

STUDIES ON MEDICALLY IMPORTANT FLIES IN THAILAND VI.
REPORT ON 48 SPECIES OF SARCOPHAGID FLIES, INCLUDING
THE TAXONOMIC KEYS (DIPTERA: SARCOPHAGIDAE)*¹⁾

BY

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ABSTRACT

Flies from different geographical parts of Thailand were collected to study their medical importance as well as to make a zoogeographical study. After examination, 48 species of 19 genera, *Kanomyia*, *Hosarcophaga*, *Blaesoxipha*, *Bercaea*, *Boettcherisca*, *Fengia*, *Lioproctia*, *Parasarcophaga*, *Phallosphaera*, *Rosellea*, *Sarcorohdendorfia*, *Sarcosolomonina*, *Sinonipponia*, *Pierretia*, *Thyrsocnema*, *Phytosarcophaga*, *Harpagophalla*, *Seniorwhitea*, and *Leucomyia* belonging to Sarcophagidae were identified and those are reported in this paper. This study is based on the specimens available in the authors' collection.

INTRODUCTION

Sarcophagidae is another family which contains hundreds of species, some of them are particularly dominant in tropical Asia. The members of this family were reported as causing human and domestic animal tissue myiasis and some of them parasitize the vertebrates, including man (Senior-White, *et al.*, 1940; Faust, *et al.*, 1974; James, 1947; James and Harwood, 1969). Because of their medical and veterinary importance, the authors studied each synanthropic species of the sarcophagid flies in Thailand in detail. In order to complete the taxonomic studies, the species which are not medically important are included. This paper is also the first paper of the taxonomic studies on

the sarcophagid flies of medical importance in Thailand.

Abbreviation. *Head:* *a*, antennae; *a*₂ and *a*₃, 2nd and 3rd antennal segments; *ar*, arista; *fv*, frontal vitta; *g*, gena; *ori*, frontal bristles; *pa*, parafacialia; *pal*, palpi; *pf*, parafrontalia; *ps*, postocular setae. *Thorax:* *ac*, acrostichal bristles; *dc*, dorsocentral bristles; *hb*, humeral bristles; *ia*, intra-alar bristles; *np*, notopleural bristles; *pa*, post-alar bristles; *ph*, posthumeral bristles; *pp*, propleuron; *prs*, prosternum; *prsb*, presutural bristles; *sa*, supra-alar bristles; *scut*, scutellar bristles; *sq*, squamae; *st*, sternopleural bristles. *Wings:* *ha*, halter; *r*₁ 1st radial vein; *r*₄₊₅, 4th and 5th radial vein; *r-m*, radio-medial cross-vein. *Legs:* *f*₁₋₃, fore, mid- and hind femora; *t*₁₋₃, fore, mid-

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and hind tibiae. *Abdomen*: *mb*, median marginal bristles; *S*₁₋₅, 1st to 5th sternites; *T*₁₋₅, 1st to 5th tergites; *GT*₁₋₂, 1st and 2nd genital tergites.

FAMILY SARCOPHAGIDAE

Sarcophagid flies vary greatly in size according to the specific differences, the larval environment and nutritional factors affecting the life of the larvae (Kano *et al.*, 1967). The flies are usually grayish, with three dark longitudinal stripes on the thorax and checkered pattern on the abdomen. The eyes are separated in both sexes but wider in the female. The arista is usually plumose along the basal half, but sometimes is pubescent. Hypopleuron has a vertical row of bristles. The inner forceps are usually much longer than the outer forceps and the phallosome is very large. Females are larviparous. These flies usually breed in the human excrement, animal carcasses and animal feces.

Only nine species of the sarcophagid flies were reported from Thailand, namely *Parasarcophaga brevicornis*, *P. yunnanesis*, *P. orchidea*, *Phallosphaera graveleyi*, *Sarcosolomonina shinonagai*, *S. harinasutai*, *Harpagophalla kempi*, *Seniorwhitea krameri* and *Leucomyia cinerea* (Delfinado and Hardy, 1977).

Only the male flies are reported in this paper.

KEY TO THE GENERA

- 1. Arista pubescent; 2 notopleural bristles *Leucomyia*
Arista plumose; usually 4 notopleural bristles 2
- 2. Acrostichal bristles absent *Bercaea*
Acrostichal bristles present 3
- 3. 3 postsutural dorsocentral bristles . . . 4
4 to 5 postsutural dorsocentral bristles 5

- 4. Inner forceps usually bent backward and spinose dorsally; acrostichal bristles regular or irregular
..... *Blaesoxipha*
Inner forceps slightly curved; acrostichal bristles always regular
..... *Pierretia*
- 5. 4 postsutural dorsocentral bristles . . . 6
5 postsutural dorsocentral bristles . . . 10
- 6. Propleuron hairy; anterior paramere large and stout, bifid anteriorly; 4th abdominal sternite usually with a patch of spine-like bristles posteriorly *Sarcorohdendorfia*
Propleuron bare; 4th abdominal sternite without such bristles 7
- 7. 5th abdominal sternite with protuberance in the middle part; styli large ..
..... *Phallosphaera*
5th abdominal sternite without any protuberance; styli slender 8
- 8. Styli very long, thread-like, about 2 times longer than the apical plate of paraphallus *Fengia*
Styli about same length or slightly longer than apical plate of paraphallus 9
- 9. Apical plate of paraphallus composed of a median apophysis and lateral projections (tri-fulcated)
..... *Sinonipponia*
Apical plate of paraphallus without any median apophysis and lateral projections *Sarcosolomonina*
- 10. Propleuron bare 11
Propleuron hairy 16
- 11. Styli large, covered with microscopic hair *Lioproctia*
Styli slender, never covered with microscopic hair 12
- 12. 4th sternite with mat of hair 13
4th sternite without any mat of hair ..
..... 14
- 13. Phallosome very large; theca long;

- apical plate of paraphallus rounded and wholly membranous
 *Seniorwhitea*
 Phallosome normal size; theca short; apical plate of paraphallus long and slender and slightly sclerotized
 *Harpagophalla*
14. 4th sternite sparsely haired; mid-femur with comb-like posteroventral bristles in apical part; hind tibia usually fringed *Parasarcophaga*
 4th sternite conspicuously haired; mid-femur without comb-like posteroventral bristles; hind tibia never fringed 15
15. Apical plate united to paraphallus without suture, slightly sclerotized
 *Thyrsocnema*
 Apical plate well differentiated to paraphallus, mostly membranous
 *Kanomyia*
16. 5th sternite with a prominent conical protuberance in the middle part ..
 *Rosellea*
 5th sternite without protuberance in the middle part 17
17. Hind tibia without fringe; ventralia globose, large and with numerous spines *Boettcherisca*
 Hind tibia with fringe; ventralia not globose and without spines 18
18. Without membranous region between theca and paraphallus; the lower half of ventralia highly sclerotized and serrated *Hosarcophaga*
 With membranous region between theca and paraphallus; ventralia not serrated 19
19. Usually small size; 1st radial vein setulose; paraphallus poorly sclerotized; apical plate largely rounded apically; ventralia reduced to a small lobe ..
 *Phytosarcophaga*
 Usually large size; 1st radial vein bare;

paraphallus highly sclerotized; slightly curved apically; ventralia well developed *Lioproctia*

GENUS *Kanomyia* Shinonaga
 et Tumrasvin, 1979

Kanomyia Shinonaga et Tumrasvin, Jap. J. Sanit. Zool., 30, 2: (1979).

Small to medium flies; arista long-plumose along the basal 1/2; 5 *post dc*; *st* 1:1:1; propleuron bare; *r*₁ bare; hind tibia without fringe; 1st to 4th sternites with numerous, relatively long hair; inner forceps slightly curved in apical part; theca short; ventralia well developed; styli long and slender; apical plate well differentiated and mostly membranous.

1. *K. bangkokensis* Shinonaga
 et Tumrasvin, 1979

K. bangkokensis Shinonaga et Tumrasvin, Jap. J. Sanit. Zool., 30, 2: (1979).

MALE. Body length 6.0 to 8.0 mm. *Head*: Frons at vertex 0.26 of head width; *fv* dark brown; *pf* and *pa* brown with silvery pollinosity; *a* dark brown but slightly orange at base, length of *a*₃ about 1.5× that of *a*₂; *g* dark brown with thick silvery pollinosity and with black hair; *ori* 8–9 pairs, lower 2 or 3 pairs divergent; 3 rows of black *ps* regular; *pal* dark brown. *Thorax*: Ashy gray; *ac* 0+1; *dc* 5–6+5; *ia* 1+3; *prsb* 1; *hb* 3–4; *ph* 2; *np* 4; *sa* 3; *pa* ♀; *scut* 3+1; *st* 1:1:1; *prs* hairy posteriorly. *Wings*: Hyaline; wing-veins light yellowish-brown; *r*₄₊₅ with a row of setae located dorsally extending more than half way from basal node to *r-m* and with some setae on ventral surface of basal node; *sq* creamy white; *ha* light brown. *Legs*: Dark brown; *f*₁ with 2 *pd* rows, 1 *pv* row; *t*₁ with 3 *ad*, 1 *pd*, 1 *pl*; *f*₂ with 5–6 *al*, 3 long *av*, a *pv* row in basal half, 1 *pd*, 1 *pl*; *t*₂ with 4 *ad*, 3–4 *pd*, 1 *pl*, 1 *v*; *f*₃ with 2 *ad* rows, 1 *av* row, 3 *pv*, 1 *pd*,

1 *pl*; *t*₃ with 4 long and a small *ad* row, 1–2 *av*, 2–3 *pd*. *Abdomen*: Same color as thorax; *T*₃ without *mb*, but *mb* well developed on *T*₄ and *T*₅; *GT*₁ and *GT*₂ brown. Forceps and genitalia as shown in Fig. 2.

Specimens examined: 32 ♂♂, Sam Sane, Bangkok, 29 VIII 1975, R. Kano, H. Kurahashi & W. Tumrasvin; 1 ♂, Bangna Nai, Bangkok, 28 VIII 1975, H. Kurahashi; 2 ♂♂, Mahidol Univ., Bangkok, 4 & 14, 1975, H. Kurahashi.

Distribution: Thailand

Remarks: This species is commonly found in Bangkok.

GENUS *Hosarcophaga* Shinonaga
et Tumrasvin, 1979

Hosarcophaga Shinonaga et Tumrasvin,
Jap. J. Sanit. Zool., 30, 2: (1979)

Medium to large flies; arista long-plumose along basal 2/3; propleuron hairy posteriorly; *ac* 0+1; *post dc* 5; *r*₁ bare; mid- and hind femora and hind tibia fringed on posterior margins of ventral surfaces; 5th sternite of male V-shaped; theca normal; no membranous region between the theca and paraphallus; the lower half of ventralia highly sclerotized and serrated; lateral plate of paraphallus membranous; styli long; apical plate of paraphallus membranous; styli long; apical plate of paraphallus well differentiated, long and slender, without lateral processes.

2. *H. serrata* (Ho, 1938)

Sarcophaga serrata Ho, Ann. Trop. Med. Parasit. 32(2): 120 (1938)

H. serrata: Shinonaga et Tumrasvin, Jap. J. Sanit. Zool., 30, 2: (1979)

MALE. Body length 10.0 to 13.0 mm. *Head*: Frons at vertex 0.20–0.22 of head width; *fv* black; *pf* and *pa* dark brown with thin silvery pollinosity; *a* dark brown,

length of *a*₃ 3× that of *a*₂; *g* dark brown with thin silvery pollinosity and with black hair; *ori* 9–11 pairs, lower 1–2 pairs divergent; 3 rows of black *ps* regular; *pal* blackish-brown. *Thorax*: Dark gray; *ac* 0+1; *dc* 5+5; *ia* 1+2; *prsb* 1; *hb* 3–4; *ph* 3; *np* 4; *sa* 4; *pa* 2; *scut* 3+1; *st* 1:1:1; *prs* hairy posteriorly. *Wings*: Sub-hyaline; wing-veins brown; *r*₄₊₅ with a row of setae located dorsally extending more than half way from basal node to *r-m* and with some setae on ventral surface of basal node; *sq* creamy white; *ha* brown. *Legs*: Black; *f*₁ with 2 *pd* rows, 1 *pv* row, long *pv* hair; *t*₁ with 2 *ad*, 1 *pl*; *f*₂ with 3–4 *al*, 1 *av* row, comb-like *pv* in apical part, short *av* fringe, long *pv* fringe, 2 *pd*, 1 *pl*; *t*₂ with 1 *av*, 1 *v*, 3–4 long *pd*, 1 *pl*; *f*₃ with 2 *ad* rows, 1 *av* row, long *av* hair, *pv* fringe, 1 *pd*, 1 *pl*; *t*₃ with 1 *ad* row, 1 strong and a row of hair-like *av*, 2 *pd*, *pv* fringe. *Abdomen*: Same color as thorax; *T*₃ without *mb* but *mb* well developed on *T*₄ and *T*₅; *S*₃ with short hair; *S*₄ sparsely haired; *GT*₁ and *GT*₂ dark brown. Forceps and genitalia as shown in Fig. 1.

