

FURTHER NOTES ON FAR EASTERN TABANIDAE
III. RECORDS AND NEW SPECIES OF HAEMATOPOTA
AND A NEW CHRYSOPS FROM MALAYSIA¹

By **Cornelius B. Philip²**

Abstract: Seven *Haematopota* species from Viet Nam and 3 from Thailand are recorded for the first time. Described as new from Thailand is *H. personata*; from North Borneo, *H. gressitti* and *H. quatei*; and from Viet Nam, *H. atrata*, *H. badia*, *H. circina*, *H. glenni*, *H. lineata*, *H. obscurata*, *H. singularis* subsp. *vietnamensis*, and *Chrysops silvifacies*.

The compactness of the tribe Haematopotini is in contrast to most other tribes of the Tabaninae and to the diversity and variation in the widely distributed species of the compact genus *Haematopota* itself. Also in remarkable contrast is the prolific southern speciation of *Haematopota* in Africa and Malaysia when compared to complete absence of the tribe in the Neotropics, Antipodes and New Guinea (Mackerras, 1954). Any additions to the faunal distribution of members of the tribe, therefore could have ultimate zoogeographic interest. Of special interest is the remarkable example of evolutionary convergence in the far southern Chilean species, *Dasybasis argentina* (Brethes), which has such startling resemblance to the group in "water-marked" wings and broad frons that it was originally described in *Chrysozona* (= *Haematopota*), yet belongs in a different tribe, the Diachlorini.

In species of *Haematopota*, where adequate specimens are available, diagnostic characters are notoriously mutable; therefore, giving a new name to a unique specimen that does not fit into standard keys could be treacherous. Yet anyone dealing with a quantity of undetermined *Haematopota* from the Far East can sympathize with the dilemma of Schurmanns Stekhoven (1926) who was impelled, in treating 32 species, to offer new names for no less than 7 unique specimens from Indonesia alone, while 8 others are based on only one or 2 specimens from the region. Serious and intensive study of this fauna could result ultimately in respectable numbers of varieties and subspecies which I will mostly avoid because of inadequate numbers of specimens available at this time.

As in Africa (Oldroyd, 1952), the genus has experienced an explosive burst of speciation in Malaysia and much taxonomic travail is predicted in faunal reviews to come. Notes from present pioneer collectors in the tropical jungle and elsewhere in the area

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2. From the U. S. Department of Health, Education, and Welfare, Public Health Service, National Institutes of Health, National Institute of Allergy and Infectious Diseases, Rocky Mountain Laboratory, Hamilton, Montana.

seem to agree that pestiferous attack on mammals (and probably on birds in the tropical rain forest) by these small, silent-flying, haematophagous pests can be excessively annoying. I have experienced their stealthy attacks in the jungle areas of Malaya and there is little doubt that their abundance is an important natural factor in demonstrated, mechanical dissemination of surra (trypanosomiasis), a wide-spread disease among Far Eastern bovine hosts (see Philip, 1960). Hence, any ecological data on various species are of importance.

The following discussion of Malaysian material is based mainly on recent collections received from the Bishop Museum, Honolulu, Hawaii, supplemented by previous records of Philip (1960). Type specimens are in that Museum. Few pertinent types were studied in the British Museum (Nat. Hist.) (BMNH), London, through courtesy of Mr. H. Oldroyd during my visit in November 1962, as indicated below.

Illustration of wing patterns impelled inclusion of a new, unrelated *Chrysops* from Viet Nam in this report.

Haematopota angustisegmentata Schuurmans Stekhoven, 1928, Zool. Jb. (1) **54**: 525 (Mid. E. Borneo).

MATERIAL EXAMINED: 3 ♀♀, Malaya (Philip, 1960); 18 ♀♀, 20 km N of Pleiku, 650 m, Viet Nam, 9.V.1960, S. & L. Quate (new record).

This species could be confused with the better-known *H. lunulata* Macq. which, however, lacks a gray prescutellar cross-band and has a gray triangle on tergite 2 as well as a more slender crescentic pale apical wing band. In my key to Malaysian species (1960), the indefinite small sooty spots at the ocular margins of the parafacials might complicate interpretation of keying to couplet 15.

Stekhoven (1932) described and figured the wing of a variant, also from Borneo, in which the apical band was incomplete and spots were present in the outer corners of only 2 of the marginal cells. The Viet Nam specimens studied here were closer to the typical form. *H. latifascia* Ric. from Assam has many features in common but the 2 hind pairs of tibiae are double-ringed and there is no prescutellar gray band.

Haematopota annandalei Ricardo, 1911, Rec. Ind. Mus. **4**: 335. Type ♀, Assam, Shillong (Howlett), seen intact in BMNH, 1962.

MATERIAL EXAMINED: Assam, type ♀; 2 ♀♀, Khasi Hills, 1960, 1300 m, Syntung, 11. IV & Maulang 12. VI, F. Schmid.

The following specimens from Thailand were assigned here until comparison with the type revealed critical differences and are herewith described as new in which respects the above 2 ♀♀ also differ.

Haematopota personata Philip, n. sp. Fig. 1.

Female: A small dark brown species with shining black swollen antennal scape, a heavy black transverse band across top of face (hence the name, meaning masked), palpi pale basally and brownish apically, 2 hind pairs of tibiae double-ringed, apical band single and incomplete.

Head: Eyes bare. Frons gray with extensive brown shadows, approximately equal in

height of sides and basal width, strongly convergent above, concave at vertex, callosity black, protuberant in lateral view, shallow, touching eyes and continuous with a black interantennal velvety spot. Paired black spots rather small, round, resting on callosity, barely separated from eyes. Median black spot small but distinct. Face with a striking black band beneath antennae, the lower margin sharp and straight between the lower margins of the eyes when viewed from below, but bowed downward from frontal view. Lower face and cheeks whitish pollinose and pilose. *Antennae* rather short, not quite as long as fore tibiae; scapes almost jet black, swollen, about 1/3 longer than thick; plate flattened and disc-like, about 1/5 longer than tall. Palpi shorter than proboscis and unusual in being white basally, darkened apically with black hairs. *Thorax*, including scutellum, dark brown with sparse short black and yellow hairs, 3 pale abbreviated lines anteriorly, a pair of pale spots at the sutures, and a narrow pale line on the disc of the scutellum. Pleural pile whitish. *Legs* pale brownish; fore femora, distal 1/2 of fore tibiae, dark rings and on 2 hind pairs of tibiae and strong hind-tibial cilia, black-haired; distal pale ring on hind tibiae less distinct than basal one. *Wings* with usual rosettes doubled outwardly, apical band sinuous from costal border, ending just across vein R_4 , pale marginal spots accentuated in cells R_1 , M_2 , Cu_1 and anal margin. Spur veins shorter than stems. Halteres brown. *Abdomen* above and below dark brown with narrow pale incisures, that on tergite 2 widened moderately in middle. Length of body: 6 mm.

