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**FIVE ADDITIONAL NEW SPECIES OF URANOETAENIA  
FROM SOUTHEAST ASIA**  
(DIPTERA: CULICIDAE)<sup>1, 2</sup>

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ABSTRACT—Five new species of *Uranotaenia* in addition to those recently published from Southeast Asia (Peyton and Klein, 1970, Proc. Ent. Soc. Wash. 72(2):243-251) are described here: **demeilloni** from West Malaysia and Thailand; **prajimi**, **pseudomaculipleura**, and **sumethi** from Thailand; **spiculosa** from South Vietnam and Thailand.

This is the second paper describing new species recognized in the SEAMP collection. Characters are given to allow them to be recognized from among their closest relatives. The genus in Southeast Asia is presently under revision and in the near future a full, complete

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account of the whole fauna of the area will be submitted at which time the new species here described will be fully dealt with according to SEAMP standards.

***Uranotaenia demeilloni*, n. sp.**

ADULT: A small light yellowish brown species with dark legs and banded abdomen. Very similar to, and difficult to differentiate from, *luteola* Edwards and *lutescens* Leicester. It is recognized by the following combination of characters: proboscis as long as or slightly longer than forefemur; decumbent head scales uniformly pale greyish brown, without pale orbital line, scales at sides with blue-green reflections; erect scales rather short, broadly expanded apically, larger and more conspicuous on occiput but sparsely scattered over vertex to near orbital margin; mesonotum light yellowish brown without broad or pale scales; postnotum dark brown in female, lighter in male but slightly contrasting with pale pleuron; pleuron uniformly light greyish brown, almost whitish, contrasting with mesonotum but not sharply so; a conspicuous line of flat, brown scales across *apn*; a small inconspicuous patch of pale brown translucent scales on upper posterior corner of *ppn*; a few scattered, flat, almost colorless translucent scales on upper *stp* and a few extending down posterior margin; legs dark brownish black, undersides of femora faintly greyish; wings dark, alula with a few broad dorsomarginal scales; abdominal terga brownish black with basal ochreous bands as follows: female with narrow bands on t-III-VII, complete to sides on t-IV-VI and not noticeably expanded laterally, very narrow and indistinct on t-III, IV, VII, often absent on t-VII, narrow but always conspicuous and of uniform width on t-V, VI; male with bands on t-II-VIII each of near uniform width to sides, narrow and inconspicuous, often inapparent on t-II, VII, VIII, broad and most conspicuous on t-IV-VI, t-V, VI nearly half as wide as segments; sterna pale whitish brown with shiny translucent scales. Although *luteola* resembles this species in the adult, the two are not closely related. The adult of *luteola* differs in the following: proboscis 0.8 to 0.9 of forefemur; decumbent head scales dark brown; orbital scales narrowly and faintly greyish; erect scales large, numerous, with long slender stems and broadly expanded apices, very conspicuous and evenly distributed over entire dorsal surface, reaching to orbital line; mesonotum light orange-brown; pleuron light yellowish brown, slight contrast with mesonotum; postnotum dark reddish brown, as dark as dark brown terga; abdominal terga with conspicuous, narrow creamy white basal bands on t-II-VII all of about equal width and complete to sides. *U. lutescens* is more closely related to this species and differs in the following: generally more yellowish in color; mesonotum, postnotum, and pleuron concolorous, uniformly light yellowish brown, no noticeable contrast; pale ochreous abdominal bands variable but essentially as follows: female with bands present on t-II-VIII, very narrow and frequently absent on t-II, VII, broadest and most conspicuous on t-IV-VI, conspicuously broadened laterally and not reaching lateral margin, t-VIII always completely yellowish white; male with yellowish white lateral patches on t-I, very broad bands on t-II-VIII, broadened laterally and complete to sides, often completely yellowish laterally and forming a continuous broad lateral line, t-III-VI broadest and usually occupying more than half of segment. The male terminalia are easily distinguished from *luteola* and *lutescens* by the following combination of characters: distimere rather long and straight, moder-

ately stout, near uniform in width to near apex; spiniform slender, arising under a membranous hood; basal mesal lobe conspicuous with 5-6 stout dorsal bristles and a few smaller delicate bristles; apical margin of tergum IX acutely produced into long, moderately broad median lobe; aedeagus with narrow median dorsal, and subapical ventral bridge; each plate with a rather straight subapical, dorsal tooth and three closely set short, stout, curved, apical, ventrolaterally directed teeth.

