

KEY TO THE EUROPEAN SPECIES OF BRACHYCAUDUS, SUBGENUS ACAUDUS (HOMOPTERA, APHIDOIDEA), WITH REDESCRIPTIONS AND A NOTE ON B. PERSICAE

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ABSTRACT

A key is given to the 17 European species of the subgenus *Acaudus* Van der Goot. Three closely related species living on Caryophyllaceae are redescribed, viz., *Brachycaudus* (*Acaudus*) *lychnidis* (Linnaeus, 1758); *Brachycaudus* (*Acaudus*) *klugkisti* Börner, 1942; and *Brachycaudus* (*Acaudus*) *populi* (Del Guercio, 1911). Host alternation of *Brachycaudus persicae* (Passerini, 1860) from *Prunus* to some Scrophulariaceae, was experimentally confirmed.

INTRODUCTION

The subgenus *Acaudus* Van der Goot, 1913 is a well-defined group of species, distinct from the other *Brachycaudus* by the presence of a pair of semiglobular or mammiform processes on the anterior part of the mesosternum (mesosternal processes) in apterae and larvae¹) (Hille Ris Lambers, 1956). Besides, a dark sclerotic dorsal shield is present in apterae viviparae.

Keys to the genus *Brachycaudus* Van der Goot, 1913, were published by Remaudière (1952) and by Shaposhnikov (1964).

Remaudière, in his key, treats ten *Brachycaudus* species from France, of which *B. amygdalinus* (Schout.) belongs to the subgenus *Thuleaphis* H.R.L., 1960, and *B. helichrysi* (Kltb.) to the subgenus *Brachycaudus*. The other species mentioned all belong to the subgenus *Acaudus*. I consider *B. semisubterraneus* C.B. and *B. persicaecola* (Boisd.), and perhaps also *B. mimeuri* Remaud., to be synonyms of *B. persicae* (Pass.). *B. lateralis* (Wlk.) I consider a synonym of *B. cardui* (L.).

Shaposhnikov, in his key, deals with 19 *Brachycaudus* species, two of which are *Appelia* species (*cerinthis* Bozh. and *prunicola* (Kltb.)); two, *amygdalinus* (Schout.) and *rumicicolens* (Patch), belong to the subgenus *Thuleaphis* (syn. *Brevicaudus* Shap.); and three, *salicinae* C.B., *helichrysi* (Kltb.) and *spiraeae* C.B., to the subgenus *Brachycaudus*. The remaining species mentioned by Shaposhnikov fit into the subgenus *Acaudus*, but I do not include *B. (A.) virgatus* Shap. in my key, because too few samples are available and, therefore, my information about this species is not sufficiently reliable.

In my key to *Acaudus* I add five more species, *iranicus* Davatchi & Remaudière, *populi* (Del Guercio), *lychnicola* H.R.L., *jacobi* Stroyan, and *lamii* (Koch). *B. napelli*

¹) Only in *Brachycaudus lucifugus* F. P. Müller the mesosternal processes are reduced or absent.

²) "*rumicicolens*" is misspelled for "*rumexicolens*".

(Schrank) and *B. aconiti* (Mordv.) in my opinion are two well defined species and not subspecies of *Brachycaudus napelli* (Schrank), as Shaposhnikov suggests.

There are five *Brachycaudus* (*Acaudus*) species living on Caryophyllaceae, which appear to be closely related, viz., *Brachycaudus lychnidis* (Linnaeus, 1758), on *Melandryum album*, sometimes on *Silene* sp. (not *S. vulgaris*), exceptionally on *Melandryum rubrum*; *Brachycaudus lychnicola* Hille Ris Lambers, 1966, on *Melandryum rubrum* and *Lychnis flos-cuculi*; *Brachycaudus klugkisti* (Börner, 1942), on *Melandryum rubrum*, sometimes on *M. album*; *Brachycaudus populi* (Del Guercio, 1911), on *Silene vulgaris*; and *Brachycaudus divaricatae* Shaposhnikov, 1956, on *Prunus* spp. and perhaps on *Melandryum* sp.

I redescribe *Brachycaudus lychnidis* (L.), *Brachycaudus klugkisti* Börner and *Brachycaudus populi* (Del Guercio), because the original descriptions are very short and incomplete. The original description of *Brachycaudus divaricatae* Shaposhnikov, 1956, is also very short and incomplete. Only few samples of this species were available. The life history of this species is not quite clear. From the examined samples from Remaudière and Van den Bosch it became apparent that sexuales are formed in May on *Prunus*. This makes host alternation to *Melandryum*, as suggested by Shaposhnikov, not very likely.

KEY TO THE EUROPEAN SPECIES OF *Brachycaudus*, SUBGENUS *Acaudus*

(Apterae viviparae not fundatrices, unless mentioned otherwise)

1. Dorsum on abdominal tergites I—IV or I—V only in the middle with a small, continuous, dark, spinal blotch having an irregularly shaped margin; mesonotum with an irregularly shaped, dark, spino-pleural transverse bar. Spinal hairs on abdominal tergite III, and also most other hairs on the abdominal tergites anterior to siphunculi, about 0.6—1.7 times as long as the basal diameter of antennal segment III. Longest hairs on abdominal tergite VIII longer than the basal diameter of antennal segment III. Length of last segment of rostrum 0.140—0.165 mm. Rhinaria on antennal segment III usually absent. Siphunculi with or without imbrications. On *Anchusa italica*. Southeast Europe and Southwest Asia *B. iranicus* Davatchi & Remaudière
- Dorsum either with the dark sclerotic shield much larger, continuously extending over the greater part of the tergum; or when the dark dorsal shield is reduced, desintegrated into small blotches or transverse bars; this dark dorsal shield fused or not with the transverse bar on mesonotum 2
2. Spinal hairs on abdominal tergite III and also most other hairs on the abdominal tergites anterior to siphunculi more than 0.8 times the basal diameter of antennal segment III 3
- Spinal hairs on abdominal tergite III and also most other hairs on the abdominal tergites anterior to siphunculi 0.8 times as long as the basal diameter of antennal segment III or shorter 8
3. Siphunculi smooth, 1.0—1.3 times as long as second joint of hind tarsi. Processus terminalis 2.8—4.0 times as long as base of antennal segment VI. First tarsal joint of hind tarsi usually with 2 hairs. In apterae viviparae antennal segment III with