Holotype ♀ (BISHOP 3466), Doi Sutep, Chiangmai, 1278 m, NW Thailand, 29.III-4.V.1958, T. C. Maa, No. 176.

Paratypes ♀♀: 3 same data (BISHOP, PHILIP). One taken indoors, is in good agreement with the holotype except for 2 which have faint gray triangles on tergite 2, and may be with small faint marginal spots in remainder of marginal cells.

The type of *H. annandalei* differs in its wider frons, less evenly bowed callosity across top, longer antennae especially the scapes, plates narrower and longer, tibial rings white not yellow and hind pair of tibiae less strongly ciliate. In my key to Malaysian species (1960), *H. personata* would run to couplet 5 with its ciliate tibiae and hind femora where it would be easily separated from *H. cilipes* Big. of Laos by its shorter antennae, swollen black scapes, wide black facial band, and incomplete apical wing band.

Haematopota atrata Philip, n. sp.

Male: This predominantly black robust fly may be the melanistic ♂ of some more ornamented described ♀ having a heavy single apical wing band, shiny black swollen antennal scapes, flattened reddish plates, reddish brown to black abdomen and legs with almost imperceptible rings on the tibiae, and hind pair with black-haired cilia.

Head: Eyes bare, enlarged facets prominent and occupying almost to upper 3/4. No ocelligerous tubercle visible in occipital notch. Frontal triangle composed of a bare, dark brown subcallus with a flattened yellow pollinose apex above, and a velvety black spot below, between the antennae. *Antenna*: Heavy blackish cross-band beneath antennae; remainder of face and cheeks whitish pilose and pollinose. Swollen scape subequal to flagellum. Palpi yellow, robust, about 2× longer than thick, black-haired apically, pale-haired basally. *Body* chiefly black, inornate with mostly fine brownish-black pile, the scutellum olivaceous, and the abdomen more reddish on basal 2 segments. *Legs*: Mid femora and basal 1/4 of fore tibiae and entire metatarsi pale. *Wings* with rosettes com-

posed of reduced unconnected small spots, but marginal spots in all cells confluent, forming a narrow jagged pale line decreasing inwardly in each cell. Spur veins longer than stems. Halteres brown. Length of body: 12 mm.

Holotype ♂ (BISHOP 3467), 25 km SW of Pleiku, 400 km, Viet Nam, 12. V. 1960, L. W. Quate.

Because of the obscure tibial rings, this species might be keyed as having unicolorous legs. The smaller *H. latifascia* Ric. from Assam and Thailand has some similarity, but the tibial rings are more distinct and the antennal scape is reddish yellow, not black.

Haematopota badia Philip, n. sp. Fig. 2.

Female: A small, predominantly yellow-brown species with similarly colored appendages and callosity; 2 hind pairs of tibiae double-ringed; apical wing band single, sinuous, incomplete, usual rosettes outlined by lines rather than spots, no marginal spots.

Head: Eyes bare. Frons buff pollinose, taller than broad with parallel sides; no median spot, paired velvety-black spots rather small, ovoid, isolated; callosity reddish, upper margin rounded with short median point, and an interantennal black spot below. Face entirely gray pollinose, without spots. *Antennae* short, subequal to height of frons, yellow with only apical annulus and basal hairs black, scape cylindrical and shorter than plate which is flattened and a little taller than thickness of scape. Palpi rather small, yellowish, with mixed black and pale hairs. *Thorax* dull brown, dorsally with 3 narrow yellow stripes and sparse brassy hairs. *Legs*: Fore legs darker brown than posterior pairs, basal 1/3 of fore tibiae and double rings on hind pairs yellow. *Wings*: Apical bands of wings S-shaped from anterior border and not reaching hind border; marginal cells crossed subapically by pale bars but no marginal spots in the outer corners. Spur veins equal to stems. Halteres brown. *Abdomen* reddish brown darkening on the last 3 segments, incisures paler and suggestions of a narrow median yellow line, dorsal vestiture mostly black, incisures and venter yellow-haired. Length of body: 9 mm.

Holotype ♀ (BISHOP 3468), DeLinh (Djiring) 1200 m, Viet Nam 22–28. IV. 1960, S. & L. Quate, light trap.