**IMMATURE STAGES:** The larva is distinctive and easily recognized by the following combination of characters: head as broad as long; hairs 5, 6-C single, long, attenuate; 8-M and 7-T 2 branched; 9-M and 9-T single; 6-I-III long, 2 branched; 6-IV-VI stout, 4 branched (3-5); comb scales 6-8, spinelike, conspicuously fringed from base to near apex; siphon very short and broad, index about 2.0 to 2.3; pecten teeth 14-20 lightly fringed laterally and with 1-3 conspicuous slender spines apically. The pupa is recognized by the following: trumpet inserted nearer to wing pad than to middorsal line, small, short, very slightly expanded apically, index 3.3 or less, uniformly light brown, tracheoid part inapparent, meatus without slit; 6-C small, no greater than 7-C; 5-IV-VII delicate, short, half or less length of succeeding segments; 9-VIII 5-7 branched; 1-IX well developed; paddle exceptionally broad, oval, only slightly longer than wide.

This species is named in honor of Dr. Botha de Meillon, Responsible Investigator, Southeast Asia Mosquito Project, for his numerous and valuable contributions to the present study of Southeast Asian *Urano-taenia*.

**TYPE DATA:** Holotype female (02127-4) with slide of larval and pupal skins, Khlong Bang Man, *Ranong*, THAILAND, 13 July 1967, from bamboo stump at 60 m. elevation, S. Maneechai. Allotype male (02150-4) with slides of terminalia and larval and pupal skins, Khao Chatri, *Ranong*, THAILAND, 17 July 1967, from bamboo internode at 80 m. elevation, C. Diraphat. Paratypes: 4 males, 4 females, 8 pupal skins, 4 larval skins, 9 larvae (02127) same data as holotype; 1 male (02129) same data as holotype, except from bamboo internode; 6 males, 9 females, 15 pupal skins, 6 larval skins, 1 larva (02150) same data as allotype; 2 larvae (02152) same locality as allotype, 17 July 1967, from split bamboo at 80 m. elevation, K. Mongkolpanya. All types deposited in U. S. National Museum.

**DISTRIBUTION:** Specimens examined: 32 males, 33 females, 21 larvae, 70 associated rearings (21 larval, 49 pupal). WEST MALAYSIA: *Perak*, Choir, 2 males, 1 female, 1 pupal skin, 1 larval skin (836, 837), 22 October 1967, Univ. Malaysia; 3 females, 1 pupal skin, 1 larval skin (857), 23 October 1967, Univ. Malaysia; *Perlis*, Wang Kelian, Kaki Bukit, 4 males, 4 females (1010), 29 November 1967, Univ. Malaysia; *Selangor*, Ulu Gombak, 1 male (16), 16 November 1967, Univ. Malaysia. THAILAND: as listed for type series; *Chanthaburi*, Ban Tha Mai, 1 male, 2 females, 3 pupal skins (00542) 6 October 1965, J. E. Scanlon; *Kanchanaburi*, Huai Lin Thin, 2 males, 1 female, 3 pupal

skins, 2 larval skins (00051), 22 May 1965, E. L. Peyton and S. Chunchulcherm; 2 males, 2 pupal skins, 1 larval skin (00060), 22 May 1965, S. Maneechai; *Lampang*, Ngao, Ban Si Pan, 1 male (02751), 20 May 1968, K. Mongkolpanya; *Mae Hong Son*, Ban Mae Ho Nua, 1 male, 4 larvae (01519), 15 September 1966, S. Maneechai; *Nan*, Ban Pha Man, 1 male, 1 female, 2 pupal skins (01434), 9 August 1966, S. Maneechai; *Nan*, Ban Wang Mo, 1 male, 2 females, 3 pupal skins, 2 larval skins, 1 larva (01395), 8 August 1966, K. Mongkolpanya; *Nan*, Pak Chom Po, 2 larvae (T131), 25 November 1961, SEATO; *Prachin Buri*, Ban Bu Phram, 4 males, 5 females, 9 pupal skins, 2 larvae (00720), 20 January 1966, K. Mongkolpanya and S. Maneechai.

**BIOLOGY:** All specimens were collected as immatures in secondary forested areas or orchard-plantations at elevations ranging from 20 m. to 900 m. The species breeds in a variety of bamboo habitats including split bamboo, stumps, internodes with small entrance holes, and cut sections on the ground but has also been collected from a discarded auto tire.