- rhinaria; and hind tibiae mostly with a few pseudosensoria. On *Aconitum*. Europe *B. napelli* (Schrank)
- Siphunculi with imbrications 4
4. Siphunculi 1.6—2.4 times length of second joint of hind tarsi. Processus terminalis 2.5—3.5 times as long as base of antennal segment VI. Spinal hairs on abdominal tergite III not more than about 1.3 times as long as basal diameter of antennal segment III. On *Aconitum*. Central and Southern Europe . . . *B. aconiti* (Mordv.)
- Siphunculi shorter, 0.7—1.5 times length of second joint of hind tarsi. Processus terminalis mostly longer, 3.5—6.0 times as long as base of antennal segment VI. Spinal hairs on abdominal tergite III usually longer, 1.1—3.4 times as long as basal diameter of antennal segment III 5
5. Last segment of rostrum 0.8—1.0 times as long as second joint of hind tarsi.¹⁾ Stigmal pori small with a thick, rather heavy sclerotic rim; second joint of hind tarsi 5.2—7.2 times as long as the greatest inner diameter of the stigmal porus of abdominal segment I. On *Silene vulgaris*. Europe . . . *B. populi* (Del Guercio)
- Last segment of rostrum 1.2—1.6 times as long as second joint of hind tarsi . . . 6
6. Spinal hairs on abdominal tergite III like most other hairs on the abdominal tergites anterior to the siphunculi, 1.9—3.4 times as long as longest hairs on antennal segment III. Longest hairs on antennal segment III 0.017—0.029 mm long, 0.8—1.3 times basal diameter of the segment. Hairs on abdominal tergites anterior to siphunculi mostly blunt or knobbed, sometimes pointed. Number of hairs on antennal segment III (7—15) mostly smaller. On *Melandryum rubrum*, sometimes on *M. album*. Europe *B. klugkisti* (Börner)
- Spinal hairs on abdominal tergite III, like most other hairs on the abdominal tergites anterior to siphunculi, 0.7—1.4 times as long as longest hairs on antennal segment III; longest hairs on antennal segment III 1.1—3 times basal diameter of the segment. Hairs on abdominal tergites in front of siphunculi mostly pointed or with thread-like apices, sometimes blunt. Number of hairs on antennal segment III (13—34) mostly greater 7
7. Hairs on antennal segment III and spinal hairs on abdominal tergite III like the other hairs on the abdominal tergites with long, thread-like apices. Base of antennal segment VI 1.0—1.7 times as long as the spinal hairs on abdominal tergite III. About 20—34 hairs on antennal segment III. Length of last segment of rostrum 0.181—0.208 mm. On underground parts and on parts of the plants just above soil surface. On *Melandryum rubrum* and *Lychnis flos-cuculi*. Bennekom (Netherlands) *B. lychnicola* H.R.L.
- Hairs on antennal segment III generally pointed, sometimes blunt or with short thread-like apices. Spinal hairs on abdominal tergite III and also most other hairs on the abdominal tergites anterior to siphunculi mostly pointed, sometimes blunt. Base of antennal segment VI 1.7—3.6 times as long as the spinal hairs on

¹⁾ Not keyed because of too few samples available: *B. divaricatae* Shap. This species has last segment of rostrum about 0.9—1.2 times as long as second joint of hind tarsi. It looks distinct from *B. populi* (Del Guercio) by the relatively larger stigmal pori and shorter second joint of hind tarsi, the latter being 3.2—4.4 times as long as the greatest inner diameter of the stigmal porus of abdominal segment I. From *B. lychnidis* (L.) and *B. lychnicola* H.R.L. it differs by the shorter last segment of rostrum (0.147—0.176 mm), from *B. klugkisti* (Börner) by the longer hairs on antennal segment III (longest of these hairs 0.029—0.050 mm long).

- abdominal tergite III. About 13—25 hairs on antennal segment III. Length of last segment of rostrum 0.185—0.210 mm. Usually living in the tops of the plants. On *Melandryum album*, sometimes on *Silene*, exceptionally on *Melandryum rubrum*. Europe *B. lychnidis* (L.)
8. Marginal tubercles present on meso- and metathorax, and abdominal tergite VII; and spinal tubercles present on abdominal tergites VII and VIII. These tubercles may be wanting partly on one or both sides. On (*Lindelofia*), *Cynoglossum*, and *Cerinthe*. Europe and Madeira *B. bicolor* (Nevsky) sensu Stroyan
- Marginal tubercles absent on mesothorax; and spinal tubercles absent on abdominal tergites VII and VIII. Marginal tubercles mostly absent on metathorax and abdominal tergite VII 9
9. Longest hairs on abdominal tergite VIII more than 2 times as long as basal diameter of antennal segment III 10
- Longest hairs on abdominal tergite VIII 2 times as long as basal diameter of antennal segment III or shorter 15
10. Cauda with more than 10 hairs. Length of last segment of rostrum 0.170—0.190 mm. Processus terminalis 2.5—3.5 times as long as base of antennal segment VI. On *Aconitum*. Central and Southern Europe *B. aconiti* (Mordv.)
- Cauda with less than 10 hairs 11
11. Length of last segment of rostrum 0.180—0.225 mm. Transverse rows of imbrications on the abdominal tergites anterior to the siphunculi indistinct or almost absent. Mesosternal processes conspicuous, semi-globular. On *Prunus*, Compositae and Boraginaceae. Europe to Central Asia, North America *B. cardui* (L.)
- Length of last segment of rostrum 0.125—0.175 mm. Transverse rows of imbrications on the abdominal tergites in front of siphunculi distinct. Mesosternal processes less conspicuous, less elevated 12
12. Processus terminalis more than 3.5 times as long as base of antennal segment VI 13
- Processus terminalis 3.5 times as long as base of antennal segment VI or less 14
13. Apterae viviparae usually without rhinaria on antennal segment III. Alatae viviparae with rhinaria on antennal segments III, IV, and usually a few sec. rhinaria on antennal segment V. Length of last segment of rostrum 0.130—0.165 mm. On *Prunus*, *Amygdalus*, *Euphrasia*, *Melampyrum* and *Rhinanthus*. Almost world-wide *B. persicae* (Pass.)
- Apterae viviparae (and oviparae) always with rhinaria on antennal segment III. Alatae viviparae with rhinaria on antennal segment III and often a few rhinaria on antennal segment IV. Processus terminalis 4—6 times as long as base of antennal segment VI. Length of last segment of rostrum 0.140—0.175 mm. On *Myosotis* and *Pulmonaria*. Western and Central Europe *B. jacobii* Stroyan
14. Longest hairs on ventral part of hind femora longer than basal diameter of antennal segment III; these hairs mostly with thread-like apices. Processus terminalis 2—3 times as long as base of antennal segment VI. Length of last segment of rostrum 0.125—0.145 mm. On *Lamium*. Central and Eastern Europe *B. lamii* (Koch)
- Longest hairs on ventral part of hind femora shorter than basal diameter of antennal segment III. All hairs on ventral part of hind femora pointed or blunt. Processus terminalis 3—5.5 times as long as base of antennal segment VI. Length of last segment of rostrum 0.130—0.165 mm. On *Prunus*, *Amygdalus*, *Euphrasia*, *Melampyrum* and *Rhinanthus*. Almost world-wide *B. persicae* (Pass.)