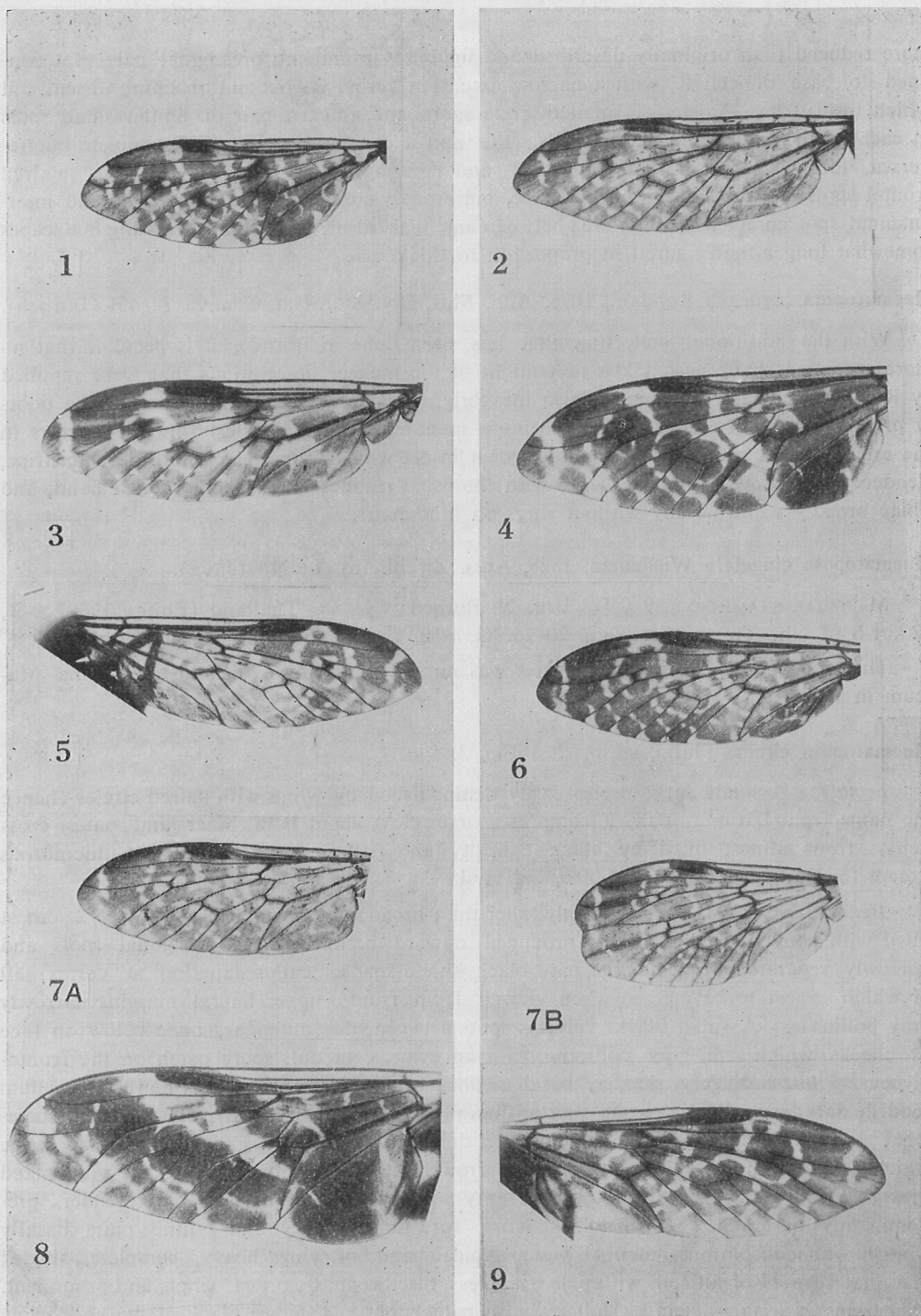
Paratype ♀♀: 35, same data as holotype; 3, same data but 920 m; 50, Dak Song, 76 km, SW of BanMeThuot, 870 m, 19–21. V. 1960, S. & L. Quate, some from "Malaise trap" (BISHOP, PHILIP). An additional broken specimen from 30 km N of DeLinh, 27. IV. 1960, S. Quate. There is little variation but in some better preserved specimens the narrow mid-abdominal yellow line is more distinct though missing in worn individuals.

In some respects, including the wing pattern with incomplete apical band and absence of marginal spots, this resembles *H. paucipuncta* S. Stek. from Java which differs in frontal and facial characters, longer darker flagellums, and more elongate scapes. *H. badia* will run to couplet 14 in my key (1960) to Malaysian species, where the lack of marginal spots on the wings and shorter antennae distinguish it.

Haematopota bizonata Schuurmans Stekhoven, 1932, Archiv Naturg. (N. F.) 1: 56 (Borneo).

MATERIAL EXAMINED: ♀, W. Coast Residency, Ronan, 8 mi. N, Paring Hot Springs, 500 m, British N. Borneo, 8–11. X. 1958, L. W. Quate (BISHOP).

This, the 2nd known specimen of this distinctive species, has wing markings even



Figs. 1-9. Photographs of wings of new species of Far Eastern *Haematopota* (12 \times).
 1, *personata*; 2, *badia*; 3, *circina*; 4, *glenni*; 5, *gressitti*; 6, *lineata*; 7A, *obscurata*; 7B, *obscurata* (abnormal); 8, *singularis* var. *vietnamensis*; 9, *quatei*.

more reduced than originally described and figured; prominent prestigmal pale spot confined to base of cell R_1 with a narrow extension across R_3 but not reaching discal cell which instead has, 2 pairs of small discrete spots, and an extra pair of similar small spots in each of the radial and cubital cells; the apical band also heavy and complete but reversed, filling 1/2 the border of cell R_3 and tapering out in margin of cell R_4 . Paired frontal spots are the same rounded-shape, but broadly contiguous to eye margins, and inter-antennal spot completely filling area between antennal fossae. Flagellums missing but scapes somewhat longer than figured in proportion to thickness.

Haematopota borneana Rondani, 1875, Ann. Mus. Civ. Stor. Nat. Genova 7: 451 (Borneo).

With the additional collecting that has been done in Borneo, it is peculiar that no more specimens have been taken that might fit the meager descriptions that were supplied by Rondani and later augmented, also meagerly, by Ricardo (1911) after she saw the poorly preserved type in Genoa. The species is mentioned here to alert future collectors in the area. It is a small predominantly brown insect with a broad black mid-thoracic stripe, slender yellow-brown antennae, wing with the usual rosettes and a single apical band, and tibiae broadly white basally without rings on hind pairs.

Haematopota cingulata Wiedeman, 1828, Auss. Zweifl. Ins. 1: 216 (Java).

MATERIAL EXAMINED: 9 ♀♀, Brit. N. Borneo; ♂, ♀, Thailand (Philip, 1960); ♀, 22 km S of Nha Trang, Viet Nam, 20-26. XI. 1960, C. M. Yoshimoto (new record).

The type of this distinctive species was not found during a visit to the Vienna Museum in 1960.

Haematopota circina Philip, n. sp. Fig. 3.

Female: A small dark species easily distinguished by wings with paired circles (hence the name from Latin, a pair of compasses or circles) about both inner and outer cross veins; frons almost filled by black callosity and pattern; and legs almost unicolorous except for darkened apices of tibiae and tarsi.

