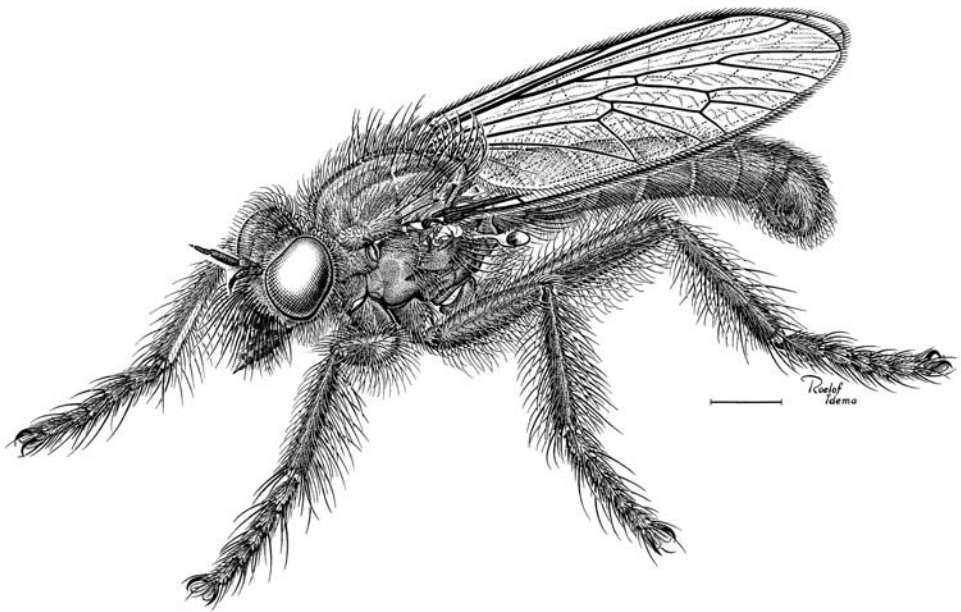


Robber flies of the Yukon



FRONTISPIECE. Male of *Lasiopogon hinei* Cole and Wilcox, found commonly along stream banks in the Yukon but also in dry, open forests and sandy areas; the species ranges from European to Far Eastern Russia and into northwestern North America, the only Palaearctic-East Beringian asilid in the Yukon. Scale line 1 mm.

Robber Flies (Diptera: Asilidae) of the Yukon

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Abstract. Twenty species of robber flies are known from more than 54 localities in the Yukon. The northern limit of the Asilidae in North America is in the northern Yukon and adjacent Northwest Territories just north of the arctic treeline, with only 2 species, *Lasiopogon canus* Cole and Wilcox and *L. prima* Adisoemarto, occurring there. Biogeography, distribution, habitat, flight period, and other ecological data are discussed for the 20 species. Faunal elements are outlined: 4 are Beringian (3 of these are East Beringian and one is Palaearctic-East Beringian), 7 are Boreal, and 9 are Cordilleran. The single Palaearctic-East Beringian species is *L. hinei* Cole and Wilcox; the name representing the Eurasian population of this species, *L. sibiricus* Lehr, is newly synonymized. The Nearctic *Cyrtopogon bimacula* (Walker) and the Palaearctic *C. maculipennis* (Macquart) are confirmed as distinct species. At least 6 other species are almost certain to be found in the Yukon after more study. Of these, *Laphria aeatus* Walker, *L. index* McAtee, *L. sadales* Walker, and *L. scorio* McAtee are species of the boreal forest and one, *C. lineotarsus* Curran, is a Cordilleran species. Other possible species are mostly Cordilleran and, when considered complete, the list of Yukon Asilidae will likely be dominated by Cordilleran species.

Résumé. *Les asiles (Diptera: Asilidae) du Yukon.* Vingt espèces d'asiles ont été trouvées en plus de 54 endroits au Yukon. La limite nord des Asilidae en Amérique du Nord se trouve dans le nord du Yukon et dans la région adjacente des Territoires du Nord-Ouest, juste au nord de la ligne des arbres dans l'Arctique, où l'on ne compte d'ailleurs que 2 espèces, *Lasiopogon canus* Cole et Wilcox et *L. prima* Adisoemarto. La biogéographie, la répartition, l'habitat, la période de vol et d'autres données écologiques sont examinées pour toutes les espèces. Quatre espèces sont béringiennes (3 sont de la Béringie orientale, la quatrième habite la région paléarctique et la Béringie orientale), 7 sont boréales et 9 sont cordillériennes. L'unique espèce trouvée dans la zone paléarctique et en Béringie orientale est *L. hinei* Cole et Wilcox; le nom qui désigne la population eurasiennne de cette espèce, *L. sibiricus* Lehr, est déclaré synonyme. L'espèce néarctique *Cyrtopogon bimacula* (Walker) et l'espèce paléarctique *C. maculipennis* (Macquart) sont reconnues comme des espèces distinctes. Au moins 6 autres espèces apparaîtront tôt ou tard au Yukon au cours d'études plus poussées: *Laphria aeatus* Walker, *L. index* McAtee, *L. sadales* Walker et *L. scorio* McAtee sont des espèces de la forêt boréale et *C. lineotarsus* Curran est une espèce cordillérienne. Les autres espèces qui risquent d'être trouvées au Yukon sont surtout des espèces de la Cordillère et, éventuellement, la liste complète des Asilidae du Yukon révélera probablement une dominance des espèces cordillériennes.

Introduction

The Asilidae contains about 5000 described species worldwide, and about 200 in Canada (McAlpine 1979). Our knowledge of the Canadian fauna as a whole is only fair, and for this reason it is difficult to put the Yukon fauna into perspective. Although in North America the Asilidae is predominantly a southern family, especially diverse in arid and semiarid environments, over the years specimens have been rather frequently collected in the Yukon.

Nevertheless, little has been published on the robber flies of the Yukon. Before this study only 4 species were reported in publications from the Territory. These species are *Cyrtopogon dasyllis* Williston (Adisoemarto 1967), *Cyrtopogon banksi* Wilcox and Martin (Wilcox and Martin 1936), *Lasiopogon yukonensis* Cole and Wilcox (Cole and Wilcox 1938), and *Rhadiurgus variabilis* (Zetterstedt) (Cannings 1993). The 16 species indicated herein as new to the Territory were first reported in Cannings (1994).

Most of the early collections of robber flies in the Yukon were largely the result of Canadian National Collection field trips to the southern and central regions in 1948 and

1949, to Rampart House in 1951, to the Ross River/Swim Lakes areas in 1960 and to Dawson and North Fork Pass in 1962. From 1979 to 1990, the region was visited a number of times by field parties from the University of British Columbia, the Royal Ontario Museum (Toronto), the Biosystematics Research Centre (Agriculture Canada, Ottawa) and the California Academy of Sciences (San Francisco). The fauna is now moderately well-known for the Shakwak and Tintina trenches, the Klondike and Dempster highways, the Ross River area and the Old Crow region. The eastern uplands of the Territory, at least south of the Richardson Mountains, have been little collected. Most, if not all, additions to the fauna will come from the forests of the southern Yukon where boreal and Cordilleran species predominate.

The Asilidae are predatory flies that as adults, pursue other insects (usually flying ones), seize them, and kill them with paralyzing saliva injected through the hypopharynx (tongue). The liquified contents of the prey are then sucked up by the proboscis (Wood 1981). The morphology of the adult fly (especially the prominent eyes, the mouthparts, and the raptorial legs) reflects this mode of prey capture and feeding.

Robber flies usually hunt in open areas where there is plenty of light, and are most active in the warmest parts of the day. Overcast skies greatly curtail their activity. Different genera, and often different species within a genus, have different hunting behaviour and preferences for perching sites.

There is usually little obvious difference between the sexes, except for the genitalia, although females tend to be larger than males and often have broader abdomens. Colour patterns sometimes differ between males and females; in Yukon species this is particularly evident in *Cyrtopogon bimacula* (Walker) and *C. dasyllis* Williston, in which the males have prominent, dark marks on the wings. Other secondary sexual characteristics occur in males, such as the expanded silver abdominal apex in *Nicocles*, the striking white abdomens of *Efferia*, and the tarsal ornamentation of some *Cyrtopogon* species. However, no species having these characters occur in the Yukon.

Records of prey taken by Asilidae indicate that they are often opportunistic predators, feeding upon any insect that they can subdue and kill. However, some species show a strong preference for prey from one or 2 insect orders (Wood 1981). In many instances this preference may simply reflect the availability of prey in the habitat where the particular robber fly lives. No information on the prey of Yukon specimens is available, and nothing of asilid life cycles in the Territory can be determined from the data collected during this study. Indeed, detailed life-history studies of robber flies are rare. Melin (1923), studying Asilidae in Sweden, showed that in northern species at least, the larva is the overwintering stage and the pupal stage lasts 2 to 6 weeks. He estimated that the life cycle of *Laphria* species was at least 3 years and that of *Lasiopogon cinctus* (Fab.) was at least 2. It is likely that larval growth is faster in warmer regions and many species probably live only one year (Theodor 1980).

Larvae are predators of the eggs, larvae and pupae of other insects in the soil or in rotting wood, although in a few species studied the immature larvae, especially, are ectoparasitic on their hosts (Wood 1981). Knutson (1972) has reviewed the literature on this subject. In the Yukon fauna *Laphria* larvae inhabit rotting wood; the other species, so far as is known, live in soil.

The world genera of Asilidae are treated by Hull (1962) and the North American genera are keyed by Wood (1981). Wood (1981) gives a summary of the morphology, biology and classification of the North American fauna.

Faunal Elements

Species may be grouped with others that share similar distributions to form what can be termed faunal elements. Most of the 20 Yukon species are confined to the Nearctic region, although 2 are Holarctic (defined here as species with transcontinental ranges in both North America and Eurasia) and one is Palaearctic-East Beringian (widespread in the northern Palaearctic region but confined to extreme northwestern North America). This section describes the Nearctic faunal elements pertaining to the Yukon fauna (species with Holarctic and Palaearctic-East Beringian distributions are also assigned a North American faunal element). Distribution (including total range) maps for characteristic species in each element are given. These faunal elements are:

1. Beringian. Species with North American ranges centred on the region in Alaska and Yukon once occupied by the Beringian glacial refugium. Yukon asilids fall into 2 categories here: Palaearctic-East Beringian (Eurasian species with a Nearctic component in Alaska, Yukon and adjacent areas) and East Beringian (Nearctic species living in Beringia only east of the Bering Strait).

2. Boreal. Species occurring in the northern transcontinental forests dominated by spruce (*Picea*). In general, these species range from the Atlantic Provinces across the northern New England states, Quebec, northern Ontario, parts of the northern tier of mid-western states, the Prairie Provinces north of the Great Plains, and northern British Columbia, often ranging considerably southward in the mountains and plateaus of the Cordillera. Such species ranging south of the central plateaus of British Columbia (south of about 51°N) could be termed Boreomontane species.

3. Cordilleran. Species confined to the western mountain systems and their associated plateaus and lowlands.

Checklist of Yukon Asilidae

In the following list, species are confined to the Nearctic region unless otherwise noted. The present study, which has gathered new specimens and collated them with previously unidentified material housed in several collections, has recorded the 16 species marked by asterisks (*) from the Yukon for the first time (see Cannings 1994).

Subfamily Dasypogoninae

- | | |
|---|----------------------------|
| 1. <i>Cyrtopogon banksi</i> Wilcox and Martin | Cordilleran |
| 2. <i>Cyrtopogon bimacula</i> (Walker)* | Boreal |
| 3. <i>Cyrtopogon dasyllis</i> Williston | Boreal |
| 4. <i>Cyrtopogon funipennis</i> Wilcox and Martin* | Cordilleran |
| 5. <i>Cyrtopogon glarealis</i> Melander* | Cordilleran |
| 6. <i>Eucyrtopogon diversipilosus</i> Curran* | Cordilleran |
| 7. <i>Eucyrtopogon</i> sp. near <i>nebulo</i> Osten Sacken* | Cordilleran |
| 8. <i>Lasiopogon canus</i> Cole and Wilcox* | East Beringian |
| 9. <i>Lasiopogon hinei</i> Cole and Wilcox* | Palaearctic-East Beringian |
| 10. <i>Lasiopogon prima</i> Adisoemarto* | East Beringian |
| 11. <i>Lasiopogon yukonensis</i> Cole and Wilcox | East Beringian |

Subfamily Laphriinae

- | | |
|--------------------------------------|-------------------|
| 12. <i>Laphria gilva</i> (Linnaeus)* | Holarctic, boreal |
| 13. <i>Laphria insignis</i> (Banks)* | Boreal |
| 14. <i>Laphria janus</i> McAtee* | Boreal |
| 15. <i>Laphria milvina</i> Bromley* | Cordilleran |
| 16. <i>Laphria partitor</i> (Banks)* | Cordilleran |
| 17. <i>Laphria posticata</i> (Say)* | Boreal |

18. *Laphria vivax* Williston* Cordilleran
 Subfamily Asilinae
 19. *Machimus callidus* (Williston)* Cordilleran
 20. *Rhadiurgus variabilis* (Zetterstedt) Holarctic, boreal

Annotated List of Species

Robber flies have been collected in more than 54 locations in the Yukon; the distribution of these sites is given in Fig. 9. The following species accounts outline the total range, distribution in the Yukon, and ecology of the 20 species known from the Territory. Distribution maps for all species are included and maps of total range for characteristic species of each faunal element are presented. The faunal element to which the species belongs follows each species name. Yukon records are summarized in terms of the Ecoregions of the Yukon recognized by the Ecological Stratification Working Group (1996). Occurrence in adjacent regions is summarized in Table 1. Detailed collection data are listed in Appendix 1.

