

COLLECTIONS OF DROSOPHILIDAE (DIPTERA) IN KENYA, WITH DESCRIPTION OF A NEW SPECIES OF *DETTOPSOMYIA*¹

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ABSTRACT: Drosophilids (Diptera) were collected by sweeping in 52 localities in Kenya from May to August, 1988. Natural population samples of *Drosophila melanogaster* were collected from 16 sites to screen for variation in mutation rates and other genetic factors. A total of 37 other species of drosophilid flies were also captured. A new species in the genus *Dettopsomyia* is described, and three new records are reported.

Natural populations of *Drosophila melanogaster* carry transposable DNA elements that increase mutation rates and cause other genetic changes (Woodruff *et al.*, 1983). Populations differ in the number of active elements in each individual. Since the species is thought to have originated in Africa, collections in Kenya were made by two of us (R. Woodruff, all sites; and J. Thompson, sites 22-31; see Figure 1) to survey transposable DNA levels (Woodruff *et al.*, 1989). A total of 34 locations were sampled. In doing this, 35 other species of the subfamily Drosophilinae and 2 species of the subfamily Steganinae were identified among 1,211 alcohol specimens (deposited at Sapporo University, Sapporo, Japan) and 36 live strains (maintained at Bowling Green State University, Bowling Green, Ohio).

Information on species distributions, collection locations and methods are given below. All collection locations are cross-referenced to the map of Kenya (Figure 1). Information on drosophilid species is summarized in Wheeler (1981, 1986), and the Afrotropical drosophilid fauna is discussed in Tsacas *et al.* (1981). A new species, *Dettopsomyia woodruffi*, is described, and new distribution records are provided for three species of the subgenus *Drosophila*: *Drosophila mercatorum*, *D. fulvimacula*, and *D. virilis*.

Genus *Zaprionus* Coquillett

1. *Zaprionus tuberculatus* Malloch, 1932. *Stylops*. 1(1): 11.
Specimens examined: 144 males and 131 females.
Locations: 1, 4-7, 11, 14, 16, 20, 26, 28, 29, 31, 34
Collection methods: sweeping and trapping on banana, mango, and other fruit, rotting tomatoes and fungus.

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2. *Zaprionus indianus* Gupta, 1970. Proc. Ind. Nat. Sci. Acad. 36: 63.
Specimens examined: 109 males and 108 females.
Locations: 1, 4, 6-8, 10, 13, 14, 16, 18-20, 26-31, 34
Collection methods: sweeping and trapping on banana, mango, and other fruit, rotting tomatoes and fungus.
3. *Zaprionus ghesquierei* Collart, 1937. Bull. Mus. Roy. Hist. Nat. Belg. 13(9): 8
Specimens examined: four males and three females.
Distribution: Afrotropical Region
Locations: 20, 31
Collection methods: sweeping on rotting fruits
4. *Zaprionus inermis* Collart, 1937. Bull. Mus. Roy. Hist. Nat. Belg. 13(9): 11
Specimens examined: two males and one female.
Distribution: Central Africa
Location: 28
Collection methods: sweeping on rotting tomatoes

Genus *Drosophila* Fallen
Subgenus *Sophophora* Sturtevant
***melanogaster* species group Sturtevant**
***melanogaster* species subgroup Hsu**

5. *Drosophila melanogaster* Meigen, 1830. Syst. Besch. Bek. Eur. Zweifl. Ins. 6: 85
Specimens examined: 113 males and 23 females
Distribution: cosmopolitan
Locations: 1, 3, 4, 6, 7, 11, 14-16, 18, 22, 23, 25, 27, 28, 31, 32, 34
Collection methods: sweeping and trapping on banana, mango, and other fruit, rotting tomatoes and fungus.
6. *Drosophila simulans* Sturtevant, 1919. Psyche 26: 153
Specimens examined: 200 males and 66 females
Distribution: cosmopolitan
Locations: 1, 4, 5, 7-11, 13, 14, 16, 18-20, 24-29, 32
Collection methods: sweeping and trapping on banana, mango, and other fruit, rotting tomatoes and fungus.
7. *Drosophila yakuba* Burla, 1954. Rev. Suisse Zool. 58: 161
Specimens examined: 15 males and two females
Distribution: Afrotropical Region
Locations: 4-7, 11, 31
Collection methods: sweeping on bananas and other rotting fruit

