

Jpn. J. Ent., 58 (3): 555–562. September 25, 1990

The *Leucophenga maculata* Species Group (Diptera, Drosophilidae) of the Palearctic and Oriental Regions

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Abstract Thirteen species of the *Leucophenga maculata* species group of the Palearctic and Oriental Regions are reviewed with taximetric analyses.

LIN and WHEELER (1972) established the *maculata-albiceps* complex in the genus *Leucophenga* MIK, for the species with so much individual variation in color, pollinosity and abdominal pattern that the species limits are uncertain. In the present study the *maculata* species group is established for this complex, in which thirteen species of the Palearctic and Oriental Regions are included.

The *maculata* species group nov.

maculata-albiceps complex, LIN et WHEELER, 1972, Univ. Texas Publ., 7213: 248.

Diagnosis. Body yellowish brown; palpus usually yellow, small in both sexes; halter yellow; wing hyaline, rarely smoky; male mesoscutum silvery pollinose in cephalic view; abdominal tergites with black spots or bands.

This species group is allied to the *subpollinosa* species group in having the silvery pollinose scutum in male, but the body is more robust and wing has no black patches.

Leucophenga maculata (DUFOR)

(Fig. 1 F)

Drosophila maculata DUFOR, 1939, Ann. Sci. nat., (2nd Ser.), zool., 12: 50.

Diagnosis. Thoracic pleura dark brown patched; legs yellow, knees pale; abdominal tergites with somewhat confluent large black spots (Fig. 1 F); scutellum brown, laterally black, apically pale.

Specimens examined. 1 ♂, Macassar, Sulawesi, 30.XI.1973 (SHINONAGA); Taiwan: 1 ♂, Fenchifu, Chia-i, 12.IV.1965 (SAIGUSA); 1 ♀, Kuantsuling, Tainan, 7.IV.1965 (SAIGUSA); Papua New Guinea, 1 ♂, Wau Mc Adams Park, 22.IX.1977 (OKADA).

Distribution. Europe, Korea, Japan, Formosa, Indonesia, Sri Lanka,

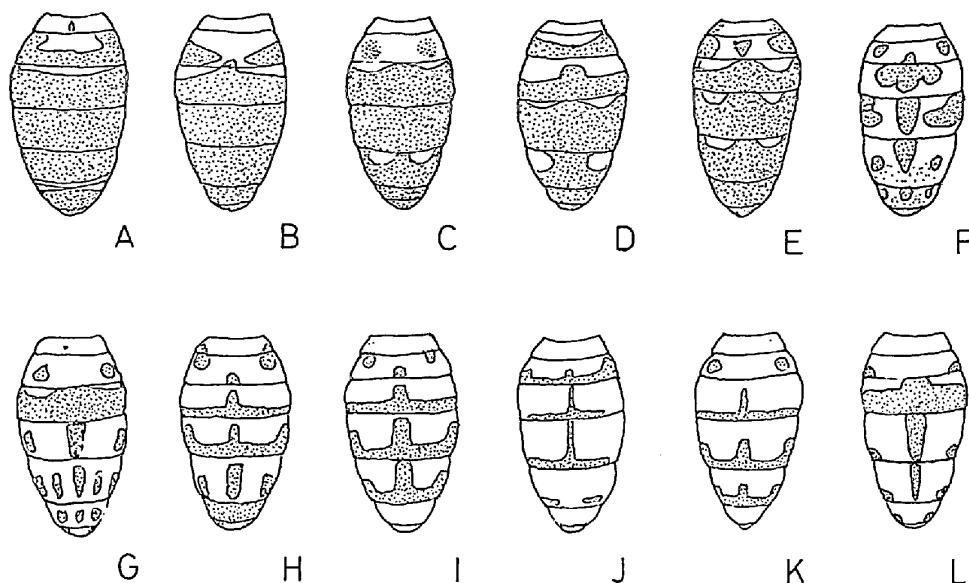


Fig. 1. *Leucophenga maculata* species group, abdominal tergite. A, *L. nigriceps*; B, *salatigae*; C, *rimbickana*; D, *confluens*; E, *meijerei*; F, *maculata*; G, *albiceps*; H, *concilia*; I, *cincta*; J, *sorii*; K, *stackelbergi*; L, *subacutipennis*. A–B, D–H. original figs.; C, I–K. from literature.

Papua New Guinea.

Leucophenga confluens DUDA

(Fig. 1 D)

Leucophenga maculata var. *confluens* DUDA, 1923, Annls hist-nat. Mus. natn. hung., 20: 32.

