

## NOTES ON MARINE DOLICHOPODID FLIES FROM THAILAND (INSECTA: DIPTERA: DOLICHOPODIDAE)

Patrick Grootaert and Henk Meuffels

Department of Entomology, Royal Belgian Institute of Natural Sciences, Brussels, Belgium. Email Patrick.Grootaert@naturalscience.be

**ABSTRACT.** – A preliminary report is given on the marine Dolichopodidae from the Thai coasts of the Andaman Sea and the Gulf of Siam. Fifteen species in 7 genera are identified. Keys to the genera and the species are provided together with short diagnoses to the species. Seven species are described as new: *Cymatopus thaicus*, new species, *Thinolestris thaica*, new species, *Thinophilus nitens*, new species, *Th. parmatus*, new species, *Thinophilus setiventris*, new species, *Nanothinophilus hoplites*, new species and *Phacaspis mitis*, new species.

**KEY WORDS.** – Marine Diptera, Dolichopodidae, Southeast Asia, new species.

---

### INTRODUCTION

Insects are not reputed to have conquered the marine environment. Nevertheless, in tropical areas, the adults of many species live in the supralittoral zone. Moreover, when the substrate is solid, such as rock or coral, many more species can even live as larvae in the intertidal zone. The larvae of the chironomid genus *Clunio* are confined to the sublittoral zone so that emergence of adults is necessarily restricted to periods when the tides are extremely low during a spring tide. Specific fly communities live on rocky and sandy beaches while other communities are adapted to live in mangroves (Cheng, 1976). Quite a number of dolichopodid flies have successfully adapted to these saline conditions, and they are especially predominant in tropical regions. Thailand is no exception to harbouring these flies and it possesses a very rich halophilous dolichopodid fauna. Unfortunately, few reports are available on this kind of fauna.

Grootaert & Meuffels (1998) published a paper on three species belonging to the genus *Nanothinophilus*, which were found in mangroves along the coast of the Andaman Sea. Another short note (Grootaert & Meuffels, 1999) dealt with the rediscovery of *Terpsimyia* in the Gulf of Siam, a so far monotypical genus, originally described by Becker (1922) from Taiwan.

In the present paper, we give a report on the communities of dolichopodids that were found during various visits to

beaches and mangroves along the Andaman Sea and the Gulf of Siam. Our report is preliminary since our visits were limited to the dry season and only a few places were explored. Nevertheless, we found some unexpected genera such as *Phacaspis*, previously only known from the southern coast of Papua New Guinea, and *Thinolestris*, so far only known from Papua New Guinea and Sulawesi. In the present paper we describe new species in the genera *Phacaspis*, *Nanothinophilus*, *Thinophilus*, *Thinolestris* and *Cymatopus*.

A short synthesis on the ecology of the various dolichopodid groups that can be found on the coasts of the Andaman Sea and the Gulf of Siam is presented at the end of this paper.

### MATERIAL AND METHODS

Material was collected mainly by net sweeping but also with white pan traps. The latter consisted of white rectangular plastic containers (18 x 13 cm and 5cm high). They were placed on the ground and filled with 3 % formaldehyde in water. A few drops of liquid soap were added to lower the surface tension. Apart of some dry mounted specimens, all specimens collected are preserved in 70 % alcohol. Holotypes and most paratypes are deposited in the collections of the Royal Belgian Institute of Natural Sciences (RBINS), but voucher specimens of most species are deposited at the Biology Department of Srinakharinwirot University in Bangkok (SWU).

## SYSTEMATIC ACCOUNT

## Key to the male marine dolichopodids occurring in Thailand (females of most genera can be identified as well with the key)

1. Arista apical; a pair of fronto-orbital bristles present (i.e. frons with a bristle at each side, halfway between base of antenna and vertex). Hydrophorinae, Aphrosylini ..... 2
  - Arista dorsal, or subapical; no fronto-orbital bristles ..... 5
2. Fore leg strongly bristled, mid and hind leg poorly bristled or without striking bristles. Usually fore tarsus shorter than or as long as tibia (splash zone of rocky shores) ..... *Cymatopus*
  - Fore leg simple; other legs also simple, but hind leg may be strongly haired or bristled. Fore tarsus clearly shorter than tibia ..... 3
3. All legs in male simple, without strong bristles ..... 4
  - Fore leg simple, hind leg with very long hairs at least on tibia ..... *Cymatopus longipilus*
4. Snout long, first tarsal segment of fore leg very short and with a ventral notch (splash zone on rocky shores) ..... *Thambemyia*
  - Snout shorter than height of head; costa with quite long, spine-like bristles, longest near wing base (intertidal zone, on pebbles and sand) ..... *Thinolestris*
5. First antennal segment dorsally bare ..... 6
  - First antennal segment dorsally haired. Dolichopodinae .. 13
6. Third antennal segment apically more or less rounded (somewhat kidney shaped in Diaphorinae, or almost circular in *Thinophilus*) ..... 9
  - Third antennal segment triangular in shape ..... 7
7. Clypeus lentiform, eyes touching above and sometimes even beneath clypeus. No acrostichal bristles present; 3 dorsocentrals ..... 8
  - Clypeus, parallel-sided; acrostichals uniseriate; (common in mangroves; only 1 species known from sandy beaches) ..... *Teuchophorus*
8. No postocular hairs present; fore leg with tarsal segments 2-4 short, at most as long as wide. .... *Nanothinophilus*
  - Usual postocular hairs present; fore leg with tarsal segments longer than wide ..... *Phacaspis*
9. Third antennal segment almost circular (as long as high) with a dorsal arista (very common on mudflats in mangroves, in supralittoral zone of sandy beaches, sometimes in sheltered areas on rocky beaches) ..... *Thinophilus*
  - Third antennal segment generally higher than long (somewhat kidney-shaped) Diaphorinae. .... 10
10. Wing: tp absent; vein M not reaching wing border. Genital capsule without strong bristles. (mangrove or swamp forest; not known yet from Southeast Asia) ..... *Cryptophleps*
  - Wing: tp present; vein M usually reaching wing margin. Genital capsule with some long bristles (on sternum 8) (in *Terpsimyia* hidden by very long lateral hairs on tip of abdomen) ..... 11
11. Wing: vein M normal, nearly straight, not interrupted or fading about its middle ..... 12

- Wing: vein M interrupted about its middle, or somewhat undulating and fading away about its middle. (in crab burrows on sandy beaches; not reported yet from Southeast Asia) ..... *Asyndetus*
- 12. Male with very long lateral hairs on tip of abdomen, hiding the genital capsule (cliffs, sandy beach) ..... *Terpsimyia semicincta* (Becker)
  - Male with 4 strong bristles on genital capsule .... *Diaphorus*
- 13. Vein M near wing tip strongly converging towards vein r 4+5 (intertidal zone of sandy beaches; not reported yet from Thailand) ..... *Paraclius*
  - Vein M not converging towards vein r 4+5 (only supralittoral of sandy beaches; not reported yet from Thailand) ..... *Dolichopus*

Genus *Phacaspis* Grootaert & Meuffels, 1988

**Discussion.** – This genus is represented in Thailand with 2 species: *Ph. petiolata* Grootaert & Meuffels and *Ph. mitis*, new species. They consist of minute flies about 1 mm long found on the mud flats in mangroves.

Key to the males of *Phacaspis* in Thailand

1. 3 dc; third antennal segment triangular, with acute tip; fore femur with at least 4 pv bristles longer than femur is wide (Thailand) ..... *Ph. mitis*, new species
  - 4 dc; third antennal segment trapezoidal with rounded tip; fore femur with a row of pv which are shorter than femur is wide (Thailand, PNG) ..... *Ph. petiolata* Grootaert & Meuffels

*Phacaspis mitis*, new species

(Figs. 1-7)

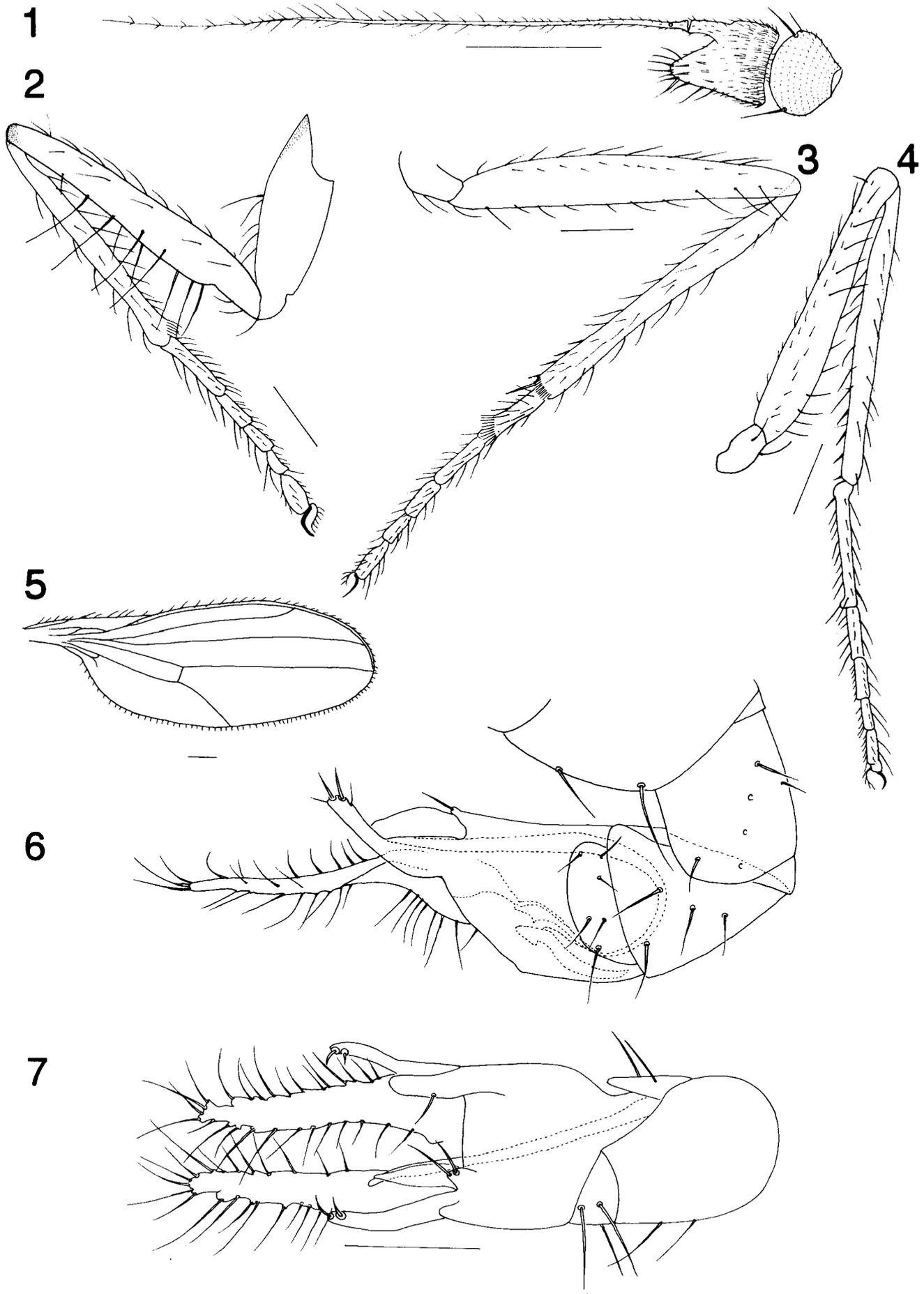
**Material examined.** – Holotype – male, Thailand: Krabi province: Ao Nang, mud flat at low tide in mangrove (near bridge, estuary), coll. P. Grootaert, 24 Oct.1997 (sample n°. 97110).

