

A key to, notes on, and descriptions of American *Pleotrichophorus* Börner (Homoptera, Aphididae)

by

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Abstract. *Pleotrichophorus ambrosiae* spec. nov., from *Ambrosia artemisiifolia*; *P. hottesi* spec. nov., from *Achillea lanulosa*; *P. lagacei* spec. nov., from *Haplopappus bloomeri*; and *P. longirostris* spec. nov. from *Eriophyllum stachaeidifolium* are described from North America. *Capitophorus bitrichus* Knowlton & Smith, 1936 is declared a synonym of *Capitophorus heterohirsutus* Gillette & Palmer, 1933; *Capitophorus xerozoous* Knowlton & Smith, 1936 a synonym of *Capitophorus gregarius* Knowlton, 1929; *Capitophorus palmerae* Knowlton, 1935 and *Capitophorus chlorophainus* Knowlton & Smith, 1936 synonyms of *Capitophorus elongatus* Knowlton, 1929; *Capitophorus rusticatus* Knowlton & Smith, 1937, a synonym of *Capitophorus pullus* Gillette & Palmer, 1933. *Capitophorus decampus* Knowlton & Smith, 1936 according to a fundatrix paratype may be an older valid name for *Capitophorus pseudoglandulosus* Palmer, 1952. A key is given to American species of which material was available.

1. Key to apterous viviparous American *Pleotrichophorus* spp.

- 1 (16) Siphunculi not longer than cauda, and at most $1\frac{1}{2}$ times as long as second joint of hind tarsi.
- 2 (3) Longest hairs on ant. segment III hardly shorter than basal diameter of the segment. Hairs on underside of head pointed, so that the front has a mixture of knobbed and pointed hairs. On *Artemisia tridentata* (syn.: *P. bitrichus* Knowlton & Smith, 1936) *P. heterohirsutus* (Gill. & Palmer)
- 3 (2) Longest hairs on ant. segment III less than half as long as basal diameter of segment. Hairs on front all capitate.
- 4 (5) Last rostral segment about 0.17 mm, over half as long as width of head between the eyes. On *Eriophyllum stachaeidifolium* *P. longirostris* spec. nov.
- 5 (4) Last rostral segment not over 0.15 mm long. On *Achillea* or *Artemisia* spp.
- 6 (7) Last rostral segment in dorso-ventral view on basal half not with strongly concave, and on distal half with more or less convex, sides, with never more than distal $\frac{1}{3}$ part hairless. On *Achillea* spp. *P. patonkui* (Hottes & Frison)
- 7 (6) Last rostral segment on basal half with very strongly concave sides, on distal half concave or cylindrical ("needle-tipped"), with distal $\frac{2}{5}$ part hairless. On *Artemisia* spp.
- 8 (9) Cauda about 0.31—0.35 mm long, $2\frac{1}{2}$ —3 times as long as siphunculi, very slender, about $2\frac{2}{5}$ times as long as basal part of ant. segment VI, normally with 2—4 dorsal hairs and 2 pairs of lateral hairs (also holo-

- type and morphotype with 2 or more dorsal hairs). Dorsal hairs on abd. tergites I—III very numerous, spinally about 17—23 per 0.1×0.1 mm. On *Artemisia longifolia* *P. brevinectarius* (Gill. & Palmer)
- 9 (8) Cauda at most 0.29 mm long, not more than 2 times as long as basal part of ant. segment VI, sometimes with more than 5 hairs, but then much less than 2 times as long as siphunculi.
- 10 (13) Longest spinal and pleural hairs on abd. tergites I—IV not more than 0.030 mm long, with very thick knobs, and therefore rarely more than $12/3$ times as long as width of knob.
- 11 (12) Cauda normally with more than 5 hairs, with 2 pairs of lateral hairs, one dorso-apical hair, and usually 1—3 mid-dorsal hairs with or without incrassate apices. Siphunculi $3/5$ — $9/10$ of length of cauda, much longer than second joint of hind tarsi. On *Artemisia tridentata*. (Types not seen) *P. spatulavillus* (Knowlton & Smith)
- 12 (11) Cauda with 5 hairs, without mid-dorsal hairs. Siphunculi half as long as cauda, about as long as second joint of hind tarsi. On *Artemisia tridentata*. (Types not seen) *P. infrequens* (Knowlton & Smith)
- 13 (10) Longest spinal and pleural hairs on abd. tergites I—IV 0.035—0.052 mm long, more slender, 2 — $3\frac{1}{2}$ times as long as width of knob. Coxae, femora, and cauda often somewhat pigmented, to dark.
- 14 (15) Processus terminalis rather short, mostly less than 4 times as long as basal part of ant. segment VI. Longest spinal or pleural hairs on abd. tergites I—III 0.045—0.052 mm long. Coxae, femora, head, cauda and siphunculi mostly dark to blackish brown pigmented. On *Artemisia californica*. (Doubtfully distinct from the next species) . . . *P. obscuratus* H.R.L.
- 15 (14) Processus terminalis about $4\frac{1}{4}$ —5 times as long as basal part of ant. segment VI. Longest spinal or pleural hairs on abd. tergites I—III 0.035—0.040 mm long. Appendages according to description pale, cauda dusky. Cauda with 5 hairs (in holotype), not 6 as Palmer (1952) writes and draws. On *Artemisia filifolia* *P. filifoliae* (Palmer)
- 16 (1) Siphunculi either longer, often very much longer than cauda, or at least over $13/5$ times as long as second joint of hind tarsi.
- 17 (18) Cauda with more than 12 hairs. First four abd. tergites with a mixture of long slightly knobbed hairs and almost "sessile", strongly knobbed hairs. Hairs on head long and thin, not capitate. On *Chrysothamnus nauseosus* *P. sporadicus* (Knowlton)
- 18 (17) Cauda in general with fewer hairs, but if with more than 12 hairs, then first four abd. tergites with more or less uniformly shaped hairs.
- 19 (20) Siphunculi conspicuously clavate, so that maximum diameter on distal half is about $12/5$ times smallest diameter on basal half. On *Haplopappus bloomeri* *P. lagacei* spec. nov.
- 20 (19) Siphunculi sometimes slightly swollen on distal half, but in the swollen area never more than $1\frac{1}{4}$ times as thick as thinnest part more basad.
- 21 (26) Stigmal pori on abd. tergite VII placed on the caudal slope of an often quite large, mostly scabrous, tubercle and at the same time siphunculi dark with the very base pale. Last rostral segment short and quite blunt. Frontal

hairs from 0.004—0.021 mm long, when very short hardly capitate.

