

A new *Brachycaudus* v. d. Goot (Homoptera, Aphididae) infesting *Lychnis flos cuculi* and *Melandryum rubrum*

by

D. HILLE RIS LAMBERS

Bladluisonderzoek T.N.O., Bennekom, Netherlands

Abstract

All morphs and the life cycle of *Brachycaudus lychnicola* spec. nov. are described. This root aphid, if associated with *Myrmica* sp., will kill *Lychnis flos cuculi*, but not *Melandryum rubrum*. *Lasius alienus* will accept the aphid as cattle but fails to breed it.

FUNDATRIX.

In life and as mounted specimens much like apterous viviparous female. Antennae only $4/7-3/5$ of length of body; segment III with only about 12 — 18 hairs the longest of which are only $1\frac{1}{2}$ — 2 times as long as basal diameter of that segment; processus terminalis about $2\frac{1}{2}$ times as long as basal part of segment VI. Stigmal pori of abdominal segment I nearly as far from those of segment II as the latter are from those of segment III. Siphunculi only $1\frac{1}{3}$ times as long as cauda. Both middle and hind tibiae with the very bases black. Other characters as in apterous viviparous female.

Measurements in mm.

No.	Length body	Ant.	Ant. segments				Siph.	Cau.
			III	IV	V	VI		
1.	2.42	1.43	0.17	0.41	0.21	$0.12 + 0.30$	0.16	0.11
2.	2.31	1.34	0.17	0.39	0.16	$0.12 + 0.30$	0.16	0.12

(1 — 2, from *Melandryum rubrum*, Bennekom, 23.IV.1965).

APTEROUS VIVIPAROUS FEMALE.

In life shiny black with the underside redbrown; antennae brownish yellow with dark basal segments and dark apex; legs with pale yellowish tibiae; siphunculi and cauda black. In mounted specimens body broadly oval, about 1.90 — 2.30 mm long. Tergum blackish sclerotic, with metanotum fused with abdominal tergites I to VI, the other tergites free; dorsal shield not touching the stigmal plates, quite smooth. Spinal tubercles absent, marginal tubercles mostly absent, sometimes present on segments II and III, small and flat. Dorsal hairs with extremely fine, long apices; spinal hairs of tergite III about 0.07 — 0.085 mm long, up to 3 times as long as basal diameter of antennal segment III, the 8 — 10 hairs on tergite VIII not much longer; marginal hairs numerous (vide sub alate viviparous female). Front sinuated. Antennae $4/5-10/11$ of length of body, with dark basal segments; flagellum pale, gradually darker towards apex; segment III approximately smooth with only at base rather distinct imbrications, in most

of the slightly alatiform apterae of the second generation with a few small rhinaria, with a great number, e.g., 20 — 34 erect hairs of which the apices are so fine that they are only seen under high power; longest hairs on this segment 2 — 3 times basal diameter of the segment; processus terminalis 5 — 6 times as long as base of segment VI, longer than segment III. Rostrum long, reaching well past the hind coxae; last segment long, mostly longer than the siphunculi, about $1\frac{1}{2}$ times as long as second joint of hind tarsi, with some 8 — 13 hairs besides the 3 subapical pairs. Mesosternal processi quite low and not distinct, on a common, more or less triangular sclerite. Siphunculi black, truncated conical, often slightly constricted at base where they are about twice as wide as in the very distinct annular incision below the flange, about $\frac{1}{12}$ of length of body, seemingly smooth, but actually with very superficial, rather straight imbrications on under- and innerside, with very wide flange. Cauda blackish, rounded or semi-oval, about $1\frac{1}{2}$ times as wide at base as it is long, about $\frac{5}{9}$ of the siphunculi, with about 16 — 18 hairs marginally and in a curved ventral row. Legs with the fore femora pale, the middle femora smoky pale with dorsally dark apex, the hind femora blackish with pale base; tibiae pale with dark apical parts, but the hind tibiae also with the very base blackish; dorsal tibial hairs like those on antennal segment III, ventral hairs more sloping, stouter and with less fine apices; first tarsal joints with 3, 3, 3 hairs.

Measurements in mm.

No.	Length body	Ant.	Ant. segments				Siph.	Cau.
			III	IV	V	VI		
1.	2.09	1.63	0.41	0.25	0.18	0.10 + 0.51	0.17	0.11
2.	1.95	1.58	0.40	0.25	0.19	0.09 + 0.49	0.16	0.11
3.	1.93	1.73	0.45	0.29	0.21	0.10 + 0.51	0.16	0.10
4.	2.03	1.70	0.44	0.28	0.20	0.10 + 0.51	0.17	0.11
5.	2.23	1.96	0.51	0.32	0.23	0.10 + 0.62	0.20	0.12
6.	2.22	2.02	0.52	0.34	0.25	0.11 + 0.61	0.21	0.12

(1 — 4, from *Lychnis flos cuculi*, Bennekom, 15.VII.1964; 5, from *Melandryum rubrum*, Bennekom, 26.V.1965; 6, like 5 but 29.V.1965).

