

ENTOMOLOGY.—Three new species of *Laminitarsus* Fullaway from Singapore and the Philippines (Hymenoptera: Braconidae).¹ YING-TOU MAO, University of California. (Communicated by C. F. W. MUESEBECK.)

In the course of revising the North American species of the hymenopterous subfamily Cardiochilinae the author found three interesting species of *Laminitarsus* Fullaway in the Baker collection at the U. S. National Museum. The genus *Laminitarsus* was first established in 1919 by Fullaway to include only one species from Los Baños, Luzon, Philippine Islands. He placed it in the subfamily Cardiochilinae without further statement.

The species of both *Cardiochiles* Nees and *Laminitarsus* Fullaway have the third abscissa of the radius arched basally, but *Laminitarsus* may be easily recognized by the extraordinarily broadened and lengthened basitarsus of the posterior leg (Figs. 6, 7, 8) and the more or less triangular propodeum.

Four species of *Laminitarsus* are now known and they may be distinguished as follows:

1. Occiput deeply excavated and temple conspicuously bulging posteriorly; second segment of hind tarsus joined apically to basitarsus. 2
Occiput shallowly excavated and temple not bulging much posteriorly; second segment of hind tarsus joined ventrally to basitarsus.
singaporensis, n. sp.
2. Wings infumated. *muirii* Fullaway²
Wings hyaline, with only apical fifth of forewing and tip of hind wing infumated. 3
3. Face rugose; basitarsus of hind leg about twice as long as remaining four tarsal segments combined. *rudis*, n. sp.
Face smooth; basitarsus of hind leg about one-third longer than remaining four tarsal segments combined. *chapini*, n. sp.

***Laminitarsus chapini*, n. sp.**

Female.—Length 6.2 mm. Body yellowish brown with the following parts black: Antenna except scape and pedicel, vertex, frons medially, clypeus apically, mesoscutum except anterolateral corner, mesopleuron except dorsally and posteriorly, pectus, base of middle tibia, middle tarsus, two spots on outer surface

of hind coxa, hind trochanters, hind femur except apex, hind tibia basally, ventrally, and apically, hind tibial spurs basally, hind basitarsus except medially, the remaining four tarsal segments, a spot on each side of second tergite and apical half of tergites 3 to 5. Fore tarsus except base, spurs of middle tibia, spurs of hind tibia apically, and ovipositor sheath dark brown; wings with apical fifth light fuliginous and the rest hyaline; veins dark.

HEAD: Antenna 41-segmented; scape and pedicel with longer pubescence than the flagellum; eye bare; ocelli slightly elevated; vertex smooth, shining, and slightly sloping towards frons; occiput excavated; frons smooth, shining, impressed, and with a median longitudinal carina; face smooth, shining, and with a short median ridge at upper third; clypeus plain, smooth, shining, and not notched at the median apical margin; maxillary palpus prominent and longer than the head; temple narrower than the eye in dorsal view and bulging posteriorly; galea short.

THORAX: Lateral face of pronotum rugose on posterior half; median lobe of mesoscutum plain; notaulices distinct and foveolate; mesopleuron smooth and shining, upper groove weakly foveolate, lower groove foveolate and its lower margin flattened, posterior groove foveolate with a smooth depression at the middle anteriorly; metapleuron rugose, median ventral part of its anterior portion smooth and shining, and the posterior margin of its posterior portion flaring; propodeum rugose, pleural carina high and distinct, areola long, flat and indistinct, spiracular area acute posteriorly, spiracle long ovate. First abscissa of radius longer and thicker than that of basal vein; second abscissa of radius slightly less than three times as long as first; third abscissa of cubitus longer than fourth; second abscissa of cubitus shorter than recurrent vein (Fig. 3); interanal vein absent. Second and fifth segments of fore tarsus about equal; inner spur of middle tarsus about as long as basitarsus, second and fifth tarsal segments about equal; hind tibia flattened and broadened apically, tibial spur about as long as the second to fifth tarsal

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² Journ. Straits Branch Roy. Asiat. Soc., no. 80: 57-58, fig. 3, ♀. 1919.

segments combined, basitarsus long, broad, and flattened, about two thirds as long as the tibia, the remaining four tarsal segments combined about three-fourths as long as the basitarsus, second tarsal segment thickened, longer than the fifth and apically joined to the basitarsus (Fig. 7); hind tarsal claws pectinate basally.