***montium* species subgroup Hsu**

8. *Drosophila nikananu* Burla, 1954. Rev. Suisse Zool. 58: 160
Specimens examined: two males and three females
Distribution: Central Africa
Locations: 30
Collection methods: sweeping on rotting banana
9. *Drosophila seguyi* Smart, 1945. Proc. Roy. Ent. Soc. Lond. (B), 14: 56
Specimens examined: living culture
Distribution: widespread in Africa

Locations: 11, 34

Collection methods: sweeping on rotting fruit

10. *Drosophila vulcana* Graber, 1957. Zool. Jahrb. Abt. Syst. 85: 309
Specimens examined: ten males
Distribution: widespread in southern Africa
Locations: 1, 2, 4, 16, 20, 21
Collection methods: sweeping and trapping on banana, other rotting fruit, fig tree, and fungus
11. *Drosophila burlai* Tsacas & Lachaise, 1974. Ann. Univ. Abidjan. ser. E (Ecologie) 7: 200
Specimens examined: one male and living cultures
Distribution: Central Africa
Locations: 1, 23
Collection methods: sweeping fungus and rotting banana

dentissima species subgroup Bock and Wheeler

12. *Drosophila anisoctena* Tsacas, 1980. Ann. Soc. Ent. Fr. (N.S.) 16: 527
Specimens examined: one male and living stocks
Distribution: Kenya and Zaire
Location: 30
Collection methods: sweeping rotting banana
13. *Drosophila bahunde* Tsacas, 1980. Ann. Soc. Ent. Fr. (N.S.) 16: 529
Specimens examined: five males and a living culture
Distribution: Kenya and Zaire
Location: 1
Collection methods: sweeping on fungus

ananassae species subgroup Hsu

14. *Drosophila ananassae* Doleschall, 1858. Natuurk. Tijds. Nederl. Indie 17: 128
Specimens examined: 32 males and eight females
Distribution: Circumtropical region
Locations: 1, 3, 4, 10, 11, 13, 14, 26, 31
Collection methods: sweeping on rotting fruits and on fresh fruits, including mango, banana, and pineapple
15. *Drosophila malerkotliana* Parshad & Paika, 1964. Res. Bull. (N.S.) Panjab Univ. 15: 225
Specimens examined: five males and three females
Distribution: widespread in Oriental African regions, Brazil
Locations: 4, 11, 16
Collection methods: sweeping on rotting fruit and trapping on banana
16. *Drosophila fima* Burla, 1954. Rev. Suisse Zool. 61: 165
Specimens examined: one male
Distribution: Central Africa
Location: 21
Collection methods: sweeping on fig tree
17. *Drosophila dimitra* Tsacas & Lachaise, 1981. Ann. Soc. Ent. Fr. (N.S.) 17(3): 410
Specimens examined: one male
Distribution: Kenya, Cameroun, Burundi, Zaire
Location: 21
Collection methods: sweeping under fig tree

Subgenus *Scaptodrosophila* Duda

18. *Drosophila latifasciaeformis* Duda, 1940. Ann. Hist-nat. Mus. Nat. Hung. 33: 2
Specimens examined: 103 males and 30 females
Distribution: widespread in Africa, U.S.A., Mexico, West Indies, South America
Locations: 1, 4-7, 11, 13, 19, 20, 23, 25, 27-29, 34
Collection methods: sweeping on rotting fruit and on mango, banana, avocado, and tomato
19. *Drosophila dibi* Burla, 1954. Rev. Suisse Zool. 61: 126
Specimens examined: four males and one female
Distribution: Kenya, Ivory Coast
Locations: 5, 10
Collection methods: sweeping on banana and other fruit and trapping on banana
20. *Drosophila* species 1.
Specimens examined: one male and one female
Locations: 2, 8
Collection methods: sweeping on banana and other fruit and trapping on banana