15. More than 10 hairs on abdominal tergite VIII, which are arranged in two or three more or less irregular transverse rows; these hairs are shorter or at the most about as long as basal diameter of antennal segment III. Processus terminalis 2.5—3.5 times as long as base of antennal segment VI 16
- Less than 10 hairs on abdominal tergite VIII, which usually are arranged in one regular transverse row 17
16. Length of last segment of rostrum 0.135—0.160 mm. Cauda with about 10—16 hairs. Alatae viviparae with rhinaria on antennal segments III, IV and usually a few sec. rhinaria on antennal segment V. On *Linaria*. Western and Central Europe *B. linariae* Stroyan
- Length of last segment of rostrum 0.165—0.185 mm. Cauda with about 5—9 hairs. Alatae viviparae with rhinaria on antennal segment III and usually a few rhinaria on antennal segment IV. On *Malva*. England, Russia, Spain . . . *B. malvae* Shap.¹⁾
17. Longest hairs on antennal segment III very thin and short (length ca. 0.004 mm) 0.2 times as long as the basal diameter of this segment. Length of last segment of rostrum 0.140—0.165 mm. The rim of the stigmal pori indented on anterior margin. Mesosternal processes reduced or absent. On *Plantago lanceolata*. Europe *B. lucifugus* F. P. Müller
- Longest hairs on antennal segment III not so very thin and short, at least 0.006 mm long, 0.3 or more times as long as the basal diameter of this segment. The rim of the stigmal pori hardly or not indented on anterior margin, more or less rounded. Mesosternal processes distinct 18
18. Length of last segment of rostrum 0.125—0.145 mm. Processus terminalis 2—3 times as long as base of antennal segment VI. On *Ballota*. Eastern Europe *B. ballotae* (Pass.)
- Length of last segment of rostrum 0.165—0.225 mm 19
19. Longest hairs on abdominal tergite VIII at least 0.023 mm long, 0.8 or more times as long as the basal diameter of antennal segment III. Mesosternal processes conspicuous, semi-globular. Length of last segment of rostrum 0.180—0.225 mm. Apteræ viviparae normally not with rhinaria on antennal segment III. On Compositae, Boraginaceae and *Prunus*. Europe to Central Asia, North America *B. cardui* (L.)
- Longest hairs on abdominal tergite VIII 0.006—0.018 mm long, 0.3—0.7 times as long as the basal diameter of antennal segment III. Mesosternal processes less conspicuous, less elevated. Length of last segment of rostrum 0.165—0.195 mm. Apteræ viviparae frequently with rhinaria on antennal segment III. On *Echium* and *Anchusa*. Central and Eastern Europe *B. mordvilkoii* H.R.L.

Brachycaudus (Acaudus) lychnidis (Linnaeus, 1758)

Aphis lychnidis Linnaeus, 1758: 451.

Linnaeus left no aphid material. The original description is fragmentary. Therefore I give a redescription of the species here.

¹⁾ Characteristics possibly not wholly reliable because too few samples are available.

Material examined: Besides the material mentioned under measurements, I have examined specimens from *Lychnis alba*, Portici (Italy), 9.III.1934, leg. D. Roberti; from *Melandryum album*, Antona near Massa (Italy), 1.IX. 1963, leg. D.H.R.L.; and from *Melandryum album*, Lido (Venice) (Italy), 6.VI.1965, leg. D.H.R.L.; all in the collection of D. Hille Ris Lambers.

Fundatrix.

Antennae about 0.5—0.6 of length of body, segment III with only about 9 hairs; processus terminalis about 2.5 times as long as basal part of segment VI. Last segment of rostrum 0.155—0.168 mm long, about 1.2 times as long as second joint of hind tarsi. Siphunculi about 0.07 of length of body. Proportions between length of longest hairs on antennal segment III and basal diameter of that segment, between length of spinal hairs of abdominal tergite III and basal diameter of antennal segment III, between length of spinal hairs of abdominal tergite III and length of longest hairs on antennal segment III, and between distances between stigmal pori of abdominal segments I, II and III, about as in apterous viviparous female. Other characters also similar to apterous viviparous female.

Measurements in mm.

No.	Length body	Ant.	Ant. segments				Siph.	Cau.
			III	IV	V	VI		
1	2.32	1.22	0.30	0.18	0.20	0.12+0.27	0.16	0.10
2	2.34	1.22	0.32	0.18	0.20	0.11+0.27	0.16	—
3	2.27	1.13	0.29	0.15	0.18	0.10+0.28	0.16	0.09

(1—3, from *Melandryum album*, Arcen (L.) (Netherlands), 3.IV.1967, leg. D.H.R.L.)

Apterous viviparous female.

In life dorsally shiny black with the underside red-brown. In mounted specimens body broadly oval, about 1.75—2.85 mm long. Front sinuated; median frontal tubercle about as high as lateral frontal tubercles. Antennae about 0.6—0.8 of length of body, with segments I and II dark, flagellum from the pale segment III gradually darker towards the base of segment VI; processus terminalis gradually slightly paler towards apex; segment III for the greater part almost smooth, with only at base rather distinct imbrications, sometimes also in later generations than the second with a few rhinaria, and with 13—25 hairs; the latter generally pointed, sometimes blunt, or with filamentary apices, longest 0.032—0.053 mm and 1.1—2.1 times basal diameter of the segment; processus terminalis 4—5.5 times as long as base of segment VI; this base 1.7—3.6 times as long as spinal hairs of abdominal tergite III. Tip of rostrum generally reaching past hind coxae; last segment 0.185—0.210 mm long, 1.3—1.6 times as long as second joint of hind tarsi, 4.3—7.8 times as long as the greatest inner diameter of the stigmal porus of abdominal segment I, with 8—14 accessory hairs. Mesosternal processes rather low and extensive, in mounted specimens mostly somewhat confluent. Tergum dark sclerotic, with metanotum fused with abdominal tergites I to VI, tergites VII and VIII free; dorsal shield quite smooth, generally not touching the stigmal

plates. Spinal tubercles absent; marginal tubercles usually present on abdominal segments II, III and IV, often also on I and sometimes on metathorax, all rather or very small, and flat or semi-globular. Hairs on abdominal tergites cephalad siphunculi mostly pointed, sometimes blunt; spinal hairs of tergite III 0.034—0.055 mm long, 1.1—2.0 times as long as basal diameter of antennal segment III and 0.7—1.4 times as long as longest hairs on antennal segment III. Tergite VIII with 6—12 hairs, mostly with filamentary apices, sometimes pointed, mostly placed in a row on posterior margin of sclerotic part of segment; longest of these hairs 0.08—0.12 mm long, 3—5 times as long as basal diameter of antennal segment III. Siphunculi dark, truncated conical, often slightly constricted at base, where they are about twice as wide as in very distinct annular incision below flange, about 0.08 of length of body and 1.0—1.5 times length of second joint of hind tarsi, with rather straight imbrications; flange wide, about 1.4 times as wide as width in subapical incision. Cauda rounded or semi-oval, about 1.5 times as wide at base as its length, with about 11—17 hairs. Legs with fore femora pale with dorsally dark apex, middle femora smoky with dorsally dark apex, or dark with pale base; the hind femora dark with pale base; tibiae pale with apex and the very base dark; first tarsal joints with 3, 3, 3 hairs.

