STUDIES ON MEDICALLY IMPORTANT FLIES IN THAILAND VII.
REPORT ON 42 SPECIES OF CALLIPHORID FLIES, INCLUDING
THE TAXONOMIC KEYS (DIPTERA: CALLIPHORIDAE)

BY

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ABSTRACT

The calliphorid flies collected from different localities in Thailand were examined to study their medical importance as well as to study from the zoogeographical standpoint of view. Forty-two species of 15 genera, Bemisia, Calliphora, Catapiriphila, Chrysomya, Hemipyrrellia, Hypomyophia, Lucilia, Melinda, Onesia, Phumia, Pollenia, Polleniophia, Taimania, Tricy-clopis and Verticia belonging to both the subfamilies Calliphorinae and Chrysomyinae were found in Thailand. Many species are newly recorded from this country. The little known species, which are redescribed in detail with the illustration of the male genitalia and female ovipositors, and the key, which is revised to the genera and species, are also presented in this paper.

INTRODUCTION

The family Calliphoridae is another family in the order Diptera which is composed of a great number of species throughout the world. The adult flies are known as blow fly, blue bottle fly and green bottle fly. Several species of these flies are of great medical and veterinary importance. Some species breed in decaying animal matter but some breed in human and animal excrement, including the feces and dung, and may thus, by subsequently settling on foodstuffs, transmit pathogenic organisms. This family also contains many species that cause myiasis in man and animals, especially Chrysomya bezziana, being called as the true myiasis-producing fly.

Because of their medical and veterinary importance, each synanthropic species in the subfamilies Calliphorinae and Chrysomyinae from Thailand is studied and reported in this paper. The members of the subfamily Rhininae will be reported in a separate part of the series. In order to complete the taxonomic study, the species which are not medically important are also included. This paper is also the first paper on the fauna of the flies of medical importance in the subfamilies Calliphorinae and Chrysomyinae in Thailand.

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Terminology

Head: a, antenna; a₂ and a₃, 2nd and 3rd antennal segments; e, epistome; f, face; fl, facialia; fo, frontal vitta; g, gena; m, medianae; mc, metacephalon; oep, occiput; ori, frontal bristle; ors, fronto-orbital bristle; orb, outer vertical bristle; pa, parafacialia; pal, palpi; pf, parafrontalia; vbr, vibrissa; vr, vibrissaria. Thorax: ac, acrostichal bristle; dc, dorsocentral bristle; h, humerus; hb, humeral bristle; ia, infra-alar bristle; mis, mesothoracic spiracle; met, metathoracic spiracle; np, notopleural bristle; pa, post-alar bristle; pc, post-alar calli; ph, posthumeral bristle; pp, prepronotum; pph, prepleural bristle; prs, prothorax; presb, presutural bristle; psb, prostigmatic bristle; sa, supra-alar bristle; sc, scutum; sc, scutellum; scut, scutellar bristle; sq, squama; sr, supraquasmal ridge; st, sternopleural bristle. Wing: e, epaulet; ba, basi-costa; ha, halter; r₄₅, 4th and 5th radial vein; r₆, radio-medial cross-vein; sc, subcostal selerite; sq, squama. Leg: f₁₋₃, fore, mid- and hind femora; ta, tarsi; t₁₋₃, fore, mid- and hind tibiae. Abdomen: ep, epi-drum; s₁₋₅, 1st to 5th sternites; T₁₋₅, 1st to 5th tergites.

Family Calliphoridae

The flies in this family are usually metallic in color, although a number of species are non-metallic. Adults are found on the excrement, human feces, animal dung, carrion, decaying animal and plant, garbage or filthy material, vegetation, flower, etc. Many species are found in the houses, settling on the foodstuff. Adult females are oviparous or larviparous. Larvae are either scavengers or parasites on insects, snails, mammals or other animals. Many of them cause myiasis in the human being and animals.

Key to the Subfamilies

1. Stem-vein of wing not setulate on posterodorsal surface of basal section ...
   Calliphorinae
2. Protuberance below base of wing with erect hair; occiput without a bare shining band behind upper half of occipital row; epistome slightly projecting
   Chrysomyinae
3. Protuberance below base of wing bare or without distinct hair; occiput with a bare shining band behind upper half of occipital row; epistome projecting
   Rhininae

Subfamily Calliphorinae

The flies belonging to this subfamily are divided into 5 tribes, Bengalini, Calliphorini, Lucillini, Phaeniini and Poleniini. For separating this subfamily from the others, the most important criteria used is that there are no setulæ on the stem-vein of the wing. The characters of prepronotum, prothorax, lower squamae and supraquasmal ridge are important for the identification of the tribes.

Key to the Tribes

1. Prepronotum hairy ................. 2
   Prepronotum bare ................ 4
2. Lower squama hairy on upper surface
   Calliphorini
3. Lower squama bare on upper surface
   Lucillini
4. Suprasquamal ridge with posterior parasquamal tuft
   Suprasquamal ridge without posterior parasquamal tuft but with anterior one
   Calliphorini
5. Suprasquamal ridge without both anterior and posterior parasquamal tufts
CALLIPHORID FLIES IN THAILAND

4. Prosternum hairy; eyes dichoptic in both sexes; body with ordinary hairiness


Phumosiini

Prosternum bare; eyes holoptic to subholoptic or dichoptic in male, dichoptic in female; body clothed with crinkly golden hair on thorax or ordinary hairiness

Polleniini

Tribes Calliphorini

Key to the Genera

1. Presutural intra-alar bristles absent . 2
   Presutural intra-alar bristles present. 4
2. Presutural acrostichal bristles 2; without facial carina .......... 3
   Presutural acrostichal bristles 0–1; facial carina well developed. Polleniopsis
3. Eyes holoptic to subholoptic in male but dichoptic in female ....... Onesia
   Eyes dichoptic in both sexes ......... Tainanina

4. Lower squama quite bare on upper surface; male usually with tuft of long hair on 3rd and 4th sternites ...... Melinda
   Lower squama more or less hairy on upper surface; male without such hair on 3rd and 4th sternites ....... 5
5. Lower squama entirely clothed with hair on upper surface; body bluish-black ............ Calliphora
   Lower squama with only group of few hair near base; body testaceous ........ Tricycleopsis

Genus Melinda Robineau-Desvoidy, 1880


Small to medium-sized flies, usually blackish-brown in color; eyes bare or hairy, in male closely approximated but not touching, in female dichoptic; 3 post ac; 3 post dc; propleura and prosternum hairy; suprasquamous ridge hairy anteriorly; sternovain bare; lower squama bare on upper surface; 2nd sternite elongated but normal in some species; 3rd and 4th sternites usually with tufts of long hair.

Key to the Species

1. Antennae and palpi wholly black; 3rd and 4th sternites without any tufts of long hair .............. nigripalpis
   Antennae dark brown but some parts orange; palpi orange; 3rd and 4th sternites with tufts of long hair ... 2
2. Humeral and post-alar calli reddish to dark brown; scutellum largely pale yellowish at apex but darkened basally; 5th tergite entirely dark brown ..... scutellata
   Humeral, post-alar calli and scutellum completely yellow; 5th tergite with or without marginal reddish band .... nuortevae

1. M. nigripalpis Kurahashi et Tumrasvin, 1979


Specimens examined and distribution have already been reported when this species was described as a new species.

2. M. nuortevae Kurahashi, 1970

(Figs. 9, 13, 16, 26, 43, 51, 59, 66)


Male. Body length 6.0–7.0 mm. Head: Eyes holoptic and hairy; facets uniform; fp reddish-brown in front of lunule; pf and pa narrow, with silver-gray dusting; pf linear at middle, very sparsely haired at level of antennal base; ori 10–12 pairs; f and f red-
dish-brown; vbr inserted just above mouth
margin: e, vr and m reddish-brown; g clothed with black hair; mc with black hair anteriorly and with yellow hair posteriorly; a dark brown, the anterior part of a2, and posterior and ventral parts of a3 orange, length of a3 3X as long as a2; pal orange. Thorax: sc grayish-brown with uneven silver-gray dusting, denser in front of suture and with 3 dark longitudinal stripes; h and pe yellowish; pp and prs hairy; ssr bare posteriorly; ms yellow to brownish-yellow; mts dark brown; set yellow. Chaetotaxy: ac 2+3, dc 2–3+3, ia 1+2, hb 3, ph 2, prsb 1, sa 2, pa 3, np 2, scut 4+1, st 2+1; ppsb and psb well developed. Wings: Hyaline; veins yellowish-brown; r4+5 with some setulae at node above and below; lower sq dark yellow and bare, ha yellow. Legs: Yellow but ta brownish; t1 with a row of short ad and 1 p; t2 with 1 ad, 1 long and a row of short pd, 1 v and 2 p; t3 with 2 long and a row of short ad, 2 av, 2 long and a row of short pd. Abdomen: Dark brown; T1,2 undusted; T3 to T5 each with a narrow median stripe, broadest on T3, marginal bristles on T4 and T5 strong; T6 with or without reddish band, but with fine erect bristles on disc; S2 elongated; ep yellow.

Specimens examined: 19♂, 2♀, Sai Yok, 500 m., Kanchana Buri, 6, 8, 25 IX, 8 X, and 27–29 XII 1975, S. Shinozuka, H. Shima, H. Kurahashi, W. Tumrasvin; 4♂, Khao Yai, 24–26 XII 1975, Tumrasvin

Distribution: Burma and Thailand

Remarks: When Kurahashi (1970) described this species as a new species, he did not have the male specimen. Therefore, the above male description is described for the first time.

3. M. scutellata (Senior-White, 1923) (Figs. 2, 8, 14, 30, 36, 59, 58, 61)


Specimens examined: 3♂, 2♀, Sai Yok, 500 m., Kanchana Buri, 27–29 XII 1975, Shinozuka, Shima; 1♂, 1♀, Doi Inthanon, 1700 m., 24 II 1979, H. Suzuki

Distribution: Nepal, India, Malaysia, Burma and Thailand

Genus Calliphora Robineau-Desvoidy, 1830


Usually large-sized flies, dull bluish-black in color, abdomen usually with slightly metallic blue reflection; eyes hairy or bare, in male closely approximated, in female dichoptic; 3 post ac; 3 post dc; prst ia developed; prosternum and propleura hairy; suprasquamal ridge with anterior parasquamal tuft; stem-vein bare; subcostal sclerite setulose; lower squama completely haired on upper surface; marginal bristles strong on 4th and 5th tergites, 5th tergite covered with long erect bristles on disc.

