

A REVISION OF THE NEARCTIC SPECIES OF THE
GENUS *PHRONIA* (DIPTERA: MYCETOPHILIDAE)

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INTRODUCTION

Phronia contains 86 species of small, brown or black mycetophilids. Adults of these fungus gnats are most often caught flying above the forest floor, especially along damp ravines. The fungivorous larvae have been found grazing on slime molds growing on the surface of decaying logs. Most species occur in the Holarctic region, but 1 described and several undescribed species are known from the Ethiopian region. In North America, there are 49 species, 33 of which are known also from Europe.

The European *Phronia* are fairly well known, due principally to the excellently illustrated monograph by Dziedzicki (1889), but also, due to many subsequent small papers by European authors and the recent review of the Finnish species by Hackman (1970). In North America, however, where comparatively few workers have been attracted to the study of Mycetophilidae, *Phronia* has been rather neglected. The only previous revision of Nearctic *Phronia* was made by Johannsen (1912), who treated 10 of the present species. Four additional species were subsequently described, 3 by Van Duzee (1928) and 1 by Shaw (1951), bringing to 14 the number of North American *Phronia* listed in Laffoon (1965). Only 1 of those 14 species was regarded as Holarctic, but I find that 10 of them are found in both North America and Europe. In this paper 6 of these names are junior synonyms, and *producta* is removed to *Macrobrachius*.

When I began this study, I was aware that there were probably more than 14 species of *Phronia* in the Nearctic region, but it exceeded my expectations to find 49. Because so many were apparently found also in Europe, I tried to see as many previously described species as possible. This survey has given me a clear idea of the distribution of the entire genus so that, while the paper

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is a revision of only the Nearctic fauna, it is a review of the genus as a whole.

I have not been able to establish whether the genus is monophyletic. The characters that define *Phronia* are the result of reductions or losses, e.g. the shortened cubital fork or the lack of mesepimeral setae, various combinations of which have been demonstrated to have occurred several times within the Mycetophilinae. Whether *Phronia* is monophyletic may be determined when data on the biology and larval morphology are available and when closely related genera are revised.

A circular relationship exists between the taxonomy and biology of fungus gnats: to report the results of extensive rearing and biological work, one needs revisions such as this; to do a revision that will bring complete satisfaction, one needs biological and larval evidence.

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I thank the following persons and institutions for the loan of specimens and, in a few cases, for expressly collecting fungus gnats for this study. (If an institution is followed by names of two curators, the first name, placed in parentheses, is that of the curator when the material was originally borrowed.) Academy of Natural Sciences, Philadelphia (J. A. G. Rehn), S. S. Roback; American Museum of Natural History (P. H. Arnaud, Jr.), P. W. Wygodzinsky; British Museum (Natural History), A. M. Hutson; California Academy of Sciences, P. H. Arnaud, Jr.; Canadian National Collection, J. R. Vockeroth; Connecticut Experiment Station, S. W. Hitchcock; Cornell University (H. Dietrich), L. L.

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PROCEDURES

This revision is based on a study of over 4,000 specimens of *Phronia*. These came from 30 personal or institutional collections as listed previously, but chiefly from the Canadian National Collection, Iowa State University, the J. L. Laffoon Collection, and the U.S. National Museum.

I prefer to study fungus gnats that are glued to a pin or to a point or pinned with minuten nadeln. Specimens stored in alcohol are harder to handle, and those that are slide-mounted restrict one to a two-dimensional view. Because *Phronia* specimens are so tiny and the terminalia not always displayed, it is often necessary to prepare the abdomens for viewing under a compound microscope. The entire abdomen is broken off a specimen and dropped into a crucible containing a solution of sodium hydroxide. When cleared, the abdomen is neutralized in a drop of acetic acid, placed in 70% alcohol for a few minutes and then

transferred to a drop of glycerin on a depression slide for microscopic study. The abdomen is later permanently stored in glycerin in a microvial, and the pin bearing the rest of the specimen is then run through the cork stopper of the microvial.

I first sorted specimens into groups according to the shape of the genitalia, which had the more obvious distinguishing characters. After grouping them thus, I searched for other body characters so that I could ultimately associate the sexes. Because non-genital characters are homogeneous in *Phronia*, it was necessary to associate males and females by looking for long series of both sexes that had been caught at the same time and place. Information from rearings of European species was helpful in many cases. Many groups of females with distinctive genitalia could not be associated with males and are not treated further here. I based a species mainly on males because their genitalia contain a greater number of distinguishing characters. Also, the females of many closely related species are quite similar.

My species definition was necessarily a morphological one, based on the presence in each sex of identical or almost identical genitalia. I allowed for intraspecific variation in the form of differences in the lateral portion of the male telomere, but variation in that structure appeared in only a few species, and then usually occurred gradually over a large geographical area. These differences were always independent of the shape of the remainder of the telomere and the aedeagus, which were static in any given species and differed greatly among species.

I then applied names to most of these groups by studying types if available, authoritatively determined material, and illustrations. I was able to see the types of all species described from Nearctic specimens except for *P. incerta* (Adams) which is presumed lost. Thirteen Nearctic species had apparently not been described previously and are treated as new here.

SYSTEMATIC POSITION

Phronia lies within the subfamily Mycetophilinae, members of which have the tibial setae and wing setulae arranged in definite rows, have a short subcosta, and lack a mediocubital crossvein. The genus can be distinguished from all other genera in the sub-

family by the combination of the following characters: mesanepisternal bristles are present, the mesepimeron is naked, the subcosta ends freely, the cubitus is forked well distad of the medial fork, vein Cu_1 is weaker and more divergent from the axis of the cubitus than Cu_2 , the hind coxa lacks a basoposterior seta, the tibial setae are weak, and the male tergum VII is very short.

I cannot show that *Phronia* is monophyletic but am assuming it is for purposes of this revision. The present definition of *Phronia* is based on character states that result from losses and reductions, the combination of which could and, in fact, has appeared many times. Thus there are species belonging to *Trichonta* and even *Mycetophila* that one might key to *Phronia*. For example, I have a series of a species from southern Chile which has the habitus of a *Phronia* with the short cubital fork and the bare mesepimeron but with strong tibial setae. Closer inspection shows that the genitalia are generically similar to those in *Mycetophila*. This is an obvious example of convergence because objective characters show the species is a *Mycetophila*. However, *Phronia* contains many species and species groups that show no positive relationships, but are placed in the same genus because no characters indicate otherwise. The resolution of affinities within *Phronia* will have to await more data on the biology and larval morphology and the revision of related genera.

Phronia and *Trichonta* (excluding the austral South American species referred to the latter) together may be monophyletic. *Trichonta* has the same distribution as *Phronia* and may contain as many species. Both genera lack mesepimeral setae, have short tibial setae, a short male abdominal tergum VII, and the same components forming the complicated telomere.

Phronia differs from *Trichonta* in that the subcosta ends freely instead of bending near the apex to join the radius, the cubital fork begins distad of the medial fork, and the posterior hind coxal setae are absent. In a few species of *Trichonta*, the cubital fork lies apicad of the medial fork (e. g. *T. vulcani* (Dziedzicki)), though not as far as in *Phronia*; in others (e. g. *T. sp.*, probably *icenica* Edwards), the hind coxa lacks a basoposterior seta. In these exceptions, 2 of the 3 character states are still as in typical

Trichonta. A few species in both genera have a ventral row of hind tibial setae, but most do not.

Macrobrachius Dziedzicki appears at first glance very similar to *Phronia*, but the resemblances are evidently convergent. It contains two species, *M. kowarzi* Dziedzicki from Europe and *M. producta* (Johannsen) from North America. As in *Phronia*, the tibial setae are short, the basoposterior hind coxal seta and mesepimeral setae are lacking, the subcosta ends freely, and the cubital fork is very short. Wing characters were responsible for the erection of *Macrobrachius*: the costa is produced more than half the distance between R_5 and M_1 instead of ending just beyond R_5 as in *Phronia*, and the cubital fork is shorter and the anal vein stronger than in any *Phronia*.

Johannsen (1909) thought the differences in the wing venation important enough to retain the genus, but Edwards (1925) did not and considered *Macrobrachius* to be only a slightly aberrant *Phronia*. Laffoon (1965) listed *Macrobrachius* as a synonym of *Phronia*. However, the abdominal tergum VII of *Macrobrachius* is very large and several times as long as tergum VIII; it can even be seen in dried specimens. In *Phronia*, tergum VII is very short, no longer than VIII dorsally, and is hidden within segment VI. A large tergum VII is presumably the primitive character state so that the common ancestor to both genera had to have a large tergum. The fact that *Trichonta* has also a very short tergum VII also shows closer affinity between *Phronia* and *Trichonta*. Although the wing differences of *Macrobrachius* are subjective in that they do not indicate evolutionary direction, they are more important when correlated with the tergal characters.

BIOLOGY

Adult *Phronia* are most often collected along the banks of streams in woodlands. No larvae of *Phronia* have been reported from North America, but 11 species have been reared from Denmark (Steenberg, 1924, 1943) and Great Britain (Edwards, 1925b; Buxton, 1960). In general, the known larvae are short, ovoid, and graze on slime molds and other fungi growing on the surface of sodden, barkless logs; most are covered with a thin layer of sticky mucus, but larvae of *annulata* and *biarcuata* have

a thick, black, slimy coating, and those of *strenua*, a black, conical test. The covering on these last 3 species is supplied largely by the larva's own excrement. Steenberg (1924) found that when he removed the covering from a *strenua* larva, another was immediately begun: the larva extended its posterior segments over itself and deposited fecal matter which was transported anteriorly over the body by undulatory movements. Not all *Phronia* larvae are free living: some of *siebeckii* have been reared from a basidiomycete (Freeman, 1956).

DISTRIBUTION

Of the 86 valid species of *Phronia* 33 are Holarctic, 35 Palearctic, and 16 Nearctic. One of the remaining 2 is from the Seychelles Islands, the other from the Bonin Islands. In addition I have seen 2 undescribed species near *forcipula* from the Palearctic region and 6 undescribed from Africa south of the Sahara. *Phronia* is unknown in the Americas south of the United States or in the Australian and Oriental Regions.

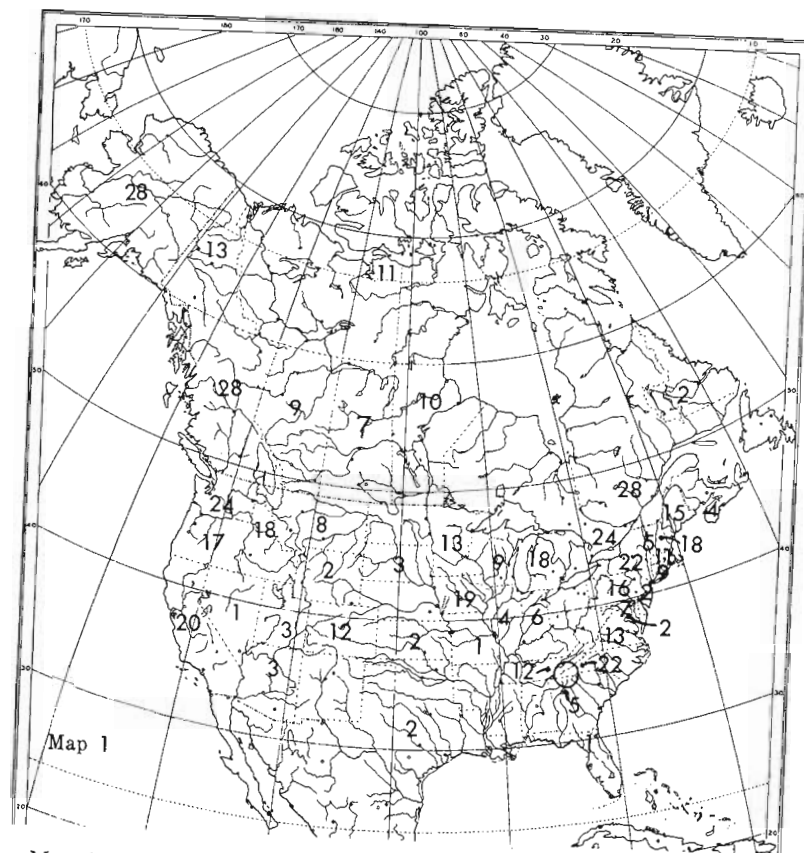
The larger number of Palearctic than Nearctic species is due in part to the several species known from females only; these will probably eventually be associated with species known from the males only. Nonetheless, the greater number of Palearctic species is probably a reflection of the actual state of affairs. In many natural groups or pairs of species, e.g. *nigricornis-dubioides-minuta-nitidiventr* or *conformis-peculiaris*, one species (the first in the 2 cases above) is Holarctic, the other(s) Palearctic. For whatever reason, Europe has more species of every species group than does North America.

The Nearctic and Palearctic areas have more species in common in boreally distributed groups than in more southerly distributed groups. Thus 5 of 6 species of the northern group made up of *exigua* and its relatives (*egregia*, *flavipes*, *tiefii*, *matilei*, and *spinigera*) are Holarctic. One, *spinigera*, is known only from the type-locality in Finland and may yet be found in North America. The 2 regions share also most species of the group containing *port-schinskyi*, which also has a far northern distribution. The species group containing *nebulosa* and *biarcuata* reaches farther south in both Europe and North America than do other species groups

and shows the greatest amount of endemism and infraspecific variation. This widely distributed group may have become more easily isolated during periods of glaciation. In fact there are minor genital differences between eastern and western specimens of *nebulosa*, a Nearctic species. These differences may well be the result of geographic isolation during the last ice age.

In North America, *Phronia* is chiefly northern in distribution, with some species restricted to Canada and Alaska. Map 1 shows the number of species I have seen from each state or province in North America. There is a definite collection bias. I consider Iowa, the vicinity of Ottawa, Ontario, northeastern United States, and Great Smokies National Park in southeastern United States to be well collected. In central Iowa, J. L. Laffoon made several trips each year between 1947 and 1972 to Ledges State Park expressly to collect fungus gnats; the collection dates on specimens caught near Ottawa by J. R. Vockeroth and Colleagues of the Biosystematics Research Laboratory, Canada Department of Agriculture, are very numerous; and Highlands, N.C., was the collecting base for many entomologists who collected fungus gnats in the late 1950's. Although there are some states between Iowa and the Atlantic coast where *Phronia* have not been collected, one can predict what will be found because most of the species found in the East are widespread in North America. This is not the case with the fauna found in western North America. That is where so many apparent endemics and most of the species known from only a few localities occur. Whereas some areas in the West have been sampled many times, I do not consider any of it well collected and predict that more species of *Phronia* will be found there.

Only 2 common species in eastern North America do not occur in the West. These are the Nearctic *similis* and the Holarctic *conformis*. However, in the West there are many species, most of them known from several localities, that are not found east of the Rocky Mountains: *avida*, *agilis*, *versuta*, *felicis*, *jocosa*, *oreas*, *hilaris*, *laffooni*, *tenebrosa*, *terrea*, *lutescens*, *gracilis*, *digitata*, and *matilei*. All except the last 4 are also endemic to western North America; 3 of those 4 are known elsewhere only from Finland and *matilei* is known additionally only from a cave in Switzerland.



MAP 1. — Number of *Phronia* species caught in each state or province.

TERMINOLOGY AND DISCUSSION OF CHARACTERS

In the species descriptions, wing length is given to indicate general size. The color of *Phronia* adults ranges from yellow and light brown to black. As Dziedzicki (1889) demonstrated, coloration is too variable for use as a species criterion. Only a few species are uniformly light or dark. While specimens of the 3 species found on Ellesmere Island in the Arctic Circle are all black, more southern specimens of these species are brown. The mesanepisternum, the large pleural sclerite between the fore coxa

and mesoscutum (Fig. 1), usually has 2-3 setae along the dorso-caudal edge, but in some species, the setae are more numerous and are situated along the dorsal edge also. Wing venation is labelled in Fig. 2. In a few species a dark apical cloud and a smaller, cubital cloud are usually present. The 4 rows of erect, short setae on the mid and hind tibiae are on the anterior (abbreviated "a"), dorsal (d), posterior (p), and ventral (v) surfaces. The setae of the anterior and dorsal rows are longer than those on the posterior and ventral rows, and most species lack a ventral row on the hind tibia. Counts of wing vein setulae and tibial setae were based on one wing, one mid tibia, and one hind tibia each of 15 specimens, if available, of each species. One may find distinct differences in those characters between any two species, but I found most of them to be undiagnostic and too variable for use as key characters.

The telomere (Figs. 3, 5) of the male genitalia appears complicated at first glance. It can be regarded as a collapsed sphere, the edges of the bowl so formed being scalloped and otherwise variously modified for holding the female abdomen during mating. The whole can be considered as 3 distinct parts that are joined basally to one another. The lateral portion is setose laterally, rarely also mesally, and usually encompasses a basoventral projection that is setose apically. This is the only part of the telomere that I consider to show intraspecific variation. The dorsal portion of the telomere is composed of a basal, setose arm and a dorso-cephalic, disc-shaped extension that is lined along the margin with strong setae. The mesal portion of the telomere is made up of a number of membranous, often bizarre lobes. One or more of its lobes is closely corrugated, giving them the appearance of tire treads.

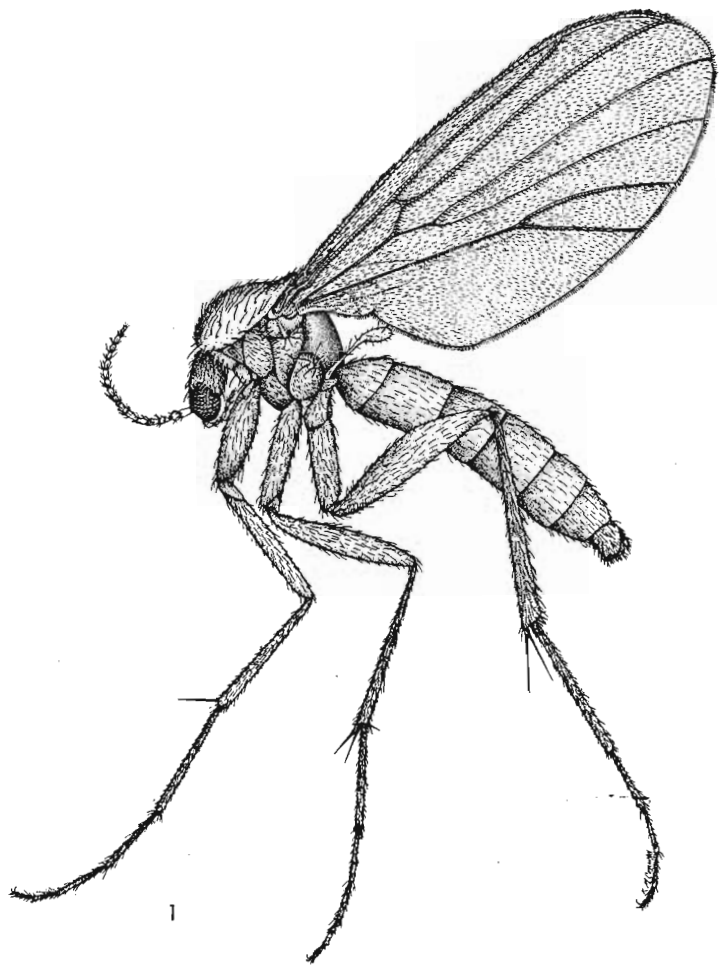
PRESENTATION OF INFORMATION

In the systematic section that follows, the 49 valid species and 2 Nearctic nomina dubia are treated in alphabetical order, thus eliminating the need for an index. I have named a new species in honor of the late Jean Laffoon. Two other names, *dryas*, and *oreas*, mean "wood nymph" and "mountain nymph," respectively; the remaining ten names are short adjectives chosen for their

pleasant sounds and connotations. For the synonymies, I have cited only the original descriptions and changes in status.

Types. — The types of most of the Winnertz species were destroyed during World War II (Tuomikoski, 1960). Fortunately, Dziedzicki (1889) illustrated the genitalia of all the Winnertz specimens that were in Bonn. Three Winnertz types probably exist, but, because each was based on a female and thus could not be identified with certainty, I did not concern myself with them here: *apicalis* and *lepida* in the Zoological Museum, Berlin, and *pigra* in "the Osten Sacken Collection" in Leningrad. Dziedzicki's types were also destroyed during World War II (Sachtleben, 1961), but as is the case with the Winnertz types, Dziedzicki's illustrations of the genitalia leave little doubt as to the identity of his species. Current place names are given for the type localities. The type series of the 6 species described from the Canary Islands by Santos (1920) are in the care of Santos' heirs and are presently not available to me.

Material examined. — I listed only the number of specimens and the number of times and places a species was collected in North America. The map accompanying each species will indicate the distribution at a glance. The depositories of the paratypes are listed in parentheses. Abbreviations for the museums are as follows: CAS, California Academy of Sciences; CNC, Canadian National Collection; CU, Cornell Univ.; ISU, Iowa State Univ.; OSU, Oregon State University; UK, University of Kansas; and USNM, U. S. National Museum. Each paratype is plainly marked with a blue label. The complete list of collection data for this revision is presently in the files of the Diptera Section in the Systematic Entomology Laboratory, USDA, but will eventually be deposited in the Smithsonian Archives. Some maps may show the distribution of more than one species. Unless stated otherwise, no affinities are implied between or among species shown on the same map. Only the locations of specimens actually seen are shown on the maps. Various faunal lists (Cole & Lovett (1921), Johnson (1925), Shaw & Townes (1936), Sherman (1920), and Strickland (1933)) have recorded species based on specimens I have not seen, but in each case those species should occur in the areas surveyed by those lists.

FIGURE 1. — *P. willistoni*, ♂.

Remarks. — Under this heading are notes concerning apparent relationships with other species, morphological variation, and biology. For many species there was nothing to say on these subjects and nothing is written.

Illustrations. — All the genital figures except 3, 138, and 140 are drawn to the same scale. I did not illustrate the female

terminalia if that has been done elsewhere unless, as in the case of the group containing *portschinskyi*, the drawings were necessary to point out differences among species.

SYSTEMATIC TREATMENT

Genus PHRONIA Winnertz

Phronia Winnertz 1863:857. Type-species, *Phronia rustica* Winnertz (= *P. exigua* (Zett.), by subs. desig. of Johannsen (1909)).

Telmaphilus Becker 1908:66. Type-species, *Telmaphilus biarcuata* Becker, by subs. desig. of Johannsen (1909). Syn. by Edwards (1925b).

Adult. — Antenna with 14 flagellomeres. Palpus 4-segmented. Mesonotum with long setae laterally and in 2 longitudinal rows beginning near humeral angles and converging toward scutellum. Scutellum with 4 strong, marginal setae sometimes interspersed with weak hairs. Postnotum with short hairs. Pronotum and proepimeron only partially separated, each usually with 1-2 large setae and smaller hairs. Mesanepisternum hexagonoid with 2-7 setae along posterodorsal edge and occasionally along dorsal edge. Mesokatepisternum and mesepimeron bare. Pleurotergite with 10-15 long setae. Metepisternum with 2 setae on posterior edge. Hind coxa without posterior setae. Fore tibia with 1 apical spur, mid and hind tibiae each with 2 apical spurs. Mid tibia with 4 rows and hind tibia with 3-4 rows of short, erect bristles differentiated from the many longitudinal rows of setulae. Fore tarsus of female dilated in some species. Wing: Sc short and ending free. C only slightly produced beyond apex of R_5 . Fork of Cu beyond fork of M. Setulae present on both surfaces of R, and on dorsal surfaces only of r-m, M_1 , M_2 , Cu petiole, Cu_1 , and Cu_2 .

Segments I-VI of male abdomen with broad, rectangular terga and narrower sterna; segments 7-8 with very short terga and sterna; segment IX, the parameres, each divided into a large basal portion fused basally and ventrally to its counterpart to form a cupulate structure surrounding the aedeagus, and apical telomeres; and segment X consisting of a rectangular tergum and 2 apical cerci, and directly ventrad of cerci, sternum X.

Female abdomen with terga and sterna I-VII rectangular; tergum and sternum VIII smaller, of various shapes, the former sometimes divided caudomesally. Cerci 2-segmented.

Larva. — Short, ovoid, sluglike to elongate-cylindrical. For details and illustrations of selected larvae, see Madwar (1937).

KEY TO MALES OF NEARCTIC PHRONIA

This key is based mainly on genital characters, which are difficult to see in dried specimens. The abdomen must usually be prepared for microscopic study before proceeding very far with the key.