Subfamily Dasypogoninae

1. *Cyrtopogon banksi* Wilcox and Martin

Cordilleran

Distribution: Southern Yukon south through British Columbia to Colorado, Utah, and the Sierra Nevada of California.

Yukon records: St. Elias Mountains (13), Yukon Plateau-North (16), Yukon Southern Lakes (17) (Fig. 10).

Biological information: *Cyrtopogon banksi* is widespread in wooded areas of the southern Yukon and is at home in both dry, open environments dominated by lodgepole pine (*Pinus contorta* Dougl.) (Fig. 30) or white spruce (*Picea glauca* (Moench) Voss) and trembling aspen (*Populus tremuloides* Michx.) and in the more moist white spruce and willow (*Salix* L.) habitats along streams. Adults have been recorded between 8 June and 24 August, with 11 of 16 dates falling in July.

TABLE 1. Distribution of Yukon robber flies in neighbouring jurisdictions. +, present; -, absent; ?, probably present but no evidence available. YT, Yukon Territory; BC, British Columbia; NT, Northwest Territories; AK, Alaska.

Species	YT	BC	NT	AK
1. <i>Cyrtopogon banksi</i> Wilcox and Martin	+	+	-	+
2. <i>Cyrtopogon bimacula</i> (Walker)	+	+	+	+
3. <i>Cyrtopogon dasyllis</i> Williston	+	+	+	+
4. <i>Cyrtopogon fumipennis</i> Wilcox and Martin	+	+	-	-
5. <i>Cyrtopogon glarealis</i> Melander	+	+	+	+
6. <i>Eucyrtopogon diversipilosus</i> Curran	+	+	-	?
7. <i>Eucyrtopogon</i> sp. near <i>nebulo</i> Osten Sacken	+	+	-	?
8. <i>Lasiopogon canus</i> Cole and Wilcox	+	?	+	+
9. <i>Lasiopogon hinei</i> Cole and Wilcox	+	+	+	+
10. <i>Lasiopogon prima</i> Adisoemarto	+	+	+	+
11. <i>Lasiopogon yukonensis</i> Cole and Wilcox	+	?	-	?
12. <i>Laphria gilva</i> (Linnaeus)	+	+	+	+
13. <i>Laphria insignis</i> (Banks)	+	+	+	?
14. <i>Laphria janus</i> McAtee	+	+	+	?
15. <i>Laphria milvina</i> Bromley	+	+	-	-
16. <i>Laphria partitor</i> (Banks)	+	+	+	?
17. <i>Laphria posticata</i> (Say)	+	+	+	?
18. <i>Laphria vivax</i> Williston	+	+	-	-
19. <i>Machimus callidus</i> (Williston)	+	+	+	+
20. <i>Rhadiurgus variabilis</i> (Zetterstedt)	+	+	+	+

2. *Cyrtopogon bimacula* (Walker)

Boreal (Fig. 7)

Distribution: Alaska east through the Yukon, southwestern Northwest Territories, the forested parts of Alberta, Saskatchewan and Manitoba to Ontario, Quebec, New Brunswick and Nova Scotia, south to New Hampshire in the east and in the mountains to New Mexico in the west.

Yukon records: Old Crow Basin (6), North Ogilvie Mountains (8), Klondike Plateau (12), St. Elias Mountains (13), Yukon Plateau-Central (15), Yukon Plateau-North (16), Yukon Southern Lakes (17) (Fig. 11).

Biological information: Along with *Laphria*, *Cyrtopogon* is the most diverse genus of asilids in northern forests. This species is the most common of the genus in the Yukon and is one of the most widespread robber flies in Canada. The dark-spotted wings of the male make it one of the most easily recognized Yukon robber flies. In the Yukon, typical habitats vary from the dry, sandy lodgepole pine woods of Tarfu Lake near the British Columbia border and the sand dunes of Carcross (Fig. 30) to the mature white spruce woods on the silty soils of the Slims River delta at Kluane. *C. bimacula* has been found on most of the dry south-facing slopes dominated by grasses and sage (*Artemisia frigida* Willd.) from Sheep Mountain at Kluane to the bluffs of the Porcupine River at Old Crow (Fig. 31). The species is common in the spruce and aspen woods that are so often encountered in the southern and central Yukon, but also frequents the edges of moister forests along rivers where white spruce, poplar (*Populus balsamifera* L.) and various willows grow. The known flight period is from 28 May to 31 July (17 of 42 records are in June). As far north as Rampart House adults have been recorded as early as 12 June. In southern British Columbia where the species is an inhabitant of subalpine forests and meadows dominated by Engelmann Spruce (*Picea engelmannii* Parry) and Subalpine Fir (*Abies lasiocarpa* (Hook.) Nutt.), usually above 4000 ft elevation, flight is normally in the last half of July and August.

Taxonomic notes: The Eurasian *C. maculipennis* (Macquart) is extremely similar in external morphology, the main differences being a tendency to have more dark setae, especially in the mystax (facial tuft of setae) and on the dorsum of the abdomen; it ranges from western Europe to Far Eastern Russia (Lehr 1988). Because of this distribution and similar morphology, there has been speculation that the 2 species should be combined. In order to determine their status, I dissected the genitalia of males of both species. The structures are similar, but significant specific differences occur. For example, the parameral sheath surrounding the aedeagus is much more massive and heavily sclerotized in *C. maculipennis*, and the apex of the sheath is shaped much differently in the 2 species. The ejaculatory apodeme and lateral ejaculatory processes also show strong differences in form. In *C. maculipennis* the subepandrial sclerites are evenly sclerotized whereas in *C. bimacula* they are ring-like. In the former species the gonocoxite spine is entire and long; in the latter it is toothed and short. The 2 populations are specifically distinct and the names should be considered valid. *C. maculipennis* has been recorded from Ontario (Lake Timagami) (Wilcox and Martin 1936), but identification based on colour of setae is risky; the specimens are probably *C. bimacula*.

3. *Cyrtopogon dasyllis* Williston

Boreal

Distribution: Alaska and Yukon south through the mountains to Oregon, Idaho and Colorado.

Yukon records: Old Crow Basin (6), Klondike Plateau (12), St. Elias Mountains (13), Ruby Ranges (14), Yukon Plateau-Central (15), Yukon Plateau-North (16), Yukon Southern Lakes (17) (Fig. 12).

Biological information: Widespread but uncommon in central and southern Yukon, especially in the Shakwak Trench and Yukon/Tintina and Eastern Plateaus regions (Fig. 12). *C. dasyllis* is easily recognized by its dense, yellow abdominal setae. There is one record north of 64°N latitude at the Bluefish Caves, a site on a limestone ridge at the southern edge of the Porcupine Plain near the Alaska boundary. Collections have come from rather dry, open habitats, especially aspen/spruce woodland with grassy openings and spruce-dominated subalpine parkland. Collections range from 25 June to 21 August; 5 of the 16 records are from August.

4. *Cyrtopogon fumipennis* Wilcox and Martin

Cordilleran

Distribution: Southern Yukon south to Washington and Idaho.

Yukon records: Selwyn Mountains (11), Yukon Southern Lakes (17) (Fig. 13).

Biological information: *C. fumipennis* is an uncommon denizen of Cordilleran forests that ranges into the southern woodlands of the Yukon. The 2 Yukon records are from dry, sandy habitats supporting lodgepole pines in the Southern Lakes (Carcross) and Logan Mountains (Nahanni Range Road) regions. Collection dates are from 21 to 30 July.

5. *Cyrtopogon glarealis* Melander

Cordilleran

Distribution: Southern Yukon south through British Columbia and the Rocky Mountains of Alberta to California and Wyoming.

Yukon records: Yukon Plateau-Central (15) (Fig. 14).

Biological information: Known from only one record (2 July) from grass/sage slopes at Pelly Crossing in the Yukon/Tintina region.

6. *Eucyrtopogon diversipilosus* Curran

Cordilleran

Distribution: Southern Yukon south to southern British Columbia and extreme southwestern Alberta.

Yukon records: Yukon Southern Lakes (17) (Fig. 15).

Biological information: Known from a single record from the dry, open lodgepole pine woods and sand dunes at Carcross in the Southern Lakes region (Fig. 30). In British Columbia and Alberta *E. diversipilosus* is mainly a species of grassland or open forest habitats. The Yukon record may represent a disjunct population; the closest records to the south are from the Chilcotin region of central British Columbia.

7. *Eucyrtopogon* sp. near *nebulo* Osten Sacken

Cordilleran

Distribution: Yukon south through British Columbia and the Rocky Mountains of Alberta to Wyoming, Utah and California.

Yukon records: Old Crow Basin (6) (Fig. 16).

Biological information: *Eucyrtopogon* is a Nearctic genus found mostly in the grasslands and open montane forests of the western Cordillera (Cannings 1989). The Yukon specimens are from 2 localities on the Porcupine Plain, far to the north of the dry forests of southern Yukon where they might be more likely expected to occur. Both sites are south-facing slopes. One, at Mason Hill, is tundra at treeline; the other, at Old Crow, is a grass/sage community among scattered white spruce (Fig. 31). *C. nebulo* is otherwise known only as far north as Revelstoke in British Columbia (51°N). Farther south in the province *E. nebulo* is common in the dry coastal Douglas-fir (*Pseudotsuga menziesii* (Mirb.) Franco) forests of the southwestern coast, the grasslands and montane forests of the southern interior and, to a lesser extent, the subalpine forests of the south.

Taxonomic notes: *Eucyrtopogon* requires revision and there are a number of undescribed species. The Yukon specimens are closest to *E. nebulo*, but show differences, and further taxonomic work may prove them to be an undescribed species.

8. *Lasiopogon canus* Cole and Wilcox

East Beringian (Fig. 4)

Distribution: Western Alaska east through the Yukon to the Tuktoyaktuk Peninsula of the Northwest Territories, south to the southern Yukon.

Yukon records: British-Richardson Mountains (5), Old Crow Basin (6), North Ogilvie Mountains (8), Eagle Plains (9), Mackenzie Mountains (10), Klondike Plateau (12), St. Elias Mountains (13), Ruby Ranges (14), Yukon Plateau-Central (15), Yukon Plateau-North (16), Yukon Southern Lakes (17) (Fig. 17).

Biological information: *L. canus* is the most frequently observed robber fly in the Yukon; it has not been recorded outside Alaska, Yukon, and extreme northwestern Mackenzie District. The species lives in many habitats: riverbanks in moist riparian woods dominated by white spruce, poplar and willow; aspen woodland; dry spruce forest; lodgepole pine parkland; south-facing slopes dominated by grasses and sage (*Artemisia frigida* Willd.) (Fig. 31); willow scrub; tundra both at the latitudinal and elevational treeline. The known flight period extends from 28 May (Kluane) to 23 August (Whitehorse). Fifty-nine of 94 records are from July, but the species flies early; 32 of the records are from June. In 1956 along the Firth River in the British Mountains, the species flew at least from 2 to 31 July and in 1984 near the same place was flying on 25 June. The latter site, at 69°13'N, is the most northerly collection locality for asilids in the Yukon (Figs. 17, 32).

Taxonomic notes: Adisoemarto (1967) records *L. canus* from central Alberta, but the specimens he collected there belong to a closely related, undescribed species of *Lasiopogon* (Fig. 4).

9. *Lasiopogon hinei* Cole and Wilcox (Frontispiece)

Palaeartic-East Beringian (Fig. 1)

Distribution: Western Alaska east to the Yukon, south to northeastern British Columbia and central Alberta; the Russian taiga east from Arkangelskaya Oblast to Kamchatka and Chukotka.

Yukon records: North Ogilvie Mountains (8), Eagle Plains (9), Mackenzie Mountains (10), Yukon Plateau-Central (15), Yukon Central Lakes (17) (Fig. 18).

Biological information: Most of the Yukon specimens of *L. hinei* come from the localities along the Dempster Highway in the Ogilvie Mountains and on the Eagle Plain, but the species also ranges to the south (Yukon/Tintina region, Shakwak Trench, Southern Lakes and into northeastern British Columbia and Alberta). Habitats range from open, dry lodgepole pine woods on sandy soil to riverbanks in moist riparian woods of willow, spruce and poplar. Collections range from 6 June to 29 July; 18 of 23 records are from July.

Taxonomic notes: *L. hinei* is the most abundant and widespread *Lasiopogon* species in Siberia and Far Eastern Russia. This population is known in the literature as *L. sibiricus* Lehr; this name is synonymized here with *L. hinei*. I have examined several specimens from both Eurasia and North America; dissections show that the structures of the male genitalia of all these specimens are virtually identical. The gonostylus, which is the crucial character for species diagnosis, shows little variation among the specimens examined, and this is also true for external morphological characters.

10. *Lasiopogon prima* Adisoemarto East Beringian (Fig. 2)

Distribution: Western Alaska east to extreme northeastern Mackenzie (NWT), south to northeastern British Columbia and west-central Alberta.

Yukon records: Yukon Coastal Plain (1), Old Crow Basin (6), North Ogilvie Mountains (8), Eagle Plains (9), Klondike Plateau (12), St. Elias Mountains (13), Yukon Plateau-North (16) (Fig. 19).