Specimens examined: 8 ♂♂, Sai Yok, 500 m., Kanchana Buri, 9–13 XII 1975, S. Shinonaga & H. Shima; 11 ♂♂, Erawan w.f., 500 m., Kanchana Buri, 7, 10 IX & 10 XII 1975, R. Kano, H. Kurahashi & S. Shinonaga.

Distribution: Borneo, Indonesia, Thailand, Taiwan

GENUS *Parasarcophaga* Johnston
et Tiegs, 1921

Parasarcophaga Johnston et Tiegs, Proc. R. Soc. Qd. 33: 86 (1921)

Frons moderately broad, rarely narrow; antennae moderately long, arista long-plumose along basal 2/3; genae broad; propleuron bare; *ac* usually 0+1; *post dc* 5; *r*₁ bare; hind tibia usually fringed; 1st and 2nd sternites with long dense pile but 3rd and

4th ones with short sparse hair; 5th sternite of male V-shaped; apical part of paraphallus well distinguishable; ventralia present; styli curved; apical plate of paraphallus with or without lateral processes.

KEY TO THE SUBGENUS AND SPECIES

1. Antennae, palpi and genital tergites bright orange, ventralia reduced to tubercles
..... Subg. *Liopygia*: *P. ruficornis*
Genital tergites light to dark brown, orange-brown or black 2
2. Ventralia pedunculated
..... Subg. *Parasarcophaga* .. 3
Ventralia not pedunculated 5
3. Palpi orange *P. orchidea*
Palpi dark brown 4
4. *ac* 1+1; 1 row of black postocular setae; genae with only few black hair at foremost anterior part; hind femur without fringe; hind tibia without *av* *P. knabi*
ac 0-1+1; 3 rows of black postocular setae, only 1st row regular; genae with numerous black hair anteriorly; hind femur with fringe; hind tibia with 1 *av* *P. albiceps*
5. Apical plate of paraphallus composed of a small or slender median apophysis and a pair of long and straight or curved arms; ventralia commonly sheet-like
..... Subg. *Liosarcophaga* .. 6
Apical plate of paraphallus composed of a large and broad median process and a pair of long and curved arms; ventralia mostly filamentous
.. Sub. *Pandelleisca* .. *P. spinipenis*
6. 2nd and 3rd sternites with dense long hair, length of which longer than the length of each sternite
..... *P. doleschalli*
Hair on 2nd and 3rd sternites shorter than length of each sternite 7
7. Hind tibia without fringe 8
Hind tibia with fringe 10
8. Apical plate of paraphallus small with lateral processes, bifid at apex
..... *P. scopariiformis*
Apical plate of paraphallus elongated and with a median apophysis ... 9
9. Membranous lobe of paraphallus rod-like, blunt at apex; mid-tibia with 2 *ad* *P. iwuensis*
Membranous lobe of paraphallus divergent and curled at apex; mid-tibia with 1 *ad* *P. yunnanensis*
10. 1 row of black postocular setae 11
More than 1 row of black postocular setae 12
11. Inner forceps enlarged dorsally and with small spines along the anterior margin of dorsal surface; ventralia composed of 2 lobes, lower one serrated; lateral arm of apical plate pointed at apex *P. amplicerca*
Inner forceps normal, not enlarged dorsally and without spines; ventralia composed of 1 lobe; lateral arm of apical plate bifid at apex .. *P. misera*
12. Black genal hair located only in the anterior part of the genae; inner forceps beak-shape at apex
..... *P. brevicornis*
Black genal hair extending beyond anterior half of the genae; inner forceps pointed at apex *P. idmais*

General Characters of the Species

Head: *fv* dark brown to black; *pf* and *pa* dark brown with silvery to golden pollinosity; *a* mostly dark brown to black, but rarely orange, length of a_3 about 2 to $3 \times$ that of a_2 ; *pal* mostly dark brown to black, but rarely orange. *Thorax*: *ac* usually 0+1; *dc* 5+5-6; *ia* 1+3; *prsb* 1; *h* 3; *ph* 3; *np* 4; *pa* 2; *scut* usually 3+1; *st* 1:1:1; *pp* bare; *prs* hairy posteriorly. *Wings*: Hyaline; wing-

veins light brown; r_1 bare; r_{4+5} with a row of setae located dorsally extending more than half way from basal node to $r-m$ and with some setae on ventral surface of basal node; sq creamy white; ha brown. *Legs*: Dark brown to black; f_1 with 2 pd rows, 1 pv row, numerous, moderately long pv hair; arrangements of bristles on t_1 , f_2 and t_2 vary among species but 1 av row, 1 row of comb-like pv on apical part, 2 pd and 1 pl always present on f_2 and 1 v always present on t_2 ; f_3 usually with 2 ad rows, 1 av row, 1 pd , 1 pl ; t_3 always with 1 ad row and 2 pd . *Abdomen*: Mostly same color as thorax; T_3 without mb but mb well developed on T_4 and T_5 ; GT_1 and GT_2 mostly dark brown to black.

Only the different characters among the species are cited individually in the text.

3. *P. knabi* (Parker, 1917)

Sarcophaga knabi Parker, Proc. U.S. natn. Mus., 54: 66 (1917)

P. knabi: Rohd., Faune l' U.R.S.S., 19(1): 350 (1937)

MALE. Body length 7.0 to 12.0 mm. *Head*: Frons at vertex 0.27 to 0.30 of head width; ori 10–11 pairs, lower 1–2 pairs divergent; g with wholly yellowish-white hair and 1 row of black hair on the anterior margin; pal dark brown and slightly yellowish-orange at tips. *Thorax*: Pale ashy-gray. *Legs*: t_1 with 3 ad , 1 pl , 1 long and a short pd row; f_2 with 2–5 al , short pv fringe; t_2 with 2 ad , 1 pl , 1 pd row; f_3 with numerous long pv hair; t_3 with av and pv fringe. *Abdomen*: T_3 with weak mb or absent. Forceps and genitalia as shown in Fig. 3.

Specimens examined: This species is distributed throughout Thailand.

Distribution: Asian countries; Australia; New Guinea

Remarks: This species is very common and found on human feces and dead ani-

mals.

4. *P. orchidea* (Böttcher, 1913)

Sarcophaga orchidea Bött., Ann. hist.-nat.

Mus. natn. hung., 11: 375 (1913)

P. orchidea: Rohd., Faune l' U.R.S.S., 19(1): 203 (1937)

MALE. Body length 9.0 to 12.0 mm. *Head*: Frons at vertex 0.28–0.30 of head width; ori 10–12 pairs, lower 1–2 pairs divergent; g with only few black hairs on foremost anterior part but sometimes with wholly yellowish-hair; usually 1 row of black ps ; pal orange. *Thorax*: Pale ashy-gray. *Legs*: t_1 with 2–3 ad , a short pd row, 1 pl ; f_2 with 3–5 al , 1 pd , 1 pl ; t_2 with 2 ad , 1 long and a row of short pd , 1 pl ; f_3 with 2 ad rows, without fringe, only numerous hair and hair-like pv ; t_3 with pv fringe. *Abdomen*: T_3 with weak mb or absent, GT_1 light brown; GT_2 dark brown. Forceps and genitalia as shown in Fig. 4.

Specimens examined: This species is also distributed throughout Thailand.

Distribution: Widespread from South-east Asia to New Guinea and Australia

Remarks: It is found on human feces and dead animals and breeds in such media in nature.

5. *P. albiceps* (Meigen, 1826)

Sarcophaga albiceps Meigen, Syst. Besch. europ. zweifl. Insekt. 5: 22 (1826)

P. albiceps: Rohd., Faune l' U.R.S.S., 19(1): 191, 436 (1937)

MALE. Body length 8.5 to 12.0 mm. *Head*: Frons at vertex about 0.28 of head width; ori 11–12 pairs, lower 2–3 pairs divergent; black genal hair not extending beyond anterior half; 2–3 rows of black ps irregular. *Thorax*: Slightly dark gray. *Legs*: t_1 with 2–3 ad , 1 long and a short pd row, 1 pl ; f_2 with 3–4 pl , long pv fringe; t_2 with 1 ad , 2 pl , 1 long and a conspicuous pd row;

f_3 with short *av* fringe, long *pv* fringe; t_3 with 2–3 *pd*, 1 *av*, *av* fringe, *pv* fringe. Forceps and genitalia as shown in Fig. 5.

Specimens examined: This species is distributed throughout Thailand.

Distribution: Asia; Europe; Hawaii; New Guinea, Solomon Islands

Remarks: This species is commonly found on human feces, dead animals, animal dung and garbage and breeds in such media in nature.

6. *P. doleschalli*

(Johnston et Tiegs, 1921)

Sarcophaga doleschalli Johnston et Tiegs, Proc. R. Soc. Qd. 33(4): 73 (1921)

P. doleschalli: Delfinado, Catalog Dipt. Oriental Region, 3: 568 (1977)

MALE. Body length 7.0 to 14.0 mm. *Head*: Frons at vertex about 0.22 of head width; *ori* 11–13 pairs, lower 2–3 pairs divergent; *g* with black hair extending beyond anterior half; 3 rows of black *ps* irregular. *Thorax*: Dark gray; *.ac* 1+1. *Wings*: Darkened on anterior half; wing-veins dark brown. *Legs*: t_1 with 3–4 *ad*, without *pd*; f_2 with 4–6 *al*, 1 *pd*, thin *av* fringe, dense and long *pv* fringe; t_2 with 1 *ad*, 1 *pd*, 4 *pl*; f_3 with *av* fringe, *pv* fringe; t_3 with 1 *av*, *av* fringe, *pv* fringe. *Abdomen*: S_1 and S_2 with dense and very long hair. Forceps and genitalia as shown in Fig. 6.

Specimens examined: 18♂♂, Khao Yai, 800 m., 60 km. S. Pak Chong, 3, 6 X 1975, R. Kano & H. Kurahashi; 5♂♂, Khao Yai, 30 km. S. Pak Chong, 24–26 XII, 1975, S. Shinonaga & H. Shima; 2♂♂, Ban Yang, 1400 m., Doi Inthanon, Chiang Mai, 19 XII 1975, H. Shima.

Distribution: China, Indonesia, Thailand, Viet Nam, Moluccas

7. *P. scopariiformis*

(Senior-White, 1927)

Sarcophaga dux scopariiformis S.-W., Spolia zeylan., 14: 82 (1927)

P. scopariiformis: Fan, Synan. Flies China: 276 (1965)

MALE. Body length 10.0 mm. *Head*: Frons at vertex 0.26 of head width; *ori* 9–11 pairs, lower 2–3 pairs divergent; *g* with black hair extending over anterior half; 3 rows of black *ps* irregular. *Thorax*: Ashy-gray. *Legs*: t_1 with 2–3 *ad*, 1 *pl*, 0–1 short *pd*; f_2 with 4 *al*, 1 *pd*; t_2 with 2 *ad*, 1 *pd*, 1 long and a row of short and strong *pl*; f_3 with a *pv* row; t_3 with 1 long and 2–3 small *av*, without fringe. Forceps and genitalia as shown in Fig. 8.

Specimen examined: 1♂, Ban Pong Din, 10 km. N.E. Doi Saket, 20 IX 1975, R. Kano.

Distribution: China, Laos, Sri Lanka, Thailand

8. *P. iwuensis* (Ho, 1934)

Sarcophaga iwuensis Ho, Bull. Fan Mem. Inst. Biol., 5: 34 (1934)

P. iwuensis: Fan, Synan. Flies China: 276 (1965)

MALE. Body length 10 mm. *Head*: Frons at vertex 0.24 of head width; *ori* 11–12 pairs, lower 2–3 pairs divergent; *g* with black hair extending beyond anterior half; 3 rows of black *ps* irregular. *Thorax*: Pale brownish-gray. *Wings*: Darkened anteriorly; wing-veins brown. *Legs*: t_1 with 2 *ad*, 1 *pl*, without *pd*; f_2 with 3 *al*, 1 *pd*, thin *pv* fringe; t_2 with 2 *ad*, 1 *pl*, 1 long and a conspicuous *pd* row; f_3 with a *pv* row; t_3 with 1 long and a several *av* row, a hair-like *pv* row. Forceps and genitalia as shown in Fig. 7.

Specimens examined: 1♂, Doi Inthanon, Chiang Mai, 19 IX 1975, H. Kurahashi; 1♂, Ban Yang, 1400 m, Doi Inthanon, 23 IX 1975, R. Kano.

Distribution: China, Thailand

9. *P. yunnanensis* Fan, 1965

P. yunnanensis Fan, Sysan. Flies China: 276 (1965)

MALE. Body length 7.0 to 11.0 mm. *Head*: Frons at vertex 0.22–0.24 of head width; *ori* 12–13 pairs, lower 3 pairs divergent; *g* with black hair beyond anterior half; 3 rows of black *ps* irregular. *Thorax*: Slightly dark ashy-gray. *Wings*: Wing-veins dark brown. *Legs*: t_1 with 1 *pl*, 2–3 *ad*, without *pd*; f_2 with 4–6 *al*, long hair-like *pv* on basal half; t_2 with 1 *pd*, 3 *pl*, 1 *ad*; f_3 with a *pv* row, no fringe; t_3 with 1 long and a conspicuous *av* row. *Abdomen*: T_3 with weak *mb*. Forceps and genitalia as shown in Fig. 10.