Paratypes – 2 males, 2 females same provenance as holotype; Trang province, Palian, mangrove, 3 males, 2 females, coll. P. Grootaert, 1 Nov.1997 (sample n°. 97152); Satun province, Pak Bara, mangrove, 3 males, 1 female (sample 97133), 1 male (sample n° 97134, coll. P. Grootaert, 28 Oct.1997; Singapore, Sungei Buloh, 10 males (sample n° 20032), coll. P. Grootaert & N. Evenhuis, 6 Oct.2000; Malaysia, Sedili Kecil, 1 male (sample n° 20047), coll. P. Grootaert & N. Evenhuis, 12 Oct.2000.

**Diagnosis.** – A small species, resembling *Ph. petiolata*. Thorax with 3 pairs of about equally long dorsocentrals. Fore femur ventrally with a row of very long, thin, straight setae. Mid and hind femora without longer hairs or bristles. Fore tibia nearly as long as femur, without bristles; mid tibia not thickened. Hypopygium very long, reaching beyond base of third abdominal segment. Basal antennal segments brown; third antennal segment triangular, with an acute apex, longer than deep.

**Male**

Body length 1.1-1.2 mm; wing length 1.0-1.15 mm.



Figs. 1-7. *Phacaspis mitis*, new species, paratype male. 1. Antenna; 2. Fore leg; 3. mid leg; 4. Hind leg; 5. Wing; 6. Hypopygium laterally; 7. Hypopygium dorsally. Scale 0.1 mm.

**Head.** Frons and face with dark metallic green ground colour. Face broad beneath antennae but rapidly narrowing downwards; before middle of face eyes almost touching (being separated by width of an eye-facet), eventually face widening again, the clypeus being wide lentiform (as wide as third antennal segment). A pair of long diverging ocellars, a pair of long verticals inserted anteriorly of the ocellars. **Antenna** (Fig. 1): basal segments dark brown; third segment yellowish brown, with apical half feebly darker. Third segment triangular, 1.25 times as long as deep, with acute apex. Arista dorsal, about 3 times as long as antenna, very shortly pubescent; basal arista segment short, less than one third of length of third antennal segment.

**Thorax** and scutellum with shining, dark metallic green ground colour. No acr, 3 about equally long dc. First dc the longest. Scutellum with 2 marginal bristles. No propleural bristle.

**Legs** yellowish brown. Coxae I yellow with brown base, coxae II and III brown. All femora dorsally browned, ventrally pale yellow; all tibiae and tarsi brownish but tarsomeres 1-4 of hind leg pale yellowish, terminal segment dark brown.

**Fore leg** (Fig. 2). Coxa anteriorly with a row of short bristles. Femur ventrally with a row of about 6, very thin, but long hair-like bristles, 4 of which are longer than greatest depth of femur; more anteroventrally a row of shorter thin bristles. Tibia nearly as long as femur; ventrally a row of very short bristles, shorter than diameter of tibia. Length of tibia and tarsal segments (in mm): 0.3 : 0.11 : 0.06 : 0.05 : 0.03 : 0.055.

**Mid leg** (Fig. 4). Coxa without bristles. Femur simple, ventrally with a row of very short, hairlike bristles. Tibia about as long as femur, without bristles. Length of tibia and tarsal segments (in mm): 0.41 : 0.16 : 0.07 : 0.06 : 0.05 : 0.06.

**Hind leg** (Fig. 3). Coxa without bristles. Femur with a few short, hair-like pv near tip. Tibia about as long as femur, without bristles, but with slightly lengthened hairs, especially so in antero- and posterodorsal rows. Length of tibia and tarsal segments (in mm): 0.41 : 0.11 : 0.08 : 0.06 : 0.04 : 0.06.

**Wing** (Fig. 5) hyaline. Apical part of m1+2 nearly straight, more or less parallel to r4+5. Tp short, much shorter than apical part of m3+4 (about 1 : 4). Halteres white with a greyish hue; squamae pale yellow with very short inconspicuous cilia.

**Abdomen** shining dark metallic green. First segment without sternum. Hairs and hind marginal bristles on terga microscopic. Hypopygium (Figs. 6, 7) very long and slender, pale yellow with brownish yellow base, reaching nearly to base of abdomen.

**Female**

Body length 1.2-1.35 mm; wing length 1.1-1.2 mm.

As the male, except:

**Head.** Face nearly twice as wide as depth of third antennal segment. Tip of third antennal segment a little less acute than in male.

**Thorax.** A long humeral, 2 notopleural, 1 sutural, 1 supraalar, no postalar, A pair of scutellars; no acr, 3 dc, almost equally long.

**Fore leg.** Coxa anteriorly with bristly hairs that are weaker than in male, but as long. Femur ventrally without bristles, with only short, very thin hairs.

**Mid leg.** Femur ventrally without short bristles.

**Hind leg.** No longer pv near tip.

**Distribution.** – Coast of Andaman Sea (Thailand).

***Phacaspis petiolata* Grootaert & Meuffels, 1988**

**Material examined.** – Thailand: Prachuap Khiri Khan province, Sam Roi Yot, mangrove, 1 male, coll. P. Grootaert, 2 Apr.1996 (sample n° 96002).

**Discussion.** – The specimen recorded here resembles the species originally described from the southern coast of Papua New Guinea in all characters and is therefore considered to be conspecific.

**Distribution.** – Coral Sea (Papua New Guinea), Gulf of Siam (Thailand).

**Genus *Nanothinophilus* Grootaert & Meuffels, 1998**

**Discussion.** – The genus *Nanothinophilus* is currently known only from the Andaman sea coast in Thailand. It is represented by 4 species: *N. armatus* Grootaert & Meuffels, 1988, *N. pauperculus* Grootaert & Meuffels, 1988, *N. dolichurus* Grootaert & Meuffels, 1988 and *N. hoplites*, new species.

**Key to male *Nanothinophilus* from Thailand**

1. Fore tibiae dorsally with at least 3 (seldom 2) or 4 (5) very strong bristles ..... 2
  - Fore tibiae dorsally without strong bristles, at most bearing some hairs ..... 3
2. Fore tibiae dorsally with 3 (seldom 2) strong bent bristles. Fore femur ventrally with bristles that are about as long as femur is wide ..... *N. armatus* Grootaert & Meuffels
  - Fore tibiae dorsally with 4 to 5 strong bent bristles. Fore femur ventrally with bristles that are longer than femur is wide ..... *N. hoplites*, new species
3. Hypopygium less than half as long as abdomen. Fore tibiae dorsally with some fine white hairs .....
  - ..... *N. pauperculus* Grootaert & Meuffels
  - Hypopygium more than half as long as abdomen. Fore tibiae dorsally with some brownish hair-like bristles .....
    - ..... *N. dolichurus* Grootaert & Meuffels

*Nanothinophilus hoplites*, new species

(Figs. 8-12)

**Material examined.** – Holotype – male, Thailand: Krabi province, Ao Nang, 24 Oct. 1997, mud flat in mangrove at low tide.

Paratypes – 1 male, 2 females, same provenance as holotype, coll. P. Grootaert (sample no. 97110).

