

VII. The *Drosophila crassifemur* Group of Species in a New Subgenus¹

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Throckmorton (1966) showed that *Drosophila crassifemur* and *D. nasalis* had some internal characteristics which are more typical of *Scaptomyza* rather than of *Drosophila*. Spieth (1966) observed that *D. crassifemur* and *D. nasalis* "display a typical scaptomyzoid pattern of mating behavior." Clayton (1966 and 1968) found that the metaphase configuration of the chromosomes of these two species are like those of most Hawaiian *Scaptomyza* species. Hardy (1966), in describing a new species closely related to *crassifemur*, indicated that this group of species should probably be placed in the genus *Scaptomyza* on the basis of internal morphology, egg characters, and mating behavior; but that on the basis of external morphology, the *crassifemur* group of species would undoubtedly fit the present concept of the genus *Drosophila*. The evidence presented by Throckmorton, Spieth, and Clayton plus the relative complexity of the external male genitalia as compared with most species of Hawaiian *Drosophila*, warrants at least the removal of this group of species from the subgenus *Drosophila* but left in the genus *Drosophila*. The name *Engiscaptomyza* will be used for this new subgenus. Its prefix is derived from the Greek word "engys" which means "near" or "close to."

In Hardy (1965) *D. crassifemur* was indicated as being found on Maui, Molokai, Hawaii, Oahu, and Kauai. Takada in 1964 (as cited by Hardy, 1966), discovered that there are distinct differences in the male genitalia of specimens of *crassifemur* from Kauai from those specimens from the other islands. Hardy (1966) described the Kauai species as *amplilobus* and indicated that a complex of species is probably present which fit the description of *crassifemur*. A detailed study of the male genitalia including the phallic organs show that a complex of species is indeed involved here, and that a separate species each fitting the original description of *crassifemur* is present on each of the major islands of the Hawaiian chain: *crassifemur* on the Maui complex (The Maui complex is comprised of the Islands of Maui, Molokai, and Lanai as discussed by Carson and Stalker, 1968), *amplilobus* on Kauai, *reducta* on Hawaii, and a new species on Oahu (*inflatus*).

At present, there are only two described species of the *nasalis* subgroup which is obviously closely related to the *crassifemur* subgroup on the basis of the external morphological characteristics. Distinct differences in the male genitalia, however, indicate a completely separate complex of species. The two species of this subgroup include *nasalis* from the Maui complex, and *undulata* from Hawaii.

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Subgenus *Engiscaptomyza* New Subgenus

Apices and basis of middle and hind tibiae with prominent brown bands; six to eight acrostichal rows; mesonotum typically with five dark brown to black vittae extending the full length except for the lateral vittae being interrupted at the suture; arista with five or six dorsal rays plus two or three ventral rays in addition to the apical fork; body typically brown with abdomen dark brown to black; wings pale brown; male genitalia very complex with enlarged claspers, anal plates with a finger-like projection on the ventral margins, presence of a sclerotized ventral fragma, aedeagus bulbous or conical with the basal apodeme as long as or longer than the aedeagus.

Type of subgenus: *Drosophila crassifemur* Grimshaw

✓ The *crassifemur* Subgroup

This subgroup is composed of four species, one of which is new and will be described here. The males of this subgroup are characterized by the swollen front femora, the presence of a pair of very conspicuous membranous lobes arising from the ventral edge of the ninth tergum, and by the venter of the front femur being densely yellow pubescent. The females are characterized by the strongly sclerotized ovipositor blades which are pointed at the apex. Both male and female specimens have two or three pairs of small setae on the scutellum in addition to the normal two pairs of scutellar bristles. On the basis of their external morphology, the species of this complex are indistinguishable. There are no reliable characters which will separate these four species except for the differences in the male genitalia. There are distinct differences in the shapes of the aedeagus (fig. 1a, e, i, m), the hypandrium (fig. 1b, f, j, n), and the lobe at the base of each clasper (fig. 1c, g, k, o). The females can be easily separated by distinct differences in the shapes of the ovipositor blades (fig. 1d, h, l, p).

The species of this subgroup are as follows:

✓ *Drosophila (Engiscaptomyza) crassifemur* (Grimshaw), **new comb.**

Drosophila crassifemur Grimshaw, 1901, Fauna Hawaiiensis 3(1):66

Redescription by Hardy, 1965, Insects of Hawaii 12:229-230.

Figures of aedeagus, hypandrium, clasper and ovipositor as in Figure 1a-d respectively. Distribution restricted to the Maui complex.