1. Caudoventral edge of basimere strongly concave; length of basimere

- mesoventrally about $\frac{1}{2}$ or less than laterally (e.g., Figs. 22, 87, 129) 2
- Caudovergent edge of basimere weakly concave, straight, or convex .. 8
2. Legs very long, thin; setal row present on ventral surface of hind tibia 3
- Legs more normal (as in Fig. 1); setal row absent from ventral surface of hind tibia 4
3. Lateral portion of telomere divided; setae of dorsal portion of telomere strongly bent (Figs. 22-23) *P. tieffi*
- Lateral portion entire; setae of dorsal portion straight (Fig. 24) *P. matilei*
4. Telomere as long as basimere, setose on both mesal and lateral surfaces; setae ranged along ventral cleft of basimere much longer than elsewhere (Figs. 30-31) *P. nigricornis*
- Telomere shorter than basimere, bare on mesal surface; ventral setae of basimere of approximately equal length 5
5. Lateral portion of telomere "C"-shaped in ventral view (Figs. 87, 96) 6
- Lateral portion of telomere not "C"-shaped (Figs. 95, 129) 7
6. Apices of lateral portion of telomere pointed, the ventral apex bare, the dorsal with 2 setae (Figs. 96-97) *P. cornuta*
- Apices of lateral portion not as pointed, the ventral apex with several mesal setae, the dorsal bare (Figs. 87-89) *P. caliginosa*
7. Lateral portion of telomere entire, its setae as long as telomere (Figs. 93-95) *P. cordata*
- Lateral portion concave apically, its setae much shorter than telomere (Figs. 128-129) *P. gracilis*
8. Caudovergent edge of basimere convex mesally (Figs. 14, 19, 122) .. 9
- Caudovergent edge concave or straight, not convex 12
9. Setal row present on ventral surface of hind tibia 10
- Setal row absent on ventral surface of hind tibia 11
10. Lateral portion of telomere evenly rounded caudally; corrugations of telomere extensive (Figs. 17-18) *P. exigua*
- Lateral portion triangular; corrugations more restricted (Figs. 14-16) *P. egregia*
11. Venter of basimere much longer mesally than laterally, bilobed apically; telomere long, attenuate *P. sudetica*
- Venter of basimere not longer mesally than laterally; telomere higher than long *P. flavipes*
12. Lateral portion of telomere with basoverventral, elongate-cylindrical projection, the latter usually with 2 apical setae (e.g. Figs. 6, 52, 80) 13
- Lateral portion of telomere without such projection (e.g. Figs. 9, 12, 47) 24
13. Lateral portion of telomere pincerlike (Figs. 50, 52, 55, 58) 14
- Lateral portion shaped otherwise 17
14. Ventral pincer of lateral portion of telomere naked apically; edge of dorsal portion of telomere straight, with row of many equally strong setae (Figs. 58-59) *P. cinerascens*
- Ventral pincer setose apically; edge of dorsal portion curved, its setae diminishing in size mesally 15
15. Dorsal pincer of lateral portion of telomere with several setae; aedeagus without caudal projections (Figs. 52-54) *P. tenuis*
- Dorsal pincer of lateral portion with only 2 setae; aedeagus with caudal projections 16
16. Telomere approximately as long as basimere, arms of the lateral portion long (Figs. 55-57) *P. fusciventris*
- Telomere much shorter than basimere, arms of the lateral portion short (Figs. 50-51) *P. bicolor*
17. Caudovergent edge of basimere stepped (Figs. 110-112) *P. forcipula*
- Caudovergent edge concave or straight, not stepped 18
18. Lateral portion of telomere convex caudally, evenly setose (Figs. 80, 125) 19
- Lateral portion otherwise 20
19. Basoverventral projection of lateral portion of telomere wide, with several setae; lateral portion of telomere with 2 mesal projections (Figs. 124-125) *P. terrea*, n. sp.
- Basoverventral projection of telomere otherwise; lateral portion without mesal projections (Figs. 80-82) *P. agilis*, n. sp.
20. Lateral portion of telomere longer than high, naked apically (Figs. 116, 127) 21
- Lateral portion higher than long, setose apically (Figs. 4, 60, 98) 22
21. Lateral portion of telomere naked above base, except for 2 strong setae on dorsal edge (Figs. 116-118) *P. effusa*, n. sp.
- Lateral portion setose on most of its lateral surface (Figs. 126-127) *P. jocosa*, n. sp.
22. Mesal portion of telomere with 2 corrugations; wing often with dark apical cloud (Figs. 4-6) *P. nebulosa*
- Mesal portion with 1 corrugation (Figs. 61, 98); wing without apical cloud 23
23. Lateral portion of telomere with 1 short, basoverventral projection (Figs. 60-61) *P. similis*
- Lateral portion with 1 short and 1 long basoverventral projections (Figs. 98-100) *P. persimilis*
24. Genitalia yellow; caudovergent edge of basimere with "V"-shaped cleft; telomere as long as basimere (Figs. 62, 64) 25
- Genitalia usually brown; caudovergent edge of basimere curved or straight; telomere usually shorter than basimere 26

25. Lateral portion of telomere bifid apically (Figs. 62-63) *P. conformis*
Lateral portion entire apically *P. laffooni*, n. sp.
26. Lateral portion of telomere quadrate, setose along entire caudal margin (Figs. 32, 44, 45, 47) 27
Lateral portion indented or rounded caudally, not quadrate 31
27. Aedeagus short (Fig. 46); lateral portion of telomere naked on caudal $\frac{1}{2}$, except for the short, wavy setae along caudal margin (Figs. 45-46) *P. petulans*
Aedeagus longer (e.g. Fig. 35); lateral portion of telomere without extensive naked area 28
28. Cerci with uniformly short apical setae; aedeagus broadly rounded apically in lateral view, shallowly bifid in dorsal view (Figs. 32-36) *P. portschinskyi*
Cerci each with 1 very long apical seta; aedeagus pointed in lateral view, deeply bifid in dorsal view (Figs. 40-43, 48) 29
29. Genitalia often yellow; lateral portion of telomere with several to many spiniform setae on mesodorsal corner; aedeagus as in Figs. 40-41 (Figs. 37-41) *P. mutabilis*
Genitalia brown; lateral portion of telomere without spiniform setae; aedeagus as in Figs. 42-43, 48 30
30. Lateral portion of telomere with short, wavy setae along caudal edge; dorsal portion of telomere with spiniform seta; aedeagus as in Figs. 42-43 (Figs. 42-44) *P. obtusa*
Lateral portion of telomere without short, wavy setae caudally; dorsal portion of telomere without spiniform seta; aedeagus as in Fig. 48 (Figs. 47-49) *P. taczanowskyi*
31. Lateral portion of telomere completely covered with setae on both lateral and mesal surfaces (Figs. 25-26, 28) 32
Lateral portion without or with few setae on mesal surface 33
32. Basimere ventrally with setae along margin much stronger than elsewhere (Figs. 28-29) *P. dryas*, n. sp.
Basimere ventrally with setae of approximately uniform size (Figs. 25-27) *P. felicitis*, n. sp.
33. Wings usually with dark apical cloud; mesal portion of telomere with 2 corrugations and 1 elongate-cylindrical, smooth projection (Fig. 7) 34
Wings not clouded; mesal portion of telomere shaped otherwise 35
34. Lateral portion of telomere concave caudally, ventral prominence larger than the dorsal (Figs. 11-13) *P. tenebrosa*
Lateral portion of telomere with 3 prominences, the dorsalmost largest (Figs. 7-10) *P. willistoni*
35. Lateral portion of telomere almost completely divided into 2 distinct lamellae (Figs. 66, 69, 90) 36
Lateral portion of telomere entire, however much incised 38
36. Dorsal and ventral sections of lateral portion of telomere evenly setose (Figs. 68-69) *P. lutescens*
Ventral section of lateral portion mostly naked (Figs. 66, 90) 37
37. Setose lateral portion of telomere longer than high (Figs. 90-92) *P. nigripalpis*
Setose lateral portion shorter than high (Figs. 66-67) *P. braueri*
38. Lateral portion of telomere with 4 distinct prominences (Figs. 84, 101, 104, 108) 39
Lateral portion with only 2-3 distinct prominences 42
39. Lateral portion of telomere much longer dorsally and ventrally than mesally (Figs. 107-109) *P. digitata*
Lateral portion not longest both dorsally and ventrally 40
40. One of 2 central prominences of lateral portion of telomere longest (Fig. 104) *P. interstincta*
Dorsalmost prominence of lateral portion of telomere longest (Figs. 84, 102) 41
41. All prominences of lateral portion of telomere pointed caudad (Figs. 83-84) *P. disgrega*
One of central prominences of lateral portion pointed mesad (Figs. 101-103) *P. distincta*
42. Lateral portion of telomere setose on considerably more than half of its lateral area 43
Lateral portion naked for considerably more than half its expanse .. 47
43. Lateral portion of telomere naked on basal half (Figs. 130-131) *P. sylvatica*
Lateral portion setose on at least part of basal half 44
44. Mesal portion of telomere with 2 corrugations (Figs. 85-86) *P. oreas*, n. sp.
Mesal portion of telomere with 1 corrugation (Figs. 70, 77, 78) 45
45. Caudal edge of lateral portion of telomere nearly straight, usually with 2-4 strong setae (Figs. 74-77) *P. cupida*, n. sp.
Caudal edge of lateral portion variously incurved (Figs. 70, 78) 46
46. Lateral portion of stylomere with long projection pointing ventrad; caudal projections of aedeagus pointed (Figs. 70-72) *P. avida*, n. sp.
Lateral portion quadrate ventrally; caudal projections of aedeagus more rounded (Figs. 78-79) *P. strenua*
47. Lateral portion of telomere longest ventrally; basimere with 2 ventro-apical setae much larger and longer than surrounding setae (Figs. 105-106) *P. versuta*, n. sp.
Lateral portion of telomere shaped otherwise; basimere ventrally with setae of approximately same size and length (Figs. 115, 119) 48
48. Lateral portion of telomere with 3 caudal prominences (Figs. 119-121) *P. melica*, n. sp.

Lateral portion with 2 caudal prominences (Figs. 113-115)
 *P. hilaris*, n. sp.

SPECIES DESCRIPTIONS

Phronia agilis, new species

Adult. — Wing length: ♂, 2.2-2.5 mm. Body dark brown, legs yellow to fuscous yellow. Anepisternum with 2 setae. Setulae on wing veins: rm, 0-2; M_1 , 39-49; M_2 , 32-41; Cu petiole, 4-12; Cu_1 , 10-20; Cu_2 , 6-14. Setae on mid tibia, 2-4a, 2-3d, 5-7p, 6-7v; on hind tibia, 5-8a, 7-10d, 7-8p. Male genitalia as in Figs. 80-82, brown. Female unknown.

Holotype. — ♂, North Fork Pass, Ogilvie Mts., 4100', Yukon, 13-VI-1962, R. E. Leech, deposited in CNC.

Paratypes. — Isabel Pass, Richardson Highway, Alaska (♂); North Fork Pass, Ogilvie Mts., Yukon (8♂♂); Aklavik (♂), Chesterfield (♂), Northwest Territories [CAS, CNC, USNM]. Map 2.

Phronia avida, new species

Adult. — Wing length: ♂, 2.3-2.6 mm. Body yellow to brown; basal abdominal segments yellow with brown triangular marks; legs mainly yellow. Setulae on wing veins: rm, 2-3; M_1 , 38-43; M_2 , 29-41; Cu petiole, 12-26; Cu_1 , 14-18; Cu_2 , 11-14. Setae on mid tibia, 2-5a, 2-3d, 5-8p, 6-8v; on hind tibia, 7-9a, 11-13d, 4-8p. Male genitalia as in Figs. 70-73, brown. Female unknown.

Holotype. — ♂, Lewis and Clark State Park, Lewis Co., Washington, VII-27-1924, A. L. Melander, USNM Type No. 66612.

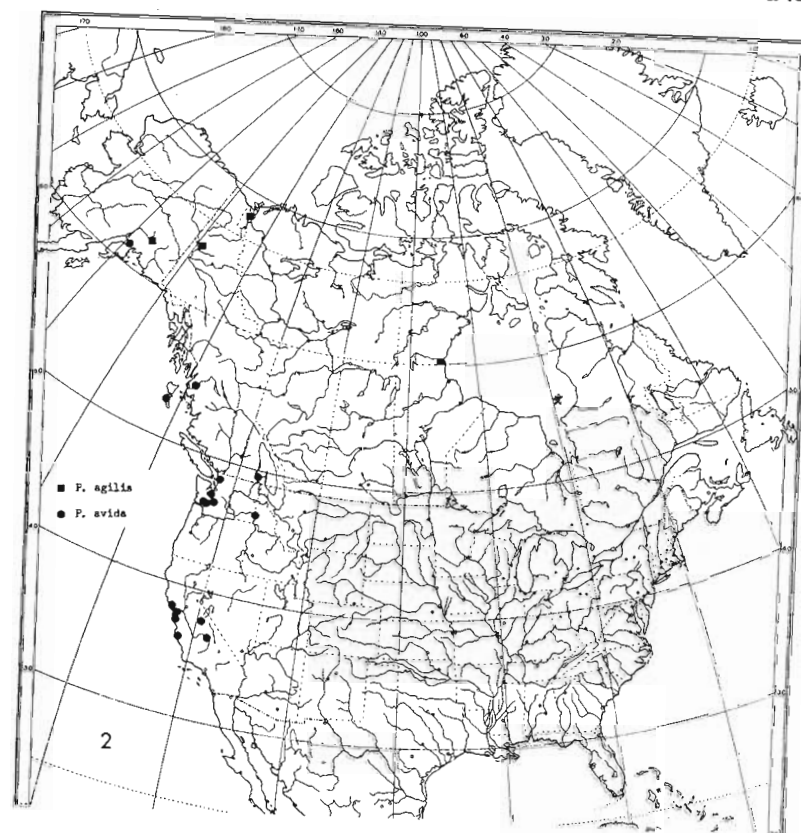
Paratypes. — 36♂♂ from 26 collections in 19 localities in western North America [USNM, CNC, ISU, and CAS]. Map 2.

Remarks. — *P. avida* shows an apparent affinity with *strenua*: although different in both species, the aedeagus is petaliform and the mesal portion of the telomere possesses the same general structures.

Phronia bicolor Dziedzicki

bicolor Dziedzicki 1889:510, pl. 14, Figs. 46-48, ♂; restored name (syn. under *tarsata* Staeger: Hackman (1970)).

Adult. — Wing length: ♂, 2.8-3.2 mm. Body brown, legs lighter, sometimes yellow. Anepisternum with 2-3 setae. Setulae on wing veins: rm, 2-4; M_1 , 49-58; M_2 , 42-46; Cu petiole, 14-20; Cu_1 , 18-22; Cu_2 , 13-15. Setae on mid tibia, 3-5a, 3-4d, 5-7p, 6-8v; on hind tibia, 7-9a, 7-11d, 5-7p. Male



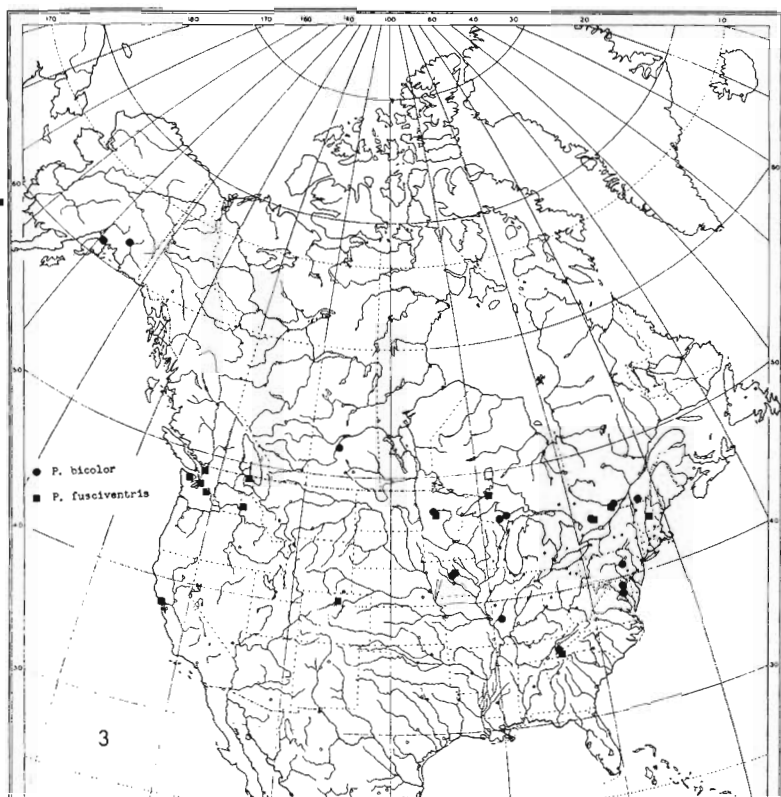
MAP 2. — *P. agilis* Gagné, *P. avida* Gagné.

genitalia as in Figs. 50-51, brown. Female reportedly as for *fusciventris* (Hackman (1970), as *crassitarsus*).

Holotype. — ♂, Ruda Guzowska [nr. Warsaw], Poland, collected VII, destroyed during World War II.

Material examined. — 26♂♂ from 22 collections in 20 localities in North America (Map 3). I have also seen specimens from Switzerland. *P. bicolor* has been recorded from Poland, Finland, France, and Great Britain.

Remarks. — *P. bicolor* is closely related to *fusciventris*: the general conformation of the telomeres is similar in both species,



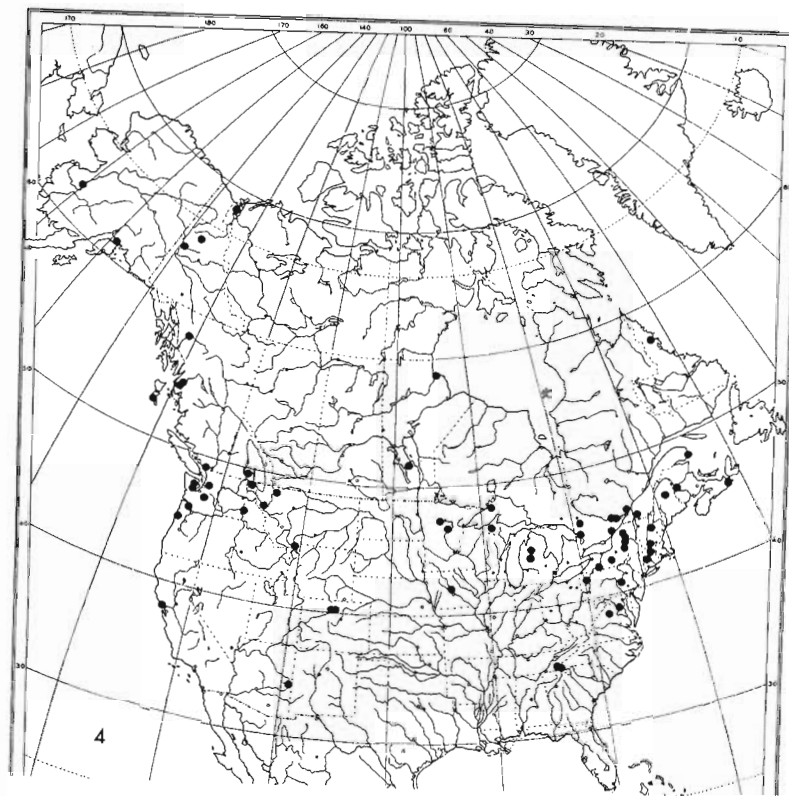
MAP 3. — *P. bicolor* Dziedzicki, *P. fusciventris* Van Duzee.

and Hackman (1970) reports that the ♀ terminalia are similar. See under *fusciventris* for further remarks.

Phronia braueri Dziedzicki

Braueri Dziedzicki 1889:466, pl. 16, Figs. 91-93, ♂, not ♀.

Adult. — Wing length: ♂, 2.6-3.4 mm; ♀, 2.7-4.1 mm. Body mainly light brown to brown; ♂ abdomen sometimes dark brown, ♀ abdomen banded yellow and brown; legs mainly yellow. Anepisternum with 2-3 setae. Setulae on wing veins: rm, 1-4; M_1 , 44-58; M_2 , 34-48; Cu petiole, 20-26; Cu_1 , 13-21; Cu_2 , 11-20. Setae on mid tibia, 2-5a, 2-6d, 7-11p, 6-9v; on hind tibia, 8-11a, 8-13d, 3-9p. Male genitalia as in Figs. 66-67, dark brown. Female terminalia light brown to brown (see Dziedzicki (1889), Figs. 189-191 (as *annulata*)).



MAP 4. — *P. braueri* Dziedzicki.

Syntypes. — 14 ♂♂, ♀, Graefenberg & Karlsbrunn, Czechoslovakia, collected VII-VIII, destroyed during World War II. Edwards (1925b) considered the female as probably *conformis*; Hackman (1970) considered it as probably *peculiaris*. A male should be designated neo-type to fix usage of the name *braueri*.

Material examined. — Ninety-one ♂♂ and 94 ♀♀ from 135 collections in 113 localities in North America (Map 4). I have also seen specimens from Great Britain. *P. braueri* has been recorded from Czechoslovakia, Germany, Finland, and Great Britain.

Remarks. — On the basis of similarities in both male and female genitalia, *P. braueri* is apparently closely related to *forcipata*

and *unica*, both known only from Europe. Edwards (1925b) made *braueri* a synonym of *annulata*, known from the female only. Hackman (1970) restored *braueri* because the female is "extremely similar" to the female of *forcipata*, and one cannot definitely refer either *braueri* or *forcipata* to *annulata*. *P. vittata* (also known from only the female and synonymized under *annulata* by Dziedzicki (1889)) and *annulata* should thus be considered nomina dubia.

Edwards (1925b) reared adults of *braueri* from larvae that were covered with a thick, black, shiny material giving the larvae the appearance of slugs.

Phronia caliginosa Dziedzicki

caliginosa Dziedzicki 1889:512, pl. 15, Figs. 58-60, ♂.

trivittata Dziedzicki 1889:515, pl. 20, Figs. 198-200, ♀; syn. by Hackman (1970).

senex Lackschewitz 1937:42, Figs. 20a-c, ♂; syn. by Hackman (1970).

Adult. — Wing length: ♂, 2.5-2.9 mm. Body brown, legs mainly yellow. Anepisternum with 2-3 setae. Setulae on wing veins: rm, 2-3; M_1 , 42-50; M_2 , 32-38; Cu petiole, 10-14; Cu_1 , 12-16; Cu_2 , 9-14. Setae on mid tibia, 3-4a, 2-3d, 5-6p, 7-9v; on hind tibia, 5-7a, 9-11d, 3-6p. Male genitalia as in Figs. 87-89, brown. Female terminalia figured in Dziedzicki (op. cit.) and Hackman (1970).

Types of names included in this taxon.

P. caliginosa: holotype, ♂, Graefenberg, Czechoslovakia, coll'd. VII, destroyed during World War II.

P. trivittata: syntypes, 2 ♀ ♀, Zaczernie, Byelorussian SSR, coll'd. VI-VII, destroyed during World War II.

P. senex: holotype, ♂, Kalvene, Latvian SSR, IV-23-1935, deposition unknown ("in possession of heirs" (Horn & Kahle, 1935)).

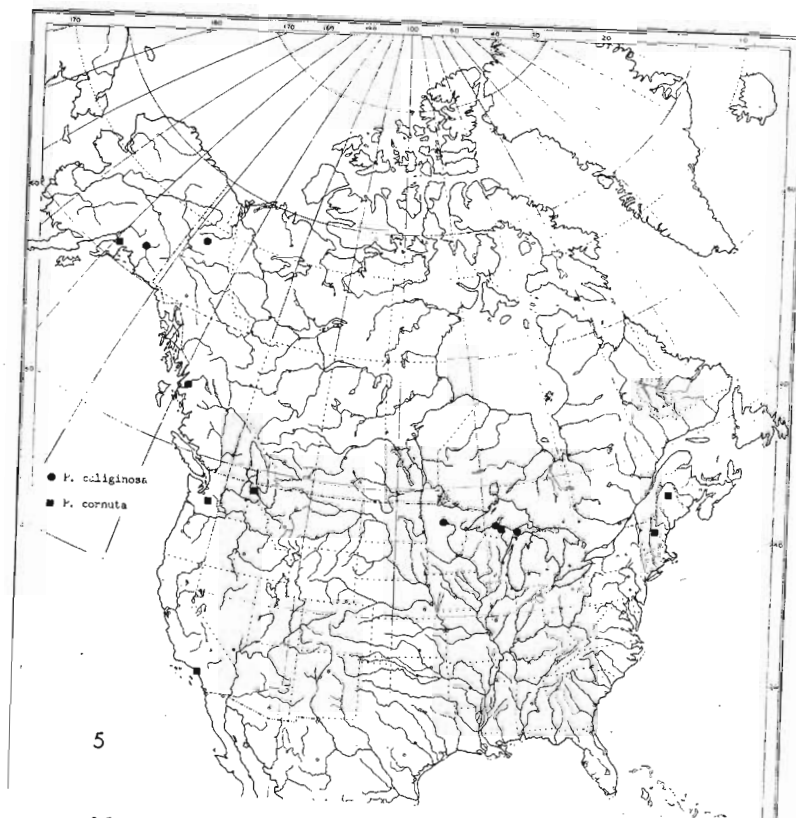
Material examined. — 20 ♂ ♂ from 7 collections in 6 localities in North America (Map 5). *P. caliginosa* has been reported in Europe from Byelorussian SSR, Czechoslovakia, and Finland.

Phronia cinerascens Winnertz

cinerascens Winnertz 1863:873, ♂, ♀.

truncata Winnertz 1863:874, ♂, ♀; syn. by Dziedzicki (1889).

Adult. — Wing length: ♂, 2.4-4.0 mm.; ♀, 2.3-4.0 mm. Body usually



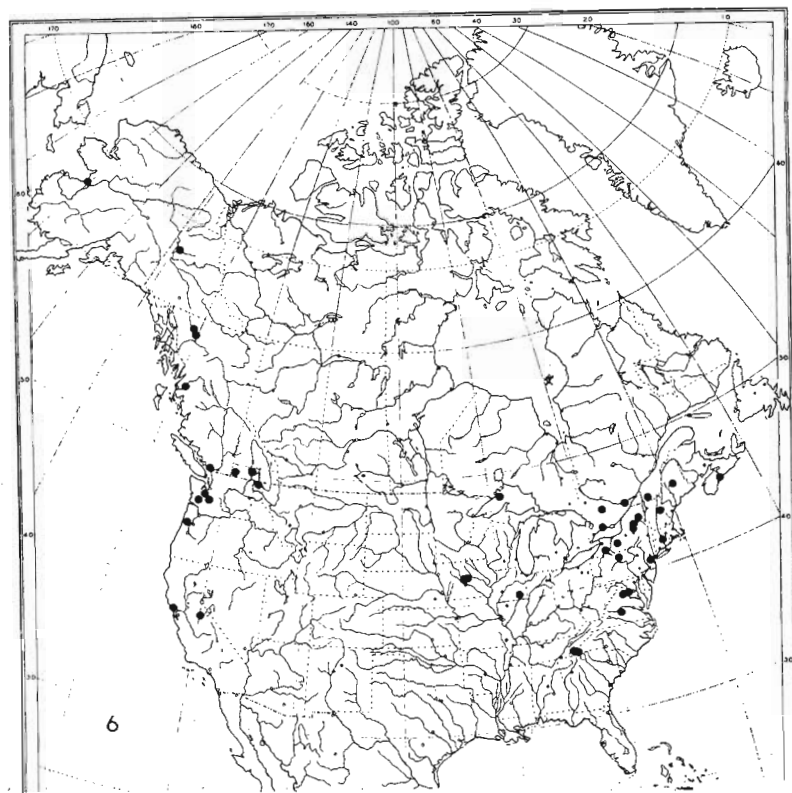
MAP 5. — *P. caliginosa* Dziedzicki, *P. cornuta* Lundström.

light brown except for yellow basal abdominal segments; legs usually yellow. Anepisternum with 2-4 setae. Setulae on wing veins: rm, 3-4; M_1 , 46-65; M_2 , 35-51; Cu petiole, 2-7; Cu_1 , 14-25; Cu_2 , 12-21. Setae on mid tibia, 2-4a, 2-6d, 5-9p, 10-14v; on hind tibia, 5-9a, 8-17d, 5-11p. Male genitalia as in Figs. 58-59, light brown. Female terminalia light brown, figured in Dziedzicki 1889, pl. 20, Figs. 182-184.

Types of names included in this taxon.