***Uranotaenia prajimi*, n. sp.**

**ADULT:** This very small dark brown species is closely related to *annandalei* Barraud and *sombooni* Peyton and Klein. The three are quite similar in general adult habitus and differ primarily in the extent of pale scaling on the head and in the supraalar scales above wing base. Distinguished as follows: decumbent head scales pale bluish white except for small patch on occiput which appears very light brown with bluish reflections. The extent of light brown scaling on occiput is somewhat variable. In the holotype female the head scales are all bluish white with only a very faint tinge of brown on occiput. In the allotype male the patch of light brown is small but distinct with outer border evanescent. In a few of the paratypes the patch is somewhat larger and more distinct but with outer border also evanescent. In *annandalei* and *sombooni* the head scales are largely dark with a narrow orbital line of silvery bluish or dull white scales. In both *annandalei* and *sombooni* there is a dense supraalar patch of moderately broad pale greyish or greyish brown scales above wing base. In *prajimi* the supraalar scales are mostly narrow, light to dark brown in color and much less numerous. It further differs from *sombooni* in the absence of scales on pleural *ppn*. The male terminalia are distinctive and easily separated from the other two species by the development of distimere and aedeagus. Distimere short, stout, slightly curved and rather uniform to near apex and then abruptly and deeply notched on ventral side at point of insertion of small spiniform, terminating into short clawlike apex on dorsal side; aedeagus narrowly connected dorsally, plates with a long, stout, slightly curved, subapical, laterally directed tooth and with 2-3 similar but slightly smaller, basolaterally directed teeth along ventral border.

**IMMATURE STAGES:** The larvae of *prajimi*, *annandalei*, and *sombooni* possess the following characters in common: head hair 1-C arising apically from prominent process, long, stout on basal half, laterally flattened and strongly curved ventrally on apical half to pointed apex; 14-C very large, flattened, leaflike and darkly pigmented; hairs 2-4-A broad, flat, leaflike, 1-A inserted beyond middle of

shaft; hairs 1, 2-P stout, brush tipped; 7-II moderately to greatly reduced in size and length, less than half of 7-I, 2-5 branched; plates of abdominal segment VIII broadly connected dorsally; comb scales, spinelike, finely fringed on basal half, with a single tooth on each plate markedly longer than remaining teeth; anal saddle long, at least 0.63 of siphon. *U. prajimi* is distinguished from the others by the following combination of characters: antennal shaft lightly spiculate, 1-A single, delicate, inserted on apical third, 2-A subapical, 7-II moderately long with 4(3-5) branches: 1-S with individual branches barbed, flat and lanceolate on apical half. In *amandalei* the antennal shaft is smooth and hair 2-A is inserted on a raised process midventrally and basad of 1-A; 7-II minute and commonly 2 branched. In *sombooni* the antennal shaft is smooth; 1-A is a short, stout, pointed spine; 7-II is moderately long and 2 branched; 1-S with individual branches barbed and moderately stout but not flattened. The pupa is easily recognized by the development of trumpet and darkly pigmented metanotum and abdominal segments I-IV. Trumpet inserted nearer to middorsal line than to wing pad, index about 4.0, slightly expanded apically, uniformly dark brown, tracheoid on basal 0.25, meatus with short slit, pinna truncate on outer half, obliquely cut on inner half to basal 0.33; integument of metanotum and abdominal segments I-IV uniformly dark brown, remaining segments light yellowish brown except for small intersegmental spots on V-VI; 1-IX conspicuous.

This species is named for Mr. Prajim Boonyakanist formerly technician-collector of the taxonomy field team and later team leader of Malaria Field Studies, Department of Medical Entomology, SEATO Medical Research Laboratory, for his loyalty and enthusiasm which greatly contributed to the present study.