Key to the Species

Hair on metacephalon all black ... pattoni Hair on metacephalon pale yellow intermixed with black hair ... vomitoria

4. C. pattoni Aubertin, 1931


5. C. vomitoria (Linne, 1758)


C. vomitoria: R.-D., 1830, Essai Myod.: 435.

C. vomitoria: Tumrasvin, Kurahashi, and

Remarks: Specimens examined and distribution of the above 2 species are the same as in the previous study (Tumrasvin et al., 1976).

Genus Tricycleopsis Villeneuve, 1927


Medium-sized flies, testaceous to black in color; eyes bare, holoptic in male, dichoptic in female; prst ac 2; prothorax, propleura and anterior part of suprasquamous ridge hairy; stem-vein bare; each lower squama with a small group of black hair at base; sternites concolorous with long hair.

6. T. paradoxa Villeneuve, 1927


Male. Body length 6.0-6.5 mm. Head: Eyes bare, holoptic; fu above lunule reddish-brown; pf linear at middle, with silver-gray dusting; anterior part of pf and posterior part of pa with setulae; ori 8-10 pairs; g and mc fuscous with dense silver-gray dusting and with black hair; a orange, a8 dark brownish dorsally and apically its length 2.5X as long as a2; pal orange. Thorax: Testaceous but disc of dorsum and pleura partially fuscous, traces of 5 black stripes present and with dense silver-gray dusting in front of suture; pp and prs with yellow hair; ssr with few hair anteriorly; ms and mts yellow. Chaetotaxy: ac 2+3, dc 2+3, ia 1+2, ib3, ph 2, prsb 1, sa 3, pa 2, np 2, scut 4+1, st 1+1; ppb and psb well-developed. Wings: Hyaline, slightly yellowish at base and most anteriorly; r4+5 with some setulae at node above and below; lower sq golden yellow with a small group of black hair at base, ha yellow. Legs: Yellow but ta dark brownish; t1 with a row of ad and 1 p; t2 with 1 ad, 1 v, a row of short pd and 2 p; t3 with 2 long and a row of short ad, 2 av and 2 pd. Abdomen: T1+2 testaceous; T3 testaceous but dark brownish posteriorly and with 1 pair of strong median marginal bristles; T4 wholly dark brown and with strong marginal bristles; T5 dark brown but paler posteriorly, with strong marginal bristles and a row of strong discal bristles; sternites concolorous with tergites; ep dark brown.

Specimens examined: 1 δ, Fang Exp. St., 500 m, Fang, 25 IX 1975, Kurahashi; 1 δ, Doi Suthep, Chiang Mai, 20-21 XII 1975, Shima; 1 δ, Pak Chong, 8 XII 1974, Somjai

Distribution: Taiwan, Malaysia, Indonesia and Thailand

Remark: The female specimen is not available in our collection.

Genus Polleniopsis Townsend, 1917


Small to medium-sized flies, usually dark blue to dull black in color; eyes bare, holoptic to subholoptic in male, dichoptic in female; profrons projecting; parafacialia broad; face generally with developed facial carina; viörißae inserted distinctly above epistomal margin; prst ac 0-1; prst ia usually absent, sometimes present; st 2+1 or 1+1; propleura and prothorax hairy; suprasquamous ridge bare; lower squama with a group of black hair on upper surface, usually on basal half.

7. P. pilosa Townsend, 1917
(Figs. 48, 54, 67)


Female. Body length 4.0-6.0 mm. Head: Eyes with sparsely minute hair (under high magnification), separated at vertex 0.34-0.36 of head width; fu reddish-brown; f
with sharp carina; \( pf \) and \( pa \) dark brown with brownish-gray dusting; \( pf \) and posterior part of \( pa \) with setulae; \( ori \) 6–7 pairs; \( ors \) 2+1; \( ovb \) present; \( g \) and \( mc \) black, silver-gray dusted; \( g \) with black hair; \( mc \) with black hair but yellowish posteriorly; \( a \) orange, \( a_{3} \) dark brownish dorsally and apically, its length 2X as long as \( a_{2} \); \( pal \) orange. **Thorax**: Dark brown with dense brownish-gray dusting; 4–5 longitudinal stripes present; \( pp \) and \( prs \) hairy; \( ssr \) bare; \( ms \) and \( mts \) dark brown. Chaetotaxy: \( ac \) 0+1, \( dc \) 2+3, \( ia \) 0+2, \( hb \) 2, \( ph \) 2, \( prsb \) 0, \( so \) 5, \( pa \) 2, \( np \) 2, \( scut \) 3+1, \( st \) 1+1; \( ppb \) and \( psb \) well developed. **Wings**: Hyaline, more yellowish anteriorly and basally; veins yellow; \( r_{4+5} \) with 2–3 setulae at \( r_{3} \) above and below; lower \( sq \) yellow, with a group of black hair at base; \( ha \) yellow. **Legs**: Dark brown; \( t_{3} \) with a row of small \( ad \) and \( pd \); \( t_{2} \) with \( 2 \) \( ad \), \( 1 \) \( v \), \( 1 \) \( pd \) and \( 2 \) \( p \); \( t_{3} \) with \( 2 \) \( ad \), \( 1 \) \( av \) and \( 2 \) \( pd \). **Abdomen**: Concolorous with thorax; marginal bristles strong on \( T_{4} \) and \( T_{5} \).

**Specimens examined**: 1♀, nr. Sai Yok, 500 m., Kanchana Buri, 8 X 1975, Kurahashi; 1♀, Doi Saket, Chiang Mai, 16 XII 1975, Shima

**Distribution**: India and Thailand

**Remark**: The male specimen is not available in our collection.

**Genus Onesia** Robineau-Desvoidy, 1830

Onesia R.-D., 1830, Ess. Myod.: 365.

The characters of the genus *Onesia* are similar to those of *Polleniopsis* except the former genus has 2 prst ac and does not have facial carina at which the latter genus has 0–1 prst ac and the facial carina is well developed.

8. *O. parafacialis* Kurahashi et Tumrasvin, 1979

(Figs. 47, 55, 62)


Specimens examined and distribution have already been reported when this species was described as a new species.

**Genus Tainanina** Villeneuve, 1926


Usually small-sized flies, black to grayish-black in color; eyes bare, dichoptic in both sexes; profrons projecting; parafacialia broad, entirely setulose; female with fronto-orbital bristles but male with or without; genae broad; 3 post ac; 3 post dc; prst ia absent; propleura and prosternum hairy; suprasquamal ridge bare; stem-vein bare; lower squama with some microscopic hair at center of upper surface.

**KEY TO THE SPECIES**

Male without fronto-orbital bristles, female with 2 procline and 1 reclinate fronto-orbital bristles ........ sarcoaphagoides

Both sexes with 1 procline and 1 reclinate fronto-orbital bristles ...... pilisquama

9. *T. sarcoaphagoides* (Malloch, 1931)


**Specimens examined**: 2♂ 8♀, Khao Yai, 30 km. S. Pak Chong, 6 X 1975, Tumrasvin; 1♂ 1♀, nr. Burma Bord., 1200 m., Fang, 26 IX 1975, Kurahashi

**Distribution**: Malaysia, Philippines and Thailand

10. *T. pilisquama* (Senior-White, 1925)


*T. pilisquama*: S.-W. *et al.*, 1940, Fauna
Specimens examined: 33 ♀, 19, Khao Yai, 30 km. S. Pak Chong, 24-26 XII 1975. Shinonaga, Shima, Tumrasvin; 19, nr. 3ai Yok, 500 m., Kanchanaburi, 11 IX 1975. Kurahashi

Distribution: India, Sri Lanka, Taiwan, Philippines and Thailand

Tribe Pollenini

Key to the Genera

Eyes in male more or less subholoptic but dichoptic in female; fronto-orbital and outer vertical bristles absent in male but present in female: arista with long hair on both sides; body clothed with crinkly golden hair on thorax ........ Pollenia

Eyes dichoptic in both sexes; fronto-orbital and outer vertical bristles present in both sexes; arista with long hair on upper side but with short hair or pubescence on lower side .................. Verticia

Genus Pollenia Robineau-Desvoidy, 1830


Small-sized flies; eyes bare, more or less approximated in male; with or without facial carina; parafacialia with long setulae; vibrissae inserted more or less above mouth margin; genae broad; thorax usually with crinkly golden hair; propleura, prosternum and suprasquamous ridge bare; subcostal sclerite with some fine bristles or bare; stem-vein bare; R₅ petiolare or open; lower squama bare on upper surface.

11. P. chotei Kurahashi et Tumrasvin, 1979
(Figs. 52, 57, 65)

Specimens examined and distribution have already been reported when this species was described as a new species.

Genus Verticia Malloch, 1927


Small-sized flies, testaceous in color; eyes bare, dichoptic in both sexes; face sunk between facialia; parafrontalia and parafrontalia setulose; fronto-orbital bristles and outer vertical bristles present in both sexes; arista with long hair on upper side but with short hair or pubescent on lower side; propleura, prosternum and suprasquamous ridge bare; r₄+₅ with broadly rounded curve; lower squama divergent from scutellum; tegite without discal bristles; 1st and 2nd sternites overlapping sides of urogites.

12. V. fasciventris Malloch, 1927
(Figs. 5, 20, 28, 41)


Male. Body length 5.5 mm. Head: Eyes bare, dichoptic; frons at narrowest point 0.24 of head width; fiv yellow; pf and pa yellow, yellow-dusted, entirely setulose; ori 9-10 pairs; ors 1+1; ovb present; g and nc yellow with short black bristles; a testaceus-yellow, length of a₃ 5X as long as a₂; pal yellow. Thorax: Testaceous-yellow with indistinct longitudinal stripes; pp, b₃x and sssr bare. Chaetotaxy; ac 3+4, dc 2+4, ia 1+3, hb 4, ph 2, prsb 1, 1 additional bristle located between post ia and sa, sa 3, pa 3, np 2, scut 5+1, st 1+1; ppb and psb well developed. Wings: Hyaline; veins yellow; r₄+₅ with setulae above and below, the above ones extending from node beyond r-m, but with 1-2 minute ones below at node; lower sq yellow and bare; ha yellow. Legs: Yellow; t₁ with 3 ad and 1 p; t₂ with 1 long and 2 short ad and 2 p; t₃ with 4 ad and 3 pd. Abdomen: All tergites with mar-
original bristles but longest on $T_4$ and $T_5$; from $T_3$ to $T_5$ each with narrow marginal brown band interrupted at middle; $S_1$ and $S_2$ overlapping sides of $T_{1,2}$ and posterior part of $T_5$; $ep$ yellow.