Biological information: Ranging from the slopes of Sheep Mountain at Kluane north through the Yukon/Tintina region to the Ogilvie Mountains, Eagle and Porcupine plains, *L. prima* is the only Yukon robber fly known from the coastal plain (Blow River mouth). Habitats vary from grassland and sage slopes to spruce forest, from streamsides in spruce and poplar woods to stream edges in tundra. The known flight period is 8 June to 8 August (7 of 13 records are from June), the former at Kluane, the latter on the Dempster Highway.

Taxonomic notes: *L. prima* is the eastern representative of a species pair that is separated by the Bering Strait. In the Yakutskaya, Magadanskaya, and Amurskaya regions of eastern Siberia and Far Eastern Russia its sister species *L. septentrionalis* Lehr is widespread. I have collected it on the sandy shores of several rivers in the Kolyma drainage of Magadanskaya Oblast.

11. *Lasiopogon yukonensis* Cole and Wilcox East Beringian (Fig. 3)

Distribution: Southern Yukon.

Yukon records: Yukon Plateau-North (16), Yukon Plateau-Central (15), Yukon Southern Lakes (17) (Fig. 20).

Biological information: *L. yukonensis* is a Beringian species apparently restricted to the dry spruce, lodgepole pine and aspen woods and grassland steppes south of the Ogilvie Mountains (Southern Lakes and Yukon/Tintina regions). It is not known outside the Yukon. Collection records are between 15 and 30 June (n = 7).

Subfamily Laphriinae

12. *Laphria gilva* (Linnaeus) Holarctic, boreal

Distribution: Alaska and Yukon east through southwestern Northwest Territories to Ontario, Quebec and Nova Scotia, south in the east to Massachusetts, New York, and Michigan, and in the mountains of the west to California, Colorado and Arizona; forested areas of Great Britain and Europe east across Siberia.

Yukon records: Mackenzie Mountains (10), Klondike Plateau (12), Yukon Plateau-North (16), Yukon Southern Lakes (17) (Fig. 21).

Biological information: *L. gilva* is common in most of the forested regions of Canada and is the only known Holarctic species of Laphriinae. None of the species in this subfamily is common in the Yukon, but *L. gilva* ranges the farthest north, entering the Ogilvie Mountains north of 64°N. It is also found in the Yukon/Tintina and Southern Lakes regions. Captures are from dry spruce and aspen woods, spruce woods at the elevational treeline, and in moist riparian forests. The known flight period is 28 June to 11 August (n = 6); all but one record are from late July and August.

13. *Laphria insignis* (Banks) Boreal

Distribution: Alaska and Yukon east across the forested parts of the Northwest Territories and Prairie Provinces to Ontario, Quebec, Labrador and Nova Scotia, south in the east to Michigan and Minnesota, in the west to California.

Yukon records: Selwyn Mountains (11), Klondike Plateau (12), Liard Basin (21) (Fig. 22).

Biological information: *L. insignis* is a widespread boreal species that in the Yukon has been found in the Yukon/Tintina region, the Logan Mountains, and the Liard Plain. It favours dry spruce/aspens woods and lodgepole pine habitats on sandy soil. The known flight period is from 4 July to 3 August (n = 3).

14. *Laphria janus* McAtee

Boreal

Distribution: Southern Yukon east to Ontario and Maine, south to New York and Michigan in the east and Colorado and Utah in the west.

Yukon records: Yukon Southern Lakes (17) (Fig. 23).

Biological information: This species has a wide distribution in boreal, transition and Cordilleran forests in North America, but in the Yukon is known only from the extreme south. The single record was from dry spruce woods (11 June).

15. *Laphria milvina* Bromley

Cordilleran

Distribution: Extreme southern Yukon south through British Columbia and the mountains of western Alberta to Oregon.

Yukon records: Pelly Mountains (18) (Fig. 24).

Biological information: In the Yukon this rather rare Cordilleran *Laphria* has been collected only along the British Columbia border at Rancheria where spruce woods on sandy soil predominate. The specimen was collected between 14 and 16 August.

16. *Laphria partitor* (Banks)

Cordilleran

Distribution: Southern Yukon south through British Columbia to Oregon.

Yukon records: St. Elias Mountains (13) (Fig. 25).

Biological information: A single specimen of *L. partitor* was collected (22–24 June) in dry spruce forest at the Slims River delta in the Shakwak Trench.

17. *Laphria posticata* (Say)

Boreal (Fig. 5)

Distribution: Alaska? and Yukon east through the forests of the Northwest Territories and Prairie Provinces to Ontario, Quebec, New Brunswick, Prince Edward Island, and Nova Scotia, south to Connecticut, New York, Michigan, and Wisconsin.

Yukon records: Yukon Plateau-Central (15), Yukon Southern Lakes (17) (Fig. 26).

Biological information: *L. posticata* is unusual among Yukon robber flies of the Boreal element in that it has no Cordilleran component to its range. In the Yukon it is apparently restricted to dry, open spruce and aspen parkland in the Southern Lakes and Yukon/Tintina regions. The 2 records are from 10 July and 4 August.

18. *Laphria vivax* Williston

Cordilleran (Fig. 8)

Distribution: Southern Yukon south through British Columbia and the Rocky Mountains of Alberta to Colorado, New Mexico, Arizona, and California.

Yukon records: Yukon Southern Lakes (17) (Fig. 27).

Biological information: Widespread in western forests, this species has been collected only once in the extreme south-central Yukon at Carcross (21 July). The habitat here is mainly lodgepole pine parkland on sandy soil (Fig. 30).

Subfamily Asilinae

19. *Machimus callidus* (Williston)

Cordilleran

Distribution: Southern Yukon south through British Columbia and western Alberta to California, Utah, and Colorado.

Yukon records: Yukon Southern Lakes (17) (Fig. 28).

Biological information: *M. callidus* is a species of western montane forests. In the Yukon it is known from Snafu Creek and Whitehorse in the Southern Lakes region where it lives in lodgepole pine woods on sand. The known flight period is from 28 June to 22 July (n = 3).

20. *Rhadiurgus variabilis* (Zetterstedt)

Holarctic, boreal (Fig. 6)

Distribution: Alaska and Yukon, east through the southwestern Northwest Territories and northern forests of the Prairie Provinces to Ontario, Quebec and Labrador, south to Michigan in the east, Colorado and Oregon in the west; Scotland and Europe east through Siberia.

Yukon records: Peel River Plateau (2), British-Richardson Mountains (5), Old Crow Basin (6), North Ogilvie Mountains (8), Mackenzie Mountains (10), Selwyn Mountains (11), Klondike Plateau (12),

St. Elias Mountains (13), Yukon Plateau-Central (15), Yukon Plateau-North (16), Yukon Southern Lakes (17) (Fig. 29).

Biological information: After *Lasiopogon canus*, *R. variabilis* is perhaps the most widespread and common asilid in the Yukon, ranging from the warm habitats of the southern valleys to the slopes of the northern mountains. It inhabits a diverse set of habitats: grassland with scattered spruce and aspen, dry open lodgepole pine and spruce woods, subalpine riparian habitats near treeline (spruce, poplar), and tundra. The flight period recorded is 4 June to 24 August; 26 of 39 records are from July.

Taxonomic notes: The Nearctic populations of this species formerly were known as *Nigrasilus nitidifacies* Hine (Cannings 1993).

Additional Species Expected from the Yukon

Several additional species will likely be found in the Yukon in the future. Boreal species such as *Laphria aeatus* Walker, *L. index* McAtee, *L. sadales* Walker, *L. scorpio* McAtee, all of which have been collected as far west as northern Alberta or south-central District of Mackenzie, are good candidates for the Yukon list because the ranges of most boreal insects regularly include the Yukon. The ranges of these *Laphria* species are probably typical of widespread or more southerly distributed boreal species.

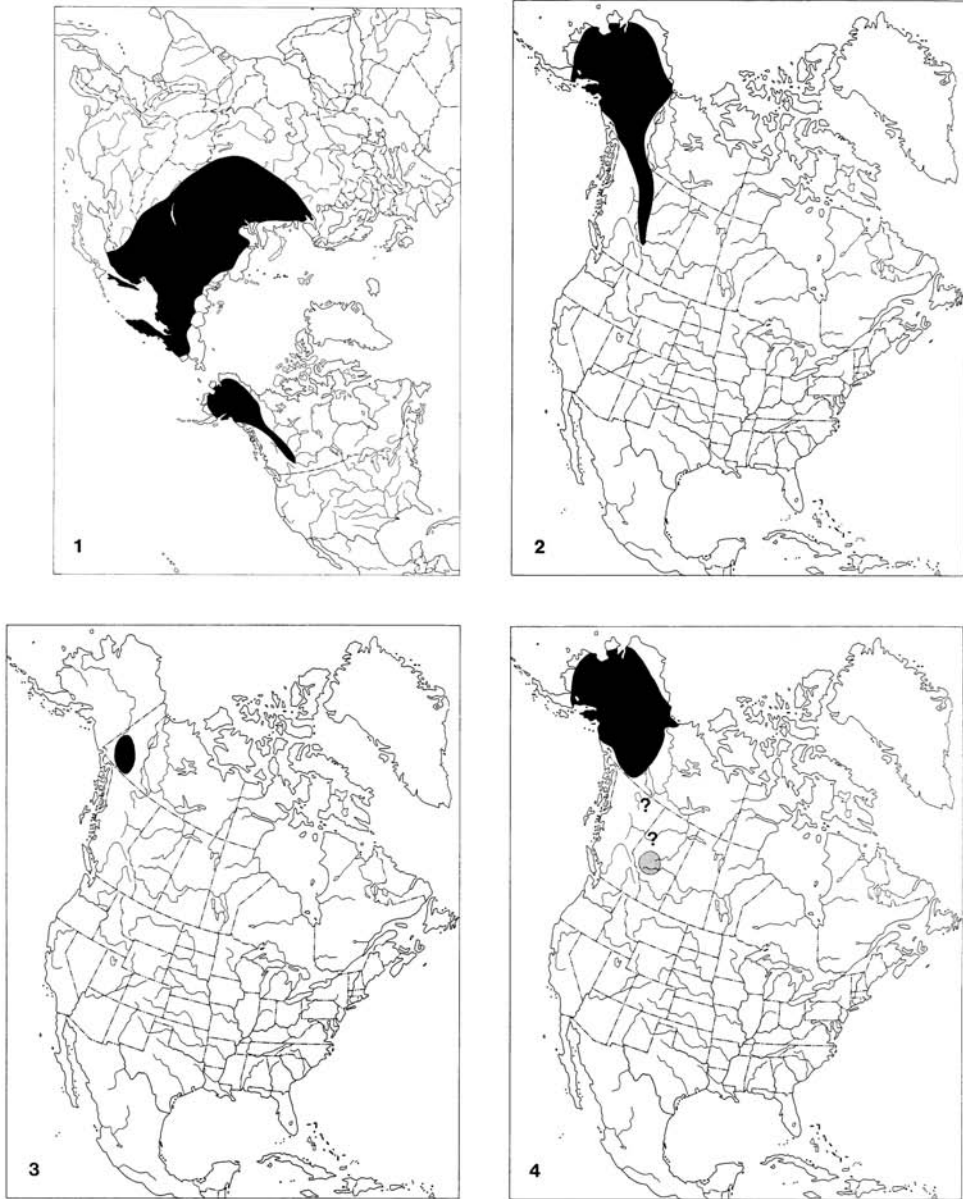
Predicting the number of Cordilleran species eventually to be found in the Yukon is more difficult. Unfortunately, northern British Columbia is inadequately collected for these flies and the true northern limits of much of the province's asilid fauna are not clear. Nevertheless, the most probable additions should be among the following species: *Cyrtopogon auratus* Cole, *C. aurifex* Osten Sacken, *C. lineotarsus* Curran, *Laphria astur* Osten Sacken, *L. asturina* Osten Sacken, *L. columbica* Walker, *L. fernaldi* (Back), *L. ferox* Williston, and *Regasilus auriannulatus* (Hine). *C. lineotarsus* is certain to be collected in southern Yukon; it is known as far north as Atlin in northern British Columbia. The other species are generally widespread ones living in mid to high elevation forests in southern and central British Columbia.

The likelihood of discovering new Beringian species is low. The complete list of Yukon robber flies probably will not exceed 35 species, and most will be of Cordilleran origin.

Analysis of the Fauna

Two of the 20 robber flies known from the Yukon have Holarctic distributions, that is, with ranges stretching across both the northern continents. *Laphria gilva* (12) and *Rhadiurgus variabilis* (20) range from the British Isles and western Europe across Russia and, in North America, from the Pacific to the Atlantic Ocean (Fig. 6). They show the characteristic distribution of Holarctic boreal species. The range of a third species, *Lasiopogon hinei* (9), is mainly Palaearctic; *L. hinei* occurs west of the Ural Mountains and ranges east to northwestern North America, where it is part of the Beringian element (Fig. 1).

