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Revision of Francis Walker's female types of North American *Rhamphomyia* Meigen (Diptera: Empididae)

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Abstract. Five Nearctic species described by Walker (1849) on the basis of female specimens are revised and illustrated. *Rhamphomyia agasicles* Walker is recognized as a subjective synonym of *R. minytus* Walker and by First Reviser action, the latter is chosen as the senior of the two names. The following additional new synonyms are proposed: *R. dana* Walker, 1849 and *R. valga* Coquillett, 1895 = *R. poplitea* Wahlberg, 1844; and *R. pulla* Loew, 1861 = *R. cophas* Walker, 1849. *Rhamphomyia mallos* Walker could not be associated with any recent specimens and only several old female specimens were found to be conspecific with *R. ecetra* Walker.

Key words. Dance flies, Nearctic, new synonyms.

INTRODUCTION

There are some 210 species of *Rhamphomyia* Meigen, 1822 described from North America (Melander 1965; Poole 1996; Barták 2002; Saigusa 2012), which likely only represents about 25 % of the total diversity in the Nearctic Region. As with most Empidoidea, species concepts are based primarily on differences in the male genitalia and species based on females alone are not easily identified subsequently. The British entomologist, Francis Walker described ten species of *Rhamphomyia*, of which six were unfortunately based solely on female specimens (Walker 1849, 1857). Many of the species described by Walker were collected in subarctic and high boreal Canada (Danks 1981) and deposited in the British Museum insect collection. These species, consisting of notoriously brief descriptions were included in Walker's cataloguing of the thousands of specimens in the museum's collection (see Evenhuis 2018). Smith (1971) revised many of the Nearctic species of Empididae *s. lat.* described by Francis Walker, but was not able to associate males with the six female-based species.

The Canadian National Collection of Insects (CNC) houses vast holdings of empidoids collected worldwide, including the genus *Rhamphomyia*. Building on the efforts of earlier curators, primarily Curran, Shewell and Chillcott (see Cumming et al. 2011), T. Saigusa sorted all available specimens of *Rhamphomyia* to subgenus, species group and species during a four month visit in 1985. In addition, extensive notes and pencil sketches of the male genitalia and male and female legs were made which have permitted identification by subsequent curators and students.

During a study of Canadian Arctic *Rhamphomyia* (Sinclair et al. in prep.), it was decided to study Walker's female *Rhamphomyia* types in order to clarify their identification by associating, if possible, the male sex. The association of males with the female types was accomplished rather rapidly for three of the five species (type of sixth species presumed lost) and is a testament to the quality and breadth of the CNC *Rhamphomyia* collection. The results are discussed below, with each species redescribed and illustrated to facilitate future species identification.

MATERIAL & METHODS

Specimens were borrowed from or housed in the following institutions: BMNH – The Natural History Museum, London; CNC – Canadian National Collection of Insects, Arachnids and Nematodes, Ottawa; MZH – Finnish Museum of Natural History, Helsinki; NHRS – Naturhistoriska Riksmuseet, Stockholm; UGIC – University of Guelph Insect Collection, Guelph; USNM – United States National Museum of Natural History, Washington, D.C. Only five of six Walker types were examined, but all species are listed below.

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Digital images of legs and wings were taken with a Leica camera model DFC425C managed by a Leica Digital Imaging System. Terms used for adult structures follow those of Cumming & Wood (2017).

Label data for primary types are cited from the top downward, with the data from each label in quotation marks. Labels are cited in full, with original spelling, punctuation, and date, and label lines are delimited by a slash (/). Additional information is included in square [ ] brackets. The repository of each type is given in parentheses. Refer to Smith (1971) for explanation of collectors and data labels of the Walker types.

TAXONOMY

***Rhamphomyia cophas* Walker, 1849**
(Figs 1–5)

Rhamphomyia cophas Walker, 1849: 499. Type locality: New York, USA.
Rhamphomyia pulla Loew, 1861: 330. Type locality: Connecticut, USA. **Syn. nov.**

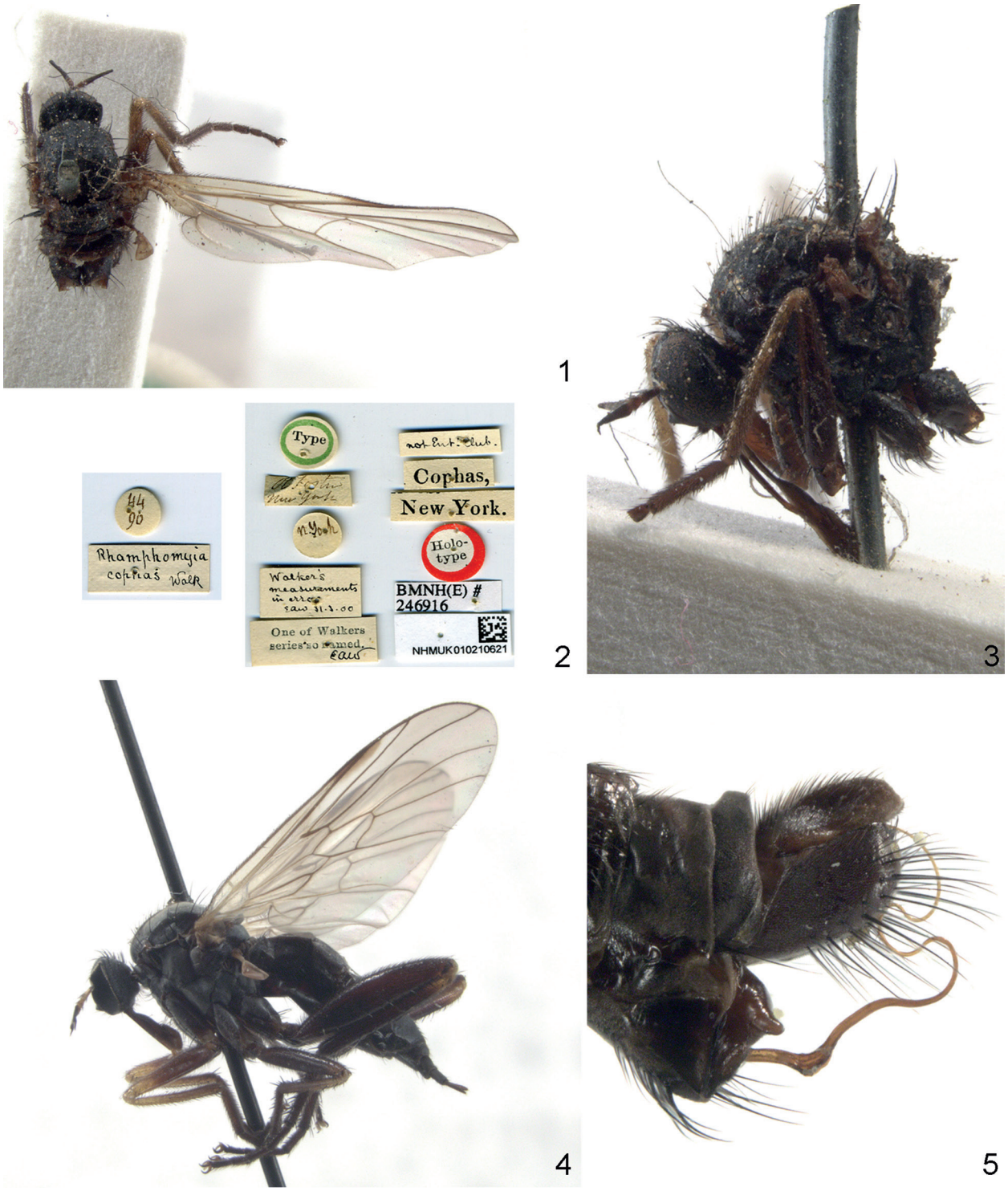
Note about synonymy. Although the holotype of *Rhamphomyia cophas* is in very poor condition (Figs 1, 3), features including leg colouration, body size and mid tibia chaetotaxy allowed for association with identified specimens of *R. pulla*. Although the male holotype of *R. pulla*, housed in the Museum of Comparative Zoology (see: http://140.247.96.247/mcz/Species_record.php?id=1016) possesses yellow femora and tibiae, female legs are much darker in this species, especially the mid and hind legs.