Specimen examined: 1♂, nr. Sai Yok, 500 m., Kanchana Buri, 8 X 1975, Kura-

hashi

Distribution: Malaysia and Thailand

Remark: The female specimen is not available in our collection.

Tribe Lucillini

Key to the Genera

1. Supraspiracular convexity clothed with conspicuous setulose erect hair ... 2
   Supraspiracular convexity pubescent ...

2. Legs with long fringe in male but un-
   fringed in female; posterior bristle on
   front tibia of female located at about
   2/5 to 1/2 from apex; 1st pair of post
   ac usually at same level with or slightly
   anterior to the 2nd pair of post dc ...

3. Anterior part of upper squama of male
   creamy or fuscous, usually with a tuft
   of blackish-brown (sometimes brown),
   hair at the inner lower margin, upper
   squama of female entirely creamy;
   narrowest part of male frons some-
   times broader than the distance be-
   tween both posterior ocelli; meta-
   cephalon usually with black hair; oc-
   ciput with more than 2 irregular rows
   of black postocular setae; frons in-
   dex in female 0.24–0.25 ... pappensis

4. Anterior part of upper squama of male
   with a tuft of yellowish-white hair at
   the inner lower margin; lower squama
   usually infuscated; narrowest part of
   male frons narrower than the distance
   between both posterior ocelli; meta-
   cephalon with several yellowish-hair;
   occiput with only one row of black
   postocular setae; frons index in female
   0.19–0.20 ... sinensis

Key to the Species

1. Post ac 3 pairs; basicosta light brown;
   subcostal sclerite pubescent; body
cupreous in color ............ cuprina
   Post ac 2 pairs; basicosta fuscous black;
   subcostal sclerite with several up-
   standing hair; body metallic green,
   blue or purple in color ........... 2

2. Anterior pair of post ac usually more
   advanced than the second pair of post
   dc; 3rd to 5th abdominal tergites
   without dark marginal bands posteri-
   orly ......................... porphyrina
   Anterior pair of post ac on the level
   with or slightly posterior to the 2nd
   pair of post dc; 3rd to 5th abdominal
   tergites with dark marginal bands
   posteriorly ................... 3

3. Anterior part of upper squama of male
   creamy or fuscous, usually with a tuft
   of blackish-brown (sometimes brown),
   hair at the inner lower margin, upper
   squama of female entirely creamy;
   narrowest part of male frons some-
   times broader than the distance be-
   tween both posterior ocelli; meta-
   cephalon usually with black hair; oc-
   ciput with more than 2 irregular rows
   of black postocular setae; frons in-
   dex in female 0.24–0.25 ... pappensis
   Anterior part of upper squama creamy,
   with a tuft of yellowish-white hair at
   the inner lower margin; lower squama
   usually infuscated; narrowest part of
   male frons narrower than the distance
   between both posterior ocelli; meta-
   cephalon with several yellowish-hair;
   occiput with only one row of black
   postocular setae; frons index in female
   0.19–0.20 .................... sinensis

Genus Lucilia Robineau-Desvoidy,

1850


Medium-sized flies, brightly metallic
green, blue, purple or copper in color; eyes
holoptic or dichoptic in male; parafron-
talia and parafacialia usually with bright
silver dusting; post ac 2–3; post dc 3; pro-
pleura and prosternum hairy; suprasqua-
mal ridge with posterior parasquamal tuft;
supraspiracular convexity hairy; stem-vein
bare; subcostal sclerite pubescent or hairy;
lower squama bare on upper surface.
13. **L. porphyrina** (Walker, 1857)

14. **L. papuensis** Macquart, 1842

15. **L. sinensis** Aubertin, 1933

16. **L. cuprina** (Wiedemann, 1830)

**Genus Hypopygiopsis** Townsend, 1916

Usually large-sized flies, brightly metallic green, blue or purple; eyes subholoptic in male but dichoptic in female; post ac 2; post dc 3; propleura and prosternum hairy; suprasquamal ridge with posterior para-squamial tuft; supraspiracular convexity hairy; subcostal sclerite hairy; lower squama bare on upper surface; legs fringed in male but unfringed in female; femora more or less swollen in male but normal in female.

**Key to the Species**
Parafrontalia, parafacialia, face, genae and metacephalon yellow and clothed with golden dust; hair on genae and metacephalon yellowish-orange; antennae entirely yellowish-orange; hair on supra-spiracular convexity yellow; all sternites yellowish-orange, with densely long orange hair (except on male 5th sternite, blackish) ............ *tumrasvini*
Parafrontalia, parafacialia, face, genae and metacephalon dark brown to fuscous, clothed with silver dust; hair on gense black and hair on metacephalon whitish; antennae dark brown; hair on supra-spiracular convexity black; all sternites dark brown with dense long black hair .......................... *infumata*

17. **H. tumrasvini** Kurahashi, 1977
Specimens examined and distribution have already been reported when this species was described as a new species.

18. **H. infumata** (Bigot, 1877)
*Somomyia infumata* Bigot, 1877, Annls Soc. Ent. Fr., 7: 42.
Specimens examined and distribution are same as in the previous study by Kurahashi (1977).

**Genus Hemipyrellia** Townsend, 1918

Medium-sized flies, brightly metallic
green or blue; eyes in male holoptic or dichoptic but dichoptic in female; parafrontalia, parafacialia, face, genae and metacephalon with dense silver-gray dust; ac 2+2; st 2+1; propleura and prosternum hairy; supraesquamal ridge with posterior parasquamal tuft; supraspiracular convexity hairy; subcostal sclerite hairy; lower squama bare on upper surface; legs unfringed.

**KEY TO THE SPECIES**

Eyes in male holoptic, dichoptic in female; 3rd antennal segment entirely orange; female abdomen with very thick dust, especially on the 5th one; 3rd tergite metallic purplish-blue, without marginal bristles; 2nd sternite of male with a group of extra long hair posteriorly ...

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**pulechra**

Eyes subholoptic in male, dichoptic in female; 3rd antennal segment entirely dark brown but sometimes orange ventrally; dust on female abdomen not so thick; 3rd tergite metallic green to cupreous-green with weak marginal bristles; 2nd sternite of male without group of long hair posteriorly

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**ligurriens**

19. **H. pulchra** (Wiedemann, 1830)


**Specimens examined:** 22♂♂, Nam Tok Mac Klang, Doi Inthanon, 18 IX 1975, Tumrasvin; 1♀, Khao Yai, 360 m., 30 km. S. Pak Chong, 5 X 1975, Kuraishchi; 1♀, Hill c. 300 m., Sakaeo, 30 km. SE, 3 IX 1975, R. Kano; 1♂, 15♀♀, Beach c. 80 km. S. Chon Buri, 30 VIII 1975, Kano, Kuraishchi, Tumrasvin; 1♀, Kanchana Buri, 18 VII 1964, Kano; 1♂, 15♀♀, nr. Sai Yok, 500 m., Kanchana Buri, 6, 7 IX, 8 X 1975, Kano, Kuraishchi, Tumrasvin

**Distribution:** India and Thailand

20. **H. ligurriens** (Wiedemann, 1830)


**Specimens examined:** 13♂♂, 5♀♀, nr. Sai Yok, 500 m., Kanchana Buri, 6, 8, 9, 11 IX, 1975, Kano, Kuraishchi, Shionagona, Tumrasvin; 4♂♂, 4♀♀, Salt Pond, 6 km. N. Chon Buri, 2 IX 1975, Kuraishchi; 12♂♂, Woods & grass Id., Ayuthaya, 1 IX 1975, Kuraishchi; 6♂♂, 17♀♀, Hill c. 300 m., Sa Kaeo, 30 km. SE, 3 IX 1975, Kano, Kuraishchi, Tumrasvin; 1♂, 3♀♀, Beach c. 30 km. S. Chon Buri, 50 VIII 1975, Kano, Kuraishchi, Tumrasvin; 12♂♂, 3♀♀, Sam Sane, Bangkok, 25 VII 1975, Kano, Kuraishchi; 6♂♂, 6♀♀, Chiang Mai Univ., 22 IX 1975, Kano, Kuraishchi, Tumrasvin; 11♂♂, 7♀♀, Bangna Nai, Bangkok, 28 VIII 1975, Kano, Kuraishchi; 6♂♂, Fang Exp. St., 500 m., Fang, 25 IX 1975, Kuraishchi; 4♂♂, 2♀♀, Nam Tok Mac Klang, Doi Inthanon, 18 IX 1975, Kano, Kuraishchi, Tumrasvin; 5♂♂, 2♀♀, Ban Pong Din, 10 km. NE. Doi Saket, 20 IX 1975, Kano, Kuraishchi, Tumrasvin; 1♂, 2♀♀, Ban Yang, 1400 m., Doi Inthanon, 17, 19 IX 1975, Kano, Tumrasvin; 2♂♂, Kasetsart Univ., Bang Khen, 31 VII 1975, R. Kano, H. Kuraishchi; 14♂♂, 2♀♀, Khao Yai, 800 m., 60 km. and 366 m., 30 km. S. Pak Chong, 3, 5, 6 X 1975, Kano, Kuraishchi; 1♂, 1♀, Top, 2667 m., Doi Inthanon, 23 IX 1975, Kano; 2♂♂, Doi Saket, 800 m., c. Chiang Mai, 15 IX, 16 XII 1975, Kuraishchi, Shima; 1♀, Erawan w.f., 500 m., Kanchana Buri, 5 IX 1975, Kano; 1♂, 1♀, Mahidol Univ., Bangkok, 26 VIII, 2 IX 1975, Kuraishchi; 1♀, Thon Buri, 27 XII 1961, G. Imadate
**Distribution:** India, Sri Lanka, China, Japan, Philippines, Malaysia, Indonesia and Thailand

**Tribe Phumosiini**

**Genus Phumosia** Robineau-Desvoidy, 1830


Medium-sized flies; testaceous-brown to dull black in color; eyes bare, holoptic in male but dichoptic in female; parafacialis without setulae; vibrissae at level or slightly above mouth margin; prst ia present; st 1+1 or 2+1; propleura and prosternum hairy; suprasquamal ridge bare; supraspiracular convexity clothed with conspicuous setulose fine hair; lower squamae bare on dorsal surface.