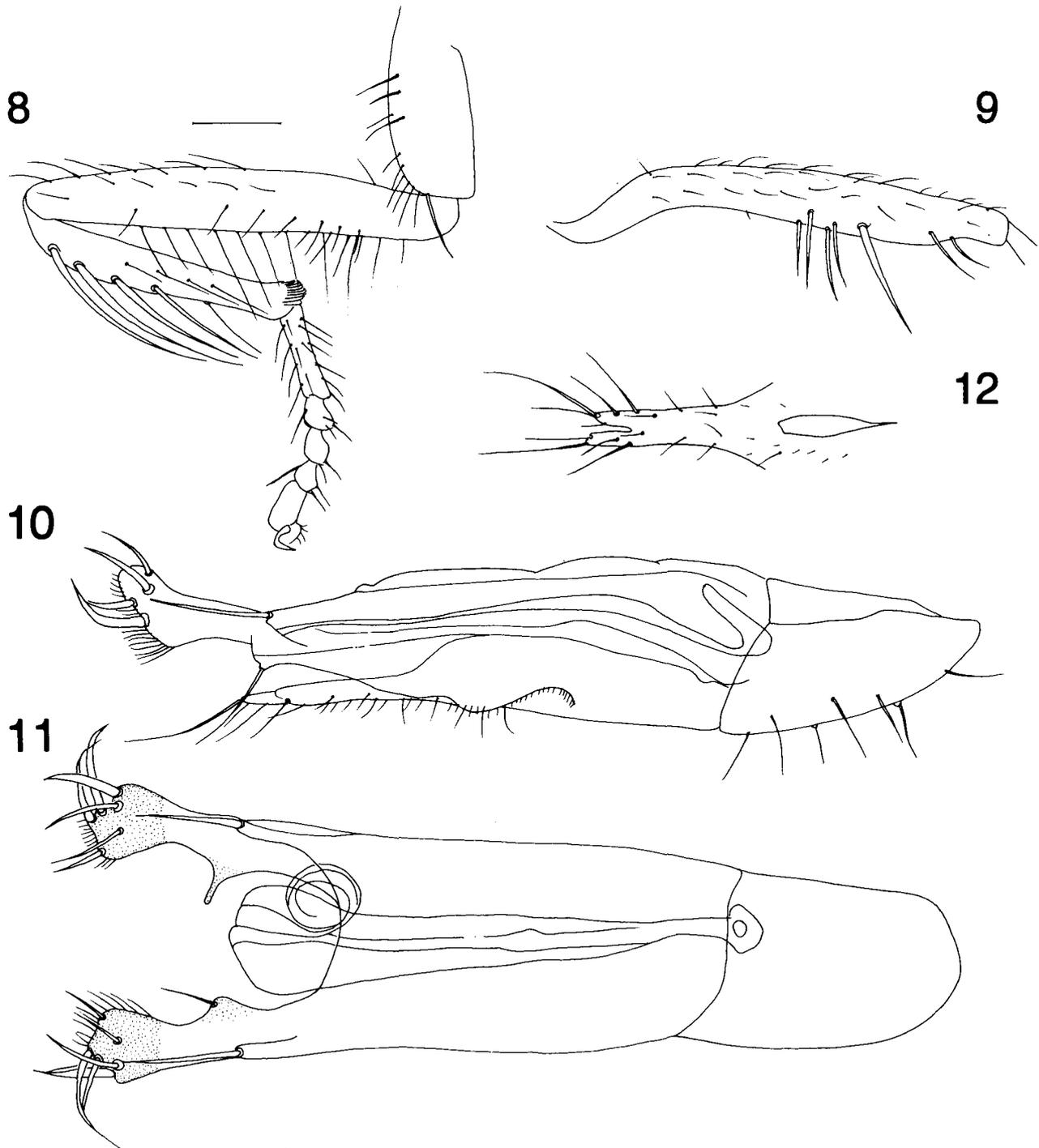
**Diagnosis.** – Like *N. armatus*, but fore tibia with a row of 4-5 very long and strong, bent bristles. Fore femur ventrally with bristles that are longer than diameter of femur. Hind femur ventrally with two irregular series of bristles, two of

which are longer than depth of femur. Hypopygium reaching beyond base of fourth abdominal segment.

**Male.**

Body length 1.55-1.6 mm; wing length 1.3 mm.

**Head.** Frons and face with dark metallic green ground colour. Face as in *N. pauperculus*, at its narrowest point less broad than depth of third antennal segment. Palpi small, yellowish, with few, very short hairlets. Rostrum short, dark brown. Chaetotaxy of head as in *N. pauperculus*, but bristles black. **Antenna** yellow; apical half of third segment feebly browned. Third segment about as long as deep, triangular with rounded



Figs. 8-12. *Nanothinophilus hoplites*, new species, holotype male. 8. Fore leg anteriorly; 9. Hind leg anteriorly; 10. Hypopygium laterally; 11. Hypopygium ventrally; 12. Cerci. Scale 0.1 mm.

basal angles and a rather acute apex. Arista dorsal, more than 3 times as long as antenna, very shortly pubescent; basal arisal segment half as long as third segment.

*Thorax* and scutellum with dark metallic green ground colour, shining. All bristles black. No acr; 3 about equally long dc. Scutellum with 2 marginals. No propleural bristle.

*Legs* and coxae pale yellow; mid coxae exteriorly browned. Fifth segment of tarsi not browned.

*Fore leg* (Fig. 8). Coxa anteriorly with very short, fine hairs, without bristles. Femur ventrally with a partly doubled row of hair-like bristles, that are longer than depth of femur; dorsally an irregular row of lengthened hairs. Tibia shorter than femur (about 3:4); dorsally a row of 4-5 very long and strong, bent brownish yellow bristles, the second one from base longest, more than half as long as tibia; on apical half, dorsally, two rows of hairs. Tarsus short; first segment ventrally with a row of short bristles. Length of tibia and tarsal segments (in mm): 0.3 : 0.1 : 0.04 : 0.03 : 0.03 : 0.05.

*Mid leg*. Coxa without bristles. Femur gently bent, at apical fourth with a thin, hairlike anterior bristle. Tibia slightly shorter than femur, feebly thickened and more or less spindle-shaped; at apical fourth a weak, but rather long ad; some hairs of the antero- and posterodorsal rows slightly lengthened. Length of tibia and tarsal segments (in mm): 0.35 : 0.15 : 0.04 : 0.04 : 0.03 : 0.05.

*Hind leg*. Coxa without bristles. Femur (Fig. 9) feebly narrowed and gently bent in basal half; ventrally, at apical third, a long, stout bristle, and about middle a few shorter bristles, hardly longer than diameter of femur; more posterodorsally an irregular row of bristle-like hairs, shorter than depth of femur. Tibia shorter than femur, bearing a long, thin, hairlike anterodorsal bristle at two thirds from base; hairs of antero- and posterodorsal rows slightly lengthened. Length of tibia and tarsal segments (in mm): 0.4 : 0.11 : 0.07 : 0.05 : 0.04 : 0.06.

*Wing* as in *N. pauperculus*.

*Abdomen* dark metallic green, with purple reflections. First segment with sternum. Hairs and hindmarginal bristles on terga microscopic. Hypopygium (Figs. 10, 11, 12) long and slender, pale yellow with brownish base, folded under abdomen, and reaching beyond base of fourth segment. Epandrial seta longer than in *N. armatus*. Bristling and shape of surstylus also different.

#### Female

Body length 1.5-1.55 mm; wing length 1.2-1.5 mm.

As the male, except:

*Head*. Face at middle about 1.5 times as wide as depth of third antennal segment.

*Fore leg*. Coxa with hairs a little longer than in male. Femur ventrally without hairlike bristles. Tibia dorsally with two rows of short bristles, all shorter than diameter of tibia.

*Mid leg*. Femur with hairs of anteroventral row somewhat lengthened; 1 weak av at apical fourth. Tibia simple, without bristles.

*Hind leg*. Femur and tibia simple, without bristles.

**Discussion.** – *N. hoplites* is certainly very closely related to *N. armatus*. The number of strong bristles on the fore tibiae might be variable in this species group but there are various differences in the male genitalia as well. So, they are considered as distinct species.

**Distribution.** – Coast of Andaman Sea (Thailand).

#### Genus *Thinophilus* Wahlberg, 1844

**Discussion.** – The genus *Thinophilus* is very common in sun exposed areas on the mud flats in mangroves and along creeks. It is less common on rocky shores and on sandy beaches. Apart from the three new species described here, we suspect that many more marine species await description.

#### Key to male *Thinophilus* of Thailand

1. All coxae darkened; 2<sup>nd</sup> tarsal segment of mid leg enlarged (Fig. 22) and darkened. ....  
..... *Th. parmatus*, new species  
– Fore coxae yellow; tarsal segments of mid leg simple ..... 2
2. Wing spotted; 3<sup>rd</sup> abdominal sternum with a cluster of hairs ..... *Th. setiventris*, new species  
– Wing unspotted; 3<sup>rd</sup> abdominal sternum without a cluster of hairs ..... *Th. nitens*, new species

#### *Thinophilus setiventris*, new species (Figs. 13-16)

**Material examined.** – Holotype – male, Thailand, Ranong province, Ranong, Wat Tapotaram, river near hot springs, 5 Apr. 1996.

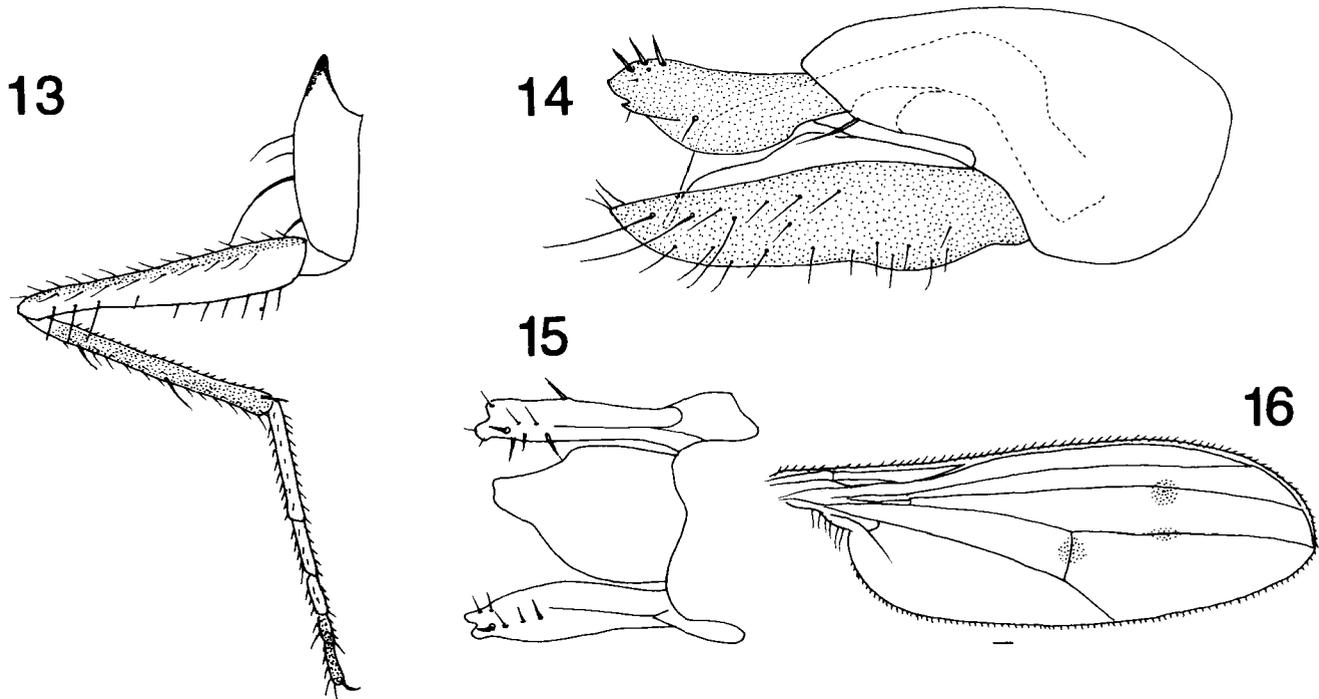
Paratypes – 5 males, 8 females, same provenance as holotype (leg. P. Grootaert (sample n° 96025)).