- 22 (23) Frontal hairs about 0.004—0.009 mm long, with slightly incrassate apices. Cauda mostly with 2—4 rather short blunt or acuminate dorsal hairs besides the 2 lateral pairs. Rather large aphids of 2.30—2.80 mm long. On *Chrysothamnus* *P. magnautensus* (Knowlton & Smith)
- 23 (22) Frontal hairs 0.009 mm or longer, spatulate to capitate. Cauda mostly with 1, more rarely with 2 dorsal hairs. Smaller aphids.
- 24 (25) Longest hairs on ant. segment III about 0.020 mm, partly erect. Hairs on basal half of tibiae erect and conspicuous. On *Gutierrezia* and *Chrysothamnus* *P. acanthovillus* (Knowlton & Smith)
- 25 (24) Longest hair on ant. segment III about 0.012 mm. Sloping hairs on basal half of tibiae very inconspicuous, sloping at angles of 30° or less. On *Gutierrezia* and *Chrysothamnus* *P. utensis* (Knowlton & Pack)
- 26 (31) Stigmal pori on abd. segment VII not much different from those on segments II—IV. Siphunculi pale or dark. Last rostral segment blunt to very acute. Frontal hairs usually very distinctly capitate.
- 27 (28) Spinal hairs duplicated and in tandem, sometimes triplicated, singly or in groups on low tubercles or elevations of the integumentum, especially on tergites V—VII; pleural hairs not in double transverse rows, singly. Last rostral segment with straight or slightly convex sides, not with longest hairs on basal half. Siphunculi pale. Cauda with 5 hairs. On *Chrysothamnus* *P. pycnorhysus* (Knowlton & Smith)
- 28 (27) Hairs more numerous, and also pleural hairs in at least double transverse rows. If hairs are placed on spinal tubercles or processes, then more than 6 caudal hairs present. Last rostral segment variable. Siphunculi pale or dark.
- 29 (30) Spinal hairs of some or all abd. tergites in two clusters on paired semiglobular processes. On *Chrysothamnus*. (*C. xerozoous*, syn. of) *P. gregarius* (Knowlton)
- 30 (29) Spinal hairs not on semiglobular processes.
- 31 (32) Abd. tergites I—VI between the hairs rugulose by irregular short rows of nodules. On *Chrysothamnus* *P. oestlundii* (Knowlton)
- 32 (31) Abd. tergites I—VI between the hairs smooth.
- 33 (34) Siphunculi black with the very base pale, not with hairs near base, about 9—11 times as long as last rostral segment. Hairs on frontal tubercles about as long as basal diameter of ant. segment III, blunt or very slightly knobbed. Hairs on ant. segment III up to more than $\frac{2}{3}$ of basal diameter of segment. On *Chrysothamnus* *P. packi* (Knowlton)
- 34 (33) Siphunculi sometimes dark or black, but in that case either with some hairs near base or much less than 9 times as long as last rostral segment, or frontal hairs very short and strongly knobbed.
- 35 (36) Frontal hairs partly slightly knobbed, the more ventral ones with acute apices, but dorsal hairs on abdomen with a knob that mostly is as wide as long. Last rostral segment with a needle-like tip about $\frac{2}{5}$ of the length of the segment. On *Artemisia tridentata*. *P. heterohirsutus* (Gill. & Palmer)

- 36 (35) Frontal hairs sometimes with very thin knobs but in that case dorsal hairs on abdomen similar; usually knobbed like the dorsal hairs on abdomen but with a longer stalk. Last rostral segment with or without needle-like tip.
- 37 (38) Dorsal hairs on head and abdomen long and slender, with very small knobs. Siphunculi with 2—12 long hairs on basal half. Dorsal hairs on mid portion of tibiae as long as or longer than local diameter of tibiae. On *Artemisia tridentata* *P. longipes* (Gill. & Palmer)
- 38 (37) Dorsal hairs markedly knobbed or funnel-shaped. Siphunculi very rarely with 1—2 very short, knobbed hairs.
- 39 (42) Dorsal side of head with only 10—14 hairs of equal length with cylindrical or tapering shafts.
- 40 (41) Last rostral segment with markedly concave sides on basal half, halfway its length about $1/5$ — $2/5$ of its basal width. On *Artemisia vulgaris*. Eastern North America *P. glandulosus* (Kltb.)
- 41 (40) Last rostral segment with straight or on basal half very indistinctly concave sides, near apex convex, halfway its length at least $1/2$ of its basal width. On *Achillea* *P. hottesi* spec. nov.
- 42 (39) Dorsal side of head either with 16 or more hairs or those hairs with shaft shorter than knob.
- 43 (46) Femora largely black or blackish, only in teneral specimens pale. Siphunculi blackish with often the very base pale.
- 44 (45) Cauda conspicuously constricted at basal one-third part. Green in life. On *Artemisia tridentata* *P. quadririchus* (Knowlton & Smith)
- 45 (44) Cauda conical with straight sides, blunt, not at all constricted. Colour in life brown. On *Artemisia tridentata* *P. pullus* (Gill. & Palmer)
- 46 (43) Femora pale, at most at apex faintly dusky; siphunculi sometimes somewhat brownish, but never blackish.
- 47 (48) Last rostral segment exceedingly long, about 0.20—0.22 mm long, with straight sides. Ant. segments I and II with some capitate hairs that are not smaller than some on vertex. On *Amsinckia* spp. (?)
. *P. amsinckii* Richards
- 48 (47) Last rostral segment shorter, not longer than 0.17 mm and then with markedly concave sides on basal half. If hairs on ant. segments I and II are similar to those on vertex, then siphunculi more than 0.70 and usually about 1.00 mm long.
- 49 (50) Antennae pale, only at articulations markedly blackish, and even segment VI with pale base. Siphunculi very long, according to PALMER (1952) either 0.70—1.05 mm or 0.90—1.00 mm long, ant. segment I and II with short capitate hairs like some hairs on vertex. On *Artemisia longifolia* *P. longinectarius* (Gill. & Palmer)
- 50 (49) Either antennae almost completely pale or dark without conspicuously dark articulations, or at least segment V and basal part of VI dark brown. Siphunculi often shorter than 0.70 mm, rarely much longer. Segments I and II with hairs very much thinner than any hair on vertex, at most spatulate.

- 51 (52) Siphunculi more than twice as long as cauda, the latter less than twice as long as last rostral segment. On various *Artemisia* spp. (*P. decampus* Knowlton & Smith probably correct name)
 *P. pseudoglandulosus* (Palmer)
- 52 (51) Siphunculi much less than twice as long as last rostral segment (Complex of *P. wasatchii* Knowlton).
- 53 (54) Last rostral segment with more or less cylindrical apex ("needle-tipped"), mostly slightly nicked just at the base of this tip. On *Artemisia douglasiana*, *A. ludoviciana*, ? *A. nutans* *P. gnaphalodes* (Palmer)
- 54 (53) Last rostral segment with straight or concave sides, gradually narrowing towards apex, and certainly not nicked at about two-thirds part of its length.
- 55 (56) Ant. segment III thick, half way its length 0.030—0.039 mm in diameter, with 1—8 rhinaria, mostly rather pigmented to blackish. Siphunculi 3—4 $\frac{1}{2}$ times as long as last rostral segment. At least a number of the hairs on front and vertex with a part of the shaft distinctly cylindrical. On *Ambrosia artemisiifolia* *P. ambrosiae* spec. nov.
- 56 (55) Ant. segment in the middle rarely up to 0.030 mm, mostly thinner, with 1—2, rather rarely 3 rhinaria, pale except at the very apex. All hairs on front and vertex distinctly widening from the very base. On *Chrysanthemum nauseosus* *P. wasatchii* (Knowlton)

2. *Pleotrichophorus ambrosiae* spec. nov.