Specimens examined: 29 ♂♂, Erawan w.f., 500 m., Kanchana Buri, 7, 10 IX 1975, R. Kano & H. Kurahashi; 29 ♂♂, Sai Yok, 500 m., Kanchana Buri, 9–13 XII 1975, S. Shinonaga & H. Shima; 1 ♂, Ban Yang, 1400 m., Doi Inthanon, 23 IX 1975, R. Kano; 1 ♂, Hill, C. 300 m., Sa Kao, 30 km. S.E., 3 IX 1975, H. Kurahashi.

Distribution: China, Thailand

10. *P. amplificercus* Shinonaga et Tumrasvin, 1979

P. amplificercus Shinonaga et Tumrasvin, Jap. J. Sanit. Zool., 30, 2: (1979)

MALE. Body length 13.0 to 14.0 mm. *Head*: Frons at vertex about 0.22 of head width; *ori* 9–11 pairs, lower 1 pair divergent; *g* with wholly yellowish-white hair; 1 row of black *ps*. *Thorax*: Pale ashy-gray. *Wings*: r_{4+5} with a row of setae located dorsally about half way from basal node to *r-m*. *Legs*: t_1 with 2–3 *ad*, 1 *pl*, without *pd*; f_2 with 3–5 *al*, 1 *pd*, relatively long *av* and *pv* hair; t_2 with 1 long and several conspicuous *ad*, a *pd* row, a *pl* row; f_3 with some long *pv* at distal end; t_3 with 1 long and a hair-like *pv* row, *pv* fringe. Forceps and genitalia

as shown in Fig. 9.

Specimens examined: 1 ♂, nr. Sai Yok, 500 m., Kanchana Buri, 9 IX 1975, W. Tumrasvin; 1 ♂, Ban Pong Din, 10 km. N.E. Doi Saket, 20 IX 1975, H. Kurahashi.

Distribution: Thailand

11. *P. spinipenis* Shinonaga et Tumrasvin, 1979

P. spinipenis Shinonaga et Tumrasvin, Jap. J. Sanit. Zool., 30, 2: (1979)

MALE. Body length 13.0 to 15.0 mm. *Head*: Frons at vertex about 0.22 of head width; *ori* 12–14 pairs, lower 2 pairs divergent; *g* with wholly yellowish-white hair; 1 row of black *ps*. *Thorax*: Ashy-gray; *ac* 1+1. *Legs*: t_1 with 2 *ad*, 1 *pl*, a short *pd* row; f_2 with 2–4 *al*, 1 *pd*, *av* fringe; t_2 with 1 *ad*, 1 *pl*, 1 long and a short *pd* row, *av* fringe, *pv* fringe; f_3 with hair-like *pv*, 1–2 *pd*; t_3 with *av* and *pv* fringe, without *av*. *Abdomen*: GT_1 brown but GT_2 orange to dark orange. Forceps and genitalia as shown in Fig. 12.

Specimens examined: 3 ♂♂, nr. Sai Yok, 500 m., Kanchana Buri, 8, 9 X 1975, R. Kano; 1 ♂, Chiang Mai, 6 II 1972, RAB.

Distribution: Thailand

Remarks: This species is easily differentiated from other species in the same genus by the shape and structure of the phallosome.

12. *P. misera* (Walker, 1849)

Sarcophaga misera Walker, List. Dipt. Br. Mus., 4: 849 (1849)

P. misera: Rohd., Faune 1' U.R.S.S., 19(1): 223 (1937)

MALE. Body length 7.0 to 11.0 mm. *Head*: Frons at vertex 0.26–0.28 of head width; *ori* 10–12 pairs, lower 2–3 pairs divergent; *g* with several black hair in foremost anterior part; 1 row of black *ps*. *Thorax*: Pale ashy-gray. *Legs*: t_1 with 2–3 *ad*, 1 *pl*, without *pd*; f_2 with 3–5 *al*, *av* fringe, *pv*

fringe, t_2 with 2 *ad*, 1 long and a row of short *pd*, 1 long *pl*; f_3 with a row of long hair-like *pv* in apical part, without fringe; t_3 with long hair-like *av*, *pv* fringe. *Abdomen*: GT_1 and GT_2 orange-brown to brown. Forceps and genitalia as shown in Fig. 13.

Specimens examined: This species is commonly found throughout Thailand.

Distribution: Borneo, China, Indonesia, Japan, Korea, Sri Lanka, Thailand; widespread in south pacific area including Australia, Hawaii and New Guinea

13. *P. brevicornis* (Ho, 1934)

Sarcophaga brevicornis Ho, Bull. Fan Mem. Inst. Biol., 5: 23 (1934)

P. brevicornis: Rohd., Faune l' U.R.S.S., 19(1): 222 (1934)

MALE. Body length 7.0 to 14.0 mm. *Head*: Frons at vertex 0.26–0.28 of head width; *ori* 10–11 pairs, lower 2–3 pairs divergent; *g* with black hair not extending beyond anterior half; 2 rows of black *ps* regular. *Thorax*: Pale brownish-gray. *Legs*: t_1 with 3 *ad*, usually without *pd*; f_2 with 4–6 *al*, *pv* fringe; t_2 with 1–2 *ad*, 1 *pd*, 1 long *pl*; f_3 with numerous long hair-like *pv* and thin *pv* fringe; t_3 with 1 *av* and numerous long hair-like *av*, *pv* fringe. Forceps and genitalia as shown in Fig. 11.

Specimens examined: This species is distributed throughout Thailand and seems to be commonly found in low land areas.

Distribution: Borneo, China, Japan, Malaysia, Thailand

Remarks: It breeds on dead animals and garbage in nature.

14. *P. idmais* (Séguy, 1934)

Sarcophaga idmais Séguy, Encycl. Ent. (B) II, Dipt., 7: 24 (1934)

P. idmais: Fan, Synan. Flies China: 289 (1965)

MALE. Body length 8.0 to 11.0 mm.

Head: Frons at vertex about 0.24 of head width; *ori* 10–11 pairs, lower 1–2 pairs divergent; *g* with black hair extending beyond anterior half; 3 rows of black *ps* irregular. *Thorax*: Ashy-gray. *Legs*: t_1 with 3–4 *ad*, 1 *pl*, without *pd*; f_2 with 4–6 *al*, *pv* fringe; t_2 with 4 *pl*, 1 long and a short *pd* row; f_3 with *av* and *pv* fringe, a moderately long hair-like *pv* row; t_3 with 1 *av* numerous long hair-like *av*, *pv* fringe. *Abdomen*: T_3 with weak *mb*. Forceps and genitalia as shown in Fig. 16.

Specimens examined: 2♂♂, nr. Sai Yok, 500 m., Kanchana Buri, 7, 9 IX 1975, R. Kano & H. Kurahashi; 2♂♂, Sai Yok, 500 m., Kanchana Buri, 9–13, 27–29 XII 1975, S. Shinonaga & H. Shima.

Distribution: China, Nepal, Thailand

15. *P. ruficornis* (Fabricius, 1794)

Musca ruficornis Fab., Ent. Syst.: 314 (1794)

P. ruficornis: Lopes, Insects Micronesia, 13(2): 48 (1958)

MALE. Body length 10.0 to 14.0 mm. *Head*: Frons at vertex 0.24–0.26 of head width; *ori* 11–13 pairs, lower 2–3 divergent; *g* with yellowish-white hair; 1 row of black *ps*; *a* and *pal* orange. *Thorax*: Light brownish-gray. *Legs*: t_1 with 2–3 *ad*, 1 *pl*, without *pd*; f_2 with 3–4 *al*, 4–5 long and flat *pv* in middle portion (which is subequal to or slightly longer than the diameter of f_2) intermixed with numerous long hair, without fringe; t_2 with 1 *ad*, 1 long *pl*, 1 *pd*; f_3 with a complete *ad* row and 1 to a row of 3 *ad* on inner side; 1 *pv* row; t_3 with 1 *av*, *pv* fringe poorly developed or almost bare. *Abdomen*: GT_1 and GT_2 orange. Forceps and genitalia as shown in Fig. 14.

Specimens examined: 8♂♂, Mahidol Univ., Bangkok, 4 IX 1975, H. Kurahashi; 3♂♂, Bangna Nai, Bangkok, 28 VIII 1975, R. Kano & H. Kurahashi; 1♂, Sam Sane,

Bangkok, 29 VIII 1975, H. Kurahashi; 1 ♂, Bangkok, 23 VIII 1964, R. Kano.

Distribution: China, India, Indonesia, Japan, Malaysia, Philippines, Sri Lanka, Thailand; Africa; Brasil; Hawaii, Madagascar, Mariana Islands, Moluccas, Samoa, Socotra

Remarks: This species is commonly found in Bangkok.

GENUS *Boettcherisca* Rohdendorf, 1937

Boettcherisca, Rohd., Faune 1' U.R.S.S., 19(1): 270 (1937)

Frons broad; arista long-plumose along basal 2/3; propleulon hairy; *ac* 0+1; *post dc* 5; *r*₁ bare; hind tibia of male without fringe; theca shorter than paraphallus; apical part of paraphallus distinguishable; ventralia large, globose and with numerous minute spines.

KEY TO THE SPECIES

1. Black genal hair not extending beyond anterior half; spines on the apical part of inner forceps not extending to the dorsal side *B. peregrina*
Black genal hair extending beyond anterior half; spines on the apical part of inner forceps extending to the dorsal side 2
2. Ventralia reduced to small rounded shape *B. javanica*
Ventralia largely produced
. *B. nathani*

General Characters of the Species

fv dark brown to black; *pf* and *pa* with golden to silvery pollinosity; *ori* 10–13 pairs, lower 2–3 pairs divergent; *a*₃ dark reddish-brown to dark brown and its length about 2× that of *a*₂; 3 rows of black *ps* irregular; *pal* black. *Thorax:* *ac* 0+1; *dc* 5+5–7; *ia* 1+2; *prsb* 1; *hb* 3; *ph* 2; *np* 4; *sa* 3; *pa* 2; *scut* 3+1; *st* 1:1:1; *pp* hairy; *prs* hairy posteriorly. *Wings:* Hyaline, darkened

anteriorly; *r*₄₊₅ with a row of setae located dorsally extending more than half way from basal node to *r-m* and with several setae on ventral surface of basal node; *sq* creamy white; *ha* brown. *Legs:* Black *f*₁ with 2 *pd* rows, a *pv* row; *t*₁ with 2–3 *ad*, 1 *pl*; *f*₂ with 3–4 *al*, a *av* row, 1 *pd*, 1 *pl*, comb-like *pv* on anterior part, thin *pv* fringe; *t*₂ with 1 *ad*, 1 *v*, 1 long and a short *pd* row, 3 *pl*; *f*₃ with 2 *ad* rows, 1 *av* row, 1 *pd*, 1 *pl*; *t*₃ with a *ad* row, 1 *v*, 2 *pd*, a row of hair-like *pv* on apical 2/3. *Abdomen:* Same color as thorax; *T*₃ without *mb* but *mb* well developed on *T*₄ and *T*₅.

Only the different characters among the species are cited individually in the text.

16. *B. peregrina*

(Robineau-Desvoidy, 1830)

Myophora peregrina R.-D., Essai Myodaires. Mem. pres. Acad. Sci. Inst. Fr., (2)2: 356 (1830)

B. peregrina: Rohd., Faune 1' U.R.S.S., 19(1): 271 (1937)

MALE. Body length 7.9 to 11.0 mm. *Head:* Frons at vertex 0.22–0.24 of head width. *Thorax:* Pale brownish-gray. *Legs:* Hair-like *pv* on *t*₃ moderately long. *Abdomen:* Genital tergites orange-brown to brown; anterior paramere much longer than posterior paramere. Forceps and genitalia as shown in Fig. 19.

Specimens examined: This species is commonly found in Bangkok and seems to be distributed in the lowland areas.

Distribution: Asia, Australia; Hawaii, New Britain, New Guinea, Samoa, Society Islands.

Remarks: This species is commonly found on garbage, animal dung, human feces, especially in privies. It could be of considerable importance as a mechanical vector of etiologic agents of diseases in areas where it is particularly abundant (Kano *et*

al., 1967).

17. *B. nathani* Lopes, 1961

B. nathani Lopes, Mem. Inst. Oswaldo Cruz, 59(1): 79 (1961)

MALE. Body length 7.0 to 13.0 mm. *Head*: Frons at vertex 0.22–0.24 of head width. *Thorax*: Dark gray. *Legs*: Hair-like *pv* on t_3 moderately long. *Abdomen*: Genital tergites orange-brown to brown; anterior paramere almost equal to posterior paramere in length. Forceps and genitalia as shown in Fig. 20.

Specimens examined: It is distributed throughout Thailand, but is never observed in the towns.

Distribution: India, Nepal, Thailand

18. *B. javanica* Lopes, 1961

B. javanica Lopes, Mem. Inst. Oswaldo Cruz, 59(1): 79 (1961)

MALE. Body length 8.0 to 11.0 mm. *Head*: Frons at vertex 0.24 of head width. *Thorax*: Pale brownish-gray. *Legs*: Hair-like *pv* on t_3 short. *Abdomen*: Genital tergites slightly orange-brown; anterior paramere little longer than posterior paramere in length. Forceps and genitalia as shown in Fig. 17.

