THE RHYACOPHILA OF PENNSYLVANIA, WITH LARVAL DESCRIPTIONS OF R. BANKSI AND R. CARPENTERI (TRICHOPTERA: RHYACOPHILIDAE)

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Abstract

Over 3,000 immature and adult specimens of the genus Rhyacophila were collected in Pennsylvania. This collection consists of 17 species most of which are new state records. The larvae of R. banksi Ross and R. carpenteri Milne were associated by the metamorphotype method. The larva of banksi is indistinguishable from known larvae of the other species of the invaria subgroup (Schmid, 1970). The larva of carpenteri is identical to R. sp. 3 (banksi ?) of Flint (1962). A revised key to the 23 known larvae of eastern Nearctic Rhyacophila is given.

Introduction

There are 34 eastern Nearctic species of Rhyacophila, of which four were described from female types. Since Flint's (1962) key to the larvae of eastern Nearctic Rhyacophila, additional larval associations of this group have been given by Smith (1968) for angelita, Sherberger and Wallace (1971) for vuphipes, and Neves (1977) for acutiloba and carolina. The larvae of banksi and carpenteri are described herein, and were associated by the metamorphotype method of Milne (1938).

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Therefore, the larvae of 23 of the 30 species recognized by male genitalia are presently known, leaving accola, appalachia, montana, mycata, otica, parantra, and teddyi unassociated.

In the past, little work has been done documenting the occurrence of Rhyacophila in Pennsylvania. Hyland (1948), in a list of 29 species of Trichoptera from the state, recorded only one Rhyacophila—nigrita. Ross (1941) mentioned three, fuscula, invaria, and nigrita, and Roback (1975) listed immatures of fuscula, and two other tentatively identified taxa.

For this study the adults were collected along streams and springs using light traps and sweeping nets. The larvae and pupae were hand-picked from stones and debris submerged in water or collected by a Hess type quantitative sampler.

The majority of specimens examined in this investigation were collected from Pennsylvania. However, a few records from adjacent areas of New Jersey are also included as they provide insight into the distribution of Rhyacophila in Pennsylvania. Over 3,000 immature and adult specimens, consisting of 17 species of Rhyacophila, were procured, most of which are new state records. The accumulation of these data from 23 counties has contributed to the knowledge of the local distribution, seasonal occurrence, and natural history of several species.

The bibliography of each species listed is not complete, and includes only descriptive references of the larvae and adult males. A list of the Rhyacophila (Schmid, 1970) occurring in eastern North America is given, because it includes species which probably later will be recorded from Pennsylvania.

**List of Eastern Nearctic Rhyacophila**

* <i>fuscula</i> Group
  *† <i>fuscula</i> (Walker 1852) Neuronia
  † <i>vuphipes</i> Milne (1936)

* <i>montana</i> Group
  <i>montana</i> Carpenter (1933)

* <i>glaberrima</i> Group
  † <i>glaberrima</i> Ulmer (1907)

* <i>carolina</i> Group
  *† <i>carolina</i> Banks (1911)
  <i>fenestra</i> Ross (1938a)
  <i>kiamichi</i> Ross (1944)
  † <i>ledra</i> Ross (1939)
† *otica* Etnier and Way (1973)
  teddyi Ross (1939)

  invaria Group
  invaria complex

† banksi Ross (1944)
† invaria (Walker 1852) *Polycentropus*
  parantra Ross (1948)
  shenandoahensis Flint (1958)
*† vibox* Milne (1936)

  nigrita complex
  accola Flint (1972)
  acutiloba Morse and Ross (1971)
  appalachia Morse and Ross (1971)
† carpenteri Milne (1936)
  mycta Ross (1941)
*† nigrita* Banks (1907)

  lobifera Group
  † lobifera Betten (1934)

  angelita Group
  angelita Banks (1911)

  siberica Group
  amicus Ross (1956)
† atrata Banks (1911)
† manistee Ross (1938a)
* melita Ross (1938a)
† minor Banks (1924)

  torva Group
  † torva Hagen (1861)

  acropedes Group
  acropedes Banks (1914)
  ignorata Schmid (1974) ♀ holotype

  ungrouped species

* formosa Banks (1911) ♀ holotype
  mainensis Banks (1911) ♀ holotype
  soror Provancher (1878) ♀ holotype