ALATE VIVIPAROUS FEMALE.

In life with black head and thorax; abdomen dorsally black, ventrally dark redbrown; antennae blackish, rest as in apterae. In mounted specimens head and thorax black, abdomen with a large black sclerotic spino-pleural blotch extending from abdominal tergites III — VI, fused with the marginal sclerites of segments V and VI, but not with those of segments II — IV; the latter marginal sclerites with about 16 — 22 hairs each. Antennae blackish, just shorter than body; segment III only along one side with some 23 — 35 flat rhinaria of various sizes; segment IV mostly without rhinaria, sometimes with up to 4 along one side. Siphunculi more slender than in apterae. Legs in older specimens black. Wings with normal venation, the veins light brown, the subcosta pale, but the stigma rather dark to blackish. 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.	1.99	1.92	0.48	0.29	0.21	0.11 + 0.67	27 & 27	0 & 0	0.19	0.10
2.	2.06	1.92	0.47	0.30	0.24	0.10 + 0.64	25 & 25	2 & 0	0.18	0.11
3.	2.17	2.03	0.49	0.34	0.25	0.11 + 0.67	24 & 26	3 & 1	0.19	0.11
4.	2.03	2.02	0.52	0.32	0.23	0.11 + 0.67	28 & 27	0 & 0	0.19	0.10
5.	2.42	2.20	0.56	0.37	0.26	0.12 + 0.71	29 & 33	0 & 0	0.22	0.12
6.	2.26	2.06	0.54	0.34	0.25	0.12 + 0.65	30 & 33	2 & 0	0.19	0.10

(1 — 4, from *Melandryum rubrum*, Bennekom, 26.V.1965; 5 — 6 as 1 — 4 but 19.V.1964).

OVIPAROUS FEMALE.

In life rich shiny redbrown, often with a translucent whitish spot in the meso-thoracic region. In mounted specimens body much more elongated oval than in apterae viviparae, smaller, only 1.60 — 1.85 mm long. Tergum mostly wholly membranous and colourless, sometimes with very vaguely yellowish sclerotic patches; head and areas on the thorax sometimes smoky. Hind tibiae on basal half slightly incrassate and there with some 15 — 30 pseudosensoria. Other characters about as in apterous viviparous female.

Measurements in mm.

No.	Length body	Ant.	Ant. segments				Siph.	Cau.
			III	IV	V	VI		
1.	1.81	1.15	0.25	0.19	0.15	0.08 + 0.37	0.14	0.08
2.	1.80	1.17	0.24	0.18	0.15	0.08 + 0.40	0.14	0.08
3.	1.83	1.24	0.26	0.20	0.16	0.08 + 0.41	0.14	0.08
4.	1.70	1.12	0.24	0.16	0.14	0.08 + 0.38	0.14	0.08
5.	1.67	1.10	0.23	0.15	0.13	0.08 + 0.39	0.14	0.08
6.	1.62	1.10	0.23	0.16	0.13	0.08 + 0.39	0.14	0.08

(1 — 2, from *Melandryum rubrum*, Bennekom, 2.X.1964; 3 — 4, idem, 10.X.1964; 5 — 6, idem, 13.X.1964).

APTEROUS MALE.

In life greenish with grey head and grey transverse bars on abdomen. In mounted specimens body very slender, about 1.30 — 1.55 mm long. Head dark sclerotic, thorax paler, abdomen with broader or narrower dark smoky spinopleural sclerotic transverse bars which in the pleural zone tend to coalesce and which on tergites V, VI and VII are fused with marginal sclerites. Antennae about as long as body, dark like the head; segment III along one side with about 18 — 28 small rhinaria, segment IV with about 5 — 14 rhinaria, segment V with 3 — 10 secondary rhinaria some of which are close to the primary rhinarium. Siphunculi $\frac{2}{3}$ of last rostral segment, only slightly tapering. Other characters more or less as in alate viviparous female. Genitalia normal.

Measurements in mm.