Type material examined. *Rhamphomyia cophas*: **HOLOTYPE** ♀, labelled (Fig. 2): "Type [green margined circle]"; "?? Foster/ New York"; "N.York [on reverse side: 44/ 90"; "Walker's/ measurements/ in error/ EAW 31.3.00"; "One of Walkers/ series so named./ EAW [on reverse side: "Rhamphomyia/ cophas/ Walk.]"; "not Ent. Club."; "Cophas,"; "New York."; "Holo-/ type [red margined circle]; "BMNH(E) #/ 246916"; "NHMUK010210621 [data matrix code]" (BMNH). The holotype is in poor condition, with left midleg, both hind legs, left fore tarsomeres 2–5 and abdomen missing; left wing is slide mounted (see Smith 1971, pl. 2, fig. 7).

Additional material examined. CANADA. Nova Scotia: Cape Breton Highlands NP, Pleasant Bay, 25–29.vi.1984, dry and wet mixed forest, H.J. Teskey (2 ♂♂, 2 ♀♀, CNC). **Ontario:** Coldwater, 20, 30.v.1959, J.G. Chillcott (8 ♂♂, 6 ♀, CNC); Midland, swampy woods, 2, 26.v.1959, J.G. Chillcott (3 ♂♂, 3 ♀♀, CNC); Orillia, 7.vi.1925, 28.vi.1926, 16.vi.1927, C.H. Curran (5 ♂♂, 1 ♀, CNC) (Fig. 4); Osgoode, 22.v.1964, J.R. Vockeroth (1 ♂, CNC); Ottawa, 30.v.1982, J.R. Vockeroth (1 ♂, CNC) (Fig. 5); Simcoe, 2.vi.1939, G.E. Shewell (1 ♂, CNC). **Quebec:** Beach Grove, 7.vi.1965, D.G.F. Cobb (1 ♂, CNC); Duncan Lake, nr. Rupert, 10.vi.1971, J.F. McAlpine (1 ♂, CNC); Gatineau Pk, King Mtn, 45°29′N, 75°51′W, 1.vi.2011, B.J. Sinclair (1 ♂, CNC); Knowlton, 20.vi.1927, G.S. Walley (1 ♂, CNC); Mt. St. Hilaire, 4.vi.1963, J.G. Chillcott (1 ♂, CNC); Norway Bay, 20.vi.1939, E.G. Lester (1 ♂, CNC); Old Chelsea, 12.vi.1964, J.R. Vockeroth (1 ♂, CNC); Rigaud, 11.vi.1981, J.R. Vockeroth (1 ♂, CNC). **UNITED STATES OF AMERICA. Georgia:** Towns Co., Tray Mtn, summit, 26.v.2000, G. & M. Wood (1 ♂, CNC). **Michigan:** Charlevoix Co., 31.v.1960, R. & K. Dreisbach (3 ♂♂, 1 ♀, CNC); Delta Co., 11.vi.1960, R. & K. Dreisbach (1 ♂, 1 ♀, CNC); Gratiot Co., 25.v.1958, R. & K. Dreisbach (2 ♂♂, 1 ♀, CNC); Mackinac Co., 7.vi.1957, 7.vi.1960, R. & K. Dreisbach (1 ♂, 4 ♀, CNC); Mecosta Co., 15.vi.1957, R. & K. Dreisbach (1 ♂, 1 ♀, CNC); Missaukee Co., 31.v.1957, R. & K. Dreisbach (1 ♂, 1 ♀, CNC); Ontonogan Co., 18.vi.1960, R. & K. Dreisbach (3 ♂♂, 1 ♀, CNC); Roscommon Co., 31.v.1957, R. & K. Dreisbach (1 ♂, 1 ♀, CNC). **New York:** McLean Reserve, nr. Dryden, 11.vi.1964, J.G. Chillcott (1 ♂, 2 ♀♀, CNC). **North Carolina:** Great Smoky Mtns NP, Noland Divide Tr., 1700 m, 35°33′58″N, 83°28′37″W, 4.vi.2001, J.M. Cumming (2 ♂♂, CNC). **Ohio:** Hocking Co., Coovert Reserve, 19.v.2003, hollow, J.M. Cumming (2 ♂♂, CNC).

Diagnosis. Males of this species are distinguished by the dark abdomen, yellow femora and tibiae, with at least apex of hind tibia darkened; scape and pedicel yellowish; and upper digitiform process of sternite 7 projecting horizontally, lower process hook-like, arched dorsally; phallus with lower loop rectangularly curved and ridged expansion only slightly broader than shaft of phallus. Female have a darkened, shiny abdomen, mid and hind femora dark with yellowish tip and fore femur mostly dark with apical half yellowish.

Redescription. Wing length 6.2–7.4 mm. **Male.** Head dark in ground-colour, with greyish pruinescence on face, frons, postgena and occiput; oral margin shiny reddish. Holoptic, eyes with ommatidia very slightly larger on upper half of eye. Frons divergent towards antennal sockets, bare. Margins of face slightly divergent. Ocellar triangle with pair of slender ocellar setae, longer than postocular setae. Upper half of occiput bearing row of stout postocular setae, stouter than ocellar setae; lower postocular setae mostly slender and longer. Occipital setae black and stout. Antenna with scape, pedicel and extreme base of postpedicel yellow; postpedicel mostly dark, nearly 4× longer than basal width; stylus length subequal to basal width of postpedicel. Palpus yellow, bearing long, slender setae. Clypeus bare, reddish and



Figs 1–5. *Rhamphomyia cophas* Walker. **1.** Holotype, female, dorsal view; **2.** Holotype labels; **3.** Holotype, lateral view; **4.** Recent specimen, female, lateral view; **5.** Male terminalia, lateral view. See Additional material examined section for locality details of recent specimens.

glossy; labrum dark and glossy, longer than eye height; labellum dark and bearing many fine setae.

Thorax dark with dense grey pruinescence; brown to black vittae beneath acrostichal and dorsocentral rows extending to prescutellar depression; posterior corner of postpronotal lobe and postalar ridge yellowish brown. Pleura with yellowish brown highlights about suture lines. Prosternum bare; proepisternum at fusion point with prosternum with several dark setae; upper part of proepisternum in front of anterior spiracle bare. Antepronotum with dense row of long, stout setae. Postpronotal lobe with 1 outstanding seta and 8 or more shorter setae of various thicknesses; acrostichal setae uniserial, two-thirds length of dorsocentral setae; dorsocentral setae uniserial, increasing in length posteriorly, prescutellar seta longer than lateral scutellar seta; 1 presutural supra-alar seta (= posthumeral), with several surrounding fine setulae; 3–4 notopleural setae, with several fine setulae anteriorly; 0 prealar setae; 1 postsutural supra-alar seta; 1 postalar seta and several shorter setae; 1 long apical pair and shorter lateral pair of marginal scutellar setae. Laterotergite with cluster of long, dark setae. Anterior and posterior spiracles blackish brown.