Apterous viviparous female.

Colour in life not known. In mounted specimens body about 1.90—2.20 mm long, rather broadly oval. Tergum membranous, pale. Integumentum smooth. Dorsal hairs numerous, on middle of tergites I—III about 10—12 per 0.1 × 0.1 mm, to about 0.035 mm long, with the short stalk widening from base, all longer than the width of the large knob; tergite VIII with 10—14 hairs in a double or triple row, with the longest hairs 0.040—0.050 mm long with a part of the shaft distinctly cylindrical and with wedge-shaped apical part; hairs on front and to some extent vertex similar to those on tergite VIII. Frontal tubercles low and strongly diverging, median process just indicated. Antennae 1 $\frac{1}{6}$ —1 $\frac{1}{2}$ times length of body, pale like head, to brownish, with vaguely brownish to dark brown tips to segments III—V and evenly blackish brown segment VI; flagellum imbricated from base to apex; segment III near base with 1—8 flat or slightly elevated rhinaria in a short row; processus terminalis 6—7 times as long as base of segment VI, with 5—8 hairs besides those at apex; those on segment I up to 0.016 mm long, thin, rod-shaped with just thicker apex; hairs on segment III to 0.013 mm, to $\frac{1}{3}$ of basal diameter of segment, at angles of 30—45°. Eyes with a trace of a triommatidion. Rostrum reaching just past middle coxae; last segment about 0.10—0.12 mm long, $\frac{2}{3}$ — $\frac{7}{8}$ of second joint of hind tarsi, acute, with on basal half just concave sides, but from the long hairs on basal half to apex evenly tapering, with the long hairs near base twice as long as the distal hairs. Legs with pale, not distinctly imbricate, femora; the tibiae slightly darker, often pale brownish, with brown apices; tarsi blackish

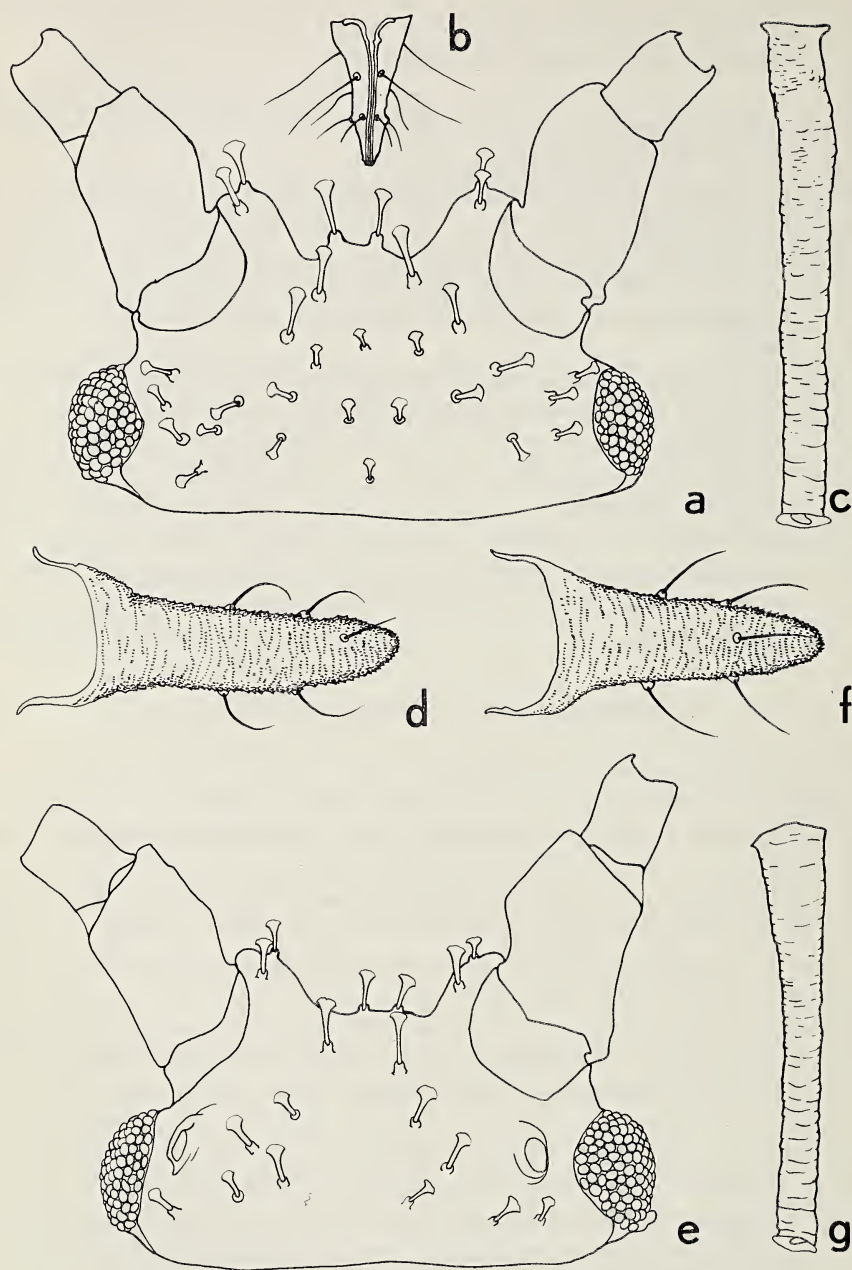


Fig. 1. *Pleotrichophorus ambrosiae* spec. nov. Apt. viv. fem.: a. head; b. ultimate rostral segment; c. siphunculus; d. cauda. Al. viv. fem.: e. head; f. cauda, g. siphunculus. All $\times 167$.

brown; first tarsal joints with 3,3,3 hairs, the conspicuously strong, acuminate, lateral ones $1\frac{4}{5}$ —2 times as long as the thinner, thorny median one. Siphunculi almost cylindrical on distal two-thirds part, only slightly thicker towards base, in the middle only $\frac{5}{6}$ — $\frac{8}{9}$ of diameter of middle portion of hind tibiae, about $\frac{2}{11}$ — $\frac{2}{9}$ of length of body, pale with often the tip conspicuously brown, rather coarsely imbricated with sometimes blunt denticles on the imbrications, with small and thin flange. Cauda pale, elongate, not or hardly constricted, blunt, $\frac{8}{11}$ — $\frac{3}{4}$ of the siphunculi, with 5 normal, curved hairs. Ventral hairs on anterior abd. segments blunt or acuminate.