Measurements in mm.

No.	Length body	Ant.	Ant. segments				Siph.	Cau.
			III	IV	V	VI		
1	2.28	1.46	0.38	0.24	0.17	0.10 + 0.41	0.18	0.10
2	1.89	1.52	0.37	0.24	0.18	0.09 + 0.49	0.17	0.08
3	2.30	1.69	0.43	0.26	0.18	0.10 + 0.55	—	0.10
4	2.62	1.86	0.51	0.33	0.22	0.10 + 0.53	0.23	0.11
5	2.64	1.61	0.41	0.28	0.21	0.10 + 0.45	0.21	0.11
6	2.34	1.59	0.40	0.27	0.17	0.09 + 0.49	0.22	0.11
7	2.23	1.41	0.31	0.21	0.16	0.10 + 0.48	0.17	0.10

(1, from *Melandryum album*, Andalucia la Nueva (And.) (Spain), I.IV.1968, leg. D.H.R.L.; 2, from *Silene vulgaris* (?), Cascais (Portugal), 6.VI.1965, leg. Oliveira; 3, from *Melandryum album*, St. Georges (France), 3.IV.1947, leg. Kruseman; 4, from *Melandryum album*, Arcen (L.) (Netherlands), 7.VII.1966, leg. D.H.R.L.; 5, from *Melandryum album*, Arcen (L.) (Netherlands), 27.IX.1966, leg. D.H.R.L.; 6, from *Silene dichotoma*, Poznań (Poland), 17.VII.1966, leg. Achremowicz; 7, from *Melandryum album*, Merano (Italy), 6.VIII.1930, leg. D.H.R.L.)

Alate viviparous female.

In mounted specimens head and thorax dark, abdomen with a dark spino-pleural sclerite extending from abdominal tergites III to VI; sclerite fused with marginal sclerites of segments V and VI; marginal sclerites of segment III each with 7—12 hairs. Antennae dark, just shorter than to about as long as body; segment III along one side with about 15—34 flat rhinaria of various sizes; segment IV with 0—4 rhinaria along one side; antennal segment III with about same number of hairs as in apterae viviparae, hairs generally pointed or blunt, sometimes slightly knobbed, the longest

0.025—0.038 mm, 0.9—1.6 times basal diameter of segment. Spinal hairs of abdominal tergite III 0.026—0.044 mm long, 1.0—1.7 times as long as basal diameter of antennal segment III, and 0.8—1.5 times as long as longest hairs on that segment. Hairs on tergite VIII about as in apterae viviparae. Wings with normal venation; veins light brown, subcosta pale, stigma rather dark. Other characters about as in apterae viviparae.

Measurements in mm.

No.	Length body	Ant.	Ant. segments				Rhinaria	on	Siph.	Cau.
			III	IV	V	VI	III	IV		
1	2.44	1.99	0.49	0.34	0.25	0.12+0.64	24 & 25	0 & 0	0.18	0.11
2	2.17	1.89	0.47	0.34	0.24	0.11+0.57	24 & 26	0 & 0	0.18	0.11
3	2.03	2.06	0.49	0.34	0.24	0.13+0.71	18 & 22	0 & 1	0.19	0.10
4	1.83	1.78	0.43	0.25	0.21	0.10+0.65	16 & 16(?)	0 & 0	0.15	0.11
5	2.21	1.97	0.50	0.33	0.26	0.12+0.61	28 & —	0 & —	0.21	—
6	2.11	1.97	0.51	0.34	0.25	0.11+0.61	23 & 28	0 & 1	0.18	0.10

(1 and 2, from *Melandryum album*, Andalucia la Nueva (And.) (Spain), 1.IV.1968, leg. D.H.R.L.; 3 and 4, from *Silene vulgaris*(?), Cascais (Portugal), 6.VI.1965, leg. Oliveira; 5, from *Melandryum album*, Arcen (L.) (Netherlands), 7.VII.1966, leg. D.H.R.L.; 6, from *Melandryum album*, Arcen (L.) (Netherlands), 4.V.1967, leg. D.H.R.L.)

Oviparous female.

In life colour about as in apterae viviparae, but hind tibiae wholly dark. In mounted specimens body generally smaller than in apterae viviparae, about 1.75-2.35 mm long. Tergum with a light-brown spino-pleural blotch extending from abdominal tergites I to IV, in the mid dorsal line less, or partly not, sclerotized, generally more or less fused with tergite V, and not reaching equally dark marginal sclerites; tergites VI and VII with irregular light-brown spino-pleural transverse bars; spino-pleural bar on tergite VIII darker. Hind tibiae wholly brown with the apex and the very base slightly darker, on basal half rather incrassate and mainly there with about 40—120 pseudo-sensoria. Antennal segment III with 10—15 pointed hairs. Other characters about as in apterous viviparous female.

Measurements in mm.

No.	Length body	Ant.	Ant. segments				Siph.	Cau.
			III	IV	V	VI		
1	2.32	1.33	0.28	0.21	0.17	0.09+0.43	0.18	0.09
2	2.25	1.23	0.26	0.20	0.16	0.08+0.42	0.16	0.10
3	1.97	1.14	0.24	0.17	0.14	0.08+0.40	0.17	0.08
4	1.89	1.10	0.21	0.17	0.15	0.08+0.38	0.16	0.08
5	1.87	1.13	0.22	0.17	0.15	0.07+0.41	0.16	—

(1—5, from *Melandryum album*, Arcen (L.) (Netherlands); 1—2, 27.IX.1966; 3, 3.X.1966; 4, 7.X.1966; 5, 10.X.1966; all leg. D.H.R.L.)

Apterous male.

In life black. In mounted specimens body more slender than in alatae viviparae, about 1.50—1.85 mm long. Anterior part of head dark sclerotic, posterior part of head, and the thorax paler, abdomen with a more or less solid, rather dark sclerotic, blotch extending from tergites I through VI, with local perforations between the tergites; this blotch fused with marginal sclerites of segments III to VI. Antennae shorter than body, as dark as head; rhinaria along one side, on segment III about 13—20, on segment IV about 7—15 and on segment V about 4—9 secondary rhinaria. Siphunculi slightly tapering. Other characters about as in alate viviparous female. Genitalia normal.

Measurements in mm.

No.	Length body	Ant. III	Ant. segments IV V VI				Rhin. on segments III IV V			Siph.	Cau.
1	1.82	1.50	0.37	0.27	0.18	0.09+0.43	19 & 13	7 & 11	8 & 5	0.12	0.07
2	1.66	1.35	0.34	0.24	0.16	0.07+0.41	16 & 19	10 & 15	6 & 8	0.11	0.06
3	1.60	1.30	0.30	0.23	0.16	0.08+0.39	19 & 20	13 & 10	9& 5	0.11	—
4	1.67	1.37	0.32	0.26	0.17	0.07+0.42	19 & 17	9 & 11	8 & 4	0.11	0.07

(1—4, from *Melandryum album*, Arcen (L.) (Netherlands); 1, 27.IX.1966; 2, 3.X.1966; 3, 7.X.1966; 4, 10.X.1966; all leg. D.H.R.L.)

