

REVIEW OF THE DIPTEROUS FAMILY PIOPHILIDÆ.¹

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In 1917 in collaboration with Anthony Spuler I published a taxonomic study of the Piophilidæ in Bulletin 143 of the Washington Agricultural Experiment Station. This work was undertaken in order to facilitate identification in this group of insects many of which are of concern to man owing to their unsanitary habits of frequenting garbage. In the meantime additional collecting has brought to light several undescribed species which are herewith described together with some notes on the taxonomy of *Piophila* and a rectification of the identity of *P. pusilla*.

Key to the Species of Mycetaulus.

Thorax wholly reddish yellow, or almost entirely so; abdomen more or less blackened. 2.

Body almost wholly black; wings uniformly subhyaline. 7.

2. Occiput brownish; wings more than three times as long as broad; pectus, metanotum and an anterior spot on mesonotum sometimes blackish. (Can.; E. U. S.)

longipennis Loew

Head yellowish or rufous; wings three times as long as wide. 3.

3. Anterior crossvein distinctly beyond middle of discal cell. . . 4.

Anterior crossvein located near middle of discal cell 6.

4. Costal cell blackened; ocellar area concolorous with head. . 5.
Costal cell hyaline; ocellar area black (E. U. S.)

pulchellus Banks

5. Costal area narrowly black from root of wing to tip, the apical spot excised in submarginal cell. (Or.) . . *costalis*, n.sp.
Costa not centrally blackened, the apical spot somewhat triangular. (Eur.; W. U. S.) *bipunctatus* Fallen

¹Contribution from the Zoology Laboratory of the State College of Washington.

6. One dorsocentral bristle; cilia of calypteres white; wings uniformly subhyaline; front tibiæ yellowish; (W. U. S.)

testaceus, n. sp.

Two dorsocentrals; cilia of calypteres brown; wings with narrow clouding at apex; front tibiæ brown. (Wash.)

polypori, n. sp.

7. Pleuræ, scutellum and end of abdomen reddish (Eur.)

analisis Meigen

Pleuræ, scutellum and abdomen black, only prothorax and humeri yellowish; front yellow. (W. U. S.) *nigritellus*, n. sp.

***Mycetaulus costalis*, n. sp.**

Male. Length 3 mm. Front reddish, occiput, face and cheeks testaceous, thorax luteous, abdomen black. Front tapering, slightly longer than width at anterior ocellus where it is twice as wide as at antennæ, posterior fronto-orbital strong. Notal hairs moderately scattering. Retracted genitalia black. Legs including coxæ mostly pale yellow, last tarsal joint dusky. Halteres white, calypteres dirty, with black fringe; wings mainly clear hyaline, costa, first vein and end of second and third veins black, remainder of veins yellowish, anterior edge of wing bordered with black which also borders the black tips of the second and third veins, costal cell wholly black, anterior crossvein about one-fourth the length of the posterior and located near two-thirds the length of the discal cell.

Holotype, North slope of Mt. Hood, Oregon, 29 July, 1921, at 3000 feet elevation.

***Mycetaulus nigritellus*, n. sp.**

Male. Length 3 mm. Head bicolored, thorax and abdomen black, front legs partly black, wings uniformly but lightly brownish hyaline. Upper two-thirds of occiput black continuing forward on the ocellar triangle and as orbital stripes to the posterior fronto-orbital bristle, remainder of front luteous, face, cheeks and lower orbits pale yellow, lower setulæ indistinct, clypeus narrowly brown, antennæ luteous, the upper part of third joint

brownish, arista blackish. Pectus and the part of the pleuræ above front coxæ brownish yellow, sometimes humeri brown, notal hairs minute and sparse, two strong sternopleurals. Base of abdomen subshining at sides, remainder of abdomen polished, genitalia small and retracted. Front coxæ whitish, basal half of front femora yellow, apical half black, ten flexor setæ, base of front tibiæ yellowish, remainder black, front metatarsi black, other joints yellowish, posterior legs yellowish, the hind femora distally slightly brown. Halteres, calypteres and fringe and root of wings whitish; wings rather pointed, veins brown, first posterior cell two-thirds as wide as submarginal on the costa, anterior crossvein at three-fifths the length of the discal cell and one-third as long as posterior crossvein.