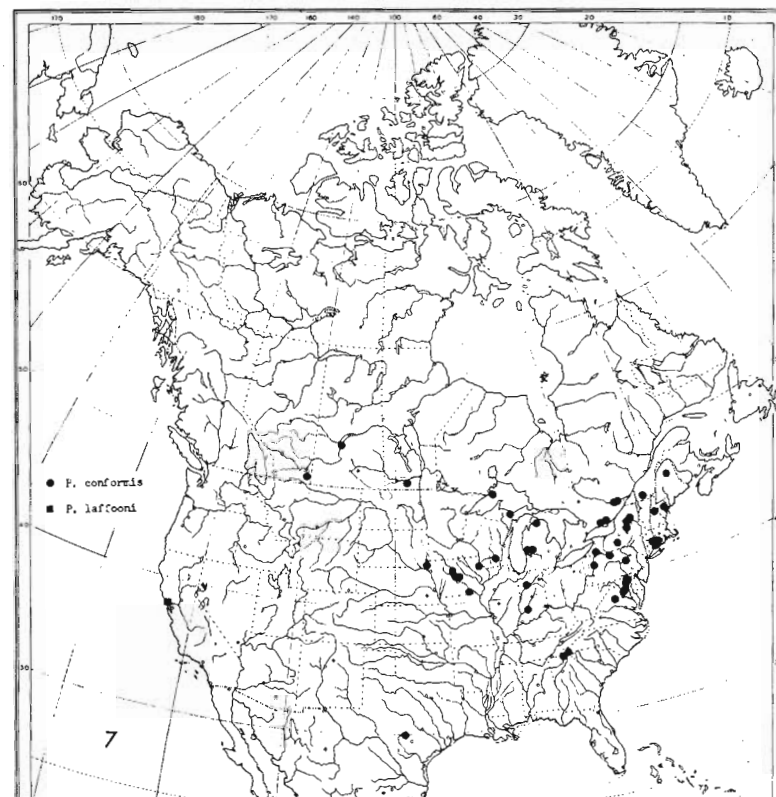
P. cinerascens: syntypes, ♂ [♂ ♂], ♀ [♀ ♀], type locality unspecified, ? Germany; destroyed with Winnertz Coll. during World War II, but genitalia illus. by Dziedzicki (1889, 1915).

P. truncata: Syntypes, ♂ [♂ ♂], ♀ [♀ ♀], ? Germany; destroyed with Winnertz Coll. during World War II.

MAP 6. — *P. cinerascens* Winnertz.

Material examined. — 82 ♂♂ and 122 ♀♀ from 76 collections in 65 localities in North America (Map 6). I have also seen specimens from Germany, Austria, Switzerland, and Great Britain. *P. cinerascens* has been previously reported in Europe from the above localities (except Switzerland) and Corsica, Poland, Czechoslovakia, Finland, and Great Britain.

Remarks. — Because of its pincerlike shape, the lateral portion of the telomere suggests a relationship with *bicolor*, *fusciventris*, and *tenuis*, but the dorsal portion of the telomere and the female terminalia are quite different from those structures in those other species. Hackman (1970) remarks that *cinerascens* is close to

MAP 7. — *P. conformis* (Walker), *P. laffooni* Gagné.

lutescens; the males of those 2 species resemble one another only in the dorsal portion of the telomere, but the female terminalia are similar.

Phronia conformis (Walker)

conformis (Walker) 1856:20 (*Mycetophila*), ♂.

leioides (Walker) 1856:24 (*Mycetophila*), ♂; syn. by Edwards (1925).

Girschneri (p. 531), *Girschnerii* (p. 479) Dziedzicki 1889:479, pl. 17, Figs. 106-108, ♂; syn. by Edwards (1913a).

difficilis Johannsen 1912:61, ♂, ♀ **New synonymy.**

Adult. — Wing length: ♂, 2.1-2.9 mm.; ♀, 2.1-3.0 mm. Body yellow to light brown; ♂ abdomen yellow with brown triangular areas; ♀ abdomen

brown with yellow caudal margins; legs mainly yellow. Anepisternum with 4-6 setae, these usually placed along both dorsal and dorsocaudal edges of sclerite. Setulae on wing veins: rm , 3-5; M_1 , 37-54; M_2 , 31-42; Cu petiole, 10-22; Cu_1 , 7-14; Cu_2 , 8-13. Setae on mid tibia, 3-4a, 2-4d, 3-8p, 5-10v; on hind tibia, 5-8a, 9-15d, 4-8p. Male genitalia as in Figs. 62-63, yellow. Female terminalia yellow to brown (see Dziedzicki (1889), Figs. 205-208 (as *braueri*)).

Types of names included in this taxon.

P. conformis: type[s], ♂ [♂♂], England, deposited in British Museum.

P. leioides: type[s], ♂ [♂♂], England, deposited in British Museum.

P. girschneri: syntypes, 2 ♂♂, Byelorussian SSR and Villach, Austria, collected V-VI, destroyed during World War II.

P. difficilis: lectotype here designated, ♂, Ithaca, New York, deposited at Cornell University. Paralectotype, ♀, same data as lectotype.

Material examined.—Type series and 140 ♂♂ and 80 ♀♀ from 106 collections in 58 localities in North America (Map 7). I have seen specimens also from Great Britain. *P. conformis* has otherwise been recorded from Byelorussian SSR, Austria, Finland, France, and Corsica.

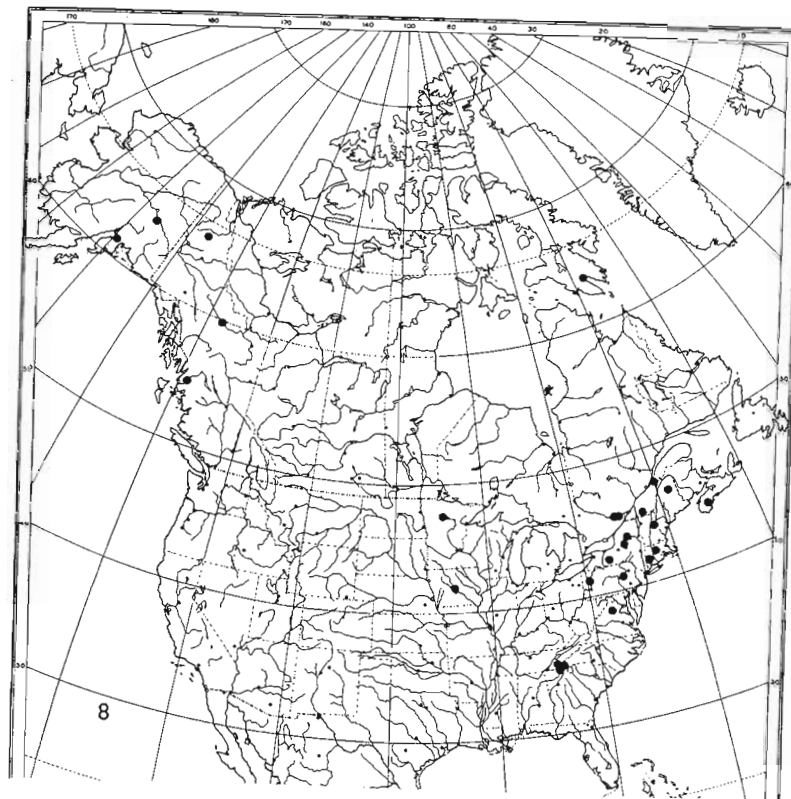
Remarks.—The closest relative of *P. conformis* is probably the Palearctic *peculiaris* Dziedzicki. The male genitalia differ principally in the shape of the lateral portion of the telomere. The female terminalia, according to Hackman (1970), are very similar. These 2 species show a marked resemblance to *laffooni* in the general shape of the ♂ genitalia, the stout legs, the anepisternal setae which are arranged along both the dorsal and dorsocaudal edges of the sclerite, the light color, and, probably, the female terminalia. For further discussion of affinities see under *laffooni*.

Edwards (1925b: 628) reported that specimens were reared from whitish larvae with a sticky covering.

Phronia cordata Lundström

cordata Lundström 1914:22, pl. 3, Figs. 23-24, ♂.

Adult.—Wing length: ♂, 2.5-3.0 mm. Body brown, legs mainly yellow. Anepisternum with 2-3 setae. Setulae on wing veins: rm , 2-4; M_1 , 37-54;



MAP 8. — *P. cordata* Lundström.

M_2 , 30-48; Cu petiole, 6-20; Cu_1 , 13-18; Cu_2 , 10-16. Setae on mid tibia, 5-11a, 6-8d, 3-8p. Male genitalia as in Figs. 93-95, brown. Female undescribed.

Holotype.—♂, "Bjälöguba, Lutarmajok (Nadelholzregion), Russian Lapland," VII-2-1913, R. Frey, in Zool. Mus., Univ. Helsinki.

Material examined.—88 ♂♂ in 58 collections from 42 localities in North America (Map 8). *P. cordata* is otherwise known only from Russian Lapland and Finland.

Phronia cornuta Lundström

cornuta Lundström 1914:21, pl. 2, Figs. 21-22, ♂.

MAP 9. — *P. cupida* Gagné.

Adult. — Wing length: ♂, 2.9-3.2 mm. Body brown to dark brown, legs mainly yellow. Anepisternum with 2-3 setae. Setulae on wing veins: rm, 2; M₁, 46-56; M₂, 41-53; Cu petiole, 15-22; Cu₁, 17-21; Cu₂, 15-22. Setae on mid tibia, 3-4a, 3d, 5-7p, 7-9v; hind tibia, 7-8a, 6-9d, 2-5p. Male genitalia as in Figs. 96-97, brown. Female undescribed.

Holotype. — ♂, "Bjälöguba, Lutarmajok (Nadelholzregion), Russian Lapland," 3-VII-1913, R. Frey, in Zool. Mus., Univ. Helsinki.

Material examined. — 12 ♂♂ from 10 collections in 10 localities in North America (Map 5). This species is otherwise known only from Russian Lapland and Finland.

Phronia cupida, new species

Adult. — Wing length: ♂, 2.2-2.4 mm. Body light brown to brown; abdominal segments 1-4 sometimes yellow basally; legs mainly yellow. Anepisternum with 2 setae. Setulae on wing veins: rm, 2; M₁, 37-43; M₂, 36-38; Cu petiole, 16-22; Cu₁, 12-17; Cu₂, 10-12. Setae on mid tibia, 2-3a, 2-3d, 6-7p, 5-6v; on hind tibia, 6-9a, 8-9d, 3-4p. Male genitalia as in Figs. 74-77, brown. Female unknown.

Holotype. — ♂, trail to "Forest Cathedral" from Tom's Run, Cook State Forest, Clarion Co., Pennsylvania, VIII-11-1961, J. L. Laffoon, USNM Type No. 6613.

Paratypes. — East Fork Santa Ana River (♂) and Sequoia N.P. (♂) California; Moscow, Idaho (♂); Great Smoky Mts. N.P., Tennessee (♂); Macon Co., North Carolina [CNC, KU, ISU, and USNM]. Map 9.

Remarks. — *P. cupida* closely resembles *strenua* from which it differs in the shape of the telomere and aedeagus. The lateral portion of the telomere is almost rectangular and has 1-3 setae placed mesally on the caudal edge. The dorsal portion of the telomere is much less setose than in *strenua*.

Phronia despecta (Walker), nomen dubium

despecta (Walker) 1848:101 (*Mycetophila*), ♀.

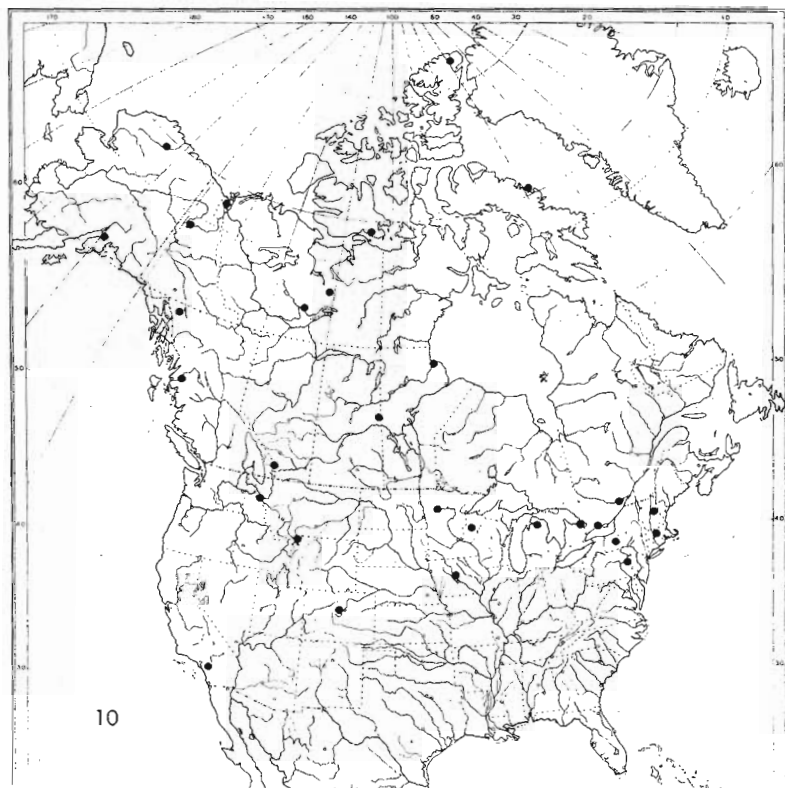
Remarks. — Lectotype here designated, ♀, St. Martin's Falls, Albany River, Hudson's Bay, G. Barnston, in British Museum (Nat. Hist.). Paralectotypes, ? (number of specimens in original series unstated).

This species is very likely synonymous with *portschinskyi*, but the second segment of the female cercus is slightly longer than in most specimens of that species. As has been pointed out (Hackman (1970), Hutson (pers. comm.)) females of closely related species can be identical. For that reason, it is the better choice to consider *despecta* a nomen dubium than the senior synonym of *portschinskyi*, a name based firmly on the description and illustrations of the male genitalia.

Phronia digitata Hackman

digitata Hackman 1970:50, Figs. 46-49, ♂.

Adult. — Wing length: ♂, 2.8-3.2 mm. Body brown, legs mainly yellow.

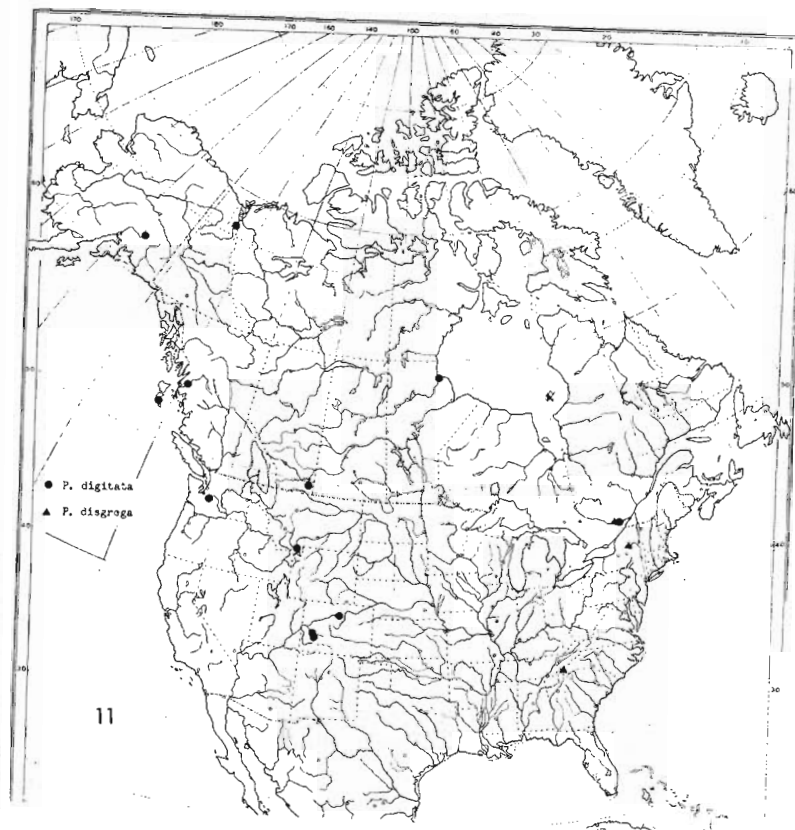
MAP 10. — *P. portschinskyi* Dziedzicki.

Anepisternum with 2 setae. Setulae on wing veins: rm, 2-3; M_1 , 48-55; M_2 , 38-48; Cu petiole, 9-17; Cu_1 , 13-18; Cu_2 , 11-15. Setae on mid tibia, 3-4a, 2-4d, 5-7p, 5-8v; on hind tibia, 5-7a, 6-9d, 5-7p. Male genitalia as in Figs. 107-109, brown. Female unknown.

Holotype. — ♂, bog of Rastila, Janakkala, Finland, 19-VI-1965, R. Tuomikoski, in Zool. Mus., Univ. Helsinki.

Material examined other than holotype. — 17 ♂♂ in 17 collections from 14 localities, chiefly in western North America (Map 11).

Remarks. — Hackman (1970) remarks that *digitata* is near *willistoni*; that may be, but he gives no reasons, and none is apparent to me.

MAP 11. — *P. digitata* Hackman, *P. disgrega* Dziedzicki.

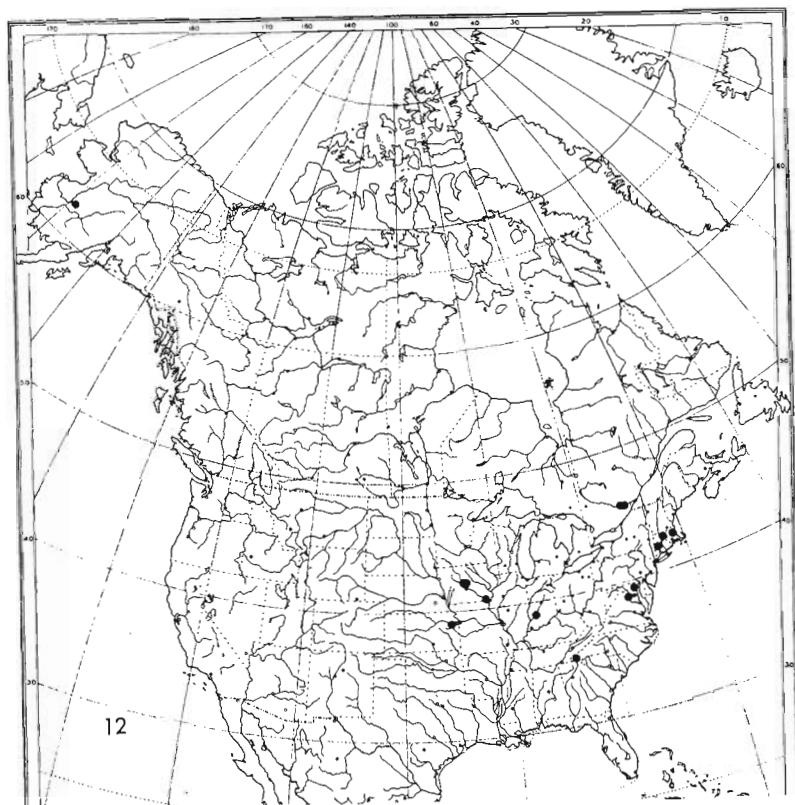
Phronia disgrega Dziedzicki

disgrega Dziedzicki 1889:481, pl. 16, Figs. 82-84, ♂.

Adult. — Wing length: ♂, 2.1-2.3 mm. Body brown, legs mainly yellow. Anepisternum with 2 setae. Setulae on wing veins: rm, 2; M_1 , 40-47; M_2 , 31-44; Cu petiole, 19-23; Cu_1 , 14-17; Cu_2 , 8-10. Setae on mid tibia, 2-3a, 2-3d, 4-6p, 7-8v; on hind tibia, 5-8a, 7-9d, 4-6p. Male genitalia as in Figs. 83-84, brown. Female illustrated in Hackman (1970), Fig. 64.

Syntypes. — 2 ♂♂, Byelorussian SSR, coll. VI, destroyed during World War II.

Material examined. — Four ♂♂ from 4 collections in 3 localities in eastern North America (Map 11). I have also seen speci-

MAP 12. — *P. distincta* Hackman.

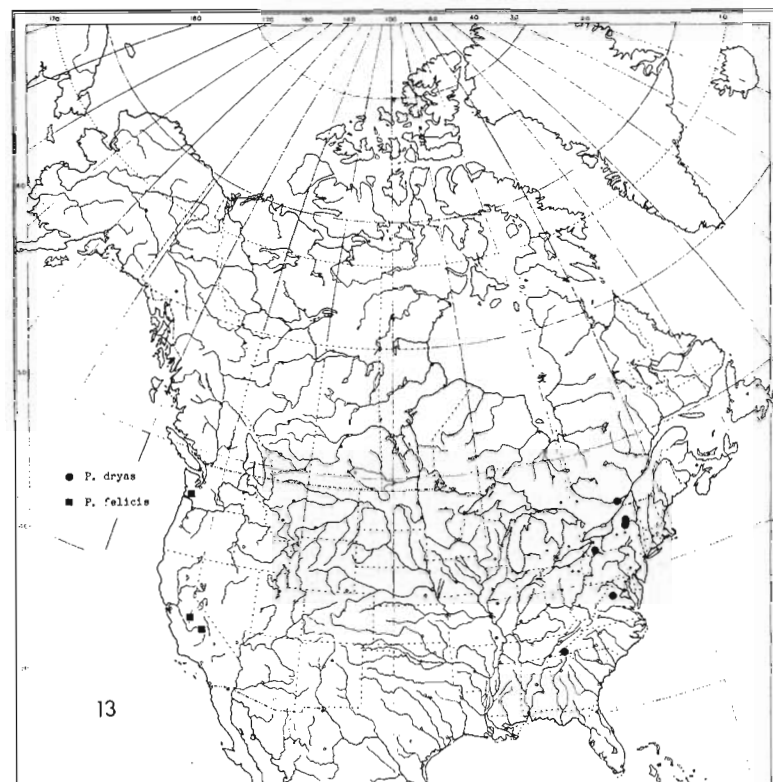
mens from Great Britain. *P. disgrege* has previously been reported from Byelorussian SSR, Finland, and Great Britain.

Phronia distincta Hackman

distincta Hackman 1970:50, Figs. 52-56, ♂.

Adult. — Wing length: ♂, 2.5-2.8 mm. Body brown to dark brown; legs brown basally, yellow beyond. Anepisternum with 2 setae. Setulae on wing veins: rm, 1-2; M₁, 45-54; M₂, 39-51; Cu petiole, 12-32; Cu₁, 15-21; Cu₂, 12-15. Setae on mid tibia, 2-3a, 2-3d, 4-6p, 5-7v; on hind tibia, 5-6a, 6-9d, 2-7p. Male genitalia as in Figs. 101-103, brown. Female unknown.

Holotype. — ♂, Ivalo, Finland, 14-VI-1962, W. Hackman, in Zool. Mus., Univ. Helsinki.

MAP 13. — *P. dryas* Gagné, *P. felicia* Gagné.

Material examined. — 20 ♂ from 18 collections in 16 localities in North America (Map 12).

Remarks. — The lateral portion of the telomere of *distincta* shows some resemblance to that of *interstincta* and *disgrege* in the shape of the various lobes, but there are many differences in the mesal portion of the telomere.

Phronia dryas, new species

Adult. — Wing length: ♂, 2.4-2.7 mm. Body light brown except for dark brown hind abdomen and yellowish legs. Anepisternum with 2-4 setae. Setulae on wing veins: rm, 3-5; M₁, 34-41; M₂, 24-33; Cu petiole, 16-20; Cu₁, 9-12; Cu₂, 7-11. Setae on mid tibia, 3-5a, 3-5d, 6-9p, 8-12v;

on hind tibia, 9-10a, 13-14d, 5-7p. Male genitalia as in Figs. 28-29, brown. Female unknown.

Holotype. — ♂, E. foot of W. Notch Mt., 1900', Hamilton Co., New York, VIII-6-1961, R. J. Gagné, USNM Type No. 66614.

Paratypes. — Old Chelsea, Quebec (♂); Cattaraugus Co. (2 ♂♂), Fulton Co. (♂), and Hamilton Co. (♂), New York; Madison Co., Virginia (♂); Macon Co., North Carolina (3 ♂♂) [CNC, ISU, and USNM]. (Map 13).

Remarks. — The telomere shows some resemblance to those of *nigricornis* and *impedita* in that the lateral portion is angular, flat, and setose on both sides, the mesal portion is fairly simple, and the dorsal portion is reduced. The basimere, however, is of a more normal size for *Phronia*, and there are no extremely long, strong setae ventrally. Also, *dryas* has a more compact, stouter body than either *nigricornis* or *impedita*.

Phronia effusa, new species

Adult. — Wing length: ♂, 2.5-3.5 mm. Body brown, legs mainly yellow. Anepisternum with 2-3 setae. Setulae on wing veins: rm, 2-3; M₁, 40-48; M₂, 32-46; Cu petiole, 10-18; Cu₁, 12-18; Cu₂, 11-14. Setae on mid tibia, 2-3a, 2-4d, 4-9p, 3-5v; hind tibia with 6-8a, 10-13d, 5-9p. Male genitalia as in Figs. 116-118, brown. Female unknown.

Holotype. — ♂, Orick, California, VI-21-1935, A. L. Melander, USNM Type No. 66615.

Paratypes. — Vic. Terrace, British Columbia (♂); Chehalis (2 ♂♂), Glacier (♂), and Sequim Bay (♂), Washington; Craig Mts., Idaho (♂); Lincoln Co., Oregon (♂); Tulare Co., California (♂) [CNC, CU, USNM, and Dirks-Edmunds Collection]. (Map 14).

Phronia egregia Dziedzicki

egregia Dziedzicki 1889:484, pls. 12-13, Figs. 16-18, ♂.

melaena Edwards 1924a:164, ♂ (as var. of *egregia*). **New synonymy.**

Adult. — Wing length: ♂, 2.8-3.2 mm.; ♀, 3.1-4.0 mm. Body dark brown to black, the latter especially in far north. Anepisternum with 2 setae. Setulae on wing veins: rm, 0-2; M₁, 40-62; M₂, 42-54; Cu petiole, 6-10; Cu₁, 14-24; Cu₂, 14-19. Setae on mid tibia, 3-5a, 2-4d, 4-6p, 8-10v; on hind tibia, 5-8a, 6-9d, 5-9p, 4-7v. Male genitalia as in Figs. 14-16, brown. Female terminalia as in *exigua* (illustrated in Hackman (1970)).



MAP 14. — *P. effusa* Gagné.

Types of names included in this taxon.

P. egregia: syntypes, 7 ♂♂, Strzygi, Poland, collected V, VIII, destroyed during World War II.

P. melaena: syntype, ♂, Liefde Bay, N. Spitsbergen, VII-28-1923, in Oxford University or British Museum; syntype, ♂, no data, Boheman Collection, Stockholm Museum.