† Species recorded from Pennsylvania.
* Species recorded from New Jersey.
KEY TO EASTERN NEARCTIC RHYACOPHILA LARVAE
(modified from Flint, 1962)

(Larvae of accola, appalachia, montana, mycta, otica, parantra, and teddyi unknown)

1. Anal proleg with an apicolateral spur (Flint, 1962: Fig. 1b) ........ 2
   Anal proleg without such a spur (Flint, 1962: Fig. 2b) ........... 7

2(1). Apicolateral spur of proleg short and sharply decurved (Flint, 1962: Fig. 6b) ......................................................... 3
     Spur long and evenly curved (Flint, 1962: Fig. 1b) ............. 5

3(2). Body segments with alternating light and dark bands .......... melita
     Body segments not contrastingly banded .......................... 4

4(3). Frontoclypeus with dark "H" pattern (Sherberger and Wallace, 1971: Fig. 1) ......................................................... vuphipes
     Frontoclypeus not patterned as above ............................. amicis

5(2). Frontoclypeus with dark transverse bands forming a "W" pattern (Flint, 1962: Fig. 1c) ................................................. fuscula
     Frontoclypeus without such a pattern .................................. 6

6(5). Head uniformly colored (Flint, 1962: Fig. 4c) .................... atrata
     Head with a dark transverse band posteriorly (Flint, 1962: Fig. 6c) ................................................................. angelita

7(1). Abdomen bearing many branched gills ............................ acropedes
     Abdomen without gills .................................................. 8

8(7). Anal proleg with a free basoventral hook (Flint, 1962: Fig. 2b) 9
     Anal proleg without a free basoventral hook (Flint, 1962: Fig. 8b,d) ................................................................. 12

9(8). Anal claw without ventral teeth (Flint, 1962: Fig. 5d) ........ 10
     Anal claw with ventral teeth (Flint, 1962: Fig. 2b) .............. 11

10(9). Head equal in length and width, with lateral margins obliquely angled (Flint, 1962: Fig. 5a) ................................. minor
      Head slightly longer than wide, with lateral margins curved (Flint, 1962: Fig. 5c) ..................................................... manistee

11(9). Frontoclypeus with a dark "V" pattern (Flint, 1962: Fig. 2c); mandibles edentate (Flint, 1962: Fig. 2a) ......................... torva
      Frontoclypeus not patterned as above; mandibles toothed apically (Flint, 1962: Fig. 11b) ............................................. lobifera

12(8). Second segment of maxillary palps subequal to first (Ross, 1944: Fig. 114) ........................................................... glaberrima
      Second segment of maxillary palps longer than first (Fig. 4d herein) ............................................................... 13

13(12). Anal claw without ventral teeth (Flint, 1962: Fig. 11d), carolina Group ................................................................. 14
      Anal claw with ventral teeth (Flint, 1962: Fig. 8b), invaria Group ................................................................. 16

14(13). Head with distinct pattern of infuscations and muscle scars (Flint, 1962: Fig. 10b) .............................. fenestra and ledra
      Head nearly concolorous .............................................. 15
15(14). Head slightly darkened posteriorly (Flint, 1962: Fig. 11a), (Arkansas and Oklahoma) .................................................. kiamichi
Head uniformly golden brown (Flint, 1962: Fig. 11c; Fig. 4a herein), (Appalachian and Piedmont regions) ...................... carolina

16(13). Head and pronotum nearly black with a conspicuous pattern of pale muscle scars and spots (Flint, 1962: Fig. 9b) ............ acutiloba
Head not marked as above .................................................. 17

17(16). Head narrowing on posterior half (Flint, 1962: Fig. 10a; Fig. 8a herein) .......................................................... carpenteri
Head either parallel sided or broadening posteriorly .................. 18

18(17). Head nearly parallel sided (Flint, 1962: Fig. 9a) .............. nigrita
Head distinctly broadening posteriorly (Flint, 1962: Fig. 8a, c; Fig. 6a herein)—invaria subgroup: banksi, invaria, shenandoahensis and vibox

THE RHYACOPHILA OF PENNSYLVANIA
fuscula Group

Rhyacophila fuscula (Walker)

Neuronta fuscula Walker 1852.