**Diagnosis.** – Medium-sized, metallic green species, with dull black spots on mesoscutum. Palpi brownish yellow. Legs, including fore coxae, yellow; hind tibia browned basally. Antennae yellow, dorsally browned. Legs poorly bristled; fore femur of male ventrally with irregular rows of scattered, short bristles, including a row of 3 to 4 longer pv on apical third. Wing clouded on tp, on apical third of r4+5 and on wing boss. Third sternum in male with a cluster of hairs.

#### Male

Body length 2.8-3.5 mm (x: 3.15 mm); wing length 2.3-2.7 mm (x: 2.5 mm).

*Head*. Frons and face with shining dark metallic green ground colour. Face at its narrowest point only a little wider than the ocellar callus; clypeus much shorter than epistoma, projecting. Palpi large, brownish yellow to brown, set with sparse, short black hairs. Rostrum dark brown. Occiput shining dark metallic green. 2 ocellars, diverging; 2 verticals, much shorter than the ocellars, converging; 2 tiny, hair-like postocellars; 2 postverticals, not in row with the postoculars. Lateral and lower postoculars pale, pluriseriate. *Antennae*



Figs. 13-16. *Thinophilus setiventris*, new species, paratype male. 13. Fore leg posteriorly; 14. Hypopygium laterally; 15. Surstyli; 16. Wing. Scale 0.1 mm.

short, yellow; all segments dorsally, and third segment also apically, broadly browned. Second segment encompassing third segment partly on upper side, bearing very short bristlets. Third segment rounded, about as long as deep. Arista dorsal, practically bare, less than 3 times as long as antenna; basal arista segment very short, hardly longer than broad.

**Thorax** and scutellum shining blackish green, with purple shine. Mesoscutum with a dull black spot in front of scutellum, between the hindmost two pairs of dc, and roundish dull black spots above wing roots; a median glossy stripe widens to the rear, to encompass the dull black spot in front of scutellum. Neck yellowish. No acr. 6 dc, the first of which is small and hairlike, and the hindmost is a long and strong bristle; the 4 dc in between them are rather short and all of about the same length. Scutellum with 2 strong marginals, flanked each by a short hair. 3 white propleural bristles. Prothoracic collar with a row of white bristles.

**Legs** yellow. Fore coxa yellow; mid and hind coxae brownish black, with yellow tips. Hind tibia browned at base. All tarsi progressively browned on last three or two segments.

**Fore leg** (Fig. 13). Coxa anteriorly with 2 long black bristles, and, more towards the inner side, with a row of 3-4 shorter, thin black bristles; at apex a slanting row of 4 bristles. Femur with 3-5 pv on apical third; ventrally an irregular row of weak, short bristles on basal half; a short dorsal bristlet at the very base of femur. Tibia about as long as femur; 2 dorsal bristles, a shorter one near base (sometimes reduced to a simple hair), and a stronger one just beyond middle; a small ventral apical bristle. Tarsal segments 1-4 with ventral apical spinules; first tarsal segment ventrally spinulose. Length of tibia and tarsal segments (in mm): 0.7 : 0.3 : 0.15 : 0.12 : 0.09 : 0.11.

**Mid leg.** Coxa with a black exterior bristle; anteriorly a mix of short black hairs and bristles. Femur with 2-3 preapical pv. Tibia about as long as femur; 2 ad; a circlet of short apicals. Length of tibia and tarsal segments (in mm): 0.92 : 0.55 : 0.24 : 0.16 : 0.1 : 0.11.

**Hind leg.** Coxa with a black exterior bristle. Femur with 1 or 2 short ad, that may be lacking. Tibia a little longer than femur; 2 ad, 3 d, 2 v, all short; 4 apicals; at anteroventral apical rim a short fringe. Length of tibia and tarsal segments (in mm): 1.2 : 0.32 : 0.3 : 0.2 : 0.1 : 0.12.

**Wing** (Fig. 16) hyaline, slightly brownish tinged, with vague brownish cloudings on tp, apical third of r4+5 and on wing boss. Apical part of m1+2 with a slight upward bent (wing boss) just in front of its middle, apically parallel to r4+5. Tp about as long as apical part of m3+4. Anal vein present, short. Halteres pale yellow. Squamae yellowish, with short pale cilia. **Abdomen** dark metallic green, shining, with large dull black saddle spots on anterior half of terga. Sixth tergum bluish black; fifth tergum with a bluish gloss. Hairs and marginal bristles on terga short, black. Third sternum with a cluster of black bristly hairs on apical two thirds; fourth and fifth sterna also with a rather long hairiness. Hypopygium black (Figs. 14, 15); cerci black, with short black hairs.

#### Female

Body length 2.8-3.8 mm (x: 3.45 mm); wing length 2.5-3.1 mm (x: 2.85 mm).

Face about 1.5 times as wide as the ocellar callus. The pv on apical third of fore femur very short or even nearly lacking; no ventral bristles or hairs. Sterna of abdomen without long hairs. Oviscapt with short black acanthae.

**Discussion.** – This species may be the same as *Thinophilus indigenus* Becker, 1902, described from various localities in Egypt and later reported from Tainan (Taiwan) by Becker (1922). It is quite doubtful that it concerns the same species. In neither paper, Becker (l.c.) mentions long bristles on the sterna. A quite similar species was found in a mangrove in Singapore. It has a ventral comb of spinules on the fore tibiae and the ventral bristling on the fore femora is also better developed. Moreover it does not possess a cluster of bristles on the third sternum like in *Th. setiventris*.

***Thinophilus nitens*, new species**  
(Figs. 17-20)

**Material examined.** – Holotype – male, Thailand, Ranong province, Ranong, Wat Tapotaram, river near hot springs, 5 Apr. 1996.

Paratypes – 2 females, same provenance as holotype, coll. P. Grootaert (sample n° 96025).

**Diagnosis.** – Large, metallic green species. Palpi yellow. Legs, including fore coxae, yellow. Fourth and fifth tarsal segments of male fore and mid legs slightly broadened and darkened. Fore femur of male ventrally with a row of bristles on basal half, and posteroventrally with a row of 4-5 bristles on apical third. Mid and hind femora of male with rows of

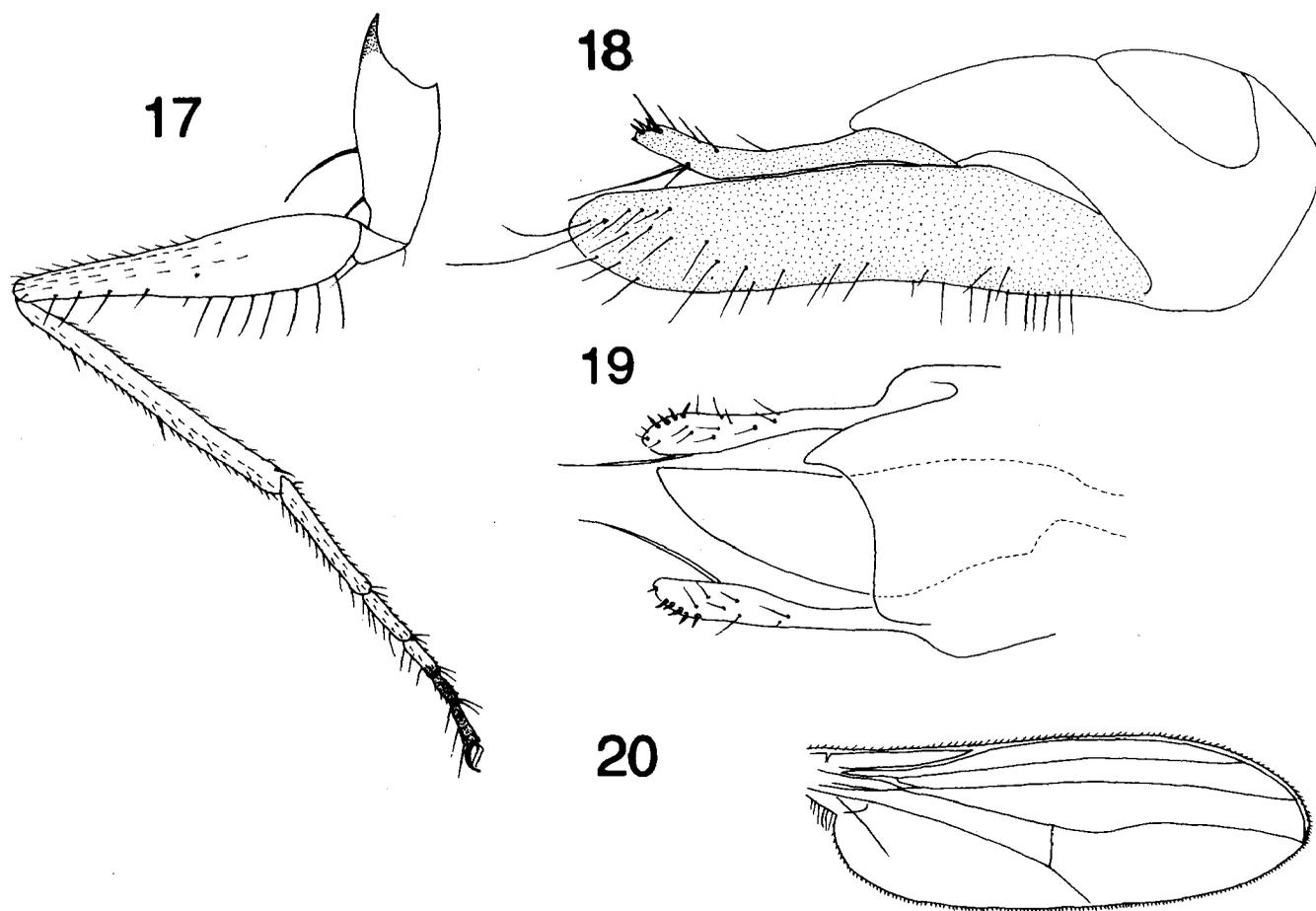
short ventral bristles. Wing hyaline, not clouded. Antennae yellow. Venter of abdomen ventrally bare.