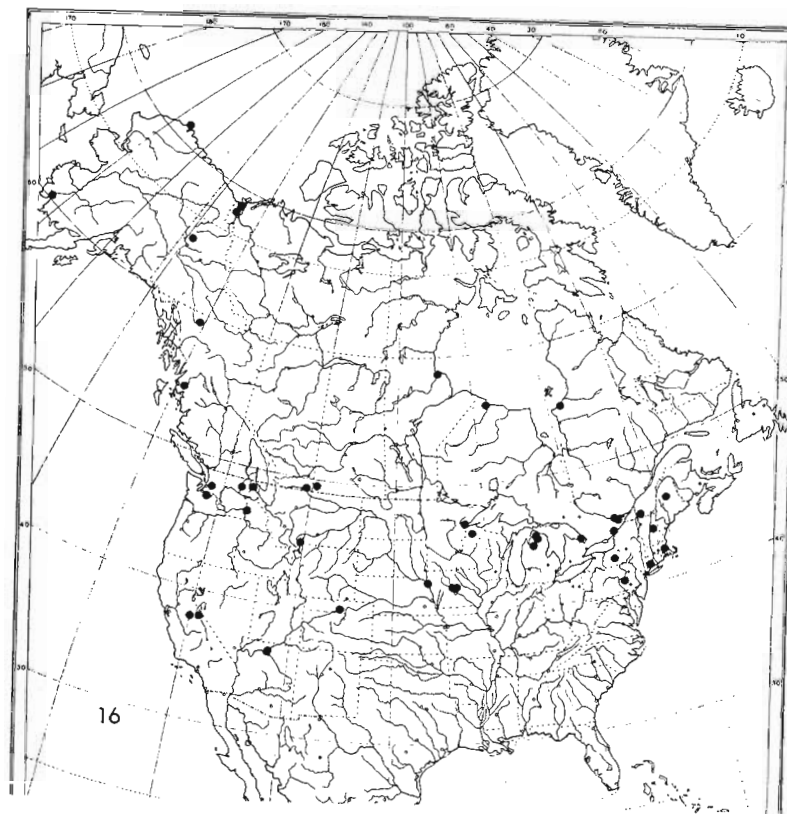
Material examined. — 59 ♂♂ and 13 ♀♀ from 33 collections in 22 localities in North America (Map 15). I have seen specimens also from Greenland, Norway, and Switzerland. *P. egregia* has otherwise been reported from the type localities and Finland.

Remarks. — See under *exigua*.

MAP 15. — *P. egregia* Dziedzicki.***Phronia exigua* (Zetterstedt)**

exigua (Zetterstedt) 1852:4246 (*Mycetophila*), ♂.
rustica Winnertz 1863:875, ♂, ♀; syn. by Edwards (1925a).
longipes Winnertz 1863:875, ♂; syn. by Dziedzicki (1889).
venusta Johannsen 1912:60, Figs. 26, 154, ♂, ♀. **New synonymy.**

Adult. — Wing length: ♂, 2.6-3.6 mm.; ♀, 3.4-4.1 mm. Body dark brown, the legs yellow-brown to brown. Anepisternum with 2-3 setae. Setulae on wing veins: rm, 0-2; M₁, 48-72; M₂, 40-54; Cu petiole, 6-16; Cu₁, 19-27; Cu₂, 17-26. Setae on mid-tibia, 4-5a, 3-4d, 3-4p, 7-9v; on hind tibia, 6-8a, 7-9d, 5-10p, 3-5v. Male genitalia: basimere as in *egregia*; telomere as in Figs. 17-18; aedeagus longer than *egregia* but without elongate lateral processes. Female terminalia illustrated in Dziedzicki (1889), Figs. 142-144.

MAP 16. — *P. exigua* Winnertz.

Types of names included in this taxon.

P. exigua: holotype, ♂, Rynberg, near Oslo, Norway, 5-11-1849, D. Siebke, deposited in Zool. Univ. Mus., Lund, Sweden.

P. rustica: syntypes, ♂ [♂♂], ♀ [♀♀], ? Germany; destroyed with Winnertz Collection during World War II, but genitalia illus. by Dziedzicki 1889, 1915.

P. longipes: syntypes or holotype, ♂ [♂♂], ? Germany; destroyed with Winnertz Collection during World War II.

P. venusta Johannsen: lectotype, ♂, here designated, Vollmer, Idaho, IX, J. M. Aldrich, at Cornell University. Paralectotype, ♀, same data as lectotype.

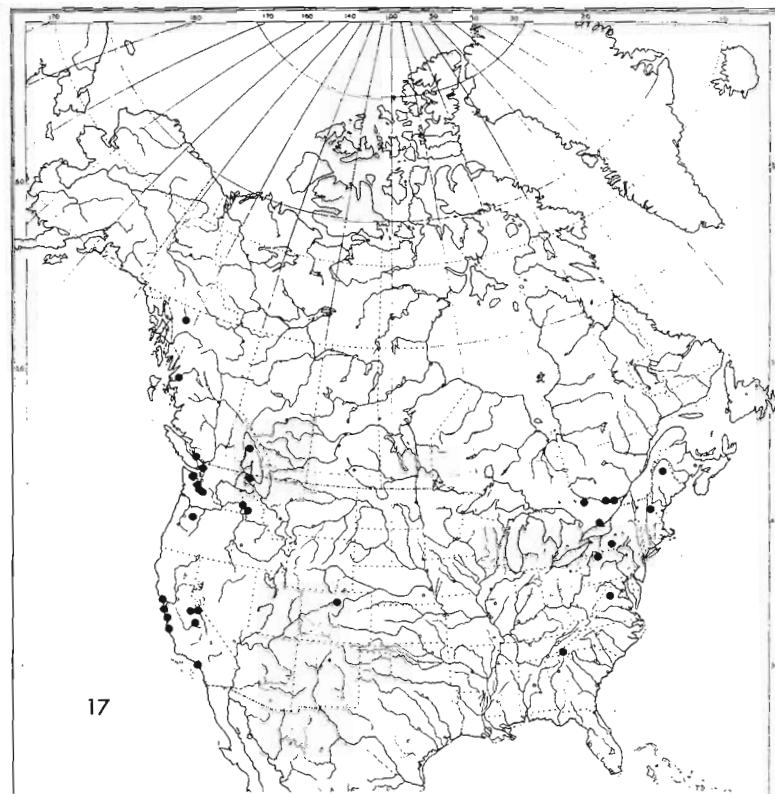
Material examined. — Type series of *P. venusta* and 68 ♂♂ and 60 ♀♀ from 66 collections in 57 localities in North America (Map 16). I have seen specimens also from Swedish Lapland, Great Britain, Austria, and Switzerland. *P. exigua* has also been reported from Greenland, Norway, Finland, Poland, Czechoslovakia, Lithuanian SSR, France, and Germany.

Remarks. — *P. exigua*, *egregia*, *flavipes*, *matilei*, *tiefii*, and *spinigera* form a discrete group of *Phronia*. All are Holarctic except *spinigera* which is known from a single specimen from Finland. The males of these species have a characteristic, setose, ventral lobe on the telomere, and all save *flavipes* (otherwise closely related to *exigua* and *egregia*) are unique in *Phronia* for the presence of a ventral row of setae on the hind tibia. Of the 6 species, *exigua* and *egregia* resemble one another most closely: the basimeres are similar and the females are not separable except in association with males. The geographic ranges of *exigua* and *egregia* overlap, but that of *egregia* extends farther north, that of *exigua*, much farther south. (See Maps 15 and 16). Although *flavipes* has lost (I assume) the ventral row of hind tibial setae, the male genitalia resemble *exigua* and *egregia* more closely than do the other species in this group; the basimere has the characteristic caudoventral projection, and the ventral lobe of the telomere has an attenuated, glabrous, mesal extension. The female tergum VIII of *exigua*, *egregia*, and *flavipes*, possess spiniform setae, and the legs and antennae are not as elongate in these as in *tiefii* and *matilei*. The 2 last named resemble one another, not only in relative size but in the concave caudoventral edge of the basimere and the large, ovoid second segment of the female cercus, which is without modified setae.

Phronia felcis, new species

Adult. — Wing length: ♂, 2.6-2.8 mm. Body dark brown, legs lighter. Anepisternum with 3 setae. Setulae on wing veins: rm, 3-4; M₁, 36-42; M₂, 32-35; Cu petiole, 3-9; Cu₁, 13-17; Cu₂, 12-14. Setae on mid tibia, 2-3a, 3-4d, 4-6p, 7-8v; on hind tibia, 7-8a, 9-12d, 3-5p. Male genitalia as in Figs. 25-27, brown. Female unknown.

Holotype. — ♂, Ilwaco, Washington, VII-1917, A. L. Melander, USNM Type No. 66616.



MAP 17. — *P. flavipes* Winnertz.

Paratypes. — Mariposa Co. (♂) and Sequoia N.P. (2 ♂♂), California [CAS and KU]. (Map 13).

Remarks. — *P. felcis* is apparently related to *nigricornis*. See discussion under the latter.

Phronia flavipes Winnertz

flavipes Winnertz 1863:876, ♂.

flabellata Van Duzee 1928:51, Fig. 19, ♂, ♀. **New synonymy.**

Adult. — Wing length: ♂, 3.1-3.6 mm.; ♀, 2.9-3.8 mm. Body uniformly dark brown. Anepisternum with 1-3 setae. Setulae on wing veins: rm, 0-1; M₁, 42-65; M₂, 37-57; Cu petiole, 0-9; Cu₁, 13-27; Cu₂, 12-22. Setae on

mid tibia, 3-5a, 3-4d, 7-11p, 2-4v; on hind tibia, 5-8a, 7-9d, 8-10p. Male genitalia as in Figs. 19-20, brown. Female terminalia illustrated in Dziedzicki (1889), Figs. 149-151.

Types of names included in this taxon.

P. flavipes: holotype or syntypes, ♂ [♂♂], ? Germany; destroyed with Winnertz Collection during World War II, but genitalia illustrated by Dziedzicki (1889, 1915).

P. flabellata: holotype, ♂, #2514, allotype ♀, and 2 ♂ paratypes, III-13-1926, Mill Valley, Marin Co., California, M. C. Van Duzee, in California Academy of Sciences.

Material examined. — Type series *flabellata* Van Duzee and 102 ♂♂ and 82 ♀♀ in 69 collections from 53 localities in North America (Map 17). I have also seen specimens from Austria, Swedish Lapland, Great Britain, and Switzerland. *P. flavipes* has otherwise been reported from Czechoslovakia, Finland, France, Corsica and Japan.

Remarks. — *P. flavipes* resembles most closely *exigua* and *egregia* (see discussion under *exigua*).

Phronia forcipula Winnertz

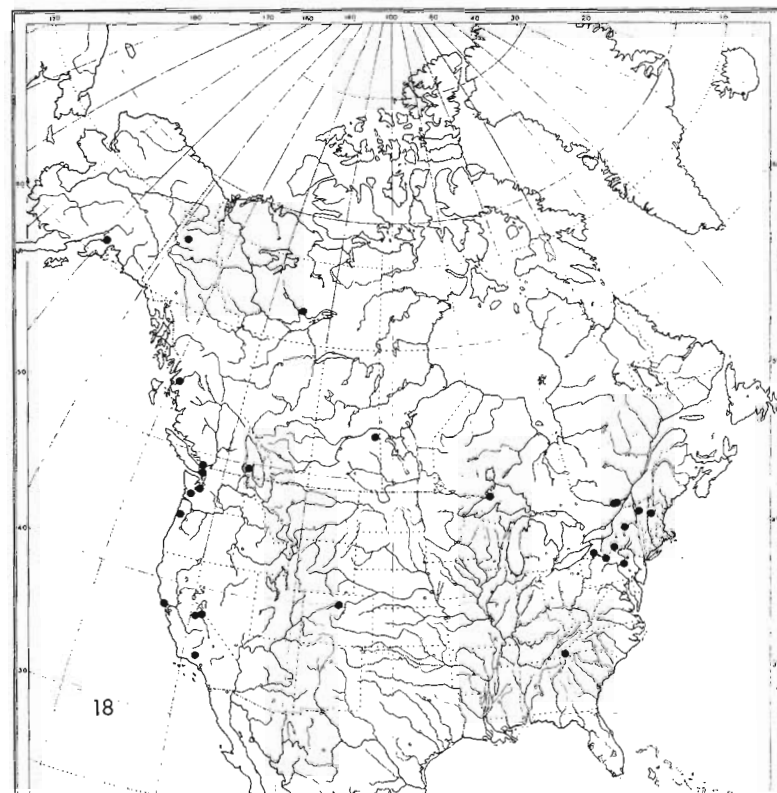
forcipula Winnertz 1863:866, ♂.

Adult. — Wing length: ♂, 2.6-3.7 mm.; ♀, 2.6-4.3 mm. Body brown to dark brown, legs brown basally, yellow beyond. Anepisternum with 2-3 setae. Setulae on wing veins: rm, 3-5; M₁, 41-62; M₂, 32-46; Cu petiole, 10-20; Cu₁, 13-20; Cu₂, 9-15. Setae on mid tibia, 2-4a, 3-5d, 7-11p, 12-17v; on hind tibia, 7-9a, 11-16d, 11-15p. Male genitalia as in Figs. 110-112, brown. Female terminalia brown, illustrated in Dziedzicki (1889) and Hackman (1970).

Holotype or syntypes. — ♂ [♂♂], ? Germany, types destroyed during World War II, but genitalia illus. by Dziedzicki (1889, 1915).

Material examined. — 56 ♂♂ and 20 ♀♀ in 50 collections from 39 localities in North America (Map 18). *P. forcipula* has been recorded in Europe from Germany, Finland, Great Britain, Poland, Czechoslovakia, Austria, France, and Corsica.

Remarks. — Dziedzicki (1889) synonymized *humeralis* Winnertz and *pygisiaca* Winnertz under *forcipula* because of general similarities of the genitalia. Hackman (1970) pointed out that *humeralis* has clouded wings as well as distinct differences from



MAP 18. — *P. forcipula* Winnertz.

forcipula in the ♂ and ♀ genitalia, and properly considered the two to be valid species. Because Winnertz did not mention any cloud on the wing of *pygisiaca*, that name is probably synonymous with *forcipula*. Inasmuch as the types of *pygisiaca* have been destroyed, the name may as well be considered doubtful.

The Holarctic *forcipula* has several close relatives, but all are Palearctic: *humeralis* Winnertz, *aviculata* Lundström, *notata* Dziedzicki, *tyrrhenica* Edwards, and 2 undescribed species, one from Spain and one from Kashmir.

Edwards (1925b) reported that adults of *forcipula* were reared from larvae found on a fruiting body of *Corticium* sp.

Phronia fusciventris Van Duzee*fusciventris* Van Duzee 1928:52, Fig. 20, ♂, ♀.*crassitarsus* Hackman 1970:48, Figs. 42-45, ♂, ♀. **New synonymy.**

Adult.—Wing length: ♂, 2.7-3.2 mm.; ♀, 2.4-3.5 mm. Body light brown to brown, the legs yellow; ♀ abdomen usually banded with yellow. Anepisternum with 3 setae. Setulae on wing veins: rm, 2-4; M₁, 45-62; M₂, 39-53; Cu petiole, 10-10; Cu₁, 13-18; Cu₂, 12-18. Setae on mid tibia, 3-5a, 3-4d, 5-7p, 7-9v; on hind tibia, 6-8a, 6-12d, 4-6p. Male genitalia as in Figs. 55-57, brown. Female terminalia brown, illustrated by Dziedzicki (1889) and Hackman (1970), similar to those of *bicolor*.

Types of names included in this taxon.

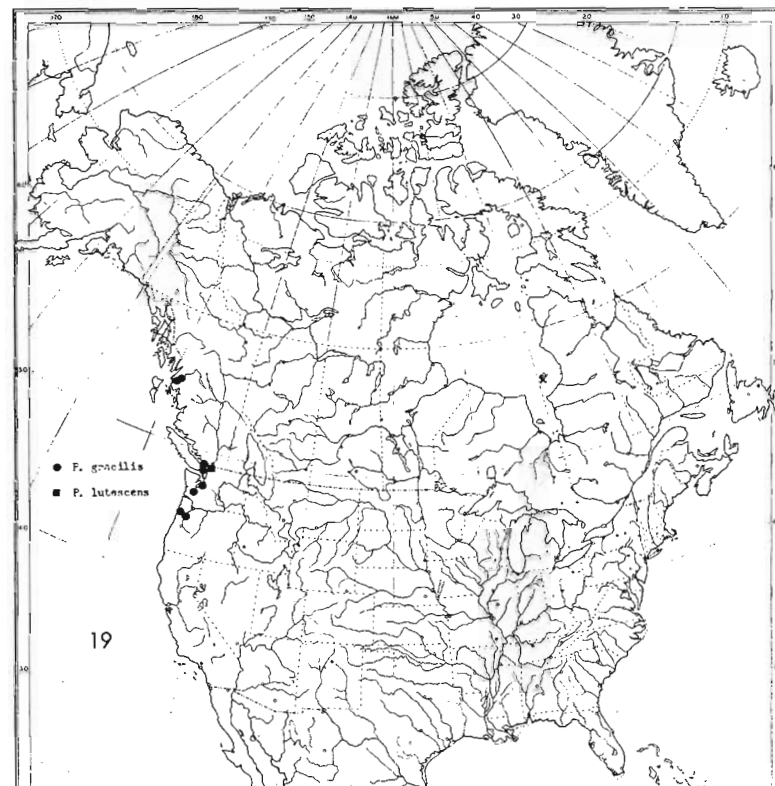
P. fusciventris: holotype, ♂, III-13-1926, Mill Valley, Marin Co., California in California Academy of Science; allotype, same data as ♂.

P. crassitarsus: holotype, ♂, VI-19-1962, Ivalo, Finland, W. Hackman, in Zool. Mus., Univ. Helsinki; paratypes, ♂♂, ♀♀, from many localities in Finland.

Material examined.—(Because of the similarity of ♀♀ of *fusciventris* to those of *bicolor*, I have not determined ♀♀ of either unless in association with ♂♂.) Type series of *fusciventris* and 33 ♂♂ and 5 ♀♀ in 28 collections from 24 localities in North America (Map 3). I have seen specimens also from Great Britain, Austria, Swedish Lapland, and Switzerland. It has been reported further from Czechoslovakia, Finland, and the Azores. The last record should be checked for reasons given below.

Remarks.—Hackman's (1970) numerous Finnish records of *fusciventris* (as *crassitarsus*) indicate that that species is replaced by *bicolor* in southern Finland. Most other continental European records support Hackman's contention that *fusciventris* lives either in the far north or at high altitudes. *P. fusciventris* does, however, occur in England, but the ♂ genitalia of those specimens are not quite the same as those of the continental specimens. A case could be made for naming the British specimens a separate species. In North America, *fusciventris* and *bicolor* are approximately sympatric in the East and allopatric in the West, with *bicolor* more northern than *fusciventris*.

Although *fusciventris* has sometimes been called *tarsata* since 1840, the female terminalia of *fusciventris* and *bicolor* cannot be



MAP 19. — *P. gracilis* Hackman, *P. lutescens* Hackman.

distinguished and, consequently, it is not certain to which species the lectotype of *tarsata*, a female, belongs. Because the type of *tarsata* was collected in Denmark, Hackman (1970), on the basis of his geographical data, considered that *tarsata* must be what has been called *bicolor*. But until *Phronia* has been sampled as well in Denmark as it has in Finland, I am inclined to save the name *bicolor* and treat "*tarsata*" as a nomen dubium. Dr. Lyneborg, of the Universitets Zoologiske Museum in Copenhagen, kindly sent me the type-series of *tarsata* Staeger. It consists of 17 specimens, only 1 of which, a female, fits the present concept of *fusciventris-bicolor*. I am here designating that specimen the lectotype.

Although the specimen was taken in Denmark it bears no locality data. The other specimens of the type series, also without locality data, were identifiable as follows: *tenuis* (6 males), *exigua* (male), *interstincta* (male, female), *forcipata* (male), and *Phronia* spp. (6 specimens, 3 females, 3 without abdomens).

Edwards (1925b) reared adults from whitish larvae with only a slight sticky covering.

Phronia gracilis Hackman

gracilis Hackman 1970:41, Figs. 1-3, 5, ♂, ♀.

Adult. — Wing length: ♂, 2.6-3.2 mm. Body brown, legs mainly yellow. Anepisternum with 2 setae. Setulae on wing veins: rm, 1-2; M_1 , 46-62; M_2 , 37-44; Cu petiole, 17-21; Cu_1 , 15-23; Cu_2 , 12-18. Setae on mid tibia, 3a, 4-5d, 5-7p, 7-9v; on hind tibia, 7-9a, 8-12d, 2-4p. Male genitalia as in Figs. 128-129, brown. Female genitalia figured in Hackman (1970).

Holotype. — ♂, Kuusamo, Juuma, Jäkälävuoma, Finland, 26-VI-1964, R. Tuomikoski, in Zool. Mus., Univ. Helsinki.

Material examined. — Paratype male from Finland and 19 ♂♂ from 15 collections in 11 localities in northwestern North America (Map 19). In Europe, it is known only from the type-locality in Finland.

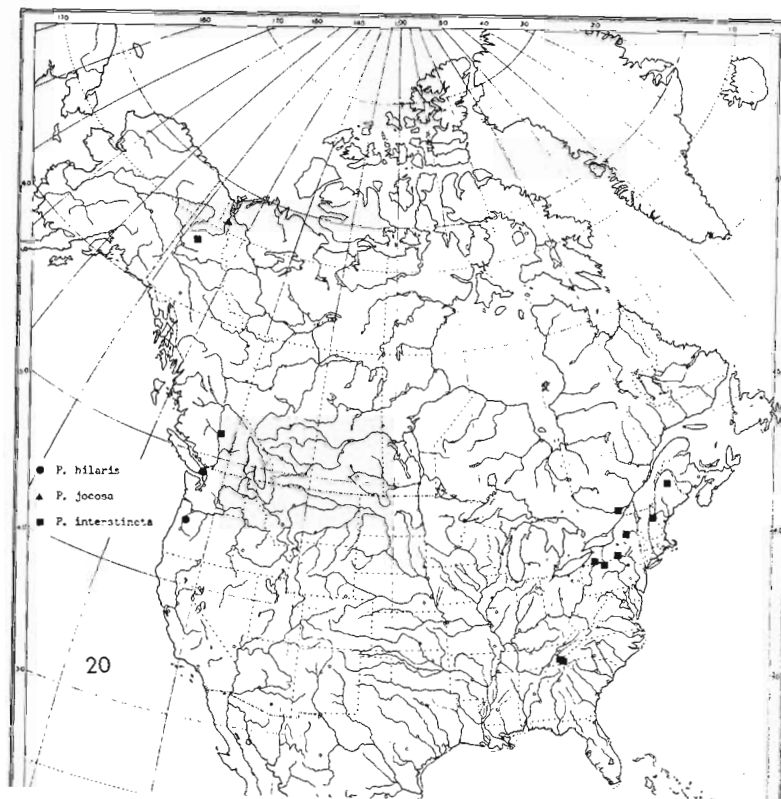
Remarks. — Hackman (1970) suggested that *gracilis* was related to *tiefii*, *exigua*, and relatives. As evidence, he cited the total or near absence of setae on the rm vein. However, the number of setae on that vein is quite variable in Nearctic *Phronia*, and therefore I cannot ascribe much significance to it, especially as it is not correlated with any other resemblance between *gracilis* and the group to which *tiefii* belongs.

Phronia hiliaris, new species

Adult. — Wing length: ♂, 2.4-2.5 mm. Body brown, legs mainly yellow. Anepisternum with 2 setae. Setulae on wing veins: rm, 1; M_1 , 54-57; M_2 , 40-45; Cu petiole, 8-10; Cu_1 , 14-17; Cu_2 , 14-15. Setae on mid tibia, 3-4a, 2-3d, 5p; 6-7v; hind tibia, 6-7a, 7-9d, 4-6p. Male genitalia as in Figs. 113-115, brown. Female unknown.

Holotype. — ♂, Mt. Constitution, Orcas I. San Juan Is., Washington, V-17-1910, USNM Type No. 66617.

Paratype. — "Corvallis Watershed," Oregon ♂ [OSU]. (Map 20).



MAP 20. — *P. hiliaris* Gagné, *jocosa* Gagné, *P. interstincta* Dziedzicki.

Remarks. — The aedeagus and, in some respects, the telomere of *hiliaris* show some resemblance to those of *melica*.

Phronia incerta (Adams), nomen dubium

incerta (Adams) 1907:37, ♂ (*Mycetophila*).

Holotype. — ♂, Mayfield's Cave, Indiana, IV-9-1903, depository unknown.

Remarks. — Johannsen (1912) saw the holotype and placed it in *Phronia*. Neither Adams nor Johannsen figured the genitalia, so that Johannsen's (1912) short description notwithstanding, it is not

possible to place this species. I have tried in vain to locate the type.

Phronia interstincta Dziedzicki

interstincta Dziedzicki 1889:497, pl. 16, Figs. 79-81, ♂.

Adult. — Wing length: ♂, 2.3-2.6 mm. Body yellow to light brown, legs yellow. Anepisternum with 2-3 setae. Setulae on wing veins: rm, 3-5; M_1 , 37-54; M_2 , 34-43; Cu petiole, 13-24; Cu_1 , 11-22; Cu_2 , 10-18. Setae on mid tibia, 2-4a, 2-5d, 7-8p, 6-9v; on hind tibia, 6-10a, 9-11d, 2-7p. Male genitalia as in Fig. 104, brown. Female terminalia as figured in Hackman (1970).

Holotype. — ♂, Waldegg, Austria, collected V, destroyed during World War II.

Material examined. — 24 ♂♂ in 15 collections from 12 localities in North America (Map 20). This species is known also from Austria, Great Britain, and Finland.

Remarks. — The telomere of *P. interstincta* shows some resemblance to those of *distincta* and *disgrega*. The known distribution of *interstincta* in the Nearctic area is interesting; it is known only from the Canadian Rockies and along the Appalachians.

Phronia jacosa, new species

Adult. — Wing length: ♂, 2.6 mm. Body dark brown, legs mainly brown. Anepisternum with 2 setae. Setulae on wing veins: rm, 3-4; M_1 , 46-49; M_2 , 38-39; Cu petiole, 6-7; Cu_1 , 18-20; Cu_2 , 13-15. Setae on mid tibia, 3-4a, 3-4d, 5-7p, 6-10v; on hind tibia, 5-7a, 7-8d, 8-9p. Male genitalia as in Figs. 126-127, dark brown. Female unknown.

Holotype. — ♂, Aklavik, Northwest Territories, VII-25-1931, O. Bryant, deposited in CAS.

Paratype. — ♂, same data as holotype [CAS]. (Map 20).

Phronia laffooni, new species

Adult. — Wing length: ♂, 2.8 mm. Body light brown, legs mainly yellow. Anepisternum with 4 setae, placed along both dorsal and dorsocaudal margins of sclerite. Setulae on wing veins: rm, 3; other setae obscured by folded wing. Setae on mid tibia, 4a, 4d, 3p, 6v; on hind tibia, 6a, 13d, 10p. Male genitalia as in Figs. 64-65, yellow. Female unknown.

Holotype. — ♂, Sausalito, Marin Co., California, V-29-1953, H. L. Mathis, in University of California, Davis. (Map 7).