Head: Eyes bare. Frons plainly taller than broad, divergent below, lower 1/2 almost filled with convex black callosity produced upward between paired diagonal spots and narrowly separated from a large bare black shield-shaped callus tapering at vertex, all of which appear to be merged when viewed from front; upper lateral margins narrowly gray pollinose. A small black velvety spot between the antennae, none below on face or cheeks which are gray pollinose with an evanescent dull sooty patch on the frontoclypeus. *Antennae* very slender, basal segments yellow, sparsely black-haired, flagellum reddish darkened apically, scape shorter than plate. Palpi bluish gray, black-haired, somewhat swollen basally. *Thorax* blackish on dorsum with a wide gray longitudinal stripe which extends onto scutellum, a pair of narrower lateral pale stripes; vestiture with mixed brassy yellow and black hairs; pleura gray with pale yellow hairs. *Legs* slender, predominantly pale reddish with black hairs, fore tibiae mostly and 2 hind pairs basally whitish with concolorous hairs. *Wings*: Apical bands of wings heavy, complete, single; marginal corners of all cells with pale triangles; rosettes anastomosed, single and prominent. Spur veins as long as stems. Halteres with pale knobs. *Abdomen* black above and below and black-haired, pale yellow-haired on rather narrow pale incisures above, more extensive

on venter. Length of body: 8.5 mm.

Holotype ♀ (BISHOP 3469), 22 km S of NhaTrang, Viet Nam, 20–26. XI. 1960, C. M. Yoshimoto.

Paratype ♀, same data (PHILIP). Readily associated but wear has obliterated the dorsal thoracic stripes. A paratype ♀ also in AMNH from "Whatrang", Annam, Dr. J. J. Vassal, 1906–1908 (locality probably misspelled, see footnote under *H. singularis*, p. 531).

The confluent wing pattern is somewhat like *H. confluens* S. Stek., and the inornate legs are suggestive of *H. equitibiata* S. S., which are otherwise very different species from Sumatra. *H. cingulata* Wied. from Java has a notal stripe and expanded frontal ornamentation, but the wing pattern consists of only one large circle and a submarginal crescentic line.

Haematopota cordigera Bigot, 1891, Bull. Soc. Zool. France **16**: 76 (Bengal).—Ricardo, 1906, Ann. Mag. Nat. Hist. ser. 7, **18**: 125 (fig. 21).—Philip, 1960, Studies Inst. Med. Res. No. **29**: 61.

Haematopota fuscifrons Austen, 1908, Ann. Mag. Nat. Hist. ser. 8, **1**: 411 (unnecessary change of name).—Ricardo, 1911, Rec. Ind. Mus. **4**: 357.

MATERIAL EXAMINED: ♀, Chiangmai, Thailand (Siam), VII. 1928; ♀, Malaya (Philip, 1960); 4 ♀♀, 20 km N of Pleiku, 650 m, Viet Nam, 9.V. 1960, S. & L. Quate; ♀, BanMeThuot, 500 m, Viet Nam, 16–18. V. 1960, R. E. Leech (new record); 3 ♀♀, Djiring, DeLinh, 400 & 1200 m, Viet Nam, 22–28. IV. 1960, S. Quate; ♀, BanMeThuot, 500 m, Viet Nam, 16–18. V. 1960, R. E. Leech (new record); ♀, Fang, Chiangmai, Thailand, 19. IV. 1958, T. C. Maa (new record).

H. mediatifrons S. Stek. was suspected of being a variant until actual specimens turned up in the present collections. The cordiform median frontal spot varies in both and, in some specimens or in certain lights, the paired spots appear separated, inverse comma-shaped. In *cordigera*, the callosity has a constricted blunt projection upward between the spots, and a narrow, double-pointed shiny tooth below, but no velvety spot, between the antennae. The antennal scapes and plates are a little more robust, the tibial rings plainer, the fore coxae and body integument darker than in *mediatifrons*. The wing pattern, particularly the complete apical band, is heavier and, in specimens studied, as figured by Ricardo (1917), there are 3 spots closely encompassed by the spur vein and fork, and an "inner" small rosette about the cross-vein at base of cell M_1 comprised of a spot in its extreme base and one in apex of discal cell, often not seen in *mediatifrons*.

Haematopota glenni Philip, n. sp. Fig. 4.

Female: A dark, medium-sized species of the *pachycera*-group with moderately swollen scape and wide plate; narrow transverse black callosity but wide black subantennal band; gray bands across prescutellum and base of scutellum, and narrowly across all tergal incisures except the 1st; legs shaggy with mid-tibiae mostly white, the hind pair with 2 pale rings; and apical band of wings double.

Head: Eyes bare with the usual wavy green bands on purple ground (relaxed). Frons subquadrate, slightly narrowed above, gray pollinose, a dark triangular spot at vertex, median spot inconspicuous, paired spots large, ovoid, and isolated. Callosity narrow, black, occupy-

ing full width of frons; upper margin sinuous as figured; patches of pale hairs above outer corners. Interantennal black spot large, continuous below with a wide, velvety-black, transverse band on upper face, below which the face and cheeks are whitish pollinose and pilose. *Antennae* brown, black-haired, scapes and plate subequal in length and height, the annuli abruptly narrowed from apex of latter. Palpi not inflated, pinkish, mostly white-haired. *Thorax*: Notum dark blackish brown, 2 admedian prominent gray lines connected to a sinuous gray band across hind margin which encroaches on scutellum; apex of latter dark; heavy lateral gray lines ending on antealar tubercles. Pleura gray with white pile. *Legs*: Coxae, fore and hind femora black, the last black ciliate along upper and lower surfaces; mid femora pale reddish, darker basally and apically. Fore and hind tibiae swollen, ciliate with black hairs; fore pair broadly white basally, hind pair with 2 rather narrow pale rings; mid pair white, narrowly darkened only apically and basally, mostly white-haired; tarsi dark. *Wing* with distinctive pattern, rosettes reduced and broken about fork and apex of discal cell, heavy and single across cell R_3 , divided in R_4 with apical band, anterior branch not reaching hind margin, hind-marginal spots prominent in upper corners of cells R_5 , M_2 , Cu_1 , and anal; a heavier band across middle of wing from base of cell R_5 into Cu_1 , but with pale spots very reduced basally. Halteres with black knobs, reddish stems. *Abdomen* blackish dorsally, gray below and narrowly on dorsal incisures with concolorous hairs; tergite 1 entirely black; no sublateral spots or median triangles; sternites 5-7 with median black half-moon spots. Length of body: 11 mm.

Holotype ♀ (BISHOP 3470), 20 km N of Pleiku, 650 m, Viet Nam, 9. V. 1960, L. W. Quate.