There is no other species of Rhyacophila from North America as frequently documented in the literature as fuscula. It is known from nearly every state and province in the Appalachian Mountains and the surrounding Great Lakes regions. Being a montane species, it is very widespread in the Pennsylvania highlands (Fig. 1). Both Flint (1962) and Roback (1975) discovered it to be the most common species of Rhyacophila in their collections of immatures from the East. However, from the material examined it appears to be no more widespread than carolina in the Alleghenies of Pennsylvania and much less common at elevations below 460 m.

The larvae were often collected from swiftly flowing riffles of pristine mountain streams, ranging from approximately 1.5 to 12 m in width. In the brook (3 to 6 m wide) issuing from Maul Spring, a constant temperature, well-oxygenated spring (9°C ± 1°C), larvae were never taken near the source, but only at distant reaches where water temperature regimes fluctuated diurnally. These observations suggest that the larvae of fuscula prefer a eurythermic environment. Seasonally, larvae were collected in the spring and adults throughout the summer.

Material examined.—Pennsylvania. Elk County: Ridgway, South Branch Island Run, 30 May 1977, 1 larva. Fayette County: Seven Springs, Back Run, 2 June 1977, 1 d. Franklin County: Turnpike between Blue and Kittatinny Mountains, 12 April 1977, 1 larva; 18 May 1977, 3 larvae. Forest County: Kellettville, Ross Run, 5 June 1976, 5 larvae; 27-28 August 1976, 3 ♀ ♂; Marienville Sportsmens Club, Spring Creek, 3-4 July.

**Rhyacophila vuphipes** Milne


*Rhyacophila vuphiphes* Sherberger and Wallace, 1971 (lapsus), (larva).

This species is known from the eastern slopes of the Appalachian Mountains of the middle and southern Atlantic coastal states. It is reported here for the first time from Pennsylvania, while other records exist from Georgia, New York, North Carolina, South Carolina, and...
Tennessee. Its most northern occurrence is in Quebec (Roy and Harper, 1975). However, it is more frequently collected in the southern Appalachian Piedmont region.

In Pennsylvania only one larva was collected from the riffle of a large meandering stream approximately 15 m in width (Fig. 1). Immatures may be collected in the early summer, and adults are on the wing from August to September.

**Material examined.**—Pennsylvania. Cumberland County: Boiling Springs, Yellow Breeches Creek, 12 June 1976, 1 larva; 17–18 September 1976, 2 ♀♂.

**glaberrima Group**


This species, the only member of the *glaberrima* group, is widely distributed throughout eastern and central North America. It is recorded for the first time from Pennsylvania, where it was collected commonly from the central and western highlands (Fig. 2). Other state and provincial records include Georgia, Illinois, Massachusetts, New Hampshire, New York, North Carolina, Nova Scotia, Quebec, Tennessee, and Virginia. In Pennsylvania larvae were found in small
streams and springs. Immatures may be collected in the spring and summer, and adults in the late summer and early autumn.


carolina Group

Rhyacophila carolina Banks


Rhyacophila carolina was the most commonly collected species in this study, occurring throughout the western slopes of the Ohio River Valley, the central ridge and valley system of the Alleghenies, and the rolling foothills of the southeastern Piedmont (Fig. 3). It is also known from Kentucky, Maine, Massachusetts, New Hampshire, New York, North Carolina, Quebec, South Carolina, and Tennessee.
Fig. 4.—Rhyacophila carolina, larva: A = head and pronotum, dorsal view; B = anal proleg, lateral view; C = mandibles, dorsal view; D = maxillary palpus (MP).