Remarks. — The single known specimen of *P. laffooni* is a very fortunate discovery. That species apparently fixes the relationship between two groups of *Phronia* species which otherwise would not seem related at all. On the one hand, *laffooni* shows a distinct resemblance to *conformis* (q.v.) and the Palearctic *peculiaris* in the shape and setation of the male genitalia, notably the "V"-cleft, yellow basimere, in the long telomere with the same components and setation, and in the shape of the setulate aedeagus. Both *laffooni* and *conformis* have on the dorsal and dorsocaudal edges of the anepisternum more setae than have most *Phronia* spp. On the other hand, *laffooni* seems related to the group of species comprising the Palearctic *signata*, the Holarctic *portschinskyi*, and others, but particularly the first. The number and placement of the anepisternal setae and the color and general conformation of the male genitalia indicate a close affinity between *laffooni* and *signata*. *P. signata*, however, has other characters in common with its several relatives, in the species group containing *portschinskyi* and *obtusa*. These characters are a shorter and broader telomere with a row of short setae along the caudal edge and an inconspicuous basoventral projection. Although *laffooni* does not indicate any direction of evolution within *Phronia*, it does provide a stepping stone that is useful in determining monophyly.

Phronia lutescens Hackman

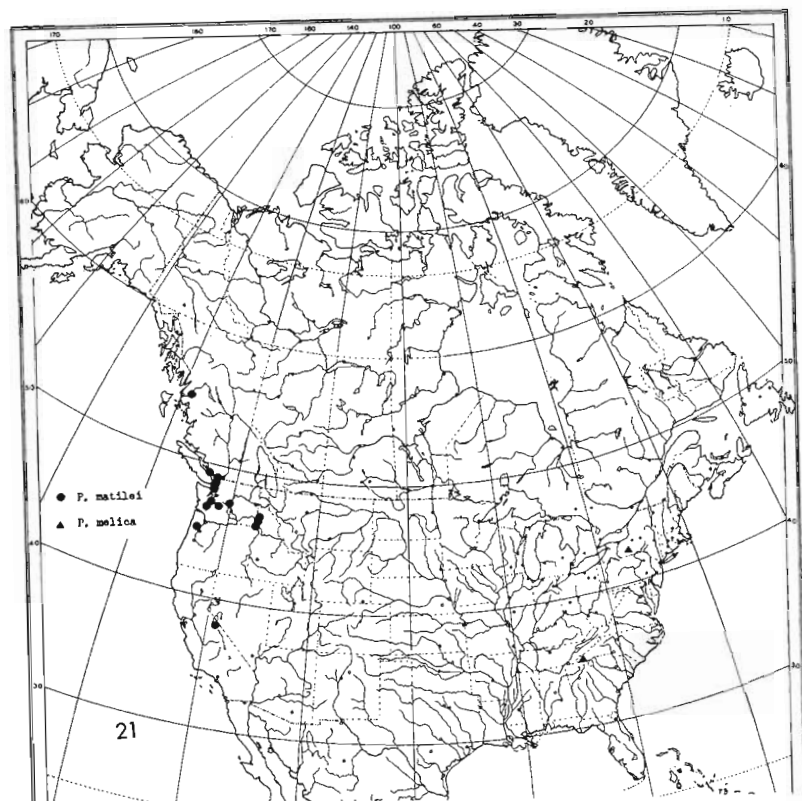
lutescens Hackman 1970:46, Figs. 36-41, ♂, ♀.

Adult. — Wing length: ♂, 3.9 mm. Body brown, legs mainly yellow. Anepisternum with 4 setae. Setulae on wing veins: rm, 3; M_1 , 61; M_2 , 51; Cu petiole, 7; Cu_1 , 19; Cu_2 , 21. Setae on mid tibia, 4a, 3d, 7p, 9v; on hind tibia, 9a, 11d, 6p. Male genitalia as in Figs. 68-69, brown. Female terminalia illustrated in Hackman (1970), Fig. 37.

Holotype. — ♂, Uukuniemi, Finland, 25-VI-1963, W. Hackman, in Zool. Mus., Univ. Helsinki.

Material examined. — One ♂ from Glacier, Washington (USNM) (Map 19). It is otherwise known only from Finland.

Remarks. — Hackman (1970) finds *lutescens* to be close to *cinerascens*. The lateral portion of the telomere of both species is as different as the dorsal portion is alike (compare Figs. 58-59



MAP 21. — *P. matilei* Hackman, *P. melica* Gagné.

with 68-69), but the ♀ terminalia are very similar, according to Hackman (1970).

Phronia matilei Hackman

matilei Hackman 1972:39, Figs. 1-3, ♂, ♀.

Adult. — Wing length: ♂, 3.7-4.5 mm.; ♀, 4.2-4.7 mm. Body mostly brown to dark brown with yellow stripes on thorax and abdomen. Antennae, legs, and abdomen very long. Anepisternum with 2 setae. Setulae on wing veins: rm, 0-1, M_1 , 69-81; M_2 , 55-66; Cu petiole, 1-3; Cu_1 , 20-29; Cu_2 , 14-21. Setae on mid tibia, 3-5a, 3-5d, 8-10p, 7-14v; on hind tibia, 4-7a, 5-10d, 4-9p, 3-9v. Male genitalia as in Fig. 24.

Holotype. — ♂, Vaud, Grande baume du Préx d'Aubonne,

Switzerland, 20-VI-1960, P. Strimati, deposited in Museum d'hist. nat., Geneva, Switzerland.

Material examined. — 15 ♂♂ and 21 ♀♀ in 22 collections from 21 localities in northwestern U.S. and southwestern Canada (Map 21). In Europe it is known only from the type-locality.

Remarks. — This species is apparently closest to *P. tiefi* (see remarks under *exigua*).

Phronia melica, new species

Adult. — Wing length: ♂, 2.2-2.3 mm. Body brown, legs mainly yellow. Anepisternum with 2 setae. Setulae on wing veins: rm, 1-3; M_1 , 38-41; M_2 , 30-34; Cu petiole, 12-15; Cu_1 , 13-19; Cu_2 , 11-13. Setae on mid tibia, 2-4a, 2-5d, 6p, 8v; on hind tibia, 6-9a, 9d, 2-4p. Male genitalia as in Figs. 119-121, brown. Female unknown.

Holotype. — ♂, Robin Branch (nr. Wayah Bald), 4400', Macon Co., North Carolina, VII-3-1958, J. L. Laffoon, USNM Type No. 66618.

Paratypes. — Ithaca, New York (♂); Macon Co., North Carolina [USNM]. (Map 21).

Phronia mutabilis Dziedzicki

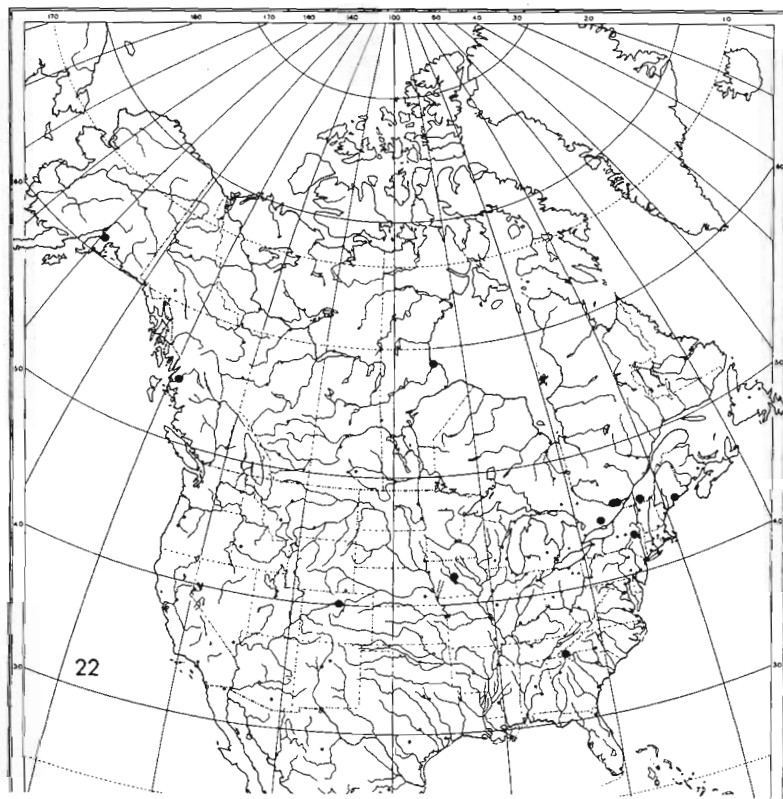
mutabilis Dziedzicki 1889:477, pl. 13, Figs. 22-24, ♂.

aestivalis Dziedzicki 1889:513, pl. 19, Figs. 156-9, ♀; syn. by Hackman (1970).

Adult. — Wing length: ♂, 2.7-3.0 mm.; ♀, 2.5-3.1 mm. Body yellow to light brown, abdomen yellow basally, brown beyond, legs mainly yellow. Anepisternum with 4-7 setae, not placed in a straight line and usually situated along both dorsal and dorsocaudal edges of sclerite. Setulae on wing veins: rm, 4-5; M_1 , 43-49; M_2 , 35-42; Cu petiole, 15-20; Cu_1 , 13-19; Cu_2 , 13-16. Setae on mid tibia, 3-4a, 3-4d, 5-8p, 5-10v; on hind tibia, 5-7a, 6-9d, 2-5p. Male genitalia as in Figs. 37-41, usually yellow, occasionally light brown; lateral portion of telomere varies slightly in length and in number and placement of corniform setae on caudal and dorsomesal surfaces; meso-basal corniform seta on mesal portion of telomere variable in size, occasionally accompanied by a closely adjacent, smaller, corniform seta. Female terminalia as in Figs. 137-138, light brown.

Types of names included in this taxon.

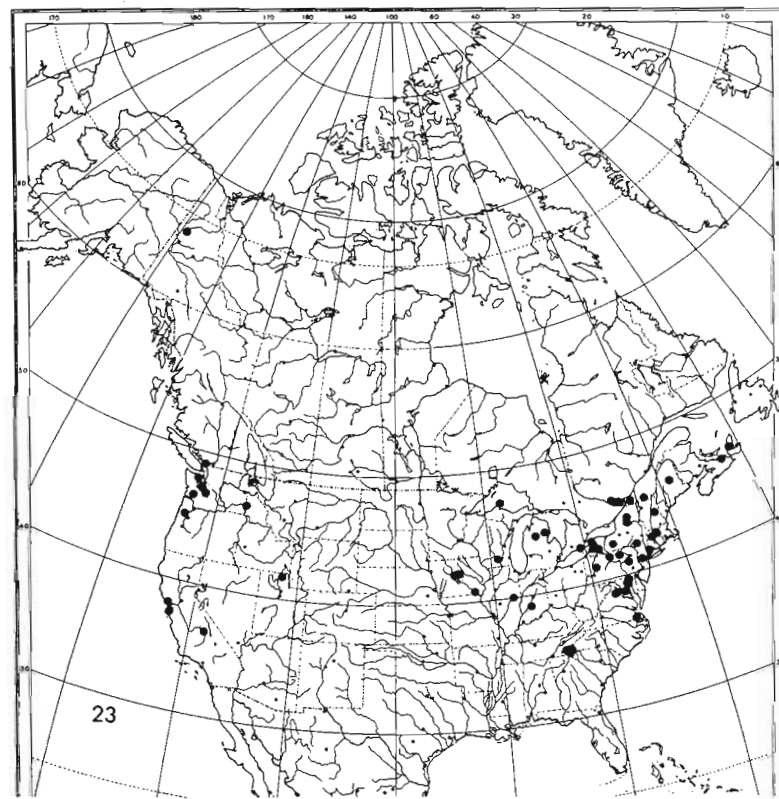
P. mutabilis: syntypes, 5 ♂♂, Graefenberg and Karlsbrunn, Czechoslovakia, and Villach, Austria, destroyed during World War II.

MAP 22. — *P. mutabilis* Dziedzicki.

P. aestivalis: holotype, ♀, Graefenberg, Czechoslovakia, VII, destroyed during World War II.

Material examined. — 26 ♂♂ and 6 ♀♀ in 18 collections from 14 localities in North America (Map 22). In Europe, *P. mutabilis* has been reported from Czechoslovakia, The Netherlands, and Finland.

Remarks. — *P. mutabilis* is close to *portschinskyi* (q.v. for further discussion of affinities) and *obtusa*. The length of the caudal cleft of the aedeagus protrudes beyond the cerci. The male cerci each have a long terminal seta as does *obtusa*, but the genitalia of *obtusa* are usually yellow and the anepisternal setae are more nu-

MAP 23. — *P. nebulosa* Johannsen.

merous and not placed in a single row. The female terminalia are also similar to *obtusa*, but have ventroapical spiniform setae on the first cercal segment and a shorter and more gradually tapered second cercal segment.

***Phronia nebulosa* (Johannsen)**

nebulosa (Johannsen) 1912:64, Figs. 30, 158 (*Telmaphilus*).

Adult. — Wing length: ♂, 2.6-3.8 mm.; ♀, 2.6-3.9 mm. Body brown to dark brown; ♀ abdomen with some yellow; legs mainly yellow, some brown, especially basally. Apical third of wing usually fuscous; setulae on wing veins: rm, 3-5; M₁, 46-63; M₂, 38-53; Cu petiole, 1-9; Cu₁, 16-20; Cu₂, 12-19. Setae on mid tibia, 3-5a, 3-5d, 6-10p, 5-11v; on hind tibia, 6-9a, 8-12d,

5-11p. Male genitalia as in Figs. 2-6, brown, the lateral portion of the telomere varying in shape between specimens from eastern (Fig. 6) and western (Fig. 4) North America. Female terminalia as in Fig. 132, brown.

Types. — Lectotype here designated, ♂, Ithaca, New York, 15-IV-1895, O. A. Johannsen, deposited at Cornell University. Paralectotype ♀, Hampton, N.H., IV-9-1905, S. A. Shaw, deposited in MCZ.

Material examined. — Type series of *nebulosa* and 248 ♂♂ and 156 ♀♀ in 186 collections from 102 localities in North America (Map 23). This species is known only from North America.

Remarks. — *P. nebulosa* can be divided into two groups, one occurring in the eastern half of North America, the other in the western third, correlated with a few minor differences in the shape and setation of the lateral portion of the telomere (compare Figs. 4 and 6). In eastern specimens, the setae along the caudoventral edge of the telomere are no stronger than elsewhere, and the two caudal projections caused by the indented margin are approximately equal in length; in the western specimens the caudoventral setae are stout, the telomere is more setose, and the dorsocaudal projection is longer than the ventrocaudal. I consider those differences minor ones that are evidently due to recent isolation. Because the affinities are so obvious, there is nothing to gain by considering the two forms separate species. *P. nebulosa* is closely related to *tenebrosa* (q.v.).

Phronia nigricornis (Zetterstedt)

nigricornis (Zetterstedt) 1852:4245 (*Mycetophila*), ♂, not ♀ (Hackman 1970).

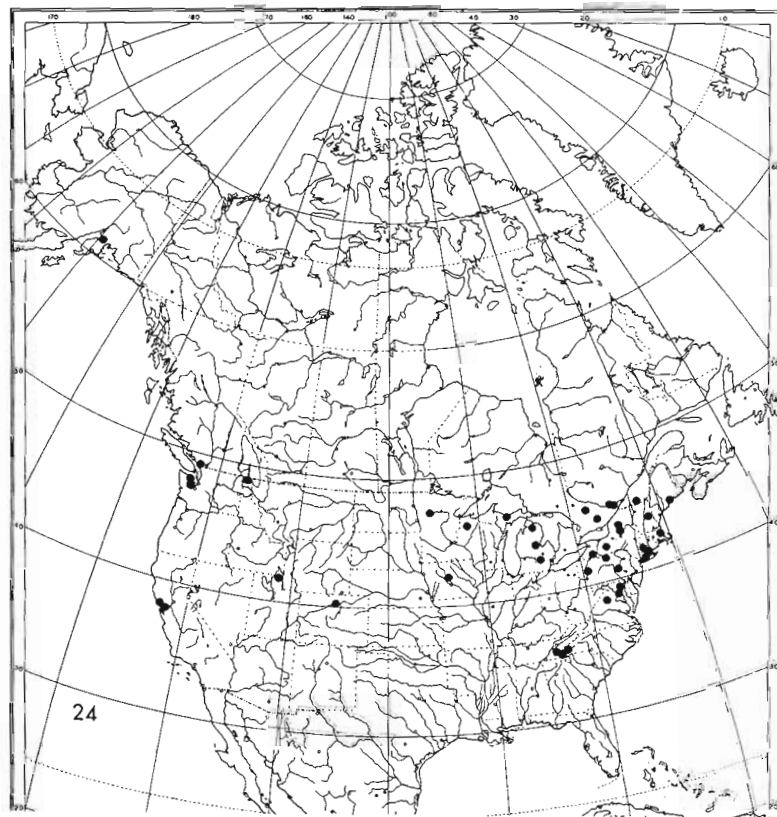
dubia Dziedzicki 1889:498, pls. 17-18, Figs. 112-116, ♂; syn. by Hackman (1970).

insulsa Johannsen 1912:60-61, Fig. 25, ♂, ♀. **New synonymy.**

Adult. — Wing length: ♂, 2.2-2.6 mm.; ♀, 2.3-2.8 mm. Body light to dark brown, the legs usually lighter. Anepisternum with 2-3 setae. Setulae on wing veins: rm , 2-5; M_1 , 35-45; M_2 , 30-36; Cu petiole, 8-14; Cu_1 , 12-17; Cu_2 , 9-11. Setae on mid tibia, 2-5a, 2-4d, 5-7p, 6-10v; on hind tibia, 6-9a, 6-10d, 5-6p. Male genitalia as in Figs. 30-31, tiny, brown. Female terminalia as in Fig. 135, brown.

Types of names included in this taxon.

P. nigricornis: lectotype (desig. Hackman (1970)), ♂, Mulfjell,



MAP 24. — *P. nigricornis* (Zetterstedt).

Jemtland, Sweden, IX-2-1850. Deposited in Zool. Univ. Mus., Lund, Sweden.

P. dubia: syntypes, 20 ♂♂, Graefenberg and Karlsbrunn, Czechoslovakia; Villach, Austria; Ruda-Guzowska, Poland; and Lithuanian SSR; collected V-VIII, destroyed during World War II.

P. insulsa: lectotype here designated, ♂, Ithaca, N.Y., deposited at Cornell University. Paralectotype ♂, same data as lectotype.

Material examined. — Type-series of *insulsa*, and 118 ♂♂ and 63 ♀♀ from 82 collections in 60 localities in North America (Map 24). I have seen specimens also from Great Britain. *P. nigri-*



25

MAP 25. — *P. nigripalpis* Lundström.

cornis has been recorded in Europe from the type localities and Denmark, Finland, and Great Britain.

Remarks. — Several Palearctic species are closely related to *nigricornis*: *dubioides* from Iran, and *nitdiventris* and *minuta* from Europe. I suspect that *minuta* is a synonym of *nigricornis* but the two others differ in the shape and setation of the male genitalia. In North America, the closest apparent relative of *nigricornis* is *felicis*: both have a reduced dorsal portion of the telomere, a lateral portion that is completely setose on both surfaces, and greatly enlarged ventral seta on the basimere. *P. dryas* also shows some

affinity to *nigricornis* in the general shape and setation of the telomere, but lacks the enlarged basimera setae.

Phronia nigripalpis Lundström

nigripalpis Lundström 1909:40, Figs. 150-152, ♂.

palustris Landrock 1924a:80, Figs. 6-7, ♂; syn. by Hackman (1970).

Adult. — Wing length: ♂, 2.5-2.9 mm. Body brown, legs mainly yellow. Anepisternum with 2 setae. Setulae on wing veins: rm, 1-2; M_1 , 40-51; M_2 , 33-44; Cu petiole, 13-20; Cu_1 , 13-24; Cu_2 , 9-13. Setae on mid tibia, 3-4a, 3-4d, 4-7p, 6-9v; on hind tibia, 6-8a, 7-9d, 2-5p. Male genitalia as in Figs. 90-92. Female terminalia (not seen) figured in Hackman (1970).

Types of names included in this taxon.

P. nigripalpis: holotype, ♂, Helsinki, Finland, V. R. Frey, in Mus. Zool., Helsinki, Finland.

P. palustris: holotype, ♂, Jööpre-Hochmoor, near Pernau, Estonian SSR, IX-3-1922, depository unknown to me.

Material examined. — 16 ♂♂ in 15 collections from 14 localities in North America (Map 25). *P. nigripalpis* is known elsewhere from Estonia and Finland.

Phronia obtusa Winnertz

obtusa Winnertz 1863:877, ♂.

Adult. — Wing length: ♂, 2.2-2.8 mm.; ♀, 2.2-2.3 mm. Body brown to dark brown, legs mainly yellow; basal segments of ♂ abdomen yellow with brown triangular areas; ♀ abdomen brown, caudal edge of basal segments yellow. Anepisternum with 2-3 setae in single row parallel to dorsocaudal edge. Setulae on wing veins: rm, 3-5; M_1 , 35-48; M_2 , 30-42; Cu petiole, 14-22; Cu_1 , 14-19; Cu_2 , 10-18. Setae on mid tibia, 3-4a, 2-4d, 5-6p, 7-10v; on hind tibia, 5-9a, 4-6d, 2-3p. Male genitalia as in Figs. 42-44, brown. Female terminalia as in Fig. 141, brown.

Holotype or syntypes. — ♂ [♂♂], ? Germany destroyed during World War II, but genitalia illustrated by Dziedzicki (1889, 1915).

Material examined. — 37 ♂♂ and 15 ♀♀ from 40 collections in 30 localities in North America. *P. obtusa* has been reported from Byelorussian SSR, Czechoslovakia, Austria, Germany, Finland, and Great Britain.

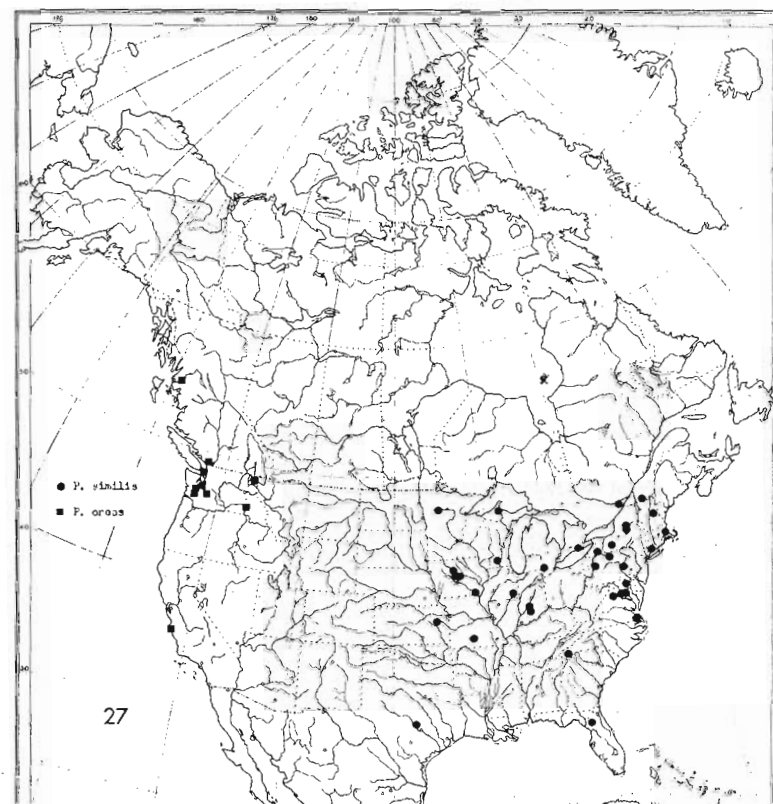
Remarks. — *P. obtusa* is probably closest to *mutabilis*, but the former has a more deeply cleft aedeagus which in lateral view is much narrower. The lateromere of *obtusa* has no spiniform setae.

MAP 26. — *P. obtusa* Winnertz.

The female first cercal segment does not have spiniform setae apicoventrally, and the second segment is narrower. The caudal margin of the female tergum VIII is not as deeply cleft in *obtusa*. See under *portschinskyi* for further discussion of affinities.

Phronia oreas, new species

Adult. — Wing length: ♂, 2.7-3.7 mm. Body light brown to brown, legs mainly yellow. Anepisternum with 2-3 setae. Setulae on wing veins: rm, 2-4; M₁, 44-63; M₂, 37-54; Cu petiole, 2-12; Cu₁, 14-22; Cu₂, 11-20. Setae on mid tibia, 3-4a, 2-4d, 6-7p, 9-11v; on hind tibia, 7-9a, 9-11d, 3-5p. Male genitalia as in Figs. 85-86, brown. Female unknown.

MAP 27. — *P. similis* Johannsen, *P. oreas* Gagné.

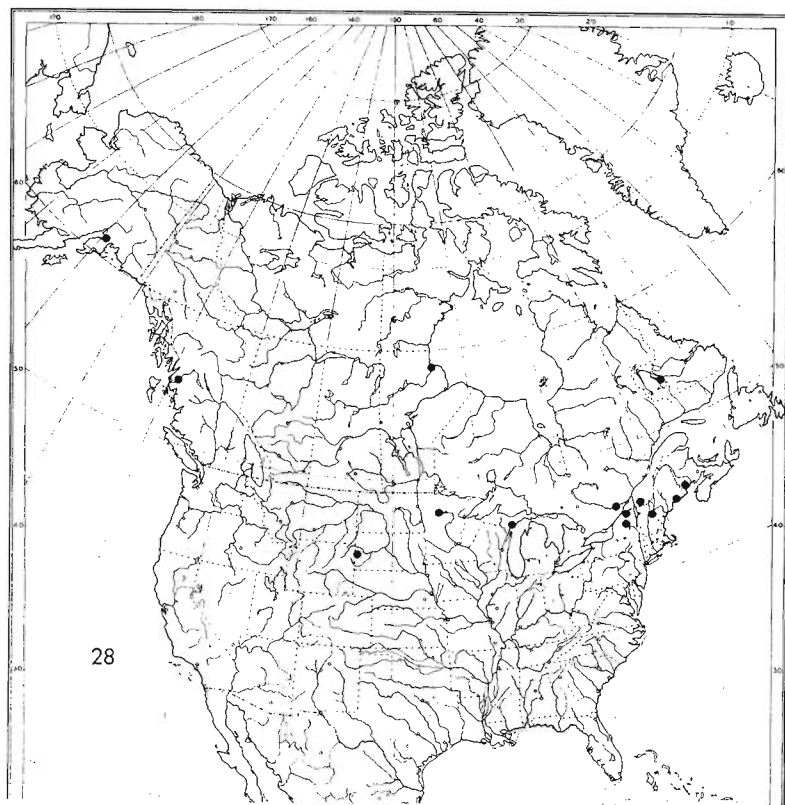
Holotype. — ♂, Moscow Mt., Idaho, VIII-26-1923, A. L. Melander, USNM Type No. 66619.

Paratypes. — 22 ♂♂ from 16 collections in 12 localities in western North America [CNC and USNM]. (Map 27).

Phronia persimilis Hackman

persimilis Hackman 1970:45, Figs. 22, 25-26, ♂, ♀.