Measurements in mm.

No.	Length body	Ant.	Ant. segments				Rhin. on III	Siph.	Cau.
			III	IV	V	VI			
1	1.93	2.80	0.60	0.47	0.42	0.14 + 0.97	4 & 6	0.45	0.30
2	2.14	2.81	0.57	0.55	0.46	0.14 + 0.89	5 & 5	0.45	0.31
3	2.14	2.55	0.56	0.43	0.39	0.15 + 0.82	3 & 5	0.40	0.31
4	1.91	2.64	0.51	0.47	0.41	0.14 + 0.91	1 & 1	0.47	0.30
5	2.15	2.86	0.61	0.51	0.42	0.15 + 1.00	3 & 4	0.47	0.29
6	1.92	2.58	0.53	0.46	0.38	0.14 + 0.89	1 & 2	0.30	0.22
7	1.96	2.80	0.58	0.49	0.42	0.15 + 0.97	5 & 8	0.43	0.29
8	2.08	3.02	0.60	0.57	0.48	0.15 + 1.03	3 & 3	0.40	0.29
9	2.13	2.95	0.58	0.51	0.44	0.16 + 1.04	4 & 4	0.41	0.30
10	2.12	2.99	0.59	0.55	0.47	0.17 + 1.00	5 & 5	0.42	0.30

(1—4, from *Ambrosia artemisiifolia*, Waddle (Pennsylvania), U.S.A., 17.VIII.1962, leg. J. O. PEPPER; 5—6, as 1—4, but Philipsburg, 11.VIII.1952; 7—8, as 1—4, but State College, 4.VIII.1966; 9—10, from *A. artemisiifolia* var. *paniculata*, Caleta el Rosario, Cuba, 23.V.1965, leg. J. HOLMAN).

Alate viviparous female.

Colour in life not known. In mounted specimens head pale with brown around the ocelli, mesonotum brown, abdomen pale with vaguely brown marginal sclerites and pleural intersegmental sclerites. Dorsal hairs generally less strongly capitate, and much less numerous, in irregular double transverse rows on abdomen, tergite VII with only 6—8 knobbed hairs. Antennae about $1\frac{1}{2}$ times body, with basal segments and base of segment III as pale as head, rest of flagellum dark to blackish brown; segment III with 10—18 rhinaria in irregular file; segment IV sometimes with 1—2 rhinaria. Legs brownish with tibiae conspicuously darker than femora. Wings evenly scaly, with thick, dark brown, normal venation. Siphunculi pale brownish, darker near apex. Cauda slightly dusky. Other characters as in apterous viviparous female.

Measurements in mm.

No.	Length body	Ant.	Ant. segments				Rhin. on segments		Siph.	Cau.
			III	IV	V	VI	III	IV		
1	2.18	3.03	0.62	0.61	0.50	0.15 + 0.97	14 & 16	0 & 0	0.38	0.29
2	1.76	2.47	0.47	0.44	0.40	0.12 + 0.89	11 & 14	0 & 0	0.29	0.25
3	2.28	3.25	0.67	0.59	0.52	0.16 + 1.11	11 & 13	0 & 0	0.38	0.27
4	2.17	3.11	0.62	0.59	0.50	0.16 + 1.05	13 & 18	0 & 1	0.38	0.28

(1—2, with apterae nos. 1—4; 3, with apterae nos. 5—6; 4, with apterae nos. 7—8).

D i s c u s s i o n. PEPPER (1965) records this aphid as *Pleotrichophorus wasatchii* (Knowlton) from some localities in Pennsylvania, and he most kindly sent me several very good slides. Later J. HOLMAN gave me a slide identified by him as *P. wasatchii*, collected on Cuba from *Ambrosia paniculata* which according to GRAY-FERNALD, Manual of Botany, ed. VIII, is a variety of *A. artemisiifolia*. Whether it is this aphid that PALMER (1952) recorded as *Capitophorus wasatchii* from *Ambrosia artemisiifolia* will have to be checked.

The aphids as apterae often have a rather unusually high number of rhinaria on ant. segment III. The lateral hairs on the first tarsal joints are conspicuously stout, slightly curved and acuminate. *P. wasatchii*, *P. gnaphalodes*, and the insect described by PALMER (1952) from *Artemisia aromatica* as *Capitophorus wasatchii* have similar hairs on the first tarsal joints. They greatly resemble one another. The Colorado specimens from *Artemisia aromatica* agree with a California sample from *Artemisia dracuncululus* in having a much blunter, and slightly shorter last rostral segment than the others; the species is probably undescribed, and is not mentioned in the key. Type material of *wasatchii* borrowed from Dr. G. F. KNOWLTON and from the U.S. Nat. Museum differs from *P. ambrosiae* by the characters mentioned in the key, but by very little else. In *P. gnaphalodes* the apical part of the last rostral segment is in most slides needle-shaped, in other specimens separated by a very inconspicuous lateral nick from the basal portion. Of course all have different host plants.

T y p e s. Holotype: apterous viviparous female (no. 8 of measurements), from *Ambrosia artemisiifolia*, State College (Pennsylvania), U.S.A., 4.VIII.1966, leg. J. O. PEPPER. In the author's collection. Paratypes: apterae and alate viviparae with collecting data as for holotype; from *A. artemisiifolia*, Waddle (Pennsylvania), U.S.A., 17.VIII.1962, leg. J. O. PEPPER; from *A. artemisiifolia*, Philipsburg (Pennsylvania), 11.VIII.1952, leg. J. O. PEPPER; and from *Ambrosia artemisiifolia* var. *paniculata*, Coleta el Rosario, Cuba, 23.V.1965, leg. J. HOLMAN; in the collections of Dr. J. O. PEPPER, State College (Pennsylvania), U.S.A., Dr. J. HOLMAN, Prague, Czechoslovakia, U.S. Nat. Museum, Washington (D.C.), U.S.A., and the author's.

3. *Pleotrichophorus bitrichus* (Knowlton & Smith, 1936).

Paratypes of *Capitophorus bitrichus* after remounting could not be distinguished from those of *Capitophorus heterohirsutus* Gillette & Palmer, 1933, and I consider *bitrichus* a synonym of *heterohirsutus*, transferred by me to *Pleotrichophorus* Börner in 1953.

4. *Pleotrichophorus chlorophainus* (Knowlton & Smith, 1936).

Remounted paratypes of *Capitophorus chlorophainus* could not be distinguished from *Capitophorus elongatus* Knowlton, 1929. I consider *C. chlorophainus* Knowlton & Smith, 1936 a synonym of *C. elongatus* Knowlton, transferred to *Pleotrichophorus* Börner by me in 1953.

