

1. At least hind femur and tibia mostly blackish-brown ..... 2
- Femora and tibiae yellow; at most hind tibia blackish at apex ..... 3
2. Wing distinctly maculated at  $M_2$  and  $m-cu$ ; 1st flagellomere usually 1.5–2 times longer than high, with drawn-out or acute apex ..... *angularis*
- Wing hyaline; 1st flagellomere rounded; Eritrea ..... *aethiopica*
3. Costa with long and broad thickening in basal half of wing; body 1.8 mm ..... *mironovi*
- Costa simple or with punctiform thickening at  $R_1$ ; larger species ..... 4
4. Last two segments of hind tarsus dilated; cercus triangular, longer than epandrium, with long pointed apex ..... *sukharevae*
- Hind tarsus simple; cercus small, usually rounded or oval, at most 1/3 as long as epandrium .. 5
5. Epistome entirely metallic bluish-green; clypeus weakly pollinose; apicoventral epandrium lobe bifurcated; hypandrium without tooth ..... *nigrotorquata*
- Face densely white pollinose, rarely metallic shining under antenna; apicoventral epandrial lobe simple or absent ..... 6
6. Hind basitarsus with 1 reduced dorsal seta, at most 1/3 as long as basitarsus; cercus elongate-oval, twice longer than wide, with acute apex ..... 7
- Hind basitarsus with 1 strong dorsal seta, half as long as basitarsus; cercus usually rounded or subtriangular, at most 1.5 times longer than wide, rarely with distinct apex ..... 8
7. Distal part of  $M_{1+2}$  (from  $m-cu$  to  $m-m$ ) 1.5 times longer than  $m-cu$  and 2/3 as long as distal part of  $M_1$  (from  $m-m$  to  $C$ ); 2.25 mm ..... *minuscula*
- Distal part of  $M_{1+2}$  equal in length to  $m-cu$  and 1/3 as long as distal part of  $M_1$ ; 2.6–3.0 mm ..... *emelyanovi*
8. Fore tibia with one strong and long posterior seta, at least twice longer than diameter of tibia; apicoventral epandrial lobe undeveloped, with epandrial setae raising from epandrium ..... 9
- Fore tibia with one fine posterior seta, not longer or slightly longer than diameter of tibia; apicoventral epandrial lobe digitiform, though often concealed, bearing 2 setae ..... 11
9. Wing distinctly maculated at  $M_2$  and  $m-cu$ ; distal unpaired epandrial process broad and rounded at apex; cercus rounded or oval, without distinct apex ..... *angularis*

- Wing evenly greyish or slightly infumated at  $M_2$  and  $m-cu$ ; distal unpaired epandrial process narrow and pointed at apex; cercus with distinct distodorsal apex ..... 10
- 10. 1st flagellomere 1.5 times longer than high; hypandrium with dorsal subapical tooth; ventral lobe of surstylus broad, with long basoventral seta and long thick apical spine directed basad ..... *hollisi*
- 1st flagellomere as long as high; hypandrium without dorsal tooth; ventral lobe of surstylus narrow, with short setae ..... *tikhonovi*
- 11.  $CuA_1$  1.5 times longer than  $m-cu$ ; face 3 times higher than wide; hypandrium without dorsal tooth; distal unpaired epandrial process broad and rounded at apex ..... *nikolaevae*
- $CuA_1$  usually barely longer than  $m-cu$ ; face usually 3.5–4 times higher than wide; hypandrium with dorsal subapical tooth; distal unpaired epandrial process narrow and pointed at apex ..... *fractinervis*

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