Legs long, stout; femora and tibiae yellow, apex of hind tibia often brown; coxae brown becoming yellowish apically. Coxae with lateral row of black setae. Femora with dense white ventral pile. Fore femur with row of anteroventral and posteroventral setae increasing in length apically. Fore tibia with long, pale ventral pubescence; 2–3 anterodorsal and posterodorsal setae; apex with several dark setae. Mid femur with anteroventral and posteroventral rows of short, even-length stout setae; 1 dark anterior preapical seta. Mid tibia with anteroventral and posteroventral row of short stout setae; 2–3 anterodorsal and posterodorsal setae. Hind femur longer and stouter compared to other femora; anteroventral row of short stout setae increasingly closer together distally; two rows of 3–5 stout anterior setae on apical third. Hind tibia with long, ventral pubescence; 5–6 black anterodorsal and posterodorsal setae, shorter than width of tibia; apex with several dark setae; 1 long seta in posteroapical comb. Tarsomere 1 of all legs slender; ventral margin of all tarsomeres with dense ventral pile; hind tarsomeres with several pairs of spine-like ventral setae.

Wing lightly infuscate; pterostigma elongate, distinct; basal costal seta present. Cell dm shorter than cell bm; CuA+CuP complete, reaching wing margin without weakening; alular incision acute; margin of calypter with dark setae. Halter with whitish knob and yellowish stalk.

Abdomen dark brown, basal segment and tergites 7 and 8 with whitish pruinescence, remaining segments shiny; setae pale brown, lateromarginal setae on segments 2 and 3 long, stouter and darker. Sternites 2–6 with pair of very long, divergent median marginal setae, nearly as long as length of sclerite. Tergite 7 similar in width to tergite 6. Sternite 7 tapered apically to truncate margin, with 2 rows of long stout setae, becoming longer posteriorly; posterolateral margin expanded into cup-like process, bearing pair of short digitiform processes: upper process short, horizontally projected; lower process hook-like, arched dorsally. Tergite 8 more thickly sclerotized than tergite 7, expanded laterally at mid-length, fused to sternite. Sternite 8 slender, compressed between expanded posterolateral margins of sternite 7; bearing long, stout setae. Terminalia (Fig. 5) dark brown, phallus pale brown. Hypandrium slender, strap-like, wrapping around base of phallus. Epandrium subrectangular, with rounded apex; posterior half clothed in long, stout setae; slightly longer than length of cercus. Subepandrial lobe lacking; bacilliform sclerite with dense, erect short setae. Cercus subrectangular with rounded apex; dorsal margin with triangular medial lobe at mid-length. Phallus slender with two deep loops, with lower loop rectangularly curved; sharply bent at mid-length at point of ridged expansion; expansion only slightly broader than shaft of phallus. Ejaculatory apodeme narrow, subtriangular; horizontal lamella on ventral margin.

Female. Similar to male except (Fig. 4): frons with greyish pruinescence, glossy medially; margin with row of setae, uppermost shorter. Acrostichal row initially uniserial, biserial on posterior half. Mid and hind femora dark with yellowish tip and fore femur mostly dark with apical half yellowish; hind femur inflated, broader than other femora; femora without ventral pile. Abdomen mostly shiny, except for apical segments; setae pale, except pair of dark, divergent setae on sternites 2–5; dark, pilose pleural membrane, indicating retracted pleural sacs. Cercus long and slender, length 4–5 times width.

Geographic distribution. This species is widespread in eastern North America, ranging from northern Ontario (Canada), south to North Carolina and Georgia (USA) and as far west as Michigan.

Remarks. Although the holotype of *R. cophas* is in poor condition, very greasy with abdomen and most of the legs missing, it can be readily assigned to the subgenus *Calorhamphomyia* Saigusa, 1963 on the basis of lustrous clypeus, leg colouration, thoracic chaetotaxy (prealar setae absent) and general body size. Saigusa (1963) assigned *R. pulla* to this subgenus.

Rhamphomyia ecetra Walker, 1849
(Figs 6–10)

Rhamphomyia ecetra Walker, 1849: 500. Type locality: Georgia, USA.

Type material examined. *Rhamphomyia ecetra*: **HOLOTYPE** ♀, labelled (Fig. 8): "Type [green margined circle]"; "One of Walkers/ series so named./ EAW [on reverse side: "Rhamphomyia/ ecetra/ Walk.]";

Figs 6–10. *Rhamphomyia ecetra* Walker. **6.** Holotype, female, dorsolateral view; **7.** Recent specimen, female antenna, lateral view; **8.** Holotype labels, left label underside of corresponding label in centre row; **9.** Recent specimen, female, lateral view; **10.** Recent specimen, female, anterior view. See Additional material examined section for locality details of recent specimens.

"Ecetra,"; "Georgia."; "Pararhamphomyia"; "Holo-/ type [red margined circle]; "BMNH(E) #/ 246919"; "NHMUK010210624 [data matrix code]" (BMNH). The holotype is missing both hind tibia and tarsus, right fore tibia and tarsi and left wing is slide mounted (see Smith 1971, pl 3, fig. 1).

Additional material examined. UNITED STATES OF AMERICA. Georgia (3 ♀♀, USNM). **North Carolina:** Morrison (3 ♀♀, USNM) (Figs 7, 9, 10).

Diagnosis. Females of this species are distinguished by the dense presutural supra-alar setae; 3 pairs of scutellar setae; dark legs with dorsal and ventral pennate setae on hind femur and tibia, mid femur and tibia and fore tibia, and dorsally only on fore and mid basitarsus; abdomen shiny with reddish margins; cell dm short, distinctive shape, shorter than cell bm; basal costal seta present.

Redescription. Wing length 4.1–4.6 mm. **Female.** Head dark in ground-colour, with greyish pruinescence on face, frons, postgena and occiput; oral margin shiny reddish. Dichoptic, ommatidia even-sized throughout. Frons and face broad, subequal in width; frons with row of setulae along eye margin (Fig. 7). Ocellar triangle with pair of long ocellar setae, longer than postocular setae. Upper half of occiput bearing row of stout postocular setae, stouter than ocellar setae; lower postocular setae brown, paler than upper setae, slender and shorter. Occipital setae black and stout; postgenal setae paler than occipital setae, long and slender. Antenna brown; scape longer than pedicel; postpedicel nearly 3× longer than basal width (Fig. 7); stylus length about equal to length of scape. Palpus dark, slender, bearing numerous long, dark setae. Clypeus bare, with greyish pruinescence; labrum dark and glossy, nearly 1.5 times longer than eye height; labellum dark and bearing many pale setae, longer than palpal setae.

Thorax dark with dense grey pruinescence; greyish-white vittae between acrostichal and dorsocentral rows; dark vittae beneath acrostichal and dorsocentral rows extending to prescutellar depression; posterior corner of postpronotal lobe and postalar ridge brownish. Prosternum bare; proepisternum at fusion point with prosternum with several long, slender setae; upper part of proepisternum in front of anterior spiracle bare. Antepronotum with dense row of stout setae. Postpronotal lobe with 1–2 outstanding setae, clothed in numerous long, slender setae; acrostichal setae biserial, subequal in length to dorsocentral setae (Fig. 10); dorsocentral setae multiserial, increasing in length posteriorly, prescutellar seta slightly shorter than lateral scutellar seta; presutural supra-alar clothed with numerous slender setae, similar to dorsocentral setae, occasionally with 1–2 outstanding setae (posthumeral); numerous long, slender anterior notopleural setae, similar to presutural supra-alars; 3–4 stronger posterior notopleural setae; 2–3 prealar setae and 1 postsutural supra-alar seta, with numerous shorter setae; 1 postalar seta; 1 long apical pair and 2 shorter lateral pairs of marginal scutellar setae. Laterotergite with cluster of long, dark setae. Anterior and posterior spiracles brownish.