Specimens examined: 21 ♂♂, Mahidol Univ., Bangkok, 2, 4, 14 IX 1975, R. Kano & H. Kurahashi; 21 ♂♂, Salt pond, 6 km. N. Chon Buri, 2 IX 1975, H. Kurahashi.

Distribution: Borneo, Indonesia, Thailand

GENUS *Sarcorohdendorfia* Baranov, 1938

Sarcorohdendorfia Baranov, Vet. Arch. Zagreb, 8: 173 (1938)

Antennae long; arista long-plumose along the basal 2/3; propleuron hairy; *post ac* 1; *post dc* 4; r_1 bare; 4th sternite of male usually with a patch of spine-like bristles posteriorly; 5th sternite of male V-shaped; 1st

genital tergite of male without marginal bristles; paraphallus long and its apical part well differentiated; apical plate of paraphallus without lateral processes; ventralia well developed; anterior paramere bifid.

KEY TO THE SPECIES

1. 4th sternite without patch of spine-like bristles posteriorly; only few black genal hair most anteriorly
..... *S. montana*
- 4th sternite with a conspicuous patch of spine-like bristles posteriorly; black genal hair extending beyond anterior half 2
2. Inner forceps rather slightly curved and with groove basally; apical plate with basal apophyses *S. flavinervis*
Inner forceps strongly bent and without groove basally; apical plate without apophyses 3
3. Hair on 4th sternite very long and equal in length to those of 3rd sternite; inner ridge of posterior surface of inner forceps with some fine long hair and outer ridge with spines; ventralia two-wave-like shaped and its apical portion hook-like
..... *S. multivillosa*
- Hair on 4th sternite much shorter than those of 3rd sternite; inner ridge of posterior surface of inner forceps bare, only with spines at outer ridge; ventralia well developed 4
4. Margin of ventralia serrated on apical half *S. inextricata*
Ventralia lobe-like and without serration *S. antilope*

General Characters of the Species

Head: *fv* black; *pf* and *pa* with bright golden to silvery pollinosity; *a* dark brown to black, length of a_3 about 2.5 to 3× that of a_2 ; black genal hair usually extending more than anterior half; usually many rows

of black *ps*, only 1st row regular; *pal* blackish-brown. *Thorax*: *ac* 5-6+1; *dc* 4-5+4; *ia* 1+2-3 (usually 3); *prsb* 1; *hb* 4; *ph* 2-3; *np* 4; *sa* 4; *pa* 2; *scut* 3+1; *st* 1:1:1; *pp* hairy; *prs* hairy posteriorly. *Wings*: Hyaline, slightly darkened anteriorly; wing-veins usually brown; r_{4+5} with a row of setae located dorsally extending about half way from basal node to *r-m*, and with some setae on ventral surface of basal node; *sq* usually creamy white; *ha* brown. *Legs*: Black; f_1 with 2 *pd* rows, 1 *pv* row and numerous long *pv* hair; t_1 with 1 *pl*, a short *pd* row; f_2 with 3-6 *al*, a *av* row, 1 *pl*, comb-like *pv* on apical 1/3 and *pv* fringe on basal 2/3; t_2 with 1 *al*, 1 *v*, 2-3 long and a row of short to conspicuous *pd*, 1 *pl*; f_3 with 2 *ad* rows, a *av* row, a hair-like *pv* row, 1 *pl*, numerous long *av* and *pv* hair; t_3 with a *ad* row, 1 strong and several hair-like *av*, *pv* fringe. *Abdomen*: Same color as thorax; T_3 usually without *mb* but *mb* well developed on T_4 and T_5 .

Only the different characters among the species are cited individually in the text.

19. *S. inextricata* (Walker, 1860)

Sarcophaga inextricata Walker, J. Pr. Linn. Soc. London, 4: 132 (1860)

MALE. Body length 8.0 to 12.0 mm. *Head*: Frons at vertex 0.22-0.24 of head width; *ori* 11-14 pairs, lower 2-3 pairs divergent. *Thorax*: Slightly brownish-gray. *Legs*: t_1 with 3-4 *ad*; f_2 with 2 *pd*, without *pv* fringe, only moderately long hair present; f_3 with 3 *pd*; t_3 with 2 long *pd*. *Abdomen*: Genital tergites orange to orange-brown. Forceps and genitalia as shown in Fig. 15.

Specimens examined: This species is usually found in the mountainous areas.

Distribution: Indonesia, Thailand

20. *S. antilope* (Böttcher, 1913)

Sarcophaga antilope Bött., Ann. hist.-nat.

Mus. natn. hung., 11: 374 (1913)

MALE. Body length 11.0 to 13.0 mm. *Head*: Frons at vertex about 0.25 of head width; *ori* 11-13 pairs, lower 2-3 pairs divergent. *Thorax*: Gray. *Legs*: t_1 with 2-3 *ad*; f_2 with 2-3 *pd*; f_3 with a row of few *av* on apical half, 2-4 *pd*; t_3 with 2 long and a conspicuous *pd* row. *Abdomen*: T_5 darker than the anterior 4 tergites or sometimes reddish-brown; GT_1 and GT_2 orange-brown. Forceps and genitalia as shown in Fig. 18.

Specimens examined: 1♂, Ban Yang, 1400 m., Doi Inthanon, 23 IX 1975, H. Kurahashi; 2♂♂, Fang Exp. St., 500 m., Fang, 25 IX 1975, R. Kano & H. Kurahashi; 1♂, Doi Huai Hwer, 1231 m., Fang, 27 IX 1975, R. Kano; 2♂♂, nr. Sai Yok, 500 m., Kanchana Buri, 9 IX 1975, R. Kano & H. Kurahashi; 1♂, Hill, C. 300 m., Sa Kaeo, 30 km. S.E., 3 IX 1975, H. Kurahashi.

Distribution: China, India, Indonesia, Japan, Korea, Nepal, Sri Lanka, Thailand; New Britain, New Ireland, Solomon islands

21. *S. flavinervis* (Senior-White, 1924)

Sarcophaga flavinervis S.-W., Rec. Ind. Mus., 26: 222 (1924)

MALE. Body length 18.0 to 20.0 mm. *Head*: Frons at vertex about 0.24 of head width; *pf* and *pa* with golden pollinosity; *ori* 11-15 pairs, lower 3-4 pairs divergent. *Thorax*: Brownish-gray. *Wings*: Yellowish basally and anteriorly; wing-veins and *sq* yellowish; *ha* pale yellowish-brown. *Legs*: t_1 with 2-3 *ad*; f_2 with 2 *pd*; f_3 with 2-4 *pd*; t_3 with 2 long and a conspicuous *pd* row. *Abdomen*: GT_1 and GT_2 dark brown. Forceps and genitalia as shown in Fig. 22.

Specimens examined: This species is found in the mountainous areas.

Distribution: India, Japan, Korea, Moluccas, Thailand

22. *S. montana* Shinonaga
et Tumrasvin, 1979

S. montana Shinonaga et Tumrasvin, Jap.
J. Sanit. Zool., 30, 2: (1979)

MALE. Body length 11.0 to 12.0 mm.
Head: Frons at vertex about 0.23 of head
width; *ori* 9–11 pairs, lower 2 pairs diver-
gent. *Thorax*: Gray; *ac* 6–7+1; *ia* 1+2.
Legs: *t*₁ with 3 *ad*; *f*₂ with 1 *pd*; *f*₃ with 1
pd; *t*₃ with 2 long *pd*. *Abdomen*: Slightly
more reddish-brown than thorax, especially
last segment reddish; *T*₃ with a pair of *mb*;
*S*₄ without any patch of spine-like bristles
posteriorly; *GT*₁ and *GT*₂ reddish-orange.
Forceps and genitalia as shown in Fig. 21.

Specimens examined: 1♂, Erawan w.f.,
500 m., Kanchana Buri, 7 IX 1975, W.
Tumrasvin; 1♂, nr. Sai Yok, 500 m, Kan-
chana Buri, H. Kurahashi; 1♂, Sai Yok,
500 m., Kanchana Buri, 27–29 XII 1975, S.
Shinonaga.

Distribution: Thailand

23. *S. multivillosa* Shinonaga
et Tumrasvin, 1979

S. multivillosa Shinonaga et Tumrasvin,
Jap. J. Sanit. Zool., 30, 2: (1979)

MALE. Body length 10.0 to 13.0 mm.
Head: Frons at vertex about 0.23 of head
width; *ori* 12–16 pairs, lower 3 pairs diver-
gent. *Thorax*: Dark ashy-gray. *Wings*: *sq*
creamy white but darkened at center. *Legs*:
*t*₂ with 2 *ad*; *f*₂ with 1 *pd*; *f*₃ with 1 *pd*; *t*₃
with 2 *pd*. *Abdomen*: *T*₃ with weak *mb*;
*S*₂ to *S*₄ covered with extra long hair which
are equal in length; *GT*₁ and *GT*₂ dark
brown. Forceps and genitalia as shown in
Fig. 23.

Specimens examined: 1♂, Doi Pui,
1685 m., C. Chiang Mai, 16 IX 1975, R.
Kano; 3♂♂, Doi Suthep, Chiang Mai, 20–
21 XII 1975, S. Shinonaga & H. Shima; 1♂,
Khao Khiaw, 1351 m., 80 km. S. Pak Chong,

6 X 1975, H. Kurahashi; 1♂, Khao Yai,
30 km. S. Pak Chong, 25–26 XII 1975, S.
Shinonaga.

Distribution: Thailand

Remarks: The hair on the sternites of
male are very characteristic of this species.

GENUS *Sarcosolomon* Baranov, 1938

Sarcosolomon Baranov, Vet. Arch.
Zagreb, 8: 73 (1938)

Arista long-plumose along the basal 1/2;
propleuron bare; *post ac* 1; *dc* 4; *r*₁ setulose
or bare; 3rd tergite with or without a pair
of median marginal bristles; inner forceps
with or without subapical spines; apical part
of paraphallus distinguishable; ventralia
well developed, membranous or sclerotized;
apical plate of paraphallus without lateral
processes; styli long and curved forward.

KEY TO THE SPECIES

1. 3rd tergite always with median margin-
al bristles; inner forceps with sub-
apical spines 2
3rd tergite without median marginal
bristles; inner forceps without sub-
apical spines 3
2. Mid-tibia with 1 *al*; inner forceps
pointed at apex and with conspicu-
ous subapical spines; paraphallus
long; ventralia pointed at apex . . .
. *S. shinonagai*
Mid-tibia with 2 *al*; inner forceps beak-
like at apex and with inconspicuous
subapical spines; paraphallus circled;
ventralia round at apex *S. sp.*
3. Vein *r*₁ setose 4
Vein *r*₁ bare 5
4. Anterior paramere with flange; ventra-
lia bifid at apex *S. harinasutai*
Anterior paramere without flange; ven-
tralia pointed at apex.
. *S. trifulcata*
5. Middle of anterior part of inner forceps

with free part bent upward; inner forceps pointed at apex; apical plate of paraphallus small

. *S. aureomarginata*

Anterior part of inner forceps normal, forked at apex; apical plate of paraphallus large *S. crinita*

General Characters of the Species

Head: *fv* black; *pf* and *pa* dark brown with golden to silvery pollinosity; *a* dark brown, length of *a*₃ about 2 to 2.5× that of *a*₂; *g* black, black genal hair extending beyond anterior half; 3 rows of black *ps*; *pal* dark brown to black. *Thorax:* *dc* usually 4+4; *ia* 1+3; *prsb* 1; *hb* 3; *ph* 2; *np* 4; *sa* 3; *pa* 2; *scut* 3+1; *st* 1:1:1; *pp* bare; *prs* hairy posteriorly. *Wings:* Hyaline; wing-veins light brown to brown; *r*₄₊₅ with a row of setae located dorsally extending more than half way from basal node to *r-m* and with some setae on ventral surface of basal node; *sq* creamy white; *ha* brown. *Legs:* Dark brown to black; *f*₁ with 2 *pd* rows, a *pv* row; *t*₁ with 2 *ad*, 1 *pl*; *f*₂ with an *av* row, 1 *pd*, 1 *pl*; *t*₂ usually with 1 *al*, 1 *v*, 1 *pl*; *t*₃ with an *ad* row, 2 *av*, 2 *pd*. *Abdomen:* Usually same color as thorax; *mb* well developed on *T*₄ and *T*₅; *GT*₁ and *GT*₂ dark brown.

Only the different characters among the species are cited individually in the text.

24. *S. shinonagai* Kano et Sooksri, 1977

S. shinonagai Kano et Sooksri, *Pacif. Inst.*, 17: 234 (1977)

MALE. Body length 7.0 to 11.0 mm. *Head:* Frons at vertex 0.24–0.26 of head width; *ori* 9–10 pairs, lower 2–3 pairs divergent; black *ps* regular. *Thorax:* Gray; *ac* 4+1. *Wings:* *r*₁ bare. *Legs:* *t*₁ with 2 *ad*, 2 long *pd*; *f*₂ with 4 *al*, a *pv* row, thin *pv* fringe in basal half; *t*₂ with 3–4 long *pd*; *f*₃ with a *pv* row, several long *pv* hair, 1 *pd*, 1 *pl*. Forceps and genitalia as shown in Fig. 29.