ABDOMEN: First abdominal suture extending obliquely forward from the sides of the median elevation of first tergite; second and third tergites medially of about equal length; hypopygium about as long as the third tergite, obtuse in profile; ovipositor sheath inconspicuous, pubescent, about half as long as the hypopygium.

Type.—Female, Iligan, Mindanao, Philippine Islands, C. F. Baker, U.S.N.M. no. 57270. This species is named in honor of Dr. E. A. Chapin, curator of insects, U. S. National Museum.

Laminitarsus rudis, n. sp.

Female.—Length 6.5 mm. Yellowish brown, the following parts black: Antenna except scape lateroanteriorly and pedicle apically, a transverse band taking in posterior part of vertex and upper part of occiput, ocellar area, frons medially, three broad longitudinal vittae on mesoscutum, mesopleuron except dorsal third, pectus, middle trochanters apically, middle tibia basally, middle tarsus except base, one spot on hind coxa dorsoapically, hind trochanters, hind femur basally, hind tarsus except base, and a transverse band on each tergite from third to seventh. Apex of hind tibia, and hind tibial spurs infuscated; wings hyaline and veins dark, forewing with apical fifth, and hind wing apically, light fuliginous.

HEAD: Antenna incomplete; scape and pedicle with pubescence about as long as the flagellum; eye bare; ocelli slightly elevated, the distance between the posterior pair about twice as long as that between either one of these and the anterior ocellus; vertex punctate and shining; occiput excavated; frons punctate, shining, with a low median longitudinal carina; face rugose, with a short median ridge at about upper third; clypeus punctate, not notched medially on apical margin; temple and eye about equal in dorsal view; maxillary palpus prominent, about as long as the head; galea short.

THORAX: Lateral face of pronotum rugose on posterior half; mesoscutum punctate, its me-

dian lobe plain; notaulices distinct, foveolate, and flat in the posterior angle; mesoscutellum punctate; upper groove of mesopleuron finely rugose, lower groove broad, punctate and flat on ventral part, and posterior groove foveolate with a smooth groove at the middle leading anteriorly to the lower groove; metapleuron rugose, its posterior margin flaring; propodeum rugose, its pleural carina high and distinct, its aerolar carina represented by a short stump posteriorly, its spiracular carina not distinct, and its spiracle long ovate. First abscissa of radius equal to that of basal vein but thicker, and about one-fourth as long as the second abscissa of radius; third abscissa of cubitus longer than the fourth; second abscissa of cubitus and recurrent vein equal (Fig. 4); interanal vein absent. Second and fifth segments of fore tarsus about equal; inner spur of middle tibia slightly shorter than the basitarsus and second and fifth tarsal segments about equal; hind tibia flattened and broadened toward apex, its inner spur longer than the second to fifth tarsal segments combined; basitarsus enormously developed, broadened, flattened, and slightly more than two-thirds as long as the tibia; the other four tarsal segments combined about half as long as the basitarsus, second and fifth segments about equal; hind tarsal claws pectinate basally.

ABDOMEN: First abdominal suture extending obliquely forward at the sides; second and third tergites of about equal length medially; hypopygium about as long as the third tergite and obtuse in profile; ovipositor sheath inconspicuous, about half as long as the hypopygium, and pubescent.

Type.—Female, Island of Basilan, Philippine Islands, C. F. Baker, U.S.N.M., no. 57271.

Laminitarsus singaporensis, n. sp.

Female.—Length 5 mm. Head and thorax yellowish brown; antenna, occiput, vertex, face medially, tip of mandible, lower half of proepisternum, mesopleuron, pectus, and anterior portion of metapleuron black. Mesoscutum black with anterolateral vitta of median lobe, and anterior end and a narrow vitta of lateral lobe laterad of the posterior half of the notaulix yellowish brown. Wings hyaline, apical fifth of forewing and tip of hind wing infumated. Legs yellowish brown, middle leg with