**Key to the Species**

Dorsum entirely testaceous-orange; hind tibia with 8 ad ........................ *testacea*

Dorsum dark brown; hind tibia usually with 2 ad ............................... *indica*

21. *P. indica* (Surcouf, 1914)

(Figs. 7, 18, 35, 46, 53, 60, 63)


Male. Body length 6.5–8.0 mm. **Head:** Eyes bare, holoptic; fr in front of lunule reddish-brown; pf linear at middle, silver-dusted; orri 7–8 pairs; pa dark brown but reddish-brown posteriorly, silver-dusted, without setulae; f and e brown, slightly silver-gray dusted; vbr inserted slightly above mouth margin; wr and m reddish-brown; g and mc black, whitish-gray dusted, with black hair; a orange, a3 dark brownish dorsally, its length 2.5X as long as a2; pal orange. **Thorax:** Dark brown and yellow to testaceous-orange on h, lateral margins and prescutellar area slightly gray-dusted but denser in front of suture and with 2 narrow inconspicuous brown longitudinal stripes in front of suture; pp and prs with yellow hair; ssr bare; ms and mts yellow. Chaetotaxy: ac 2+1, dc 2–3+4–5, ia 1+3, hb 8, ph 3, prsb 1, sa 3, pa 2, np 2, scut 4+1, st 1+1; ppb and psb well developed. **Wings:** Hyaline, slightly yellowish at base; veins light brown; r4+5 with blackish setulae extending about 1/2 way from basal node to r-m, but extending less than 1/2 way below; lower sq brownish-yellow; ha yellow. **Legs:** Yellow; t1 with 1 p, and 2–3 ad; t2 with 1 ad, 1 v, 1 pd and 2 p; t3 with 2 ad, 2 av and 1–2 pd. **Abdomen:** Testaceous-orange; T1-2 with or without dark brown marginal band; T3 with a dark brown marginal band and with weak marginal bristles; T4 dark brown on anterior 2/3 to entirely dark brownish; T5 entirely dark brown, shiny metallic, whitish-gray-dusted; S3 and S4 yellow; S3 to S5 testaceous-orange to brown.

Female. Body length 7.0–8.0 mm.; eyes separated at vertex 0.34–0.36 of head width; fr black; pf black, silver-gray dusted; orri 8–11 pairs; orss 2+1; ovsd present. Other characters similar to those of the male.

**Specimens examined:** 2♂ 8, 7♂ 2, Hill, c. 300 m., Sa Kaao, 30 km. SE., 3 IX 1975, Kano, Kurasashi; 5♂ 3, 4♀ 9, Erawan w.l., Kanchana Buri, 5 IX, 10 X 1975, Kano, Kurasashi; 3♂ 1♀, Doi Saket, 300 m., c. Chiang Mai, 15 IX 1975, Kurasashi; 2♂ 9, Woods grass ld., Ayutthaya, 1 IX 1975, Kurasashi; 2♂ 2♀, nr. Sai Yok, 500 m., Kanchana Buri, 6 IX 1975, Kano; 1♂ 2♀ 9, Khao Yai, 566 m. and 800 m., 30 km. and 60 km. S. Pak Chong, 6 X 1975, Kano; 1♂, Chiang Mai Univ., 22 IX 1975, Tumarsravin

**Distribution:** India, Sri Lanka, Taiwan.
Malaysia, Indonesia and Thailand

22. *P. testacea* (Senior-White, 1923)  
(Figs. 10, 15, 33, 40, 49, 56, 64)

*Caiusa testacea* S.-W., 1923, Spolia Zeylan., 12: 310.


Male. Body length 5.0–7.0 mm. **Head**: Eyes bare, holoptic; *pf* and *pa* dark brown with silver-gray dusting; *pf* with sparsely short and fine yellow setulae; *ori* 7–9 pairs; *pa* bare, reddish posteriorly; *f* and *e* testaceous-orange, slightly silver-gray dusted; *vbr* slightly above mouth margin; *m* and *vr* reddish-brown; *g* and *mc* black with whitish-gray dusting and with black hair; *a* orange but *a* 3 dark-brownish dorsally, its length: 2.5X as long as *a* 2; *pal* orange. **Thorax**: Testaceous-orange, slightly darkened between the narrow black median longitudinal stripes in front of suture and with thin silver-gray dusting; *pb* and *prs* with yellow hair; *sbr* bare; *ms* and *mts* yellow. Chaetotaxy: *ac* 2+1–2, *dc* 2+4, *ia* 1+3, *hb* 3, *ph* 2, *prsb* 1, *sa* 3, *pa* 2, *np* 2, *scut* 3–5+1–2, *st* 1+1; *pb* and *psb* well developed. **Wings**: Hyaline, slightly yellowish-brown anteriorly, especially near base; veins yellowish-brown; *t* 4+5 with blackish setulae above and below extending about 1/2 or slightly beyond 1/2 way from basal node to *r-m*; lower *sq* brownish-yellow, bare on upper surface; *ha* yellow. **Legs**: Yellow; *t* 1 with 4–5 *ad* and 1 *p*; *t* 2 with 1 *ad*, 1 *v*, 1 *pd* and 2 *p*; *t* 3 with 3 *ad*, 2 *av*, 2 *pd*. **Abdomen**: Same color as thorax but *T* 4 and *T* 5 blackish (probably due to postmortem) *T* 3 with weakly developed marginal bristles but well developed on *T* 4 and *T* 5; sternites yellow; *ep* yellow.

Female. Body length 6.0–7.0 mm.; eyes separated at vertex 0.30–0.34 of head width; *fv* reddish-black to black; *pf* black with silver-gray dusting and with short black setulae; *ori* 10 pairs; *ors* 2+1; *ovb* present; *t* 8 with 2–3 *ad*, 2 *av* and 2–3 *pd*. Other characters similar to those of the male.

**Specimens examined**: 1♂, Erawan w.f., Kanchana Buri, 5 IX, 10 X 1975, Kano, Kurahashi; 3♂♂, 2♀♀, Hill, c. 300 m., Sa Kaeo, 5 IX 1975, Kano, Kurahashi; 2♂♂, 5♀♀, nr. Sai Yok, 500 m., Kanchana Buri, 6, 8, 11 IX, 7 X 1975, Kano, Kurahashi, Tumrasvin; 1♀, Khao Yai, 366 m., 30 km. S. Pak Chong, 5 X 1975, Kano; 1♀, Ban Yang, 1400 m., Doi Inthanon, 17 IX 1975, Kurahashi

**Distribution**: India, Sri Lanka, Philippines, Malaysia and Thailand

**Tribe Bengaliini**

**Key to the Genera**

Fronto-orbital bristles present in both sexes; proboscis slender; *st* 2+1; 3rd tergite always with 1 pair of strong median marginal bristles; body with brightly metallic coloration ....... Catapicephala

Fronto-orbital bristles present in female only; proboscis stout; *st* 1+1; 3rd tergite without strong median marginal bristles; body dull brown to testaceous .............. Bengalia

**Genus Catapicephala** Macquart, 1851


Usually large-sized flies, brightly metallic green, blue or purple in color; eyes bare, dichoptic in both sexes; parafacialia without setulae; at least 1 pair of fronto-orbital bristles and outer vertical bristles present in both sexes; palpi long, protruding beyond mouth margin; antennae very long; *ac* 2–3+3–4; *st* 2+1; propodeum bare; prosternum hairy; suprasquamous ridge and supraspiracular convexity bare; wings in-
fuscated; stem-vein bare; lower squama bare on upper surface; \( T_3 \) with 1 pair of strong median marginal bristles.

**Key to the Species**

1. Mid-tibia with 2 \( al; ors \) 2+2; frons index 0.26–0.28; claws and pulvilli very short and stout; metacephalon covered with white hair and mixed with several black hair anteriorly; female unknown ............... *kurahashii*

   Mid-tibia with 1 \( ad; one pair of recinate ors well developed; frons index less than 0.25; claws and pulvilli very long, longer than the last tarsal segment in male, normal in female; metacephalon with white hair only.

   ............... 2

2. Palpi brown; antennae entirely fuscous; 6th and 7th sternites reddish-orange in female; \( ors \) 2+1 in both sexes ............... *michikoae*

   Palpi orange; antennae orange, darkened apically; 6th and 7th sternites black in female; \( ors \) 0+1 in male, 2+1 in female ............... *sinica*

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23. *C. kurahashii*, Tumrasvin et Kano, 1977


Specimens examined and distribution have already been reported when this species was described as a new species.

24. *C. michikoae* Tumrasvin et Kano, 1977


Specimens examined and distribution have already been reported when this species was described as a new species.

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25. *C. sinica* Fan, 1965


**Genus Bengalia** Robineau-Desvoidy, 1830


Medium to large-sized flies, testaceous to brown in color; eyes bare, dichoptic in both sexes; parafacialia and parafacialia with setulae entirely; frontal-orbital bristles developed in female but not in male; outer vertical bristles present in both sexes; vibrissae inserted at level just above mouth margin; clypeus projecting; palpi long, protruding beyond the mouth margin; proboscis stout; \( prst \) ac absent; \( st \) 1+1; propleura bare; prosternum, suprasquamal ridge and supraspiracular convexity bare; wings hyaline, clear to light brown; stem-vein bare; protuberance below base of wing rounded or pointed; lower squama bare on upper surface; hind tibia fringed or unfringed; 5th tergite with or without strong discal bristles.

Senior-White *et al.* (1940) used the numbers of spines on fore tibia and mid-femur of the male as the important characters for identification of the species. We found that those characters were unreliable, even in the same specimen in which the number of spines on each left and right tibia and femur was still different. Moreover, the shape of the posterior projection of the 5th sternite and the ventral projection of the epandrium of the same species also vary slightly among the specimens collected from the different localities. Therefore, as in the sarcophagid flies, only the genitalic characters seem to be the most reliable for
the identification of the species. At the present time, as only the males are described and keyed in this paper, the identification of the female is still questionable.