**Male**

Body length 4.3 mm; wing length 3.4 mm.

**Head.** Frons and face with shining dark metallic green ground colour, with coppery reflections. Face at its narrowest point distinctly wider than ocellar callus. Clypeus much shorter than epistoma, more bronze-coloured, feebly projecting. Palpi large, yellow, with scattered short black hairs. Rostrum brownish black. Occiput shining dark metallic green. 2 ocellars, pointing upwards, diverging; 2 shorter verticals, pointing forwards, converging; no postocellars; 2 short postverticals, not in row with the postoculars. Upper postoculars uniseriate, short, black; lateral and lower postoculars pluriseriate, not very long, whitish. **Antennae** short, yellow; second and third segments dorsally feebly browned. Second segment encompassing third segment partly on upper side, bearing tiny marginal bristlets. Third segment rounded, about as long as deep. Arista dorsal, practically bare, about 2,5 times as long as antenna; basal arisal segment very short.

**Thorax** and scutellum shining dark metallic green, with a purplish shine. No dull black spots on mesoscutum. Neck brownish yellow. No acr; 6 dc, the hindmost of which only is a long bristle. Scutellum with 2 large marginals, each



Figs. 17-20. *Thinophilus nitens*, new species, holotype male. 17. Fore leg posteriorly; 18. Hypopygium laterally; 19. Surstyli; 20. Wing. Scale 0.1 mm.

flanked by a short hair. Propleura with a few white hairs, two of which are long, and one bristle-like. Prothoracic collar with a row of white bristles.

*Legs* yellow. Fore coxa yellow; mid and hind coxae dark, with yellow tips. Fore and mid tarsi darkened from base of fourth segments onwards; fourth and fifth segments slightly broadened. Hind tarsus darkened from tip of second segment onwards; fifth segment very feebly broadened.

*Fore leg* (Fig. 17). Coxa anteriorly with white hairs and one black bristle; at apex a row of 5 thin black bristles. Femur ventrally, on slightly more than basal half, with a row of about 8 thin black bristles, all of them shorter than diameter of femur; posteroventrally on apical third a row of 4-5 short bristles. Tibia about as long as femur; 2-3 very short, hairlike ad. First tarsal segment ventrally spinulose; tarsal segments 1-4 each with 2 apicoventral spinules. Fourth and fifth segments slightly broadened, dorsally rather shaggy haired. Length of tibia and tarsal segments (in mm): 1.0 : 0.42 : 0.2 : 0.14 : 0.1 : 0.15.

*Mid leg*. Coxa with a strong black exterior bristle; anteriorly a rather long black hairiness, the hairs growing shorter towards tip of coxa. Trochanter with a black ventral spot, and 3 very small anterior bristlets. Femur ventrally on basal two thirds with a row of short bristles; posteroventrally, about middle of femur, a row of 3-5 short bristles; on apical third some of the hairs of the posterior row, and one of the anterior row, are bristlelike; a small preapical pv. Tibia about as long as femur; 2 ad and 2 pd, forming pairs near base and at middle of tibia, all short; a circle of apicals, including a rather strong ventral bristle. Tarsal segments 1-4 each with 2 apicoventral spinules. Fourth and fifth tarsal segments slightly broadened, dorsally rather shaggy haired. Length of tibia and tarsal segments (in mm): 1.3 : 0.8 : 0.26 : 0.18 : 0.11 : 0.15.

*Hind leg*. Coxa with a feeble, black exterior bristle. Trochanter ventrally with a black spot, with a ventral bristle and a few hairs. Femur ventrally with a row of very short bristles; dorsally near base some of the hairs are bristlelike; a short preapical av, and an equally short preapical pv. Tibia about as long as femur; 3 ad, 2 pd, all short; 4 apicals; at anteroventral apical rim a short brownish fringe. Tarsal segments 1-4 each with 2 apicoventral spinules. Fifth tarsal segment very slightly broadened. Length of tibia and tarsal segments (in mm): 1.65 : 0.5 : 0.38 : 0.27 : 0.15 : 0.17.

*Wing* (Fig. 20) hyaline, feebly brownish tinged, without cloudings. Apical part of m1+2 gently curved (wing boss) before its middle, apically parallel to r4+5. Tp about as long as apical part of m3+4. Anal vein present. Halteres pale yellow. Squamae pale yellow, with pale cilia.

*Abdomen* beautifully shining dark metallic green, sideways bluish, dorally on terga 1-4 more bronzy, on terga 5 and 6 more bluish-green and purplish; incisions between the terga hardly dulled. Hairs and marginal bristles on terga very short, black. Venter bare. Hypopygium (Figs. 18, 19) blackish, folded in under terga 5 and 6, its tip reaching nearly the anterior margin of the fifth abdominal segment.

#### **Female**

Body length 4.4-5.3 mm; wing length 3.9-4.1 mm.

Face not much wider than in male. Fore femur has only a row of short pv on apical third. Mid and hind femora without ventral bristles. Mid femur with a row of very short posterior bristlets on apical two fifths; hind femur has a row of very short ad on apical half. Fore tibia: 2 ad, 2 pd, sometimes a weak ventral bristle. Hind tibia: 3 ad, 3 pd, 2 ventral bristles. Oviscapt with short black acanthae.

#### ***Thinophilus parmatus*, new species**

(Figs. 21-26)

**Material examined.** – Holotype – male, Thailand: Phang-Nga province: Takua Pa, river, estuary, coll. P. Grootaert, 8 May. 1998 (sample n° 98031).

Paratypes – 5 males, 2 females of same provenance as holotype; Trang province, Palian, 1 Nov. 1997, 1 male, 1 female, mangrove (sample n° 97152).

**Derivatio nominis.** – Lat. *parmatus*, 'bearing a small shield', referring to the enlarged second tarsomere on the mid leg.

**Diagnosis.** – Rather small species with yellow palpi, yellow antennae and all coxae dark. Male: second segment of mid tarsus dorsally enlarged into a dark brown lobe; third segment less widened, contrasting pale. 6-7 dc growing longer backwards, all relatively short. Cerci yellow; aedeagus without extension.

#### **Male**

Body length 2.3-2.7 mm; wing length 2.05-2.3 mm.

**Head.** Frons and face with shining dark metallic green ground colour. Face rather narrow, at its narrowest point about half as wide as depth of third antennal segment. Clypeus only one third as long as epistoma, broader than long, protruding. Palpi large, yellow, bearing scattered, very short black bristlets. Rostrum large, blackish. Postcranium shining dark metallic green. 2 large, diverging ocellars; 2 verticals (broken off); 2 tiny postocellars; 2 postverticals (broken off). Upper postoculars uniseriate, black; lower postoculars very short, pale; lower postcranium with very short, pale hairs. *Antenna* short, yellow; upper margin of third segment narrowly brown. Second segment not encompassing third segment on upper half, with very short, pale marginal bristlets. Third segment short, rounded, with long, pale pubescence. Arista subapical, black, about twice as long as antenna, with microscopic pubescence; basal arisal segment yellow, very short.

**Thorax** and scutellum shining dark metallic green, with bronze and purplish reflections; between the rows of dc dark two dark longitudinal stripes, reaching backwards to last but one pair of dc. No acr. 6-7 dc, all rather short, growing longer backwards. Scutellum with 2 marginals, without lateral hairs. Propleurae with a few very short hairs [bristles?, broken off].

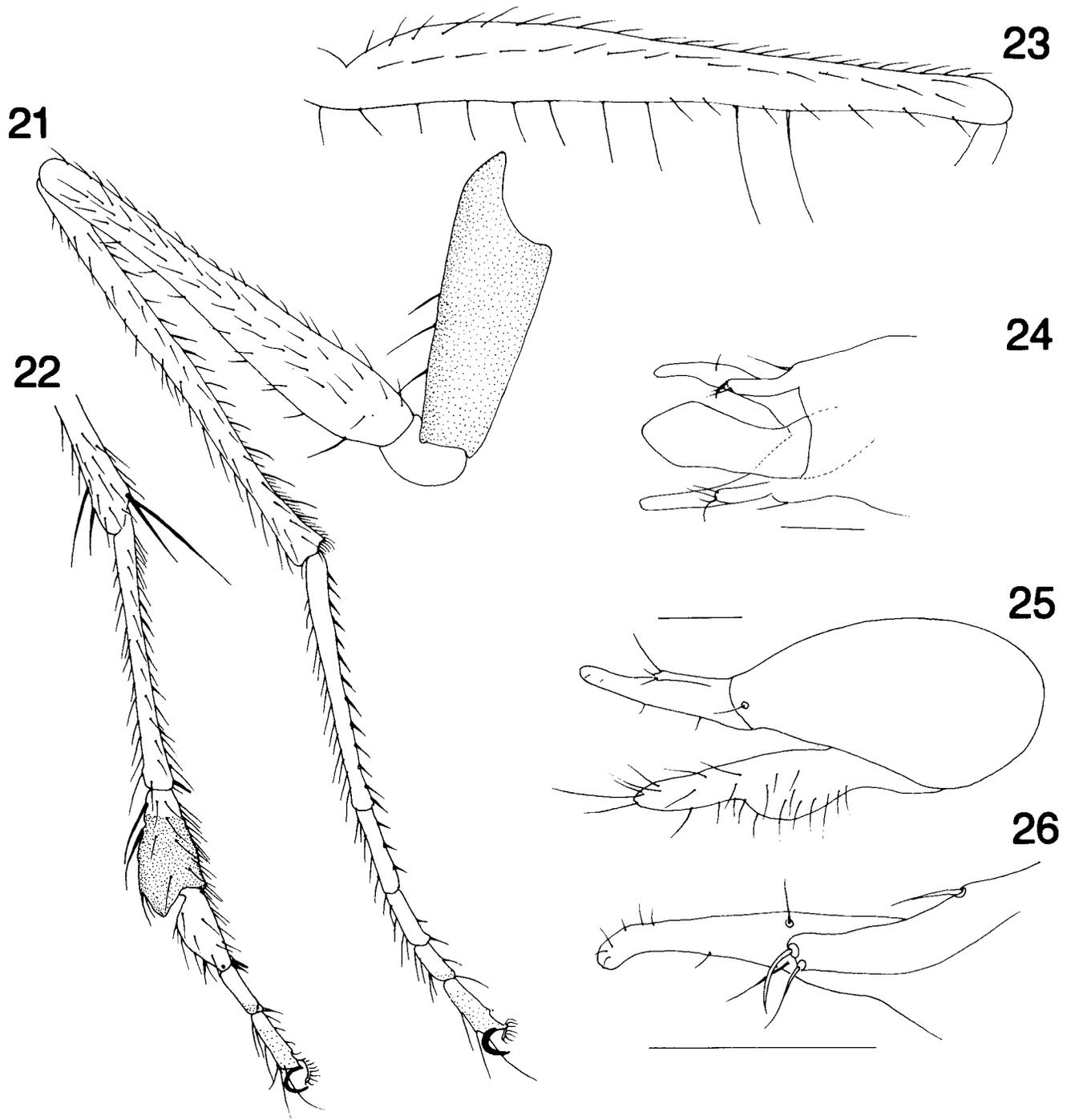
**Legs.** All coxae dark; fore and mid coxae with greenish gloss; hind coxa usually paler, brownish. Legs yellow; fifth segments of all tarsi feebly browned. Enlarged second tarsal segment of mid leg dark brown, third segment yellowish white.