Description of larva (Fig. 4).—Overall length of mature larva 16 mm. Head: Distinctly narrowing anteriorly; coloration variable; in some specimens golden brown, immaculate; in others, slightly darker with faint muscle scars; right mandible with three apical teeth, middle tooth slightly longer than dorsal tooth and much longer than ventral tooth. Left mandible with two apical teeth subequal in length. Abdomen: Anal proleg with very short basoventral and apicolateral processes, the latter barely noticeable; anal claw with no ventral teeth. Neves (1977) has associated this species with the larval form, R. sp. 5 of Flint (1962). It is the authors’ opinion that the larval forms of R. sp. 6 and R. sp. 7 of Roback (1975) are both carolina.

Habitat.—Many larvae were collected from small pristine streams 0.6 to 4.8 mm in width. Occasionally, immatures were also found in springs. Mature larvae were collected from February to August, prepupae from February to May, pupae from May to August, and adults from April to October. These observations make it difficult to determine either if most mature larvae discovered in the late summer pupate and emerge in the autumn, or if some may overwinter as pupae. These overwintering pupae may be part of a second generation that emerge in the spring, or there may be two cohorts involved.

Rhyacophila ledra Ross


This species has been recorded previously from Georgia, Illinois, North Carolina, Ohio, and Tennessee. It is not common in Pennsylvania, from which it is recorded for the first time (Fig. 3). Its overall distribution apparently entails the Ohio River Valley and the southern Appalachian Mountains. There are insufficient data available to conclude what is the definitive aquatic habitat of this species. Ross (1944) collected a few mature pupae in May from a small temporary stream. Adults have been collected on the wing in June.

Rhyacophila otica Etnier and Way

This species previously recorded from Tennessee by Etnier and Way (1973) is relatively uncommon in Pennsylvania where only a few adult specimens have been collected at an ultraviolet light trap (Fig. 3). The immature stages of this species remain unknown.


invaria Group

This group is composed of two subgroups, the invaria subgroup and the nigrita subgroup (Schmid, 1970) both of which are restricted to eastern Nearctica.

invaria Subgroup

Rhyacophila banksi Ross, 1944 (male and female genitalia).

Rhyacophila sp. 3 (carpenteri ?). Flint, 1962.

This interesting species was found to be rather common in the Appalachians of western Pennsylvania (Fig. 5). Other state records include New Hampshire, Tennessee, and Vermont.
Description of larva (Fig. 6).—Overall length 16 mm. **Head**: Coloration variable; in some, golden brown, in others dark brown with an irregular row of pale muscle scars extended on each side of the front and the coronal suture. Muscle scars faintly distinguishable on the frontocephalis, lateral and posterior portions lighter; right mandible with three apical teeth, mesal tooth longest; left mandible with two apical teeth, ventral tooth longer; maxillary palpi with second segment twice as long as the first. **Abdomen**: Proleg with basoventral and apicolateral processes, neither free of membrane; claw with one large ventral tooth and sometimes a smaller tooth.

Flint (Roback, 1975) was of the opinion that "it is impossible to separate the larvae of *R. invaria*, *R. shenandoahensis*, and *R. vibax." Likewise, we are unable to distinguish the larvae of *R. banksi* from these three species.

Discussion.—These species, besides sharing a hypothetical common ancestor and many synapomorphic characters, also appear to inhabit similar aquatic environments, specifically small streams and springs. Furthermore, it is uncommon for more than one species of the *invaria* subgroup to occur at the same locality, therefore the species involved appear to be allopatric.
Habitat. — Many larvae of *hanksi* were collected from small streams and springs (0.3 to 1.2 m wide). However, a few were collected near the confluence of the hatchery spring and Spring Creek at Marienville. Immatures were also taken from Spruce Run, a naturally acidic stream (pH = 3.5 in July). Seasonally, immatures have been collected in the spring and early summer, and adults are on the wing from June to August.


*Rhyacophila invaria* (Walker)

*Polycentropus invariatus* Walker, 1852.