Paratype ♀♀ : 23, same or related data (BISHOP, PHILIP). In close agreement though the wing pattern varies in intensity and the mesal diagonal band may be nearly as heavy as figured for *H. rubida* Ric. by Ricardo (1911), while the longitudinal thoracic stripes may be incomplete. Related *H. singularis* is at once distinguished by the more somber fore and mid tibiae, the heavier diagonal band on wings, and sublateral gray spots on last 2 abdominal tergites. The ornamentation of the wings and legs is distinctive within the group related to *H. pachycera* and other Oriental species.

In my key to Malaysian species (1960), *H. glenni* would run to couplet 5, where it would separate easily from *H. cilipes* Big. by its swollen antennae, strikingly patterned thorax, more punctate pattern of the wings with rosettes and double apical band. Named in honor of John H. Glenn, Jr., first American astronaut orbited on 20 February 1962, the day the species was described in manuscript.³

Haematopota gressitti Philip, n. sp. Fig. 5.

Female: A rather large dark brown species with slender antennae, wing with the usual rosettes, marginal triangles, and split apical spot, legs blackish brown with the unusual character of only the basal thirds of the 2 hind pairs of tibiae white like the fore pair.

Head: Eyes bare. Frons taller than broad and moderately divergent below, brown pollinose, no median spot, the paired spots rather small, roughly diamond-shaped with

3. This dedication to USA success in space is compensatory, since the author described (1958), under similar circumstances, *Tabanus sputnikulus* from the Caribbean, in commemoration of the launching of the first sputnik by USSR.

upper points; callosity bulging, brown upper margin convex, lower margin narrowly indented by a blackish extension of the interantennal spot. Face and cheeks gray pollinose and pilose, upper parafacials with dull brown evanescent patches visible in certain lights. *Antennae* cylindrical; 2 basal segments reddish, black-haired; plates brown, slender, a little longer than scapes. Palpi sooty brown, black-haired, elongate, rather heavy basally. *Thorax* including scutellum dull brown, inornate except antealar tubercles and pleura reddish, appressed brassy hairs on dorsum. Spots of rosettes rather heavy and somewhat confluent. *Wings*: Apical band touching both margins but split and overlapping in the middle. Halteres with orange knobs. Spur veins prominent. No evidence of mesal rings on 2 hind pairs of tibiae; legs not swollen or ciliate. *Abdomen* brown, grading to blackish on last 4 segments, black-haired with definite yellow-haired pale incisures which are extensive ventro-basally.

Holotype ♀ (BISHOP 3471), Sepilok For. Res., Sandakan Bay (NW), 1–10 m, British N. Borneo, 27. X. 1957, J. L. Gressitt.

Paratypes ♀♀: 1, same data, and 2 also same but Sapagaya Lumber Camp, 2–20 m, 2. XI. 1957 (BISHOP, PHILIP). These are in good agreement with the holotype but punctations are more discrete and finer in 2.

Compared to *H. borneana* Rond., this species is larger, the hind tibiae less widely white basally, the apical bands divided in the middle, and there is no mid-thoracic stripe. There appear to be no close relatives in the area. In my key to Malaysian species, *H. gressitti* would run to couplet 14 where it would separate from *borneana* as above.

***Haematopota irrorata* Macquart, 1838, Dipt. Exot. 1: 167 (Patria ignota).**

MATERIAL EXAMINED: ♀, type (fragments) in Paris Museum; 8 ♀♀, N. Borneo; 12 ♀♀, Malaya (Philip, 1960); 2 ♀♀, "Borneo, Muir Coll."; ♀, W. Borneo, Manorg. Muir Coll.; ♀, Pontianak, Borneo, F. Muir; BRITISH N. BORNEO: 16 ♀♀ Sandakan Bay (SW), Sapagaya Lumber Camp, 2–20 m, 8. XI. 1957, J. L. Gressitt; 4 ♀♀, same data but Sepilok For. Res., 1–10 m, 26. X. 1957; ♂, Mt. Kinabalu, Tenompok, 2. XI. 1958, T. C. Maa, "Faunula of Bamboo Hut Lot 5"; ♀♀, Tawau Res., Kalabakan R., 30 m W of Tawau, 9–18. XI. 1958, L. W. Quate, "primary forest"; ♀ Singkor, 19. I. 1959, T. C. Maa; ♀, Sandakan Res., Gomantong Caves, 20 m S of Sandakan, 22–26. IX. 1958, T. C. Maa.

The possibility of synonymy here of *H. pungens* Dol. is discussed by Ricardo (1911) and Philip (1960) because of variation in the species. The ♂ has not previously been described and is readily associated on features, particularly the reduced apical wing spots, that distinguish the ♀♀ though the tibial rings of the ♂ are even less distinct. The large facets occupy the upper 2/3 of the eye area.

***Haematopota javana* Wiedeman, 1828, Dipt. Exot., 100 (Java).**

MATERIAL EXAMINED: 9 ♀♀, Malaya (Philip, 1960); ♀, Banna, Chawang nr. Nabon, 70 m, S. Thailand, 4. IX. 1958, J. L. Gressitt (new record).

Type seen in Vienna Museum during a visit in 1960. A specimen from Java in my possession agrees.

***Haematopota lata* Ricardo, 1906, Ann. Mag. Nat. Hist. ser. 7, 8: 121 (India).**

MATERIAL EXAMINED: ♀, Chiangdao, Chiangmai Prov., 450 m, Thailand, 5–11. IV. 1958,

T. C. Maa (new record).

Haematopota lineata Philip, n. sp. Fig. 6.

Female: A small dark brown species with prominent gray mid-dorsal stripe on thorax, frons filled with large convex blackish brown callus in lower 1/2 and large evanescent velvety-blackish spot above, wings with the usual rosettes, the apical band incomplete, double, overlapping mesally, the mid and hind tibiae double ringed.

Head: Frons taller than wide, moderately divergent below, with paired velvet spots confluent with heavy forked extensions above extending nearly to vertex viewed from in front, but from above buff-gray pollinosity expands from the sides; callosity obtuse angulate above, and extended below between antennae replacing the usual black velvet spot. Except for a bilobed dull sooty patch beneath antennae, seen only from the side, face and cheeks gray pollinose and pilose. *Antennae* reddish slender sparsely-haired (flagellums missing). Palpi dirty yellowish, rather chunky, black-haired. *Thorax* dark brown dorsally, narrowly margined with gray around front and sides, the median stripe broadest on scutellum, and narrowly expanded around hind margin. *Legs* brown, sparsely hirsute, mid femora more reddish, fore tibiae white, apical 1/4 black, only the distal yellowish rings on hind tibiae not distinct. *Wings*: Apical band single on fore and hind wing margins but sinuous and split just below vein R₄. All marginal cells with pale spots in outer corners. Spur veins longer than stems. Halteres orange yellow. *Abdomen* brown above and below, darkening caudally, incisures narrowly paler with yellowish hair, a large reddish spot beneath the scutellum, and suggestions of a narrow mid-dorsal line. Length of body: 8 mm.