*Fore leg* (Fig. 21). Coxa anteriorly with two irregular rows of short black hairs and bristles, growing slightly longer downwards; at apical rim a few short, black, bent bristles. Femur ventrally with a row of short, hairlike bristles, longest near base (hardly half as long as depth of femur); a small preapical pv. Tibia about as long as femur; ventrally with a row of short bristles, as long as or slightly shorter than diameter of tibia; no dorsal bristles. Tarsal segments 1-4 ventrally 'prickly' as a result of rows of short bristles. Length of tibia and tarsal segments (in mm): 0.8 : 0.43 : 0.15 : 0.12 : 0.09 : 0.1.

*Mid leg*. Coxa anteriorly with a few short, hairlike bristles; at tip a row of close-set, short, bent bristles. Femur ventrally

with two irregular rows of short, thin bristles, longest on basal half of femur (bristles of the more anteroventral row longest, slightly longer than half a diameter of femur); a preapical pv. Tibia slightly longer than femur; 2 short, weak ad on basal half; 1 small, weak pv (not always present); some apical bristles, the 2 ventral ones rather strong. Second tarsal segment (Fig. 22) dorsally enlarged into a dark brown lobe, bearing rather long bristly hairs dorsally; third segment broadened at base, tapering towards its tip (Fig. 22). Length of tibia and tarsal segments (in mm): 1.1 : 0.5 : 0.17 : 0.15 : 0.1 : 0.11.

*Hind leg*. Coxa with a black exterior bristle. Femur (Fig. 23) ventrally with scattered, short, very thin erect hairs, one



Figs. 21-26. *Thinophilus parmatus*, new species, paratype male. 21. Fore leg posteriorly; 22. Mid tarsus; 23. Hind femur; 24. Aedeagus and surstyli ventrally; 25. Hypopygium laterally; 26. Surstyli. Scale 0.1 mm.

or two of which, on apical third, are long (longer than greatest depth of femur) and bristlelike, Tibia a little shorter than femur, without bristles on shaft or with only a small, weak ad; bristles of apical crown short. Length of tibia and tarsal segments (in mm): 1.05 : 0.42 : 0.3 : 0.15 : 0.12 : 0.15.

*Wing* feebly brownish tinged, without dark shades. Veins brownish yellow or yellow. Apical part of m1+2 nearly straight, very slightly converging with r4+5. Tp straight, about as long as apical part of m3+4 or slightly longer. Anal vein present, short. Halteres yellow. Squamae yellow, with white cilia.

*Abdomen* with shining dark metallic green ground colour, with coppery reflections; no dull black bands. Hairs on terga short, black; hindmarginal bristles black, short, except on sides of first tergum. Fourth sternum with black bristles on protruding apical part. Hypopygium (Figs. 24-26) with yellow cerci and aedeagus; aedeagus without extension.

**Female**

Body length 2.5-2.85 mm; wing length 2.2-2.4 mm.

Face about as wide as depth of third antennal segment. Clypeus about half as long as epistoma. Legs very poorly bristled. All femora ventrally bare. Fore tibia without ventral

bristlets. Mid tibia with 2 small ad and a small pv. Hind tibia with 1 ad and 1 pd close together, both very short. Mid tarsus simple. Oviscapt with very small, black acanthae.

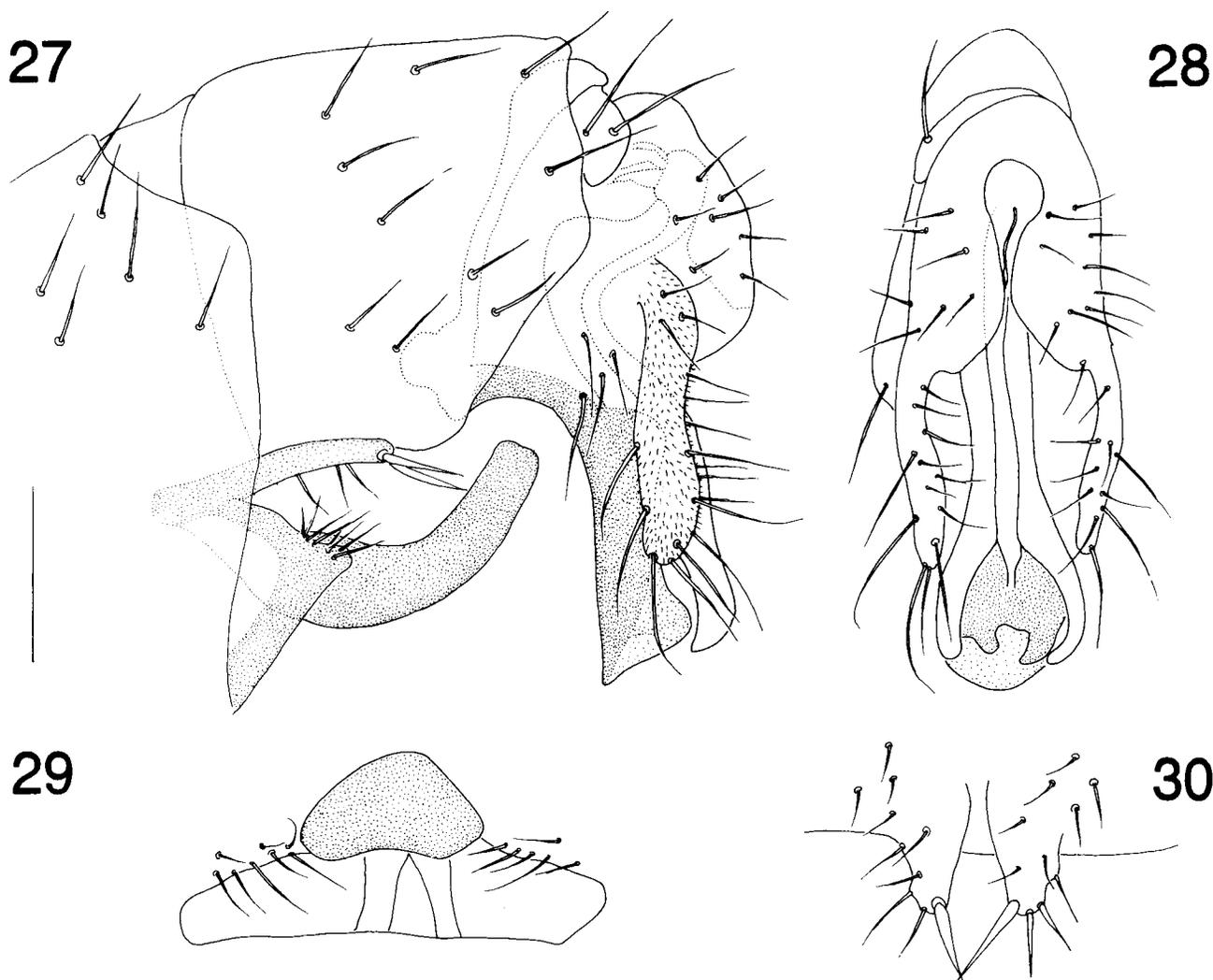
**Distribution.** – Coast of Andaman Sea.

**Genus *Thinolestris* Grootaert & Meuffels, 1989**

**Discussion.** – The genus *Thinolestris* Grootaert & Meuffels, 1989, was originally described from a species from the Coral Sea (PNG) and a second species from North Sulawesi (Indonesia). The present new species is the most western and northern record of the genus.

***Thinolestris thaica*, new species**  
(Figs. 27-30)

**Material examined.** – Holotype – male and paratypes: Thailand: Phang-Nga province, Khao Lak, Nangtong, 8 males, 6 females (n° 96058) coll. P. Grootaert, 9 Apr.1996 (specimens dry on pin); 2 males, 2 females, coll. P. Grootaert, 7 May.1998 (sample n° 98022). Swept from patches of sand and pebbles on shaded part of the intertidal zone of the beach.



Figs. 27-30. *Thinolestris thaica*, new species, paratype male. 27. Tip abdomen laterally; 28. Hypopygium dorsally; 29. Base hypandrium; 30. Ventral appendages sternum 6. Scale 0.1 mm.

**Male**

Body length: 1.5-1.75 mm.

**Head.** Frons, face and occiput brown in ground-colour but densely covered with a grey dusting with a greenish tinge. Bristles brown. Antenna as in *Th. luteola*. All segments yellowish, arista black. Third antennal segment a little longer than wide.

**Thorax.** Mesonotum yellowish brown with brown bristles. In the anterior half, a grey dusted patch between the row of dc and the humeri, at each side; a similar grey patch in front of the scutellum. Pleura brown but a dense greyish-green dusting.