Adult. — Wing length: ♂, 2.7-3.3 mm. Body and legs yellow to light brown. Anepisternum with 3-4 setae. Setulae on wing veins: rm, 3-4; M₁, 43-56; M₂, 40-49; Cu petiole, 17-22; Cu₁, 15-18; Cu₂, 12-17. Setae on mid tibia, 3-5a, 3-5d, 5-7p, 10-12v; on hind tibia, 6-8a, 9-10d, 4-5p. Male genitalia as in Figs. 87-88, brown.

MAP 28. — *P. persimilis* Hackman.

talia as in Figs. 98-100, brown. Female not seen, terminalia illustrated in Hackman (1970).

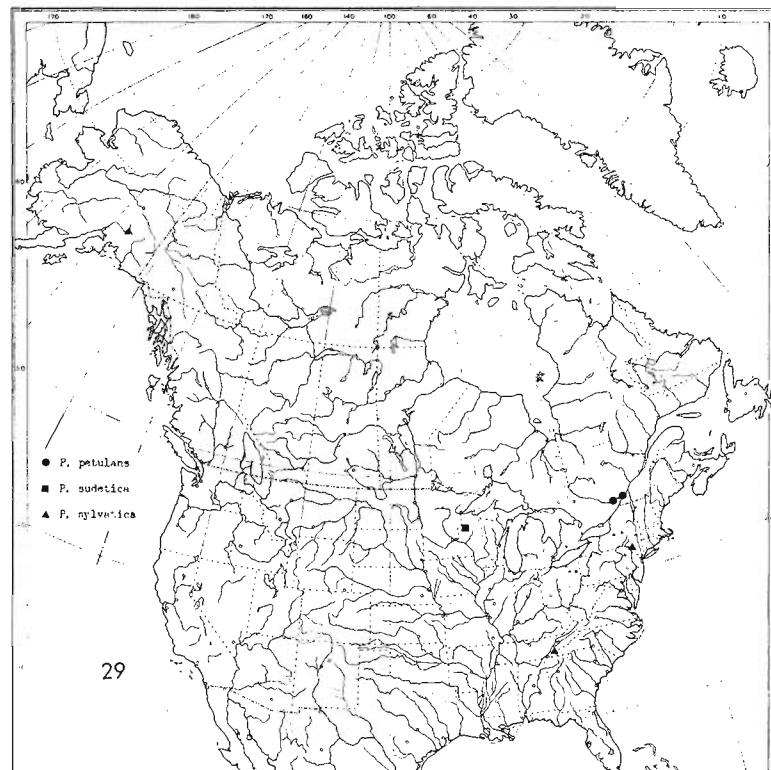
Holotype. — ♂, Esbo, Westend, Finland, 10-VI-1962, in Zool. Mus., Univ. Helsinki.

Material examined. — Paratype from Finland and 24 ♂♂ in 21 collections from 18 localities in North America (Map 29). *P. persimilis* is otherwise known from several localities in Finland.

Phronia petulans Dziedzicki

petulans Dziedzicki 1889:465, pl. 12, Figs. 10-12, ♂.

Adult. — Wing length: ♂, 2.4-2.6 mm. Body light brown to brown with

MAP 29. — *P. petulans* Dziedzicki, *P. sudetica* Dziedzicki, *P. sylvatica* Dziedzicki.

some yellow on abdomen; legs yellow. Anepisternum with 2-3 setae in a straight row parallel to dorsocaudal edge. Setulae on wing veins: rm, 3-6; M₁, 38-48; M₂, 32-35; Cu petiole, 6-13, Cu₁, 7-9; Cu₂, 7-9. Setae on mid tibia, 3a, 2-3d, 5-6p, 5-8v; on hind tibia, 5-8a, 8d, 7-8p. Male genitalia as in Figs. 45-46, brown. Female unknown.

Syntypes. — 2 ♂♂, Byelorussian SSR, collected VI-VII, destroyed during World War II.

Material examined. — 13 ♂♂ from the vicinity of Ottawa, Ontario (Map 29). *P. petulans* has also been reported from Byelorussian SSR, Finland, and Great Britain.

Remarks. — This species belongs to a group of species that are closely related. See notes under *portschinskyi*. In *petulans* the

short male cercus with its very long terminal seta and the short aedeagus are distinctive.

Phronia portschinskyi Dziedzicki

portschinskyi Dziedzicki 1889:502, pls. 13, 20, Figs. 19-21, 185-188, ♂, ♀.

Adult. — Wing length: ♂, 2.4-3.0 mm.; ♀, 2.2-3.3 mm. Body brown to dark brown, legs lighter to yellow. Anepisternum with 2-4 setae, usually in a single row parallel to dorsocaudal edge. Setulae on wing veins: rm, 3-5; M₁, 38-45; M₂, 35-44; Cu petiole, 11-20; Cu₁, 12-22; Cu₂, 11-14. Setae on mid tibia, 3-4a, 3-4d, 4-5p, 6-9v; on hind tibia, 6-7a, 6-10d, 2-3p. Male genitalia as in Figs. 32-36, brown; the corniform setae on the caudal edge of the lateral portion of the telomere vary in number and position. Female terminalia brown, Figs. 139, 140.

Syntypes. — ♂, ♀, Stryj, Poland, collected VI, destroyed during World War II.

Material examined. — 43 ♂♂ and 41 ♀♀ from 58 collections in 37 localities in North America (Map 10). *P. portschinskyi* has also been reported from Poland and Finland, and I have seen a specimen from Norway.

Remarks. — The closest relative of *portschinskyi* in the Nearctic area is probably *mutabilis*. The caudal incision of the aedeagus of *portschinskyi* is shallower; in lateral view, the aedeagus is broadly rounded caudally. The cerci have no single long, strong, apical seta. The female tergum VIII has spiniform setae only along the caudal edge.

Because of several similarities in the genitalia of both sexes, I am able to segregate an apparently natural group of *Phronia*, consisting of *portschinskyi*, *mutabilis*, *obtusa*, *petulans*, and *taczanowskyi*, all Holarctic, and *signata*, *siebeckii*, and possibly *elegans*, known so far only from the Palearctic Region. The aedeagus tapers from a bulbous base into caudal projections of various length; the lateral portion of the telomere is short, more or less rectangular, lacks a basoventral projection, and has variously modified setae (corniform or short and wavy) along the caudal edge; the dorsal portion is small in many species and in most, a large corniform seta is present mesobasally; and the female tergum VIII, at least on the species known from the Nearctic area, has spiniform setae. *P. laffooni* (q.v.) suggests a possible connection between this group and *conformis*.



MAP 30. — *P. strenua* Winnertz.

Phronia similis Johannsen

similis Johannsen 1912:62, ♂ (in part, not Fig. 28).

Adult. — Wing length: ♂, 2.3-2.6 mm.; ♀, 2.3-3.0 mm. Body usually brown, legs yellow to light brown. Anepisternum with 2-3 setae. Setulae on wing veins: rm, 2-4; M₁, 35-53; M₂, 33-44; Cu petiole, 12-16; Cu₁, 12-21; Cu₂, 10-15. Setae on mid tibia, 3-5a, 3-5d, 5-7p, 8-9v; on hind tibia, 7-9a, 8-11d, 4-7p. Male genitalia as in Figs. 60-61, brown. Female terminalia as in Fig. 134, brown.

Lectotype. — Here designated, ♂, Ithaca, New York, IX, at Cornell University. Paralectotype, ♂, same data as lectotype, belongs to *taczanowskyi* (telomere figured in original description of *similis*.)

Material examined.— Other than type-series, 120 ♂♂ and 38 ♀♀ in 90 collections from 45 localities in the eastern half of North America (Map 27). *P. similis* is unknown in Europe.

Phronia strenua Winnertz

strenua Winnertz 1863:862, ♂; restored name (syn. under *flavicollis*, Hackman (1970)).

Adult.— Wing length: ♂, 2.4-3.1 mm. Body brown; basal segments of abdomen yellow basally; legs mainly yellow. Anepisternum with 2-4 setae. Setulae on wing veins: rm, 3-5; M₁, 38-52; M₂, 34-51; Cu petiole, 14-30; Cu₁, 17-21; Cu₂, 10-18. Setae on mid tibia, 3-5a, 3-5d, 5-7p, 7-9v; on hind tibia, 6-9a, 8-12d, 4-7p. Male genitalia as in Figs. 78-79, brown. Female terminalia illustrated in Steenberg (1924).

Holotype or syntypes.— ♂ [♂♂], ? Germany; destroyed during World War II, but genitalia illustrated by Dziedzicki (1889, 1915).

Material examined.— 34 ♂♂ in 19 collections from 15 localities in Canada and northern U.S. (Map 30). *P. strenua* has been reported from Byelorussian SSR, Czechoslovakia, Austria, Germany, Denmark, Great Britain, and Finland.

Remarks.— The shape of the lateral portion of the telomere of *strenua* is rather variable but the remainder of the genital organs remain constant. The Nearctic *cupida* approaches *strenua*, but the aedeagal projections are longer, the dorsal portion of the telomere is less setose, the caudal edge of the lateromere is only slightly concave, and 1-3 large setae are present on the caudal margin.

Hackman (1970) synonymized *strenua* under *flavicollis*, known from the female only. Because the females of so many closely related species of *Phronia* are indistinguishable, I think it better to consider a name based on a female as dubious, as I have done here, rather than to retain it as a senior synonym of a well-known name.

Steenberg (1924) gave a detailed, illustrated description of the larvae which were found on sodden, barkless logs. The larvae characteristically carry a conical covering formed from their excrement.

Phronia sudetica Dziedzicki

sudetica Dziedzicki 1889:505, pl. 18, Figs. 117-119, ♂.

Adult.— Wing length: ♂, 2.8 mm. Body brown, legs mainly yellow. Anepisternum with two setae. Setulae on wing veins: rm, 4; M₁, 42; M₂,

31; Cu petiole, 19; Cu₁, 17; Cu₂, 13. Setae on mid tibia, 6a, 4d, 8p, 7v; hind tibia lost. Male genitalia as in Figs. 122-123, brown. Female possibly *semiatrata* Dziedzicki, teste Hackman (1970).

Syntypes.— 2 ♂♂, Graefenberg, Czechoslovakia, collected VII, destroyed during World War II.

Material examined.— ♂ from Washburn Co., Wisconsin (Map 29). *P. sudetica* is also known from Czechoslovakia and Finland.

Phronia sylvatica Dziedzicki

sylvatica Dziedzicki 1889:488, pl. 15, Figs. 64-66, ♂.

Adult.— Wing length: ♂, 2.6-2.7 mm. Body light brown to brown, legs mainly yellow. Anepisternum with two setae. Setulae on wing veins: rm, 2; M₁, 34-40; M₂, 34-36; Cu petiole, 18-22; Cu₁, 11-13; Cu₂, 10-12. Setae on mid tibia, 4-5a, 5d, 6-8p, 8v; on hind tibia, 7-9a, 10d, 4-6p. Male genitalia as in Figs. 130-131, brown. Female undescribed.

Holotype.— ♂, Zaczernie, Byelorussian SSR, collected VII, destroyed during World War II.

Material examined.— 3 ♂♂ from 3 widely scattered localities in North America (Map 29). This species has otherwise been recorded from the type-locality and Finland.

Phronia taczanowskyi Dziedzicki

taczanowskyi Dziedzicki 1889:462, pls. 13, 19, Figs. 34-36, 163-166, ♂, ♀. *detruncata* Lackschewitz 1937:41, ♂; syn. by Hackman (1970).

Adult.— Wing length: ♂, 2.1-2.9 mm.; ♀, 2.5-3.1 mm. Body brown, anterior segments of ♂ abdomen lighter, legs mainly yellow. Anepisternum with 4-6 setae, not placed in a single, straight row. Setulae on wing veins: rm, 2-4; M₁, 36-45; M₂, 27-37; Cu petiole, 2-17; Cu₁, 9-14; Cu₂, 9-15. Setae on mid tibia, 2-3a, 1-3d, 4-5p, 6-9v; on hind tibia, 5-6a, 6-7d, 3-7p. Male genitalia as in Figs. 47-49, brown. Female terminalia as in Fig. 136, brown.

Types of names included in this taxon.

P. taczanowskyi: syntypes, 3 ♂♂, ♀, Strzygi, Ruda-Guzowska, and Tarchomin, Poland, destroyed during World War II.

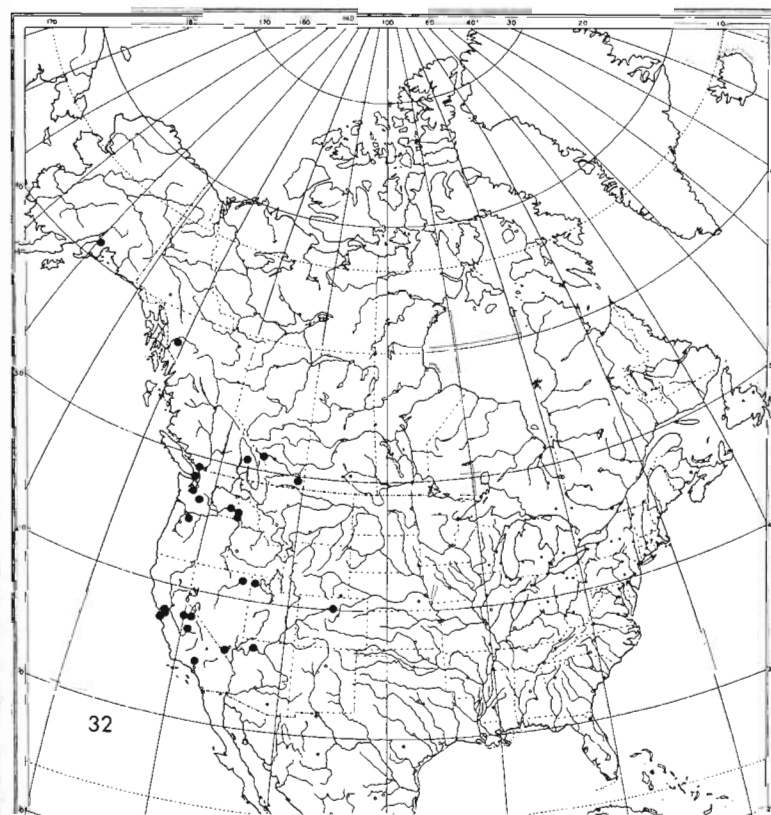
P. detruncata: holotype, ♂, Kalvene, Latvian SSR, 17-V-1932, P. Lackschewitz, deposition unknown ("in possession of heirs" (Horn and Kahle, 1935)).

Material examined.— 49 ♂♂ and 31 ♀♀ in 36 collections

MAP 31. — *P. taczanowskyi* Dziedzicki, *P. versuta* Gagné.

from 21 localities in North America (Map 30). *P. taczanowskyi* has been reported from Poland, Latvia, Great Britain, and Finland.

Remarks. — *P. taczanowskyi* forms a natural group with *portschinskyi* and several other *Phronia* (see under *portschinskyi* for further discussion). *P. taczanowskyi* is easily distinguished from those other species by the widely separated caudal projections of the aedeagus and the presence on the female tergum VII of 3-4 pairs of extremely long setae. Also, the female tergum VIII is deeply cleft on the caudal edge, and the resulting lobes are triangular; in dried specimens, the cerci barely protrude beyond segment VIII.

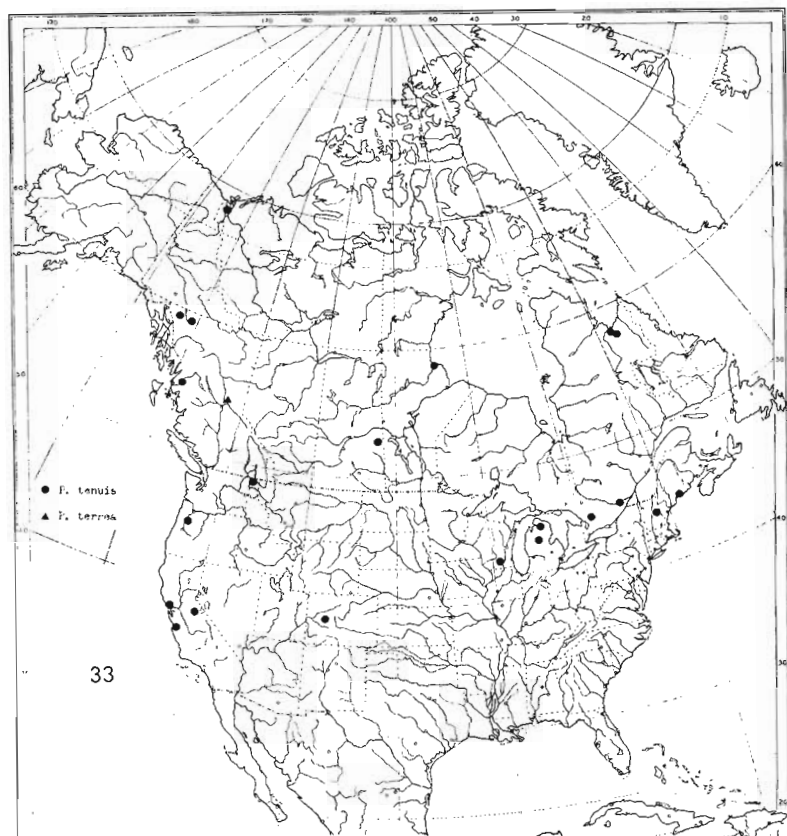
MAP 32. — *P. tenebrosa* Coquillett.

Phronia tenebrosa Coquillett

tenebrosa Coquillett 1904:170, ♀.

Adult. — Wing length: ♂, 2.8-3.4 mm.; ♀, 3.1-3.8 mm. Body dark brown to black, legs fuscous yellow to brown. Anepisternum with 2-3 setae. Apical third of wing fuscous; setulae on wing veins: rm, 1-2; M₁, 54-67; M₂, 45-53; Cu petiole, 8-12; Cu₁, 21-30; Cu₂, 13-19. Setae on mid tibia, 3-4a, 3-4d, 3-6p, 5-7v; on hind tibia, 5-7a, 7-9d, 9-12p. Male genitalia as in Figs. 11-13, dark brown. Female terminalia as in Fig. 133, dark brown.

Holotype. — ♀, San Mateo Co., California, C. F. Baker, USNM Type No. 8031.



MAP 33. — *P. tenuis* Winnertz, *P. terrea* Gagné.

Material examined other than holotype. — 80 ♂♂ and 41 ♀♀ in 29 collections from 28 localities in western North America (Map 32). *P. tenebrosa* is known only from North America.

Remarks. — *P. tenebrosa* is related to the other species with a fuscous cloud on the apical third of the wing, viz. *willistoni*, *nebulosa*, and the Palearctic *biarcuata*, but especially the last two. The mesal and dorsal portions of the telomere of these species are rather similar, but differences can be found in the lateral portion of the telomere, the aedeagus, and the female terminalia.

Phronia tenuis Winnertz

tenuis Winnertz 1863:872, ♂, ♀.

basalis Van Duzee 1928:61, Fig. 18, ♂, ♀, preocc. Winnertz 1863. **New synonymy.**

californica Fisher 1938:222, new name for *basalis* Van Duzee. **New synonymy.**

hitchcocki Shaw 1951:67, Fig. 5, ♂. **New synonymy.**

Adult. — Wing length: ♂, 2.6-3.5 mm.; ♀, 2.7-4.4 mm. Body brown to dark brown, legs lighter. Anepisternum with 2 setae. Setulae on wing veins: rm, 2-4; M₁, 47-58; M₂, 38-49; Cu petiole, 15-27; Cu₁, 15-28; Cu₂, 13-20. Setae on mid tibia, 2-5a, 2-4d, 7-10p, 9-17v; on hind tibia, 6-9a, 10-14d, 7-12p. Male genitalia as in Figs. 52-54, brown. Female terminalia brown, illustrated in Dziedzicki (1889).

Types of names included in this taxon.

P. tenuis: syntypes, ♂ [♂♂], ♀ [♀♀], ? Germany, destroyed during World War II, but illustrated in Dziedzicki (1889, 1915).

P. basalis: holotype, ♂, Mill Valley, Marin Co., California III-13-1926, in Cal. Acad. Sci. Allotype and 3 ♀ paratypes, same data as holotype.

P. hitchcocki: holotype, ♂, Snowy Range Mts., Albany Co., Wyoming, IX-25-1947, D. G. Denning, in F. R. Shaw Coll. at U. Mass.

Material examined. — Type series of *basalis*, holotype of *hitchcocki*, and 40 ♂♂ and 5 ♀♀ from 39 collections in 30 localities in North America. I have seen specimens also from Swedish Lapland, Switzerland, and Nepal. This species has also been recorded from Germany, Austria, Czechoslovakia, Poland, and Finland.

Remarks. — Edwards (1925b) reported rearings of this species from whitish larvae covered with a sticky coating.

Phronia terrea, new species

Adult. — Wing length: ♂, 2.7 mm. Body brown, legs yellow. Anepisternum with 2 setae. Setulae on wing veins: rm, 0; M₁, 39; M₂, 31; Cu petiole, 17; Cu₁, 12; Cu₂, 10. Setae on mid tibia, 3a, 3d, ?p, ?v; on hind tibia, 4a, 5d, 5p. Male genitalia as in Figs. 124-125, brown. Female unknown.

Holotype. — ♂, Summit Lake, Mile 392. Alaska Highway, British Columbia, 2-4-VII-1959, R. E. Leech, deposited in CNC. (Map 33).

Remarks. — The lateral portion of the telomere is remarkable because of the large, setose, basoventral lobe and the two other lobes that arise mesally.

Phronia tiefii Dziedzicki

tiefii Dziedzicki 1889:483, pl. 13, Figs. 85-87, ♂.

marginata Dziedzicki 1889:508, pl. 21, Figs. 209-211, syn. by Hackman (1970).

Adult. — Wing length: ♂, 3.4-4.0 mm.; ♀, 3.5-4.6 mm. Male antennae, legs, and abdomen very long, body brown to dark brown; female body parts not as long, color brown, thorax and abdomen usually banded yellow. Anepisternum with 2-4 setae. Setulae on wing veins: rm, 0-2; M₁, 60-82; M₂, 43-64; Cu petiole, 0-9; Cu₁, 16-24; Cu₂, 14-22. Setae on mid tibia, 3-5a, 3-5d, 6-10p, 7-12v; on hind tibia, 5-6a, 6-13d, 5-8p, 1-5v. Male genitalia as in Figs. 22-23, brown. Female terminalia figured in Dziedzicki (1889) and Hackman (1970).

Types of names included in this taxon.

P. tiefii: syntypes, 2 ♂♂, Villach, Austria, destroyed during World War II.

P. marginata: syntypes, 34 ♀♀, Waldegg, Austria, Graefenberg and Karlsbrunn, Czechoslovakia, and Milosna, Poland, collected V-VIII, destroyed during World War II.

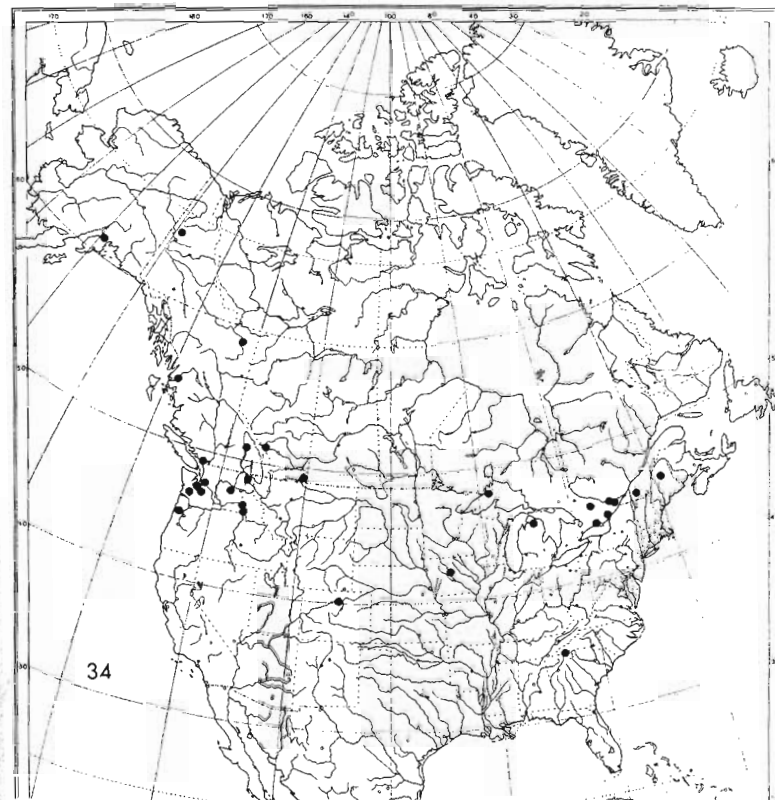
Material examined. — 28 ♂♂ and 78 ♀♀ from 56 collections in 38 localities in North America (Map 34). I have seen specimens also from Swedish Lapland and Switzerland. *P. tiefii* is known also from the type localities and Finland.

Remarks. — This species is unique among *Phronia* for its sexual dimorphism in color and in length of abdomen, legs, and antennae. The closest relative of *tiefii* appears to be *matilei* (see discussion of both under *P. exigua*).

Phronia versuta, new species

Adult. — Wing length: ♂, 3.2 mm. Body mostly dark brown, legs very long, fuscous yellow to yellow. Anepisternum with two setae. Setulae on wing veins: rm, 1-2; M₁, 57-60; M₂, 50-52; Cu petiole, 10-13; Cu₁, 17-21; Cu₂, 15-16. Setae on mid tibia, 3a, 3-4d, 8-9p, 3-4v; on hind tibia, 5-6a; 5d; 6-7p. Male genitalia as in Figs. 105-106, brown. Female unknown.

Holotype. — ♂, Saddleback Mt., Lincoln Co., Oregon, VIII-3-



MAP 34. — *P. tiefii* Dziedzicki.

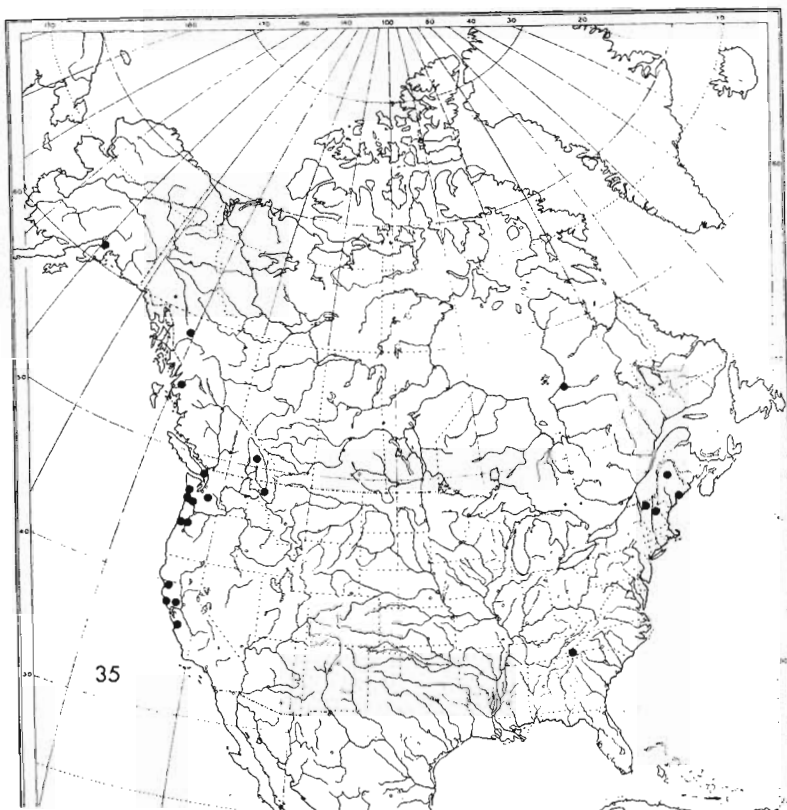
1960, J. C. Dirks-Edmunds, USNM Type No. 66620 (kindly donated by collector).