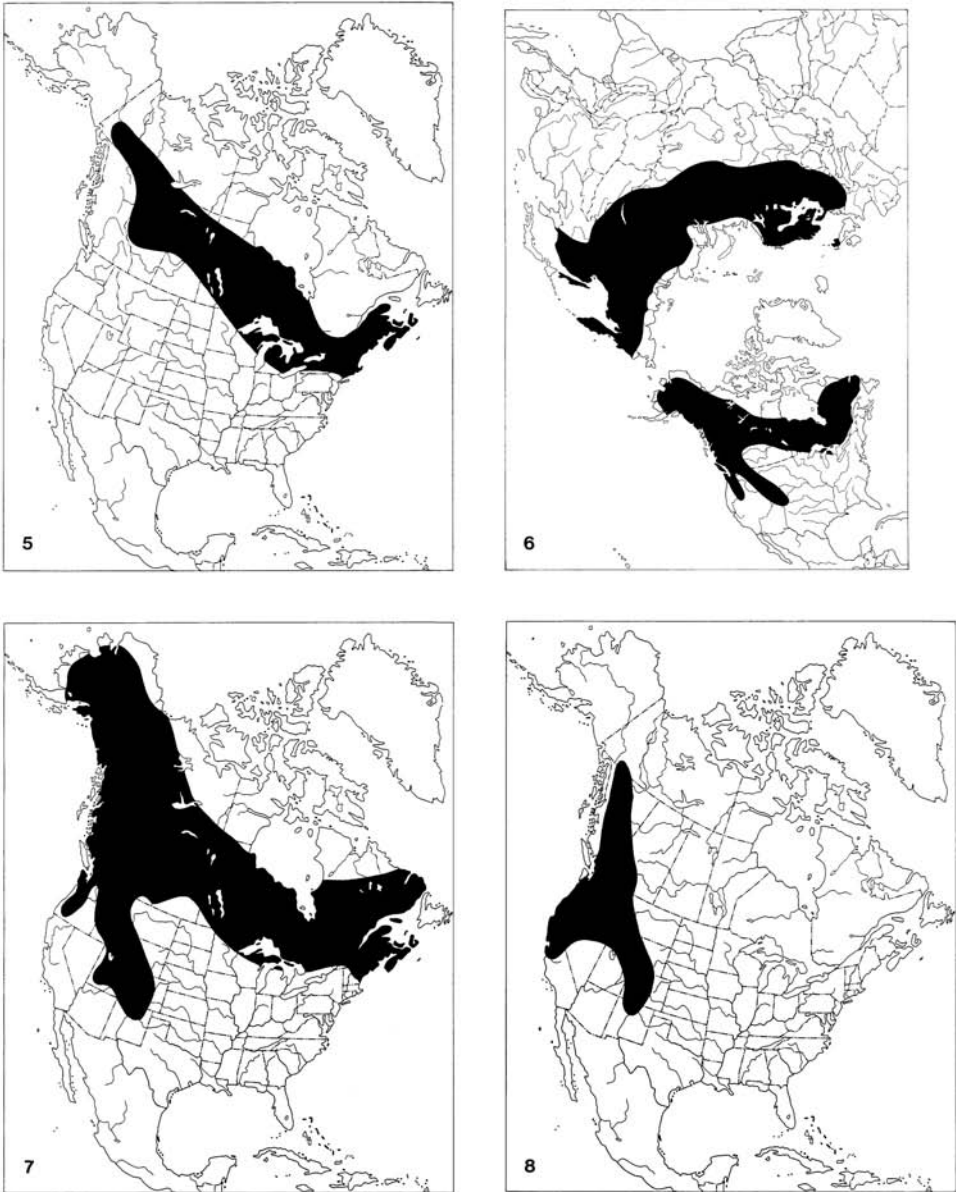
The 2 boreal species probably developed Holarctic distributions in the late Tertiary (Miocene) when the boreal environments of North America and Eurasia were continuous across Beringia (Matthews 1979). *Rhadiurgus* is apparently of Eurasian origin (Cannings 1993), while *Laphria* is a cosmopolitan genus (Hull 1962). In North America *R. variabilis* (20) and *L. gilva* (12) likely spent the Pleistocene south of the ice sheets. Their present boreal distributions, then, are the result of their following the boreal environment north (or upslope, in parts of the western mountains) as the ice melted. *Lasiopogon hinei* (9), on the other hand, probably has had a more recent history in North America, occupying most of its present range during the existence of the Beringian refugium.



FIGS. 1-4. Approximate ranges of Yukon Asilidae of the Beringian element. 1, *Lasiopogon hinei* Cole and Wilcox (9) (Palearctic-East Beringian); 2, *L. prima* Adisoemarto (10) (East Beringian); 3, *L. yukonensis* Cole and Wilcox (11) (East Beringian); 4, *L. canus* Cole and Wilcox (8) (East Beringian) (black) and an undescribed close relative (stippled). Question marks indicate that no specimens of either species have been collected in the intervening area.

The Nearctic distributions of the 20 Yukon robber flies allow the species to be placed in 3 faunal elements:

1. Beringian (4 spp., 20%). *Lasiopogon canus* (8), *L. hinei* (9), *L. prima* (10), *L. yukonensis* (11).



FIGS. 5-8. Approximate ranges of Yukon Asilidae; examples of the Boreal and Cordilleran elements. 5, *Laphria posticata* (Say) (17) (Boreal); 6, *Rhadiurgus variabilis* (Zetterstedt) (20) (Boreal; Holarctic species); 7, *Cyrtopogon bimacula* (Walker) (2) (Boreal); 8, *Laphria vivax* Williston (18) (Cordilleran).

2. Boreal (7 spp., 35%). *Cyrtopogon bimacula* (2), *C. dasyllis* (3), *Laphria gilva* (12), *L. insignis* (13), *L. janus* (14), *L. posticata* (17), *Rhadiurgus variabilis* (20).
3. Cordilleran (9 spp., 45%). *Cyrtopogon banksi* (1), *C. fumipennis* (4), *C. glarealis* (5), *Eucyrtopogon diversipilosus* (6), *E. sp. near nebulo* (7), *Laphria milvina* (15), *L. partitor* (16), *L. vivax* (18), *Machimus callidus* (19).

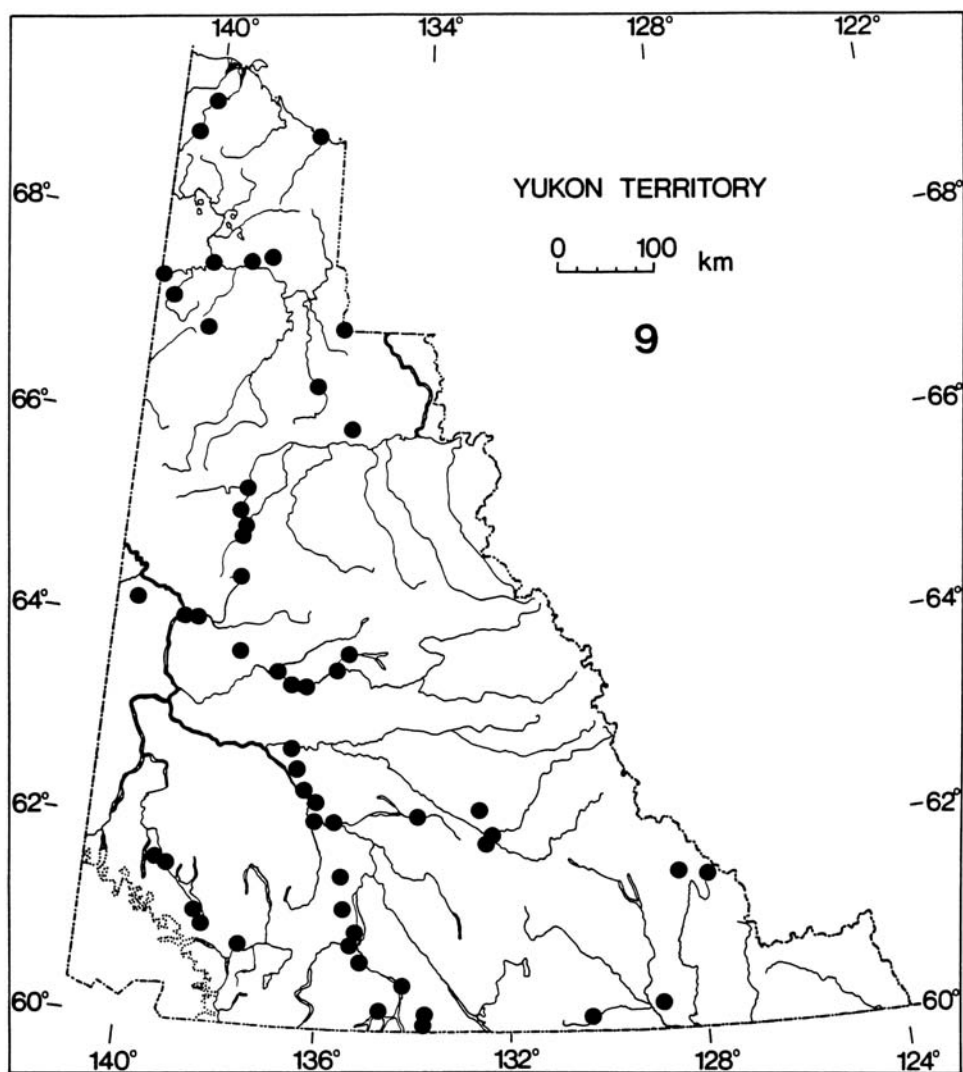
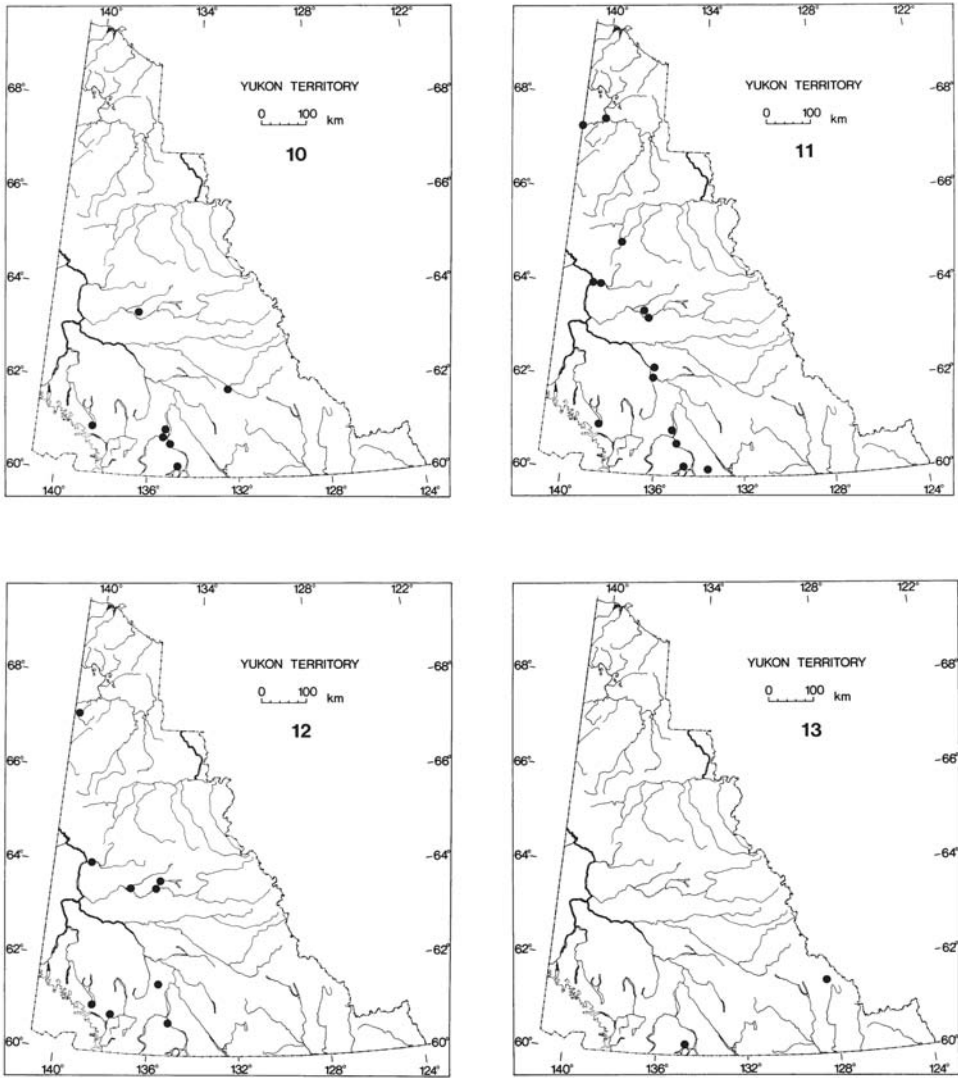


FIG. 9. Distribution of localities in the Yukon where robber flies have been collected.

Beringian Element. The 4 Yukon species of *Lasiopogon* all have Beringian distributions. Although the phylogenetic relationships among the species of the genus are not established, it is clear from preliminary studies that these Yukon species are more closely related to Eurasian species than to Nearctic congeners. East Beringian species (Beringian species with strictly Nearctic ranges), e.g. *Lasiopogon prima* (10) (Fig. 2), *L. yukonensis* (11) (Fig. 3) and *L. canus* (8) (Fig. 4), live only east of the Bering Strait. On the other hand, *L. hinei* (9) is a Palaearctic-East Beringian species, with a distribution reminiscent of that of the dragonfly *Somatochlora sahlbergi* Tryb[̂]m (Cannings and Cannings 1985). Similarly, the Asiatic sister species of *L. prima* (10), *L. septentrionalis*, is widely distributed in eastern Siberia and Far Eastern Russia.