***Brachycaudus (Acaudus) klugkisti* (Börner, 1942)**

Acaudus klugkisti Börner, 1942: 260.

Through the kind help of Dr. Petersen, Deutsches Entomologisches Institut, Eberswalde, Germany, I could examine the Börner types of *Brachycaudus klugkisti*. They all seem to be part of a culture on *Melandryum rubrum*, started from material from Waldau, with dates 4.VI.1942 to July 1942.

The slides are labelled as follows:

- "*Acaudus klug-/kisti* CB. 1942/Typen (a)" on a red label and "*Melandr rubrum*/Waldau-Ost/4.6.42/A. klugkisti" on a white label.
- "*Acaudus klug-/kisti* CB. 1942/Typen (b)" on a red label and "*Melandr rubrum*/Waldau/5.6.42/Zucht Labor/10.6.42" on a white label.
- "*Acaudus/klugkisti* CB/1942/Typen (c)" on a red label and "*Melandr rubrum*/Zucht Labor von/Waldau-Heide-/teich 20.6.42/A. klugkisti" on a white label.
- "*Acaudus/klugkisti*/CB. 1942/Typen (d)" on a red label and "*Melandr rubr*/Zucht aus Waldau/Juli 1942/A. klugkisti" on a white label.

It is not clear which "Waldau" is meant with this indication on the labels, since I found 9 localities in Germany with the name Waldau. Börner's manuscript with the description of *A. klugkisti* Börner, 1942 was finished between April and June 1942; the locality mentioned on the type slides is not mentioned in his description. The collecting dates suggest that the "types" were not available when he made his description, and thus do not have the status of types. It is also interesting that Börner's paper mentions only apterae, but part of the types are alatae. It is remarkable that the apterae in the type slides in one respect do not at all agree with the description. Börner indicates that the hairs on the tergites mostly are shorter than similar hairs in *Brachycaudus lychnidis*. ("Die länge der Rückenborsten ist bei *klugkisti* durchweg etwas kürzer als bei *lychnidis*"). Actually the reverse is the case.

Börner did not indicate a holotype. Therefore I selected the lowest specimen of the apterae viviparae in slide (d), (Deutsch. Entomol. Institut Coll. Carl Börner 26/55) as neotype. The labelling is described above. The other specimens in the slides (a), (b), (c) and (d) (resp. Deutsch. Entomol. Institut Coll. Carl Börner 26/52, 26/53, 26/54 and 26/55) do not have any type status. A slide labelled "Acaudus/klugkisti CB./1942/Cotypen" on a red label and "Melandr. rubr. Zucht 806/♀ ♀ Nbg/8.5.43" on a white label I have left out of consideration.

Material examined: The material mentioned under measurements, except the "types", all in the collection of D. Hille Ris Lambers (from *Melandryum rubrum*, Meppel (Netherlands), 19.V.1965, leg. P.D., partly in the collection of the Plant Protection Service). The "types" are in the Deutsches Entomologisches Institut, Eberswalde (Germany). Further material I have examined from *Melandryum album*, Ouddorp (Netherlands), 28.VI.1965, leg. v. d. Bund (in coll. D. Hille Ris Lambers and in coll. Plant Protection Service) and from *Lychnis* (?), Burgst (Netherlands), VI.1928, leg. Roepke (in coll. D. Hille Ris Lambers).

Fundatrix.

Antennae about 0.4—0.5 of length of body, of 5 segments; processus terminalis 2.5—3.5 times as long as basal part of segment VI. Distance between stigmal opercula of abdominal segments I and II about $\frac{2}{3}$ of distance between stigmal opercula of segments II and III. Siphunculi about 0.06—0.065 of length of body. Other characters about as in apterous viviparous female.

Measurements in mm.

No.	Length body	Ant.	Ant. segments			Siph.	Cau.
			III	IV	V		
1	2.01	0.91	0.30	0.13	0.10+0.27	0.13	0.10
2	2.23	1.07	0.35	0.15	0.11+0.33	0.14	0.11

(1—2, from *Melandryum rubrum*, Wageningen (Netherlands), 17.IV.1943, leg. D.H.R.L.)

Apterous viviparous female.

In life dorsally shiny black with the underside red-brown. In mounted specimens body

oval, about 1.50—2.45 mm long. Front sinuated, median frontal tubercle a little higher than lateral frontal tubercles. Antennae about 0.5—0.7 of length of body, segment I rather dark, segment II paler, flagellum from the pale segment III gradually darker towards the base of segment VI; processus terminalis gradually slightly paler towards apex; segment III strikingly narrowed at base with distinct imbrications over about its whole length, without rhinaria and with 7—15 hairs; the latter generally pointed, sometimes blunt or knobbed with an oblong knob; longest of these hairs 0.017—0.029 mm long and 0.8—1.3 times basal diameter of segment; processus terminalis 4—6 times as long as base of segment VI. Tip of rostrum reaching hind coxae; last segment 0.143—0.172 mm long, 1.2—1.5 times as long as second joint of hind tarsi, with 6—10 accessory hairs. Mesosternal processes low and not conspicuous. Tergum dark sclerotic with mesonotum mostly not completely fused with the dorsal shield formed by metanotum and tergites I to VII; tergite VIII free; dorsal shield quite smooth, without reticulations, generally also fused with the stigmal plates. Spinal tubercles absent, marginal tubercles often present on abdominal segments II, III and IV, small and semi-globular. Hairs on abdominal tergites cephalad siphunculi mostly blunt, or knobbed with an oblong knob, sometimes pointed. Spinal hairs of tergite III 0.042—0.065 mm long, 1.9—3.4 times as long as basal diameter of antennal segment III and 1.9—3.4 times as long as longest hairs on antennal segment III. Tergite VIII with the 6—8 hairs pointed or with filamentary apices; mostly placed in a row on posterior margin of sclerotic part of segment; longest of these hairs 0.07—0.10 mm, 3—5 times as long as basal diameter of antennal segment III. Siphunculi dark, truncated conical, sometimes slightly constricted at base, and there 1.5—2 times as wide as in very distinct annular incision below flange, about 0.07 of length of body and 1.0—1.5 times length of second joint of hind tarsi, with rather straight imbrications; flange wide, about 1.4 times as wide as in subapical incision. Cauda rounded, about 1.2 times as wide at base as its length, with about 6—12 hairs. Legs with fore femora pale, middle femora pale or smoky, hind femora smoky to blackish; tibiae pale with apex slightly darker; first tarsal joints with 3, 3, 3 hairs or with 3, 3, 2 hairs (types with only 2 hairs on first joint of hind tarsi).

Measurements in mm.