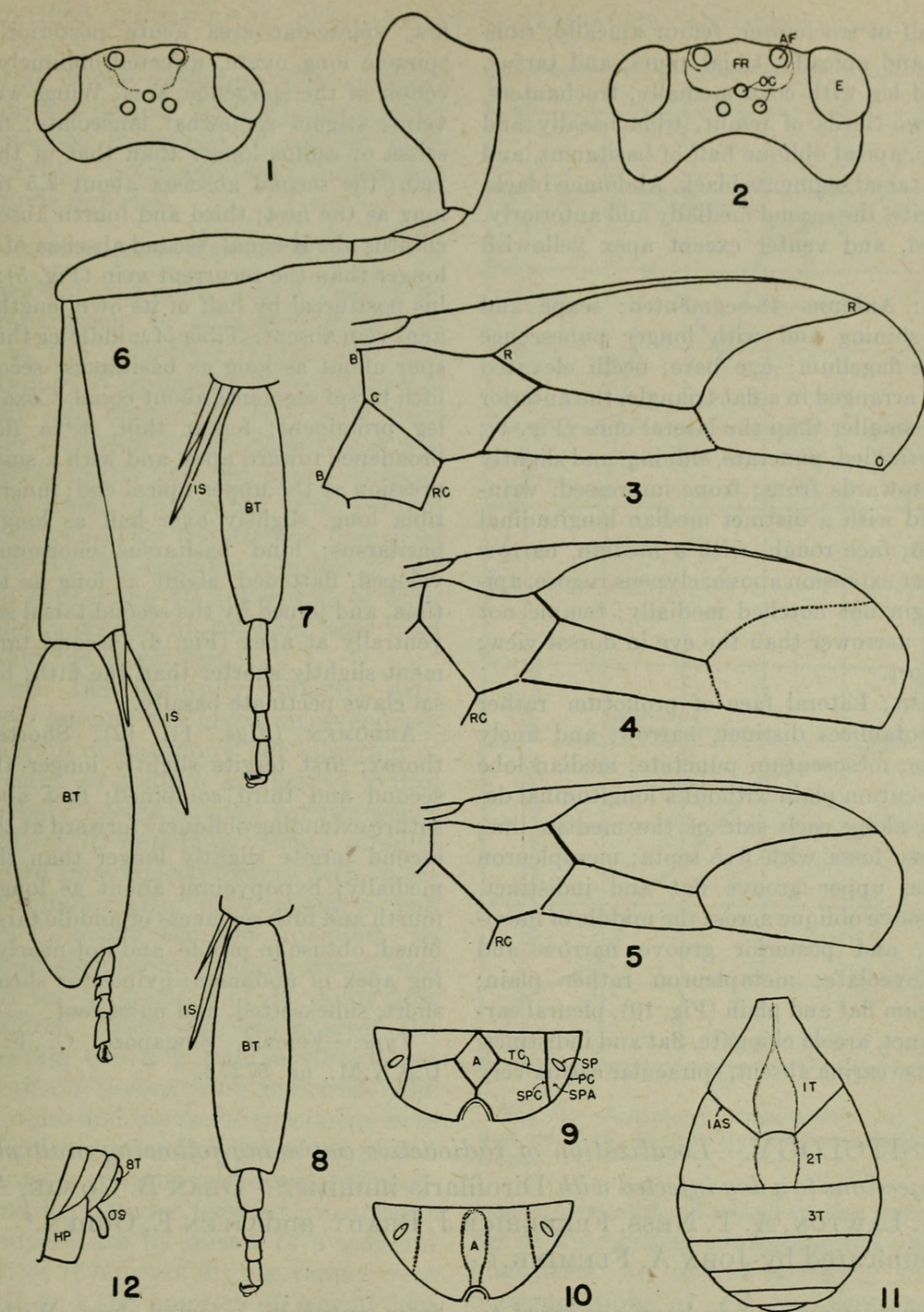


FIG. 1.—Head of *singaporensis* (dorsal view). FIG. 2.—Head of *chapini* (dorsal view) (similar to *rudis*). FIG. 3.—Part of forewing of *chapini* showing radius and cubitus. FIG. 4.—Part of forewing of *rudis* showing radius and cubitus. FIG. 5.—Part of forewing of *singaporensis* showing radius and cubitus. FIG. 6.—Left hind leg of *singaporensis* (ventral view). FIG. 7.—Part of hind leg of *chapini* showing tibial spurs and tarsus. FIG. 8.—Part of hind leg of *rudis* showing tibial spurs and tarsus. FIG. 9.—Typical propodeum of *Cardiochiles* Nees. FIG. 10.—Propodeum of *Laminitarsus* Fullaway. FIG. 11.—Abdomen of *singaporensis* (dorsal view) (similar to *chapini* and *rudis*). FIG. 12.—Part of abdomen of *singaporensis* showing hypopygium and ovipositor sheath (similar to *chapini* and *rudis*).