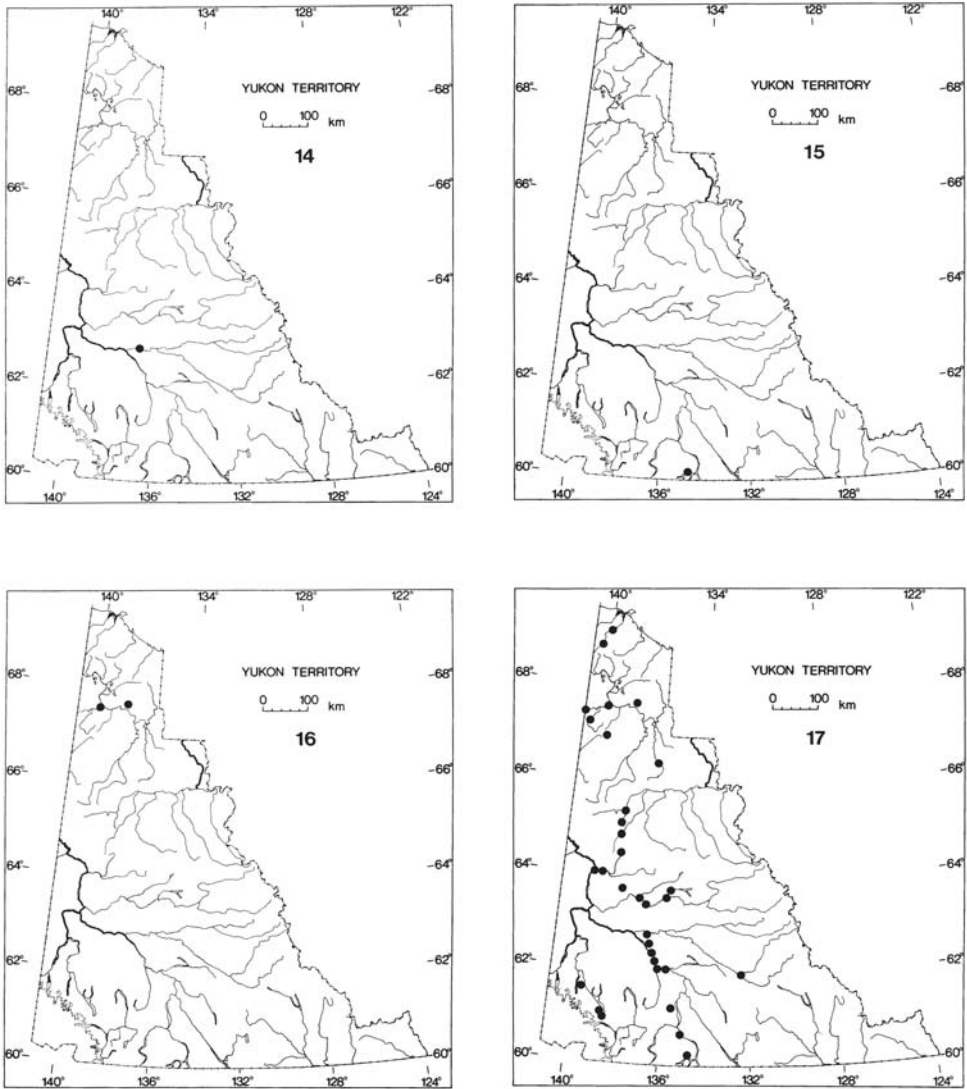
Lasiopogon is a predominant genus in the northern Holarctic region and is not restricted to forests as is *Laphria*, whose larvae develop in wood. It is perhaps the group best adapted



FIGS. 10–13. Distribution of Yukon Asilidae. 10, *Cyrtopogon banksi* Wilcox and Martin (1); 11, *C. bimacula* (Walker) (2); 12, *C. dasyllis* Williston (3); 13, *C. fumipennis* Wilcox and Martin (4).

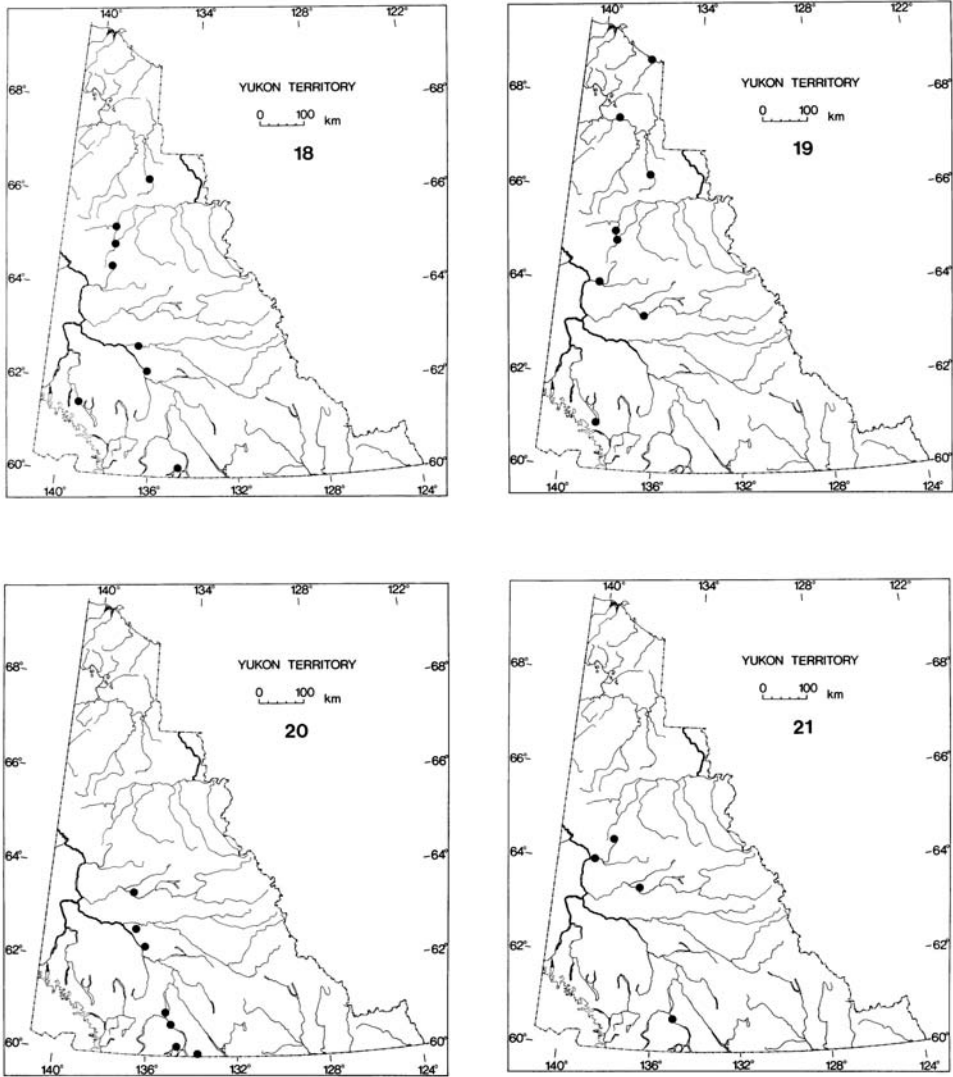
to the dry, cool, mainly unforested conditions that apparently existed in Beringia during the Pleistocene (Matthews 1982). Three of the 6 species that live in the Ogilvie Mountains or northwards are *Lasiopogon*, and 141 of the 184 specimens collected in this northern area are *Lasiopogon*. The numbers of specimens of the 4 Beringian *Lasiopogon* species are evenly divided between the southern valleys (south of the Ogilvie Mountains) (142 specimens) and the more northerly regions (141 specimens).

No species of robber fly is truly arctic, although the range of *Lasiopogon canus* (8) extends to the Yukon North Slope within the southern fringe of the low arctic; it has been collected just north of the treeline along the Firth River (69°13'N) (Fig. 32) and in the



FIGS. 14–17. Distribution of Yukon Asilidae. 14, *Cyrtopogon glarealis* Melander (5); 15, *Eucyrtopogon diversipilosus* Curran (6); 16, *E.* sp. near *nebulo* Osten Sacken (7); 17, *Lasiopogon canus* Cole and Wilcox (8).

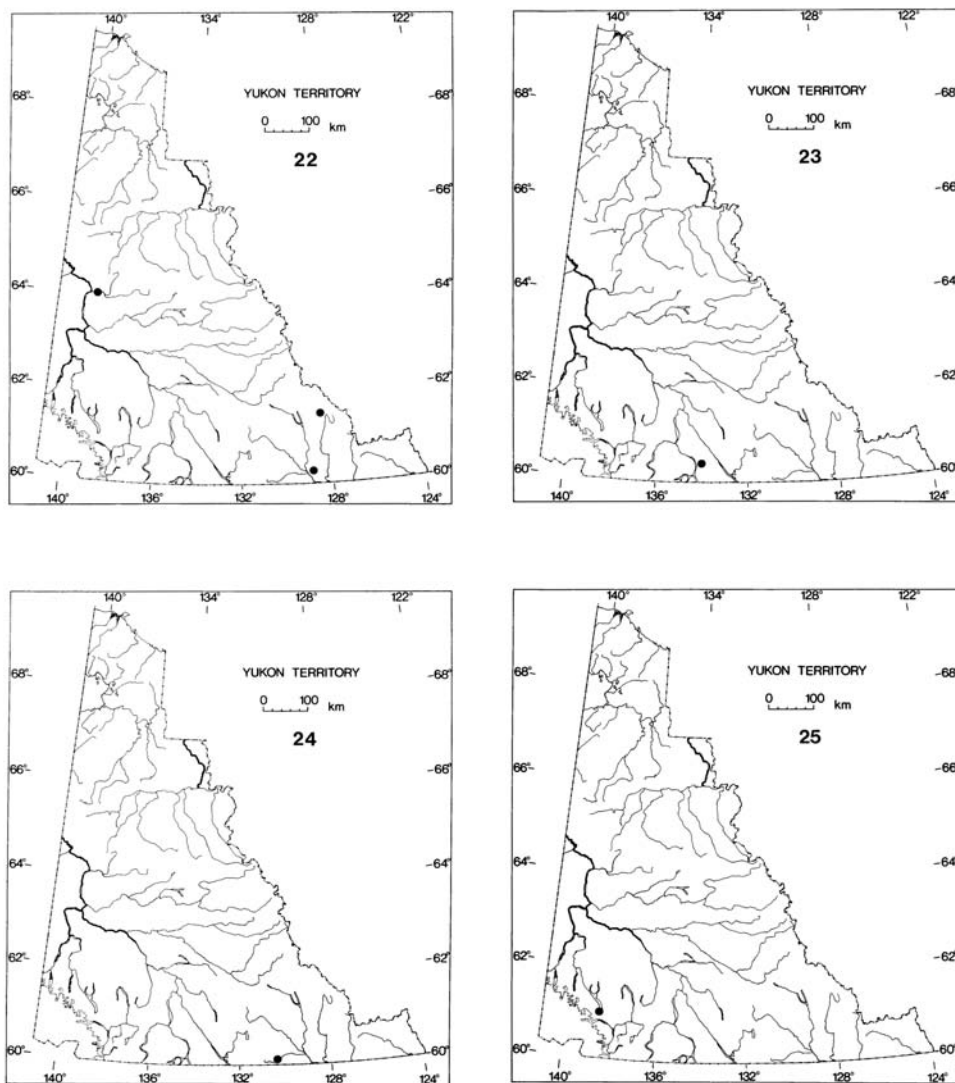
Northwest Territories on the Tuktoyakyuk Peninsula ($69^{\circ}27'N$). *Lasiopogon prima* (10) has been collected at Shingle Point near the mouth of the Blow River on the Beaufort Sea (approx. $68^{\circ}55'N$). These are the most northerly records of Asilidae in North America. *Rhadiurgus variabilis* (20) is known as far north as $70^{\circ}23'N$ in Norway (Cannings 1993), where the temperatures usual at that latitude are ameliorated by the Gulf Stream. In Canada and the Yukon it has been collected north to $67^{\circ}37'N$ (Old Crow). *Lasiopogon cinctus* (Fab.) undoubtedly ranges as far north as *Rhadiurgus* in Scandinavia and western Russia, and other species such as *L. septentrionalis* Lehr and *L. hinei* (9) probably approach $70^{\circ}N$ in Russia farther east (where the climate is more severe than in northwestern Europe), although the northern limits of their ranges are not known.



FIGS. 18–21. Distribution of Yukon Asilidae. 18, *Lasiopogon hinei* Cole and Wilcox (9); 19, *L. prima* Adisoemarto (10); 20, *L. yukonensis* Cole and Wilcox (11); 21, *Laphria gilva* (Linnaeus) (12).

The restricted Beringian distributions of *Lasiopogon* species in the Yukon and their affinity to steppe-like and tundra habitats suggest that they appeared in Beringia during the Pleistocene and were unable to spread east or south because of the continental and Cordilleran ice sheets. The reasons for their lack of significant expansion beyond the boundaries of Beringia since the melting of the ice are not clear.