Legs short, slender, brown with grey pruinescence on coxae. Fore coxa with row of long slender anterolateral setae; lateral regions of mid and hind coxae with similar setae. Fore femur with row of fine anteroventral setae, shorter than width of femur. Fore tibia densely clothed in setae, dorsal setae pennate, subequal in length to width of tibia; ventral setae slightly pennate, shorter than width of tibia; apex with several stout subapical setae. Mid femur with dense white ventral pile; anteroventral row of short, even-length setae; posteroventral row of pennate setae nearly as long as width of femur; dorsal setae slightly pennate. Mid tibia with anterodorsal and posteroventral row of pennate setae; 1 stout anterodorsal seta at mid-length and several subapical setae. Hind femur (Fig. 9) with dense white ventral pile; dorsal margin with pennate setae; posteroventral row of pennate setae longer than dorsal row; anteroventral row of setae short and slender. Hind tibia with dorsal and ventral pennate setae, shorter than width of tibia; 3–4 anterodorsal and posterodorsal setae; 1 long seta in posteroapical comb. Tarsomere 1 of fore and mid legs with short dorsal pennate setae; hind leg with 3–4 stout anterodorsal and posterodorsal setae, longer than tarsomere; 3–4 stout anteroventral and posteroventral setae, subequal to width of tarsomere.

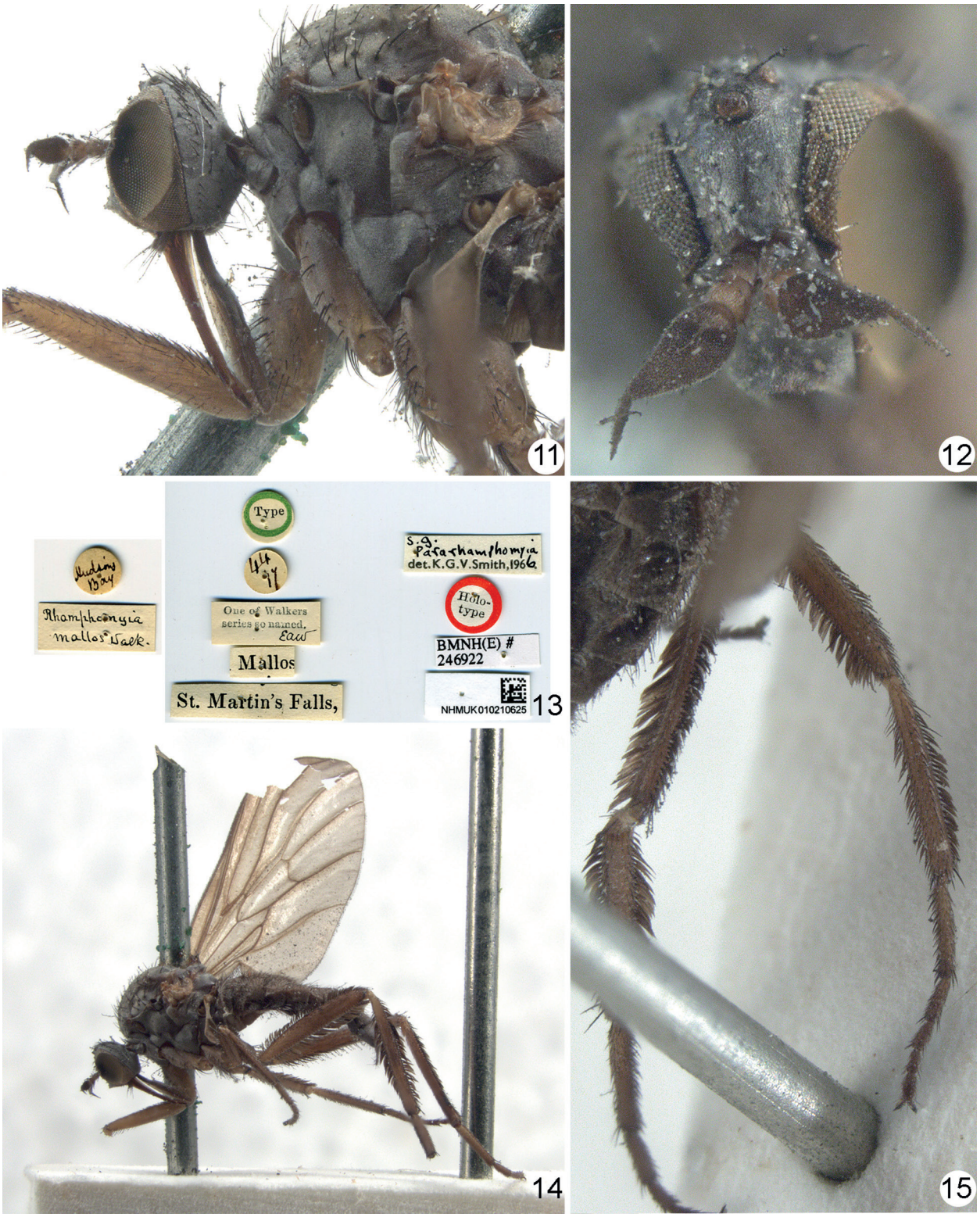
Wing infuscate; pterostigma elongate, distinct; long basal costal seta present. Cell dm shorter than length of cell bm (Fig. 9); CuA+CuP reaching wing margin with weakening at mid-length; alular incision acute; margin of calypter with long brown setae. Halter brown.

Abdomen shiny with reddish lateral margins and dark posterior margins; setae dark and numerous. Cercus long and slender, with fine setae.

Male. Unknown.

Geographic distribution. This species is possibly restricted to the southern Appalachian Mountains of Georgia and North Carolina (USA).

Remarks. *Rhamphomyia ecetra* is assigned to the *R.* (*Pararhamphomyia*) *plumifera* group *sensu* Saigusa (unpubl. data) (or perhaps *R. obscura* group *sensu* Barták & Kubík 2009) and appears very similar to the species complex of *R. brevis* Loew, 1861/*R. corvina* Loew, 1861. *Rhamphomyia ecetra* is characterized by three pairs of scutellar setae and most specimens of the *brevis*/*corvina* complex have two pairs of scutellar setae. Males from Georgia are required to make further conclusions concerning the identification of this species.



Figs 11–15. *Rhamphomyia mallos* Walker. **11.** Holotype, female, fore femur, head, lateral view; **12.** Holotype, antenna, head, anterior view; **13.** Holotype labels, left two labels underside of corresponding labels in centre row; **14.** Holotype, lateral view; **15.** Hind leg, posterior view.

***Rhamphomyia mallos* Walker, 1849**
(Figs 11–15)

Rhamphomyia mallos Walker, 1849: 502. Type locality: St. Martin's Falls [Ogoki], Albany River, Ontario, Canada.