5. *Pleotrichophorus decampus* (Knowlton & Smith, 1936).

I saw a paratype of *Capitophorus decampus* from Colinston (Utah), 28.IV.1927 which possibly is a fundatrix, probably of the insect later described as *Capitophorus pseudoglandulosus* Palmer, 1952. It is, therefore, probable that *Pleotrichophorus decampus* (Knowlton & Smith) is an older name for *pseudoglandulosus* Palmer, transferred to *Pleotrichophorus* Börner by me in 1953.

6. *Pleotrichophorus hottesi* spec. nov.

Apterous viviparous female.

Colour in life greyish green. In mounted specimens body 1.90—2.25 mm long, rather broadly oval. Tergum membranous, pale. Integumentum smooth. Dorsal hairs rather numerous, on middorsum about 8 per 0.1×0.1 m, about 0.025—0.044 mm long. The longer ones with a more or less cylindrical shaft and fan-shaped, striate top, the short ones almost from base widening, with apices 0.013—

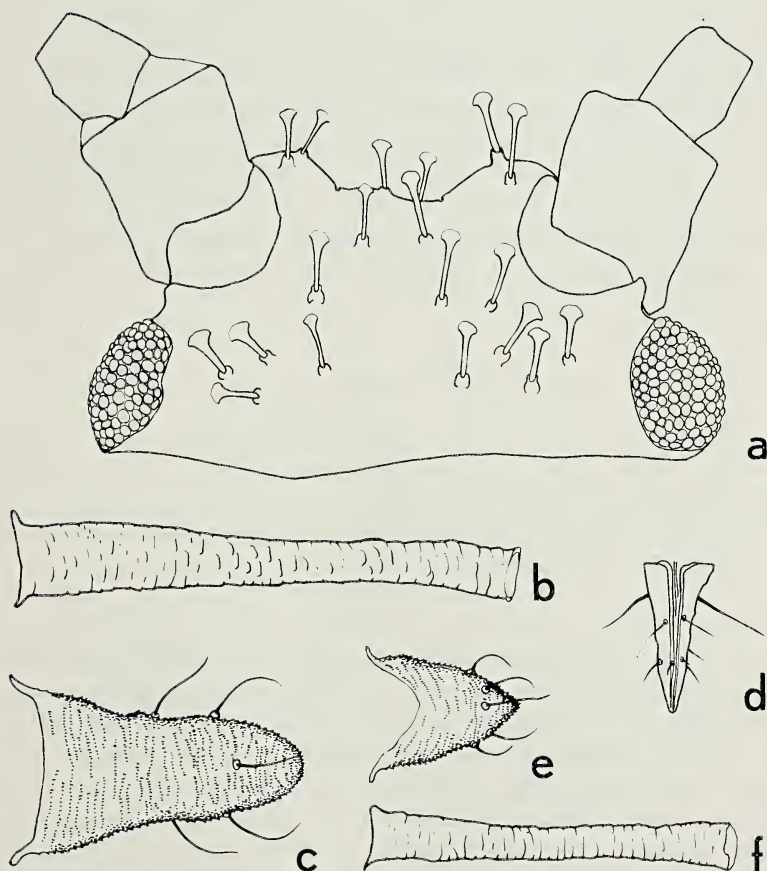


Fig. 2. *Pleotrichophorus hottesi* spec. nov. Apt. viv. fem.: a. head; b. siphunculus; c. cauda. Apt. male: d. ultimate rostral segment; e. cauda; f. siphunculus. All $\times 167$.

0.021 mm wide; tergite VIII with 8—12 hairs in a double row of which the anterior one has 2—4 hairs. Head smooth on upper- and underside with similar capitate hairs of up to 0.050 mm long; frontal tubercles diverging, rather low, with 2—3 hairs each. Antennae evenly pale yellowish with segment VI and apical part of V dark brown, $12/7$ — $12/5$ times as long as body; flagellum slightly imbricated from base to apex; segment III with 2—3 small, mostly very closely packed, quite flat and inconspicuous rhinaria near base; processus terminalis about 5 — $5\frac{1}{2}$ times base of segment VI, with 1—2 hairs besides those at apex; hairs on antennae rod-shaped with slightly incrassate apex, on segment I to 0.015 mm long, on segment III to 0.009 mm, about $1/4$ of basal diameter of segment. Eyes with just discernible triommatidia. Rostrum reaching to hind coxae; last segment 0.11—0.13 mm long, subequal to second joint of hind tarsi, rather acute, when depressed with straight sides, otherwise near apex slightly convex, with the 2 long (0.060 mm) hairs near base very much longer than any of the more apical hairs; apical 0.040 mm hairless. Legs pigmented like antennae, with apices of tibiae faintly brownish, tarsi dark brown; femora faintly imbricated, apically more distinctly so; first tarsal joints with 3,3,3 hairs, the middle one about half as long as the lateral ones. Siphunculi more or less markedly constricted at base, distal half more or less cylindrical, rather widening basad and slightly so apicad, about $1/6$ — $1/5$ of length of body, pale with very faintly brown apex, on basal part smooth on inner side, distinctly imbricated on outer side, more distad imbricated with denticles on the imbrications dorsally and on outer side, but much less distinctly ventrally, at thinnest part about $4/5$ of diameter of middle portion of hind tibiae, with hardly developed, indistinct flange. Cauda pale, rather thick, very blunt, hardly or not constricted, about $3/5$ of siphunculi, with 5 normal, acute hairs.

Measurements in mm.

No.	Length body	Ant.	Ant. segments				Rhin. on III	Siph.	Cau.
			III	IV	V	VI			
1	1.91	2.65	0.53	0.48	0.46	$0.16 + 0.85$	2 & 3	0.38	0.22
2	2.23	2.78	0.58	0.53	0.49	$0.16 + 0.84$	3 & 3	0.39	0.23
3	2.00	2.57	0.55	0.55	0.50	$0.15 + 0.79$	2 & ?	0.39	0.23

(1—2, from *Achillea* sp., Nat. Monument, Grand Junction (Colo.), U.S.A., 13.IX.1956, leg. F. C. HOTTES & D.H.R.L.; 3, from *Achillea* sp., Mud Springs, Glade Park (Colo.), U.S.A., 7.VII.1958, leg. F. C. HOTTES).

Apterous male.

Colour in life like apterous viviparous female. In mounted specimens body smaller and much narrower. Antennae and legs brownish; head, pleural intersegmental sclerites on abdomen, and siphunculi faintly brownish. Hairs more slender and with narrower, more crenulated apices. Antennae more than $12/3$ times as long as body; segment III and IV with small rhinaria in more or less double file along one side, segment V with rhinaria in almost single file. Siphunculi not constricted at base, in the middle thinnest and only about $5/9$ — $5/8$ of thickness or middle portion of hind tibiae, at base and apex about $14/5$ times as thick. Cauda only about $1/3$ of length of siphunculi. Genitalia normal. Other characters mainly as in apterous viviparous female.