✓ *Drosophila (Engiscaptomyza) amplilobus* (Hardy), **new comb.**

Drosophila amplilobus Hardy, 1966, Univ. Tex. Publ. 6615:197-200.

Figures of aedeagus, hypandrium, clasper and ovipositor as in Figure 1e-h respectively. Distribution restricted to Kauai.

✓ *Drosophila (Engiscaptomyza) reducta* (Hardy), **new comb.**

Drosophila reducta Hardy, 1965, Insects of Hawaii 12:445-446.

Figures of aedeagus, hypandrium, clasper and ovipositor as in Figure 1i-l respectively. Distribution restricted to the Island of Hawaii.

✓ *Drosophila (Engiscaptomyza) inflatus* new species

Here again, specimens of this species fit so nearly the description of typical *crassifemur* (in Hardy, 1965, 12:229-230) and *amplilobus* (in Hardy, 1966,

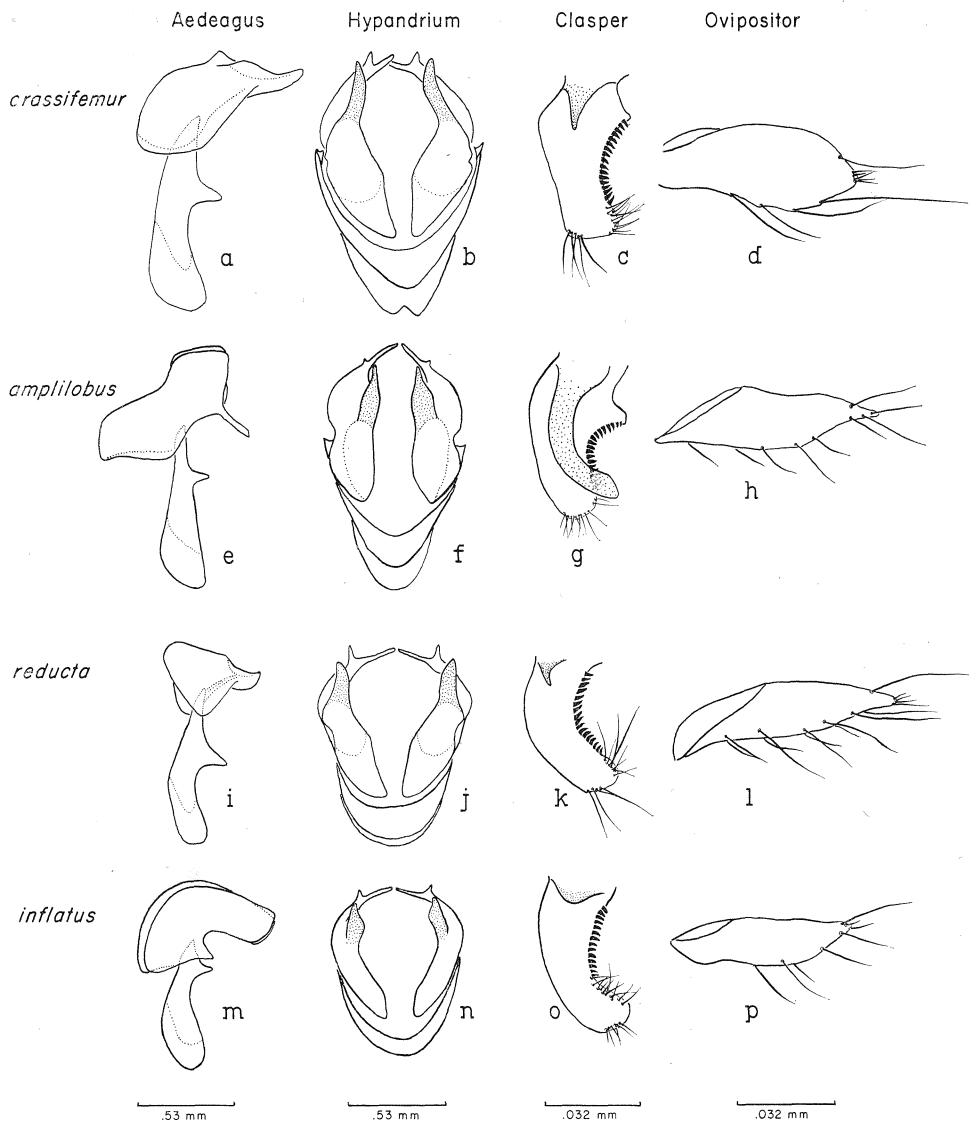


FIG. 1. The *D. (E.) crassifemur* subgroup.