Holotype ♀ (BISHOP 3472), BanMeThuot, 500 m, Viet Nam, 16–18.V.1960, S. Quate.

The mid-thoracic line and expansive callosity resemble *H. cingulata* Wied. which, however, has confluent lines and circles on the wing rather than punctate rosettes. The split, incomplete double apical band is like that of *H. bilineata* Ric., but it differs markedly in other characters, notably the notal line and enlarged scapes. *H. lineata* runs to couplet 14 in my key to Malaysian species where it is distinguished by the prominent mid-thoracic and scutellar line and expansion of the median spot to the vertex.

Haematopota mediatifrons Schuurmans Stekhoven, 1926, Treubia 6 (Suppl.): 132 (Sumatra & Malaya); 1928. Zool. Jahrb. abt. f. Syst. 54: 435 (Mid. E. Borneo).

MATERIAL EXAMINED: 3♀♀, Sandakan Bay (NW), Sepilok For. Res., 1–10 m, N. Borneo, 26.X.1957, J. L. Gessitt; 7♀♀, Tawau Res., Kalabakan R., 30 m W of Tawau, 9–18.XI.1958, L. W. Quate & T. C. Maa; 2♀♀, Kalabakan Primary Forest, 15.XI.1958, T. C. Maa; ♀, Sandakan Res., Gomantong Caves, 20 m S of Sandakan, 22–26.XI.1958, T. C. Maa (new record).

This species is so close to *H. cordigera* Big. that, because of variation, identification is difficult without representatives of both. Except in 2 specimens, the described double apical wing band is often broken or the outer branch faded, halo-like, and not as heavy as the single band in *cordigera*. In the exceptions the antennal scapes are a little heavier and more shiny brownish dorsally, the plates not as slender, the fore coxae and, often, femora darker, blackish, the tibial rings more distinct; frontal differences were listed under *cordigera*. The small pointed velvety spot invading the lower border of the callosity between the antennae, noticed by Stekhoven (1928) in the Bornean specimen of *mediatifrons*,

can usually be seen in certain light in the present series. The fore coxae and 2 hind pairs of legs are mostly yellow with indistinct tibial rings; in a number of specimens, the median rings of the hind tibiae are so obscure as to confuse keys that segregate the species as double-ringed in this location.

Haematopota mirabilis Schuurmans Stekhoven, 1932, *Archiv Naturg.* (N. F.) **1**: 93 (Borneo), nom. nudum.

Stekhoven (*op. cit.*) described 2 new Bornean species, viz., *angustisegmentata* and *bizonata* but no description of *mirabilis* was offered, though the name was listed in the summary with omission of the other 2. It appears likely that he revised the text of his report after the summary was prepared and replaced the name, *mirabilis*, with one of the other 2 in the revision. It thus is eliminated from citation for the fauna from Borneo.

Haematopota montana Ricardo, 1917, *Ann. Mag. Nat. Hist. ser. 8*, **19**: 225 (Mysore, India).

MATERIAL EXAMINED: ? ♀, Fang, nr. Chiangmai, 500 m, Thailand, 12-19. IV. 1958, T. C. Maa (? new record).

In spite of the disparity in locality, I can assign this specimen to no other described species. As stated by the describer, the species is like *H. latifascia* Ric. without the facial band. The wide shallow reddish brown callosity with upper and lower margins flat and nearly straight, a prominent interantennal spot but no facial ones, robust reddish scapes about as long as plates, mummy brown bodies, and wing pattern all in agreement with essential characters, except for lack of a marginal spot in cell M_3 , appear to confirm the assignment. The need for confirmatory specimens in Thailand is obvious.

Haematopota obscurata Philip, n. sp. Figs. 7A, 7B (abnormal).

Female: A small brownish plain species with dull reddish appendages, antennae slender, hind tibiae double-ringed, callosity comprising a narrow black band, wings with usual rosettes, double but split and incomplete apical bands, and marginal spots rather small, missing in cell M_3 .

Head: Eyes bare. Frons subequal in height and basal width, slightly divergent below, buff-gray pollinose, median spot small, paired spots rather small, angular, isolated. Callosity a narrow black band with short median dorsal tooth and a small black velvety interantennal spot below. Face and cheeks gray pollinose with coarse punctations on parafacials but no distinct black spots. *Antennae* reddish, slender, darkening apically on the flagellum, scapes cylindrical, black-haired, shorter and hardly thicker than plates. Palpi flesh pink, little thickened basally, with intermixed black and pale hairs. *Thorax* including scutellum dull ashy brown, without distinct stripes and with sparse brassy hairs, pleura more grayish with pale hairs. *Legs* reddish, darkening at knees and distal of the basal 1/3 of the fore pair, both hind pairs of tibiae obscurely double-ringed; vestiture sparse and mostly pale. *Wings*: Rosettes punctate, apical band starting at each border, split and overlapping below vein R_4 . Spur veins longer than stems. Halteres smoky brown. *Abdomen* brown basally, darkening caudally, incisures paler, pale-haired, and a suggestion of a gray median triangle on tergite 2, pale hairs accentuated on venter. Length of body: 8 mm.

Male: Eyes bare, upper facets not as enlarged as usual but occupying about the upper 2/3. No visible occipital tubercle. Frontal triangle small, buff gray pollinose, a

taller interantennal spot than in holotype, antennal segments proportionately shorter and thicker, and apical band a little heavier. Though more worn, other characters agree with holotype. Length of body: 8.5 mm.

Holotype ♀ (BISHOP 3473), 30 km NW of Pleiku, 300 m, Viet Nam, 10.V.1960, L. W. Quate; allotype ♂, same data as holotype.