In Pennsylvania this species was collected only in the eastern regions of the Tuscorora Mountains and the Piedmont (Fig. 5). It is apparently separated in distribution from *hanksi* which is common in the western mountains of the Appalachians. It is also known from Maine, Massachusetts, New York, Quebec, and Nova Scotia. Several larvae were collected in springbrooks from February to July, mature pupae in June, and adults were on the wing in June and July. The larvae are very similar to those of other species of the *invaria* subgroup (see *hanksi*).


*Rhyacophila vibox* Milne

This is the most widely dispersed species of the *invaria* subgroup, being known from Illinois, Maine, Massachusetts, Michigan, New Hampshire, New York, North Carolina, Ontario, Quebec, Tennessee, Vermont, Wisconsin, and recorded herein for the first time from Pennsylvania and New Jersey (Fig. 5). Its distribution in Pennsylvania apparently is not restricted to a specific geographic region of the state as observed for two other species of the *invaria* subgroup, *banksi* and *invaria*. The larvae of *vibox* are very difficult to distinguish from the other known larvae of this subgroup (see *banksi*). The immatures of *vibox* have been collected mostly from small eurythermic streams, 0.6 to 1.5 m wide from April to June. Mature pupae and adults occur in May and June.

**Material examined.**—**Pennsylvania.** Beaver County: Raccoon Creek State Park, Mineral Run, 30 May 1976, 2 δ; stream near marina, April 1975, 2 larvae; 28 May 1976, 5 δ pupae, 1 δ: 19 May 1977, 1 larva, 5 δ pupae. Clearfield County: S. B. Elliott State Park, Lick Run, 18 April 1977, 9 larvae, 2 prepupae; 30 May 1977, 2 larvae, 6 prepupae, 14 δ pupae, 1 δ, 1 ♀; 23 June 1977, 12 δ pupae, 8 ♀ pupae; 1 May 1978, 3 larvae, 2 prepupae; 1 June 1978, 2 larvae, 1 prepupa, 3 δ pupae, 4 ♀ pupae, 3 δ ♂. Forest County: Kellettville, small spring near Ross Run, 7 June 1978, 6 δ pupae, 7 ♀ pupae. Potter County: Harmontown, small spring near Route 449, 2 July 1978, 4 larvae, 5 prepupae, 1 δ pupa. Westmoreland County: Rector, Powdermill Nature Reserve, White Oak Run, 31 May 1975, 1 δ, 2 ♀ ♀. New Jersey. Sussex County: Stokes State Forest, small stream near Sawmill Road, 4 April 1977, 3 larvae; 11 April 1977, 1 δ, 2 ♀ ♀; 30 June 1977, 1 larva, 1 prepupa.
Fig. 8.—Rhyacophila carpenteri, larva: A = head and pronotum, dorsal view; B = anal proleg, lateral view; C = mandibles, dorsal view; D = maxillary palpus (MP).

*nigrita* Subgroup

*Rhyacophila carpenteri* Milne


*Rhyacophila* sp. 3 (banksi?). Flint, 1962.

This interesting species is distributed throughout the Appalachian Mountains, being documented from Kentucky, Massachusetts, New Hampshire, North Carolina, and Quebec. It is a new state record for Pennsylvania, where three localities were discovered to be frequented by adults, and subsequent samplings procured several larvae and metamorphotypes (Fig. 7). It is identical to *R*. sp. 3 larval form of Flint.
who remarks, "This species is easily recognized by the shape of the head, for no other species yet found in the East has a head capsule that gradually narrows toward the rear."

**Description of larva** (Fig. 8).—Overall length, 14 mm. **Head**: Light chestnut color, nearly parallel sided, but distinctly narrowing posteriorly; right mandible with three apical teeth, middle tooth longest; left mandible with two apical teeth, ventral tooth longer; maxillary palpi with second segment 2.5 times as long as the first. **Thorax**: Pronotum with a row of setae on the anterior margin, shorter mesad and gradually lengthening anterolaterally. **Abdomen**: Anal proleg with basoventral and apicolateral processes, neither free of the membrane; anal claw with one small ventral tooth.

**Habitat.**—Immatures were collected from a small springbrook, 0.9 to 1.5 m wide, approximately 60 m from the source. Larvae were taken in April and May; prepupae, May and June; pupae, June and July; adults, June, July, and August.