Leucophenga confluens: LIN et WHEELER, 1972, Univ. Texas Publ., 7213: 244.

Diagnosis. Palpus brown; thoracic pleura with brown patches; legs pale yellow; wing hyaline; abdominal tergites mostly black, 2T with caudal black continuous bands (Fig. 1 D); scutellum dark brown, apically white.

Specimens examined. Formosa: 6♂, 7♀, Lishan, Taichung, 31.V. – 1.VI.1971 (KANMIYA); 4♂, 2♀, Fenchifu, Chia-i, 12.IV.1965 (SAIGUSA, MIYAMOTO); 1♂, Hassenzan, Taichung, 29.V.1971 (KANMIYA).

Distribution. Formosa, Sri Lanka.

Leucophenga meijerei DUDA

(Fig. 1 E)

Leucophenga albiceps var. *meijerei* DUDA, 1924, Archiv. naturgesch., 90 A (3): 240.

Leucophenga meijerei: LIN et WHEELER, 1972, Univ. Texas Publ., 7213: 248.

Diagnosis. Thoracic pleura pale, with dark patches; legs yellow; abdominal tergites mostly black; 2T yellow with 3 black spots (Fig. 1 E); scutellum black,

apically pale.

Specimens examined. Formosa: 4 ♀, Wulai, Taipei, 15.XII.1977 (IKEDA); 3 ♂, 4 ♀, Lishan, Taichung, 31.V-1.VI.1971 (KANMIYA); 4 ♂, 2 ♀, Fenchifu, Chia-i, 13.IV.1977 (SAIGUSA, MIYAMOTO); 1 ♀, Chiaoriping, Chia-i, 13.IV.1965 (SAIGUSA); 1 ♀, Taataka-anbu, Chia-i, 3.IV.1965 (SAIGUSA); 1 ♂, 1 ♀, Tungpu, Nantou, 10.IV.1965 (SAIGUSA); Amami Is., 1 ♀, Mt. Yuwan, 28.IV.1976 (KANMIYA).

Distribution. Formosa, Amami Is. (n. loc.).

***Leucophenga nigriceps* OKADA**

(Fig. 1 A)

Leucophenga nigriceps OKADA, 1966. Bull. Brit. Mus. (Nat. Hist.) Ent. Suppl., 6: 31.

Diagnosis. Palpus yellow, apically black; thoracic pleura dark patched; legs yellow, with mid and hind knees black; wing hyaline; abdominal tergites mostly black (Fig. 1 A).

Specimens examined. Nepal (OKADA, 1966).

Distribution. Nepal.

***Leucophenga salatigae* DE MEIJERE**

(Fig. 1 B)

Leucophenga salatigae DE MEIJERE, 1914. Tijdschr. Ent., 57: 260.

Diagnosis. Palpus black; thoracic pleura black striped; legs yellow; wing hyaline; abdominal tergites mostly black (Fig. 1 B); scutellum black, apically yellow.

Specimens examined. Nepal (OKADA, 1966)

Distribution. Java, Nepal, Africa.

***Leucophenga albiceps* DE MEIJERE**

(Fig. 1 G)

Leucophenga albiceps DE MEIJERE, 1914. Tijdschr. ent., 57: 258.

Diagnosis. Palpus yellowish white; thoracic pleura pale yellowish white; wing hyaline; abdominal tergites black spotted (Fig. 1 G); scutellum dark yellowish brown, apically white.

Specimens examined. 1 ♂, 1 ♀, Puli, Nantow, Formosa, 19.VIII.1967 (OKADA); 1 ♂, Oozushi, Ehime, Japan, 3.VI.1973 (IKEDA).

Distribution. Java, Nepal, Formosa, Japan (n. loc.).

***Leucophenga concilia* OKADA**

(Fig. 1 H)

Leucophenga concilia OKADA, 1956, Syst. Study Dros. Jpn.: 30.

Diagnosis. Palpus yellowish white; thoracic pleura black below; legs yellow with mid and hind knees black; wing hyaline; abdominal tergites with black caudal bands, which are protruded medially and laterally (Fig. 1 H); scutellum dark brown, apically yellow.

Specimens examined. 2 ♂, Sonai, Ishigaki Is., 24.VI.1971 (WATANABE); 1 ♂, Oohara, Iriomote Is., 9.VII.1974 (SHINONAGA); 1 ♀, Kamiozoegawa, Saga, 10.VIII.1973 (YAMAGISHI).