Paratype ♀♀: VIET NAM: 11, same data; 12, 20 km N of Pleiku, 650 m, 9.V.1960, S. & L. Quate; 3, Kontoum, N of Pleiku, 550 m, 13.V.1960, L. W. Quate; 1, Dak Song, 76 km SW of BanMeThuot, 870 m, 19-21.V.1960, S. & L. Quate, "Malaise trap"; 1, BanMeThuot, 500 m, 16-18.V.1960, S. Quate (BISHOP, PHILIP). *Paratype*: There is good agreement in most characters, but punctations and marginal spots sometimes more prominent and lower prong of apical band sometimes obscured. In a few, the mid-dorsal triangle on tergite 2 is more distinct, while not evident in poorly preserved specimens. In 1 paratype from the Pleiku series an extremely rare teratoid, possibly atavistic doubling of the radial sector of the left wing has occurred; the other wing is quite normal. There are 2 sets of basal cells in tandem, while, outwardly, vein R₅ of the upper doublet joins R₃ of the lower leaving a petiole to the wing margin over 1/3 the length of adjoining upper cell R₄. The wing membrane appears functional though the lifting surface must have made actual flight awkward.

H. elegans S. Stek. of Java has a brown callosity and apical spot divided from the fore margin. *H. cingalensis* Ric. from Ceylon and Bengal has 3 thoracic stripes, a mid-abdominal stripe, and brown callosity. These appear to be most closely related here.

Haematopota pungens Doleschall, 1856, *Natuurk. Tijdschr. v. Ned. Indie* **16**: 407 (Java).

MATERIAL EXAMINED: ♀, Java; ♀, Thailand (Philip, 1960); 5 ♀♀, DeLinh (Djiring), 1200 m, Viet Nam, 22-28.IV.1960, L. W. Quate; ♀, same data but Dalat, 1300 m, 28.IV-4.V.1960. (new record).

The type was not found during a visit to Vienna Museum in 1960.

Stekhoven (1926) has discussed variation in this species, some of which appear to intergrade with *H. irrorata* Macq. The specimens studied by me average larger in size than the latter, are darker, have more definite tibial rings, and the apical wing spots reach the the costal margin.

Haematopota segmentata Schuurmans Stekhoven, 1932, *Archiv Naturg.* (N. F.) **1**: 56 (Borneo).

If this species is among the Bishop Museum material from Borneo, I have not recognized it. It was keyed to the last couplet of my Malaysian report (1960) as with "Antennae brown, slender; callosity brown, not swollen; face ?; tergite 2 without median pale triangle; hind tibiae with 2 complete rings."

Haematopota singularis vietnamensis Philip, n. subsp. Fig. 8.

Female: This is a striking and lovely representative of both the *pachycera* group with much enlarged antennal segments and the *rubida* group with wing rosettes replaced by a prominent pale band sloping diagonally inward below the stigma. Legs ciliate, tibiae swollen, the 2 hind pairs double-ringed.

Head: Eyes bare. Frons about equally broad and tall, gray pollinose; vertex with a dark brown flat inverted triangle nearly its full width; median spot minute, the 2 lateral ones, isolated subovoid; callosity shining black, transversely angled upward between the paired spots. Large velvety black spots between and below antennae and on upper cheeks coalescent. Lower face and cheeks pearl gray pollinose and pilose. *Antennae* reddish yellow, black-haired basally, scapes and plates unusually inflated, the former and flagellums subequal in length. Palpi yellow, elongate, blunt, swollen basally, and pale hirsute. *Thorax* strikingly ornamented; a coal black transverse irregular band between wing bases, a pearl gray band behind this which includes all but black tip of scutellum, 3 narrow gray lines anteriorly, the lateral bullae reddish yellow. Pleura gray with a smoky black stripe in middle extending around the chest. *Legs* dark brown to blackish; most of mid femora and basal 2/3 of hind pair, pale reddish, reddish rings on basal 1/3 of fore tibiae and double on 2 hind pairs; vestiture ciliate, most pronounced apically on fore tibiae and hind femora, pale or dark in agreement with underlying integument. *Wings* with reduced pattern except for heavy oblique substigmatal band which terminates abruptly at hind margin of cubital cell and encloses a dark irregular blotch below the stigma. Apical band double, the inner line sharp but narrow and broken, the outer complete but in form of an indistinct halo, apex of cell R_5 pale, and small marginal spots in the outer corners of anal, cubital and M_2 cells; suggestions of a thin, incomplete rosette around apex of the discal cell margined inwardly by the heavy diagonal band. Spur veins short. Halteres dark brown. *Abdomen* black dorsally, tergite 1 entirely so, remainder with pearl gray, white-haired incisures, widest on tergite 2, which widen across the sides of tergites 2-4 and a pair of gray ovoid sublateral spots on tergite 7. Venter pearl gray, white-haired, a broad, dark median band on the last 3 sternites. Length of body: 11.5 mm.

Holotype ♀ (BISHOP 3474), BanMeThuot, 500 m, Viet Nam, 16-18. V. 1960, S. Quate.

Paratype ♀ (PHILIP), N of Pleiku, 650 m, Viet Nam, 9. V. 1960, S. & L. Quate. In close agreement, except more worn and possibly teneral, the apical wing band single without outer halo, and a pair of sublateral gray spots on tergite 6 as well as 7.

Study of the types of *H. rubida* Ric. from Burma and *H. singularis* Ric. from Annam⁴ (BMNH, 1962) showed them to be very close. In addition to the less ciliate legs of the former mentioned originally, it was a browner insect with somewhat narrower front. The present variety is apparently a dark variant of the latter with reduced wing pattern, the diagonal band not continued broadly across the anal cell and spots in outer corners of only alternate cells. This is also distinguished by a more prominent transverse gray band across the prescutellar and scutellar with a brown tip on the scutellum, and by the gray sublateral spots on the last 1 or 2 tergites. Future adequate series may reveal complete intergradation.

Haematopota splendens Schuurmans Stekhoven, 1926, Treubia 6 (Suppl.): 95 (Malaya).

Haematopota truncata S. Stek., *ibid*, 126 (Sumatra). **New Synonymy.**

MATERIAL EXAMINED: ♀, type of *splendens* (BMNH); ♂, 5 ♀ ♀, Malaya; ♀, Thailand

4. The locality on label on the type, like that of *H. circina* n. sp. above and *H. cilipes* Bigot, was probably misspelled "Near NhaTang, Annam" and according to word from H. Oldroyd, should likely refer to NhaTrang on the coast of Annam, 12°15' N, 109°10' E.