Specimens examined: 3♂♂, Sai Yok, 500 m., Kanchana Buri, 9–13 XII 1975, S. Shinonaga; 6♂♂, nr. Sai Yok, 500 m., Kanchana Buri, 6, 9 IX 1975, R. Kano & H. Kurahashi.

Distribution: Thailand

25. *S. harinasutai* Kano et Sooksri, 1977

S. harinasutai Kano et Sooksri, *Pacif. Inst.*, 17: 233 (1977)

MALE. Body length 5.0 to 9.0 mm. *Head:* Frons at vertex about 0.24 of head width; *ori* 8–10 pairs, lower 2–3 pairs divergent; black *ps* regular to subirregular. *Thorax:* Gray; *ac* 4+1. *Wings:* *r*₁ setose. *Legs:* *t*₁ with 2 *ad*, 2 long *pd*; *f*₂ with 2–4 *al*, a *pv* row, thin *pv* fringe on basal half; *t*₂ with 2 long and a conspicuous *pd* row; *f*₃ with a *pv* row, several long *pv* hair, 1 *pd*, 1 *pl*. Forceps and genitalia as shown in Fig. 24.

Specimens examined: This species is distributed only in the mountainous areas.

Distribution: Thailand.

26. *S. crinita* (Parker, 1917)

Sarcophaga crinita Parker, *Proc. U.S. natn. Mus.*, 54: 93 (1917)

Sarcosolomonina crinita: Lopes et Kano, *Pacif. Inst.*, 11: 181 (1969)

MALE. Body length 6.0 to 9.0 mm. *Head:* Frons at vertex 0.24–0.26 of head width; *ori* 9–12 pairs, lower 2–3 pairs divergent; black *ps* regular. *Thorax:* Gray; *ac* 4+1. *Wings:* *r*₁ bare. *Legs:* *t*₁ with 2 *ad*, a short *pd* row; *f*₂ with a *al*, a *pv* row, several long *pv* hair in basal part (but in some specimens with slightly thin fringe); *t*₂ with 1–3 long *pd*; *f*₃ with 1 *pd*, 1 *pl*, a *pv* row, without several long *pv* hair. Forceps and genitalia as shown in Fig. 25.

Specimens examined: 4♂♂, Sai Yok, 500 m., Kanchana Buri, 9–13 XII 1975, S. Shinonaga; 5♂♂, nr. Sai Yok, 500 m., Kan-

chana Buri, 11 IX & 8 X 1975, R. Kano & H. Kurahashi; 1 ♂, wood & grass ld., Ayutthaya, 1 IX 1975, H. Kurahashi.

Distribution: China, Philippines, Thailand Taiwan; Admiralty islands, Australia, New Britain, New Guinea, Solomon islands.

27. *S. aureomarginata* Shinonaga
et Tumrasvin, 1979

S. aureomarginata Shinonaga et Tumrasvin, Jap. J. Sanit. Zool., 30, 2: (1979)

MALE. Body length 10.0 mm. *Head*: Frons at vertex 0.22 of head width; *ori* 12–14 pairs, lower pairs not divergent; length of a_3 about 5X that of a_2 ; black *ps* irregular. *Thorax*: Ashy-gray; *ac* 6+1; *dc* 5+4; *ia* 1+2. *Wings*: r_1 bare; *sq* white but darkened anteriorly. *Legs*: t_1 with 2 *ad*, a short *pd* row; f_2 with 4–5 *al*, thin and short *av* and *pv* fringe, 3 *pd*, 3 *pl*; t_2 with 2 long and a conspicuous *pd* row; f_3 with 2–3 *pd*, 1 *pl*, short and thin *av* fringe, a row of hair-like *pv*; t_3 with *av* and *pv* fringe. *Abdomen*: T_{1+2} and T_3 slightly golden ashy; T_4 and T_5 brightly golden. Forceps and genitalia as shown in Fig. 26.

Specimen examined: 1 ♂, Erawan w.f., 500 m., Kanchana Buri, 10 IX 1975, H. Kurahashi.

Distribution: Thailand

28. *S. trifulcata* Shinonaga
et Tumrasvin, 1979

S. trifulcata Shinonaga et Tumrasvin, Jap. J. Sanit. Zool., 30, 2: (1979)

MALE. Body length 10.0 mm. *Head*: Frons at vertex 0.26 of head width; *ori* 10 pairs, lower 2 pairs divergent; black genal hair not extending beyond anterior half; black *ps* regular. *Thorax*: Ashy-gray; *ac* 5+1. *Wings*: r_1 setulose. *Legs*: t_1 with 3 *ad*, 1 relatively long and a row of short *pd*; f_2 with 3 *al*, a *pv* row, long *pv* hair; t_2 with 1 long and some short *al*, 3 long and a short

pd row; f_3 with a *pv* row and a row of hair-like *pv*, 1 *pd*, 1 *pl*; t_3 with 2 long and a short *pd* row. Forceps and genitalia as shown in Fig. 27.

Specimens examined: 1 ♂, Sai Yok, 500 m., Kanchana Buri, 27–29 XII 1975, S. Shinonaga.

Distribution: Thailand

29. *S. sp.*

MALE. Body length 5.0 to 8.0 mm. *Head*: Frons at vertex 0.24–0.26 of head width; *ori* 8–10 pairs, lower 2 pairs divergent; black *ps* regular. *Thorax*: Brownish-gray, median longitudinal stripe with 2 narrow submedian stripes; *ac* 0+1; *dc* 5+4–5. *Legs*: t_1 with 2–3 *ad*, a short *pd* row; f_2 with 3–5 *al*, 1 *pd*, 1 *pl*, a *pv* row and several long *pv* hair; t_2 with 2 *al*, a long and a conspicuous *pd*; f_3 with a *pv* row, long *av* and *pv* hair. *Abdomen*: T_3 with a pair of *mb*. Forceps and genitalia as shown in Fig. 28.

Specimens examined: 17 ♂♂, Mangrove, Chon Buri, 23 XII 1975, S. Shinonaga; 7 ♂♂, Salt Pond, 6 km. N. Chon Buri, 2 IX 1975, H. Kurahashi & W. Tumrasvin; 2 ♂♂, Beach, c. 30 km. S. Chon Buri, 30 VIII 1975, H. Kurahashi & W. Tumrasvin.

Distribution: Singapore, Thailand

Remarks: The subapical spines on inner forceps are so small that we must look under the microscope (100X). Mr. Murphy has many specimens of this species collected in Singapore and he is describing them now. Therefore, we have not named this species in this paper at this time.

GENUS *Blaesoxipha* Löw, 1861

Blaesoxipha Löw, Wien. ent. Mschr. 5: 384 (1861)

Small to medium size; arista plumose along basal 1/2; *post dc* 3; propleuron bare; hind tibia without fringe; 3rd tergite with

or without median marginal bristles; 3rd and 4th sternites with numerous, relatively long hair; 5th sternite V-shaped; phallosome small, long and slender; inner forceps usually bent posteriorly and spinose; ventralia with or without spines; apical plate of paraphallus long and membranous.

KEY TO THE SPECIES

1. 3rd tergite with a pair of strong median marginal bristles; *st* 2:1 2
- 3rd tergite with inconspicuous or without median marginal bristles; *st* 1:1 3
2. Palpi orange to dark brown (if dark brown, distinctly orange at apex); 2nd antennal segment orange *B. pachytyli*
- Palpi and 2nd antennal segment blackish-brown *B. filipjevi*
3. Middle part of inner forceps with free part bent backward; ventralia spinose; anterior paramere much enlarged and curved upright *B. thailandica*
- Middle part of inner forceps without free part bent backward; ventralia without spines; anterior paramere slender *B. unicolor*

General Characters of the Species

Head: *fv* black; *pf* and *pa* dark brown to black with slightly silvery pollinosity; length of a_3 2× that of a_2 ; *g* black with slightly silvery pollinosity and with black hair; 3 black *ps* rows irregular. *Thorax:* Median longitudinal stripe with 2 narrow submedian stripes; *ia* 1+3; *prsb* 1; *hb* 3; *ph* 2; *np* 4; *sa* 3-4; *pa* 2; *scut* 3+1; *pp* bare; *prs* hairy posteriorly. *Wings:* Hyaline; wing-veins yellowish-brown to brown; r_1 bare; r_{4+5} with a row of setae located dorsally extending more than half way from basal node to *r-m* and with some setae on ventral surface of basal node; *sq* light brown in

posterior half; *ha* yellowish-brown. *Legs:* Brownish-black; f_1 with a *pv* row, numerous, moderately; long *pv* hair; t_1 with 1 *pl*; f_2 with 2 long *av*, 2-3 long *pv* in basal half, 3-4 strong but short *pv* distally, 1 *pd*, 1 *pl*; f_3 with a *av* row, 3 long *pv*, 1 *pd*, 1 *pl*; t_3 with 2 long and a row of some short *ad*. *Abdomen:* Same color as thorax; *mb* on T_4 well developed.

Only the different characters among the species are cited individually in the text.

30. *B. pachytyli* (Skuse, 1891)

Masicera pachytyli Skuse, Agric. Gaz. N.S.W., 2: 251 (1891)

B. pachytyli: Hardy, Proc. Linn. Soc. N.S. Wales, 61: 89 (1936)

MALE. Body length 5.0 to 8.0 mm. *Head:* Frons at vertex 0.16-0.20 of head width; *a* brown, a_2 and posterior part of a_3 orange to orange-brown; *ori* 9-12 pairs, the lower 1 pair divergent. *Thorax:* Dark brownish-gray; *ac* 3+3; *dc* 3-4+3. *Legs:* f_1 with 2 *pd* rows; t_1 with 2-3 *ad*; f_2 with 1-2 *al*; f_3 with 2 *ad* rows; t_3 with 2 *av*, 2-3 *pd*. Forceps and genitalia as shown in Fig. 30.

Specimens examined: 2♂♂, Prov. Khao-phappa, Khaochang, 200-400 m., G. A. Samuelson, Bishop Museum, 3 I 1964; 2♂♂, Doi Huai Hwer, 1231 m., Fang, 27 IX 1975, R. Kano; 1♂, Fang Exp. Stn., 500 m., Fang, 25 IX 1975, R. Kano; 1♂, Beach, c. 30 km. S. Chon Buri, 30 VIII 1975, R. Kano.

Distribution: Philippines, Thailand; Australia, Bismark Archipelago

31. *B. filipjevi* Rohdendorf, 1928

B. filipjevi Rohd., 1928: 26

MALE. Body length 10.0 mm. *Head:* Frons at vertex 0.18 of head width; *ori* 12 pairs, lower 1-2 pairs divergent. *Thorax:* Brownish-gray; *ac* 3+5; *dc* 4+3. *Wings:* Subhyaline. *Legs:* f_1 with 2 *pd* rows; t_1 with

2 *ad*; *f*₂ with 2 *al*; *f*₃ with 2 *ad* rows; *t*₃ with 1 *av*, 2 *pd*. Forceps and genitalia as shown in Fig. 34.

Specimens examined: 1 ♂, Doi Huai Hwer, 1231 m., Fang, 27 IX 1975, R. Kano.

Distribution: Thailand; Central Asia; North Africa; Palearctic region

32. ***B. thailandica*** Shinonaga et Tumrasvin, 1979

B. thailandica Shinonaga et Tumrasvin, Jap. J. Sanit. Zool., 30, 2: (1979)

MALE. Body length 7.0 mm. *Head*: Frons at vertex 0.16 of head width; *a* dark brown; *ori* 12 pairs, lower 1 pair divergent. *Thorax*: Dark gray; *ac* 2+4; *dc* 3+3. *Wings*: Hyaline. *Legs*: *f*₁ with a *pd* row; *t*₁ with 2 *ad*; *f*₂ with 1 *al*; *f*₃ with an *ad* row; *t*₃ with 2 *av*, 2 *pd*. Forceps and genitalia as shown in Fig. 32.

Specimen examined: 1 ♂, Sai Yok, 500 m., Kanchana Buri, 27-29 XII 1975, S. Shinonaga.

Distribution: Thailand

33. ***B. unicolor*** Villeneuve, 1912

B. unicolor Vill., 1912: 615

MALE. Body length 8.0 mm. *Head*: Frons at vertex 0.20 of head width; *a*₂ orange posteriorly; *ori* 10 pairs, lower 1 pair divergent; *pal* dark brown. *Thorax*: Gray; *ac* 2+4; *dc* 4+3. *Wings*: Slightly subhyaline. *Legs*: *f*₁ with 1 *pd* row; *t*₁ with 3-4 *ad*; *f*₂ with 2 *al*; *f*₃ with an *ad* row; *t*₃ with 1 *av*, 2 *pd*. Forceps and genitalia as shown in Fig. 31.

Specimens examined: 1 ♂, Chiang Mai, Fang, 500 m., 4 XII 1958, T. C. Maa.

Distribution: Thailand; Palearctic region

Remarks: Most species of this genus were reported as the parasites of locust (Rohdenorf, 1937; Kano *et al.*, 1967). The members of this genus seem to be distributed mostly in the northern part of Thailand.