Distribution. Japan, Korea, China.

***Leucophenga cincta* DE MEJERE**

(Fig. 1 I)

Leucophenga cincta de MEJERE, 1911. Tijdschr. ent., 54: 395.

Diagnosis. Thoracic pleura yellowish brown; legs yellow; wing slightly brownish; abdominal tergites yellow, with medially protruded caudal black bands; 2T with 3 black spots (Fig. 1 I); scutellum brown, marginally yellow.

Specimens examined. None.

Distribution. Java.

***Leucophenga bezzii* STURTEVANT**

Leucophenga bezzii STURTEVANT, 1927. Phil. J. Sci., 32: 364.

Leucophenga limbickana SINGH et GUPTA, 1981. Proc. Ind. Acad. Sci., 90: 197? (Fig. 1 C).

Diagnosis. Thoracic pleura yellow; legs yellow; wing smoky; abdominal tergites mostly black; scutellum reddish brown.

Specimens examined. None.

Distribution. Philippines, India(?).

***Leucophenga sorii* KANG, LEE et BAHUNG**

(Fig. 1 J)

Leucophenga sorii KANG, LEE et BAHUNG, 1965. Annot. zool. japon., 38: 97.

Diagnosis. Palpus yellowish brown; thoracic pleura yellow; legs yellow; wing hyaline; 3-4T with narrow caudal black bands, which are medially protruded (Fig. 1 J); scutellum yellowish.

Specimens examined. None.

Distribution. Korea, Japan (Hokkaido).

***Leucophenga stackelbergi* DUDA**

(Fig. 1 K)

Leucophenga stackelbergi DUDA, 1935. Die Fliegen Palaeark. Reg., 58 G: 40.

Diagnosis. Thoracic pleura with blackish gray longitudinal stripe; legs yellow; wing hyaline, costa somewhat dark. 3–5T with narrow caudal bands, which are protruded medially and laterally (Fig. 1 K); scutellum mat yellowish brown.

Specimens examined. None.

Distribution. Siberia.

***Leucophenga subacutipennis* DUDA**

Leucophenga subacutipennis DUDA, 1924. Archiv. Naturgesch., 90 A (3): 189.

Diagnosis. Thoracic pleura yellow; legs yellow; wing hyaline; abdominal tergites with narrow black caudal bands; scutellum mat yellowish brown.

Specimens examined. None.

Distribution. Formosa.

***Leucophenga rectinervis* OKADA**

(Fig. 1 L)

Leucophenga rectinervis OKADA, 1966. Bul. Br. Mus. (N.H.) Ent. Suppl., 6: 33.

Diagnosis. Thoracic pleura yellow; legs yellowish white; abdominal tergites with black spots, 2T white, with 2 small black spots laterally (Fig. 1 L); scutellum yellowish brown, apically white.

Specimens examined. Nepal (OKADA, 1966).

Distribution. Nepal.

Taximetric analyses

Eight diagnostic characters ($n=8$, A–H) each coded in two states (0, 1) for thirteen species ($t=13$) are taximetrically analysed. From the $n \times t$ matrix (Table 1), a dendrogram of relationships of the species is produced by means of MCD proximity analysis and UPGMA cluster analysis (Fig. 2). A key to species is automatically established from the dendrogram.

- A. Palpus yellow (A=0) or apically black (a=1).
- B. Arista with upper branches more than 6 (B=0) or less than 5 (b=1).
- C. Thoracic pleura entirely yellow (C=0) or with dark patches (c=1).
- D. Legs yellowish white (D=0) or with knees black (d=1).

Table 1. Character (n) $\times$ Taxon (t) matrix.

t	n							
	A	B	C	D	E	F	G	H
<i>bezzii</i>	NC	0	0	0	0	1	0	1
<i>nigriceps</i>	1	1	1	1	0	1	1	0
<i>salatigae</i>	1	0	1	0	0	1	1	0
<i>maculata</i>	0	0	1	0	0	0	1	0
<i>confluens</i>	0	0	1	0	0	1	1	0
<i>meijerei</i>	0	0	1	0	0	1	1	0
<i>concilia</i>	0	0	1	1	0	0	1	0
<i>albiceps</i>	0	1	0	0	0	0	1	0
<i>cincta</i>	NC	0	0	0	0	0	1	0
<i>sorii</i>	0	0	0	0	0	0	0	0
<i>stackelbergi</i>	NC	NC	1	0	0	0	0	0
<i>subacutipennis</i>	0	0	0	1	NC	0	0	0
<i>rectinervis</i>	0	0	1	0	0	0	1	0