Paratype. — ♂, same locality as holotype [USNM]. (Map 31).

Phronia willistoni Dziedzicki

willistoni Dziedzicki 1889:486, pls. 15 and 19, Figs. 73-75, 152-155, ♂, ♀.

Adult. — Wing length: ♂, 2.7-3.9 mm.; ♀, 2.7-3.4 mm. Body brown to dark brown, legs mainly yellow. Apical third of wing usually fuscous. Setulae on wing veins: rm, 3-5; M₁, 61-70; M₂, 54-63; Cu petiole, 12-26; Cu₁, 19-29; Cu₂, 18-23. Setae on mid tibia, 3-5a, 2-5d, 7-10p, 12-17v; on hind tibia, 7-9a, 10-15d, 5-14p. Male genitalia as in Figs. 7-10, brown. Female terminalia figured in Dziedzicki (1889) and Hackman (1970).

MAP 35. — *P. willistoni* Dziedzicki.

Syntypes. — 5 ♂♂, ♀, Karlsbrunn, Czechoslovakia; Lithuanian SSR; and Strzygi and Nowo-Minsk, Poland, collected V-VIII, destroyed during World War II.

Material examined. — 64 ♂♂ and 35 ♀♀ in 35 collections from 30 localities in North America. In addition I have seen specimens from Corsica and Spain. *P. willistoni* has been recorded from Poland, Lithuania, Corsica, Austria, and Finland.

LIST OF NAMES IN PHRONIA

This list includes all names, including those of fossils, originally

or now placed in *Phronia*.² Valid names in *Phronia* are set in boldface; other names are junior synonyms, dubious, of uncertain placement, or transferred to other genera. Taxa described as varieties are treated as full species here. I have not seen the fossil species and have marked as "not seen" those other species for which I have seen neither specimens nor genital illustrations.

abbreviata (Becker) 1908 (*Telmaphilus*). Palearctic.

abdominalis (Santos) 1920 (*Telmaphilus*), as var. of *abbreviata* (Becker). Palearctic (not seen).

abreui Landrock 1927, new name for *bicolor* (Santos).

aestivalis Dziedzicki 1889. Hackman (1970): syn. of *mutabilis* Dziedzicki.

agilis Gagné, new species. Nearctic.

annulata Winnertz 1863. Hackman (1970): nomen dubium.

apicalis Winnertz 1863. Palearctic (♀ only, not seen).

appropinquata Strobl 1901. Palearctic.

areolata Enderlein 1910. Edwards (1913b): to *Exechia*.

aterrima Grzegorzek 1875. Landrock (1927): to *Anatella*.

austriaca Winnertz 1863. Nomen dubium, possibly = *signata* Winnertz (see also Hackman 1970). Palearctic.

aviculata Lundström 1914. Palearctic.

avida Gagné, new species. Nearctic.

basalis Winnertz 1863. Palearctic.

basalis Van Duzee 1928, preocc. Winnertz 1863; renamed *californica* Fisher. N. syn. of *tenuis* Winnertz.

biarcuata (Becker) 1908 (*Telmaphilus*). Palearctic.

bicolor Dziedzicki 1889. Holarctic.

bicolor (Santos) 1920 (*Telmaphilus*), preocc. in *Phronia* by Dziedzicki 1889; renamed *abreui* Landrock. Palearctic (not seen).

boninensis Colless 1966. Bonin Is., Oceania (♀ only).

borealis Hackman 1970. Palearctic.

braueri Dziedzicki 1889. Holarctic.

brevifurcatus (Enderlein) 1910 (*Macrobrachius*). Ethiopian.

brevipennis Théobald 1937. Fossil, incertae sedis.

brunnea (Macquart) 1834 (*Mycetophila*). Type prob. lost, incertae sedis (see also Séguy 1940).

californica Fisher 1938, new name for *basalis* Van Duzee. N. syn. of *tenuis* Winnertz.

caliginosa Dziedzicki 1889. Holarctic.

² I almost missed a paper by G. P. Ostroverkhova (1970). New data on Siberian fungus gnats (Diptera, Mycetophilidae). Entomol. Obozr. 49:452-458) in which 4 new species of *Phronia* were described: *P. setigera* (? = *Trichonta vulcani* (Dziedzicki)), *P. dissecta*, *P. meniscoidea* (? = *P. forcipula* Winnertz), and *P. angulosa* (? *P. disgrega* Dziedzicki).

- ciliata* Meunier 1904. Fossil, incertae sedis.
cinerascens Winnertz 1863. Holarctic.
conformis (Walker) 1856 (*Mycetophila*). Holarctic.
cordata Lundström 1914. Holarctic.
crassipes Winnertz 1863. Wulp (1877): syn. of *tarsata* Staeger. Nomen dubium; Palearctic.
crassitarsus Hackman 1970. N. syn. of *fusciventris* Van Duzee.
cupida Gagné, new species. Nearctic.
decorosa Dziedzicki 1889. Hackman (1970): syn. of *interstincta* Dziedzicki.
despecta (Walker) 1848 (*Mycetophila*). Nomen dubium; Nearctic.
detruncata Lackschewitz 1937. Hackman (1970): syn. of *taczanowskyi* Dziedzicki.
difficilis Johannsen 1912. N. syn. of *conformis* Walker.
digitata Hackman 1970. Holarctic.
disgrega Dziedzicki 1889. Holarctic.
distincta Hackman 1970. Holarctic.
dryas Gagné, new species. Nearctic.
dubia Dziedzicki 1889. Hackman (1970): syn. of *nigricornis* Zetterstedt.
dubioides Matile 1969. Palearctic.
dziedzickii Lundström 1906. Palearctic.
effusa Gagné, new species. Nearctic.
egregia Dziedzicki 1889. Palearctic.
elegans Dziedzicki 1889. Palearctic.
elegantula Hackman 1970. Palearctic.
emarginata Strobl 1901. Palearctic (not seen).
exigua (Zetterstedt) 1852 (*Mycetophila*). Holarctic.
felicis Gagné, new species. Nearctic.
flabellata Van Duzee 1928. N. syn. of *flavipes* Winnertz.
flabellipennis Enderlein 1910. Edwards 1913b: To *Exechia*.
flavicauda Winnertz 1863. Type lost, genitalia undescr.: nomen dubium; Palearctic.
flavicollis Winnertz 1863. Nomen dubium, poss. syn. of *strenua* Winnertz (see also Hackman 1970); Palearctic.
flavida (Santos) 1920 (*Telmaphilus*), as var. of *biarcuata* (Becker). Palearctic (not seen).
flavipes Winnertz 1863. Holarctic.
forcipata Winnertz 1863. Palearctic.
forcipula Winnertz 1863. Holarctic.
fusciventris Van Duzee 1928. Holarctic.
girschneri Dziedzicki 1889. Edwards (1925b): syn. of *conformis* Walker.
gracilis Hackman 1970. Holarctic.
hilaris Gagné, new species. Nearctic.
hitchcocki Shaw 1951. N. syn. of *tenuis* Winnertz.
humeralis Winnertz 1863. Palearctic.

- humeralis* (Santos) 1920 (*Telmaphilus*), preocc. in *Phronia* by Winnertz 1863; renamed *insularis* Landrock. Palearctic (not seen).
incerta (Adams) 1907 (*Mycetophila*). Type lost, nomen dubium; Nearctic.
insularis Landrock 1927. N. name for *humeralis* (Santos).
insulsa Johannsen 1912. N. syn. of *nigricornis* (Zetterstedt).
interstincta Dziedzicki 1889. Holarctic.
jocosa Gagné, new species. Nearctic.
johannae Steenberg 1924. Gagné (1974): syn. of *biarcuata* (Becker).
kowarzi (Dziedzicki) 1889 (*Macrobrachius*). Restored to *Macrobrachius*.
laeta Winnertz 1863. Dziedzicki 1889: syn. of *basalis* Winn.
lafooni Gagné, new species. Nearctic.
leioides (Walker) 1856 (*Mycetophila*). Edwards 1925: syn. of *conformis* Walker.
lepida Winnertz 1863. Palearctic (♀ only; genitalia undescr.).
longelamellata Strobl 1898. Palearctic.
longicosta (Brunetti 1912 (*Macrobrachius*)). Oriental; incertae sedis.
longinervis Freeman 1951. To *Trichonta*, n. combination.
longipes Winnertz 1863. Dziedzicki 1889: syn. of *rustica* Winnertz.
lutescens Hackman 1970. Holarctic.
maculata Dziedzicki 1889. Palearctic (♀ only).
marginata Dziedzicki 1889. Hackman (1970): syn. of *tiefii* Dziedzicki.
matilei Hackman 1972. Holarctic.
melaena Edwards 1924a, as var. *egregia* Dziedzicki. N. syn. of *egregia* Dziedzicki.
melica Gagné, new species. Nearctic.
minuta Landrock 1928. Palearctic.
mutabilis Dziedzicki 1889. Holarctic.
mutila Lundström 1911. Palearctic.
nebulosa (Johannsen) 1912 (*Telmaphilus*). Nearctic.
nigricornis (Zetterstedt) 1852 (*Mycetophila*). Holarctic.
nigripalpis Lundström 1909. Holarctic.
nitidiventris (Wulp.) 1858 (*Mycetophila*). Palearctic.
notata Dziedzicki 1889. Palearctic.
obscura (Walker) 1848 (*Mycetophila*). Johannsen 1926: "prob. a *Phronia*." Incertae sedis.
obscura Dziedzicki 1889. Palearctic.
obscuripes (Santos) 1920 (*Telmaphilus*), as var. of *abbreviatus* (Becker). Palearctic (not seen).
obtusa Winnertz 1863. Holarctic.
ochracea (Santos) 1920 (*Telmaphilus*). Palearctic (not seen).
opaca Dziedzicki 1889. Palearctic (♀ only).
oreas Gagné, new species. Nearctic.
palustris Landrock 1924. Hackman (1970): syn. of *nigripalpis* Lundström.
peculiaris Dziedzicki 1889. Palearctic.
persimilis Hackman 1970. Holarctic.

- petulans* Dziedzicki 1889. Holarctic.
pigra Winnertz 1863. Palearctic (♀ only; genitalia undescr.).
portschinskyi Dziedzicki 1889. Holarctic.
praecox Edwards 1925b. Gagné 1974: syn. of *biarcuata* (Becker).
producta Johannsen 1912. Restored to *Macrobrachius*.
pygisiaca Winnertz 1863. Dziedzicki (1889): syn. of *forcipula* Winnertz.
rustica Winnertz 1863. Edwards (1925a): syn. of *exigua* (Zett.).
saxatilis Dziedzicki 1889. Hackman 1970: syn. of *siebeckii* Dziedzicki.
saxigena Dziedzicki 1889. Palearctic (♀ only).
semiatrata Dziedzicki 1889. Palearctic (♀ only).
semifumata Brunetti 1912. Edwards (1924b): to *Exechia*.
senex Lackschewitz 1937. Hackman (1970): syn. of *caliginosa* Dziedzicki.
siebeckii Dziedzicki 1889. Palearctic.
signata Winnertz 1863. Palearctic.
silhouettensis Enderlein 1910. Matile 1970: to *Pseudexechia*.
similis Johannsen 1912. Nearctic.
simplex Brunetti 1912. Edwards (1924b): to *Exechia*.
sinuata Freeman 1956. Kidd and Ackland (1969): syn. of *siebeckii* Dziedzicki.
spinigera Hackman 1970. Palearctic.
squalida Winnertz 1863. Hackman (1970): syn. of *nitidiventris* (Wulp).
strenua Winnertz 1863. Holarctic.
subsylvatica Hackman 1970. Palearctic.
subvenosa Enderlein 1910. Edwards (1913b): to *Exechia*.
sudetica Dziedzicki 1889. Holarctic.
sylvatica Dziedzicki 1889. Holarctic.
taczanowskyi Dziedzicki 1889. Holarctic.
tarsata (Staeger) 1840 (*Mycetophila*). Lectotype desig. herein under *fusci-ventris*. Nomen dubium; Palearctic.
tenebrosa Coquillett 1904. Nearctic.
tenuis Winnertz 1863. Holarctic.
terrea Gagné, new species. Nearctic.
tiefi Dziedzicki 1889. Holarctic.
triangularis Winnertz 1863. Palearctic.
tricineta Enderlein 1910, as var. of *subvenosa*. Edwards (1913b): to *Exechia*.
tristis Strobl 1897, as var. of *flavicauda* Winnertz. Palearctic (♀ only, not seen).
trivittata Dziedzicki 1889. Hackman (1970): syn. of *caliginosa* Dziedzicki.
truncata Winnertz 1863. Dziedzicki (1889): syn. of *cinerascens* Winnertz.
tyrrhenica Edwards 1928, as var. of *forcipula* Winnertz. Palearctic.
umbricula Grzegorzek 1875. Hackman (1970): syn. of *humeralis* Winnertz.
uncinata Lundström 1916. Landrock (1927): syn. of *forcipata* Winnertz.
unica Dziedzicki 1889. Palearctic.

- unifurcata* Meunier 1917. Fossil, incertae sedis.
venusta Johannsen 1912. N. syn. of *exigua* (Zetterstedt).
versuta Gagné, new species. Nearctic.
virgata Cockerell 1921. Fossil, incertae sedis.
vitiosa Winnertz 1863. Barendrecht (1938): syn. of *nitidiventris* (Wulp).
vittata Winnertz 1863. Dziedzicki (1889): syn. of *annulata* Winnertz, thus nomen dubium.
vulcani Dziedzicki 1889. N. comb. in *Trichonta*.
willistoni Dziedzicki 1889. Holarctic.

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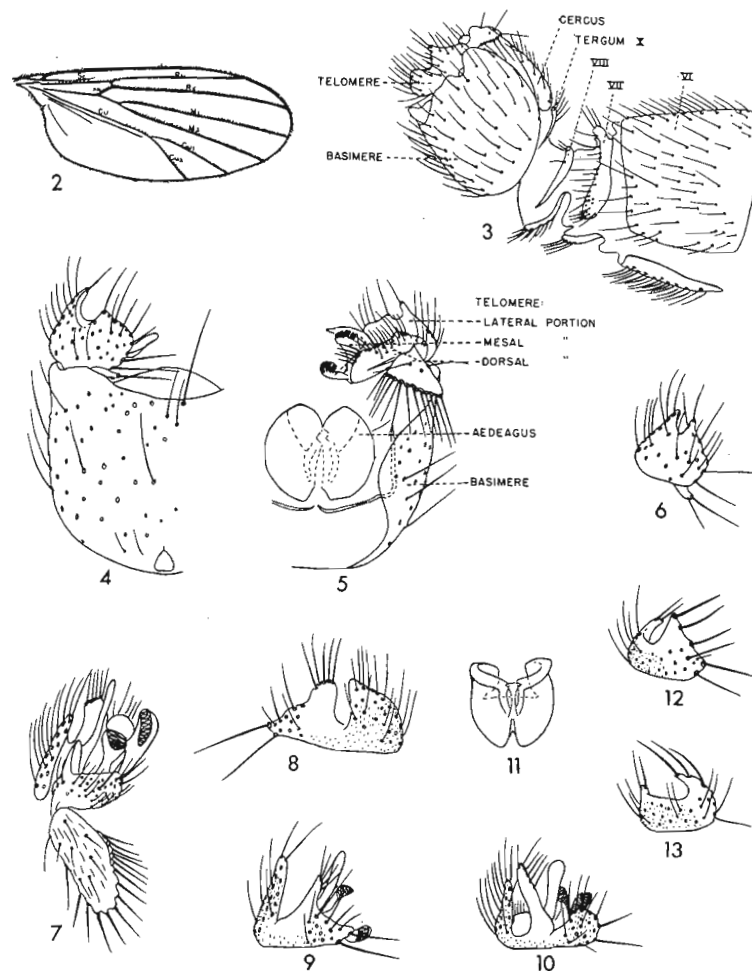
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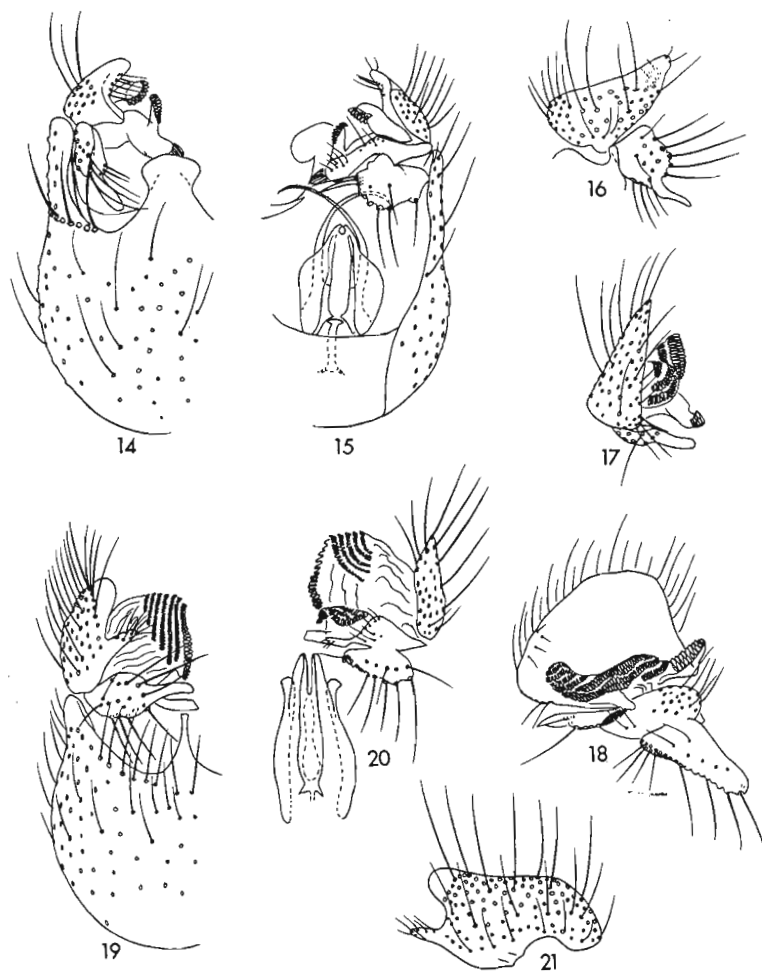
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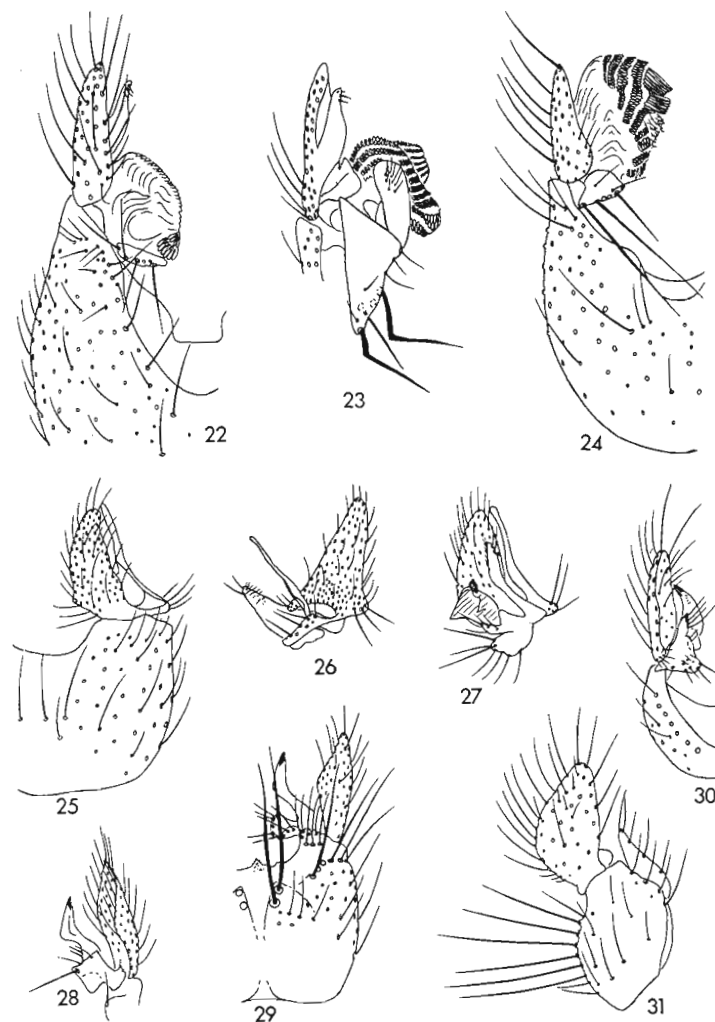
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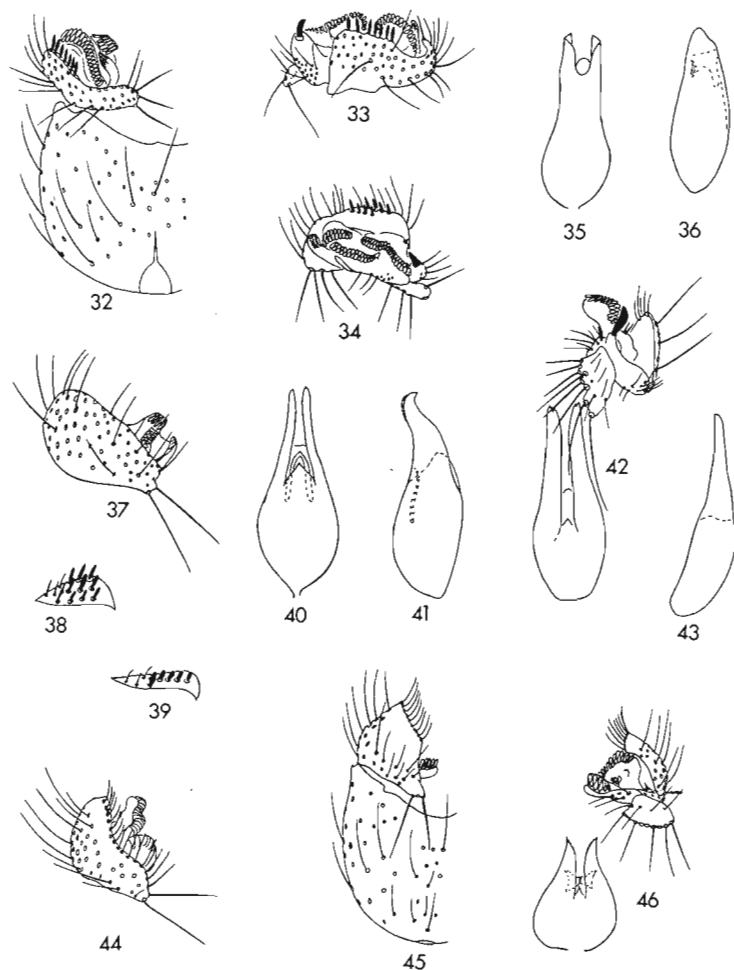
FIGURES 2-13. Figs. 2-6, *P. nebulosa* (2-5, Vancouver, B.C.; 6, Macon Co., N.C.): 2, wing; 3, ♂ postabdomen (lat.); 4, ♂ genitalia (vent.); 5, same, cerci removed (dor.); 6, telomere (vent.). Figs. 7-10, *P. willistoni* (7, nr. Terrace, B.C.; 8, Corvallis, Ore.; 9, Mt. Rainier, Wash.; 10, Seal Harbor, Me.): 7, telomere (dor.); 8, same (lat.); 9, same (vent.); 10, same (vent.). Figs. 11-13, *P. tenebrosa* (Mt. Hood, Ore.): 11, aedeagus (dor.); 12, telomere (vent.); 13, same (lat.).



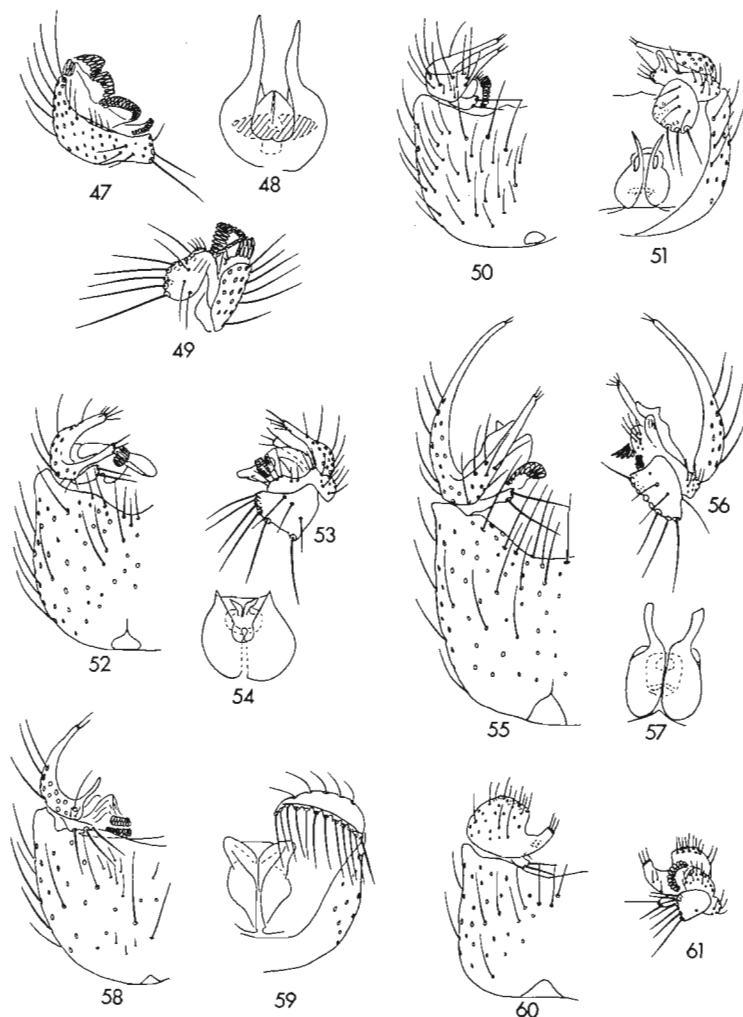
FIGURES 14-21: Figs. 14-16, *P. egregia* (Matanuska, Alas.): 14, ♂ genitalia (vent.); 15, same, cerci removed (dor.); 16, telomere (lat.). Figs. 17-18, *P. exigua* (Matanuska, Alas.): 17, telomere (vent.); 18, same (mes.). Figs. 19-21, *P. flavipes* (Moscow Mt., Ida.): 19, genitalia (vent.); 20, telomere and aedeagus (dor.); 21, telomere (lat.).