GENUS ***Lioproctia*** Enderlein, 1928

Lioproctia Ender., Arch. klass. phyl. Ent., 1: 26 (1928)

Medium to large size; arista long-plumose along the basal 1/2; *prst ac* well developed; *post dc* 4; propleuron hairy or bare; phallosome very large; styli large and stout, covered with microscopic hair; apical part of paraphallus without lateral processes.

KEY TO THE SPECIES

Propleuron bare; 3rd and 4th sternites with long hair, the length of each hair on each sternite being almost equal; genital tergite dark brown; inner forceps broad and pointed at apex, anterior margin without spines *L. beesoni*
 Propleuron hairy; 3rd sternite with short hair but 4th one with sparse hair; genital tergite brownish-orange; inner forceps broad and beak-like at apex, anterior margin with some strong spines along the middle portion *L. pattoni*

General Characters of the Species

Head: *fv* black; *pf* and *pa* dark brown with golden silvery pollinosity; *a* dark brown, length of *a*₃ about 2.5× that of *a*₂; *g* black; 3 rows of black *ps* irregular; *pal* black. *Thorax*: Median longitudinal stripe with 2 narrow submedian stripes; *ac* 5-6+1-2; *dc* 5+4; *prsb* 1; *hb* 4-6; *ph* 2; *np* 4; *sa* 3-5; *pa* 2; *scut* 3-5+1; *st* 1:1:1; *prs* hairy posteriorly. *Wings*: Hyaline, slightly darken anterior half; wing-veins brown; *r*₁ bare; *r*₄₊₅ with a row of setae located dorsally extending more than half way from basal node to *r-m*, and with some setae on ventral surface of basal node; *sq* creamy white; *ha* brown. *Legs*: Black, *f*₁ with 2 *pd* rows, a *pv* row, numerous long *pv* hair, thin *av* and *pv* fringe on basal half; *t*₁ with a row of short *pd*; *f*₂ with 3-4 *al*, 1-2 *pd*, a *av* row, comb-like *pv*; *t*₂ with 1 *ad*, 1 *v* 1-3 *pl*, 2-3

long and a conspicuous *pd* row; *f*₃ with 2 *ad* rows, an *av* row, 1 *pl*, a hair-like *pv* row, long *pv* hair; *t*₃ with an *ad* row, 1 *av*, 2 *pd*, *av* and *pv* fringe. *Abdomen*: Same color as thorax; *T*₃ without *mb* but *mb* well developed on *T*₄ and *T*₅.

Only the different characters among the species are cited individually in the text.

34. *L. beelsoni* (Senior-White, 1924)

Sarcophaga beelsoni S.-W., Rec. Indian Mus., 26: 243 (1924)

L. beelsoni: Delfinado, Catalog Dipt. Oriental Region, 3: 567 (1977)

MALE. Body length 10.0 to 12.0 mm. *Head*: Frons at vertex about 0.24 of head width; *ori* 12 pairs, lower 2–3 pairs divergent; *g* with only black hair. *Thorax*: Light brownish-gray; *ia* 1+2–3. *Legs*: *t*₁ with 2 *ad*, 1 *pl*; *f*₂ with 1 *pl*, numerous, relatively long *av* and *pv* hair forming weak fringe in basal half; *f*₃ with 3 *pd*, a hair-like *pv* row, numerous long *pv* hair, *av* fringe. Forceps and genitalia as shown in Fig. 35.

Specimens examined: 1♂, Doi Huai Hwer, 1231 m., Fang, 27 IX 1975, H. Kurahashi; 1♂, nr. Burma Bord., 1200 m., Fang, 26 IX 1975, H. Kurahashi.

Distribution: Burma, China, Japan, Thailand

35. *L. pattoni* (Senior-White, 1924)

Sarcophaga pattoni S.-W., Rec. Indian Mus., 26: 242 (1924)

L. pattoni: Delfinado, Catalog Dipt. Oriental Region, 3: 567 (1977)

MALE. Body length 9.0 to 15.0 mm. *Head*: Frons at vertex 0.23 of head width; *ori* 11–14 pairs, lower 2–3 pairs divergent; *g* with black hair in anterior part. *Thorax*: Dark gray; *ia* 1+2. *Legs*: *t*₁ with 2 *ad*, 1 *pl*; *f*₂ with 1–2 *pl*, *av* and *pv* fringe; *f*₃ with 2 *pd*, *av* and *pv* fringe. Forceps and genitalia as shown in Fig. 36.

Specimens examined: This species is commonly found in the mountainous areas.

Distribution: China, India, Thailand, Taiwan, Viet Nam

GENUS *Pierretta* Robineau-Desvoidy, 1863

Pierretta R.-D., Hist. nat. Dipt. Paris, 2: 422 (1863)

Usually small size, rarely medium to large; arista long-plumose along basal 1/2; propleuron bare; *post dc* 3; *r*₁ bare or setose; 3rd tergite with or without median marginal bristles; 1st to 4th sternites with numerous long hair; 5th sternite V-shaped; theca short; apical part of paraphallus well developed, but usually fused with basal part; styli long; ventralia usually well developed.

KEY TO THE SPECIES

Vein *r*₁ setose; section V of costa with short spines along the anterior margin; 4th sternite covered with normal long hair. . .

..... *P. calicifera*

Vein *r*₁ bare; section V of costa with short spines along about basal half of the anterior margin; 4th sternite almost wholly covered with mat of short hair and some long hair on lateral margin . . *P. melania*

General Characters of the Species

Head: *fv* black; *pf* and *pa* dark brown with silvery to golden pollinosity; 3 rows of black *ps*; *pal* dark brown. *Thorax*: *ac* 0+1; *prsb* 1; *hb* 4; *ph* 2; *scut* 3+1; *st* 1:1:1; *prs* hairy posteriorly. *Wings*: Hyaline; wing-veins brown; *r*₄₊₅ with some setae on ventral surface of basal node; *ha* brown. *Legs*: Black; *f*₁ with 2 *ad* rows; *t*₁ with 2–3 *ad*, 1 *pl*; *f*₂ with 1 *pl*, an *av* row, a *pv* row; *t*₂ with 1 *pl*; *f*₃ with 1 *pl*; *t*₃ with an *ad* row, 2 *pd*. *Abdomen*: Same color as thorax; *T*₃ without *mb* but *mb* well developed on *T*₄ and *T*₅; *GT*₁ and *GT*₂ dark brown.

Only the different characters among the species are cited individually in the text.

36. *P. calicifera* (Böttcher, 1912)

Sarcophaga calicifera Bött., Ent. Mitt., 1: 169 (1912)

P. calicifera: Fan, Synan. Flies China: 233 (1965)

MALE. Body length 5.0 to 6.0 mm. Head: Frons at vertex 0.30–0.32 of head width; *ori* 7–8 pairs, lower 1 pair divergent; black *ps* regular. Thorax: Brownish-gray; *dc* 3–4+3; *ia* 0–1+2–3; *np* 3–4. Wings: r_{4+5} with setae located dorsally extending more than half way from basal node to *r-m*; *sq* creamy white but slightly darkened at center. Legs: f_1 with a *pv* row; f_2 with 3–4 long *pl* in middle portion, 1 *pd*; t_2 with 2 long and a short *ad* row, 2 *pd*, 1 *pl*; f_3 with a row of complete and a row of incomplete *ad*, 1 *av* row, 3 extra long *pv* in the basal part, 1 *pd*; t_3 with 1 strong and a fine *av* row, long *pv* hair. Forceps and genitalia as shown in Fig. 33.

Specimens examined: This species is commonly found in the towns.

Distribution: China, India, Japan, Philippines, Sri Lanka, Thailand, Taiwan

37. *P. melania* Shinonaga
et Tumrasvin, 1979

P. melania Shinonaga et Tumrasvin, Jap. J. Sanit. Zool., 30, 2: (1979)

MALE. Body length 7.0 to 8.0 mm. Head: Frons at vertex 0.22 of head width; *ori* 11–13 pairs, lower 2 pairs divergent; black *ps* irregular. Thorax: Median longitudinal stripe with 2 narrow submedian stripes; brownish-gray; *dc* 4+3; *ia* 1+2; *np* 4. Wings: r_{4+5} with setae located dorsally extending less than half way from basal node to *r-m*; *sq* creamy white. Legs: f_1 with 1 row of hair-like *pv* and numerous long *pv* hair; t_1 with 1 row of very short *pd*; f_2 with 2–3 *pl*, 3 *pd*, *pv* fringe; t_2 with 2–3 *ad*, 2–3 *pl*, 1 long and a conspicuous *pd*

row; f_3 with 2 complete *ad* rows, 1 *av*, 1–2 *pd*, *av* and *pv* fringe; t_3 with 1 *av*, *av* and *pv* fringe. Forceps and genitalia as shown in Fig. 37.

Specimens examined: 2♂♂, Doi Inthanon, Chiang Mai, 19 XII 1975, S. Shinonaga.

Distribution: Thailand

GENUS *Phallosphaera* Rohdendorf, 1938

Phallosphaera Rohd., Trans. Sikhotealin St. Res., 2: 107 (1938)

Medium to large size; antennae long; arista long-plumose along the basal 2/3; propleuron bare or hairy; *post ac* 1; *post dc* 4; r_1 bare; 5th sternite V-shaped with a protuberance in the middle part of ventral surface; phallosome large and heavily sclerotized; theca short; apical plate of paraphallus without processes; styli stout.

KEY TO THE SPECIES

- 3 rows of black postocular setae regular; length of 3rd antennal segment 3× that of 2nd segment; inner forceps very large, widely broadened on dorsal surface and curved at apical half, without tuft of long hair near distal end. *P. kurahashii*
Only 1st row of black postocular setae regular; length of 3rd antennal segment 4× that of 2nd segment; inner forceps not so broad and stretched and with a tuft of long hair in subapical part . . . *P. gravey*

General Characters of the Species

Head: *fv* black; frons at vertex 0.22 of head width; *pf* and *pa* dark brown with golden-silvery pollinosity; *g* black with golden to silvery pollinosity and with black hair in anterior half; *a* dark brown. Thorax: *ac* 0+1; *dc* 5+4; *ia* 1+3; *prsb* 1; *ph* 2 *np* 4; *sa* 3; *pa* 2; *scut* 3+1; *st* 1:1:1; *prs* hairy posteriorly. Wings: Hyaline, slightly darkened anteriorly; wing-veins brown; r_3 bare; r_{4+5} with a row of setae located dorsally extend-

ing more than half way from basal node to *r-m* and with some setae on ventral surface of basal node; *sq* creamy white but darkened at center; *ha* light brown. *Legs*: Black; f_1 with 2 *pd* rows; a *pv* row; t_1 with 1 *pl*; f_2 with 3–4 *al*, an *av* row, comb-like *pv*, *av* and *pv* fringe; t_2 with 1 *al*, 1 *pl*; f_3 with 2 *ad* rows, an *av* row, a *pv* row, 1 *pl*; t_3 with an *ad* row, 1 *av*, 2 *pd*, *av* and *pv* fringe. *Abdomen*: Same color as thorax; genital tergite dark brown.

Only the different characters among the species are cited individually in the text.

38. *P. kurahashii* Shinonaga
et Tumrasvin, 1979

P. kurahashii Shinonaga et Tumrasvin,
Jap. J. Sanit. Zool., 30, 2: (1979)

MALE. Body length 13.0 mm. *Head*: *ori* 10 pairs, lower 1 pair divergent. *Thorax*: Ashy-gray. *Legs*: t_1 with a short *pd* row, 2 *ad*; f_2 with long *av* fringe; t_2 with 2 long and a conspicuous *pd* row; f_3 with 2 *pd*, without fringe. *Abdomen*: T_3 with weak *mb*. Forceps and genitalia as shown in Fig. 39.

Specimen examined: 1♂, nr. Sai Yok, 500 m., Kanchana Buri, 11 IX 1975, H. Kurahashi.

Distribution: Thailand

39. *P. gravelyi* (Senior-white, 1924)

Sarcophaga gravelyi S.-W., Rec. Indian
Mus. 26: 229 (1924)

P. gravelyi: Kano et al., Fauna Japonica,
Sarcophagidae: 91 (1967)

MALE. Body length 12.0 mm. *Head*: *ori* 13 pairs, lower 3 pairs divergent. *Thorax*: Dark gray. *Legs*: f_1 with numerous long *pv* hair; t_1 with 2–3 *ad*; f_2 with weak *av* fringe; t_2 with 1 long and a conspicuous *pd* row; f_3 with 4 *pd*, *av* fringe. *Abdomen*: T_3 without *mb*. Forceps and genitalia as shown in Fig. 44.

Specimen examined: 1♂, Doi Pui, 1685 m., C. Chiang Mai, 16 IX 1975, W. Tumrasvin.

Distribution: China, India, Japan, Korea, Nepal, Thailand

GENUS *Bercaea* Robineau-Desvoidy, 1863

Bercaea R.-D., Hist. nat. Dipt. Paris, 2:
549 (1863)

Medium to large size; arista long-plumose along basal 3/5; *ac* absent; propleuron bare; r_1 bare; hind tibia fringed; 3rd and 4th sternites with short hair; 1st genital tergite with strong marginal bristles; inner forceps long and slender, claw-like at apex; theca very short; paraphallus very large and highly sclerotized, apical plate short with short lateral processes; ventralia claw-like; styli slender and bent forward.