No.	Length body	Ant.	Ant. segments				Siph.	Cau.
			III	IV	V	VI		
1	1.90	1.15	0.25	0.16	0.12	0.08+0.43	0.14	—
2	± 1.50	0.99	0.21	0.14	0.08	0.08+0.37	0.12	± 0.07
3	2.21	1.27	0.28	0.19	0.13	0.09+0.45	0.16	0.10
4	1.78	1.00	0.21	0.12	0.11	0.07+0.37	0.13	0.10
5	1.65	0.79	0.13	0.10	0.08	0.06+0.31	0.10	0.08
6	1.85	1.07	0.22	0.13	0.12	0.08+0.40	0.14	0.08
7	2.39	1.51	0.37	0.22	0.17	0.09+0.49	0.18	0.12
8	2.15	1.39	0.31	0.19	0.13	0.09+0.51	0.17	0.10

(1, from *Melandryum rubrum*, Waldau (Germany), VII.1942, leg. Börner (neotype); 2, from *Melandryum rubrum*, Waldau (Germany), VII.1942, leg. Börner, ("type" series); 3, from *Melandryum rubrum*, Waldau (Germany), 4.VI.1942, leg. Börner

("type" series); 4, from *Melandryum rubrum*, Laren (N.H.) (Netherlands), 6.VII.1930, leg. D.H.R.L.; 5, from *Melandryum rubrum*, Houthem (L.) (Netherlands), 24.VI.1946, leg. D.H.R.L.; 6, from *Melandryum rubrum*, Bennekom (Netherlands), 30.V.1965, leg. D.H.R.L.; 7, from *Melandryum rubrum*, Meppel (Netherlands), 19.V.1965, leg. P.D.; 8, from *Melandryum album*, Flynn Dyke (Cambs.) (England), 11.VII.1964, leg. D.H.R.L.)

Alate viviparous female.

In mounted specimens head and thorax dark, abdomen with a dark spino-pleural sclerite extending from tergites III to VII; this blotch fused with the marginal sclerites of segments V and VI and more or less with the marginal sclerites of segment IV; marginal sclerites of segment III with 4—9 hairs each. Antennae dark, just shorter than body; segment III along one side with 11—31 rhinaria of various sizes with slightly elevated rim, and membrane bulging with flat top; segment IV with 0—3, exceptionally up to 8, rhinaria along one side. Spinal hairs of abdominal tergite III shorter than in apterae, 0.033—0.050 mm long, 1.5—2.2 times as long as basal diameter of antennal segment III and 1.5—2.4 times as long as longest hairs on antennal segment III; antennal hairs about as in apterae viviparae; hairs on abdominal tergite VIII slightly shorter than in apterae viviparae, viz., longest of these hairs 0.065—0.08 mm long, 2.5—4 times as long as basal diameter of antennal segment III. Wings with normal venation, the veins light brown, both subcosta and stigma rather pale, along all the veins with an equally narrow, distinct light brownish border. Other characters about as in apterae viviparae.

Measurements in mm.

No.	Length body	Ant.	Ant. segments				Rhin. on		Siph.	Cau.
			III	IV	V	VI	III	IV		
1	1.71	1.62	0.39	0.22	0.17	0.11+0.59	12 & 11	0 & 0	0.13	0.09
2	± 1.73	1.67	0.38	0.26	0.17	0.10+0.63	14 & 15	0 & 0	0.14	—
3	2.03	1.94	0.49	0.31	0.21	0.11+0.68	22 & 20	0 & 0	0.16	0.11
4	2.08	1.95	0.48	0.30	0.20	0.12+0.71	21 & 23	2 & 2	0.17	0.11
5	2.11	1.92	0.51	0.30	0.21	0.11+0.66	21 & 19	1 & 1	0.15	0.10
6	2.19	1.91	0.50	0.32	0.22	0.11+0.61	— & 28	1 & 2	0.18	0.11

(1 and 2, from *Melandryum rubrum*, Waldau (Germany), VII.1942, leg. Börner ("type" series); 3, from *Melandryum rubrum*, Waldau (Germany), 5.VI.1942 to 10.VI.1942, leg. Börner ("type" series); 4, from *Melandryum rubrum*, Bennekom (Netherlands), 30.V.1965, leg. D.H.R.L.; 5, from *Melandryum rubrum*, Meppel (Netherlands), 19.V.1965, leg. P.D.; 6, from *Melandryum album*, Flynn Dyke (Cambs.) (England), 11.VII.1964, leg. D.H.R.L.)

Oviparous female.

In mounted specimens tergum wholly dark sclerotic, head and most of thorax paler, about as in apterae viviparae. Hind tibiae conspicuously incrassate in middle, and there with 20—45 pseudosensoria. Antennae with 5 or 6 segments. Spinal hairs of abdominal

tergite III 0.050—0.055 mm long, with a very conspicuous knob; these hairs 2.7—3.7 times as long as basal diameter of antennal segment III and 3.6—4.3 times as long as longest hairs on antennal segment III. Other characters about as in apterous viviparous female.

Measurements in mm.

No.	Length body	Ant.	Ant. segments				Siph.	Cau.
			III	IV	V	VI		
1	1.73	0.89	0.17	0.11	0.10	0.08+0.32	0.11	0.08
2	1.46	0.65	0.17	0.08	0.08+0.24	—	0.11	0.08
3	1.52	0.89	0.15	0.12	0.10	0.07+0.34	0.11	0.08

(1—3, from *Melandryum rubrum*, Wageningen (Netherlands), 19.X.1943, leg. D.H.R.L.)

Apterous male.

In mounted specimen body about as slender as in alatae viviparae. Head for the greater part, and tergum wholly dark sclerotic, thorax paler. Antennae with 5 segments, as dark as the head. Rhinaria along one side of segments III to V. Spinal hairs of abdominal tergite III 0.036 mm long, 2.4 times as long as basal diameter of antennal segment III and 3.0 times as long as longest hairs on antennal segment III. Siphunculi distinctly tapering. Femora pale, tibiae smoky. Other characters about as in alate viviparous female. Genitalia normal.

Measurements in mm.

No.	Length body	Ant.	Ant. segments			Rhin. on segments			Siph.	Cau.
			III	IV	V	III	IV	V		
1	1.01	0.82	0.27	0.09	0.07+0.30	22 & 20	3 & 4	1 & 1	0.07	0.06

(1, from *Melandryum rubrum*, Wageningen (Netherlands), 19.X.1943, leg. D.H.R.L.)

***Brachycaudus (Acaudus) populi* (Del Guercio, 1911)**

Anuraphis populi Del Guercio, 1911: 307.

Prof. Dr. M. Martelli, Milano, most kindly permitted the loan of the Del Guercio material of *Anuraphis populi*. This consisted of three slides, which are labelled as follows:

"*Anuraphis/populi*/Del Gu/deleted/apt. populea/Kalt." on a white label and "deleted/*Populus nigra*/Spagna/n. 56" in ink on a white label. This is slide 15/54 on a typed label on the back of the slide in the Del Guercio collection, Milano.

"*Anuraphis/populi*/del Guercio/paralectotype/Det: del Guercio" on a white label and "*Populus nigra*/Spagna/no. 56/Remounted 1967/by H.R.L. from slide/15/54" on a white label.