Female. Front tarsi wholly black, the metatarsus somewhat thicker than the other joints; ovipositor terete.

Types. Lookout Mt., Priest Lake, Idaho, 20 August, 1919, paratypes, Lake McDonald, Glacier Park, Montana; Moscow Mt., Idaho; and Mt. Spokane, Washington; July-September: fifteen males and six females.

***Mycetaulus polypori*, n. sp.**

Male. Length 3.5 mm. Head and thorax testaceous, abdomen blackish, legs mostly testaceous yellow, the distal part of front femora and tibiæ and the front tarsi blackish, wings narrowly blackened at apex. Antennæ pale yellow, arista brown, occipital black setulæ conspicuous; front wider than long and two-thirds as wide at lunule as at ocelli. Thoracic hairs fine and rather abundant, bristles long, two dorsocentrals. Base and apex of abdomen and venter yellowish brown, genitalia small, with spiral yellow filament. Front coxæ yellow, sometimes the front femora lack the darkening at the apex. Halteres white, calypteres yellowish white, the fringe brown; wings yellowish hyaline, auxiliary and first vein, distal end of second, third and fourth veins and apical part of costa blackish, remainder of veins yellowish, a narrow blackish cloud following

the blackened portions of the veins at the apex of the wing, anterior crossvein at middle of discal cell and a little shorter than half the length of the posterior crossvein.

Types, twenty-six males and eleven females, in the vicinity of Longmire, Mt. Rainier, Washington, July, 1922. The specimens were taken disporting themselves on the underside of the shelf-fungus, *Polyporus*, growing on tree-trunks in the shady woods. They would not readily take to flight but were secured by suddenly blowing them into the net.

***Mycetaulus testaceus*, n. sp.**

Male. Length 3.5 mm. Head and thorax entirely testaceous abdomen black, legs yellowish with the front tarsi and apical joints of posterior tarsi black; wings uniformly subhyaline. Occiput dull, its setulæ black; front wider than long, its setulæ fine and black. Hairs of mesonotum very fine and abundant, black, only the posterior dorsocentral developed; abdomen truncate at tip, genitalia small, without processes. Calypteres fringed with white hairs, halteres white; costa and first vein blackish, other veins yellowish at base, becoming darker distally, two apical sections of costa subequal, anterior crossvein very slightly beyond middle of discal cell, one-third as long as posterior crossvein.

Type, Moscow Mt., Idaho, 24 June 1919; two paratypes, Ilwaco, Washington, May and July.

The single dorsocentral bristle suggests *Piophila* were it not that the humeral and presutural bristles are strong as in *Mycetaulus*. Location in this genus is further indicated by the yellow body-color, two strong sternopleurals, long cephalic bristles and undoubted relationship to *M. polypori*.

***Prochyliza brevicornis*, n. sp.**

Similar to *P. xanthostoma* in coloration except that the yellow of the face continues over the antennæ across the anterior part of the front. This yellow portion of the front curves down.

The second antennal joint is about one-half the length of the third. There are three or four black setæ on the lower part of the front coxæ.

This is the form mentioned in Bulletin 143 of the Washington State Agricultural Experiment Station, page 56, as superficially resembling *Piophila affinis*. Insamuch as I have taken seventeen specimens all constant in the correlation of characters given above the form may be given specific rank. The localities represented are Yellowstone Park, several places, Flathead Lake, Montana, and Chicago, Illinois; all captured in July or August.

P. xanthostoma has the front entirely black and plane or convex to the lunule. In only one specimen is there any yellow color above the antennæ. The second antennal joint is extremely variable but always is longer in proportion to the third joint than in this brachycerous form. The coxal setæ are present in the male but are undeveloped in the female. In *Piophila affinis* the venter of the male is shaggy with black hair, which is not the case in *Prochyliza*.

Subgenera of Piophila.