TYPE DATA: Holotype female (01955-102) with slide of pupal skin, Ban Pa Daeng, *Lampang*, THAILAND, 11 April 1967, from stream pool at 700 m. elevation, K. Mongkolpanya. Allotype male (01955-103) with slides of terminalia and pupal skin, same data as holotype. Paratypes: 1 male, 3 females, 4 pupal skins, 6 larvae (01955) same data as holotype; 1 larva (LG4), Ngao, *Lampang*, THAILAND, 19 September 1963, SMRL; 2 females, 2 pupal skins (01962), same locality and date as holotype, C. Diraphat; 1 male, 2 females, 3 larval skins, 3 pupal skins (CM133), Suan Mayao, Doi Sutep, *Chiang Mai*, THAILAND, 28 September 1963, SMRL; 3 females, 3 pupal skins, 3 larval skins, 4 larvae (05668), Doi Sutep, *Chiang Mai*, THAILAND, 10 December 1969, K. Mongkolpanya; 1 female (CM137), Huey Kheo, Doi Sutep, *Chiang Mai*, THAILAND, 1 October 1963, S. Esah; 2 larvae (05674), Ban Tham, Chieng Dao, *Chiang Mai*, THAILAND, 11 December 1969, P. Boonyakanist. All types deposited in U. S. National Museum. No other specimens available for examination.

BIOLOGY: Collected only as immatures in forested or open forest fringe areas from stream pools, puddle (?), rock pool, and elephant footprint along stream, often containing abundant dead leaves, sticks, and algae and usually under partial or heavy shade. Four of the above collections are recorded at 600 m. to 700 m. elevation.

***Uranotaenia pseudomaculipleura*, n. sp.**

**ADULT:** This small brown species is very similar to *maculipleura* Leicester in general adult habitus but can be recognized by the following combination of characters: decumbent head scales light brown, tips of scales on orbital line and to sides faintly greyish but not forming distinct lines or patches; erect scales moderately long, numerous, broadly expanded apically, extending to near orbital margin; mesonotum light brown, without broad or pale scales; pleural integument pale greyish brown with distinct darker brown areas as follows: *apn*, *ppn*, *psp*, upper half of *stp*, and *mep* except for narrow pale edges; an inconspicuous patch of loosely arranged, broad, flat, light brownish, translucent scales on upper half and narrowly extending down posterior margin of *stp*; all other pleural scales absent; legs dark, fore and midfemora with a few scattered bristles, but without conspicuous arrangement of hairs or bristles; wings dark, alula with a few broad dorso-marginal scales; abdominal terga dark brown; sterna light greyish brown. *U. maculipleura* differs in being a much larger species generally; mesonotum a darker rust brown; *apn* with a few broad, flat, light brown scales; scale patch on upper half of *stp* conspicuous, scales more numerous and shiny; basal 0.25 of midfemur densely clothed on all aspects with delicate hairs and a few longer bristles; fore-femur with similar fine hairs and bristles restricted mostly to inner and posterior aspects and not as conspicuous as those on midfemur. The male terminalia are not readily distinguished from those of *brevirostris* Edwards, *modesta* Leicester, *moultoni* Edwards, and *tubanguii* Baisas, all of which are apparently closely related though some of the adults are strikingly different in external morphology. All of these have a long, slender, rather straight distimere with spiniform inapparent or absent; aedeagus with narrow subapical dorsal and ventral bridge; plates with a large dorsal, subapical tooth and 2-3 ventral, subapical teeth; posterior margin of tergum IX very broadly rounded, without corners or lobes; short rows or patches of 4-6 long slender bristles to each side of midline near posterior margin. No attempt will be made here to point out minor differences among above listed species.

**IMMATURE STAGES:** The larva is easily recognized and readily distinguished from all known Southeast Asian species by the following combination of characters: hair 1-C minute, inapparent, inserted apically on prominent rounded process; 5, 6-C single, long, simple, attenuate; 14-P variable, 4-12 branched, most commonly 10-11; 6, 7-I, II strongly pigmented, single, stout, with pointed apex; comb plates large, closely approximate dorsally; comb scales 11, uniform, evenly spaced, slightly expanded and broadly rounded apically, with a few strong, conspicuous, basolateral denticles becoming progressively reduced to fine fringe apically; siphon strongly pigmented dark brown, index 4.0 to 4.5; pecten teeth about 20, short, broad, darkly pigmented with very fine inapparent apical fringe; anal saddle strongly pigmented, without strong spicules along posterior margin. The pupa is easily recognized by the following: trumpet inserted nearer to wing pad than middorsal line, uniformly brown; index about 4.0, uniform in width from about basal 0.2, tracheoid part inapparent, meatus without slit; abdominal hair 5-IV-VI single, long, one and a half times length of succeeding segments; 9-VIII fan shaped, with 8-10 barbed branches; 1-IX and 1-P undeveloped; paddle with inner and outer part beyond midrib about equal in width; inner and outer margin with closely set fine serrations toward apex; apex very deeply emarginate at midrib.