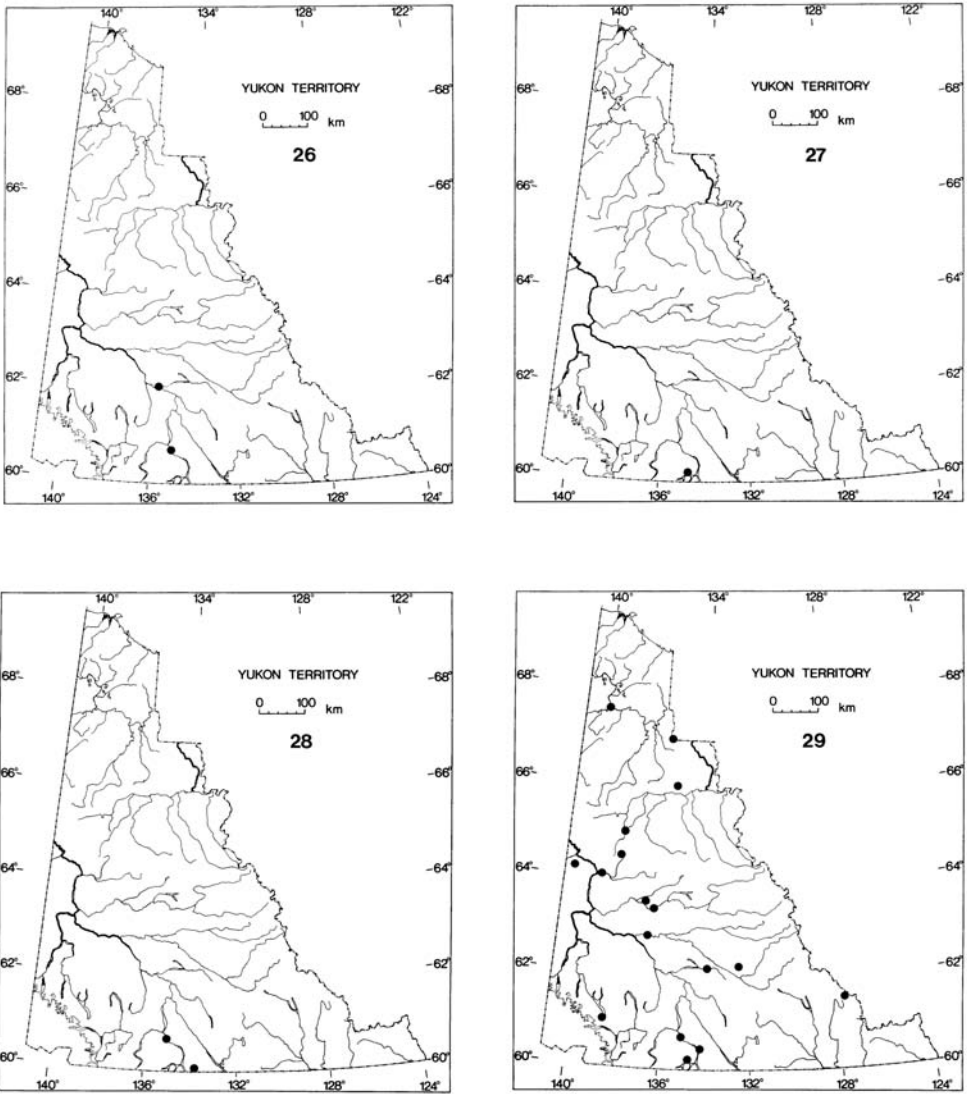
There is no transcontinental boreal *Lasiopogon* fauna in North America. Evidently this is a real phenomenon and is not the result of a lack of collecting, judging from the plentiful records of other asilids collected across the northern Canadian forests. The absence of *Lasiopogon* is notable given the ability of the species to cope with northern conditions. *L. tetragrammus* Loew, a species of the northern Appalachians and the Great Lakes region,



FIGS. 22–25. Distribution of Yukon Asilidae. 22, *Laphria insignis* (Banks) (13); 23, *L. janus* McAtee (14); 24, *L. milvina* Bromley (15); 25, *L. partitor* (Banks) (16).

ranges north to James Bay; it is the only species in the east to inhabit the boreal forest. There are many species in the western Cordillera, but only *L. cinereus* Cole reaches 55° N in British Columbia, and the rest remain south of 51° N. Several species on the Great Plains extend north along rivers into the aspen parkland, but none enters the boreal forest.

The Beringian species meet these Plains species only in the foothills of the Rocky Mountains and the adjacent parkland in Alberta. Two of the 4 Beringian species, *L. hinei* (9) and *L. prima* (10), range south from the Yukon on the east side of the Rockies in northeastern British Columbia and northwestern Alberta to about 52° N (Figs. 1, 2). *L. canus* (8) was thought to have a similar distribution (Adisoemarto 1967), but Alberta specimens are now known to represent an undescribed species, almost certainly the sister species of *L. canus*.



FIGS. 26–29. Distribution of Yukon Asilidae. 26, *Laphria posticata* (Say) (17); 27, *L. vivax* Williston (18); 28, *Machimus callidus* (Williston) (19); 29, *Rhadiurgus variabilis* (Zetterstedt) (20).

The relationship of the distributions of these 2 species is unclear, and it is not known if either occurs in northeastern British Columbia (Fig. 4). How or when the vicariance of these 2 species occurred is ambiguous, but apparently the Alberta species is derived from the Beringian fauna. Thus, the 3 widespread Beringian *Lasiopogon* species have managed to colonize the northwestern edge of the Great Plains but have not penetrated much into the Cordillera south of the Yukon. *L. yukonensis* (11) is uncommon and local and has not yet been found outside the warm, dry valleys of the southwestern Yukon.

Boreal Element. Details on the distribution of boreal asilids are not yet complete enough to allow a division of the Boreal category into widespread, northern, or southern elements



FIG. 30. Carcross sand dunes; lodgepole pines in left foreground. This dry habitat is home to several robber flies, especially Cordilleran species from the south: *Cyrtopogon banksi*, *C. fumipennis*, *Eucyrtopogon diversipilosus*, and *Laphria vivax*. Boreal species (*Cyrtopogon bimacula* and *Rhadiurgus variabilis*) and Beringian species (*Lasiopogon canus*, *L. hinei*, and *L. yukonensis*) also occur here.

as has been done with the dragonflies, for example (Cannings and Cannings 1997). Nevertheless, even with this lack of data there are apparent differences in the latitudinal extent of the ranges among boreal species. For example, *Laphria posticata* (17) has a rather southerly range that, in the west, remains south of the Subarctic Province (Ecological Land Classification) and in the east includes the Transition Province (Fig. 5). The more extensive northerly ranges of *Rhadiurgus variabilis* (20), with its Holarctic distribution (Fig. 6), and *Cyrtopogon bimacula* (2), with a strictly Nearctic range (Fig. 7), are typical of widespread boreal species.

The significance of the Boreal element is readily explained by the great expanse of the boreal forest in the Yukon. However, Yukon robber flies are not dominated by boreal species. There are probably only about 15 species of boreal asilids in Canada (only 7 of which have been recorded in the Yukon) and there are enough warm, dry habitats in the southern Yukon to support a significant group of boreal montane species from the south.



FIG. 31. South-facing slopes supporting relict grassland and sage habitat along the Porcupine River at Old Crow. The Beringian species *Lasiopogon canus*, the Boreal species *Cyrtopogon bimacula* and *Rhadiurgus variabilis*, and the Cordilleran species *Eucyrtopogon* sp. near *nebulo* live here.

Four of the 7 Boreal species are in the genus *Laphria* (s. lat.). These *Laphria* species do not range north of the warm southern valleys, although *L. gilva* (12) has been collected at the southern edge of the Ogilvie Mountains. *Cyrtopogon bimacula* (2), *C. dasyllis* (3), and *Rhadiurgus variabilis* (20) reach the Porcupine Plain north of 67° N latitude. Unlike the situation in the Odonata (Cannings et al. 1991), robber flies of the Boreal element are not the dominant species in the northern Yukon. Only 39 of 184 specimens of Asilidae collected in, or north of, the Ogilvie Mountains are Boreal species, and 18 of these 39 specimens are of one species, *Rhadiurgus variabilis* (20).

The name of the Nearctic populations of *R. variabilis* (20) has recently been synonymized with the Eurasian one (Cannings 1993) and the Eurasian *Lasiopogon sibiricus* is herein synonymized with the New World *L. hinei* (9). This suggests that after closer scrutiny several other robber flies from northern coniferous forests on either side of the Bering Strait may be found to be conspecific. The species of *Laphria* s. lat. are the best candidates for such an examination. In *Cyrtopogon*, *C. bimacula* (2) and the Eurasian *C. maculipennis* Macquart are closely related and have ranges that cover the northern Nearctic and Palaearctic regions, respectively. Nevertheless, they have been shown here to be distinct species.

Cordilleran Element. Almost half the robber fly fauna of the Yukon is of Cordilleran origin, represented by species living in the montane forests of the western mountains of the continent. Eight of the 9 Cordilleran species collected in the Yukon show a distinct southern distribution in the Territory, ranging through the southern Shakwak Trench, Southern Lakes region, Liard Plain, and into the southern Yukon/Tintina region. All but 2 of the records of these 8 species are south of 62° N latitude. One of the 7 localities for *Cyrtopogon banksi* (1)

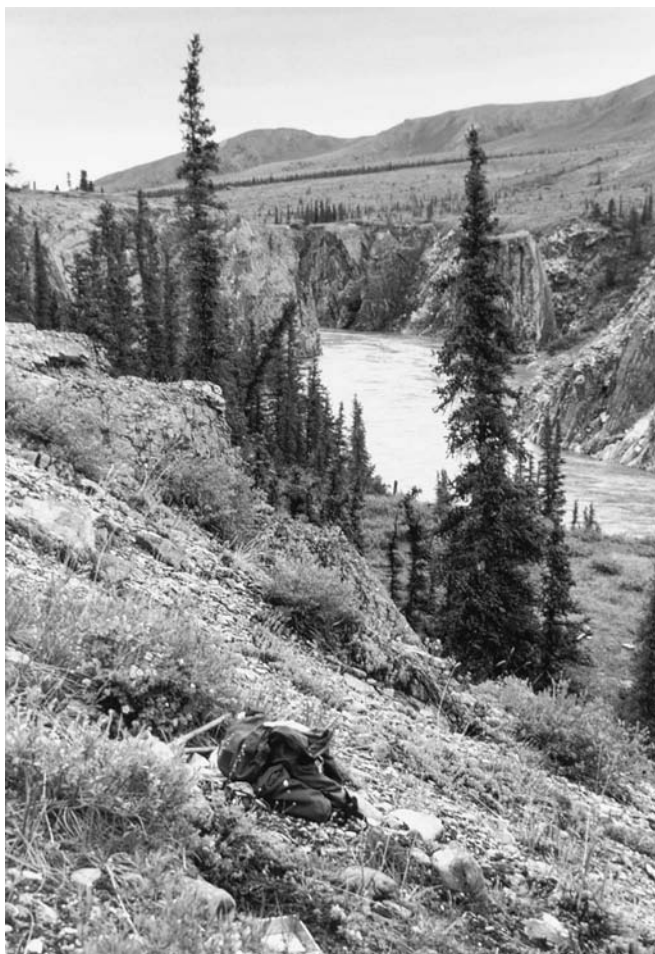


FIG. 32. The Firth River at 69° 13'N, the most northerly locality known for the Asilidae in the Yukon (*Lasiopogon canus*).

is at Moose Creek, km 562 of the Klondike Highway (63° 30'N); *C. glarealis* (5) has been collected only at Pelly Crossing, south of 63° N. Cordilleran robber flies are not tolerant of subarctic conditions in the Yukon.

The anomaly is *Eucyrtopogon* sp. near *nebulo* (7), which has been found only on the Porcupine Plain at Old Crow and Mason Hill. As has been pointed out earlier, this identification is uncertain. *Eucyrtopogon* is a difficult genus and needs revision, and species limits are not well understood; there is a good possibility that these specimens represent an undescribed species. Whether the fly is *E. nebulo* or not, it is likely that its presence in the far northern Yukon represents a significant range disjunction relative to southern populations of the genus. *E. diversipilosus* (6) is known from the southern Yukon, but *E. nebulo* is not; in British Columbia it has not been collected north of 51° N. If the species is undescribed, it may be restricted to the northern Yukon and could be considered a Beringian species. If this is so, however, it would be one with recent, post-Pleistocene origins to the south rather than to the west in Eurasia; *Eucyrtopogon* is strictly a western Nearctic taxon.

Acknowledgements

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Appendix 1. Collection records of Asilidae in the Yukon.

Collectors are indicated by the following initials: BDM, B.D. Marshall; BG, B. Gill; BM, B. Macdonald; CCL, C.C. Loan; CSG, C.S. Guppy; DL, D. Lafontaine; DLW, D.L. Watson; DMW, D.M. Wood; EFC, E.F. Cashman; EK, E. Krebs; G&DMW, G.&D.M. Wood; GGES, G.G.E. Scudder; JEHM, J.E.H. Martin; JJR, J.J. Robinson; JKH, J.K. Horie; LV, L. Vasington; MP, M. Polak; MTH, M.T. Hughes; PFB, P.F. Bruggemann; PHA, P.H. Arnaud Jr.; PJS, P.J. Stitsko; RAC, R.A. Cannings; RAM, R.A. Moore; REL, R.E. Leech; RHR, R.H. Robertson; RJa, R. Jaagumagi; RJC, R.J. Cannings; RM, R. Madge; SAM, S.A. Marshall; SGC, S.G. Cannings; WRM, W.R. Mason; WWJ, W.W. Judd. Where no collector is noted under ROME specimens, the label data state "ROM field party".