The genus *Piophila* was based on *P. casei* as genotype but the inclusion of many subsequently described species has caused it to become heterogeneous. In line with the present tendency to recognize finer distinctions Hendel in 1917 segregated the genus *Allopiophila* from the group, basing it entirely on chæto-tactic characters. *Piophila casei* and a few of its congeners are markedly different from the majority of the species left in *Piophila*. Removal of the species grouped with *P. casei* and the separation of those in *Allopiophila* makes it necessary to revive Liou's name *Stearibia*, founded on *foveolata* Mg.=*nigriceps* Mg. As the size of bristles is quite variable the diagnostic characters have only relative and not absolute value. Hence it is premature to assign more than subgeneric rank to these names.

In order to show the relationships of the species of *Piophila* with reference to the divisions into subgenera and to facilitate identification of several new forms the following table is presented.

Five species not represented in my collection are omitted since their descriptions are too brief to show phyletic location in the key. The omitted species are: *P. concolor*, a red species probably a Cordylurid; *nitens*, perhaps a *Pseudodinia*; *senescens*, vaguely recorded by Macquart in 1851 as from North America and not since recognized, possibly not *Piophila* since it is gray pubescent; and the Greenland hairy species *pilosa* and *nigerrima*.

Key to the Subgenera and Species of Piophila.

Mesonotum finely scabrous, centrally not pubescent but with three rows of setulæ, one in the middle and one on each dorsocentral row; fronto-orbital, humeral, presutural and sternopleural bristles undeveloped; ocellar bristles small, widely distant and located opposite the front ocellus, the ocellar triangle differentiated as a shining space on the satiny front; vertical bristles small; mesopleuræ sparsely hairy; pygidium transverse, retracted within the fifth segment and asymmetrically excised toward the right side; cheeks more than half the eye-height; second and third joints of front tarsi subequal to metatarsus. Subgenus *Piophila* Fallen, s. str. Genotype and only American species, cosmopolitan. *casei* Linn.

Mesonotum smoothly polished and uniformly pubescent; ocellar bristles located behind the front ocellus; cheeks less than half the eye-height; sternopleural bristles usually present, though small; front metatarsi longer than two following joints together.....2.

- 2 Fronto-orbital, humeral and presutural bristles minute or wanting; mesopleuræ usually sparsely hairy; pygidium retracted and cleft toward the right side, i. e. the sixth segment displaced: lower occiput black or blackish, with a pruinose vertical stripe below the eyes abruptly stopping in a vertical line on the cheeks. (if occiput is shining, front blackened on upper three fourths, legs mostly black, and antennæ dark above, see *Prochyliza brevicornis*, n. sp.) Genotype *P. nigriceps* Meig. Subgenus *Stearibia* Lioy.....3.

- One or two fronto-orbitals, humeral and presutural bristles well developed; mesopleuræ bare; pygidium pendant and extending forward under abdomen, the sixth segment superior; back part of cheeks shining, no pollinose vertical stripe beneath the eyes. Genotype *P. luteata* Hal. Subgenus *Allopiophila* Hendel.....9.
3. Scutellum flattened and microscopically roughened; front entirely black and devoid of pubescence; veins thin and pale. (Eur.; N. Am.).....*nigriceps* Meigen.
Scutellum convex and smooth; front more or less yellow or red.....4.
4. Front coxæ yellow.....5.
Front coxæ entirely black; femora black except knees, front tibiæ blackish, their tarsi black.....8.
5. Venter of male heavily hairy; sixth abdominal segment large and convex; posterior legs in large part black; upper half of front black; hind metatarsi subequal to remaining joints together.....6.
Venter with short sparse hairs; sixth abdominal segment of male not strongly convex; hind metatarsi shorter than remaining joints together; front yellow quite to the vertex.....7.
6. Halteres yellow. (Eur.; Mass., Ont., Wash.)..*affinis* Meigen.
Halteres tipped with black. (Wash.)..*affinis*, var. *halterata* M., S.
7. Posterior legs yellow: cheeks, antennæ, base of arista and mouthparts yellow (N. U. S., B. C.)..*privigna*, n., sp.
Posterior legs in large part black; cheeks, antennæ, arista and mouthparts piceous. (Wash.)....*morator* n. sp.
8. Mouthparts, cheeks, face, half of front and antennæ yellowish; halteres entirely yellow. (Mont., Id., Wash.)
nigricoxa M., S.
Mouthparts, cheeks, face and antennæ black, anterior half of front deep reddish: halteres with blackened tip. (Ill.) *occipitalis* M., S.
9. Front coxæ yellow; yellow of front continuing as an M-shaped mark to vertex; at least posterior fronto-orbital strong.....10.