**TYPE DATA:** Holotype female (01830-6) with slide of larval and

pupal skins, Nam Tai, *Phangnga*, THAILAND, 22 October 1966, from split bamboo at about 150 m. elevation, Kol Mongkolpanya; Allotype male (01830-4) with slides of terminalia and larval and pupal skins, same data as holotype; Paratypes: 12 females, 16 males, 25 pupal skins, 9 larval skins, and 4 larvae, (01830) same data as holotype. All types deposited in USNM.

**DISTRIBUTION:** Specimens examined: 41 males, 58 females, 33 larvae, 109 associated skins (26 larval and 83 pupal). THAILAND, as listed for type series; same locality as type series, 1 female (01762), 19 October 1966, S. Maneechai; 4 males, 5 females, 9 pupal skins, 5 larval skins, 1 larva (01794, 01797, 01798), 21 October 1966, K. Mongkolpanya and S. Maneechai; 3 males, 7 females, 11 pupal skins, 6 larvae (01819, 01828, 01829), 22 October 1966, K. Mongkolpanya and S. Maneechai; *Phangnga*, Khao Pak Chaung, 1 male, 2 females, 2 pupal skins (01648), 13 October 1966, K. Mongkolpanya; *Phangnga*, Thap Wen, 1 male, 4 females, 5 pupal skins, 4 larvae (01661, 01663), 14 October 1966, K. Mongkolpanya; *Ranong*, Ban Chatri, 11 males, 21 females, 20 pupal skins, 9 larval skins, 8 larvae (02104, 02106, 02114), 12 July 1967, S. Maneechai; *Ranong*, Khlong Bang Man, 4 males, 4 females, 7 pupal skins, 2 larval skins, 9 larvae (02130, 02136, 02137), 13 July 1967, C. Diraphat and K. Mongkolpanya; *Ranong*, Pra Chum Pharam, 1 female, 1 pupal skin, 1 larval skin (02140), 14 July 1967, C. Diraphat.

**BIOLOGY:** All specimens were collected as immatures in secondary forested areas at elevations ranging from 20 m. to 150 m. The species breeds in a variety of bamboo habitats including split bamboo, stumps, internodes with small entrance holes and cut sections on the ground but has also been collected once from banana leaf axil. Habits of the adults are unknown.

#### *Uranotaenia spiculosa*, n. sp.

**ADULT:** A moderately large species closely resembling *stricklandi* Barraud in overall adult ornamentation and recognized by the following: erect head scales long, numerous, very conspicuous, broadly expanded apically, extending to orbital margin; paratergite with a few broad, inconspicuous, posterior, greyish translucent scales; pleural integument with well defined large brown areas surrounded by light greyish brown: *apn*, *U + M-ppn*, *psp*, upper two-thirds of *stp*, *mep*, and most of metapleuron brown; *apn* with light brown scales, a few light brown scales with blue-white reflections on upper posterior corner of *ppn*, a large patch of flat greyish translucent scales on upper third of *stp*, a small rather inconspicuous patch of similar scales on posterior edge of *psp*, a large patch of greyish translucent scales at middle of *mep*; legs dark; wings dark, alula with a few broad dorsomarginal scales; abdominal terga with narrow basal ochreous bands. *U. stricklandi* differs in the presence of two distinct dark areas on pleural *stp*, a uniformly light metapleuron and the absence of scales on paratergite and *psp*. The latter two characters are absent in all other known species of *Uranotaenia*. The male terminalia are

not easily distinguished from other closely related species as *hongayi* Gailliard and Ngu, *koli* Peyton and Klein, *luteola* Edwards, *philippinensis* Delfinado, *stonei* Bohart and Ingram, and *stricklandi* Barraud.