Subgenus *Drosophila* Fallen

21. *Drosophila mercatorum* Patterson & Wheeler, 1942. Univ. Texas Publ. 4213: 93
Specimens examined: 12 males and three females
Distribution: Kenya (New Record), U.S.A., South America, Europe
Location: 26
Collection methods: sweeping on rotting citrus
22. *Drosophila repleta* Woollaston, 1858. Ann. Mag. Nat. Hist. Ser. 3, 1: 117
Specimens examined: eight males and two females
Distribution: cosmopolitan
Locations: 1, 14, 22, 23, 31
Collection methods: sweeping fruits, including banana, mango, pineapple, and strawberry jam
23. *Drosophila hydei* Sturtevant, 1921. Carnegie Inst. Publ. 301: 101
Specimens examined: 14 males and 13 females
Distribution: cosmopolitan
Locations: 1, 19, 20, 25, 32
Collection methods: sweeping fungus and rotting fruit
24. *Drosophila fulvimacula* Patterson & Mainland, 1944. Univ. Texas publ. 4445: 42
Specimens examined: live cultures
Distribution: Kenya (New Record; First Old World Record), Mexico to Brazil
Locations: 7, 25
Collection methods: sweeping rotting fruit
25. *Drosophila nasuta* Lamb, 1914. Trans. Linn. Soc. Lond. Ser. 2 (Zool.), 16: 346
Specimens examined: one female
Distribution: Central Africa, Seychelles, Madagascar, Mauritius
Location: 1
Collection methods: sweeping on fungus
26. *Drosophila virilis* Sturtevant, 1916. Ann. Ent. Soc. Am. 9: 330
Specimens examined: live cultures
Distribution: Kenya (New Record), widespread in southern Nearctic, Neotropical, and northern Oriental regions
Location: 16
Collection methods: trapping on banana

27. *Drosophila immigrans* Sturtevant, 1921. Carnegie Inst. Publ. 301: 83
Specimens examined: five males and three females
Distribution: cosmopolitan
Locations: 1, 19, 25
Collection methods: sweeping on rotting fruit and on fungus and on fruit, including banana and pineapple
28. *Drosophila nutrita* Duda, 1935. Stylops 4: 25
Specimens examined: one male
Distribution: Kenya (New Record), Abidjan, Ivory Coast, Cameroon, Zimbabwe
Location: 19
Collection methods: sweeping on rotting fruit
29. *Drosophila adamsi* Wheeler, 1959. Univ. Texas Publ. 5914: 183
Specimens examined: two males
Distribution: widespread in Africa
Location: 2
Collection methods: sweeping on fungus
30. *Drosophila funebris* (Fabricius), 1787. Mantissa Insectorum 2: 345
Specimens examined: one male
Distribution: cosmopolitan
Location: 32
Collection methods: sweeping on rotting banana
31. *Drosophila pruinosa* Duda, 1940. Ann. Hist-nat. Mus. Nat. Hung. 33: 41
Specimens examined: six males and two females
Distribution: Central Africa
Locations: 23, 30
Collection methods: sweeping on rotting banana

Subgenus *Dorsilopa* Sturtevant

32. *Drosophila busckii* Coquillett, 1901. Ent. News 12: 18
Specimens examined: two males and one female
Distribution: cosmopolitan
Locations: 7, 23
Collection methods: sweeping on rotting fruit

Genus *Lissocephala* Malloch

33. *Lissocephala* species 1.
Specimen examined: one female
Location: 8
Collection methods: sweeping on rotting fruit

Genus *Chymomyza* Czerny

34. *Chymomyza* species 1.
Specimens examined: two males
Location: 4
Collection methods: sweeping on rotting fruit

Genus *Scaptomyza* Hardy

35. *Scaptomyza* species 1.
Specimen examined: one male

Location: 33

Collection methods: sweeping on a lily

Genus *Dettopsomyia* Lamb

36. *Dettopsomyia woodruffi* Takada, n.sp.