- Coxæ black; fronto-orbital weak.....14.
10. Wings hyaline, veins yellowish.....11.
Wings with dark apical cloud, veins brown; abdomen
closely and finely scabrous. (Mont., Ida., Wash.)
liturata M., S.
11. Sixth segment of male abdomen pruinose; cheeks one-third
eye-height; base of arista brown; propleural bristle
strong.....12
Sixth segment shining; legs typically wholly yellow except
tips of tarsi; cheeks less than one-third eye-height;
arista black; propleural bristle weak. (Mont., Ida.,
Wash.).....*xanthopoda* M., S.
12. Front legs black except coxæ and knees, posterior femora
mostly black. (Mass., N. Y.).....*oriens* M., S.
At least base of front femora yellow, posterior legs mostly
yellow.....13.
13. Legs almost wholly yellow; lower occiput yellow. (Alaska)
setosa M., S.
Front legs black beyond middle of femora, excepting knees;
lower occiput largely black. (Eur.; Wash.)
pusilla Meigen
14. Posterior femora and all tibiæ yellow, front metatarsi
merging in color with remaining joints; front reddish
toward antennæ. (Wyo., Mont., Ida., Wash., Cal.)
nitidissima M., S.
All femora black except narrowly at knees, first joint of
front tarsi yellow sharply contrasting with black re-
mainder: front entirely black. (Ida., Wash.)
atrifrons M., S.

Piophila morator, n. sp.

Male. Length 2.75 mm. Front testaceous, vertex, ocellar triangle, upper orbits and occiput piceous black, cheeks, face, mouthparts and antennæ brown, the antennæ appearing velvety with cinereous pubescence; a vertical gray pruinose stripe beneath eyes, cheeks at middle one-fourth the eye-height; base of arista brown, remainder black; interfrontal pubescence distinct

but sparse and pale, bristles weak. Humeral, presutural and sternopleural bristles undeveloped, prothoracic bristle weak; hairs of meso- and sterno-pleuræ present, propleuræ heavily pruinose. Abdomen bluntly elliptical, ventral hairs short and sparse, pygidium retracted, cleft on right side. Front coxæ yellowish, posterior coxæ piceous, legs piceous except the yellowish knees and posterior tarsi. Halteres nearly white. Wings hyaline, veins pale.

Holotype, Pullman, Washington, May.

***Piophila privigna*, n. sp.**

Male. Length 3 mm. Front light yellow up to the vertex, the small ocellar triangle and the uppermost orbits black, occiput shining black, its lower sides with a white pruinose stripe extending from the eyes to the oral margin, face, cheeks, mouth-parts and antennæ light yellow, arista brown, paler at base; cheeks broad, at middle one-third and at pruinose stripe one-half the eye-height; interfrontal hairs sparse and yellow, ocellar and postvertical bristles small, no fronto-orbitals. Thorax polished black with bluish lustre, no humeral, presutural or sternopleural bristles, notal pubescence uniform, meso- and sternopleuræ with scattering hairs, scutellum convex, prothoracic bristle small, propleuræ heavily pruinose. Abdomen polished black with blue lustre, the sixth segment displaced so that the retracted pygidium appears cleft, ventral hairs short and sparse. Legs light yellow, the distal two-thirds of front femora black and the distal three-fourths of front tibiæ brown. Halteres whitish. Wings hyaline, veins pale yellow.

Female. Front tarsi black.

Types, four males and eight females; Woods Hole, and New Bedford (Hough) Mass.; Cold Spring Harbor, N. Y.; Chicago, Ill.; Sheridan (Metz), Wyo.; Potlatch, Ida.; Pullman, Colfax, Ilwaco, Wash.; Nelson, B. C.: July and August. This is the species recorded as *P. pusilla* in Bulletin of the Washington State Agricultural Experiment Station No. 143, p. 61., under which name the other specimens there listed have been distributed among collections. I have taken the real *pusilla* at Olympia, Wash.



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