**Key to the Species**

1. Protubercance below the base of wing pointed; abdomen not tessellated; 4th sternite with 1 pair of long and strong bristles in male; small to medium-sized ........................................... *labiata*

Protuberance below base of wing rounded; abdomen slightly to heavily tessellated; 4th sternite without such bristles; medium to large-sized ........................................... 2

2. Fifth tergite with 1 pair of discal bristles; *T*<sub>1+2</sub> and *T*<sub>3</sub> with 1 strong marginal bristle on each lateral side; hind tibia more or less fringed (in *pseudo-variicolor* unfringed) ........................................... 6

Fifth tergite without discal bristles; *T*<sub>1+2</sub> and *T*<sub>3</sub> with lateral marginal bristles; hind tibia never fringed ........................................... 3

3. Hair on pteropleuron wholly yellowish ........................................... 4

Hair on pteropleuron never wholly yellowish ........................................... 5

4. Body yellowish-brown; genae with only yellow hair; parafacialia with yellow setulae; vibrissae inserted just above mouth margin; upper and lower squamae brown, border of upper squama yellowish; fore femur with long fringe on anteroventral surface in male; fore tibia with distinct protuberance and with stout spines rearranged in a continuous row in male; 4th tergite with 1 pair of strong median marginal bristles; projection of 5th sternite not symmetrical ........................................... *asymmetrica*

Body brown, much paler on lateral margins of thorax; genae with short brown setulae beyond anterior half, remainder yellowish; parafacialia with black setulae; vibrissae inserted beyond mouth margin; upper and lower squamae yellowish-white, border of upper squama brown; fore femur without fringe on anteroventral surface in male; fore tibia without distinct protuberance, stout spines rearranged in a discontinuous row in male; 4th tergite without median marginal bristles ........................................... *torosa*

5. Upper squama with a tuft of yellow hair on inner lower margin and yellow-ciliated. In male fore tibia with stout spines on protuberance; posterior paramere stout and beak-like at apex; outer forceps with free margin bent backward apically in lateral view ........................................... *chiangmaiensis*

Upper squama with a tuft of brown hair on inner lower margin and brown cilia in male; posterior paramere slender and slightly curved at apex; outer forceps emarginated anteriorly in lateral view ........................................... *siamensis*

6. Mid-tibia double-fringed in male ........................................... 6

........................................... *emarginata*

Mid-tibia unfringed in male ........................................... 7

7. In male fore tibia with 2-5 short stout setae; outer forceps with free margin nearly straight on lateral view ........................................... *bezii*

In male fore tibia with several small spines; outer forceps emarginated on lateral view ........................................... 8

8. Hind tibia unfringed, with only a row of long setae anterior half in male ........................................... *pseudovariicolor*

Hind tibia conspicuously fringed in male ........................................... *variicolor*

26. *B. labiata* Robineau-Desvoidy, 1830
(Figs. 11, 24, 29, 42)
Male. Body length 7.0–10.0 mm. Head: Eyes bare, dichoptic, frons at narrowest point 0.25–0.27 of head width; fx reddish-brown but yellowish-brown most anteriorly, with black setulae; or 8 pairs; ovb present; pa yellow, yellow-dusted, with yellow setulae but with only few black ones most posteriorly; f and fl yellow, with yellow dusting; vbr inserted at level of mouth margin; e, vr, and m yellow; vr with yellow setulae; g yellow with black setulae, only few yellow hair present most posteriorly; mc yellow, with yellow hair; ocp yellowish-brown; a yellow but a2 darkened dorsally, length of a2 2.5X as long as a2; pal pale yellow; proboscis yellow to light brownish-yellow. Thorax: Blackish-gray, yellowish laterally, traces of 2 narrow longitudinal stripes present; pp bare; prs with yellow hair; pleural parts mostly yellow; ssr bare; ms and mts yellowish-white. Chaetotaxy: ac 0+1, dc 2–4, ia 1+2, hb 2, ph 2, prsb 1, sa 4, pa 2, np 2, scut 3+0, st 1+1; ppb and psb well developed. Wings: Hyaline; veins brown; e and ba yellow; sc yellow and bare; r4,5 with setulae above and below extending more than 1/2 way from basal node to r-m; lower sg yellow, bare on upper surface; ha yellow. Legs: Yellow; f1 with fringe on anteroventral surface; t1 without protuberance, with 3–4 long stout spines on plain-margined anteroventral surface, t ad and 1 p; f2 with a double comb of erect stiff hair at apex; t2 with 2 p, without ad; t3 with 2 ad and 2–3 av. Abdomen: Yellow to brownish-yellow but darkened on T4 and T5, with brown marginal band on each tergite, band on T1,2,4 never interrupted, on T5 and T4 varied from interrupted to not interrupted, but on T5 always interrupted; T1,2 and T3 with some fine marginal bristles on lateral sides; a row of marginal bristles on T4 varied from completed to incomplete; T3 without discal bristles, with a row of marginal bristles; sternites yellow, generally darkened on S4 and S5; s1 with yellow hair; S2 and S3 with yellow hair, each sternite with 1 pair of marginal bristles and some black hair on lateral corner of posterior margin; S4 with yellow hair, with 1 pair of extra long and strong median marginal bristles and with several black hair posteriorly and laterally; S5 with black hair, posterior projection brown; ep black but yellowish posteriorly.
Specimens examined: 11 d, nr. Sai Yok, 500 m., Kanchana Buri, 6, 7, 8, 11 IX, 7, 8 X 1975, Kano, Kurahashi, Tumrasvin; 2 d, Sai Yok, 500 m., Kanchana Buri, 9–13 XII 1975, Shinonaga, Shima; 1 d, Erawan w.f., 500 m., 9–13 XII 1975, Shinonaga; 2 d, Khao Yai, 366 m. and 800 m., 30 km. and 60 km. S. Pak Chong, 5, 6 X 1975, Kano; 2 d, Fang Exp. St., 500 m., Fang, 25 IX 1975, Kano, Tumrasvin; 1 d, Ban Pong Din, 16 km. NE. Doi Saket, 20 IX 1975, Kurahashi.
Distribution: India, Malaysia, Indonesia and Thailand.

27. B. asymmetria Kurahashi Tumrasvin, 1979
Specimens and distribution have already been reported when this species was described as a new species.

28. B. torosa (Wiedemann, 1819) (Figs. 3, 19, 32, 38)
Male. Body length 11.0–12.5 mm. Head: Eyes bare, dichoptic, frons at narrowest
point 0.30 of head width; \( f_v \) slightly reddish-brown, but slightly darkened posteriorly, covered with black setulae; \( f_l \) brown, with brownish-yellow dusting and with black hair; \( o_r i \) 9–10 pairs; \( o_v b \) present; \( p_a \) yellow to brownish-yellow and sometimes slightly darkened posteriorly, with yellow dusting, covered with black setulae but sometimes with yellowish ones most anteriorly; \( f \) and \( f_l \) yellow, with yellow dusting; \( o_b r \) inserted distinctly above mouth margin; \( e \) yellow; \( v_r \) and \( m \) yellowish-orange; \( v_r \) with only yellow setulae; \( g \) brownish-yellow with short brown hair beyond anterior half, the remainder yellowish; \( m_e \) yellow with yellow hair; \( o_c p \) brown; \( a \) orange to brownish-orange, \( a_3 \) dark brownish dorsally and on the outer surface, its length 2.5X as long as \( a_2 \); \( p_a l \) pale yellow with black setulae; proboscis yellowish-brown. Thorax: Brown, much paler on lateral margins, with yellowish-brown dusting and with several traces of brown longitudinal stripes; \( p_p \) bare; \( p_r_s \) with yellow hair; pleural parts only slightly darkened; \( s_s r \) bare; \( m_s \) and \( m_t s \) yellow.

Chaetotaxy: \( a_c 0+1, d_c 2–4 \) (if 4, the anterior 2 fine)+4, \( i_a 1+2, h_b 2, p_h 2, p_r_s_b \) 1, \( s_a 2, p_a 2, n_p 2, s_c u_t 4+0, s_t 1+1; p_p_b \) and \( p_s_b \) well developed. Wings: Hyaline: veins brownish-yellow; \( e \) and \( b_a \) yellow; \( s_c \) yellow and bare; \( r_{4+3} \) with setulae above and below extending more than 1/2 way from basal node to \( r-m \); lower \( s_q \) yellowish-white, bare on upper surface; \( h_a \) yellow. Legs: Yellow; \( f_1 \) without fringe; \( t_1 \) without distinct protuberance, stout spines rearranged in a discontinuous row, the anterior group with 2 rather long, the posterior group with 5–6 but 3–4 ones longest and also with some minute spines near by, 4 \( a_d \) and 1 \( p \); \( f_2 \) with 5–6 closely-set flat and stout \( p_v \) spines at apex; \( t_2 \) with 1 \( a_d \) and 2 \( p \); \( t_3 \) with 2–3 \( a_d \) and 2 \( a_v \).

Abdomen: Pale brown, slightly darkened on \( T_3 \), slightly tessellated; each tergite with a narrow brown longitudinal and a median band; each lateral side of \( T_{1+2} \) and \( T_2 \) without marginal bristles; \( T_4 \) without strong median marginal bristles, with only a complete row of short marginal bristles; \( T_5 \) without discal bristles but with a complete row of well developed marginal bristles; sternites yellow, slightly darkened on \( S_5 \); \( S_1 \) with yellow hair; \( S_2 \) with yellow hair and with 1 pair of marginal bristles and some black hair on lateral corner of posterior margin; \( S_3 \) with yellow hair anteriorly and with black hair posteriorly and also with 1 pair of marginal bristles on lateral corner of posterior margin; \( S_4 \) with black hair but with yellow hair most anteriorly and with 1 pair of marginal bristles on lateral corner of posterior margin; \( e_p \) black.

Specimens examined: 1 \( t \), N. Nayok, 22 IV 1972, P.G.; 1 \( t \), Pukue, 12 I 1974, Arcom; 1 \( t \), Bang Khen, 26 VII 1973, Sumon; 1 \( t \), Rai Suwan, 9 VII 1974, Suwapee.

Distribution: India, Sri Lanka, Malaysia, Indonesia, Philippines and Thailand.

29. **B. chiangmaiensis** Kurahashi et Tumrasvin, 1979


Specimens examined and distribution have already been reported when this species was described as a new species.

