

Further Notes on the Genus *Drosophilella* DUDA
with Descriptions of Two New Species from
Indonesia (Diptera, Drosophilidae)

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Synopsis

OKADA, T. 1987—Further notes on the genus *Drosophilella* DUDA with descriptions of two new species from Indonesia (Diptera, Drosophilidae). *Proc. Japn. Soc. syst. Zool., Tokyo*, No. 36: 38-45.

Two new species of the genus *Drosophilella* DUDA are described from Java, one associated with *Colocasia gigantea* HOOK, f. (Araceae) and another with *Arenga pinnata* MERRILL (Palmae). *D. monoconica* TODA et OKADA is synonymized with *D. colocasiae* DUDA and new distribution records of *D. colocasiae* and *D. diconica* TODA et OKADA are given. Taximetical analyses are made of 13 species of this genus.

In total, thirteen species have hitherto been known in the genus *Drosophilella* DUDA, mostly found associated with the inflorescence of *Colocasia* and its allied plants in Southeast Asia and New Guinea. The present study gives further knowledges about synonymy and distribution records, with descriptions of two new species from Indonesia.

Descriptions of New Species

Drosophilella gigantea n. sp.

(Figs. 1A-G)

♂, ♀. Body about 2.3 mm in length, subshiny black. Eye (Figs. 1A, B) oval, bare, dark red. Antenna dark brown. Arista 1.5 times as long as antenna, merely pubescent. Palpus dark brown, apically rounded, with a few setae. Ocellar triangle large, black. Periorbit broad, black. Frons broader than long, dark orange brown to brownish black. Ocellars somewhat outside triangle. Postverticals moderate. Face mat gray; carina very broad, sulcate. Clypeus brownish black. Cheek very broad, 4/5 as broad as largest diameter of eye, mat dark brown, black below. Anterior reclinate orbital 1/4 as long as posterior reclinate, outside proclinate. Vibrissa long, succeeding orals short. Thorax mat black. Scutellum shorter than broad, broadly rounded apically. Humeralis 2, long. Prescutellars well developed, as long as lateral scutellars. Anterior dorso-centrals 1/3 as long as posteriors; length distance of dorsocentrals 3/4

cross distance. Acrostichal hairs in 4 rows. Lateral scutellars parallel; apicals longer than laterals, nearer to each other than to laterals. Sterno-index about 0.6. Legs with femora and tibiae black, tarsi yellowish brown; 2nd tarsal joint of fore leg (Fig. 1C) distally much elongate, with about 6 stout black teeth in two rows. Wing (Fig. 1D) hyaline, slightly fuscous basally. R_{2+3} straight; R_{4+5} and M parallel. Costal chaetotaxy (HACKMAN & VÄISÄNEN, 1985) type B₂. C-index 2.0; 4V-index 1.7; 4C-index 1.1; 5x-index 1.1; Ac-index 3.0; C1-bristle 1; C3-fringe 1/2 or slightly more. Halter black. Abdominal tergites mat black. Sternites pale, without special process or sculpture. Periphallic organs (Fig. 1E) dark brownish black; epandrium ventrally narrowly prolonged; surstylus slender. Phallic organs (Fig. 1G) dark brownish black; aedeagus oblong, basally narrowing, without basal process. Ovipositor (Fig. 1F) broad, orange brown, apically broadly truncate.

Holotype ♂, allotype ♀, paratypes 7♂ 1♀, Botanical Garden, Bogor, Java, 31.XII.1986 (HAMBALI), *ex* inflorescence of *Colocasia gigantea* Hook, f. (Araceae), at composting ground. Types in National Science Museum (Nat. Hist.), Tokyo.