Specimens are housed in collections indicated by initials in parentheses: CASC, California Academy of Sciences, San Francisco; CNCI, Canadian National Collection, Agriculture Canada, Ottawa; IBPV, Institute of Biology and Pedology, Vladivostok; BCPM, Royal British Columbia Museum, Victoria; ROME, Royal Ontario Museum, Toronto; SMDV, Spencer Entomological Museum, University of British Columbia, Vancouver; DEBU, University of Guelph, Guelph.

Where locality data were taken from publications, this is indicated in an initial paragraph in the species data lists.

Subfamily Dasypogoninae

1. *Cyrtopogon banksi* Wilcox and Martin (Fig. 10)

Whitehorse, Fish L. Bench, 16.vi.1923 (Wilcox and Martin 1936).

Alaska Hwy. km 1706, Slims R. delta along Sheep Creek Rd., 60°59'N 138°34'W, 8–10.vi.1979 malaise (2♂) (ROME); Carcross, sand dunes, 20.vii.1987 (1♂) SGC (UBC); Klondike Hwy. km 562, Moose Cr. Campground, 63°30'N 137°01'W, 18–20.vii.1979 malaise (2♂ 1♀) (ROME); Kluane, Sheep Creek Rd., 7.vii.1986 (2♀), 23.vii.1985 (1♂ 9♀) SGC (SMDV); Kluane N.P., Sheep Mt. trail, 23.vii.1985 (1♂ 6♀) SAM (DEBU); Lapie Canyon, Ross R., 2.vii.1986 (1♂) BM (SMDV); Takhini Hot Springs, 26.vi.1989 (1♂ 1♀) PHA (CASC); Whitehorse, 1.vii.1948 (1♂), 7.vii.1948 (1♂) MTH (CNCI), 5.vii.1948 (1♀), 9.vii.1948 (1♀) WRM (CNCI), 26.vii.1950 (1♂) RHR (CNCI), 24.viii.1959 (1♂) RM (CNCI); Whitehorse, 20 mi N on Klondike Loop, 23.vi.1987 (1♀) SAM (DEBU).

2. *Cyrtopogon bimacula* (Walker) (Fig. 11)

Alaska Hwy. km 1706, Slims R. delta on Sheep Creek Rd., 60°59'N 138°34'W, 8–10.vi.1979 malaise (12♂ 2♀) (ROME); Alaska Hwy. km 1706, Sheep Creek Rd. on W side Slims R. delta, 60°59'N 138°34'W, 10.vi.1979 (3♂) (ROME); Atlin Rd. km 35, Tarfu L. at campground, 60°04'N 133°45'W, 18–20.vi.1982 malaise (2♂), 19.vi.1982 (2♀) (ROME); Blackstone R., km 138 Dempster Hwy., 3000 ft, 29.vi.1979 (1♀) SGC (SMDV); Carcross, sand dunes, 16–18.vi.1982 (2♂ 3♀) G&DMW (CNCI), 13.vii.1982 (1♀) SGC, LV, RAM (SMDV), 21.vii.1987 (2♀) MP (CNCI); Carcross, aspen parkland, 19–20.vii.1987 (4♀) MP, DMW (CNCI), 21.vii.1987 (1♀) SGC (SMDV); Carmacks, prairie slope, 19.vi.1982 (1♂ 3♀) G&DMW (CNCI); Dawson, 1500 ft, 6.vii.1949 (1♂) PFB (CNCI); Dawson, 14 mi E, 31.vii.1962 (1♀) PJS (CNCI); Dawson, Midnight Dome, 13.vii.1985 (2♂ 1♀) SGC (SMDV); Dempster Hwy. km 140.5 (mi 87), 18–28.vii.1973 (1♂) G&DMW (CNCI), 17–18.vii.1981 (1♂) DL, G&DMW (CNCI); Klondike Hwy., Five Fingers Rapids, 62°16'N 136°19'W, 14.vi.1979 (2♀) (ROME); Klondike Hwy. km 562, Moose Cr. Campground, malaise, 63°31'N 137°01'W, 22–25.vii.1980 (2♂) (ROME); Klondike Hwy. km 562–66, 63°04'N 137°01'W, 30.vi.–2.vii.1980 malaise on streambank (2♂) (ROME); Kluane, Sheep Creek Rd., 23.vii.1985 (1♂ 2♀) SGC (SMDV); Kluane, Sheep Mt., 5.vii.1979 (1♀), 28.v.1980 (2♂) SGC (SMDV), 2.vi.1979 (3♀), 4.vi.1979 (2♀) GGES (SMDV), 28.v.1980 (3♀) BG (SMDV), 24.vi.1982 (3♀) SGC, LV, RA (SMDV), 23.vii.1985 (1♂ 4♀) SAM (DEBU); Mayo Rd. km 14, on logging road 0.5 mi from highway, 63°25'N 136°30'W, 14.vi.1982 (1♂) (ROME); Minto Landing, Klondike Loop, 287.4 km SE Dawson, 27–28.vi.1989 (10♂ 5♀) PHA (CASC); Old Crow, 29.vi.1983 (1♀), 30.vi.1983 (4♀), 2.vii.1983 (1♂), 4.vii.1983 (1♀), 6.vii.1983 (1♀) RAC (SMDV), 4.vii.1983 (1♀), 14.vii.1983 (2♀) SGC (SMDV), 11.vii.1983 (1♀) RJC (SMDV); Old Crow, 6 mi up Porcupine R., 69°34'N 139°46'W, 21–24.vii.1981 (1♀) RJa (ROME); Rampart House, 12.vi.1951 (1♀), 18.vii.1951 (1♂) CCL (CNCI), 15.vii.1951 (1♂) JEHM (CNCI); Whitehorse, 20.vi.1949 (1♀) JKH (CNCI); Whitehorse, 20 mi N on Klondike Loop, 23.vi.1987 (1♀) SAM (DEBU).

3. *Cyrtopogon dasyllis* Williston (Fig. 12)

Whitehorse (Adisoemarto 1967).

Alaska Hwy. km 1630, Pine Cr. Campground, on spruce bark, 60°47'N 137°30'W, 25.vi.1982 (1♂) (ROME); Bluefish Caves, 2000 ft (67°08'N 140°48'W), 7.vii.1983 (1♂) SGC (SMDV); Braeburn Lodge, 5 km N, 19.viii.198 (1♀) EK, JJR (SMDV); Dawson, 14 mi E, 1300 ft, 29.vii.1962 (1♀) REL (CNCI); Kluane, 21.viii.1988 (1♂) SGC (SMDV); Mayo, 29.vi.1980 (1♀) BG (SMDV); McQuesten, 10 km E, 28.vi.1980 (1♀) RJC (SMDV); Minto Landing, Klondike Loop, 27–28.vii.1989 (1♀) PHA (CASC); Whitehorse, 1.vii.1948 (1♀), 9.vii.1948 (2♀), 12.viii.1948 (1♂) MTH (CNCI), 9.vii.1949 (1♀) CCL (CNCI), 20.vii.1949 (1♀) DLW (CNCI), 4.viii.1949 (1♀) JKH (SMDV), 8.viii.1949 (1♀) JKH (CNCI), 4.vii.1950 (1♂) RHR (CNCI).

4. *Cyrtopogon fumipennis* Wilcox and Martin (Fig. 13)

Carcross, 21.vii.1987 (1 ♀) SGC (SMDV); Nahanni Range Rd. (61°38'N 128°20'W), 30.vii.1986 (1 ♀) SGC (SMDV).

5. *Cyrtopogon glarealis* Melander (Fig. 14)

Pelly Crossing, 2.vii.1985 (1 ♀) SGC (SMDV).

6. *Eucyrtopogon diversipilosus* Curran (Fig. 15)

Carcross, 20.vii.1987 (1 ♀) MP (SMDV).

7. *Eucyrtopogon* sp. near *nebulo* Osten Sacken (Fig. 16)

Old Crow, Mason Hill, south slope, 4.vii.1981 (1 ♀) CSG (SMDV); Old Crow, 30.vi.1983 (2 ♂), 1.vii.1983 (1 ♂), 2.vii.1983 (1 ♂); 4.vii.1983 (1 ♂) RAC (SMDV).

8. *Lasiopogon canus* Cole and Wilcox (Fig. 17)

Alaska Hwy. km 1706, Sheep Creek Rd. on W side Slims R. delta, 60°59'N 138°34'W, 10.vi.1979 (5 ♀), 10–12.vi.1979 malaise (1 ♂) (ROME); Alaska Hwy. km 1706, pond on E side Slims R. delta, 60°59'N 138°30'W, 22–24.vi.1980 malaise (6 ♂), 16.vii.1979 (2 ♀) (ROME); Alaska Hwy. km 1713, Horseshoe Bay Campground, 61°02'N 138°31'W, 21–25.vi.1980 malaise (6 ♀) (ROME); Alaska Hwy. km 1800, Swede Johnson Cr., 61°35'N 139°25'W, 9.vi.1979 malaise (1 ♂) (ROME); Klondike Hwy. km 562–566, 63°31'N 137°07'W, 28–30.vi.1980 malaise (1 ♂ 2 ♀), 30.vi.–2.vii.1980 malaise (2 ♂ 2 ♀) (ROME); Bluefish Ridge, 2600 ft (67°10'N 140°30'W), 6.vii.1983 (2 ♂ 1 ♀) SGC (SMDV); British Mts., Firth R., 2.vii.1956 (1 ♀), 7.vii.1956 (1 ♀), 17.vii.1956 (1 ♂), 24.vii.1956 (1 ♂), 25.vii.1956 (1 ♂), 31.vii.1956 (1 ♂) EFC (CNCI), 20.vii.1956 (1 ♀), 21.vii.1956 (1 ♂) REL (CNCI); Carcross, 21.vii.1987 (1 ♂), 22.vii.1987 (1 ♀) SGC (SMDV); Carmacks, 2.vii.1980 (1 ♀) RJC (SMDV); Carmacks, 30 km E (62°02'N 135°51'W), 10.vii.1982 (1 ♀) SGC, LV, RAM (SMDV); Congdon Cr., Kluane L., 21.vi.1982 (1 ♀) SGC (SMDV); Dawson, 1.vii.1949 (1 ♂) WWJ (CNCI); Dawson, 14 mi E, 31.vii.1962 (1 ♀) PJS (CNCI); Dawson, Midnight Dome, 13.vii.1985 (1 ♂) SGC (SMDV); Dempster Hwy. km 200, Ogilvie R., 65°22'N 138°19'W, 29–30.vi.1979 malaise (1 ♂) (BCPM); Dempster Hwy. km 134, 1000 m, 10.vii.1981 (1 ♂) DL, G&DMW (CNCI); Dempster Hwy. km 155, 950 m, 16–18.vii.1981 (1 ♂) DL, G&DMW (CNCI); Dempster Hwy. km 159, 1400 m, 12.vii.1981 (1 ♂ 2 ♀) DL, G&DMW (CNCI); Dempster Hwy. km 155, 950 m, 29.vi.–3.vii.1980 (2 ♂), DL, G&DMW (CNCI); Eagle R., Dempster Hwy., 9.vii.1985 (1 ♀) SAM (DEBU); Firth R., 69°13'N 140°03'W, 25.vi.1984 (1 ♂) SGC (SMDV); Frog L., 67°30'N 140°15'W, 13.vii.1981 (1 ♀) SGC (SMDV); Gravel L., 58 mi E Dawson, 11.viii.1962 (1 ♀) REL (CNCI); Kluane, 3.vi.1981 (1 ♀) CSG (SMDV); Klondike Hwy. km 562, Moose Cr. Campground, 63°31'N 137°01'W, 19.vi.1979, 18–20.vii.1979 (3 ♀), 22–25.vii.1980 malaise (4 ♂), 25–26.vii.1979 malaise in *Salix* scrub (2 ♀) (ROME); Klondike Hwy. km 466, Pelly Crossing Campground, 62°49'N 136°35'W, 14–17.vi.1979 malaise (4 ♂ 3 ♀), 26–27.vi.1980 (6 ♂ 4 ♀) (ROME); Klondike Hwy. km 450, von Wilczek L., 62°41'N 136°43'W, 26–27.vi.1980 malaise (1 ♀) (ROME); Klondike Hwy., Five Fingers Rapids, 62°16'N 136°19'W, 14.vi.1979 (1 ♀) (ROME); Kluane, Sheep Cr., 61°10'N 140°18'W, 23.vi.1984 (1 ♀) SGC (SMDV); Kluane, Sheep Creek Rd., 23.vii.1985 (1 ♂ 2 ♀), 7.viii.1986 (1 ♀) SGC (SMDV); Kluane, Sheep Mt., 2.vi.1979 (1 ♂) GGES (SMDV), 8.vi.1979 (1 ♀) SGC (SMDV), 28.v.1980 (2 ♀) RJC (SMDV); Kluane, Slims R. delta, 2.vi.1979 (1 ♂ 2 ♀) GGES (SMDV), 2.vii.1979 (1 ♂) SGC (SMDV); Little Fox L., 3.vii.1980 (1 ♀) RJC (SMDV); Mason Hill, 67°19'N 137°40'W, 4.vii.1981 (1 ♂) CSG (SMDV); Mayo, 29.vi.1980 (1 ♂) BG (SMDV); Mayo Rd. km 14, on logging road 0.5 mi from highway, 63°25'N 136°30'W, 14.vi.1982 (1 ♀) (ROME); McQuesten, 10 km E, 28.vi.1980 (1 ♂) BG (SMDV); Minto Landing, Klondike Loop, 4.vii.1978 (4 ♂ 7 ♀), 27–28.vi.1989 (2 ♂ 5 ♀) PHA (CASC); North Fork Pass, 3000 ft, 64°31'N 138°13'W, 27.vi.1982 (1 ♂ 1 ♀ *in copula*) SGC (SMDV); Old Crow, 30.vi.1983 (1 ♀), 2.vii.1983 (3 ♀), 3.vii.1983 (5 ♀), 4.vii.1983 (2 ♀), 6.vii.1983 (1 ♀) RAC (BCPM), 11.vii.1983 (1 ♀) RJC (SMDV); Old Crow, 1 km E, 16.vii.1981 (1 ♀) CSG (SMDV); Old Crow, 6 mi up Porcupine R., 67°34'N 139°46'W, 3–4.vii.1981 (4 ♀), 10–12.vii.1981 (2 ♀), 15–17.vii.1981 (4 ♂ 3 ♀), 17–18.vii.1981 (3 ♂ 1 ♀), 19–21.vii.1981 (3 ♂ 3 ♀), 21–24.vii.1981 (6 ♂ 22 ♀), 28.vii.1981 (1 ♂ 2 ♀) RJA (ROME); Old Crow, Mason Hill, alpine slope, 67°24'N 137°48'W, 4.vii.1981 (ROM#810539c) (1 ♂) BDM (ROM); Pelly Crossing, 30.vi.–15.vii.1985 (1 ♀), E. Krebs, J.J. Robinson (SMDV); Rampart House, 14.vii.1951 (1 ♀) JEHM (CNCI); Ross R., 3000 ft (61°56'N 132°30'W), 10.vii.1951 (1 ♂), 13.vii.1951 (1 ♀), 19.vii.1951 (1 ♀), 21.vi.1960 (1 ♀), 22.vii.1951 (1 ♂), 20.vi.1960 (1 ♂) JEHM (CNCI); Tantalus viewpoint, Klondike Loop, 4.vii.1978 (1 ♂) PHA (CASC); Tatchun Cr. (62°17'N 136°17'W), 19.vii.1982 (1 ♀) GGES (SMDV); Whitehorse, 1.vii.1948 (1 ♂), WRM, MTH (CNCI), 5.vii.1948 (1 ♂ 1 ♀), 11.vii.1948 (1 ♀) WRM (CNCI), 8.vii.1948 (1 ♀), MTH (CNCI), 13.vi.1949 (1 ♀), 28.vi.1949 (1 ♀) DLW (CNCI), 20.vi.1949 (1 ♂), 25.vii.1949 (1 ♀), 30.vii.1949 (1 ♂) JKH (CNCI), 23.viii.1950 (1 ♂) RHR (CNCI), 21.vii.1981 (1 ♀) CSG (SMDV).