Type area: Kiboko region, Kenya

Locations: 4, 5

Collection methods: collected by R.C. Woodruff by sweeping on banana and rotting fruit

Diagnosis: Eye much oblique to body axis; ocellars inserted just outside triangle made by ocelli; anterior reclinate orbital about 1/3 as long as proclinate; cheek about 1/3 as broad as greatest diameter of eye; costal lappet large; costal-index 1.0; R2 + 3 strongly curved to costa apically; R4 + 5 and M parallel; acrostichal bristle absent; tibia ringed; wing not spotted; acrostichal hairs in four rows; C3-fringe more than 1/2.

Description: Male and female (Figure 2). Body about 1.5mm; wings about 1.5mm in alcohol specimens. Eye much oblique to body axis. Arista with four upper and two lower branches plus terminal fork. Ocellar triangle dark brown. Ocellars inserted just outside triangle. Anterior reclinate about 1/3 as long as proclinate, situated slightly before proclinate. Vibrissa strong; other orals fine. Cheeks about 1/3 as broad as greatest diameter of eye, yellowish brown. Frons flat, yellowish brown, orbits yellowish brown; a pair of dark brownish stripes between ocelli and orbits. Palpi dark brown with two stout apical setae.

Mesonotum dark brown, with two pairs of greyish longitudinal stripes. Acrostichal hairs in four rows; dorsocentrals in two pairs; anterior scutellars divergent; posterior scutellars convergent, upright. Halteres yellowish brown. Sterno-index about 0.5.

Abdomen dark brown, slightly shining. Legs yellowish brown; all tibiae with two dark brownish rings.

Wings hyaline, distal costal incision deep, lappet black and large. R2 + 3 strongly curved to costa; R4 + 5 and M parallel; C-1 bristles two, long. Costal-index about 1.0; 4V-index about 3.0; 4C-index about 2.3; 5x-index about 2.3; C3-fringe on basal 3/4.

Periphallalic and phallic organs are shown (Fig. 2d, e) and the female egg-guide (Fig. 2g) is compared to egg-guides of some other Kenyan drosophilids (Fig. 3).

Type material: Holotype male, Kiboko by sweeping in a garden of bananas and other fruit, R.C. Woodruff, May 17, 1988. Paratypes: one male and one female from same locality, and one female from Makindo by sweeping rotting fruit, R.C. Woodruff, May 17, 1988. The type-series of the new species is deposited in the Biological Laboratory, Sapporo University, Japan.

Subfamily Steganinae

Genus *Leucophenga* Mik

Subgenus *Leucophenga* Mik

37. *Leucophenga apicifera* (Adams), 1905. Kansas Univ. Sci. Bull. 3: 185

Specimen examined: one female

Distribution: Central to south Africa

Location: 22

Collection methods: sweeping on banana and pineapple

38. *Leucophenga disjuncta* Bachli, 1971. Exploration Parc. Nat. de l'Upemba. Fasc. 71: 32