30. **B. siamensis** Senior-White, 1924 (Figs. 12, 21, 25, 37)

**B. siamensis** S.-W., 1924, Spolia Zeylan., 13: 106.

Male. Body length 13.0 mm. Head: Eyes bare, dichoptic, frons at the narrowest point 0.32 of head width; \( f_v \) yellowish-brown but dark brownish posteriorly,
covered with black setulae; \( pf \) brown, grayish-yellow dusted, with black setulae; \( ori \) 9 pairs; \( ovb \) present; \( pa \) yellow, yellow dusting, with conspicuously large dark brown fleck most posteriorly, with yellow setulae but with blackish ones most posteriorly; \( f \) and \( fl \) yellow with yellow dusting; \( vbr \) inserted just above mouth margin; \( e \) yellow; \( vr \) browish-orange with some brown setulae; \( m \) yellow; \( g \) yellow, with some black hair but with yellow hair most posteriorly; \( mc \) yellow, with yellow hair; \( cep \) brown; \( a_2 \) brownish-orange, \( a_3 \) brown, paler ventrally, its length 2.5X as long as the 2nd; \( pai \) yellow; proboscis brownish-orange. **Thorax**: Brown, grayish-brown dusted; traces of 2 longitudinal stripes present; \( pp \) bare; \( prs \) with yellow hair; pleural parts dark brown; \( ssr \) bare; \( ms \) and \( mts \) yellow. Chaetotaxy: \( ac \) 0+1, \( dc \) 2+4, \( ia \) 1+2 (presutural one fine), \( hb \) 2, \( ph \) 2, \( psb \) 1, \( sa \) 4, \( pa \) 2, \( np \) 2, \( scut \) 3+0, \( st \) 1+1; \( ppb \) and \( psb \) well developed. **Wings**: Light brown to slightly infuscated; veins brown; \( e \) and \( ba \) yellow; \( sc \) yellowish-brown; \( r_{4,5} \) with setulae above and below extending more than 1/2 way from basal node to \( r-m \); lower \( sq \) yellowish-brown, bare on upper surface; \( ha \) yellow. **Legs**: Yellow, but anterior and apical surfaces of \( f_1 \), apical half of \( f_2 \) and anterior part of \( f_3 \) brownish; \( f_1 \) with fringe; \( t_1 \) without protuberance, with 5–6 long stout spines on plain-margined anterolateral surface (of which the anterior 2–3 ones longest) intermixed with some short spines, 3 \( ad \) and 1 \( p \); \( f_2 \) with 6 closely-set flat and stout posteroventral spines at apex; \( t_2 \) with 1 \( ad \) and 2 \( p \); \( t_3 \) with 2 \( ad \) and 2–3 \( av \) without fringe. **Abdomen**: Brown, darkened on \( T_4 \) and \( T_5 \), slightly tessellated, with 1 broad dark band on each tergite (narrowest on \( T_{1,2} \)); \( T_{1,2} \) and \( T_3 \) without lateral marginal bristles; \( T_4 \) with 1 pair of median marginal bristles and with 2 marginal bristles on each lateral side; \( T_5 \) without discal bristles but with a row of marginal bristles; sternites yellow but dark brownish on \( S_5 \); \( S_4 \) with yellow hair; \( S_3 \) with yellow hair and with a pair of long marginal bristles and some bristle-like hair on lateral corner of posterior margin and also with 2 bristle-like hair on posterior margin; \( S_2 \) with yellow hair and with 1 pair of long marginal bristles on lateral corner of posterior margin and also with several bristle-like hair on lateral margin and 1 pair of such hair on posterior margin; \( S_1 \) slightly brownish posteriorly, with black hair except yellowish ones most posteriorly and with 1 pair of long marginal bristles on lateral corner of posterior margin and also with several bristle-like hair on lateral margin and 1 pair of such hair on posterior margin; \( S_5 \) brown but dark brownish anteriorly, posterior projection metallic dark brown. **Specimens examined**: 1 \( \delta \), Chiang Mai, 1200 m., 11 IV 1966, J. Sedlacek; 1 \( \delta \), Pak Chong, 3 VII 1971, Yuwadee. **Distribution**: Thailand

31. **B. emarginata** Malloch, 1927  
(Figs. 1, 17, 27, 39)  
**Male**: Body length 11.0–14.0 mm. **Head**: Eyes bare, dichoptic, frons at the narrowest point 0.29 of head width; \( fv \) light reddish-brown but darkened posteriorly, covered with black setulae; \( pf \) dark brown, brownish-gray dusted, with some black setulae; \( ori \) 8–9 pairs; \( ovb \) present; \( pf \) yellow, yellow dusting, with conspicuously dark brown fleck most posteriorly and with black setulae; \( f \) and \( fl \) yellow, with yellow dusting; \( vbr \) inserted just above mouth margin; \( e \), \( vr \) and \( m \) yellow; \( vr \) with short yellow setulae (sometimes 4–5 brown setulae present); \( g \) and \( mc \) yellow, yellow dusted,
covered with yellow hair; cep yellowish-brown; a₂ brownish-orange, a₃ dark brown but orange at base, its length 2.5X as long as the 2nd; pal yellow; proboscis brownish-orange. Thorax: Brown, with grayish-brown dusting, traces of 2 brown longitudinal stripes present; pp bare; prs with yellow hair; pleural parts dark brown; ssr bare; ms yellow; mts light brown. Chaetotaxy: ac 0+1, dc 4–5+4, ia 1+2 (presutural one fine), hb 2–3, ph 2–3, prsb 1, sa 4, pa 4, np 2, scut 4+1, st 1+1; ppb and psb well developed. Wings: Light brown; veins brown; e and ba yellow; sc yellow and bare; r₄,₅ with setulae above and below extending more than 1/2 way from basal node to r₅u; lower sq white, bare on upper surface; ha yellow. Legs: Yellow; all femora brownish; f₁ with fringe; t₁ without protuberance, with several minute spines on plain-margined anteroventral surface, 3–4 ad and 1 p; f₂ with 7–8 closely set flat and stout posteroventral spines at apex; t₂ with 1 ad, 2–3 p and thin fringe on about apical half of anteroventral and posteroventral surfaces; f₃ heavily fringed on anteroventral and posteroventral surfaces; t₃ with 2 ad and heavily fringed on anteroventral and posteroventral surfaces. Abdomen: Pale brown, darkened on T₄ and T₅, with a broad black marginal band on each tergite (T₁₂ narrowest) and with heavily silver tessellation; each lateral side of T₁₂ and T₃ with 1 strong marginal bristle; T₄ with 1 pair of strong median marginal bristles and with 2–3 strong marginal bristles on each lateral side; T₅ with 2 strong discal bristles and a row of strong marginal bristles; sternites yellow, darkened on S₁; S₁ with yellow hair; S₂ with yellow hair but with black hair on posterior margin and with 1 pair of median marginal bristles; S₃ with yellow hair but with black hair on lateral and posterior margins and with 1 pair of median marginal bristles; S₄ with yellow hair and with several black hair on posterior half and also on lateral margin and with 1 pair of marginal bristles; S₅ dark brown, covered with black hair; ep dark brown.

Specimens examined: 6♂ ♀, nr. Sai Yok, 500 m., Kanchana Buri, 8, 11 IX 1975, Kurahashi, Tumrasvin; 1♂, Sai Yok, 500 m., Kanchana Buri, 9–13 XII 1975, Shima; 1♂, Erawan w.f., Kanchana Buri, 10 XII 1975, Shinonaga; 1♂, Pukae, 5 VIII 1971, 14 VII 1974, Pacharee; 1♂, Bang Khen, 10 XII 1978, Sawake

Distribution: China, Singapore, Taiwan and Thailand

32. B. bezzii Senior-White, 1923 (Figs. 4, 23, 31, 44)


Male. Body length 9.0–11.0 mm. Head: Eyes bare, dichoptic, frons at the narrowest point 0.31 of head width; fr reddish-brown, with black setulae; pg dark brown, with brownish-gray dusting, covered with black setulae; orl 7–8 pairs; ovar present; pa yellow, yellow-dusted, with conspicuously dark brown fleck most posteriorly, with black setulae; f and β yellow-dusted; vbr inserted just above mouth margin; e and vr yellow; vr with some brown setulae; m yellowish-orange; g and mc yellow, yellow-dusted, covered with yellow hair; cep brown; a₂ reddish-brown, a₃ dark brown but orange near base, its length 2.5X as the 2nd; pal yellow; proboscis brownish-orange. Thorax: Brown, grayish-brown-dusted, paler at sides; traces of 2 narrow brown median and some longitudinal stripes present; pp bare; prs with yellow hair; pleural parts dark brown; ssr bare; ms pale yellow; mts yellow to light brown. Chaetotaxy: ac 0+1, dc 2+4, ia 0–1+2 (presutural one fine), hb 2, ph 2, prs 1, sa
CALLIPHORID FLIES IN THAILAND

4, pa 2, np 2, scut 3+1–2 (usually 1), st 1+1; ppb and psb well developed. Wings: Pale brown; veins brown; e and ba yellow; sc yellow and bare; r4+5 with setulae above and below extending more than 1/2 way from basal node to r-m; lower sq white, bare on dorsal surface; ha yellow. Legs: f1 largely brownish but paler at base; f2 entirely brownish; f3 brownish but apical part of anterior surface, ventral and posterior surfaces yellowish; f1 fringed; t1 without protuberance, with 2–3 long and 2–5 short and stout spines on plain-margined anteroventral surface, 3 ad and 1 p; f2 with closely-set 8–9 flat and stout posteroventral spines at apex; t2 with 1 ad and 2 p; f3 with thin av and pv fringe; t3 with 3 ad, 1 av, thin av fringe and thin and short pv fringe. Abdomen: Brown but slightly darkened on T4 and with heavy silver-gray dusting; each tergite with rather broad black marginal band (on T1+2 narrowest); from T1+2 to T4 each with a fine black median stripe; T1+2 and T3 with some weakly developed marginal bristles laterally; T4 with 1 pair of strong median marginal bristles and with 2 more pairs laterally; T5 with 1 pair of strong discal bristles and with a row of strong marginal bristles posteriorly; S1 to S3 yellow with yellow hair, S2 with 2 pairs of fine hair-like marginal bristles on lateral corner of posterior margin; S4 with several black hair on posterior lateral margin; S5 dark brown with yellow hair and with several black hair and 1 pair of hair-like bristles on lateral corner of posterior margin; S6 dark brown, covered with black hair except for anterior part with yellow ones; ep black.


Distribution: India, Sri Lanka, China, Japan (Sukoku), Taiwan, Malaysia, Philippines and Thailand.

33. *B. pseudovaricola* Kurahashi et Tumrasvin, 1979


Specimens examined and distribution have already been reported when this species was described as a new species.

34. *B. varicolor* (Fabricius, 1805)

(Figs. 6, 22, 34, 45)

*Musca varicolor* Fab., 1805, Syst. Antl. 295.