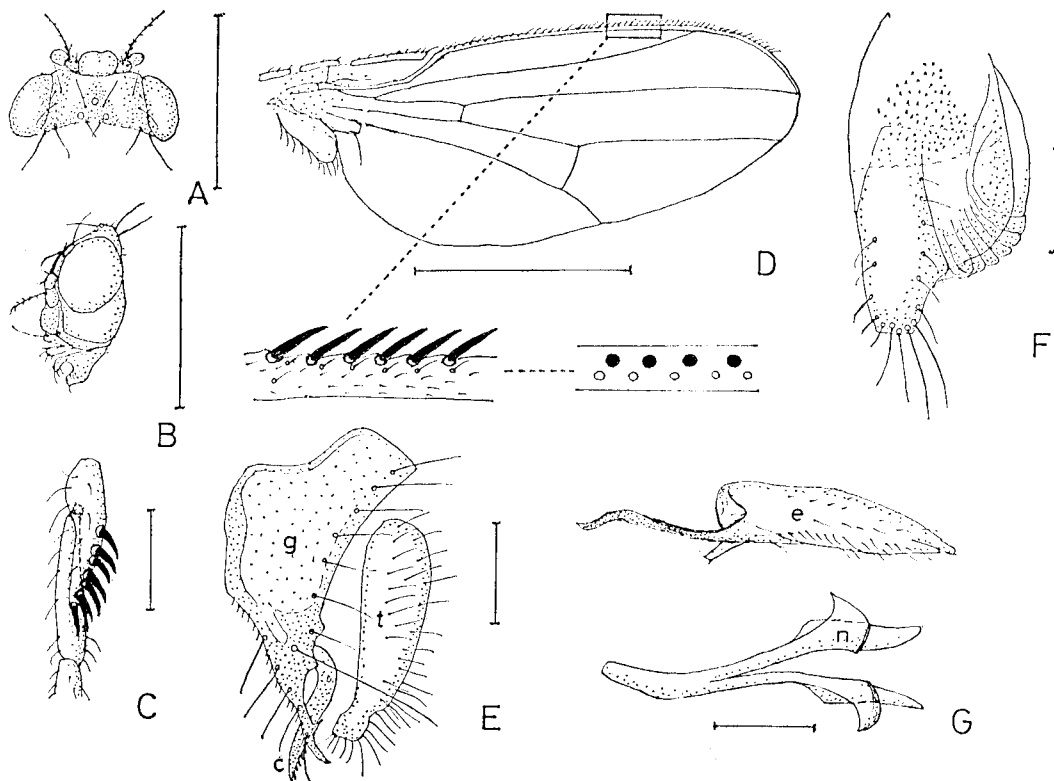


Fig. 1. *Drosophilella gigantea* n. sp. A, B, Head; C, 2nd and 3rd tarsal joints of fore leg; D, wing; E, periphallic organs; F, ovipositor; G, phallic organs. Scale 0.1 mm.

Relationships. This species differs from any of the known species of the genus by having well developed prescutellars, sulcate carina and exceptionally large body by which the specific name was given. It somewhat resembles *D. zeylanica* OKADA in costal chaetotaxy type and broad carina.

***Drosophilella arenga* n. sp.**

(Figs. 2A-F)