Measurements in mm.

No.	Length body	Ant.	Ant. segments				Rhin. on segments			Siph.	Cau.
			III	IV	V	VI	III	IV	V		
1	1.44	2.53	0.60	0.44	0.42	0.16 + 0.73	28 & 31	20 & 16	12 & 14	0.30	0.11

(1, with apterae no. 1—2).

Discussion. Two apterae viviparae, one apterous male, and a few larvae were threshed from an *Achillea* near Grand Junction, Colorado. Dr. F. C. HOTTES writes me that only two species of *Achillea* occur in Colorado, and that the host plant must have been *Achillea lanulosa*. He later collected one more specimens of the same aphid at Mud Springs, evidently from the same *Achillea*.

The new species rather resembles *P. ambrosiae* spec. nov., but that has more hairs on vertex, rather different hairs on the abdomen, more rhinaria in apterae, a thinner cauda, etc.

The species is named for Dr. F. C. HOTTES of Grand Junction, Colorado, great specialist on American *Cinara* spp. and on the early history of aphidology.

Type s. Holotype: apterous viviparous female (no. 1 of measurements), from *Achillea* near *millefolium*, National Monument, Grand Junction (Colorado), U.S.A., 13.IX.1965, leg. F. C. HOTTES & D.H.R.L. Paratypes: apterous viviparous female and apterous male with collecting data as for holotype; and apterous viviparous female from *Achillea* spp., Mud Springs, Glade Park (Colorado), U.S.A., 7.VII.1958, leg. F. C. HOTTES.

7. *Pleotrichophorus infrequens* (Knowlton & Smith, 1936).

PALMER (1952) writes the species name *infrequens*, but *infrequenus* is not a lapsus calami as it is used consistently, 3 times, in KNOWLTON & SMITH (1936b).

8. *Pleotrichophorus lagacei* spec. nov.

Apterous viviparous female.

Colour in life not known. In mounted specimens body elongate, about 1.80—2.50 mm long. Tergum membranous, colourless. Integumentum smooth or faintly reticulated. Dorsal hairs numerous, in double transverse rows on tergites I—V, mostly slightly wider than long, virtually without shaft, with striate, slightly serrated, flattish, very widely fan-shaped knobs, about 0.017—0.019 mm long; tergite VIII with about 12 such hairs; head dorsally and ventrally with same type of hairs. Marginal tubercles apparently absent. Head with very low, strongly diverging frontal tubercles bearing 4—6 hairs, and hardly indicated median frontal process. Antennae $11\frac{1}{10}$ — $11\frac{1}{3}$ times as long as body, with pale basal segments, and about basal $\frac{2}{3}$ — $\frac{4}{5}$ part of segment III pale brownish yellow, the rest dark brown to black; flagellum from base to apex markedly imbricated with broad, straight scales; antennal hairs also on segment I rod-shaped with slightly incrassate blunt apex, at most 0.008 mm long, on segment III to $\frac{1}{4}$ of basal diameter of segment III with 1—2 small, not protruding or bulging rhinaria near base; processus terminalis $6\frac{1}{2}$ —7 times base of last segment, with 5—7 hairs besides those at apex. Eyes without visible triommatidia. Rostrum short, reaching

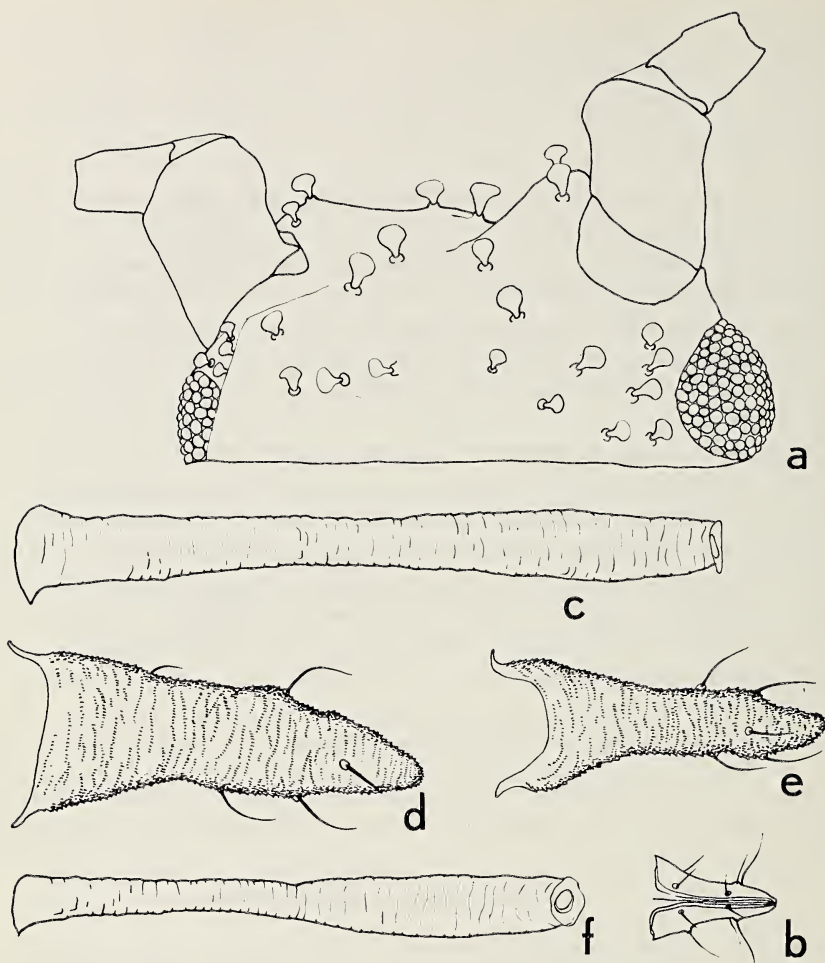


Fig. 3. *Pleotrichophorus lagacei* spec. nov. Apt. viv. fem.: a. head (twisted); b. ultimate rostral segment; c. siphunculus; d. cauda. Al. viv. fem.: e. cauda; f. siphunculus. All $\times 167$.

to middle coxae; last segment about 0.10—0.105 mm long, only $\frac{5}{7}$ of second joint of hind tarsi, rather acute but not styletto-shaped, with the 4 hairs on basal half not longer than longest of the 3 subapical pairs. Legs pale with pale to blackish brown tibial apices and brownish black tarsi; femora and less distinctly tibiae over whole length striate-imbricate; first tarsal joints with 3,3,3 hairs. Siphunculi about $\frac{1}{5}$ — $\frac{1}{4}$ of length of body, pale with brownish apices, striate-imbricated or even denticulate from near base to apex, on basal $\frac{1}{2}$ — $\frac{2}{3}$ part about 1— $1\frac{1}{7}$ times as thick as middle portion of hind tibiae, on distal part conspicuously swollen and $1\frac{1}{3}$ — $1\frac{1}{2}$ times as thick as on thinnest part more basad, with small, rather thin flange. Cauda elongate, pale, slightly constricted at basal $\frac{2}{5}$ part, about $\frac{3}{5}$ — $\frac{2}{3}$ of the siphunculi, with 5 hairs of which the dorso-apical one may be acute, spatulate or knobbed.