Male. Body length 11 mm. Head: Eyes bare, dichoptic, frons at the narrowest point 0.26 of head width; fuv reddish-brown, with black setulae; pf dark brown with grayish-brown dusting, covered with black setulae; ori 8–9 pairs; ove present; pa yellow, yellow-dusted, with conspicuously dark brown fleck most posteriorly, with brown setulae; f and fl yellow, yellow dusting; vbv inserted just above mouth margin; e and vr yellow; vr with some brown setae; m yellowish-orange; g and mc yellow, yellow-dusted, covered with yellow hair; oep brown; a2
reddish-brown, $a_5$ dark brown but orange near base, its length 2.5X as long as the 2nd; pal yellow; proboscis brownish-orange.

Thorax: Brown, brownish-orange dusted, paler at sides, traces of 2 narrow brown median and some longitudinal stripes present; $pp$ bare; $prs$ with yellow hair; pleural parts dark brown; $ssr$ bare; $ms$ yellow; $mts$ light brown. Chaetotaxy; $ac$ 0–1, $dc$ 2–4, $ia$ 0–2, $hb$ 2, $ph$ 2–3, $prs$ 1, $sa$ 4, $pa$ 2, $np$ 2, scut 3–0; $st$ 1+1; $ppb$ and $pbs$ well developed. Wings: Pale brown; veins brown; $e$ and $ba$ yellow; $sc$ yellow and bare; $r_{1+5}$ with setulae above and below extending more than 1/2 way from basal node to $r$–$m$; lower $sq$ pale yellow, bare on upper surface; $ha$ yellow. Legs: Yellow; $f_1$ and $f_2$ entirely brownish; $f_3$ brownish but lower part of anterior surface and about basal half of posterior surface yellowish; $f_1$ unfringed; $t_3$ without protuberance, with several minute spines on plain-margined anterodorsal surface, 3 $ad$ and 1 $p$; $f_2$ with 7–9 closely-set stout and flat spines at apex; $t_2$ with 1 $ad$ and 2 $p$; $f_3$ with very thin fringe; $t_3$ with 2 $ad$, 1 $av$, thin $av$ and $pv$ fringe. Abdomen pale yellow, slightly tessellated; each tergite with rather broad black marginal band; $T_{1+2}$ to $T_4$ each with a fine black median stripe; each lateral side of $T_{1+2}$ and $T_4$ with 1 strong marginal bristle; $T_4$ with 1 pair of strong median marginal bristles and with a row of marginal bristles; $S_1$ yellow with yellow hair; $S_2$ yellow with yellow hair and with 2 long black marginal bristles and some fine black hair on posterior margin; $S_3$ yellow with short and fine yellow hair anteriorly, lateral and posterior sides with black hair and with 2 long black marginal bristles; $S_4$ yellow but dark brownish posteriorly, with black hair and 2 long black marginal bristles; $S_5$ dark brown, covered with black hair; $ep$ black.

Specimens examined: 1 $\delta$, Nakhon Nayok Prov., Khao Yai Nat. Park, 5 VI 1965, P.D. Ashlock; 1 $\delta$, nr. Burma Bord., 1200 m., Fang, 26 IX 1975, Tumrasvin

Distribution: India, Laos, Viet Nam, Taiwan, Malaysia, Indonesia and Thailand

Remarks: We studied and compared all characters of varicolor, bezzii and emarginata in detail and we were sure that these 3 species were distinct.

Subfamily Chrysomyinae

The flies in this subfamily are all metallic in coloration. The presence of distinct setulae on the posterodorsal surface of basal section of stem-vein of wing, lower squama entirely hairy on upper surface, the sutural knob with erect hair, and the poorly developed bristles on the thoracic dorsum are the main characters of the members of this subfamily.

Genus Chrysomya Robineau-Desvoidy, 1830


Small to medium-sized flies, usually metallic green, blue or purple in color; eyes large and bare, in male holoptic or dichoptic, upper 2/3 of male facets uniform or remarkably enlarged but female facets always uniform; $prs$ $ac$ absent; propleura and prothorax hairy; suprasquama ridge usually with anterior parasquama tuft, sometimes short hair present posteriorly in some species; subcostal sclerite hairy; 5th tergite with many fine erect bristles on disc.

Key to the Species

1. Mesothoracic spiracles white; facets of male eyes small and uniform ...... 2

Mesothoracic spiracles brown to black; facets on upper 2/3 of male eyes remarkably enlarged but lower 1/3 small (all facets uniform in bezziana.
and villeneuvi) .................. 3

2. Eyes dichoptic in both sexes; fronto-orbital bristles absent in both sexes; sternopleural bristles 0+1; 3rd and 4th tergites with marginal dark bands posteriorly, only 3rd tergite with a narrow longitudinal median stripe; dorsal and ventral surfaces of 5th tergite with black hair only; usually small-sized, 4.0–6.0 mm. .... nigripes

Eyes holoptic in male; fronto-orbital bristles absent in male; sternopleural bristles 1+1; 3rd and 4th tergites with marginal dark bands posteriorly and with longitudinal median stripes on 3rd to 5th tergites; dorsal surface of 5th tergite with black hair intermixed with white hair but with only white hair on ventral surface; body size 6.5–9.0 mm. .......... albiceps rufacies

3. Eyes dichoptic in both sexes; one strong reclinate fronto-orbital and outer vertical bristles present in both sexes; face sunk deeply between inflated parafacialia; femora greatly swollen in male, less so in female; apical half of pv row on each mid-femur comb-like in male, not so conspicuous in female; each tarsal segment in male short and stout, normal in female; disc of 5th tergite of male clothed with dense short hair, but minute or almost bare in female .... villeneuvi

Eyes holoptic or only slightly separated in male, reclinate fronto-orbital and outer vertical bristles absent in male; apical half of mid-femur without comb-like pv row in both sexes; tarsal segment normal; disc of 5th tergite with many fine erect bristles in both sexes ...................... 4

4. Parafacialia and genae yellowish-orange, both covered with yellowish-white hair; 3rd antennal segment entirely orange; anterior half of upper squama whitish and covered with white hair dorsally; 5th tergite with white hair intermixed with black hair on dorsal surface, but with only white hair on ventral surface ..................... 5

Parafacialia and genae fuscous, both covered with black hair; 3rd antennal segment not entirely orange; anterior half of upper squama white to blackish-gray and covered with dark brown to black hair dorsally or bare; 5th tergite with only black hair on both dorsal and ventral surfaces ...... 6

5. Eyes in male with remarkably enlarged facets on upper 2/3, the lower 1/3 with small facets; lower squamae dark brown with dark brown hair dorsally .......... megacephala

Eyes in male with only small facets and uniform; lower squamae white to yellowish-white and with white or black hair dorsally .......... bezziana

6. Anterior half of upper squama whitish and bare dorsally, anterior margin yellowish-white to slightly light brown, posterior margin dark brown; male head hemispherical distinctly in profile ..................... chani

Anterior half of upper squama never pure whitish and covered with dark brown to black hair dorsally, anterior and posterior margins dark brown; male head flattened in profile ... 7

7. Posthumeral bristles absent (sometimes weakly developed in female); body large in size, 12.0–13.0 mm. ................. thanomthini

Posthumeral bristles well developed; body not more than 10 mm. in length ................ pinguis

35. C. villeneuvi Patton, 1922

C. villeneuvi Patton, 1922, Indian J.
Specimens examined: 22♀♂, 14♂♀, nr. Sai Yok, 500 m., Kanchana Buri, 6, 8, 9, 11 IX, 7 X 1975, Kano, Kurahashi; 16♂♂, 14♀♀, Erawan w.f., 500 m., Kanchana Buri, 7, 10 IX 1975, Kano, Kurahashi; 6♂♂, 5♀♀, Khao Yai, 366 m. and 800 m., 30 km. and 60 km. S. Pak Chong, 3, 5, 6 IX 1975, Kano, Kurahashi; 3♂♂, 2♀♀, khao Khia, 1351 m., 80 km. S. Pak Chong, 3, 6, 10 IX 1975, kurahashi; 2♂♂, 2♀♀, Doi Pui, 1685 m., c. Chiang Mai, 16 IX 1975, Kano, Kurahashi; 2♂♂, 2♀♀, Nam Tok Mae Klang, Doi Inthanon, 18 IX 1975, Kano, Kurahashi; 1♂, 2♀♀, Ban pong Din, 10 km. N.E. Doi Saket, 20 IX 1975, Kurahashi; 6♀♀, Ban Yang, 1400 m., Doi Inthanon, 17 IX 1975, Kano, Kurahashi; 2♂♂, 1♀♀, Fang Exp. St., 500 m., Fang, 25 IX 1975, Kurahashi; 2♂♂, 1♀♀, Doi Huai Hwer, 1231 m., Fang, 27 IX 1975, Kurahashi; 2♂♂, 2♀♀, nr. Burma Bord., 1200 m., Fang, 26 IX 1975, Kurahashi

Distribution: India, Sri Lanka, Malaysia and Thailand

36. *C. nigripes* Aubertin, 1932


Specimens examined: 7♂♂, 4♀♀, nr. Sai Yok, 500 m., Kanchana Buri, 6, 8, 11 IX 1975, Kano, Kurahashi; 2♂♂, 15♀♀, Erawan w.f., 500 m., Kanchana Buri, 5, 7 IX 1975, Kano, Kurahashi; 2♂♂, Khao Khia, 1551 m., 80 km. S. Pak Chong, 6 X 1975, Kurahashi; 2♂♂, nr. Ban Sap Bon, 90 km. E. Sara Buri, 4 X 1975, Kurahashi; 3♂♂, Khao Yai, 366 m., 30 km. S. Pak Chong, 6 X 1975, Kurahashi; 2♂♂, 2♀♀, Ban pong Din, 10 km. N.E. Doi Saket, 20 IX 1975, Kano, Kurahashi; 2♂♂, 6♀♀, Nam Tok Mae Klang, Doi Inthanon, 18 IX 1975, Kano, Kurahashi; 3♂♂, Fang Exp. St., 500 m., Fang, 25 IX 1975, Kurahashi; 3♂♂, 1♀♀, Doi Huai Hwer, 1231 m., Fang, 27 IX 1975, Kano, Kurahashi; 2♂♂, nr. Burma Bord., 1200 m., Fang, 26 IX 1975, Kurahashi

Distribution: Malaysia, Singapore, Philippines and Thailand

37. *C. chani* Kurahashi, 1979


Specimens examined: 27♂♂, 22♀♀, nr. Sai Yok, 500 m., Kanchana Buri, 6, 9, 11 IX, 7, 8 X, 9-13 XII 1975, Kano, Kurahashi, Shinozaga; 2♂♂, 1♀♀, Erawan w.f., 500 m., Kanchana Buri, 5 IX 1975, Kano, Kurahashi; 10♂♂, 3♀♀, Khao Yai, 366 m., 30 km. S. Pak Chong, 5 X 1975, Kano, Kurahashi; 6♂♂, Khao Khia, 1351 m., 80 km. S. Pak Chong, 6 X 1975, Kurahashi; 2♂♂, 4♀♀, Hill, c. 300 m., Sa Kaeo, 30 km. S.E., 3 IX 1975, Kurahashi; 10♂♂, 4♀♀, Ban pong Din, 10 km. N.E. Doi Saket, 20 IX 1975, Kurahashi, Tumrasvin; 1♀, Nam Tok Mae Klang, Doi Inthanon, 18 IX 1975, Kano; 6♂♂, Fang Exp. St., 500 m., Fang, 25 IX 1975, Kurahashi, Tumrasvin; 2♂♂, 5♀♀, Doi Huai Hwer, 1231 m., Fang, 27 IX 1975, Kano, Kurahashi; 1♀, Ban Yang, 1400 m., Doi Inthanon, 23 IX 1975, Tumrasvin; 1♀, nr. Burma Bord., 1200 m., Fang, 26 IX 1975, Kurahashi

Distribution: India, Sri Lanka, Malaysia and Thailand.