(Philip, 1960); 3 ♀♀, Ulu Langat, Selangor, 300–390 m, Malaya, 13. VI. 1958, T. C. Maa; 2 ♂♂, nr. Sandakan, Bettotan, N. Borneo, 31. VII. 1937, Kloss & Pendlebury, at light; 2 ♀♀, Sandakan Bay (NW), Sepilok For. Res., 1–10 m, Brit. N. Borneo, 31. X. 1957, J. L. Gressitt.

Recent information from Buitenzorg, Java, indicates that Tabanidae listed by Stekhoven as in "Veterinary State Laboratory" cannot now be found. The type and other specimens of *truncata* can, therefore, be presumed lost. I have a Selangor ♀ which agrees in detail with the unique type of *splendens*, but is better preserved and, like several other specimens studied, has the "truncate figure" (triangle) on tergite 2 which he considered to differentiate the 2 species. This figure is readily obscured by wear or soiling. The wing pattern of these specimens does not differ from that which he figures for *truncata*. The pale spot in the outer corner of cell M_3 (4th posterior) may be small or missing in different specimens. The wing of *splendens* is neither figured nor adequately described to substantiate his statement that the wings are different. The figures of the antennae, frontal, and facial features do not appear to differ significantly, and I consider the synonymy as very probable. *H. splendens* has page priority.

Specimens examined from N. Borneo are from coastal areas. Another series from higher elevations near Tenompok are close but reveal critical, consistent differences of the following new species.

Haematopota quatei Philip, n. sp. Fig. 9.

Female: A small dark species closely related to the preceding with short, somewhat swollen shiny black scapes, fore and hind tibiae with equivalent basal white rings only, wings with the usual rosettes, no marginal spots in cells R_1 and M_3 , and apical spot single, broken and incomplete.

Head: Eyes bare, purple with 4 wavy green lines (relaxed). Frons a little taller in height at sides than basal width, sooty-gray pollinose, a small pointed black spot below vertex, and 2 subovoid ones touching ocular margins and almost resting on the piceous callosity which is wide and shallow, bowed upward, and strongly indented below by intrusion of an interantennal black spot. Face and ckeeks gray pollinose and pilose, upper parafacials with 2 black spots, which in *splendens* are solid, not thus divided. *Antennae* black, rather short, a little shorter than fore tibiae, scapes somewhat swollen, not 2× longer than thick and about equal to the chunky plates which are widest nearly in middle. Palpi slender, sooty brown, dark-haired apically, pale-haired basally. *Thorax* including pleura and scutellum dark brown, the prescutellar, gray transverse band seen in *splendens* hardly noticeable here. *Legs* brownish red, fore coxae gray on anterior basal 1/2, hind tibiae like fore tibiae with a white ring on basal 1/3, 2 obscure, narrow yellowish rings on the mid pair. *Wings*: Rosettes around the outer cross veins and fork tending to be confluent, no spots close to the spur vein and fork, or in outer margins of cells R_1 and M_3 ; apical band consisting of 3 spots, 2 connected in cell R_3 and one across vein R_4 . Spur veins shorter than stems. Halteres brown. *Abdomen* brown, black-haired, darkening caudally, incisures narrowly pale with sparse pale hairs. Venter brown, pale-haired bands more prominent. Length of body: 8.5 mm.

Male: Except for the usual sex differences and smaller, similar to ♀ in all respects and easily associated. Enlarged facets occupying upper 2/3 of ocular area, frontal triangles

shining black. Length of body: 6 mm.

Holotype ♀ (BISHOP 3475), Tenompok, British. N. Borneo, 15. II. 1959, L. W. Quate, light trap; allotype ♂, same data but 1460 m, 50 km E of Jesselton, 2. XI. 1958, T. C. Maa.

Paratype ♀♀: 3, same data as allotype but from X. 1958–II. 1959, T. C. Maa & L. W. Quate; ♀, Singkor, 19. I. 1959, T. C. Maa (PHILIP). In good agreement with the holotype, except the punctations are largest in the Singkor ♀.

In *H. splendens* S. Stek., the antennal plates are as long as the scapes and widest basally rather than in the middle, the parafacial spots are large, triangular and solid black, the palpi creamy with paler hairs, mid-tibial rings more distinct, the gray markings across prescutellum, and in middle of tergite 2 plainer, marginal spots in all marginal cells, apical band usually heavier and complete, punctae occur in base of cell M_1 and closely around the fork. The venter is more widely gray, particularly basally and in the ♂.

***Chrysops silvifacies* Philip, n. sp.**

Female: A blackish deerfly with abdomen basally yellow, face buff pollinose with an isolated rounded black callus under each antenna, and a rather narrow apical spot separated from the crossband of the wing.

Head: Eyes (relaxed) with occipital margin contiguous, the other spots isolated from each other and from eye margins, the shaft of the arrowhead abbreviated. Frons narrower than wide, slightly divergent below, buff pollinose, ashy gray on the ocelligerous tubercle, callosity black, flat ovoid, barely separated from the eyes. *Antennae* not elongated, brown basally with black hairs, the flagellums black; scapes only slightly swollen and but little longer than pedicels. Palpi blackish brown. *Thorax*: Notum and scutellum blackish (possibly discolored on account of wear), a few brassy hairs evident. Pleura buff-gray pollinose with yellow pile. *Legs* black with sparse black hairs, tibiae not swollen. *Wings* with 2 basal cells and anal area mostly hyaline, apex of hyaline triangle reaching costa at apex of stigma, the crossband a little wider than discal cell and fading near hind margin and crossing cubital cell without a sinus. Halteres black. *Abdomen*: Tergite 1 with a dark figure below scutellum, dull yellow at sides; tergite 2 bright yellow with concolorous hairs and a narrow black hind margin; tergite 3 with 3 dull reddish isolated spots and a smaller one in middle of tergite 4; remainder black with sparse yellow hairs caudally. Venter dull reddish basally, darkening on last 3 sternites, mostly yellow haired. Length of body: 8 mm.

Holotype ♀ (BISHOP 3476), 15 km NW of Dalat, 1850 m, Viet Nam, 5. V. 1960, L. W. Quate.

The predominantly pollinose face sets this apart from all species of the region, except the peculiar *C. silviaris* Phil. and Mack. of Burma, which has a more infuscated wing apically, and more yellow on legs and abdomen. The 2 are obviously derived from common ancestry and have *Silvius*-like faces.

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