**IMMATURE STAGES:** The larva is easily distinguished from all but *hongayi* by the following combination of characters: integument of thorax and abdomen densely clothed with fine hairlike spicules; head hair 1-C curved on outer margin and more straight on inner margin, expanded toward apex, leaflike, inserted laterally on prominent triangular process more or less as in *sumethi* new species; 5, 6-C long, simple, attenuate; 4-C delicate, 4-5 branches, at least half as long as 5, 6-C; 14-P 12 or more branches; 13-P stellate with short, stout spiniform branches; abdominal hairs 1, 5, 13 on most segments stellate, with stout pointed branches; 9-II-VI a stout simple spine, moderately long on II and progressively shorter to VI; comb plate very small; comb scales 15-19, uniform in size, evenly spaced, very lightly fringed from base to rounded apex; pecten teeth 18-24, long, stout simple spines reaching to middle of siphon or slightly beyond; 1-S inserted slightly beyond middle and very near distal pecten tooth. It would appear that the mere presence of the primitive, well developed hair 13-P would be sufficient to distinguish *spiculosa* from all other *Urantaenia*. However, the relationship between *spiculosa* and *hongayi* appears quite close and the state of hair 13-P and abdominal hairs is unknown in *hongayi*. *U. hongayi* apparently differs in the minute head hair 4-C; pecten teeth reaching well beyond middle of siphon; 1-S inserted at apical 0.25. The pupa is not easily distinguished from other closely related species and therefore no attempt to do so will be made here.

**TYPE DATA:** Holotype female (00247-15) with slide of larval and pupal skin, Khao Mai Ha Wa, *Chon Buri*, THAILAND, 30 June 1965 from crab hole, edge of small stream at 150 m. elevation, E. L. Peyton. Allotype male (00247-108) with slides of terminalia and pupal skin, same data as holotype. Paratypes: 7 males, 7 females, 14 pupal skins, 9 larval skins, 19 larvae (00247) same data as holotype. All types deposited in USNM.

**DISTRIBUTION:** Specimens examined: 9 males, 14 females, 35 larvae, 30 associated rearings (11 larval, 19 pupal). SOUTH VIETNAM, *Quang Tri*, An Khe, 1 female (1342), 17 September 1966, 20th PMU. THAILAND, as listed for type series; same locality as type series, 8 larvae (00238, 00240-00242, 00248), 30 June 1965, E. L. Peyton, K. Mongkolpanya, 1 male, 2 females, 3 pupal skins, 1 larval skin (00416), 19 August 1965, E. L. Peyton; *Chanthaburi*, 5 larvae (00959), 26 March 1966, K. Mongkolpanya; *Chon Buri*, Bang Phra, Siracha, 1 female (U1446), 22 March 1964, SEATO; *Chon Buri*, Ban Rai, 1 female (02203), 16 August 1967, K. Mongkolpanya; *Khon Kaen*, Thom Photi Yan, 1 female (T1822), 1963, SEATO; *Prachin Buri*, Ban Bu Phram, 3 larvae (00706, 00713, 00714), 20 January 1966, K. Mongkolpanya.

**BIOLOGY:** Collected only as immatures in Thailand from crab holes along the banks of shallow running streams with heavy forest cover at



elevations ranging from 20 m. to 650 m. The female from South Vietnam is without collection data.

*Uranotaenia sumethi*, n. sp.

**ADULT:** A rather large uniformly light brown species, recognized by the following combination of characters: decumbent head scales light brown or greyish brown except for narrow white orbital line expanded at sides; erect scales, light with exceptionally long, slender stems and broadly expanded apices, numerous and very conspicuous, extending to orbital line; mesonotum and postnotum concolorous, very light brown; pleuron lighter, more whitish but not sharply contrasting with mesonotum or postnotum; *apn* with light brown scales, 1 large and several (4-8) smaller delicate bristles on lower margin; *ppn* with a patch of flat, very light brown scales with blue-white reflections and 1-2 bristles on upper posterior corner; *stp* with a very inconspicuous patch of flat, colorless, translucent scales on upper half; legs dark, undersides of femora not noticeably lighter; wings dark, alula with a few broad dorsomarginal scales; abdominal terga uniformly light brown; sterna light brownish white with shiny translucent scales. There are a number of brown unornamented species in Southeast Asia, but with the exception of *hongayi* Galliard and Ngu and *pylei* Baisas all are easily separated by the characters listed. Both *hongayi* and *pylei* are closely related to *sumethi*. We have not seen specimens of *hongayi* but it would appear from the brief description of the adult that it differs only in the following: "scales shiny white on anterior pronotal lobes and sternopleuron." Both species have been found breeding in pools on the floor of caves, *hongayi* in North Vietnam and *sumethi* in Thailand. There are clear differences between the two species in the male terminalia and immature stages. The adults of *pylei* look very much like *sumethi* but differ as follows: *ppn* with 4-5 bristles on upper posterior corner; a few small scattered inapparent, light brown scales on upper third of *stp* and middle *mep*; postnotum dark brown contrasting with pale pleuron; abdominal terga dark brown; sterna light brown; basal 0.33 of midfemur densely clothed on inner surface with fine delicate bristles or hairs. The male terminalia are distinctive; distimere long, slender, slightly curved, of near uniform width to near tapered apex: basal mesal lobe well defined with 3 stout dorsal bristles, 1-2 stout, ventral bristles and numerous smaller bristles; aedeagus with narrow median dorsal and subapical ventral bridge; each plate bearing a broad, flat, apically expanded, dorsal, subapical tooth, directed somewhat apicolaterally, a short, stout, apical, laterally directed tooth and a larger, curved, subapical, ventral, basally directed tooth. The aedeagus is somewhat as shown for *hongayi*. However, the illustration of *hongayi* shows two, more or less, superimposed, dorsal, subapical teeth which are tapered to narrow apex. This is typical for most members of this species group. Often the lower and somewhat smaller tooth is completely obscured by the upper tooth in dorsal view and can be seen clearly only in lateral view.