6615:197-200) that it would be repetitious to redescribe the general external features. The species can be differentiated by distinct differences in the shapes of the aedeagus, hypandrium, and clasper of the male genitalia as in Figures 1m-o respectively, and in the ovipositor blade as in Figure 1p. Distribution restricted to the Island of Oahu.

Holotype male plus one paratype male from Mt. Kaala, Oahu, 4,000', July 2-3, 1968, (K. Y. Kaneshiro). Allotype female plus five paratype females, from Wiliwilinui Ridge, Oahu, May 11, 1965, (K. Y. Kaneshiro). Three other paratypes, two males and one female from Mt. Kaala, Oahu, September, 1952 (N. Morton) and Mt. Kaala, Oahu, April 22, 1965, (M. Delfinado).

Type and allotype in the B. P. Bishop Museum. Paratypes to be distributed among the following collections: U. S. National Museum, British Museum (Natural History), and the University of Hawaii.

The *nasalis* Subgroup

This subgroup is comprised of two species, one from the Maui complex (Maui and Molokai) and the other from Hawaii. The species of this complex are easily distinguished from those of the *crassifemur* subgroup by the following characteristics: the front femora not swollen, absence of extra setae on the scutellum aside from the normal two pairs of scutellar bristles, absence of densely yellow pubescence on the venter of the front femora of the males, and by the absence of the fleshy membranous lobes arising from ventral margin of the ninth tergum of the male genitalia. The females of this subgroup are readily separated from those of the *crassifemur* subgroup by the greatly swollen, yellow seventh sternum (very conspicuous in situ) and by the broad, blunt ovipositors. The two species in this subgroup are easily separated due to the conspicuous markings in the wings of *undulata* (fig. 203b, Hardy, 1965, 12:494). Also, there are distinct differences in the shapes of the head, palpi, and aedeagus. The head of *undulata* is nearly triangular in shape as seen from a direct lateral view with the frontal margin at least three times longer than the lower margin. In *nasalis*, the head is nearly quadrate with the frontal margin only about one-half times longer than the lower

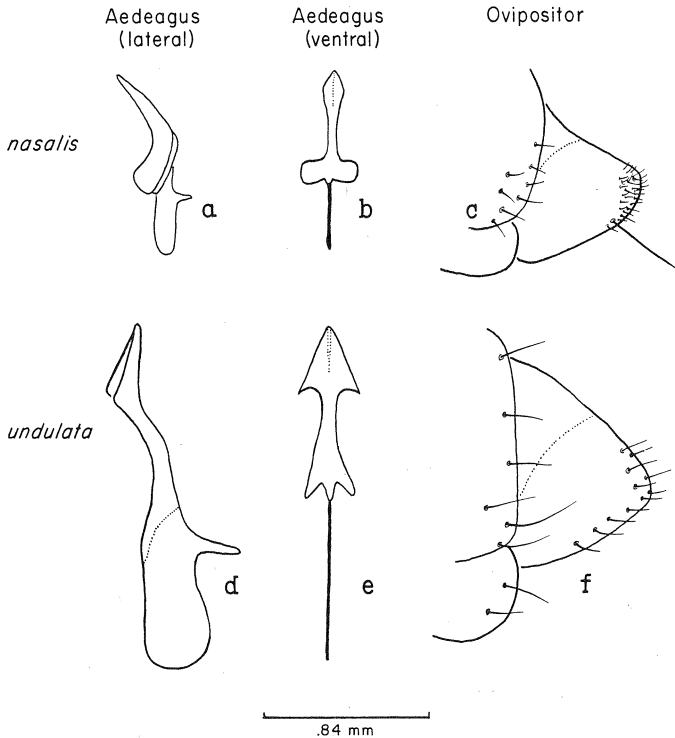


FIG. 2. The *D. (E.) nasalis* subgroup.

margin. The palpus of *undulata* is very narrow and long rather than very broad and short as in *nasalis*. The differences in the shapes of the aedeagus are as in Figure 2a, b and d, e.

Drosophila (Engiscaptomyza) nasalis (Grimshaw), **new comb.**

Drosophila nasalis Grimshaw, 1901, Fauna Hawaiiensis 3(1):66

Redescription by Hardy, 1965, Insects of Hawaii 12:380-381

Shapes of aedeagus and ovipositor as in Figure 2a-c. Distribution restricted to the Maui complex of Islands.

Drosophila (Engiscaptomyza) undulata (Grimshaw), **new comb.**

Drosophila undulata Grimshaw, 1901, Fauna Hawaiiensis 3(1): 58

Redescription by Hardy, 1965, Insects of Hawaii 12:493-495

Shapes of aedeagus and ovipositor as in Figure 2d-f. Distribution restricted to the Island of Hawaii.

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