Type material examined. *Rhamphomyia mallos*: **HOLOTYPE** ♀, labelled (Fig. 13): "Type [green margined circle]"; "44/ ?? [underside: Hudson's/ Bay]"; "One of Walkers/ series so named./ EAW [on reverse side: "Rhamphomyia/ mallos/ Walk.]"; "Mallos,"; "St. Martin's Falls,"; "s.g./ Pararhamphomyia/ det. K.G.V. Smith, 1966"; "Holo-/ type [red margined circle]; "BMNH(E) #/ 246922"; "NHMUK010210625 [data matrix code]" (BMNH). Holotype is missing the left foreleg, fore tibia and tarsi and left hind tarsomere 2–5; the left wing is slide mounted (see Smith 1971, pl. 3, fig. 2).

Diagnosis. The holotype female is characterized by pale legs, bare prosternum, pennate setae on mid- and hindlegs and thickened setae dorsally on fore femur; postpedicel short, rounded basally; abdomen with pennate setae laterally on segments 3 and 4 (on pleura?).

Redescription. Wing length 7.3 mm. **Female.** Head dark in ground-colour, with greyish pruinescence on face, frons, postgena and occiput; oral margin pruinescent. Dichoptic, ommatidia with uppermost smaller. Frons and face broad, subequal in width; frons with row of setulae along eye margin, uppermost shorter. Ocellar triangle with pair of ocellar setae. Upper half of occiput bearing row of stout postocular setae; lower postocular setae slender and shorter. Occipital setae black and stout; postgenal setae long and slender. Antenna (Fig. 12) with scape and pedicel pale brown, postpedicel darker; scape 1.5 times longer than pedicel; postpedicel with broad base, 4 times longer than pedicel; stylus greater than half length of postpedicel. Palpus yellowish brown, slender, bearing numerous long, dark setae. Clypeus not visible; labrum dark and glossy, nearly 1.3 times longer than eye height (Fig. 11); labellum dark and bearing many long, dark setae.

Thorax dark with dense grey pruinescence; brownish vittae beneath acrostichal and dorsocentral rows; lateral scutum with apparent brownish ring encircling base of major setae; posterior corner of postpronotal lobe and postalar ridge brownish. Prosternum bare; proepisternum at fusion point with prosternum with 3 long, slender setae; upper part of proepisternum in front of anterior spiracle bare. Antepronotum with row of stout setae. Postpronotal lobe with 1 outstanding seta, clothed in numerous long and short, slender setae; acrostichal setae biserial, subequal in length to dorsocentral setae; dorsocentral setae uniserial, biserial anteriorly, prescutellar seta subequal in length to scutellar setae; dorsocentral row curved towards postpronotal lobe anteriorly; 3 presutural supra-alar setae (posthumeral) and 2 posterior presutural supra-alar setae; 4–5 anterior notopleural setae and 3 posterior notopleural setae in oblique row; 3–4 prealar setae; 1 postsutural supra-alar setae; 1 postalar seta; 2 pairs of marginal scutellar setae. Laterotergite with cluster of long, dark setae. Anterior and posterior spiracles yellowish brown, concolourous with halter.

Legs long, pale or yellowish brown with very thin grey pruinescence on coxae. Fore coxa with row of long slender anterolateral setae; lateral region of mid and hind coxae with similar setae. Fore femur with row of anteroventral and posteroventral setae; stronger anterodorsal setae on basal third. Fore tibia lost. Mid femur with anteroventral row of short, even-length setae, longer near base; posteroventral row of pennate setae nearly half length of femur width; anterodorsal setae narrowly pennate, slightly shorter than setae of posteroventral row. Mid tibia with anterodorsal and posteroventral row of pennate setae; row of anteroventral setae short. Hind femur with row of anterodorsal and posteroventral pennate setae (Fig. 15); setae of anteroventral row short and slender. Hind tibia with row of anterodorsal and posteroventral pennate setae, shorter than width of tibia; 5–6 posterodorsal setae; 1 long seta in posteroapical comb. Tarsomere 1 of all legs without pennate setae.

Wing infuscate, especially along veins (Fig. 14); pterostigma elongate, distinct; basal costal seta absent. Cell dm slightly shorter than length of cell bm; CuA+CuP reaching wing margin with weakening at mid-length; alular incision nearly right angled; calypter with dark setae. Halter yellowish brown.

Abdomen dark brown with black setae; pennate setae laterally on segments 3 and 4. Cercus long and slender, with fine setae.

Male. Unknown.

Geographic distribution. The label data is likely incorrect (see Remarks) and this species is possibly found in southeastern North America.

Remarks. *Rhamphomyia mallos* initially appeared very similar to *R.* (*Dasyrhamphomyia*) *villipes* Coquillett, 1900 on the basis of pennate setae on legs and large size, but the latter species has more setae on the fore femur, proboscis distinctly longer, postpedicel elongate and without abdominal pennate setae. No specimens could be found that matched the distinctive combination of features of this female, especially the abdominal pennate setae. It is doubtful such a large sized species from northern Ontario would be absent from the CNC, which could indicate that the specimen is mislabelled and possibly originates from the southeastern United States of America. Expanding the search, we found that *R. mallos* is rather similar to *R. testacea* Loew, 1862, with reduced setae on the fore femur and broad postpedicel, but the length

of the pennate setae of the latter species is longer than the width of corresponding leg segment (see MCZ type collection: http://140.247.96.247/mcz/Species_record.php?id=13637). There is also an undescribed brownish species in the CNC from Virginia, Tennessee, Arkansas and possibly Mississippi and Texas, where the females possess abdominal pennate setae, very similar shaped postpedicel and very long pennate setae on all legs. The latter species is currently assigned to a group of species similar to *R. pectinata* Loew, 1861. Unfortunately all these species differ from *R. mallos* in antennal colour, thoracic chaetotaxy and length of the pennate setae on the legs.

Rhamphomyia minytus Walker, 1849
(Figs 16–20)

Rhamphomyia minytus Walker, 1849: 502. Type locality: St. Martin's Falls [Ogoki], Albany River, Ontario, Canada.

Rhamphomyia agasicles Walker, 1849: 499. Type locality: St. Martin's Falls [Ogoki], Albany River, Ontario, Canada. **Syn. nov.**

Note about synonymy. *Rhamphomyia minytus* and *R. agasicles* were described in the same paper by Walker (1849). We consider these names to be subjective synonyms, with the former based on a male and the latter on a female of the same species. Acting as the First Reviser, we select *R. minytus* as the senior synonym (Article 24.2.2 of the Code, ICZN 1999).

The shiny scutum, anepisternum and abdomen and the broadened hind tarsomere 1 allowed for the association of the sexes. The illustrations of the male terminalia and hind tarsi by Smith (1971, figs 13, 14) facilitated identification of additional males specimens and direct examination of the male holotype of *R. minytus* was un-necessary.

Type material examined. *Rhamphomyia agasicles*: **LECTOTYPE** ♀, labelled (Fig. 18): "Type [green margined circle]"; "One of Walkers/ series so named./ EAW [on reverse side: "Rhamphomyia/ agasicles/ Walk.]"; "Agasciles,"; "St. Martin's Falls,"; "LECTO-/ TYPE [blue margined circle]; "Pararhamphomyia [written by Smith]"; "BMNH(E) #/ 246915"; "NHMUK010210622 [data matrix code]" (BMNH). The lectotype is in good condition, with the left wing slide mounted (see Smith 1971, pl. 2, fig. 6).

Additional material examined. CANADA. British Columbia: Alaska Hwy, mi 392, Summit Lake, 4500 ft, 2–4.vii.1959, E.E. MacDougall (1 ♀, CNC); same locality, 5300 ft, 18.vi.1959, R.E. Leech (1 ♀, CNC) (Fig. 19); same locality, 5000 ft, 23.vi.1959, R.E. Leech (1 ♂, CNC) (Figs 17, 20); same locality, 4500 ft, 23–24.vi.1959, R.E. Leech (1 ♀, CNC).