"*Brachycaudus/populi*/del Guercio/*paratype*/Det. del Guercio" on a red label and "N. Spain/Pl. *Populus nigra*/Loc. ?/Date ?/Leg. ?/Remounted 1967/by H R L from 56/slide 15/54" on a white label.

Del Guercio did not indicate types. Therefore I have selected the middle specimen of the first mentioned slide as lectotype, indicated on a label on the backside as "lectotype H. C. Burger, 1974". The remaining Del Guercio specimens I consider paralectotypes.

It is unlikely that the collector (I.S. Tavares) should have found this *Silene*-inhabiting species on *Populus nigra*. As Dr. D. Hille Ris Lambers pointed out, the host plant record by Del Guercio is the result of a mix-up. Del Guercio (1911) recorded *Anuraphis populi* from *Populus nigra* but this aphid is restricted to *Silene inflata* (= *vulgaris*). In his list on p. 298 this is followed by *Pemphigus inflatae* n. sp. from *Silene inflata*, but this aphid is *Pemphigus spyrothecae* Pass., and it lives exclusively on *Populus nigra*.

Material examined: The material mentioned under measurements, in the collection of D. Hille Ris Lambers (except all types but one). Types in the Laboratorio di Entomologia Agraria, University of Milano, Italy, one paralectotype in the collection of D. Hille Ris Lambers, Bennekom.

Fundatrix: unknown.

Apterous viviparous female.

In life dorsally shiny black with the underside red-brown. In mounted specimens body broadly oval, about 1.60—2.85 mm long. Front sinuated; median frontal tubercle about as high as lateral frontal tubercles. Antennae about 0.6—0.8 times length of body; segment I and II of antennae dark, from the pale, or basally pale, segment III gradually darker towards the base of segment VI; processus terminalis gradually slightly paler towards apex; segment III with rather distinct imbrications especially at base, sometimes with a few rhinaria, also in later generations than the second, and with 16—29 hairs generally pointed, sometimes blunt or with thread-like apices; longest of these hairs, which are rather different in length, 0.031—0.042 mm long and 1.1—1.4 times basal diameter of the segment; processus terminalis 3.5—6 times as long as base of segment VI. Tip of rostrum just reaching hind coxae; last segment 0.143—0.185 mm long, 0.8—1.0 times as long as second joint of hind tarsi; this low proportion is especially caused by the long second joints of tarsi (see sub legs); number of accessory hairs on last segment of rostrum 7—11. Mesosternal processes rather low and extensive and in mounted specimens mostly somewhat confluent. Stigmal plates, at least the more posterior ones, generally united with the dark sclerotic dorsal shield, which is quite smooth without reticulations. Stigmal pori small, with a thick, rather heavy sclerotic rim; greatest inner diameter of the stigmal porus of abdominal segment I 0.023—0.036 mm. Spinal tubercles absent, marginal tubercles often present on segments II, III and IV, sometimes on I and metathorax, all rather or very small, and flat or semi-globular. Spinal hairs of tergite III rather variable in length, 0.042—0.063 mm long, 1.2—2.3 times as long as basal diameter of antennal segment III; these hairs in specimens in spring with blunt or knobbed apices, and in specimens in autumn mostly with thread-like apices. Abdominal tergite VIII with 6—12 hairs with thread-like apices, most of

these hairs placed in a row on the posterior margin of the sclerotic part of the segment; longest of these hairs 0.09—0.11 mm long, 2.7—4.2 times as long as basal diameter of antennal segment III. Siphunculi dark, truncated conical, sometimes slightly constricted at base where they are about twice as wide as in the very distinct annular incision below the flange, about 0.07 of length of body and 0.7—1.1 times length of second joint of hind tarsi, with rather straight imbrications, the basal $1/5$ — $1/7$ part more or less smooth; the wide flange about 1.4 times as wide as the siphuncular width in the subapical incision. Cauda rounded or semi-oval, about 1.5 times as wide at base as it is long, with some 10—15 hairs. Legs with the fore femora pale with dorsally dark apex, the middle femora pale smoky with dorsally dark apex, or blackish with pale base, mostly only a little more pale than hind femora, which are blackish with pale base; tibiae pale with dark base and apex; first tarsal joints with 3, 3, 3 hairs; second joints of hind tarsi 0.143—0.202 mm long and 5.2—7.2 times as long as the greatest inner diameter of the stigmal porus of abdominal segment I; the second joints of other tarsi a little shorter.

Measurements in mm.

No.	Length body	Ant.	Ant. segments III IV V VI	Siph.	Cau.
1	1.60	1.17	0.30 0.16 0.14 0.08+0.37	—	0.08
2	—	1.51	0.39 0.22 0.16 0.09+0.49	0.15	—
3	1.66	1.19	0.30 0.16 0.14 0.08+0.38	0.12	—
4	2.78	1.80	0.49 0.30 0.22 0.09+0.52	0.14	0.11
5	2.48	1.95	0.49 0.33 0.24 0.11+0.61	0.16	—
6	2.13	1.37	0.41 0.23 0.18 0.09+0.31	—	0.10
7	2.21	1.54	0.40 0.26 0.19 0.09+0.44	0.14	0.10
8	2.72	2.06	0.52 0.40 0.26 0.11+0.59	0.19	0.12

(1, *Populus nigra*, (Spagna) Spain, date unknown, leg. Del Guercio (lectotype); 2 and 3, *Populus nigra*, (Spagna) Spain, date unknown, leg. Del Guercio (paralectotypes); 4, *Silene vulgaris*, Bosco-Lugano (Switzerland), 29.V.1950, leg. Stäger; 5, *Silene vulgaris*, Grossglockner, 2200 m (Austria), 28.VIII.1960, leg. D.H.R.L.; 6, *Silene vulgaris*, Trento (Italy), 12.VI.1965, leg. D.H.R.L.; 7, *Silene vulgaris*, Schynige Platte (Switzerland), 9.IX.1966, leg. D.H.R.L.; 8, *Silene vulgaris*, Cavtat (Yugoslavia), 19.IV.1966, leg. D.H.R.L.)

Alate viviparous female.

In mounted specimens head and thorax dark, abdomen on tergite III with a spino-pleural sclerotic bar, which only in the pleural zone is fused with a more or less united sclerotic spino-pleural blotch extending from abdominal tergites IV to VI; this blotch also fused with the marginal sclerites of segments V and VI; marginal sclerite of segment III with 9—14 hairs. Antennae dark, about as long as body; segment III along one side with 19—36 flat rhinaria of various sizes; segment IV mostly without rhinaria, sometimes with 1—3 along one side; processus terminalis longer than in apterae

viviparae. Wings with normal venation, the veins light brown, the subcosta pale, the stigma rather dark.

Other characters about as in apterae viviparae.

Measurements in mm.