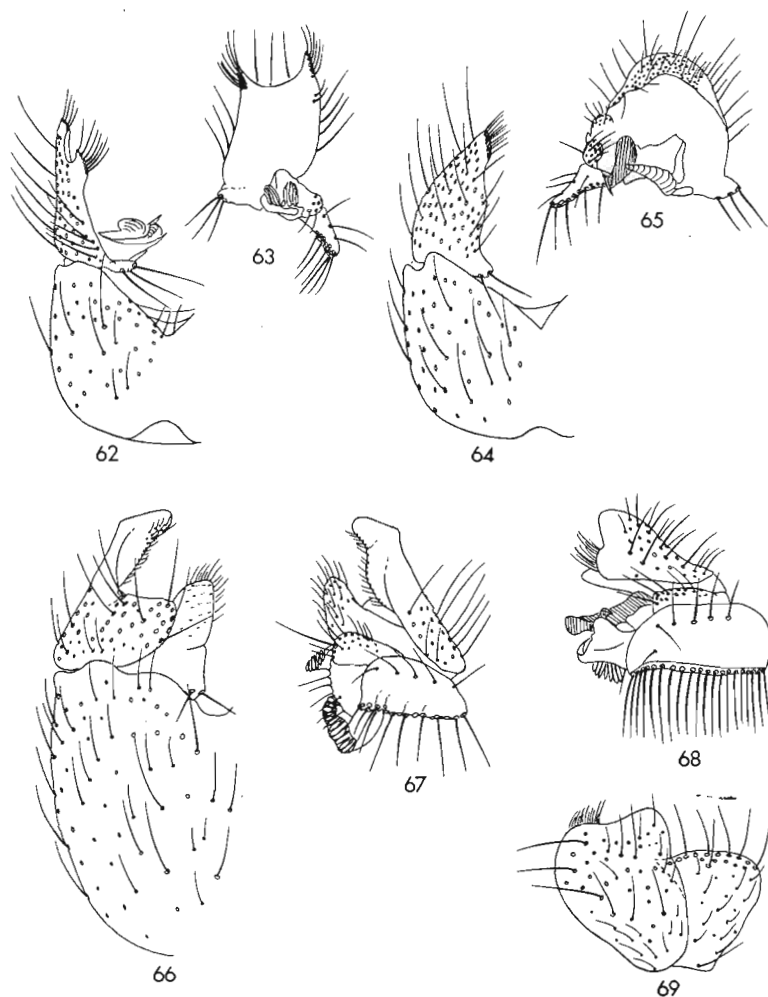
FIGURES 22-31: Figs. 22-23, *P. tiefii* (Old Chelsea, Que.): 22, genitalia (vent.); 23, telomere (dor.). Fig. 24, *P. matilei* (Tacoma, Wash.): 24, genitalia (vent.). Figs. 25-27, *P. dryas* (Hamilton Co., N.Y.): 25, genitalia (vent.); 26, telomere (lat.); 27, same (dor.). Figs. 28-29, *P. felicitis* (nr. Terrace, B.C.): 28, telomere (dor.); 29, genitalia (vent.). Figs. 30-31, *P. nigricornis* (Algonquin Pk., Ont.): 30, genitalia (vent.); 31, same (lat.).



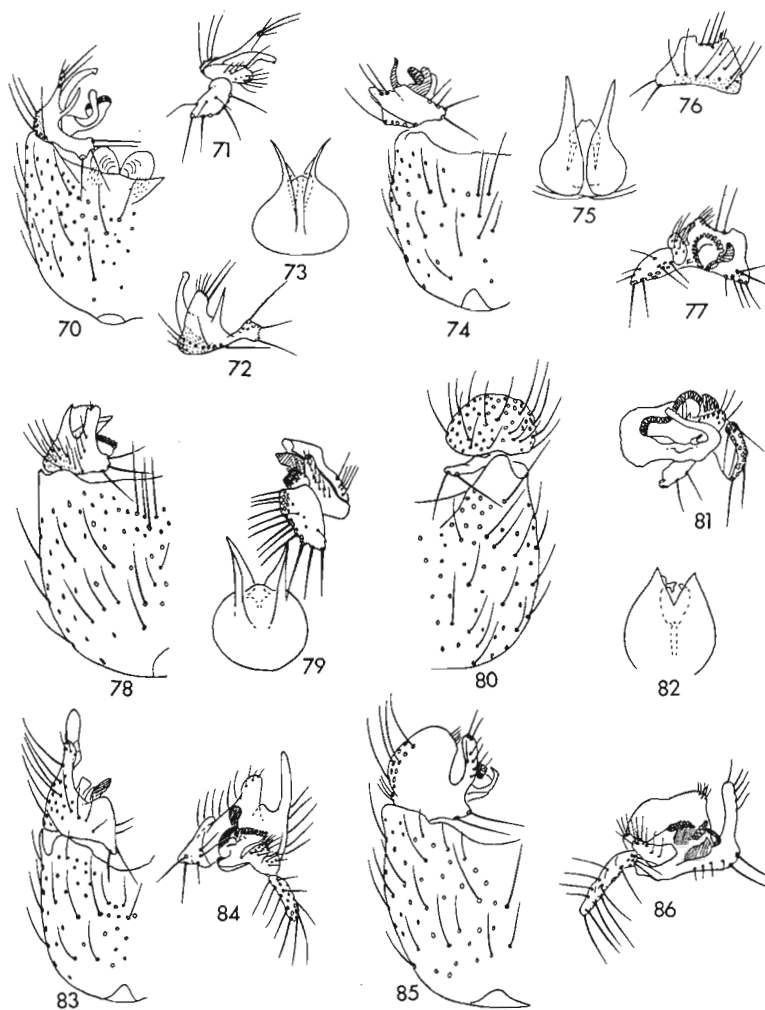
FIGURES 32-46: Figs. 32-36, *P. portschinskyi* (32-33, Matanuska, Alas.; 34-36, Hazen Camp, Ellesmere I., N.W.T.): 32, genitalia (vent.); 33, telomere (lat.); 34, same (mes.); 35, aedeagus (dor.); 36, same (lat.). Figs. 37-41, *P. mutabilis* (37-38, 40-41, Ledges S.P., Ia.; 39, Matanuska, Alas.): 37, telomere (vent.); 38, dorsocaudal corner of telomere (mes.); 39, same (mes.); 40, aedeagus (dor.); 41, same (lat.). Figs. 42-44, *P. obtusa* (42, Old Chelsea, Que.; 43-44, Ledges S.P., Ia.): 42, aedeagus and telomere (dor.); 43, aedeagus (lat.); 44, telomere (vent.). Figs. 45-46, *P. petulans* (Beechgrove, Que.): 45, genitalia (vent.); 46, aedeagus and telomere (dor.).



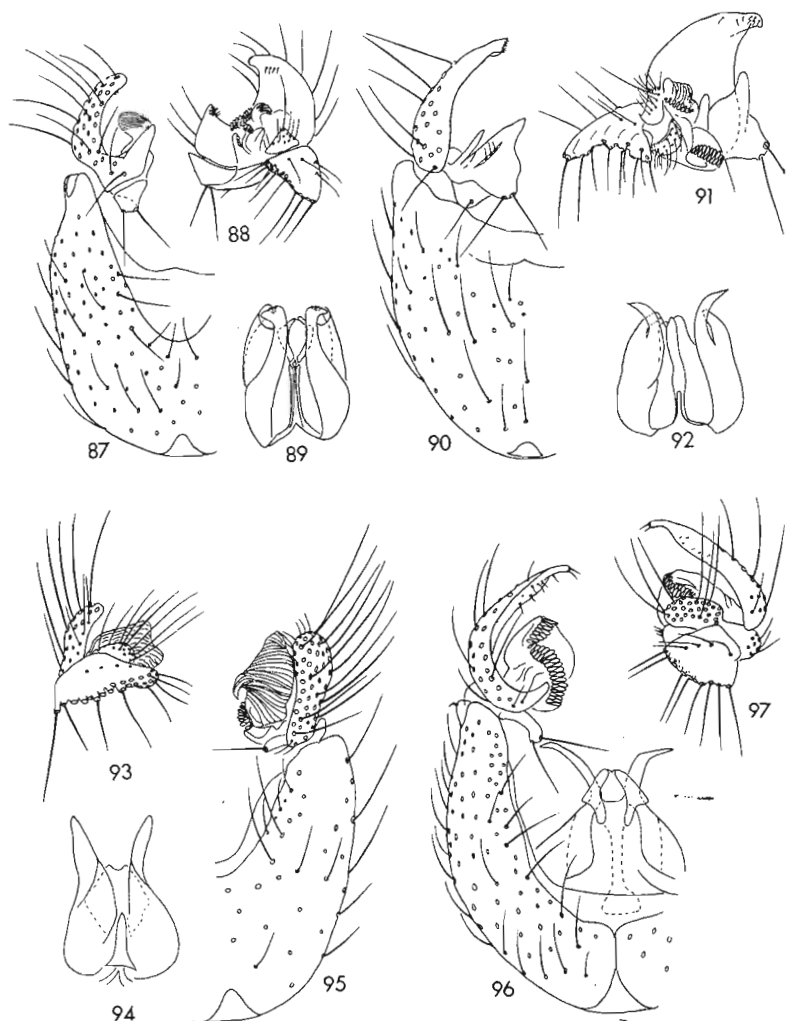
FIGURES 47-61: Figs. 47-49, *P. taczanowskyi* (Ledges S.P., Ia.): 47, telomere (vent.); 48, aedeagus (dor.); 49, telomere (dor.). Figs. 50-51, *P. bicolor* (Ledges S.P., Ia.): 50, ♂ genitalia (vent.); 51, same (dor.). Figs. 52-54, *P. tenuis* (Chatcolet, Ida.): 52, ♂ genitalia (vent.); 53, telomere (dor.); 54, aedeagus (dor.). Figs. 55-57, *P. fusciventris* (Sequim Bay, Wash.): 55, ♂ genitalia (vent.); 56, telomere (dor.); 57, aedeagus (dor.). Figs. 58-59, *P. cinerascens* (Maçon Co., N.C.): 58, ♂ genitalia (vent.); 59, same, cerci removed (dor.). Figs. 60-61, *P. similis* (Ledges S.P., Ia.): 60, ♂ genitalia (vent.); 61, telomere (dor.).



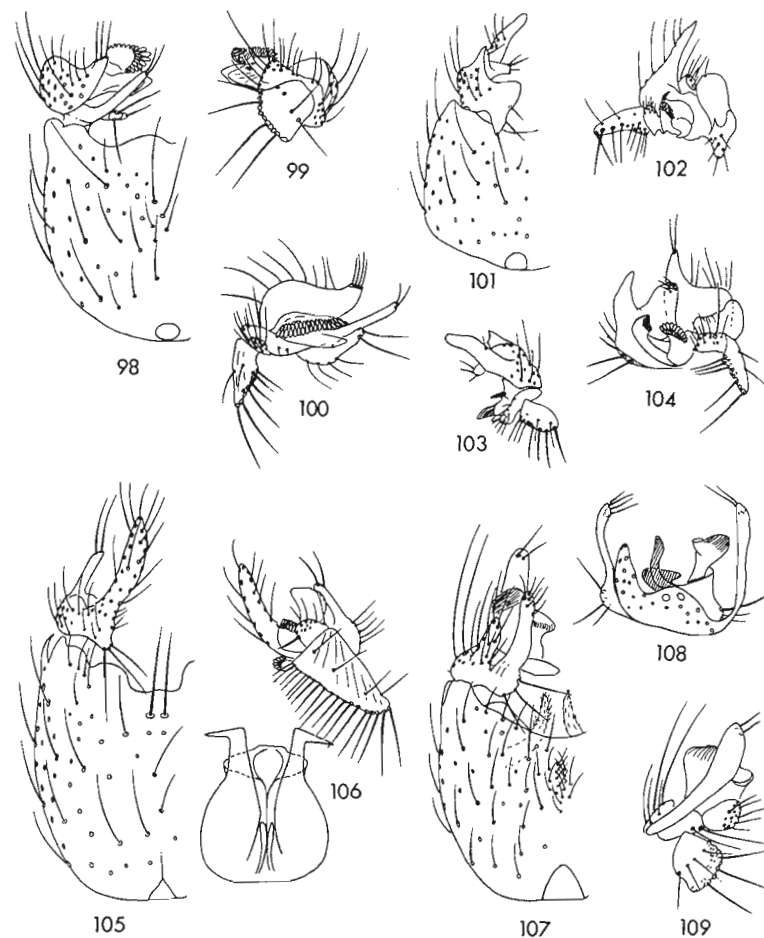
FIGURES 62-69: Figs. 62-63, *P. conformis* (Mt. Vernon, Va.): 62, ♂ genitalia (vent.); 63, telomere (mes.). Figs. 64-65, *P. laffooni* (Sausalito, Cal.): 64, ♂ genitalia (vent.); 65, telomere (mes.). Figs. 66-67, *P. braueri* (Viento, Ore.): 66, ♂ genitalia (vent.); 67, telomere (dor.). Figs. 68-69, *P. lutescens* (Glacier, Wash.): 68, telomere (dor.); 69, same (lat.).



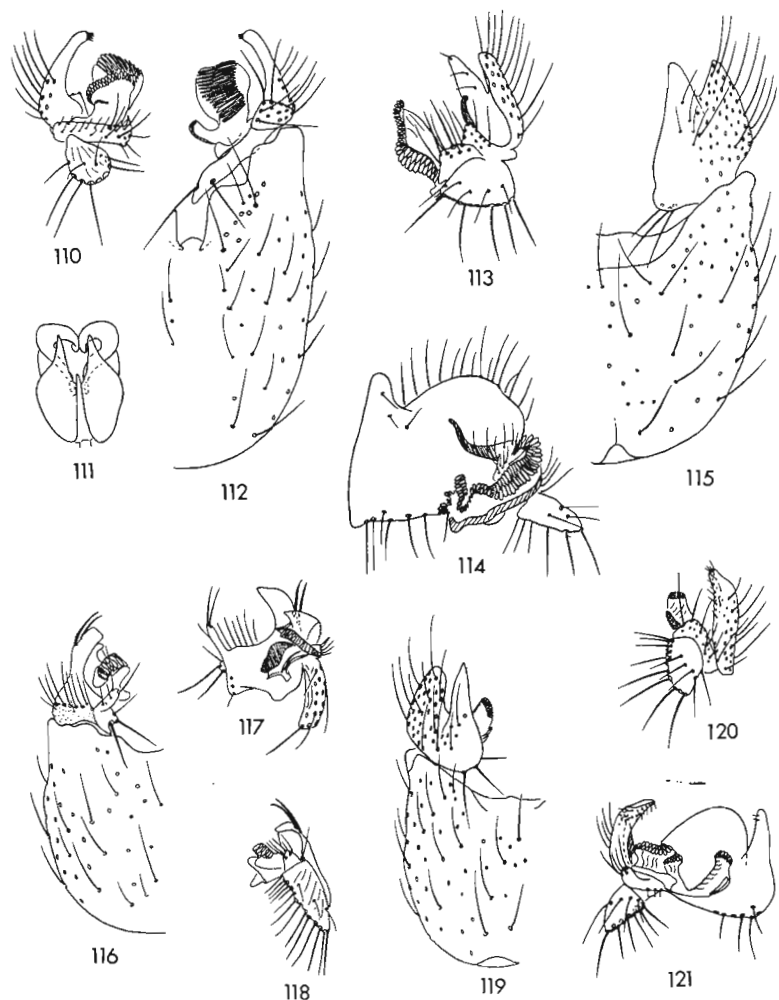
FIGURES 70-86: Figs. 70-73, *P. avida* (Robson, B.C.): 70, ♂ genitalia (vent.); 71, telomere (dor.); 72, same (lat.); 73, aedeagus (dor.). Figs. 74-77, *P. cupida* (Clarion Co., Pa.): 74, ♂ genitalia (vent.); 75, aedeagus (dor.); 76, telomere (lat.); 77, same (mes.). Figs. 78-79, *P. strenua* (Chatcolet, Ida.): 78, ♂ genitalia (vent.); 79, telomere and aedeagus (dor.). Figs. 80-82, *P. agilis* (Ogilvie Mts., Y.T.): 80, ♂ genitalia (vent.); 81, telomere (mes.); 82, aedeagus (dor.). Figs. 83-84, *P. discrega* (Mitchell Co., N.C.): 83, ♂ genitalia (vent.); 84, telomere (mes.). Figs. 85-86, *P. oreas* (Moscow Mt., Ida.): 85, ♂ genitalia (vent.); 86, telomere (mes.).



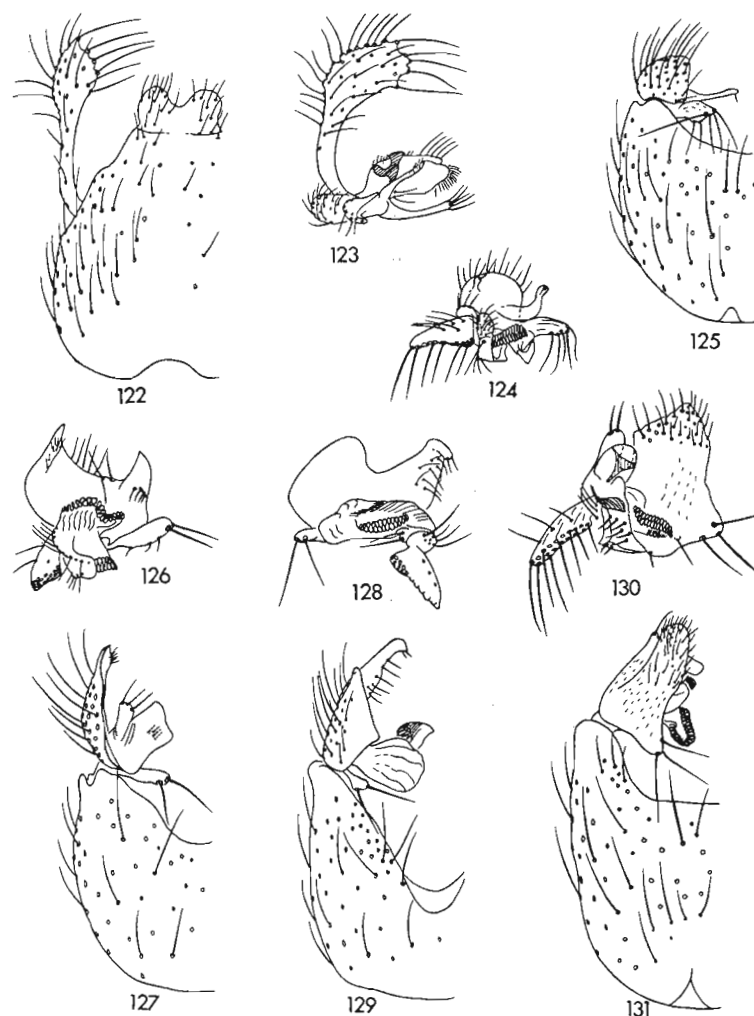
FIGURES 87-96: Figs. 87-89, *P. caliginosa* (Isabel Pass, Richardson Hwy., Alas.): 87, ♂ genitalia (vent.); 88, telomere (mes.); 89, aedeagus (dor.). Figs. 90-92, *P. nigripalpis* (Robson, B.C.): 90, ♂ genitalia (vent.); 91, telomere (mes.); 92, aedeagus (dor.). Figs. 93-95, *P. cordata* (Highlands, N.C.): 93, telomere (dor.); 94, aedeagus (dor.); 95, ♂ genitalia (vent.). Figs. 96-97, *P. cornuta* (Matanuska, Alas.): 96, ♂ genitalia (vent.); 97, telomere (dor.).



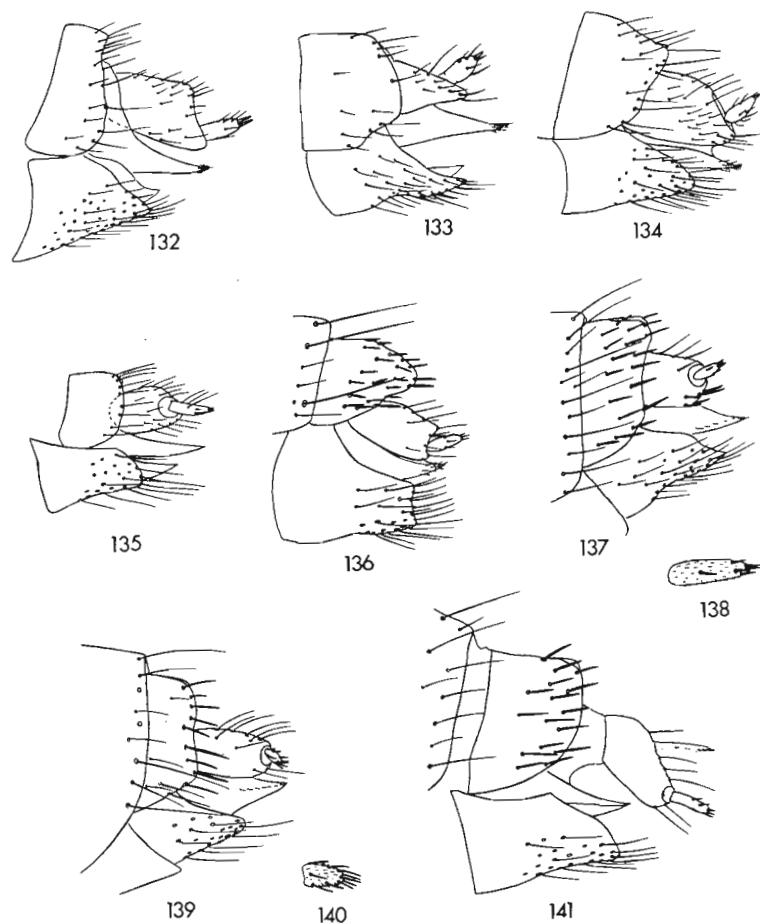
FIGURES 98-109: Figs. 98-100, *P. persimilis* (Keene Valley, N.Y.): 98, ♂ genitalia (vent.); 99, telomere (dor.); 100, same (mes.). Figs. 101-103, *P. distincta* (Unalakleet, Alas.): 101, ♂ genitalia (vent.); 102, telomere (mes.); 103, same (dor.). Fig. 104, *P. interstincta* (Madison Co., Va.): 104, telomere (mes.). Figs. 105-106, *P. versuta* (Lincoln Co., Ore.): 105, ♂ genitalia (vent.); 106, aedeagus and telomere (dor.). Figs. 107-109, *P. digitata* (nr. Terrace, B.C.): 107, ♂ genitalia (vent.); 108, telomere (lat.); 109, same (dor.).



FIGURES 110-121: Figs. 110-112, *P. forcipula* (Cattaraugus Co., N.Y.): 110, telomere (dor.); 111, aedeagus (dor.); 112, ♂ genitalia (vent.). Figs. 113-115, *P. hilaris* (Corvallis Watershed, Ore.): 113, telomere (dor.); 114, same (mes.); 115, ♂ genitalia (vent.). Figs. 116-118, *P. effusa* (Glacier, Wash.): 116, ♂ genitalia (vent.); 117, telomere (mes.); 118, same (dor.). Fig. 119-121, *P. melica* (Macon Co., N.C.): 119, ♂ genitalia (vent.); 120, telomere (dor.); 121, same (mes.).



FIGURES 122-131: Figs. 122-123, *P. sudetica* (Washburn Co., Wisc.): 122, ♂ genitalia (vent.); 123, telomere (lat.). Figs. 124-125, *P. terrea* (Mi. 392, Alas. Hwy., B.C.): 124, telomere (mes.); 125, ♂ genitalia (vent.). Figs. 126-127, *P. jocosa* (Aklavit, N.W.T.): 126, telomere (mes.); 127, ♂ genitalia (vent.). Figs. 128-129, *P. gracilis* (Ilwaco, Wash.): 128, telomere (mes.); 129, ♂ genitalia (vent.). Figs. 130-131, *P. sylvatica* (Isabel Pass, Richardson Hwy., Alas.): 130, telomere (mes.); 131, ♂ genitalia (vent.).



FIGURES 132-141: Figs. 132-135, abdominal segments VIII to X: 132, *P. nebulosa* (Hamilton Co., N.Y.); 133, *P. tenebrosa* (San Mateo Co., Cal.); 134, *P. similis* (Falls Church, Va.); 135, *P. nigricornis* (Clarion Co., Pa.). Figs. 136-141, ♀ abdominal segments VII to X: 136, *P. taczanowskyi* (Matanuska, Alas.); 137, *P. mutabilis* (Ottawa, Ont.); 138, same, 2nd cercal segment (2x larger than Fig. 137); 139, *P. portschinskyi* (Fort Churchill, Man.); 140, same, 2nd cercal segment (2x larger than Fig. 140); 141, *P. obtusa* (Old Chelsea, Que.).

A REVISION OF *TANARTHURUS* LECONTE WITH A PRESENTATION OF ITS MID-CENOZOIC SPECIATION (COLEOPTERA: ANTHICIDAE) ¹

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INTRODUCTION

The genus *Tanarthrus* was erected by Dr. J. L. LeConte (1851) for *T. salinus*, which he found frequenting a salt lake in the Colorado Desert. In his description, LeConte noted the one character most diagnostic for the genus, a median constriction of the eleventh antennal segment. The following year, after returning to New York by sea via Panama, LeConte removed some mold grown during the voyage from the antennae of some specimens of *Anthicus alutaceus* LeConte and discovered that they also bore the constricted antennal segment. This species, which he also collected in southern California, was then removed to *Tanarthrus* (LeConte 1852). LeConte added *T. salicola* from the Great Salt Lake of Utah in 1875.

Colonel T. L. Casey revised the genus in 1895 and added four more species: *T. brevipennis* from northern Arizona; and *nubifer*, *tricolor* and *densus* from the Great Salt Lake. In the same paper Casey proposed two subgenera: *Tanarthrus* containing *T. salinus* and *Tanarthropsis* containing the remaining six species. The subgenera were separated by the relative lengths of the lobes of the eleventh antennal segment, along with the length and thickness of the tarsi.

In the next and last revision of this group, H. F. Wickham (1906) raised the subgenera to the generic level and added four new species to *Tanarthropsis*: *T. virginalis* and *mormon* from Utah; *inyo* from Owens Lake, California; and *infernalis* from Panamint Valley, California. He placed *T. tricolor* Casey as a synonym of *T. salicola* LeConte.

¹ This paper is based on a thesis submitted in partial fulfillment of the requirements for the M.S. degree at the University of Arizona. It has been prepared for publication, modified and expanded at the Ohio State University.