All figures are proportionally drawn. A, areola; AF, antennal foramen; B-B, basal vein; BT, basitarsus; C-C, cubitus; E, eye; FR, frons; HP, hypopygium; IS, inner spur; OC, ocelli; OS, ovipositor sheath; PC, pleural carina; RC, recurrent vein; R-R, radius; SP, spiracle; SPA, spiracular area; SPC, spiracular carina; ST, stigma; TC, transverse carina; IAS, first abdominal suture; 1T, first tergite; 2T, second tergite; 3T, third tergite; 8T, eighth tergite.

basal half of trochanter, femur apically, tibia basally and apically, tibial spurs, and tarsus, and hind leg with coxa medially, trochanters, apical two-thirds of femur, tibia basally and medially, apical oblique half of basitarsus, and last two tarsal segments black. Abdomen black, first tergite, the second medially and anteriorly, the third, and venter except apex yellowish brown.

HEAD: Antenna 48-segmented; scape and pedicel shining and with longer pubescence than the flagellum; eye bare; ocelli elevated slightly, arranged in a flat triangle, the anterior member smaller than the lateral ones (Fig. 1); vertex wrinkled, punctate, shining, and slightly sloping towards frons; frons impressed, wrinkled, and with a distinct median longitudinal elevation; face rough, with a median, narrow triangular extension above; clypeus rugose, apical margin not notched medially; temple not bulging, narrower than the eye in dorsal view; galea short.

THORAX: Lateral face of pronotum rather plain; notaulices distinct, narrow, and finely foveolate; mesoscutum punctate; median lobe of mesoscutum plain without a longitudinal depression along each side of the median line; transverse fossa with five septa; mesopleuron punctate, upper groove flat and indistinct, lower groove oblique across the middle of mesopleuron, and posterior groove narrow and finely foveolate; metapleuron rather plain; propodeum flat and plain (Fig. 10), pleural carina distinct, areola elongate, flat and indistinct, transverse carina absent, spiracular carina very

low, spiracular area acute posteriorly, and spiracle long ovate, directed obliquely in the center of the spiracular area. Wings with thin veins; stigma somewhat lanceolate; first abscissa of radius longer than that of the basal vein; the second abscissa about 2.5 times as long as the first; third and fourth abscissae of cubitus about equal; second abscissa of cubitus longer than the recurrent vein (Fig. 5); nervulus postfurcal by half of its own length; interanal vein absent. Tibia of middle leg thin, inner spur about as long as basitarsus; second and fifth tarsal segments about equal. Coxa of hind leg prominent; femur thin; tibia flattened, broadened toward apex, and with a smooth depression at the upper apical end; inner spur of tibia long, slightly over half as long as the basitarsus; hind basitarsus enormously developed, flattened, about as long as the hind tibia, and joined by the second tarsal segments ventrally at apex (Fig. 6); second tarsal segment slightly shorter than the fifth; hind tarsal claws pectinate basally.

ABDOMEN (Figs. 11, 12): Shorter than thorax; first tergite slightly longer than the second and third combined; first abdominal suture extending obliquely forward at the sides; second tergite slightly longer than the third medially; hypopygium about as long as the fourth and fifth segments of middle tarsus combined, obtuse in profile, and not nearly attaining apex of abdomen; ovipositor sheath very short, subexserted, and pubescent.

Type.—Female, Singapore, C. F. Baker, U.S.N.M., no. 57272.

PARASITOLOGY.—*Localization of radioactive antimony following multiple daily injections to a dog infected with Dirofilaria immitis.*¹ DEAN B. COWIE, ALFRED H. LAWTON, A. T. NESS, FREDERICK J. BRADY, and GLEN E. OGDEN.² (Communicated by JOHN A. FLEMING.)

Antimony compounds have appeared to offer the most promise in the treatment of human filarid infections. In our studies it was found (1) that daily injections of several such compounds were effective in eradicating microfilariae of *Dirofilaria immitis*

from naturally infected dogs. With regard to the fate of antimony in the tissues, we have reported (2) the distribution of radioactive antimony following a single intravenous administration of tartar emetic, sodium antimonyl xylitol, and an aqueous suspension of antimony trioxide. Since multiple daily injections of compounds at the dosage level of 0.8 milligram of antimony per kilogram of body weight were used in the experimental treatments, a knowledge

¹ Received March 16, 1945.

² From the Department of Terrestrial Magnetism of the Carnegie Institution of Washington and the Laboratories of Zoology, Chemistry, and Industrial Hygiene Research, National Institute of Health.



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