**Legs** yellow, only fifth segments of all legs browned. Coxa I anteriorly with pale hairs, longer than in *Th. luteola*. Femur I ventrally on whole length with a double row of short, pale bristly hairs, longer than half the width of the femur. Anteroventrally in apical half, 4 short brown bristles. Tibia I ventrally with a row of very short, brownish bristles. **Abdomen** with short yellowish-white bristles (somewhat golden): first tergum yellow in ground-colour; following terga brown in ground-colour but covered by a thick grey dusting with a faint green metallic tinge. Hypandrium shining black. Cerci white.

Hypopygium (Figs. 27-30): tip of hypandrium not indented as seen from the side.

**Female:** Femur I ventrally with shorter bristles. The short, brown anteroventral bristles are also present in the apical half of the femur, but the brown ventral bristles on the tibia are absent. Abdomen brown, All terga dorsally darkened and covered with a grey dusting, less greenish than in male. Sternum 5 with long white marginal bristles.

**Differential diagnosis.** – Very much like *Th. luteola* Grootaert & Meuffels from the southern coast of Papua New Guinea (Coral Sea). The difference in the species ought to be sought in the male genitalia. The somatic characters are not very useful to distinguish the species. *Th. luteola* has the tip of the hypandrium indented and differently shaped and bristled appendages on the abdominal sterna.

**Genus *Thambemyia* Oldroyd, 1956**

**Discussion.** – *Th. pagdeni* was originally described from specimens found at Penang in Malaysia. So, it is no surprise to find it in Thailand. The type species remains the only known species in Thailand, where it is present on the coasts of both seas.

***Thambemyia pagdeni* Oldroyd, 1956**

**Material examined.** – Thailand: Phang-Nga province, Khao Lak, Nangtong, 1 male, 2 females (sample n° 96050) coll. P. Grootaert, 9 Apr.1996 (dry on pin); Trat province, Ko Chang, Hat Sai Khao, 1 male, 1 female, coll. P. Grootaert, 22 Feb.1999 (sample n° 99054).

**Discussion.** – The genus *Thambemyia* is further known from Borneo (an undescribed species found in Brunei by Grootaert, *in litt.*). It has radiated in Japan (known under the name *Conchopus*) as well as in Hawaii (under the name *Paraphrosylus*) (Masunaga, *in litt.*; Grootaert & Evenhuis, *in litt.*).

**Distribution.** – Rocky shores of the Andaman Sea (Thailand, Malaysia), Indian Ocean (Sumatra), Gulf of Siam.

**Genus *Cymatopus* Kertész, 1901**

**Discussion.** – The genus *Cymatopus* is represented in Thailand by three species groups: a species group with simple fore legs, but with long haired hind legs (*C. longipilus*), and two species groups with heavily ornamented fore legs: *C. malayensis* belongs to a group of larger species where the male has dense whiskers and notched wings with fields of microtrichia; *C. thaicus* belongs to a group of smaller species with the usual postocular hairs and simple wings.

**Key to the male *Cymatopus* in Thailand**

1. Hind legs simple without peculiar bristles or hairs ..... 2
  - Hind legs modified, with long hairs and bristles .....  
..... *C. longipilus* Parent
2. Wing modified with indented hind border and with fields of longer microtrichia on wing membrane; large species ....  
..... *C. malayensis* Parent
  - Wing simple; smaller species ..... *C. thaicus*, new species

***Cymatopus malayensis* Parent, 1935**

**Material examined.** – Thailand: Phang-Nga province, Khao Lak, 3 males, 4 females, coll. P. Grootaert, 7 May.1998 (sample n° 98022); Trat province, Ko Chang, Hat Sai Khao, 2 males, 4 females coll. P. Grootaert, 22 Feb.1999 (sample n° 99054); Rayong province, Ko Samet, Ao Tawan, 4 Dec.1999, 1 male, 2 females (sample n° 99114); Bahn Phe, 1 male, 1 female, coll. P. Grootaert, 16 Oct.2000; Singapore, Labrador beach, 8 males, 19 females (sample n° 20034), coll. P. Grootaert & N. Evenhuis, 7 Oct.2000; Malaysia, Sedili Kecil, 1 male, 10 females (sample n° 20046), coll. P. Grootaert & N. Evenhuis, 12 Oct.2000.

**Distribution.** – Shores of the Andaman Sea and the Gulf of Siam.

***Cymatopus longipilus* Parent, 1935**

**Material examined.** – Trat province, Ko Chang, Hat Sai Khao, 3 males, 1 female (sample n° 99054), coll. P. Grootaert, 22 Feb.1999; Rayong province, Ko Samet, Ao Tawan, 4 Dec.1999, 1 male, 2 females (sample n° 99114); Laem Rua Taek, 5 Dec.1999, 4 males, 3 females (sample n° 99116); 3 females (sample n° 20056), coll. P. Grootaert, 17 Oct.2000.

**Distribution.** – Shores of the Andaman Sea and the Gulf of Siam.

*Cymatopus thaicus*, new species

(Figs. 31-36).

**Material examined.** – Holotype – male and paratypes: Thailand: Phang-Nga province, Khao Lak, Nangtong, 6 males, 6 females (n° 96058), coll. P. Grootaert, 9 Apr. 1996 (specimens dry on pin); 7 May. 1998, 3 females (n° 98023); Malaysia, Sedili Kecil, 13 males, 4 females (sample n° 20046), coll. P. Grootaert & N. Evenhuis.

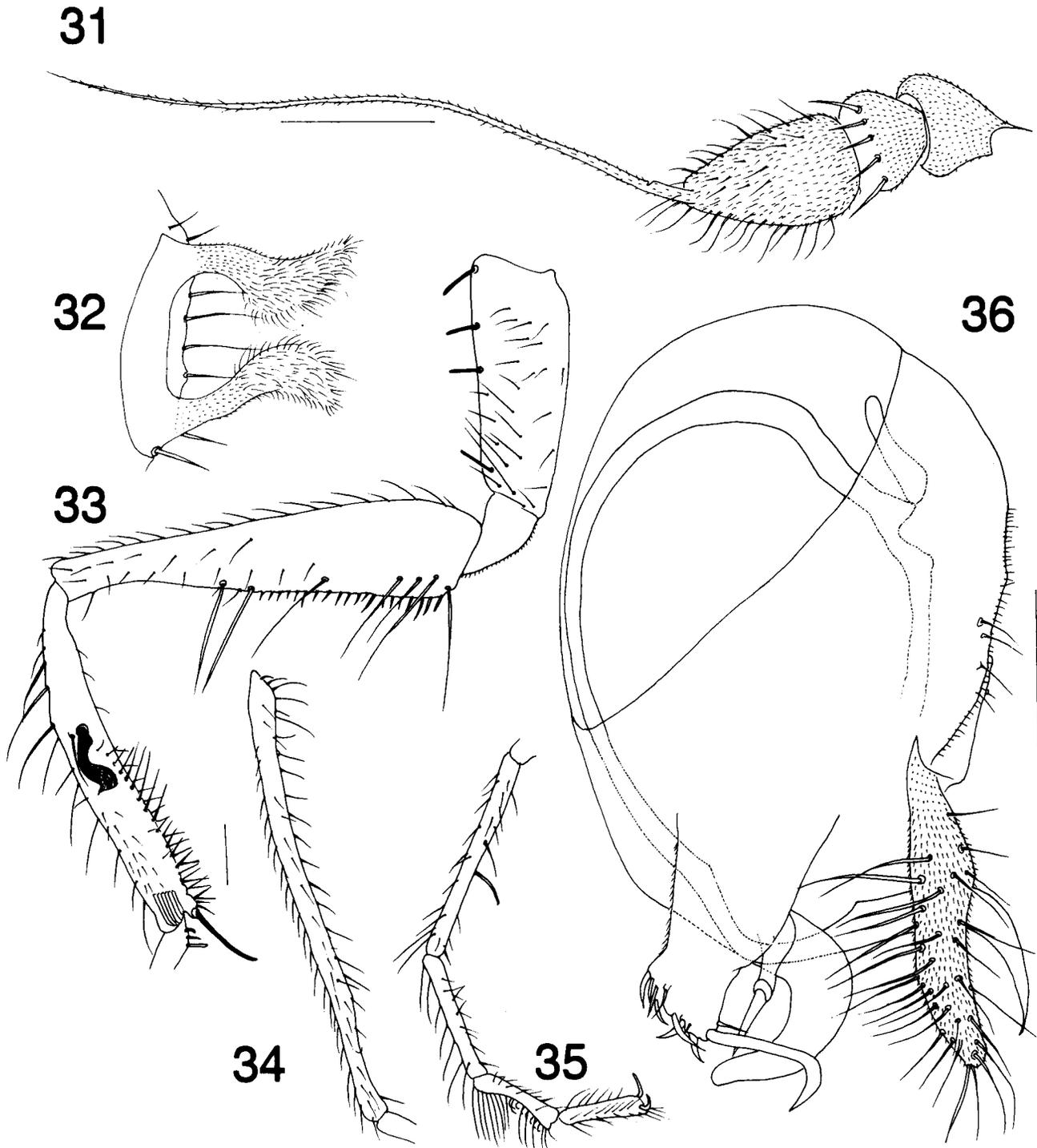
**Diagnosis.** – A small species with yellow legs. Fore tibia with a black foliaceous bristle and without spur, but a long black apical bristle. Fourth tarsal segment laterally flattened

but not excavated and as long as terminal segment. Closely allied to *Cymatopus calcaratus* Parent, 1935 and *C. calcaratoides* Grootaert and Meuffels, 1993, but both have a long apical spur on fore tibia.

**Male**

Body length: 2- 2.1 mm; wing length: 2.25 mm.

**Head.** Frons and face black in ground-colour, light silvery-grey dusted; clypeus protruding. Face narrower than width of third antennal segment. Palpi brown with black hairs; 2-



Figs. 31-36. *Cymatopus thaicus*, new species, paratype male. 31. Antenna; 32. Fore femur and tibia anteriorly; 33. Fore metatarsus; 34. Fore tarsomeres 2-5; 35 hypopygium; 36. Extensions on sternum 6. Scale 0.1 mm.

3 longer apical hairs (as long as palpus), but no bristles. Rostrum brown. Occiput black, ventrally with pale hairs. A pair of long ocellar bristles, and a pair of shorter but strong fronto-orbitals, just above level of antennal sockets; a pair of minute postocellars; a pair of converging postverticals. Postocular cilia uniseriate and black above, rather long; lower postocular cilia pale, pluriseriate. *Antennae* (Fig. 31) black; third segment conoid, slightly longer than wide. Arista sub-apical, more than twice as long as antenna.