Diagnosis. Females of this species are distinguished by the shiny scutum, anepisternum and abdomen; hind femur with short posterodorsal pennate setae; hind tibia with short anteroventral setae; hind tarsomere 1 as broad as apex of hind tibia; wings broad, darkly infuscate with pale base. Males are distinguished by the broad and setose hind tarsomere 1; base of hind tibia with cluster of posterior setae; cercus and epandrium narrow and elongate with base of both shiny.

Redescription. Wing length 3.5–3.8 mm. **Male.** Head dark in ground-colour, with greyish pruinescence on face, frons, postgena and occiput; oral margin shiny reddish. Holoptic, eyes with ommatidia larger on upper half of eye, smaller on lower half. Frons divergent towards antennal sockets, bare. Margins of face slightly divergent; greyish pruinescence laterally, glossy medially. Ocellar triangle shiny with pair of ocellar setae, shorter than postocular setae. Occipital setae posterior to ocellar triangle stouter than postocular setae. Postocular setae long and slender; postgenal setae similar to postoculars. Antenna dark; scape slightly longer than pedicel; postpedicel nearly 3× longer than basal width; stylus length about half length of scape. Palpus dark, slender, bearing several long, subapical setae. Clypeus bare and glossy; labrum dark and glossy, slightly longer than eye height; labellum dark and bearing many dark setae, subequal or longer than palpal setae.

Thorax dark brown with dense grey pruinescence; anepisternum shiny; dorsum of scutum shiny, with anterior face of postpronotal lobe and lateral margin from notopleuron to scutellum and prescutellar depression pruinescent. Prosternum bare; proepisternum at fusion point with prosternum with several setae; upper part of proepisternum in front of anterior spiracle bare. Antepronotum with row of stiff setae. Postpronotal lobe with 1 outstanding seta and several shorter, finer setae; acrostichals biserial, slightly shorter than dorsocentral setae; dorsocentrals biserial to prescutellar depression, increasing in length posteriorly, uniserial prescutellar setae shorter than apical scutellar setae, dorsocentral row curved towards postpronotal lobe anteriorly; 1 presutural supra-alar seta (posthumeral) and several shorter setulae; 3 notopleural setae, with several setulae; 0 prealar setae; 1 postsutural supra-alar seta; 1 postalar seta; 1 long apical pair and short lateral pair of marginal scutellar setae. Laterotergite with cluster of long, dark setae. Anterior and posterior spiracles concolourous with pleura.

Legs dark brown, somewhat shiny. Fore coxa with row of 5–6 stiff anterolateral setae; lateral regions of mid and hind coxae with similar setae. Fore femur with row of fine posteroventral setae. Fore tibia with several rows of dorsal setae, longer than width of tibia; posterior

Figs 16–20. *Rhamphomyia minytus* Walker. **16.** Lectotype of *R. agasicles* Walker, female, dorsolateral view; **17.** Recent specimen, male terminalia, lateral view; **18.** Lectotype of *R. agasicles* Walker, labels, left label underside of corresponding label in centre row; **19.** Recent specimen, female, lateral view; **20.** Recent specimen, male hind leg, anterior view. See Additional material examined section for locality details of recent specimens.

face clothed with fine short setae. Mid femur with anteroventral and posteroventral rows of stout setae, longer than width of femur. Mid tibia clothed with stout ventral setae, shorter than width of tibia. Hind femur (Fig. 4E) slightly twisted medially on apical third; basal half with row of posterior setae, subequal to width of femur; apical third with row of posterodorsal setae increasing in length apically. Hind tibia straight, with anterodorsal setae, increasing in length and stouter apically; base of hind tibia with cluster of posterior setae; 1 long seta in posteroapical comb. Hind tarsomere 1 greatly expanded and flattened, broader than tibia (Fig. 20), with dense dorsal setae, longer than width of segment; tarsomeres 2 and 3 somewhat swollen with long dorsal setae.

Wing lightly infuscate; pterostigma elongate, lightly infuscate; without basal costal seta. Cell dm subequal in length to cell bm; CuA+CuP weak, reaching wing margin as crease; alular incision right angled; margin of calypter with brown setae. Halter pale yellowish brown.

Abdomen dark brown, shiny, with longer ventral setae; dorsolateral setae pale brown. Tergite 8 reduced to half-length of sternite; sternite 8 with short rounded posterior margin bearing long setae, longer than length of sclerite. Terminalia (Fig. 17) dark brown (undissected). Epandrium elongate, slightly constricted beyond middle, bearing many fine setae, longer along ventral margin and apically; middle outer face with dense setae; lower basal half polished. Cercus elongate, 3/4 length of epandrium; expanded beyond mid-length; polished on basal half; dorsal margin at base bearing many short, fine setae; inner surface on apical half with numerous slender setae. Phallus filamentous, with slight inward curve towards middle, forming loop extending beyond epandrium and recurved between cerci; ejaculatory apodeme and hypandrium not examined in undissected specimen.

Female. Similar to male except frons shiny with pale lateral setulae, with greyish pruinescence above antennae; hind femur with short posterodorsal pennate setae, hind tibia with short anteroventral setae; hind tarsomere 1 as broad as apex of hind tibia (Fig. 16); wings broader than male, darkly infuscate with pale base (Fig. 19).

Geographical distribution. This species is known from northern British Columbia and northern Ontario (Canada).

Remarks. *Rhamphomyia minytus* is assigned to the *R.* (*Pararhamphomyia*) *caudata* (Zetterstedt, 1838) group, and in North America this species group also includes *R. priapulus* Loew, 1861 and *R. ursinella* Melander, 1928 and several undescribed species.

***Rhamphomyia poplitea* Wahlberg, 1844**
(Figs 21–28)

Rhamphomyia poplitea Wahlberg, 1844: 107. Type locality: Quickjock, Sweden.
Rhamphomyia dana Walker, 1849: 502. Type locality: St. Martin's Falls [Ogoki], Albany River, Ontario, Canada. **Syn. nov.**
Rhamphomyia valga Coquillett, 1895: 428. Type locality: New Hampshire, USA. **Syn. nov.**

Note about synonymy. Females of this species are rather distinctive on the basis of the very long pennate setae (Figs 23–24, 27) and *R. dana* matched females identified by Chillcott (1959) as *R. valga*. *Rhamphomyia valga* is assigned to the *R. basalis* Loew, 1864 group defined on the basis of the highly modified male hind leg (Chillcott 1959). All species of the *R. basalis* group were examined in detailed in both the USNM and CNC and in combination with the key to females in Chillcott (1959) only one species (*R. valga*) matched the female Walker type.

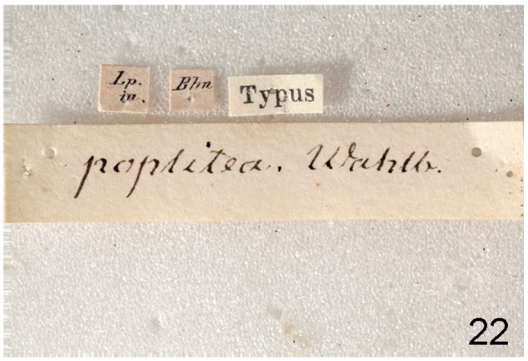
Following the initial identification of *R. dana* with *R. valga*, it was learned that the European species, *R. poplitea* should also be assigned to the *R. basalis* group. Only digital images of the holotype of *R. poplitea* were studied. On the basis of identical colour of the abdomen, shape of the male hind leg and male terminalia *R. valga* is considered a synonym of *R. poplitea*.