**Material examined.**—**Pennsylvania.** Elk County: Ridgway, spring near Route 949, 3–4 July 1976, 12 ♀♂; 16 April 1977, 1 larva; 30 May 1977, 2 larvae, 2 prepupae; 23 June 1977, 1 prepupa, 2 ♀ pupae; 1 July 1977, 4 ♀ pupae, 1 ♀ pupa; 12 July 1977, 3 ♀ pupae, 3 ♀ pupae, 1 ♂; Ridgway, South Branch Island Run, 3 July 1976, 2 ♀♂.


**Rhyacophila nigrita** Banks


This species is very common throughout the Appalachians, being previously recorded from Kentucky, Massachusetts, New Hampshire, North Carolina, Pennsylvania, Quebec, and Tennessee; specimens reported herein are a new state record from New Jersey. In Pennsylvania it was collected from many different localities (Fig. 7), its larvae typically inhabiting clear mountain rivulets concurrently with *fuscula* and *carolina*. Many immatures were collected at Maul Spring—first instars, from June to August; fifth (last) instars, from November to June; adults, from May to September.

**Material examined.**—**Pennsylvania.** Bedford County: Schellsburg, spring near Route 30, 1 August 1976, 2 larvae. Elk County: Ridgway, South Branch Island Run, 29 May 1977, 1 ♀ pupa. Fayette County: Seven Springs, Neals Run Spring, 2 June 1977, 4 ♂♂; 7 June 1977, 2 ♀ pupae, 2 ♀ pupae. Franklin County: Turnpike between Blue and Kittatinny Mountains, Trout Run, 12 June 1976, 1 ♀; 18 May 1977, 2 larvae. 1 prepupa. Forest County: Kelletsville, Ross Run, 5–6 June 1976, 1 larva, 1 ♀; Tionesta, small stream at Camp Tionesta, 6 June 1976, 1 ♀; Truemans Corner, Minister Creek, 5 June 1976, 1 prepupa. Fulton County: Emmaville, Chestnut Bridge Hollow, 28–29 May 1977, 1 larva, 1 ♀; 1 July 1977, 2 ♀ pupae, 2 ♂♂; McConnellsburgh, Aughwick Creek, 30 June 1977, 2 ♂♂. Lancaster County: New Holland Watershed Area, 4–5 June 1977, 5 larvae, 3 ♀ pupae, 2 ♀♂; 26–27 June 1977, 1 ♀ pupa, 3 ♀♂, 9 ♀♀; 16–17 July 1977, 3 ♂♂, 4 ♀♀. Pike County: Milford, Sawkill Creek, 11 June 1977, 1 prepupa. Tioga
County: Ansonia, Colton Point, Right Branch Run, 1 July 1978, 8 ♂♂, 11 ♀♀. Warren County: Cobham, Rams Horn Spring, 24–25 July 1976, 2 ♂♂, 2 ♀♀; 18 April 1977, 2 larvae. Westmoreland County: Laughintown, Furnace Run, 14–15 July 1976, 1 ♂; Retc-
tor, Powdermill Nature Reserve, Maul Spring, 28 January 1975, 51 larvae; 6 February 1975, 2 larvae; 28 February 1975, 20 larvae; 27 March 1975, 37 larvae; 24 April 1975, 34 larvae; 6 May 1975, 3 larvae, 3 prepupae, 3 pupae; 22 May 1975, 44 larvae, 8 prepupae, 26 pupae; 31 May 1975, 3 ♂♂, 3 ♀♀; 19–20 June 1975, 46 larvae, 8 prepupae, 18 pupae, 102 ♀♀; 16–17 July 1975, 12 larvae, 2 pupae, 23 ♂♂, 50 ♀♀; 13–14 August 1975, 21 larvae, 1 prepupa, 18 ♂♂, 21 ♀♀; 10–11 September 1975, 39 larvae, 1 ♂, 4 ♀♀; 11 October 1975, 54 larvae; 5 November 1975, 52 larvae; 3 December 1975, 93 larvae; 3 January 1976, 38 larvae; 6 May 1977, 3 larvae; 22 January 1977, 4 ♂♂, 6 ♀ ♀, 16 ♂♂, 14 ♀♀; 1 July 1977, 2 prepupae, 4 ♂♂, 2 ♀ ♀. New Jersey. Sussex County: north of High Point State Park near Route 23, Clove Run, 19 May 1977, 1 prepupa. Stokes State Forest, small stream near Sawmill Road, 4 April 1977, 1 larva; 30 April 1977, 15 larvae, 7 prepupae; 11 June 1977, 2 larvae, 3 prepupae, 3 ♂♂, 6 ♀ ♀, 1 ♀.