♂, ♀. Body (Fig. 2A) about 1.3 mm in length, brownish black. Head (Figs. 2B, C) broader than thorax. Eyes broadly separated from each other, bare, dark brown. Antenna with 2nd joint orange, 3rd brownish black. Arista 3 times as long as antenna, with about 10 upper and 4 lower short branches. Palpus yellowish brown, with an apical seta. Ocellar triangle black. Ocellars long, outside triangle. Periorbit vary broad especially anteriorly. Postverticals moderate. Frons twice as broad as long, mat orange brown; frontal triangle marginally brownish black. Cheek mat yellowish gray, 1/9 as broad as greatest diameter of eye. Clypeus yellowish gray. Anterior reclinate orbital half as long as posteriors. Second oral half as long as vibrissa. Mesoscutum and scutellum mat grayish brown, medially darker. Thoracic pleura paler. Humerals 2. Prescutellar absent. Anterior dorsocentrals much before posteriors, nearly as long as posteriors. Acrostichal hairs in 4 rows. Scutellars equal in length; laterals somewhat divergent, apicals nearer to each other than to laterals. Sterno-index 0.3. Legs yellowish gray; 2nd tarsal joint of fore leg apically not prolonged and without stout teeth. Wing (Fig. 2A) hyaline, veins yellow. C-index 2.8; 4V-index 2.2; 4C-index 1.0; 5x-index 2.0; Ac-index 2.0; C1-bristles 2; C3-fringe 2/7. Costal chaetotaxy type B. Halter yellowish gray, stalk yellow. Abdominal tergites mat black; sternites without special process or sculpture. Periphallalic organs (Fig. 2D) pale brown; epandrium ventrally much prolonged and semicircularly curved. Surstylus rounded, with about 6 distal teeth. Cercus oval. Phallic organs (Fig. 2E) pale brown; aedeagus elongate, without basal process; paramere absent. Ovipositor (Fig. 2F) pale brown, elongate, apically pointed, with about 20 marginal teeth.

Holotype ♂, allotype ♀, paratypes 3♀, Bogor, Java, 13.III.1986 (ISKANDAR), *ex* inflorescence of *Arenga pinnata* MERR. (Palmae). Types in National Science Museum (Nat. Hist.), Tokyo.

Relationships. This species differs from ordinary member of *Drosophilella* by having second tarsal joint of fore leg normal, without elongation and stout teeth. It is, however, placed in this genus because of having antennae broadly separated from each other, ocellars outside

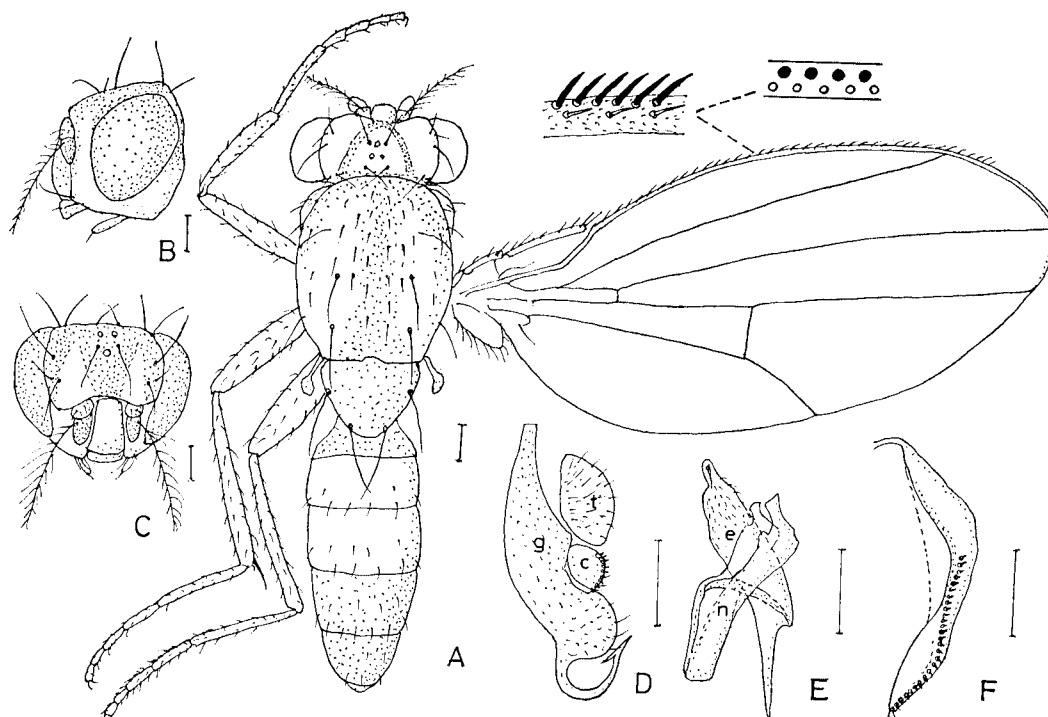


Fig. 2. *Drosophilella arenga* n. sp. A, Body; B, C, head; D, periphallial organs; E, phallic organs; F, ovipositor. Scale 1.0 mm for A, B, D; 0.1 mm for other figs.