40. *B. haemorrhoidalis* (Fallén, 1816)

Musca haemorrhoidalis Fallén, Vetensk.
Akad. Handl., 237 (1816)

B. haemorrhoidalis: Lopes, Proc. Hawaiian Ent. Soc., 17: 425 (1961)

MALE. Body length 8.0 to 13.6 mm. *Head*: Frons at vertex 0.28 of head width; *fv* black; *pf* and *pa* dark brown with golden-silvery pollinosity; *a* dark brown, length of a_3 3× that of a_2 ; *g* with golden-silvery pollinosity and with black hair anteriorly; *ori* 10–12 pairs, lower 2–3 pairs divergent; 5 rows of black *ps* irregular; *pal* dark brown. *Thorax*: Brownish-gray; median longitudinal stripe with 2 narrow submedian stripes; *ac* 0; *dc* 5–6+5–6; *ia* 1+2–3; *prsb* 1; *hb* 3; *ph* 2; *np* 4; *sa* 4; *pa* 2; *scut* 3+1; *st* 1:1:1; *prs* hairy posteriorly. *Wings*: Hyaline; wing-veins brown; r_{4+5} with a row of setae located dorsally extending less than to about half way from basal node to *r-m* and with some setae on ventral surface of basal node; *sq* creamy white; *ha* brown. *Legs*: Black; f_1 with 2 *pd* rows, a *pv* row, numer-

ous long *pv* hair; t_1 with 2 long *ad*, 1 *pl*; f_2 with 3–6 *al*, an *ad* row, comb-like *pv*, 1–2 *pd*, 1 *pl*, thin *av* fringe, long *pv* fringe; t_2 with 1–2 *al*, 1 long and a short *pd* row, 1 *pl*, 1 *v*; f_3 with 2 *ad* rows, an *av* row, 1 *pd*, 1 *pl*, numerous relatively long *av* hair, some long *pv* hair and hair-like *pv* at distal end; t_3 with an *ad* row, 1 *av*, 2 *pd*, *av* and *pv* fringe. *Abdomen*: Same color as thorax; T_3 without *mb* but *mb* well developed on T_4 and T_5 , GT_1 reddish-brown, GT_2 orange to orange-brown. Forceps and genitalia as shown in Fig. 40.

Specimens examined: 8♂♂, Ban Yang, 1400 m., Doi Inthanon, 17, 19, 23 IX 1975, R. Kano & H. Kurahashi; 1♂, Top, 2667 m., Doi Inthanon, 23 IX 1975, R. Kano; 6♂♂, Doi Pui, 1685 m., C. Chiang Mai, 16 IX 1975, R. Kano & H. Kurahashi.

Distribution: India, Korea, Nepal, Thailand; Africa; Europe; Hawaii, N. & S. America.

Remarks: This species is distributed around the human dwellings in the high mountains, gathering on the human feces or animal carcasses. Many cases of myiasis caused by this species have been reported (James, 1947).

GENUS *Fengia* Rohdendorf, 1964

Fengia Rohd., Rev. Ent. U.S.S.R., 43: 83 (1964)

Medium to large size; antennae long, arista long-plumose along the basal 2/3; *post dc* 4; propleuron bare; hind tibia fringed; 3rd tergite without median marginal bristles; 5th sternite V-shaped; outer forceps broad; tæca short; apical plate of paraphallus united to paraphallus without suture; styli thread-like and very long, much longer than apical plate.

41. *F. ostindicae* (Senior-White, 1924)
Sarcophaga ostindicae S.-W., Re. Indian.

Mus., 26: 233 (1924)

F. ostindicae: Rohd., Rev. Ent. U.S.S.R., 43: 83 (1964)

MALE. Body length 10.0 to 12.0 mm. *Head*: Frons at vertex 0.22–0.24 of head width; *fv* black; *pf* and *pa* with golden to silvery pollinosity; *a* dark brown, length of a_3 3× that of a_2 ; *g* with golden to silvery pollinosity and with black hair; *ori* 11–12 pairs, lower 2–3 pairs divergent; 4 rows of black *ps* regular; *pal* blackish-brown. *Thorax*: Pale brownish-gray; *ac* 4+1–2; *dc* 3+4; *ia* 1+3; *prsb* 1; *hb* 3; *ph* 2; *np* 4; *sa* 3–4; *pa* 2; *scut* 3+1; *st* 1:1:1; *prs* hairy posteriorly. *Wings*: Hyaline; wing-veins light-brown; r_1 bare; r_{4+5} with a row of setae located dorsally, extending more than half way from basal node to *r-m* and with some setae on ventral surface of basal node; *sq* creamy white; *ha* brown. *Legs*: Black; f_1 with 2 *pd* rows, a *pv* row, numerous long *pv* hair; t_1 with 2 *ad*, 1 *pl*; f_2 with 2–4 *al*, an *av* row, comb-like *pv*, 2 *pd*, 1 *pl*, *av* and *pv* fringe; t_2 with 1 *al*, 1 *v*, 3 long and a small *pd* row, 1 *pl*; f_3 with 2 *ad* rows, an *av* row, a *pv* row, 2 *pd*, 1 *pl*, *av* and *pv* fringe; t_3 with an *ad* row, 1 *av*, 2 *pd*, *av* and *pv* fringe. *Abdomen*: Same color as thorax; *mb* well developed on T_4 and T_5 ; genital tergites dark brown. Forceps and genitalia as shown in Fig. 38.

Specimens examined: 2♂♂, Doi Huai Hwer, 1231 m., Fang, 27 IX 1975, R. Kano & H. Kurahashi; 1♂, Fang Exp. St., 500 m., Fang, 25 IX 1975, H. Kurahashi; 1♂, Doi Saket, 300 m., C. Chiang Mai, 15 IX 1975, W. Tumrasvin; 1♂, Ban Pong Din, 10 km. N.E. Doi Saket, 20 IX 1975, W. Tumrasvin.

Distribution: China, India, Thailand, Taiwan.

GENUS *Rosellea* Rohdendorf, 1937

Rosellea Rohd., Fauna U.S.S.R. Dipt., 19: 242 (1937)

Medium to large size; arista long-plumose along basal 1/2; *post dc* 5; propleuron hairy; r_1 bare; hind tibia fringe; 5th sternite with prominent conical protuberance in the middle part of the ventral surface; inner forceps broad and pointed at apex; theca normal length; ventralia well developed; apical plate of paraphallus large, poorly sclerotized.

42. ***R. khasiensis*** (Senior-White, 1924)

Sarcophaga khasiensis S.-W., Rec. Indian Mus., 26: 246 (1924)

R. khasiensis: Delfinado, Catalog Dipt. Oriental Region, 3: 574 (1977)

MALE. Body length 8.0 to 13.0 mm. *Head*: Frons at vertex 0.24 of head width; *fv* black; *pf* and *pa* dark brown with silvery to golden pollinosity; *a* dark brown, length of a_3 2.5× that of a_2 ; *g* black with silvery pollinosity and with black hair; *ori* 13–14 pairs, lower 2–3 pairs divergent; 3 rows of black *ps* regular; *pal* blackish-brown. *Thorax*: Dark brownish-gray; *ac* 0+1; *dc* 5–6+5; *ia* 1+2; *prsb* 1; *hb* 3–4; *ph* 2; *np* 4; *sa* 3; *pa* 2; *scut* 3+1; *st* 1:1:1; *prs* hairy posteriorly. *Wings*: Hyaline; wing-veins brown; r_{4+5} with a row of setae located dorsally extending more than half way from basal node to *r-m* and with some setae on ventral surface of basal node; *sq* creamy white; *ha* brown. *Legs*: Black; f_1 with 2 *pd* rows; a *pv* row, numerous, relatively long *pv* hair; t_1 with 3–4 *ad*, 1 *pl*; f_2 with 3–4 *al*, an *av* row, comb-like *pv*, 2–3 *pd*, 1 *pl*, *av* and *pv* fringe; t_2 with 2 *ad*, 1 *v*, 2–3 long and a short *pd* row, 1 *pl*; f_3 with 2 *ad* rows, an *av* row, moderately long *qv* hair, several long hair-like *pv* and thin *pv* fringe on apical 2/5, 1–5, 1–2 *pd*, 1 *pl*; t_3 with a *ad* row, 1 *av*, 2 *pd*, *av* and *pv* fringe. *Abdomen*: Same color as thorax: T_3 without *mb* but *mb* well developed on T_4 and T_5 ; GT_1 and GT_2 dark brown. Forceps and genitalia as

show in Fig. 42.

Specimens examined: 7 ♂♂, Ban Yang, 1400 m., Doi Inthanon, 19 IX 1975, R. Kano & W. Tumrasvin; 1 ♂, Doi Inthanon, Chiang Mai, 19 IX 1975, S. Shinonaga.

Distribution: China, India, Nepal, Thailand

GENUS ***Sinonipponia*** Rohdendorf, 1965

Sinonipponia Rohd., Rev. Ent. U.S.S.R., 44: 694 (1965)

Arista long-plumose along basal 2/3; propleuron usually bare; *post dc* 4; r_1 bare; hind tibia fringed; sternites with numerous long hair; 5th sternite V-shaped; theca short; phallosome large; basal lobe pointed apically; styli long; apical plate of paraphallus composed of median apophysis and lateral projections.

43. ***S. hainanensis*** (Ho, 1936)

Sarcophaga hainanensis Ho, Bull. Fan Mem. Inst. Biol., 6: 210 (1936)

Sinonipponia hainanensis: Fan, Synan. Flies China, 247 (1965)

MALE. Body length about 8.0 mm. *Head*: Frons at vertex 0.22–0.24 of head width; *fv* black; *pf* and *pa* dark brown with silvery pollinosity; *a* brown, length of a_3 2.5× that of a_2 ; *g* black with silvery pollinosity and with black hair; *ori* 10 pairs, lower 1–2 pairs divergent; 3 rows of black *ps* regular; *pal* black. *Thorax*: Dark gray; *ac* 0+1; *dc* 4–5+4; *ia* 1+2; *prsb* 1; *hb* 3; *ph* 2; *np* 4; *sa* 3; *pa* 2; *scut* 3+1; *st* 1:1:1; *prs* hairy posteriorly. *Wings*: Hyaline; wing-veins light brown; r_{4+5} with a row of setae located dorsally extending more than half way from basal node to *r-m* and with some setae on ventral surface of basal node; *sq* creamy white; *ha* light brown. *Legs*: Blackish-brown; f_1 with 2 *pd* rows; a *pv* row; t_1 with 2 *ad*, 1 *pl*; f_2 with 5–7 *al*, 3–4 strong *ad* in basal 1/2, 1 *pd*, 1 *pl*, a *pv* row and numerous

long *pv* hair in basal 1/2; t_2 with 2 *al*, 2 *v*, 2–3 *pd*, 1 *pl*; f_3 with 2 *ad* rows, an *av* row, a *pv* row, several long *av* hair, 1–2 *pd*, 1 *pl*; t_3 with an *ad* row, 1 *av*, 1 *pd*, thin *av* and *pv* fringe. *Abdomen*: Same color as thorax: T_3 with weak or without *mb* but *mb* well developed on T_4 and T_5 ; GT_1 and GT_2 dark brown. Forceps and genitalia as shown in Fig. 43.

Specimens examined: 4♂♂, Beach, C. 30 km. S. Chon Buri, 30 VIII 1975, R. Kano & H. Kurahashi.

Distribution: China, Thailand, Taiwan

Remarks: This species is commonly found on the seashore and gather on decaying fish or other organic debris.

GENUS *Thyrsoenema* Enderlein, 1928

Thyrsoenema Enderl., Arch. Klass. phyl. Ent., 1: 42 (1928)

Small size; arista long-plumose along basal 1/2; *post dc* 5; propleuron bare; r_1 bare; 3rd and 4th sternites with conspicuous hair; 5th sternite V-shaped; theca normal length; ventralia well developed; styli very long and bent; apical plate of paraphallus well developed, long and slender, largely rounded apically.

44. *T. caudagalli* (Böttcher, 1912)

Sarcophaga caudagalli Bött., Ent. Mitt., 1: 167 (1912)

T. caudagalli: Rohd., Faune l' U.R.S.S. Dipt., 19: 169 (1937)

MALE. Body length 7.0 mm. *Head*: Frons at vertex about 0.22 of head width; *pf* and *pa* dark brown with silvery pollinosity; *a* dark brown, length of a_3 2× that of a_2 ; *g* black, slightly silvery pollinosity and with black hair; *ori* 10–12 pairs, lower 2 pairs divergent; 3 rows of black *ps* regular; *pal* dark brown. *Thorax*: Dark gray; *ac* 5–6+1; *dc* 4–5+5; *ia* 1+3; *prsb* 1; *hb* 3; *ph* 2; *np* 4; *sa* 3; *pa* 2; *scut* 3+1; *st* 1:1:1;

prs hairy posteriorly. *Wings*: Hyaline; wing-veins brown; r_{4+5} with a row of setae located dorsally, extending more than half way from basal node to *r-m* and with some setae on ventral surface of basal node; *sq* creamy white; *ha* brown. *Legs*: Dark brown; f_1 with 2 *pd* rows, a *pv* row; t_1 with 3–4 *ad*, 1 long and a *pd* row, 1 *pl*; f_2 with 4 *al*, 1–2 *pd*, 1 *pl*, an *av* row, a *pv* row, without comb-like *pv*; t_2 with 3–4 *al*, 2–3 long and some short *pd*, 1 *pl*, 1 *v*; f_3 with 2 *ad* rows, an *av* row, a *pv* row, 1 *pd*, 1 *pl*; t_3 with an *ad* row, 2–3 *av*, 2 *pd*. *Abdomen*: Same color as thorax; T_3 with weak or without *mb* but *mb* well developed on T_4 and T_5 ; GT_1 and GT_2 dark brown. Forceps and genitalia as shown in Fig. 41.