9. *Lasiopogon hinei* Cole and Wilcox (Fig. 18)

Alaska Hwy. km 1787, Sakwi Cr., 61°29'N 139°16'W, 9.vi.1979 (1 ♀) (ROME); Carcross, sand dunes, 16–18.vii.1982 (2 ♀), G&DMW (CNCI); Dempster Hwy. mi 40, 13–18.vii.1973 (2 ♀) G&DMW (CNCI); Dempster Hwy. km 140.5 (mi 87), 1–4.vii.1973 (3 ♂ 1 ♀) G&DMW (CNCI), 1–4.vii.1973 (1 ♂) G&DMW (BCPM), 5–7.vii.1973 (1 ♂) G&DMW (CNCI), 5–7.vii.1973 (1 ♀) G&DMW (BCPM), 8–12.vii.1973 (3 ♂) G&DMW (CNCI), 8–12.vii.1973 (1 ♂) G&DMW (BCPM), 8–12.vii.1973 (1 ♂) G&DMW (IBPV), 16–17.vii.1973 (3 ♂ 1 ♀) G&DDM (CNCI), 16–17.vii.1973 (1 ♂) G&DMW (BCPM), 21–23.vii.1980 (1 ♂ 1 ♀) G&DMW (CNCI), 27–29.vii.1980 (1 ♀) DL, DMW (CNCI), 11–13.vii.1981 (5 ♂) DL, G&DMW (CNCI),

17–18.vii.1981 (5♂ 1♀) DL, G&DMW (CNCI), 17–18.vii.1981 (1♀) DL, G&DMW (BCPM), 17–18.vii.1981 (1♀) DL, G&DMW (IBPV); Dempster Hwy. km 379, Eagle R., 66°27'N 136°45'W, 6.vi.1979 (1♀) (ROME); Dempster Hwy. km 200, Ogilvie R., 65°22'N 138°19'W, 29–30.vi.1979 malaise (1♀) ROME field party (BCPM); Dempster Hwy., Eagle R., 9.vii.1985 (1♀) SGC (SMDV); Klondike Hwy. km 466, Pelly Crossing Campground, 62°49'N 136°45'W, 14–17.vi.1979 malaise (1♂ 5♀) (ROME); Klondike Hwy. km 382, Tachun Cr. Campground, 62°16'N 136°17'W, 14.vi.1982 (1♀) (ROME).

10. *Lasiopogon prima* Adisoemarto (Fig. 19)

Alaska Hwy. km 1706, W side Slims R. delta, 60°59'N 138°34'W, 8.vi.1979 (1♂) (ROME); Blackstone R., km 142 Dempster Hwy., 29.vi.1982 (1♀) SGC (SMDV); Blue Bluffs, 30 km E Old Crow, 6.vii.1987 (1♂) SGC (SMDV), 6.vii.1987 (1♂ 1♀) SAM (DEBU); Congdon Cr., Kluane L., 21.vi.1982 (1♂) SGC (SMDV); Dempster Hwy. mi 87, 4–8.viii.1973 (2♀) G&DMW (CNCI); Eagle R., Dempster Hwy., 15.vi.1980 (1♂ 1♀) RJC (SMDV), 15.vi.1980 (1♂) BG (SMDV), 9.vii.1985 (1♂) SAM (BCPM); Engineer Cr., km 159.5 Dempster Hwy. (65°05'N 138°20'W), 30.vi.1982 (1♂) SGC, LV, RAM (SMDV); Klondike R., km 1, Dempster Hwy., 28.vi.1987 (1♀) SAM (DEBU); Shingle Point, Blow R., 7.vii.1987 (3♀) SAM (DEBU); Stewart Crossing, 5.vii.1978 (1♂), PHA (CASI).

11. *Lasiopogon yukonensis* Cole and Wilcox (Fig. 20)

Whitehorse, Fish L. Bench, 16.vi.1923 (1♂ — holotype), J.A. Kusche (CASI) (Cole and Wilcox 1938). Carcross, sand dunes, 16–18.vi.1982 (5♂ 5♀) G&DMW (CNCI); Klondike Hwy., McCabe Cr., 62°32'N 136°45'W, 15.vi.1979 (1♂) (ROME); Klondike Hwy. km 562–566, 63°31'N 137°01'W, 30.vi.–2.vii.1980 malaise trap on streambank (1♂) (ROME); Little Atlin L., 23.vi.1982 (1♂) SGC, LV (SMDV); Tatchun Cr., 29.vi.1985 (1♂) EK, JJR (SMDV); Whitehorse, 20 mi N, 23.vi.1987 (1♂ 1♀) SAM (DEBU).

Subfamily Laphriinae

12. *Laphria gilva* (Linnaeus) (Fig. 21)

Dawson, 14 mi E (1300 ft), 31.vii.1962 (1♀) PJS (CNCI); Dempster Hwy. km 72, Tombstone Campground, on tree trunk, 64°31'N 138°28'W, 4.viii.1980 (1♂) (ROME); Klondike Hwy. km 562, Moose Cr. Campground, malaise in *Salix* scrub, 68°30'N 137°01'W, 26–27.vii.1979 (1♂) (ROME); Whitehorse, 7.viii.1948 (1♀), 11.viii.1948 (1♂ 1♀ in copula) WRM (CNCI), 28.vi.1949 (1♀) DLW (CNCI).

13. *Laphria insignis* (Banks) (Fig. 22)

Campbell Hwy. km 27, 1 km along logging road, 60°14'N 129°00', 4.vii.1981 (1♀) BDM (ROME); Dawson, 14 mi E (1300 ft), 3.viii.1962 (1♂) PJS (CNCI); Nahanni Range Rd. km 128, 61°38'N 128°20'W, 30.vii.1986 (1♂) SGC (SMDV).

14. *Laphria janus* McAtee (Fig. 23)

Alaska Hwy. km 1403, Judas Cr. Campground, 60°23'N 134°08'W, 11.vi.1980 (1♀) (ROME).

15. *Laphria mulvina* Bromley (Fig. 24)

Rancheria, Swift R., 14–16.viii.1948 (1♀) WRM, MTH (CNCI).

16. *Laphria partitor* (Banks) (Fig. 25)

Alaska Hwy. km 1706, Slims R. delta, pond on E side, 60°59'N 138°30'W, 22–24.vi.1980 malaise (1♀) (ROME).

17. *Laphria posticata* (Say) (Fig. 26)

Carmacks, 30 km E, 10.vii.1982 (1♀) ? (CNCI); Whitehorse, 25.vii.1949 (1♀) JKH (SMDV), 4.viii.1949 (1♀) JKH (SMDV).

18. *Laphria vivax* Williston (Fig. 27)

Carcross, 21.vii.1987 (1♂) SGC (SMDV).

Subfamily Asilinae

19. *Machimus callidus* (Williston) (Fig. 28)

Snafu Cr., 60°08'N 133°48'W, 28.vi.1981 (1♂) CSG (SMDV), 22.vii.1981 (1♀) SGC (SMDV); Whitehorse, 2.vii.1948 (1♂ 1♀) WRM, MTH (CNCI).

20. *Rhadiurgus variabilis* (Zetterstedt) (Fig. 29)

Alaska Hwy. km 1703, Horseshoe Bay Campground, 61°02'N 138°31'W, 21–25.vi.1980 malaise (1♂) (ROME); Carcross, 20.vii.1987 (1♀), 21.vii.1987 (1♀), 22.vii.1987 (2♂) SGC (SMDV); Carcross, 2 km N, 17.vii.1980 (1♂) DMW, DL (CNCI); Carcross, dunes 2 km N, 19–20.vii.1987 (1♂) MP, DMW (CNCI); Dawson, 14 mi E, 1300 ft, 29.vii.1962 (1♂) REL (CNCI), 30.vii.1962 (1♀), 1.viii.1962 (1♂) PJS (CNCI); Dawson, 36 mi W, 3000 ft, 24.viii.1949 (1♂ 1♀) PFB (CNCI); Dempster Hwy. mi 40, 7–12.vii.1973 (1♂) G&DMW (CNCI); Dempster Hwy. mi 87, 27–30.vi.1973 (2♂ 1♀), 8–12.vii.1973 (1♂), 18–28.vii.1973 (1♂) G&DMW (CNCI); Dempster Hwy. km 465, 22.vii.1982 (1♂) DMW (CNCI); Klondike Hwy. km 566, 63°31'N 137°03'W, 22–25.vii.1980 malaise (2♂ 1♀) (ROME); Klondike Hwy., Pelly Crossing Campground, 62°49'N 136°34'W, 26–27.vi.1980 malaise (2♂) (ROME); Kluane, 23.vii.1979 (1♀) SGC (SMDV); Kluane Nat. Pk., Sheep Creek Rd., 23.vii.1985

(1 ♀), 7.viii.1986 (2 ♀) SGC (SMDV); Kluane Nat. Pk., Sheep Mt., 4.vi.1979 (1 ♀) GGES, 24.vi.1982 (1 ♀) SGC, LV, RAM (SMDV), 23.vii.1985 (2 ♂) SAM (DEBU); Kluane Nat. Pk., base Mt. Wallace, 1050 m, 14–15.vii.1980 (1 ♂ 2 ♀) DMW, DL (CNCI); Magundy R., km 448 Campbell Hwy., 28.vii.1981 (1 ♀) CSG (UBC); Marsh L., 10.vii.1948 (1 ♂) WRM, MTH (CNCI); Nahanni Range Rd. km 128, 61°38' 128°20'W, 30.vii.1986 (2 ♂ 2 ♀) SGC (SMDV); Old Crow, 67°37'N 139°15'W, 13.vii.1981 (2 ♀) CSG (SMDV); Old Crow, 29.vi.1983 (1 ♂ 1 ♀) RJC (UBC), 11.vii.1983 (1 ♀), 4–29.vii.1983 (1 ♀) SGC (SMDV), 30.vi.1983 (1 ♂), 4.vii.1983 (1 ♂ 1 ♀) RAC (BCPM); Richardson Mts., 65°55'N 135°46'W, 5.vii.1982 (1 ♂ 1 ♀) DMW (CNCI); Stewart Crossing, 6 km NE, 29.vi.1980 (1 ♂) BG (SMDV); Swim Lks., 3200 ft, 133°W 62°13'N, 20.vi.1960 (1 ♂) JEHM (CNCI); Whitehorse, 11.vii.1950 (1 ♂) RHR (CNCI); Whitehorse, 27.vii.1949 (2 ♂), 4.viii.1949 (1 ♀) JKH (CNCI).