triangle, frons broader than long, carina large, cheek broad, acrostichal hairs in 4 rows and anterior dorsocentrals well before posteriors. It somewhat resembles *D. zeylanica* in having costal chaetotaxy type B₂, basal process of aedeagus absent, conical process of male sixth abdominal sternite absent and male cercus ventrally not prolonged, but it differs from the latter by having arista plumose, caudoventral corner of epandrium not prolonged and anteroventral corner of epandrium much elongate and curved. Association with *Arenga pinnata* (Palmae) of this species is also unique among the genus *Drosophilella*.

Synonymy and New Distribution Records

Drosophilella colocasiae DUDA

Drosophilella colocasiae DUDA, 1924, Arch. Naturgesch., 90 (A3): 226.

Drosophilella monoconica TODA et OKADA, 1983, Kontyû, Tokyo, 51: 170. n. syn.

This synonymy is settled through examination of a lot of specimens from Java and Thailand.

Specimens examined. Many ♂, ♀, Bogor, Java, 10.X.1986 (HAMBALI), *ex* inflorescence of *Colocasia esculenta* SCHOTT; many ♂, ♀, Bogor, Java, 31.XII.1986 (HAMBALI), *ex* inflorescence of *Colocasia gigantea*

HOOK, f. at composting ground; many ♂, ♀. Bangkok, Thailand, 10.X. 1986 (HAMBALI), ex *Colocasia esculenta* at marshy area near the nursery of Department of Harbiculture, Kasebrarb University.

Distribution. Java, Thailand, Burma.

***Drosophilella diconica* TODA et OKADA**

Drosophilella diconica TODA et OKADA, 1983, Kontyû, Tokyo, 51: 172.

Specimens examined. Many ♂, ♀, same data as in the previous species, collected simultaneously. A few ex., Sri Lanka, 1962, Loc. 89 (ANDERSSON, BRINCK, CEDERHOLM, through DANIELSSON).

Distribution. Java, Thailand, Burma, Sri Lanka.

***Drosophilella iskandari* OKADA**

Drosophilella iskandari OKADA, 1986, Proc. Japn. Soc. syst. Zool., (33): 36.

This species seems to be intermediate between *D. colocasiae* and *D. diconica*, having male and female genitalia as in *diconica* and the process of male sixth abdominal sternite as in *colocasiae*.

The distribution records of *Drosophilella* species in relation to the host plants and costal chaetotaxy types are summarized in Table 1.

Table 1. The distribution records of *Drosophilella* species in relation to the host plants and costal chaetoeaxy types.

| <i>Drosophilella</i> species | host plant | Costal chaetotaxy type | distribution |
|------------------------------|---|------------------------|----------------------------------|
| <i>colocasiae</i> | <i>Colocasia esculenta</i> <i>Colocasia gigantea</i> | B ₁ | Java, Thailand, Burma |
| <i>diconica</i> | <i>Colocasia esculenta</i> <i>Colocasia gigantea</i> | B ₁ | Java, Thailand, Burma, Sri Lanka |
| <i>iskandari</i> | <i>Colocasia esculenta</i> | B ₁ | Java |
| <i>stamenicola</i> | <i>Colocasia esculenta</i> | B ₁ | New Guinea |
| <i>pistilicola</i> | <i>Colocasia esculenta</i> | B ₁ | New Guinea |
| <i>gigantea</i> | <i>Colocasia gigantea</i> | B ₂ | Java |
| <i>alocasiae</i> | <i>Alocasia odora</i> | B ₂ | Ryukyus, Formosa, China |
| <i>ænalocasiae</i> | <i>Alocasia odora</i> | B ₂ | Ryukyus, Formosa, China |
| <i>zeylanica</i> | ? | B ₂ | Sri Lanka |
| <i>baechlii</i> | <i>Homalomena lancifolia</i> | B ₀ | Malaya |
| <i>bogneri</i> | <i>Homalomena lancifolia</i> | B ₀ | Malaya |
| <i>toshiokai</i> | <i>Homalomena</i> sp. | B ₀ | Philippines |
| <i>arenga</i> | <i>Arenga pinnata</i> | B ₂ | Java |
| <i>seminigra</i> | ? | ? | New Guinea |