Measurements in mm.

No.	Length body	Ant.	Ant. segments				Rhin.	Siph.	Cau.
			III	IV	V	VI			
1	2.44	2.72	0.53	0.52	0.39	0.13 + 0.96	1 & 2	0.52	0.32
2	1.96	2.74	0.52	0.48	0.41	0.14 + 0.99	1 & 1	0.50	0.30
3	1.84	2.20	0.45	0.36	0.34	0.13 + 0.75	1 & 1	0.41	0.27
4	2.50	2.94	0.61	0.47	0.42	0.16 + 1.06	1 & 2	0.56	0.36
5	2.48	2.81	0.58	0.48	0.44	0.16 + 0.94	1 & 1	0.55	0.33
6	1.89	2.41	0.40	0.38	0.38	0.14 + 0.89	1 & 1	0.47	0.29

(1—6, from *Haplopappus bloomeri*, Mt. Shasta (Calif.), U.S.A., 24.VIII.1966, leg. C. LAGACE no. L 66.VIII.24b).

Alate viviparous female.

Colour in life not known. In mounted specimens head and thorax brownish, abdomen with small vaguely brown marginal sclerites and pleural intersegmental sclerites. Dorsal hairs mostly distinctly longer than wide, often wedge-shaped, e.g., on underside of head. Antennae with only the very base of segment III pale, rest brown to black; segment III with 11—13 rhinaria more or less in a row, and apparently also segment IV sometimes with a small rhinarium. Legs about as dark as mesonotum, with bases of femora pale, and apices of tibiae blackish brown. Wings with thick, dark veins, dark grey stigma. Stems of siphunculi thinner than in apterae, and swollen area to $1\frac{4}{5}$ times as thick as thinnest part more basad; imbrications very indistinct and surface under low power seemingly smooth. Cauda much thinner than in apterae. Other characters as in apterous viviparous female.

Measurements in mm.

No.	Length body	Ant.	Ant. segments				Rhin. on segments		Siph.	Cau.
			III	IV	V	VI	III	IV		
1.	2.01	2.65	0.51	0.43	0.38	0.14 + 1.01	11 & 13	0 & 1	0.44	0.26

(1, with apterae no. 1—6).

Discussion. This is the first *Pleotrichophorus* with really clavate siphunculi that I have seen. In several American species they are thinnest in the middle and wider towards apex, but siphunculi as in *Rhopalosiphum nymphaeae* (L.) are not found in other species of the genus, although several *Capitophorus* spp. show them. *P. lagacei* could easily be mistaken for a *Capitophorus*, but the chaetotaxy, the sensoriation of the antennae in apterae, and alatae, the non-rostrate last rostral segment and its chaetotaxy, and even the wing venation are typically as in other *Pleotrichophorus* with not distinctly swollen siphunculi.

Within the genus *P. lagacei* can easily be distinguished with the key to North American species of *Pleotrichophorus* on p. ...

This aphid is named for Mr. C. LAGACE of the University of California, Berkeley, who discovered this and many other very interesting aphids.

Type s. Holotype: apterous viviparous female (no. 1 of measurements), from *Haplopappus bloomeri*, Ski Lodge on Mt. Shasta (2600 m. a.s.l.) (Siskiyou County, California), U.S.A., 24.VIII.1966, leg. C. LAGACE no. L 66-VIII-24b. In the author's collection. Paratypes: apterous and alate viviparous females, collecting data

as for holotype, in the collection of the Entomology Dept., Univ. of California, Berkeley, and in the author's collection.

9. *Pleotrichophorus longirostris* spec. nov.

Apterous viviparous female.

Colour in life not known. In mounted specimens body about 1.65—1.90 mm long, oval, rather slender. Tergum membranous, pale. Integumentum smooth. Dorsal hairs very numerous, about 20 per 0.1×0.1 mm, about 0.016—0.035 mm long without the slender sockets, shortly petiolate with fan-shaped, striate, flat, serrated apices of about 0.012—0.020 mm wide; tergite VIII with about 24 hairs in a double row; head frontally and ventrally with longer, more petiolate and

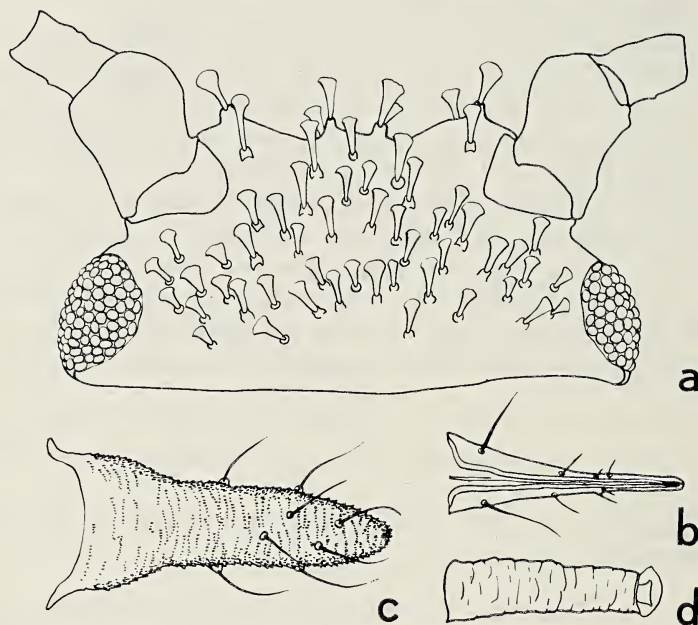


Fig. 4. *Pleotrichophorus longirostris* spec. nov. Apt. viv. fem.: a. head; b. ultimate rostral segments; c. cauda d. siphunculus. All $\times 167$.

apically narrower hairs. Antennae $12/7$ — $12/5$ times as long as body, with brownish basal segments, flagellum brownish yellow, apicad darker to black, imbricated from base to apex; segment III with 1—2, rarely 3, slightly elevated, not bulging rhinaria near base; processus terminalis 4—5 times base of last segment, with 5—8 hairs besides those at apex; hairs on antennae with slightly enlarged apices, blunt, on segment III about $1/4$ of basal diameter of segment. Eyes without visible triommatidia. Rostrum reaching to hind coxae; last segment long, 0.17—0.19 mm, just over $1 1/2$ times as long as second joint of hind tarsi, styletto-shaped, very slender, with longest hairs (0.084 mm) near base, and with apical 0.070 mm hairless. Legs pale brownish with dark brown tibial apices and blackish brown tarsi; femora and especially tibiae rather indistinctly striate-imbricate; first tarsal joints with 3,3,3 hairs, the middle ones about half as long as the rather thorny lateral

ones. Siphunculi with distal $1/3-1/2$ cylindrical, gradually widening towards base, about $1/10$ of length of body, brownish with paler base, imbricated with denticles on the imbrications, in the middle just thicker than middle portion of hind tibiae, with small but distinct flange. Cauda elongate, slightly constricted at basal $1/3$, pale, $12/5-12/3$ times as long as siphunculi, with 3 pairs of lateral hairs, and 2—4 dorsal hairs, all acute and curved.