No.	Length body	Ant.	Ant. segments				Rhinarium		Siph.	Cau.
			III	IV	V	VI	III	on IV		
1	2.19	2.24	0.55	0.38	0.30	0.10+0.75	29 & —	0 & —	0.15	—
2	2.25	—	—	—	—	—	28 & —	0 & —	0.15	0.10
3	2.11	2.30	0.55	0.39	0.30	0.13+0.77	27 & 31	0 & 0	0.18	0.12
4	2.58	2.50	0.58	0.47	0.33	0.14+0.79	25 & 28	0 & 0	0.22	0.14
5	2.40	—	—	—	—	—	32 & 36	0 & 1	0.20	0.10
6	2.15	2.01	0.53	0.36	0.26	0.09+0.61	23 & 26	0 & 0	0.16	0.11

(1 and 2, *Silene vulgaris*, Trento (Italy), 12.VI.1965, leg. D.H.R.L.; 3 and 4, *Silene vulgaris*, Cavtat (Yugoslavia), 19.IV.1966, leg. D.H.R.L.; 5, *Silene vulgaris*, Cavtat (Yugoslavia), 20.IV.1966, leg. D.H.R.L.; 6, *Silene vulgaris*, Arogno (Switzerland), 21.VIII.1962, leg. Remaudière)

Oviparous female.

In mounted specimens body smaller than in apterae viviparae. Tergum wholly membranous and colourless to slightly sclerotic. Hind tibiae on basal half more or less incrassate and mainly there with 20—65 pseudosensoria, some of which extend more distad. Other characters about as in apterous viviparous female.

Measurements in mm.

No.	Length body	Ant.	Ant. segments				Siph.	Cau.
			III	IV	V	VI		
1	2.05	1.16	0.24	0.19	0.15	0.07+0.39	0.13	0.09
2	2.15	1.30	0.28	0.23	0.18	0.08+0.40	0.14	0.09
3	1.60	1.14	0.28	0.18	0.15	0.08+0.33	0.11	0.08
4	1.75	1.17	0.26	0.17	0.16	0.09+0.36	0.12	0.09

(1 and 2, *Silene vulgaris*, Grossglockner, 2200 m (Austria), 28.VIII.1960, leg. D.H.R.L.; 3 and 4, *Silene vulgaris*, Col de Puymorens, 1800 m (France), 18.IX.1952, leg. Remaudière).

Apterous male.

In mounted specimens body more slender than in alatae viviparae, and smaller. Head dark sclerotic, thorax and abdomen with smoky sclerotic spino-pleural transverse bars, which on metathorax and tergites I and II are small, irregular and sometimes locally united or missing, on tergites III—VII broader, more regular and more or less locally united, especially in the pleural zone, while on tergites V—VII they are united also

with the marginal sclerites. Antennae longer than body, dark like the head; rhinaria chiefly along one side; on segment III about 28—37 rhinaria, on segment IV about 16—30 rhinaria and on segment V about 11—17 secondary rhinaria. Siphunculi cylindrical or very slightly tapering. Genitalia normal. Other characters about as in *alatae viviparae*.

Measurements in mm.

No.	Length body	Ant. III	Ant. segments				Rhin. on segments			Siph.	Cau.
			IV	V	VI		III	IV	V		
1	1.68	1.86	0.44	0.35	0.26	0.09+0.57	30 & 36	28 & 22	16 & 16	0.10	0.07
2	1.71	1.83	0.41	0.37	0.27	0.09+0.54	35 & 35	23 & 17	12 & 13	0.11	0.06

(1 and 2, *Silene vulgaris*, Grossglockner, 2200 m (Austria), 28.VIII.1960, leg. D.H.R.L.)

Alate male.

In mounted specimen thorax more sclerotic than in apterous male. Segment III of antenna with more rhinaria than in apterous male. Genitalia normal. Wing venation normal. Other characters about as in apterous male.

Measurements in mm.

No.	Length body	Ant. III	Ant. segments				Rhin. on segments			Siph.	Cau.
			IV	V	VI		III	IV	V		
1	1.58	1.98	0.53	0.36	0.23	0.11+0.60	37 & 40	15 & 16	11 & 13	0.10	0.08

(1, *Silene vulgaris*, Col de Puymorens, 1800 m (France), 18.IX.1952, leg. Remaudière)

***Brachycaudus (Acaudus) persicae* (Passerini, 1860)**

Myzus persicae Passerini, 1860: 35.

Brachycaudus persicae (Pass.) has a complete or partial host alternation from *Prunus* (and *Amygdalus*) to *Euphrasia*, *Melampyrum*, *Rhinanthus* and, possibly, related Scrophulariaceae.

An indication for host alternation is given by the observation that in summer *Brachycaudus persicae* (Pass.) is rarely met with on *Prunus* and moreover that many *alatae* generally appear in spring. The suspicion of host alternation to Scrophulariaceae arose when Dr. D. Hille Ris Lambers noticed that in Australia *Brachycaudus persicae* (Pass.) not only was found on *Prunus* but also on *Parentucellia latifolia*. Also Eastop (1966) suspected the possibility of host alternation. *Brachycaudus mimeuri* Remaudière, only met with on *Euphrasia lutea*, does not show morphological differences from *Brachycaudus persicae* (Pass.) from *Prunus*, but is generally smaller.

In April 1969, I received living *Brachycaudus persicae* (Pass.) from a glass-house at

Blokker (Netherlands), where the animals were found on the above ground parts of plums. Almost immediately alatae appeared, which were transmitted to *Euphrasia* sp. and *Rhinanthus glaber*, and afterwards also from *Euphrasia* and *Rhinanthus glaber* to *Melampyrum pratense*. The animals bred in numerous colonies on these Scrophulariaceae till the end of July. The aphids lived on the above ground parts of the secondary host-plants. After July the plants died so that the culture could not be continued.

Brachycaudus persicae (Pass.), 12.V.1969, brought by D. Hille Ris Lambers from the above ground parts of apricot (*Prunus armeniaca*) from Ventimiglia (Italy), were first transmitted to peach (*Prunus persica*). As could be expected, alatae did not appear any more. On 10.IX.1969 a number of apterae viviparae were transferred from peach to *Melampyrum pratense*. Although in the beginning most of the produced larvae on *Melampyrum* died, the transfer succeeded eventually. The culture on the above ground parts of *Melampyrum pratense* could be continued till November 1969. During November a lot of alatae (gynoparae) appeared, the first on 5.XI.1969. A prolonged culture unfortunately failed because the foodplant succumbed.

ACKNOWLEDGEMENTS

I am very much indebted to Dr. D. Hille Ris Lambers, Bennekom, for the opportunity to examine the *Brachycaudus* material in his collection and for advice on the manuscript.

Thanks are also due to Drs. V. F. Eastop (London, England), J. Holman (Prague, Czechoslovakia), M. Martelli (Milano, Italy), J. M. Nieto Nafria (Salamanca, Spain), F. Ossianilsson (Uppsala, Sweden), G. Petersen (Eberswalde, Germany), G. Remaudière (Paris, France), G. Kh. Shaposhnikov (Leningrad, Russia) and H. L. G. Stroyan (Harpندن, England), for the loan or gift of material.

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