Taximetical analyses

A dendrogram of relationships of 13 species of *Drosophilella* is established by means of S_{sm} proximity analysis and UPGMA cluster analysis using 12 diagnostic characters: A, A', B, D', E', F, G, H, H', K, U, V, which are as used in the previous papers (OKADA, 1986), excepting U and V:

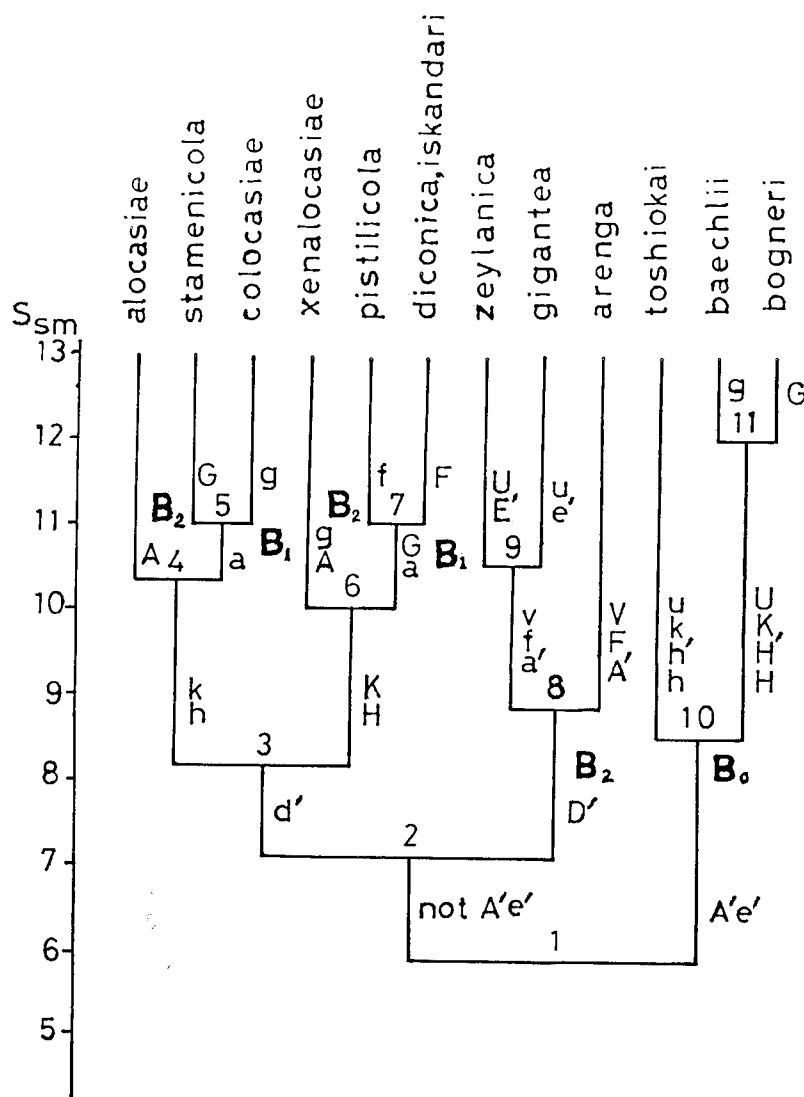


Fig. 3. A dendrogram of relationships of 13 species of the genus *Drosophilella* ($t=13$), based on 12 diagnostic characters ($n=12$), constructed by means of S_{sm} proximity analysis and UPGMA cluster analysis. Alphabetical signs on the branches of dendrogram: character states chosen from original $n \times t$ matrix. B_0, B_1, B_2 , costal chaetotaxy types; numerical figures on branching points of dendrogram: order of key couplets.