*Thorax*. Brownish-black in ground-colour and covered with a fine dull grey dusting. No acrostichals; 5 dorsocentrals. 1 short humeral, 1 very long posthumeral, 1 short sutural, 1 very short notopleural, 1 short postsutural, 1 supraalar, 1 longer postalar. Scutellum with 2 converging marginals, each flanked by a tiny hair; a row with 3 black propleurals.

*Legs*. Legs yellow, but coxa II and III brown. *Fore leg*. (Fig. 32). Coxa I anteriorly with a row of about 6 short, black bristles. Trochanter I bare. Femur I thickened on basal 3 quarters, and abruptly narrowed on apical fourth. Ventrally at base 2-3 longer hairs (shorter than diameter of femur), followed by a series of very short black bristlets on basal half; somewhat more posteroventrally on basal 3/4 a row of black bristles; anteroventrally at base with 3 long bristles, towards middle with an isolated bristle and at the narrowing of the femur 2 stronger anteroventral bristles, longer than femur is wide; a small posteroventral preapical bristle. Tibia I (Fig. 32) shorter than femur, bent, without an apical spur, but with a long black apical bristle. Anteriorly at basal third a curious long black foliaceous bristle (Fig. 32) with a bristle at its base. Dorsally on basal third with some strong bristles. Ventrally on apical half a double row of short but rather strong densely set bristles. Metatarsus I (Fig. 33) very long, slender, longer than tibia, apical quarter narrower and slightly bent; with a long anterior preapical bristle, ventrally with short bristles. Second segment anteroventrally with 2 short bristles and dorsally near tip with 3 longer bristles. Fourth segment (Fig. 34) laterally flattened, slightly bent and dorsally with long hair-like bristles, as long as terminal segment. Fifth segment lengthened and flattened dorsoventrally, with shorter claws than on other legs. Length ratio of tibia I and tarsus I: 15 : 21 : 9 : 5 : 3 : 3.

*Mid leg*. Coxa II with a two weak, black exterior bristles. Femur II slightly inflated in basal third, slender, without bristles; only very short anteroventral and posteroventral preapical bristlets present. Tibia II about as long as femur. Length ratio of tibia II and tarsus II: 31 : 20 : 10.5 : 7 : 3 : 4.

*Hind leg*. Coxa III with a weak, black exterior bristle. Femur III also very slender, just slightly thickened in basal half; without bristles. Tibia III with a short, dorsal bristle on basal fifth. Length ratio of tibia III and tarsus III: 31 : 21 : 14 : 7 : 4 : 4.

*Wings* slightly yellowish-brown tinged, with brownish veins; m1+2 slightly undulated. r1 and r2+3 slightly converging towards tips; r2+3 and m1+2 parallel. Apical part of m1+2 longer than basal part. Tp short, oblique, shorter than apical part of m3+4 (about 1 : 2). Anal vein absent, only represented by a short fold. Halteres yellowish white. Squamulae yellow with pale cilia.

*Abdomen* blackish-brown dusted. Hairs and bristles on terga very short, black. Fourth sternum with short black spinules. Sixth segment with white, ventral extensions (Fig. 36). Hypopygium (Figs 35) small, sessile, black. Cerci narrow, with slightly broadened base, pale brown, with short pale hairs. Hypandrium, dark brown, broad with lateral appendages carrying a spine-like bristle.

#### **Female**

Body length: 2.0-2.1 mm; wing length: 2.4 mm.

Same as male except:

*Head*. Face broader (slightly broader than width of third antennal segment).

*Legs* yellow, but tarsi browned. Femur I ventrally at base with 3 rather strong bristles of unequal length. Anteroventrally near middle with 3 strong bristles. Metatarsus I shorter than in male, and following segments simple.

*Genitalia* with two black acanthae on both sides.

**Discussion.** – There is another undescribed species on the western coast of Sumatra that differs from *C. thaicus* in having the fore legs with longer bristles on the tip of tarsomere 3, having different shape of tarsomere 4, having tarsomere 5 much longer than tarsomere 4, having less anteroventral bristles on the base of the fore femur and having the base of the antennae generally yellowish brown. In *C. thaicus* the fore leg has not so long bristles on the tip of tarsomere 3, the shape and bristling on tarsomere 4 is different and it is as long as tarsomere 5; the fore femur has anteroventrally near the base 3 long bristles, followed by a gap, than a single bristle and 2 strong black bristles near the middle of the femur.

**Distribution.** – Rocky shores of Andaman Sea (Thailand, Malaysia)

## GENERAL DISCUSSION

The present paper is only a preliminary report on the dolichopodids found in marine habitats in Thailand. Presently, 15 species in 7 genera have been identified and named (Table 1). However, more species await description. Several new species are expected in the genus *Thinophilus*. Two species of the subfamily Dolichopodinae, one species probably belonging to *Paraclius* and another closely related to *Dolichopus* have been found in the supralitoral of respectively rocky and sandy beaches along the Andaman Sea. They await description. Two specimens of a species related to *Terpsimyia* and so belonging to the Diaphorinae were found in the mangroves near Ranong. A large *Diaphorus* species was found on the sandy beach of Sam Roi Yot, but it is not clear whether it is truly a marine species. Surprisingly, no *Asyndetus* species have yet been found. This genus lives in the burrows of ghost crabs on the beach, and although ghost crabs are very common in Thailand, we did not succeed to find any *Asyndetus* in their burrows.

Table 1. Habitat preference and geographical distribution of the dolichopodids of marine habitats in Thailand. M: mangrove; RB: rocky beach (beach with pebbles and rocks); RS: rocky shore (large rocks, cliffs and reef flats); SB: sandy beach.

		Andaman Sea	Gulf of Siam
<b>Hydrophorinae</b>			
<i>Cymatopus longipilus</i>	RS	X	X
<i>Cymatopus malayensis</i>	RS	X	X
<i>Cymatopus thaicus</i>	RS	X	X
<i>Nanothinophilus armatus</i>	M-SB	X	
<i>Nanothinophilus dolichurus</i>	M-SB	X	
<i>Nanothinophilus hoplites</i>	M-SB	X	
<i>Nanothinophilus pauperculus</i>	M-SB	X	
<i>Thambemyia pagdeni</i>	RS	X	X
<i>Thinolestris thaica</i>	RB	X	
<i>Thinophilus nitens</i>	M	X	
<i>Thinophilus parmatus</i>	M	X	
<i>Thinophilus setiventris</i>	M	X	
<b>Diaphorinae</b>			
<i>Terpsimyia semicineta</i>	M		X
<b>Incertae sedis</b>			
<i>Phacaspis mitis</i>	M	X	X
<i>Phacaspis petiolata</i>	M		X

Each type of beach has its typical species. On rocky beaches, the genera *Cymatopus* and *Thambemyia* are found foraging in the splash zone. They are very alert to the breaking waves. *Thinolestris* is found on beaches with pebbles and sand. It is also active in the intertidal zone. *Thinophilus* is found on sandy beaches and on the mud flats in mangroves. The mangroves harbour *Nanothinophilus*, *Thinophilus* and *Phacaspis*.

The marine dolichopodid fauna is severely threatened in Thailand. The sandy beaches are perturbed by tourism and breeding sites on the supralittoral zone of the beaches are destroyed. The number of *Cymatopus* specimens on heavily frequented rocky beaches is quite low in comparison to undisturbed areas. Finally it is common knowledge that mangroves disappear at very, very fast rate because of human destruction. The type locality of the 3 *Nanothinophilus* species discovered in 1996, had already disappeared by the time their description had been published in 1998.

#### ACKNOWLEDGEMENTS

The present study is in the scope of project no. 2.9008.90 financed by the Fund for Scientific Research (Belgium) and by the "D.W.T.C." Department for Scientific, Technical and Cultural Affairs of the Federal Belgian Government. The first author thanks the authorities of Srinakharinwirot University (Bangkok) for their continuous support. He also thanks Prof. Dr. Peter Ng, Dr. Li Daiqin and Dr. H.D. Murphy (National University of Singapore) for their help with field trips in Singapore and Malaysia. Last but not least,

P. Grootaert thanks his friend Dr. Neal Evenhuis for sharing his grant during our stay in Singapore.

#### LITERATURE CITED

- Becker, 1922. Dipterologische Studien. Dolichopodidae der Indo-Australischen Region. *Capita zoologica* (Leiden) **1** (4), 247 pp.
- Cheng, L., 1979. *Marine Insects* (Amsterdam and Oxford). 581 pp.
- Grootaert, P. & Meuffels, H.J.G., 1988 (1989). Dolichopodidae (Diptera) from Papua New Guinea VII. Description of *Thinolestris* gen. nov., a new beach dwelling genus of Hydrophorinae. - *Indo-Malayan Zoology*, **5** (1):31-39.
- Grootaert, P. & Meuffels, H.J.G., 1993. Dolichopodidae (Diptera) from Papua New Guinea X. Description of new species of the marine genus *Cymatopus* Kertész. *Invertebrate Taxonomy*, **7**: 1575-1588.
- Grootaert, P. & H.J.G. Meuffels, 1998. Description of *Nanothinophilus* gen. n. from mangroves in South Thailand with a revision of *Paralleloneurum* Becker (Insecta, Diptera, Dolichopodidae). *Zoologica scripta*, **27**(3): 165-174.
- Grootaert, P. & H. Meuffels, 1999. Discovery of *Terpsimyia semicineta* Becker, a marine dolichopodid fly in the Gulf of Siam (Insecta Diptera Dolichopodidae). *Belgian Journal of Entomology* **1**(1): 153-159.
- Meuffels, H. & Grootaert, P., 1984. Dolichopodidae (Diptera) from Papua New Guinea I: The genus *Cymatopus* Kertész with a discussion on *Abatetia* Miller and *Cemocarum* gen. nov. - *Indo-Malayan Zoology*, **1**: 141-158.
- Meuffels H. & P. Grootaert, 1988 (1989). Dolichopodidae (Diptera) from Papua New Guinea VIII. *Phacaspis*, a new genus incertae sedis from the mangrove. - *Indo-Malayan Zoology*, **5** (2): 311-319.