Type material examined. *Rhamphomyia dana*: **HOLOTYPE** ♀, labelled (Fig. 25): "Type [green margined circle]"; "One of Walkers/ series so named./ EAW [on reverse side: "Rhamphomyia/ dana/ Walk.]"; "Dana,"; "St. Martin's Falls,"; "Pararhamphomyia/ det. K.G.V. Smith, 1968"; "Holo-/ type [red margined circle]; "BMNH(E) #/ 246917"; "NHMUK010210623 [data matrix code]" (BMNH). The holotype is in good condition, with right postpedicel missing and left wing slide mounted (see Smith 1971, pl. 2, fig. 8).

Rhamphomyia poplitea: **HOLOTYPE** ♂, labelled (Fig. 22): "Lp./ in. [Lapponia interior]"; "Bhn [Boheman collection]"; "Typus"; "poplitea, Wahlb. [unit tray label]" (NHRS).

Rhamphomyia valga: **HOLOTYPE** ♂, labelled: "White Mts./ Morrison."; "Collection/ C.V. Riley"; "Type/ No. 3217/ U.S.N.M. [red label]"; "Rhamphomyia/ valga/ Coq." (USNM).

Additional material examined. CANADA. New Brunswick: Kouchibouguac NP, 5–14.vii.1977, J.R. Vockeroth, G.A. Calderwood (1 ♂, 2 ♀♀, CNC). **Newfoundland & Labrador:** Fogo Island, vii.1929, C.W. Johnson (1 ♂, CNC); Goose Bay, 24.viii.1947, W.E. Beckel (1 ♂, CNC); same locality, 7.vii.1952 (2 ♀♀, CNC). **Ontario:** Iroquois Falls, 21–30.vi.1987, J.R. Vockeroth (2 ♀♀, CNC); Thunder Bay Distr., Neys Prov.



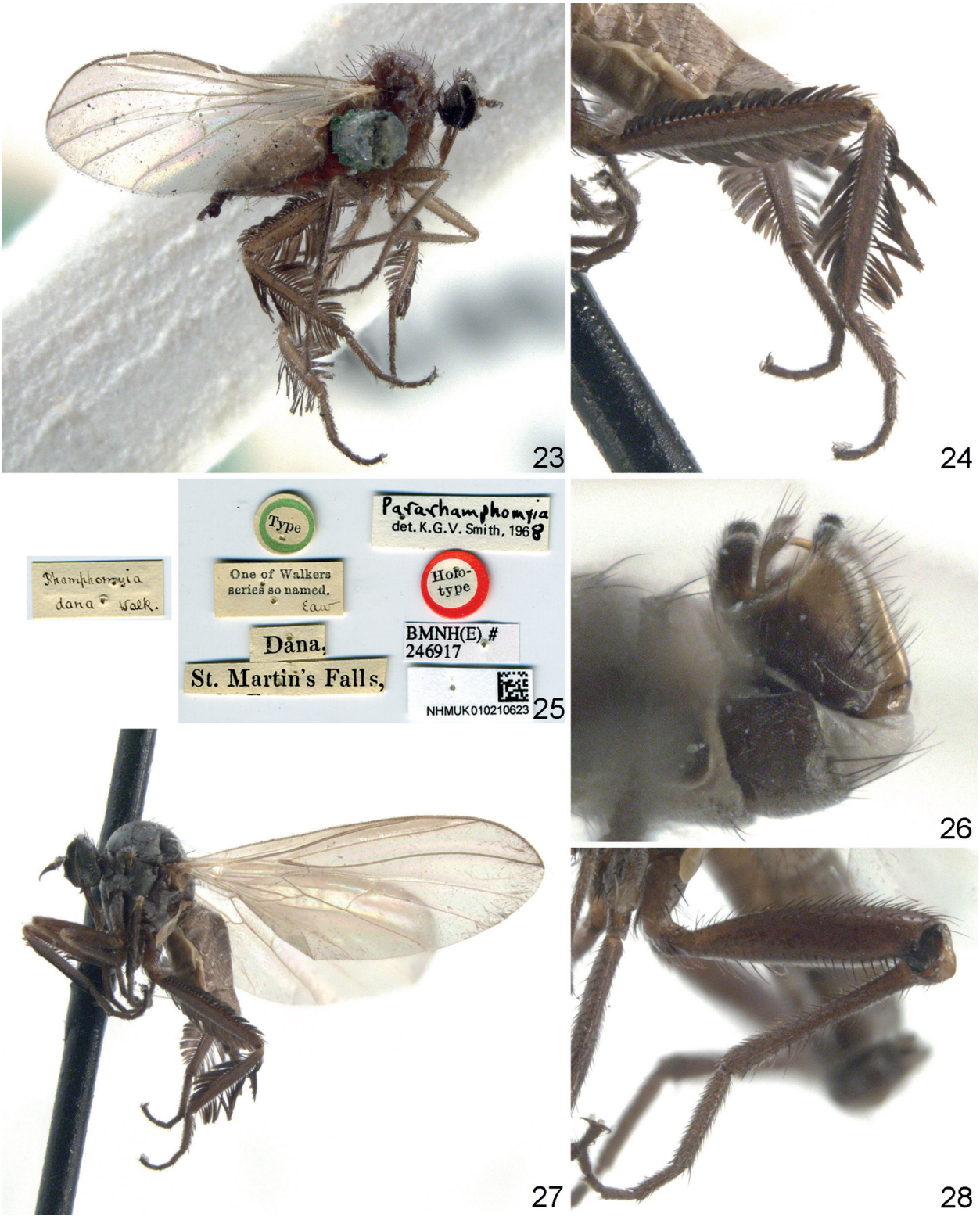
Figs 21–22. *Rhamphomyia poplitea* Wahlberg. **21.** Holotype, male, lateral view; **22.** Holotype label, upper three labels attached to specimen; lower label pinned to unit tray (photographs: Y. Brodin).

Pk, Dune Trail, 48°46′52″N, 86°36′53″W, MT, yellow pans, 7–19.vii.2002, M. Buck (2 ♀♀, UGIC); Thunder Bay Distr., Prairie R. at Hwy 17, 38 km E Terrace Bay, 48°48′N, 86°47′W, boggy spruce MT, 15–19.vii.2002, M. Buck (2 ♂♂, 4 ♀♀, UGIC). **Quebec:** Fort Chimo, 22.vii.1948, R.H. MacLeod (1 ♀, CNC); same locality, 7–9.vii.1954, J.F. McAlpine, E.E. Sterns (2 ♂♂, CNC); Indian House Lake, 9.vii.–15.viii.1954, W.R. Richards (31 ♂♂, 8 ♀♀, CNC) (Figs 24, 27, 28); James Bay Rte, km 204.5, 50°58′59″N, 77°38′2″W, black spruce/Sphagnum, MT, 7–16.vii.2001, M. & B. Buck (1 ♀, UGIC) (Fig. 26); James Bay Rte, km 578.4, 53°32′40″N, 77°40′40″W, dry lichen conifer forest, yellow pans, 9–15.vii.2001, M. & B. Buck (1 ♀, UGIC); Knob Lake, 54°47′N, 66°47′W, 16.vii.1948, E.G. Munroe (1 ♀, CNC); La Ferme, 1.vii.1943, A. Robert (1 ♂, CNC); Laniel, 19.vi.1939, F.P. Ide (1 ♀, CNC); same locality, 21.vi.1941, A.R. Brooks (1 ♂, CNC); Parke Reserve, Kamouraska, 11–17.vii.1957, G.E. Shewell (3 ♀♀, CNC). **Yukon:** Dempster Hwy, mi 87, 8–12.vii.1973, G.&D.M. Wood (1 ♀, CNC); Dempster Hwy, Eagle R. crossing; MT, 9–10.vii.1985, S.A. Marshall (1 ♂, UGIC). **FINLAND.** Enontekis, Palmén (1 ♂, 1 ♀, MZH), Enontekis, R. Frey (1 ♀, MZH); Muonio, R. Frey (1 ♂, MZH); Tiensu (1 ♂, MZH). **UNITED STATES OF AMERICA. Alaska:** King Salmon, Naknek River, 3–14.viii.1952, J.B. Hartley (1 ♂, 1 ♀, CNC).