Specimen examined: one male

Distribution: Central Africa

Location: 21

Collection methods: sweeping on fig tree

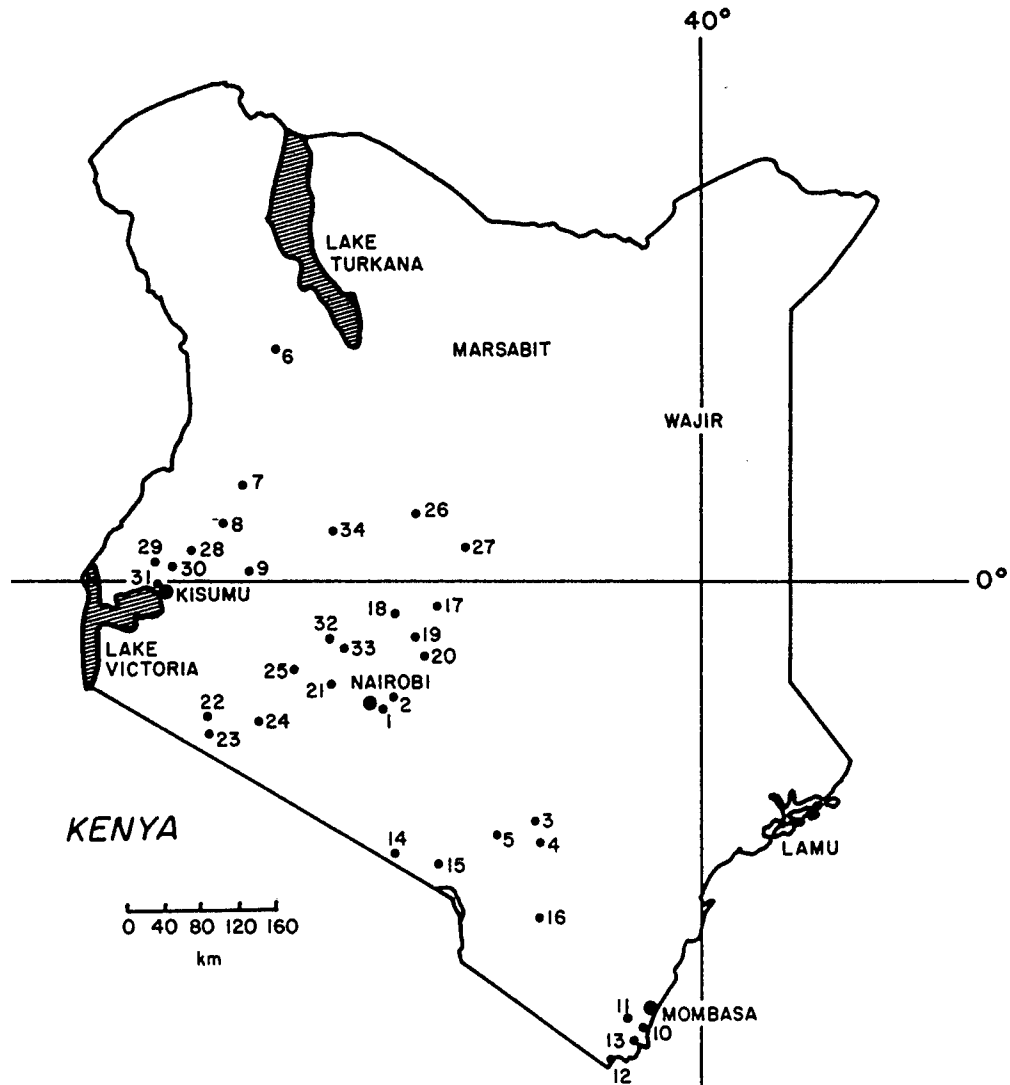


Fig. 1. Collection locations: 1, Nairobi; 2, Nairobi National Park; 3, Hunter's Lodge, highway A109 near Kiboko; 4, Makindu, on A109 west of B7 junction; 5, National Range Research Station Headquarters, Kiboko; 6, Lokichar, on A1 west of Lake Turkana; 7, Makutano, on A1 north of Kitale; 8, Kitale; 9, Eldoret; 10, Jadini Beach Hotel, on Diani Beach south of Mombassa; 11, Kwale, southwest of Mombassa; 12, Shimoni, on coast just north of Tanzanian border; 13, Ukunda, on highway A14 south of Mombassa; 14, Namanga, on A104 on Tanzanian border; 15, Amboseli Serena Lodge, Amboseli National Park; 16, Ngulia Lodge, West Tsavo National Park; 17, Mt. Kenya; 18, Naro Moru River Lodge, on A2 west of Mt. Kenya; 19, Karatina, on A2 southwest of Mt. Kenya; 20, Sagana, on A2 southwest of Mt. Kenya; 21, Mayer's Farm, on B3 between Narok and Nairobi; 22, Mara River Camp, Masai Mara National Reserve; 23, Little Governor's Camp, Masai Mara National Reserve; 24, Narok; 25, Naivasha; 26, Isiolo; 27, Meru; 28, Kakunga, on A1 between Kitale and Kisumu; 29, Kakamega, on A1 north of Kisumu; 30, Kakamega National Forest; 31, Kisumu; 32, North Kinagop, near Naivasha on edge of Aberdare Range; 33, Mt. Aberdares, southeast edge of Aberdare Range; 34, Island Camp, Lake Baringo.