Specimens examined: 1♂, Ban Pong Din, 10 km. N.E. Doi Saket, 20 IX 1975, R. Kano; 2♂♂, Sam Sane, Bangkok, 29 VIII 1975, R. Kano & H. Kurahashi.

Distribution: China, Taiwan, Thailand

GENUS *Phytosarcophaga* Rohdendorf, 1937

Phytosarcophaga Rohd., Faune l' U.R.S.S. Dipt., 19: 301 (1937)

Usually small size; antennae short, arista plumose along basal 1/2; *post dc* 5; propleuron hairy; costal bristles strong; r_1 setulose; hind tibia fringed; 1st to 4th sternites with numerous short black hair; 5th sternite V-shaped; inner forceps pointed at apex; theca long; paraphallus poorly sclerotized; apical plate of paraphallus largely rounded apically; ventralia reduced to a small lobe.

45. *P. gressitti* (Hall et Bohart, 1948)

Sarcophaga gressitti Hall et Bohart, Proc. Wash. Ent. Soc., 50: 131 (1948)

P. gressitti: Lopes, Insects Micronesia, 13: 21 (1948)

MALE. Body length 5.0 to 8.0 mm.

Head: Frons at vertex 0.28 of head width; *fv* black; *pf* and *pa* dark brown with silvery pollinosity; *a* dark brown, base of a_3 and tip of a_2 orange, length of a_3 1.5 \times that of a_2 ; *g* black with silvery pollinosity and with black hair; *ori* 8–10 pairs, lower 2 pairs divergent; 3 rows of black *ps* regular; *pal* dark brown. *Thorax:* Ashy-gray; a median stripe with 2 narrow submedian stripes; *ac* 0+1; *dc* 4–5+5; *ia* 1+2; *prsb* 1; *hb* 3; *ph* 2; *np* 4; *sa* 3; *pa* 2; *scut* 3+1–2; *st* 1:1:1; *prs* hairy posteriorly. *Wings:* Hyaline; wing-veins brown; r_{4+5} with a row of setae located dorsally extending more than half way from basal node to *r-m* and with some setae on ventral surface of basal node; *sq* creamy white; *ha* light brown. *Legs:* Black; f_1 with 2 *pd* rows, a *pv* row; t_1 with 2 *ad*, 1 *pl*; f_2 with 2–4 *al*, an *ad* row, a *pv* row, 1 *pd*, 1 *pl*; t_2 with 2 *ad*, 2 *pd*, 1 *pl*, 1 *v*; f_3 with an *ad* row, 1 *av*, 2 *pd*, *av* and *pv* fringe. *Abdomen:* Same color as thorax; T_3 without *mb* but *mb* well developed on T_4 and T_5 ; GT_1 and GT_2 dark brown. Forceps and genitalia as shown in Fig. 47.

Specimens examined: 61 ♂♂, Beach, C. 30 km. S. Chon Buri, 30 VIII & 11 X 1975, R. Kano, H. Kurahashi & W. Tumrasvin.

Distribution: Philippines, Thailand; Hawaii, Micronesia, Ogasawara Ids.

Remarks: This species is also commonly found on the seashore gathering on the decaying fish or other organic debris.

GENUS *Harpagophalla* Rohdendorf, 1937

Harpagophalla Rohd., Faune U.R.S.S. Dipt., 19: 276 (1937)

Usually medium size; arista long-plumose along basal 2/3; *post dc* 5; propleuron bare; r_1 bare; hind tibia fringed; sternites with very long hair; 5th sternite V-shaped; inner forceps curved at apex and with tuft of long hair near apex; outer forceps broad, triangle-shaped; theca very short; ventralia small;

apical plate of paraphallus long and slender.

46. *H. kempfi* (Senior-White, 1924)

Sarcophaga kempfi, Rec. Indian Mus., 26: 247 (1924)

H. kempfi: Delfinado, Catalog Dipt. Oriental Region, 3: 580 (1977)

MALE. Body length 6.0 to 11.0 mm. *Head:* Frons at vertex 0.24 of head width; *fv* black; *pf* and *pa* black, with silver-gray pollinosity; *a* dark brown, length of a_3 2 \times that of a_2 ; *g* black with silver-gray pollinosity and with black hair; *ori* 9–10 pairs, lower 1–2 pairs divergent; 3 rows of black *ps* regular; *pal* black. *Thorax:* Brownish-gray; *ac* 0+1; *dc* 5+5; *ia* 1+2; *prsb* 1; *hb* 3; *ph* 2; *np* 4; *sa* 3; *pa* 2; *scut* 3+1; *st* 1:1:1; *prs* hairy posteriorly. *Wings:* Hyaline; wing-veins light brown r_{4+5} with a row of setae located dorsally extending more than half way from basal node to *r-m* and with some setae on ventral surface of basal node; *sq* creamy white; *ha* brown. *Legs:* Black; f_1 with 2 *pd* rows, a *pv* row, numerous, moderately long *pv* hair; t_1 with 2 *ad*, 1 long and a short *pd* row, 1 *pl*; f_2 with 3–6 *al*, an *ad* row, a comb-like *pv*, 1–2 *pd*, 1 *pl*, *pv* fringe; t_2 with 2 *ad*, 1 *v*, 2–3 long *pd*, 1 *pl*; f_3 with 2 *ad* rows, 1–2 *pd*, 1 *pl*, *av* and *pv* fringe; t_3 with an *ad* row, 1 *av*, 2 *pd*, *av* and *pv* fringe. *Abdomen:* Same color as thorax; T_3 without *mb* but *mb* well developed on T_4 and T_5 ; S_4 with mat of hair posteriorly and with long hair laterally; GT_1 and GT_2 dark brown. Forceps and genitalia as shown in Fig. 45.

Specimens examined: 2 ♂♂, Hill, C. 300 m., Sa Kaeo 30 km. S. E., 3 IX 1975, R. Kano; 1 ♂, nr. Ban Sap Bon, 30 km. E. Sara Buri, 4 X 1975, H. Kurahashi.

Distribution: China, India, Indonesia, Laos, Sri Lanka, Thailand; New Guinea

GENUS *Seniorwhitea* Rohdendorf, 1937

Seniorwhitea Rohd., Faune 1' U.R.S.S. Dipt., 19: 297 (1937)

Medium to large size; antennae long, arista long-plumose along basal 2/3; *post dc* 5; propleuron bare; r_1 bare; mid- and hind tibiae with fringe; 3rd and 4th sternites almost wholly covered with thick mat of hair; 5th sternite V-shaped; phallosome large; theca very long; apical plate of paraphallus large, rounded and wholly membranous; styli long; ventralia small, curved at apex.

47. *S. krameri* (Böttcher, 1912)

Sarcophaga krameri Bött., Ent. Mitt., 1: 165 (1912)

Seniorwhitea krameri: Lopes, Mem. Inst. Oswaldo Cruz, 62: 162 (1964)

MALE. Body length 9.0 to 13.0 mm. *Head*: Frons at vertex about 0.24 of head width; *fv* black; *pf* and *pa* dark brown with golden pollinosity; *a* dark brown, length of a_3 2.5× that of a_2 ; *ori* 8–11 pairs, lower 1–2 pairs divergent; *g* black with silver-gray pollinosity and with black hair; 3 rows of black *ps* regular; *pal* dark brown. *Thorax*: Dark gray; a median stripe with 2 narrow submedian stripes; *ac* 0+1; *dc* 5+5–6; *ia* 1+2; *prsb* 1; *hb* 3; *ph* 2; *np* 4; *sa* 3–4; *pa* 2; *scut* 3+1; *st* 1:1:1; *prs* hairy posteriorly. *Wings*: Hyaline, darkened anteriorly; wing-veins brown; r_{4+5} with a row of setae located dorsally extending more than half way from basal node to *r-m* and with some setae on ventral surface of basal node; *sq* creamy white; *ha* brown. *Legs*: Black; f_1 with 2 *pd* rows, a *pv* row, numerous, long *pv* hair; t_1 with 2–3 *ad*, 1–2 long and a short *pd* row, 1 *pl*; f_2 with 3–5 *al*, an *av* row, comb-like *pv*, *av* and *pv* fringe; t_2 with 1–2 long *pd*, 4–5 long *pl*, *av* and *pv* fringe; f_3 with 2 *ad* rows, 2–3 *pd*, 1 *pl*, *av* and *pv* fringe; t_3 with

an *ad* row, 2 *pd*, *av* and *pv* fringe. *Abdomen*: Same color as thorax; T_3 without *mb* but *mb* well developed on T_4 and T_5 ; GT_1 and GT_2 dark brown. Forceps and genitalia as shown in Fig. 46.

Specimens examined: This species is found in the mountains throughout Thailand.

Distribution: Burma, China, India, Laos, Malaysia, Nepal, Singapore, Sri Lanka, Thailand, Taiwan; Hawaii

GENUS *Leucomyia* Brauer
et Bergenstamm, 1891

Leucomyia Bra. et Berg., Denksch. Akad. Wiss., Wien, 58: 64 (1891)

Small size; covered with thick whitish pollinosity; frons very broad; antennae short; arista pubescent along basal 1/2; frontal profile little sloped; haustellum little longer than labella; propleuron bare; r_1 bare; 3rd and 4th sternites with short black hair; 5th sternite V-shaped; anterior paramere divergent at tip; theca long; ventralia small; styli long and curved forward; apical plate of paraphallus curved, without lateral processes.

48. *L. cinerea* (Fabricius, 1794)

Musca cinerea Fab., Ent. Syst., 4: 311 (1794)

L. cinerea: Bra. et Berg., Denkschr. Akad. Wiss., Wien, 58: 64 (1891)

MALE. Body length 6.0 to 7.0 mm. *Head*: Frons at vertex about 0.44 of head width; *fv*, *pf*, *pa* and *g* covered with grayish-white pollen; *a* brown, length of a_3 1.5× that of a_2 , a_2 orange anteriorly; *ori* 7–8 pairs, lower 1 pair divergent; *g* with white hair only; outer vertical bristles well developed; 1 row of black *ps*; *pal* orange to orange-brown. *Thorax*: Grayish-white; a median longitudinal stripe with 2 narrow submedian stripes; *ac* 0+1; *dc* 3–4+3; *iä*

1+2; *prsb* 1; *hb* 2; *ph* 2; *np* 2; *sa* 3; *pa* 2; *scut* 2+1; *st* 1:1; *prs* hairy posteriorly. *Wings*: Hyaline; wing-veins light brownish-yellow; r_{4+5} with a row of setae located dorsally extending more than half way from basal node to *r-m* and with some setae on ventral surface of basal node; *sq* creamy white; *ha* light yellowish-brown. *Legs*: Black f_1 with 2 *pd* rows; a *pv* row; t_1 with 2-3 *ad*, a *pl*; f_2 with 3-5 *al*, an *av* row, a *pv* row, 1 *pd*, 1 *pl*; t_2 with 2 *al*, 2-3 *pd*, 1 *pl*, 1 *v*; f_3 with an *ad* row, an *av* row, a *pv* row 1 *pd*, 1 *pl*; t_3 with 2-3 long *ad*, 2 *av*, 2 *pd*. *Abdomen*: Same color as thorax: T_3 without *mb* but *mb* well developed on T_4 and T_5 ; S_1 and S_2 covered with long yellowish-white hair; GT_1 and GT_2 dark brown, covered with grayish-white pollen. Forceps and genitalia as shown in Fig. 48.

Specimens examined: 25♂♂, Beach, C. 30 km. S. Chon Buri, 30 VIII 1975, R. Kano, H. Kurahashi & W. Tumrasvin; 7♂♂, Seashore, Chon Buri, 23 XII 1975, S. Shinonaga; 3♂♂, Salt pond, Chon Buri; 23 XII 1975, W. Tumrasvin.

Distribution: China, India, Japan, Laos, Sri Lanka, Thailand

Remarks: This species is commonly found on the seashore gathering on the dead or decaying fish or other organic debris.

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EXPLANATION OF FIGURES

Forceps and genitalia

- Fig. 1. *Hosarcophaga serrata*
 Fig. 2. *Kanomyia bangkokensis*
 Fig. 3. *Parasarcophaga knabi*
 Fig. 4. *Parasarcophaga orchidea*
 Fig. 5. *Parasarcophaga albiceps*
 Fig. 6. *Parasarcophaga doleschalli*
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 Fig. 24. *Sarcosolomonina harinasutai*
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