Diagnosis. Females of this species are distinguished by long, broad and apically truncate dorsal and ventral pennate setae on the mid and hind femora and mid and hind tibia, longer than width of corresponding leg segment, and slender dorsal pennate setae on hind tarsomere 1; abdomen yellowish brown to pale brown, contrasting with grey thorax. Males are distinguished by the highly modified hind legs (characteristic of *basalis* group) and form of the male terminalia.

Redescription. Wing length 4.5–4.9 mm. **Male.** Head dark in ground-colour, with greyish pruinescence on face, frons, postgena and occiput; oral margin shiny reddish. Holoptic, eyes with ommatidia larger on upper half of eye, smaller on lower half. Frons divergent towards antennal sockets, bare. Margins of face slightly divergent. Ocellar triangle with pair of ocellar setae, shorter than postocular setae. Upper third of occiput bearing row of stout postocular setae, longer than ocellar setae; lower postocular setae slender and shorter. Occipital setae black and stout, extending ventrally; postgenal setae similar to occipital setae. Antenna dark; scape slightly longer than pedicel; postpedicel nearly 3× longer than basal width; stylus length about equal to length of scape. Palpus dark, slender, bearing single long, subapical seta. Clypeus bare, with greyish pruinescence; labrum dark and glossy, slightly longer than eye height; labellum dark and bearing many dark setae, shorter than palpal seta.

Thorax dark with dense grey pruinescence; brownish vittae beneath acrostichal and dorsocentral rows extending to prescutellar depression; posterior corner of postpronotal lobe and postalar ridge brownish. Prosternum bare; proepisternum at fusion point with prosternum with 1 stiff seta and sometimes several thinner setae; upper



Figs 23–28. *Rhamphomyia poplitea* Wahlberg. **23.** Holotype of *R. dana* Walker, female, lateral view; **24.** Recent specimen, female hind leg, anterior view; **25.** Holotype of *R. dana* Walker, labels, left label underside of corresponding label in centre row; **26.** Recent specimen, male terminalia, lateral view; **27.** Recent specimen, female, lateral view; **28.** Male hind leg, anterior view. See Additional material examined section for locality details of recent specimens.

part of proepisternum in front of anterior spiracle bare. Antepronotum with row of setae. Postpronotal lobe with 1 outstanding seta and several shorter, finer setae; acrostichals biserial, slightly shorter than dorsocentral setae; dorsocentrals uniserial, increasing in length posteriorly, prescutellar seta slightly shorter than scutellar setae, dorsocentral row curved towards postpronotal lobe anteriorly; 1 presutural supra-alar seta (posthumeral) and 1 posterior supra-alar seta (opposite anterior notopleural) longer and stouter; 1 anterior and 3–4 posterior notopleural setae, with several setulae near anterior notopleural seta; 2 prealar setae; 1 postsutural supra-alar setae; 1 postalar seta; 1 long apical pair and short lateral pair of marginal scutellar setae. Laterotergite with cluster of long, dark setae. Anterior and posterior spiracles yellowish brown.

Legs short, brown with pale "knees". Fore coxa with row of 5–6 stout anterolateral setae; lateral regions of mid and hind coxae with similar setae. Fore femur with row of fine anteroventral setae. Fore tibia with pale ventral pubescence. Mid femur with anteroventral row of short, even-length stout setae; posteroventral row of stout setae longer, greater than half width of femur. Mid tibia with anteroventral and posteroventral rows of very short, stout setae, shorter than ventral setae of femur. Hind femur greatly swollen, of uniform width on apical half (Figs 21, 28); anteroventral row of setae weak on basal half, stronger preapically; posteroventral row slender and long basally, decreasing evenly to setulae at apex. Hind tibia geniculate at base; straight, without crest of flattened setae and not flattened; setae of anteroventral row stout; anterodorsal setae numerous, some at least twice width of tibia; 1 long seta in posteroapical comb. Tarsomere 1 of all legs slender, with dense ventral setae.

Wing lightly infuscate (Fig. 21); pterostigma elongate, normally pale; short basal costal seta present. Cell dm subequal in length to cell bm; CuA+CuP unpigmented, reaching wing margin as crease; alular incision obtuse; margin of calypter with brown setae. Halter pale yellowish brown.

Abdomen brown, paler than thorax; posterior margins of tergites and sternites paler; clothed in dark setae, longer along posterior margin; setae finer and somewhat paler on ventrolateral margin. Tergite 7 narrower than sternite 7, with posterolateral and posterior margin more thickly sclerotized. Tergite 8 reduced to half-length of sternite 8, narrowed laterally; posterior margin of sternite 8 with long setae, longer than length of sclerite 8. Terminalia (Fig. 26) lighter brown, with apex of epandrium darkened. Hypandrium slender, wrapping around base of phallus. Epandrium subtriangular, produced posterior into slender rounded projection closed in very short, stout setae; posterior half clothed in long setae, some longer than half-length of epandrium. Subepandrial lobe digitiform; slightly arched with rounded apex; with 6–8 long setae on apical half. Cercus subrectangular with truncate apex, shorter than subepandrial lobe. Phallus broad and even throughout basal half; apical half strongly tapered and arched. Ejaculatory apodeme subtriangular, very large, as broad as length of hypandrium; horizontal lamella on posterior margin.

Female. Similar to male except: wing darkly infuscate (Fig. 27), broader than in male. Legs with long, broad and apically truncate dorsal and ventral pennate setae on the mid and hind femora and mid and hind tibiae, longer than width of corresponding leg segment, and slender dorsal pennate setae on hind tarsomere 1 (Figs 23–24, 27). Abdomen yellowish brown to pale brown, contrasting with grey thorax.

Geographic distribution. This species ranges across Canada and North America, from New Hampshire to Alaska (see Additional material examined). In the Palaearctic Region, *R. poplitea* occurs in Sweden, Finland and across Russia (Shamshev 2016).

Remarks. This species (as *valga* Coquillett) was included in the *R. basalis* group by Chillcott (1959). This species group is defined by the enlarged femur-tibia joint of the male hind leg (Fig. 28) (Chillcott 1959) and is assigned to the subgenus *Pararhamphomyia* Frey, 1922. Chillcott (1959) listed three European species that appear to be assigned to this species group on the basis of male genitalia, but apparently overlooked *R. poplitea*.

Rhamphomyia tristis Walker, 1857

Rhamphomyia tristis Walker, 1857: 148. Type locality: "United States".

Type material. Not available (see Smith 1971).

Remarks. According to Smith (1971), the type specimen has not been identified in BMNH and the Oxford University Museum of Natural History.

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