**IMMATURE STAGES:** The larva is easily distinguished from all others by the following combination of characters: head hair 1-C short, curved, slightly expanded apically, leaflike, inserted laterally on prominent triangular process which projects on inner side to beyond middle of 1-C; 5, 6-C long, simple, attenuate; 14-P, 6-8 branched; 1-II-VI single or double; 6-III-VI very long, moderately stout, single or double and lightly barbed; 9-II-VI a short, stout, simple spine; comb plate very small; comb scales 11-12 (8-14), large, uniform in size, evenly

spaced, spinelike, with very fine lateral fringe to near apex; pecten teeth 21-23 (20-30), short, stout, apically fringed, a few teeth also laterally fringed. *U. hongayi* appears somewhat like this species but the comb scales are described as 18 in number and finely denticulate with rounded apex. The individual pecten teeth are long, simple spines and described as 19 in number. The pupa is easily distinguished from all presently known species by the following combination of characters: trumpet inserted nearer to wing pad than to middorsal line, uniformly light brown, indistinctly tracheoid on anterior basal fifth; meatus without slit; hairs 11-C and 3-I-III multiple branched beyond middle, strongly brush tipped; 5-IV-VII single, lightly spiculate, long, at least one and a half times succeeding segments; 1-IX undeveloped.

This species is named for Mr. Sumeth Chunchulcherm, former technician-collector of the taxonomy field team, Department of Medical Entomology, SEATO Medical Research Laboratory for his loyalty and enthusiasm which greatly contributed to the present study.

TYPE DATA: Holotype male (KB35-11) with slides of terminalia and larval and pupal skins, Gang Lawa Cave, Huey Bong Ti, *Kanchanaburi*, THAILAND, 18 March 1964, from clear shallow pool on floor of cave, at about 200 m. elevation, S. Chunchulcherm and K. Mongkolpanya; Allotype female (KB35) with one midleg missing, same data as holotype. Paratypes: 6 males, 6 females, 5 pupal skins, 1 larval skin (KB35), same data as holotype; 1 male, 7 females, 8 pupal skins, 3 larval skins, 8 larvae (00176, 00177), same locality as holotype, 2 June 1965, E. L. Peyton, S. Maneechai, K. Mongkolpanya. The majority of paratypes are in rather poor condition with at least one or more legs broken or missing. All types deposited in USNM.

DISTRIBUTION: Specimens examined: 9 males, 17 females, 50 larvae, 19 associated rearings (5 larval, 14 pupal). THAILAND, as listed for type series; same locality as type series, 1 male, 4 females, 37 larvae (KB6-KB9, KB11, KB32, KB85, KB87, KB88, KB185), all derived from the same cave on various dates in 1964, K. Mongkolpanya, S. Chunchulcherm; *Nakorn Nayok*, Pha Kleuy Mai, Khao Yai National Park, 5 larvae (NY123), 21 May 1964, K. Mongkolpanya, S. Chunchulcherm.

BIOLOGY: The immature stages have been collected on a number of occasions from clear shallow pools on the floor of the same cave. The small collection of 5 larvae from *Nakorn Nayok* province were from a tree hole (?). In their habitat the large larvae are pale white in color and have a slow sluggish undulating movement and can remain immobile on the bottom for very long periods. The immatures were difficult to rear to adult. The life cycle was not studied but hundreds of third and fourth instar larvae remained alive in the laboratory for over one month. The few adults listed above were all that were recovered from literally hundreds of larvae and pupae isolated for this purpose. Habits of the adults are unknown.

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