lobifera Group

Rhyacophila lobifera Betten


This lone member of the lobifera group occurs throughout the Ohio River Valley and the central United States. It is recorded for the first time from Pennsylvania (Fig. 2) while other state records include Illinois, Kentucky, Ohio, Oklahoma, and Tennessee. In Pennsylvania, only one specimen was collected from the riffle area of a stream approximately 6 m wide. However, Ross (1944) mentioned that they were common in small springs and temporary streams. It is probable that this is their definitive habitat as Stern and Stern (1969) found many larvae amid the moss and algae in a springbrook. In Kentucky, Resh et al. (1975) found its flight period to be limited to two weeks in late April and early May.

Material examined.—Pennsylvania. Armstrong County: Vandergrift, Carnahan Run, 16 March 1975, 1 larva.

sibirica Group

Rhyacophila atrata Banks


This montane species is indigenous to the Appalachian Mountains of Massachusetts, North Carolina, New Hampshire, and New York. It is also a new state record for Pennsylvania where adults have been collected from three counties in May and June (Fig. 9). Flint (1962) discovered that the larvae live in riffles of streams 1.8 to 4.8 m wide.

Material examined.—Pennsylvania. Forest County: Kelletville, Ross Run, 5–6 June 1976, 1 ♂, 1 ♀. Franklin County: Turnpike between Blue and Kittatinny Moun-
Fig. 9.—Distribution of the species of Rhyacophila of the sibirica group.

This species has been recorded previously from Michigan, New Hampshire, and New York. This caddisfly is recorded here for the first time from Pennsylvania where we believe it to be relatively rare (Fig. 9). The larvae live in meandering trout streams approximately 4.8 to 5.5 m wide (Flint, 1962). Adults have been collected in late May.


Rhyacophila melita Ross


This species has been recorded from Michigan, New Hampshire, New York, and Vermont. R. melita probably occurs in Pennsylvania, because it has been collected in New Jersey (new state record) only a few miles from the Pennsylvania state line (Fig. 9). These immatures were discovered in a large, clear mountain stream approximately 9 m wide, only a few km east of the Appalachian Trail.
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Material examined. — New Jersey. Sussex County: north of High Point State Park, Clove Run, 16 April 1977, 3 larvae.

Rhyacophila minor Banks


This is the most familiar species of the siberica Group in eastern North America. It has been recorded previously from Maine, Massachusetts, North Carolina, New Hampshire, Nova Scotia, New York, South Carolina, West Virginia, and Tennessee. It is herein recorded for the first time from Pennsylvania where it is relatively common (Fig. 9). Many immatures were collected from Maul Spring, but other records indicate that it inhabits larger streams as well.


torva Group

Rhyacophila torva Hagen


This is the only species of the torva group (Schmid, 1970) and is restricted to eastern Nearctica, where its occurrence is common throughout the Appalachian Mountains. It is known from Maine, Massachusetts, North Carolina, New Hampshire, New Jersey, New York, Quebec, Tennessee, Virginia, Vermont, Washington, D.C., and West Virginia. This is the first report of this species from Pennsylvania, where its larvae were found under large stones in a fast-flowing, limpid stream approximately 6 m wide. Flint (1962) stated that they appear to dwell in streams about 1.8 to 2.7 m in width. Mature larvae may be collected in the spring and adults throughout the summer (Fig. 9).

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Literature Cited


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