Measurements in mm.

No.	Length body	Ant.	Ant. segments				Rhin. on III	Siph.	Cau.
			III	IV	V	VI			
1	1.85	2.24	0.49	0.39	0.36	0.16 + 0.68	2 & 2	0.19	0.31
2	1.71	2.20	0.46	0.37	0.35	0.16 + 0.70	2 & ?	0.18	0.30
3	1.69	2.21	0.45	0.38	0.35	0.15 + 0.73	1 & 1	0.16	0.26
4	1.65	2.30	0.43	0.39	0.37	0.16 + 0.79	2 & 2	?	0.27
5	1.69	2.24	0.47	0.40	0.36	0.14 + 0.73	2 & 2	0.17	0.27
6	1.72	2.23	0.48	0.37	0.35	0.17 + 0.71	2 & 2	0.17	0.28

(1—6, from *Eriophyllum staechadifolium*, 4.8 km E. of Lucia (Cal.), U.S.A., 6.IV.1966, leg. R. VAN DEN BOSCH no. 66-IV-6a).

Discussion. By the combination of its long last rostral segment and its short siphunculi this species can be very easily distinguished from the other members of the genus. A similar, even longer, last rostral segment is found in *P. amsinckii* Richards, described from presumably *Amsinckia*, Oliver, British Columbia, Canada. A specimen of the latter species most kindly donated by Dr. RICHARDS differs by long capitate hairs on the head and even on ant. segments I and II, by long and thin siphunculi about 3 times as long as the short cauda, and a processus terminalis about 7 times as long as the basal part of segment VI.

Types. Holotype: apterous viviparous female (no. 1 of measurements), from *Eriophyllum staechadifolium*, 3 mi. E. of Lucia (Monterey County, California), U.S.A., 6.IV.1966, leg. R. VAN DEN BOSCH no. 66-IV-6a. In the author's collection. Paratypes: apterous viviparous females with collecting data as for holotype, in the collection of the Dept. of Biol. Control, Univ. of California, Berkeley, and in the author's collection.

10. *Pleotrichophorus magnautensis* (Knowlton & Smith, 1936).

Though PALMER (1952) writes the species name *magnautensis*, the original spelling is *magnautensus*. In KNOWLTON & SMITH (1936) *Capitophorus utensis* (Knowlton & Pack, 1929) (original spelling *C. utense*) is quoted as *C. utensus*, and the species name *magnautensus* evidently means *magna-utensus*.

11. *Pleotrichophorus palmerae* (Knowlton, 1935).

Paratypes of *Capitophorus palmerae* Knowlton after remounting could not be distinguished from *Capitophorus elongatus* Knowlton, and in my opinion *Capitophorus palmerae* Knowlton, 1935 is a synonym of *Capitophorus elongatus* Knowlton, 1929, transferred to *Pleotrichophorus* Börner by me in 1953.

12. *Pleotrichophorus rusticatus* (Knowlton & Smith, 1937).

I saw paratypes from Yellowstone (Wyoming) (type locality) and Livingston (Montana) and I cannot distinguish those from *Capitophorus pullus* Gillette & Palmer, 1933. Therefore *Capitophorus rusticatus* Knowlton & Smith, 1937 is considered a synonym of *Capitophorus pullus* Gillette & Palmer, 1933, transferred to *Pleotrichophorus* Börner by me in 1953. I have not seen specimens with 0—2 hairs on the siphunculi as mentioned by PALMER (1952) from Rexburg (Idaho).

13. *Pleotrichophorus wasatchii* (Knowlton, 1927).

Although this aphid was originally described from *Chrysothamnus*, PALMER (1952) lists a number of additional hosts, among which *Ambrosia artemisiifolia* and *Artemisia aromatica*. I saw some of PALMER's material from *Artemisia aromatica*. They clearly differ in the structure of the last rostral segment from the types of *wasatchii*. Specimens from *Ambrosia* were not seen from Colorado, but I saw some very poor ones from Texas and they seem to be the aphid described in the present paper as *Pleotrichophorus ambrosiae* spec. nov. It would seem that PALMER was dealing with a mixture of species.

Acknowledgements. Thanks are due to Drs. G. F. KNOWLTON, Logan (Utah), U.S.A.; J. O. PEPPER, State College (Pennsylvania), U.S.A.; LOUISE RUSSELL, Washington, U.S.A. and H. L. G. STROYAN, Harpenden (Herts.), England for the loan or gift of material. The drawings were made by Mrs. M. HIELKEMA-VISSER.

References

- HILLE RIS LAMBERS, D., 1953. Contributions to a monograph of the Aphididae of Europa, V. *Temminckia* 9: 1—176.
 KNOWLTON, G. F. & C. F. SMITH, 1936a. Capitophorus aphids infesting Chrysothamnus. *Can. Entom.* 68 : 107—113.
 ———, 1936b. Capitophorus aphids infesting Artemisia. *Can. Entom.* 68 : 229—234.
 PALMER, M. A., 1952. Aphids of the Rocky Mountain Region. *Thomas Say Foundation* 5 : 1—452.
 PEPPER, J. O., 1965. A list of the Pennsylvania Aphididae and their host plants. *Trans. Amer. ent. Soc.* 91: 181—231.

Een tweetal Pyraliden talrijk in een stadstuin. Op 26.VII.1968 haalde een vriend mij naar een stadstuin in het centrum van Deventer. De tuin was in onbruik geraakt en onder een oude appelboom tierden de brandnetels welig. Bij het betreden van de tuin en het beroeren van de brandnetels stoven tientallen exemplaren van *Eurrhyncha hortulata* L. en *Silepta ruralis* Scop. in het rond. Bij nader toezien voerde *ruralis* de boventoon. Afgezien van enige vliegen en muggen was er overigens geen insectenleven. Wat verder de buurt in was geen spoor van de beide Pyraliden te bekennen.

G. J. FLINT, Swaefkenstraat 39, Deventer.

Correctie. p. 160, regel 20 van boven, *rufipes* moet zijn: *rufidens*.