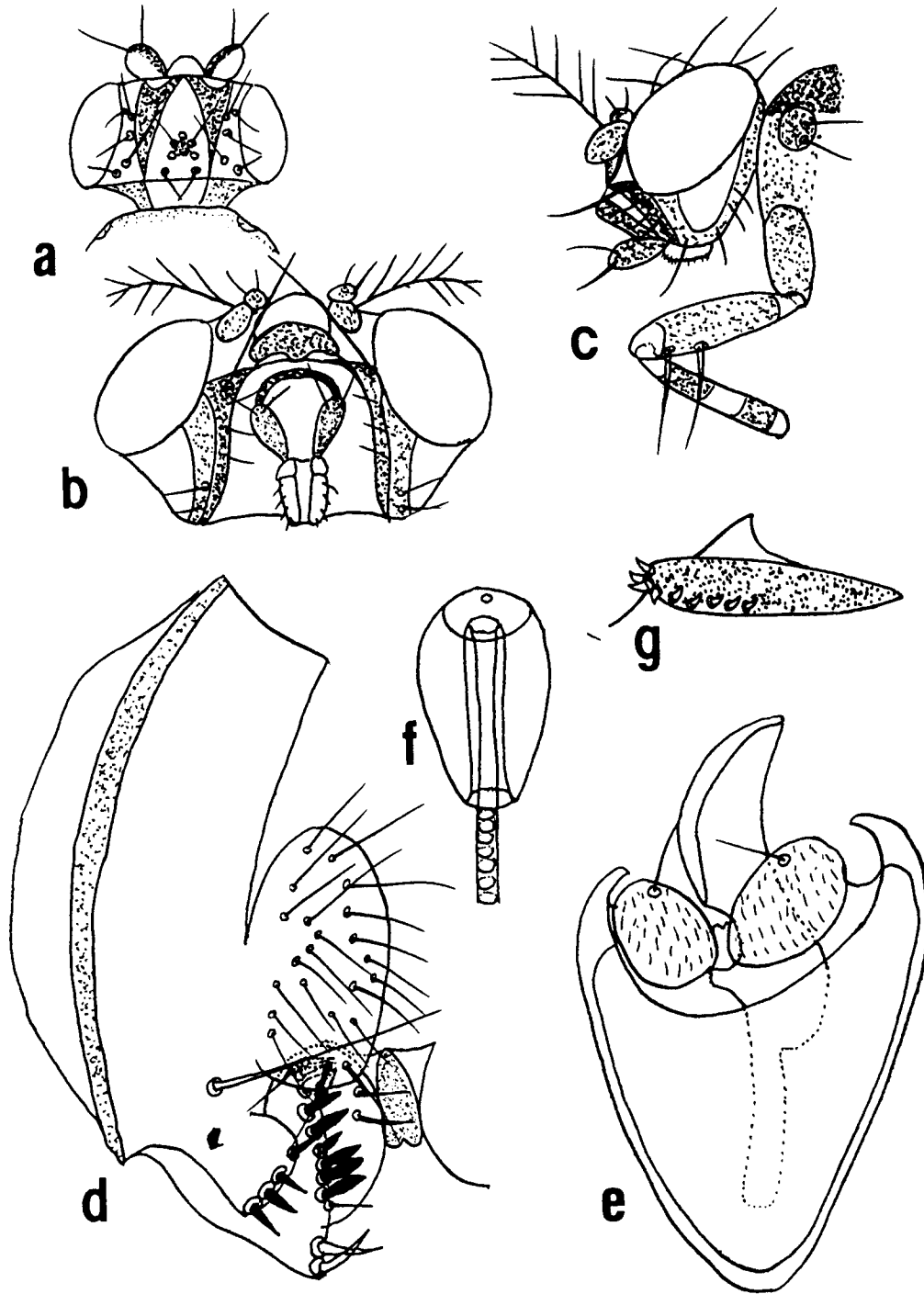


Fig. 2. *Dettopsomyia woodruffi* Takada, n.sp. (a) dorsal view of head, (b) ventral or anterior view of head, (c) lateral view of head and first leg, (d) peripheral organs, (e) ventrolateral aspect of phallic organs, (f) spermatheca, (g) egg-guide of female.

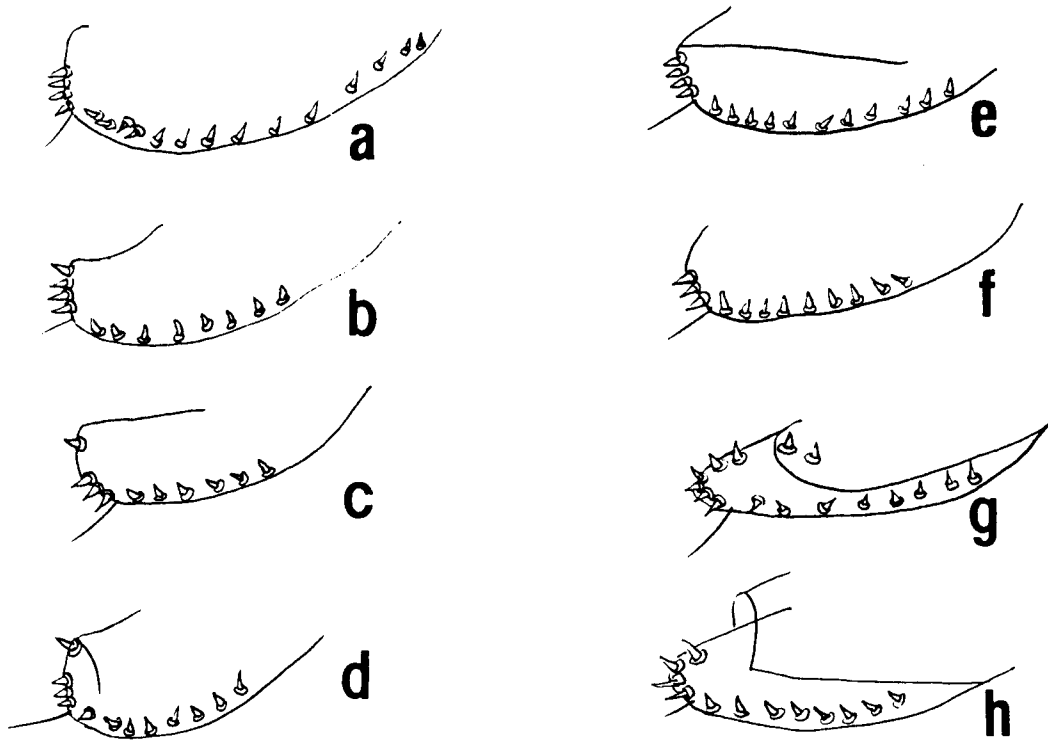


Fig. 3. Egg-guides of females of some Kenyan Drosophilidae. (a) *Drosophila melanogaster* (b) *D. yakuba*, (c) *D. nikananu*, (d) *D. malerkotliana*, (e) *D. simulans*, (f) *D. seguyi*, (g) *Zaprionus tuberculatus*, (h) *Drosophila (Scaptodrosophila) latifasciaeformis*

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