U. Prescutellars absent ($U=0$), or present ($u=1$).

V. Stout bristles of 2nd tarsal joint of fore leg absent ($V=0$), or present ($v=1$).

D. seminigra DUDA is excluded from the analyses because of insufficient informations. The result of analyses is shown in Fig. 3. Insertion of two new species does not affect seriously the previously obtained dendrogram (OKADA, 1986). These two species are clustered together with *D. zeylanica* to make a major cluster. Some mistakes in the previous dendrogram are emended, e.g., *iskandari*, read F for f; *toshiokai*, read h, h' for H, H'; *baechlii*, *bogneri*, read H, H' for h, h'; *zeylanica*, read H' for h'.

From the dendrogram a key to the species of the genus *Drosophilella* is automatically constructed.

Revised key to species of the genus *Drosophilella*

1. Not simultaneously arista plumose (A') and male cercus ventrally prolonged (e') 2
- Arista plumose (A'); male cercus ventrally prolonged (e') 10
2. Ventral process of male 6th sternite present (d') 3
- Ventral process of male 6th sternite absent (D') 8
3. Basal process of aedeagus present (h); ovipositor narrow especially distally (k) 4
- Basal process of aedeagus absent (H); ovipositor broad, blade-like (K) 6
4. Costal bristles strong at least partially (A) *alocasiae*
- Costal bristles fine (a) 5
5. Surstylus present (G) *stamenicola*
- Surstylus absent (g) *colocasiae*
6. Costal bristles strong at least partially (A); surstylus absent (g) *xenalocasiae*
- Costal bristles fine (a); surstylus present (G) 7
7. Caudoventral corner of epandrium acute-angular (f) *pistilicola*
- Caudoventral corner of epandrium rectangular (F) 7'
- 7'. Sternal process of male abdomen bifurcate (D) *diconica*
- Sternal process of male abdomen conical (d) *iskandari*
8. Arista plumose (A'); caudoventral corner of epandrium rectangular (F); stout bristles of 2nd tarsal joint absent (V) *arenga*
- Arista pubescent (a'); caudoventral corner of epandrium acute-angular (f); stout bristles of 2nd tarsal joint present (v) 9
9. Male cercus ventrally not prolonged (E'); prescutellars absent (U)

- *zeylanica*
 — Male cercus ventrally prolonged (e'); prescutellars present (u) ...
 *gigantea*
 10. Basal process of aedeagus present (h); paramere present (h);
 ovipositor narrow especially distally (k); prescutellars present (u)
 *toshiokai*
 — Basal process of aedeagus absent (H); paramere absent (H');
 ovipositor broad, blade-like (K); prescutellars absent (U) 11
 11. Surstylus absent (g) *baechlii*
 — Surstylus present (G) *bogneri*

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摘 要

岡田豊日 (東京都)——タロイモショウジョウバエ属 (*Drosophilella*) の知見追加とインドネシア産 2 新種の記載。

インドネシア, タイ, スリランカなどから得られた多くのタロイモショウジョウバエ類を検した結果, *Drosophilella monoconica* は *D. colocasiae* のシノニムであることが判明し, *D. colocasiae*, *D. diconica* の分布知見が追加された。また, インドネシア産の 2 新種を記載した。それぞれハスイモ (サトイモ科) およびサトウヤシ (ヤシ科) の花から得られたものであるが, 本属の種が, ヤシ科植物の花から得られたのは, これがはじめてである。

Literature cited

- HACKMAN, W. and R. VÄISÄNEN, 1985. The evolution and phylogenetic significance of the costal chaetotaxy in the Diptera. *Ann. Zool. Fennici*, 22: 169-203.
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