38. *C. albiceps rusifacies* (Macquart, 1848)


Specimens examined: 8♂♂, 11♀♀, nr. Sai Yok, 500 m., Kanchana Buri, 6, 11 IX, 7 X, 9-13, 27-29 XII 1975, Kano, Shinozaga, Kurahashi; 2♀♀, Erawan w.f., 500 m.,
Kanchana Buri, 5 IX 1975, Kano; 8♂, 2♀, Sam Sane, Bangkok, 29 VIII 1975, Kano, Kurahashi; 2♂, 4♀, Bangna Nai, Bangkok, 28 VIII 1975, Kano, Kurahashi, Tumrasvin; 1♀, Bangkok, 22 IX 1961, Imadate; 1♂, Kasetsart Univ., Bangkok, 11 VIII 1975, Kurahashi; 2♂, 2♀, Beach, c. 30 km S. Chon Buri, 30 VIII 1975, Kano, Kurahashi; 1♂, 3♀, Salt Pond, 6 km N. Chon Buri, 2 IX 1975, Kurahashi; 4♂, 8♀, Hill, c. 200 m, S. Kao, 6 IX 1975, Kurahashi, Tumrasvin; 3♂, 10♀, nr. Ban Sak, 30 km E. Sara Buri, 4 X 1975, Kurahashi; 3♂, 1♀, Khao Yai, 366 m, 30 km S. Pak Chong, 5 X 1975, Kurahashi; 4♂, 1♀, Woods & grass Id., Ayutthaya, 1 IX 1975, Kurahashi; 1♂, 1♀, Chiang Mai Univ., 22 IX 1975, Kurahashi; 6♂, 2♀, Ban Pong Din, 10 km N.E. Doi Saket, 20 IX 1975, Kano, Kurahashi; 2♂, 1♀, Nam Tok Mae Klaug, Doi Inthanon, 18 IX 1975, Kano, Kurahashi

**Distribution:** Oriental region and Australia

59. **C. pinguis** (Walker, 1858)


*Species examined:* 27♂, 3♀, nr. Sai Yok, 500 m, Kanchana Buri, 6, 9, 11 IX, 7, 8 X 1975, Kano, Kurahashi; 26♂, 7♀, 2♀, Erawan w.f., Kanchana Buri, 5, 7, 8, 9 IX 1975, Kano, Kurahashi; 22♂, 19♀, Khao Yai, 800 m, 30 km and 60 km S. Pak Chong, 3, 5, 6 X, 25-26 XII 1975, Kano, Kurahashi, Tumrasvin; 13♂, 2♀, Khao Khiaw, 1351 m, 80 km S. Pak Chong, 3, 6 X 1975, Kurahashi; 8♂, 27♀, Doi Pui, 1685 m, 16 IX 1975, Kano, Kurahashi; 6♂, 1♀, Doi Suthep, Chiang Mai, 20-21 XII 1975, Shinonaga, Shima; 6♂, 10♀, Ban Yang, 1400 m, Doi Inthanon, 17, 23 IX 1975, Kano, Kurahashi; 5♂, 10♀, Top, and nr. Top, 2300-2400 m, Doi Inthanon, 17, 23 IX, 19 XII 1975, Kano, Kurahashi, Shima; 1♂, Fang Exp. St., 500 m, Fang, 25 IX 1975, Kurahashi; 1♂, nr. Burma Bord., 1200 m, Fang, 26 IX 1975, Kurahashi

**Distribution:** India, Sri Lanka, China, Korea, Japan, Taiwan, Malaysia, Indonesia and Thailand

40. **C. megacephala** (Fabricius, 1794)

*Musca megacephala* Fab., 1794, Syst. Ent., 4: 47.


*Species examined:* 4♂, 1♀, nr. Sai Yok, 500 m, Kanchana Buri, 6, 11 IX, 8 X 1975, Kano, Kurahashi; 6♂, 1♀, Erawan w.f., 500 m, Kanchana Buri, 5, 10 IX 1975, Kano, Kurahashi; 3♂, 4♀, Kanchana Buri, 18 VII 1964, Kano; 5♂, 4♀, Bangna Nai, Bangkok, 28 VIII 1975, Kano, Kurahashi, Tumrasvin; 2♀, 2♀, Bangkok, 23 VII 1964, Kano; 3♂, 2♀, Beach, c. 30 km S. Chon Buri, 30 VIII, 1975, Kano, Tumrasvin; 6♂, 3♀, Khao Yai, 366 m, 30 km S. Pak Chong, 5, 6 X, 24-26 XII 1975, Kurahashi, Shima; 2♂, 2♀, Khao Yai, 800 m, 60 km S. Pak Chong, 3 X 1975, Kano; 2♂, 3♀, Woods & grass Id., Ayutthaya, 1 IX 1975, Kurahashi; 1♂, 1♀, Khao Khiaw, 1551 m, 80 km S. Pak Chong, 5 X 1975, Kurahashi; 2♂, 3♀, 2♀, Hill, c. 200 m, S. Kao, 3 IX 1975, Kurahashi; 4♀, nr. Ban Sak, 30 km E. Sara Buri, 4 X 1975, Kurahashi, 2♀, S. Buri, 3 X 1961, and 2 X 1975, Imadate, Kano; 4♂, 2♀, 2♀, Ban Pong Din, 10 km N.E. Doi Saket, 20 IX 1975, Kano, Kurahashi; 1♀, Chiang Mai, 2 XI 1961, Imadate; 1♂, 2♀, Chiang Mai Univ., 22 IX 1975, Kurahashi; 8♀, 149♀, Nam Tok Mae Klaug, Doi Inthanon, 18 IX 1975, Kano, Kurahashi;
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REFERENCES


EXPLANATION OF FIGURES

Plate 1. Fifth Sternites of Male

Fig. 1. *Bengalia emarginata*
Fig. 2. *Melinda scutellata*
Fig. 3. *Bengalia torosa*
Fig. 4. *B. bezzi*
Fig. 5. *Verticia fasciventris*
Fig. 6. *Bengalia varicolor*
Fig. 7. *Phumosia indica*
Fig. 8. Tufts of hair on 3rd and 4th sternites of male *Melinda scutellata*
Fig. 9. Tufts of hair on 3rd and 4th sternites of male *Melinda nuortevae*
Fig. 10. *Phumosia testacea*
Fig. 11. *Bengalia labiata*
Fig. 12. *B. siamensis*
Fig. 13. *Melinda nuortevae*

Plate 2. Phallostyles and Anterior and Posterior Parameres

Fig. 14. *Melinda scutellata*
Fig. 15. *Phumosia testacea*
Fig. 16. *Melinda nuortevae*
Fig. 17. *Bengalia emarginata*
Fig. 18. *Phumosia indica*
Fig. 19. *Bengalia torosa*
Fig. 20. *Verticia fasciventris*
Fig. 21. *Bengalia siamensis*
Fig. 22. *B. varicolor*
Fig. 23. *B. bezzi*
Fig. 24. *B. labiata*

Plate 3. Epandrium, Inner and Outer forceps (Lateral View)

Fig. 25. *Bengalia siamensis*
Fig. 26. *Melinda nuortevae*
Fig. 27. *Bengalia emarginata*
Fig. 28. *Verticia fasciventris*
Fig. 29. *Bengalia labiata*
Fig. 30. *Melinda scutellata*
Fig. 31. *Bengalia bezzi*
Fig. 32. *B. torosa*
Fig. 33. *Phumosia testacea*

Plate 4. Inner and Outer Forceps (Posterior View)

Fig. 34. *Bengalia varicolor*
Fig. 35. *Phumosia indica*

Fig. 36. *Melinda scutellata*
Fig. 37. *Bengalia siamensis*
Fig. 38. *B. torosa*
Fig. 39. *B. emarginata*
Fig. 40. *Phumosia testacea*
Fig. 41. *Verticia fasciventris*
Fig. 42. *Bengalia labiata*
Fig. 43. *Melinda nuortevae*
Fig. 44. *Bengalia varicolor*
Fig. 45. *B. varicolor*
Fig. 46. *Phumosia indica*

Plate 5. Sternites of Female (Figs. 47–53), 6th to 9th Tergites of Female (Figs. 54–60) and 6th to 9th Sternites of Female (Figs. 61–67)

Fig. 47. *Onesia parafacialis*
Fig. 48. *Polleniopsis pilosa*
Fig. 49. *Phumosia testacea*
Fig. 50. *Melinda scutellata*
Fig. 51. *M. nuortevae*
Fig. 52. *Pollenia chotei*
Fig. 53. *Phumosia indica*
Fig. 54. *Polleniopsis pilosa*
Fig. 55. *Onesia parafacialis*
Fig. 56. *Phumosia testacea*
Fig. 57. *Pollenia chotei*
Fig. 58. *Melinda scutellata*
Fig. 59. *M. nuortevae*
Fig. 60. *Phumosia indica*
Fig. 61. *Melinda scutellata*
Fig. 62. *Onesia parafacialis*
Fig. 63. *Phumosia indica*
Fig. 64. *P. testacea*
Fig. 65. *Pollenia chotei*
Fig. 66. *Melinda nuortevae*
Fig. 67. *Polleniopsis pilosa*