E. Halter pale (E=0) or with knob black (e=1).

F. Abdominal tergites black spotted or banded (F=0) or mostly black (f=1).

G. Scutellum yellowish brown (G=0) or basally black and apically yellow (g=1).

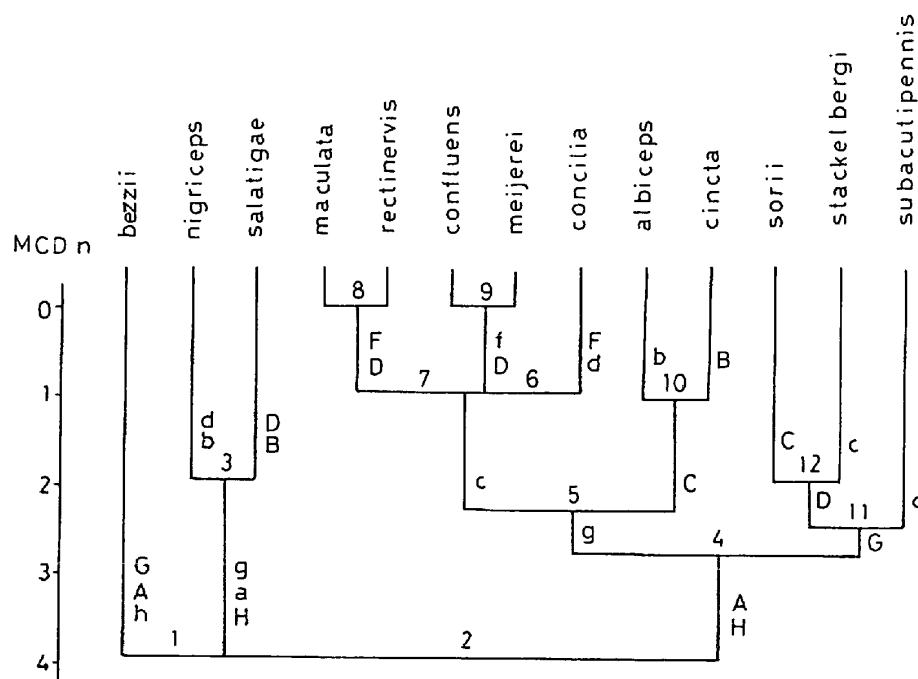


Fig. 2. A dendrogram of the species of the *Leucophenga maculata* species group. Alphabetical signs on the branches = diagnostic character states chosen from the original $n \times t$ matrix (Table 1); numerical figures at the branching points = orders of key couplets.

H. Wing hyaline (H=0) or smoky (h=1).

Key to the species

1. Wing smoky (h); palpus yellow (A); scutellum yellowish brown (G) ... *bezzi*
— Wing hyaline (H). 2
2. Palpus apically black (a); scutellum black or dark brown, apically yellow (g).
..... 3
— Palpus usually yellow (A). 4
3. Arista with upper branches less than 5 (b); legs with knees black (d).
..... *nigrescens*
— Arista with upper branches more than 6 (B); legs yellowish white (D).
..... *salatigae*
4. Scutellum basally black, apically yellow (g). 5
— Scutellum yellowish brown (G). 11
5. Thoracic pleura with dark brown patches (c). 6
— Thoracic pleura yellow (C). 11
6. Legs with mid and hind knees black (d); abdominal tergites black banded (F).
..... *concilia*
— Legs yellowish white (D). 7
7. Abdominal tergites black spotted (F). 8
— Abdominal tergites mostly black (f). 9
8. 2T with 3 black spots. *maculata*
— 2T with 2 small black spots. *rectinervis*
9. 2T with caudal black band. *confluence*
— 2T with 3 black spots. *meijerei*
10. Arista with upper branches less than 5 (b). *albiceps*
— Arista with upper branches more than 6 (B). *cincta*
11. Legs with knees black (d). *subacutipennis*
— Legs yellowish white (D). 12
12. Thoracic pleura with dark brown patches (C). *stackelbergi*
— Thoracic pleura yellow (C). *sorii*

Acknowledgement

I am much indebted to my colleagues for collecting material: the late Dr. Hiroshi IKEDA, Dr. Kenkichi KANMIYA, Dr. Shôiti MIYAMOTO, Dr. Toyohi SAIGUSA, Dr. Satoshi SHINONAGA, Mr. Nobutaka WATANABE and Dr. Kenzo YAMAGISHI.

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