No.	Length body	Ant.	Ant. segments				Rhin. on segments				Siph.	Cau.
			III	IV	V	VI	III	IV	V			
1.	1.34	1.27	0.32	0.20	0.16	0.07 + 0.40	19 & 21	5 & 9	8 & 3	0.10	0.06	
2.	1.48	1.56	0.37	0.26	0.18	0.08 + 0.53	25 & 27	10 & 12	4 & 6	0.10	0.06	
3.	1.40	1.31	0.32	0.22	0.16	0.08 + 0.39	20 & 21	6 & 8	5 & 5	0.11	0.06	
4.	1.49	1.39	0.37	0.24	0.16	0.08 + 0.41	21 & 22	7 & 10	8 & 6	0.11	0.06	

(1, from *Melandryum rubrum*, Bennekom, 2.X.1964; 2, idem, 10.X.1964; 3 — 4, idem, 13.X.1964).

DISCUSSION. The present species differs from all other members of the genus *Brachycaudus* v. d. Goot and of the subgenus *Acaudus* v. d. Goot by the very numerous, very long and fine hairs on the antennae. In other respects than chaetotaxy it strongly resembles *Brachycaudus* (*Acaudus*) *klugkisti* Börner which may occur on the same host plant with the new species.

The species was discovered in 1963 when I noticed that *Lychnis flos cuculi* in my garden withered and died. On the roots colonies of a *Brachycaudus* were found. Thinking that it was *Brachycaudus klugkisti* Börner which commonly infests *Melandryum rubrum* in my garden I gave no special attention to the root aphids. But next year I realized that *Lychnis flos cuculi* was not recorded as a host plant of *B. klugkisti*, and I made a few documentary slides. Then the curious chaetotaxy of the aphids was noticed, and the following observations were made.

B. lychnicola appears to be dependent on a *Myrmica* species, and, if attended by this ant, it will kill *Lychnis flos cuculi*. It also infests the roots, lowest petioles and leaves, and lowest parts of stems of *Melandryum rubrum* when *Myrmica* attends it, but it does not kill the latter plant. It could easily be bred without ants on *Melandryum rubrum* on potted plants under lamp-chimneys in the laboratory, but not if the pots without ants were dug in in the garden. Plants of *Lychnis* or *Melandryum* near nests of *Lasius alienus* could easily be colonized with the aphids, and the ants immediately began attending the aphids, but within a month the colonies were gone. Plants of both *Lychnis* and *Melandryum* on the roots of which *Lasius alienus* kept large herds of *Aphis sambuci* L. could not be successfully colonized with *Brachycaudus lychnicola*.

At present *Lychnis flos cuculi* in my garden maintains itself only where no *Myrmica* nests are near. Attempts to find the new aphid in natural biotopes of *Lychnis flos cuculi* failed. It should be interesting to know whether also in nature *Myrmica*, via *Brachycaudus lychnicola*, limits the occurrence of this plant.

The life cycle of the aphid is simple. Fundatrices develop on *Melandryum rubrum* near soil level on the roots or lowest parts of the stem, and they are mature by the middle of April. The second generation consists of many alatae and a smaller number of apterae many of which are slightly alatiform (a few rhinaria on antennal segment III and a slightly abnormal mesothorax). Later generations irrespective of population density are almost exclusively apterous. Sexuals begin to appear in the second half of September. Male larvae are in contrast to female larvae not brown-red but yellowish white. The eggs are laid on petioles and roots of *Melandryum rubrum*, their initially orange colour soon turns to black.

Hibernation as eggs on *Lychnis flos cuculi* was not found. It might occur, but apparently plants are colonized only by the alatae of the second generation and *Lychnis* when infested does not survive when *Myrmica* is present, and is soon free of this species when *Myrmica* is not present.

TYPES. Holotype: Apterous viviparous female (measurements no. 1), from *Lychnis flos cuculi*, Bennekom, 15.VII.1964, leg. D. HILLE RIS LAMBERS. Paratypes: Apterous viviparous females with collecting data as for holotype, and apterous and alate viviparous females, fundatrices, oviparous females and males from *Melandryum rubrum*, Bennekom, at various dates in 1964 and 1965, leg. D. HILLE RIS LAMBERS.

Wagner, E., Wanzen oder Heteropteren, I Pentatomorpha. Die Tierwelt Deutschlands und der angrenzenden Meeresteile. Deel 54, 235 pag. 149 fig. VEB Gustav Fischer Verlag Jena, 1966. Prijs MDN 39,40.

Na een lange onderbreking sinds het verschijnen van deel 41 (1952) van „Die Tierwelt Deutschlands” over de familie der Miridae (Hemiptera-Heteroptera) geeft Dr. E. WAGNER in deel 54 een voortzetting van de systematische behandeling van de in Duitsland voorkomende Heteroptera. Het onderwerp van het zojuist verschenen boek is de groep der Pentatomorpha Lest., Pend. et Southw., 1954, welke wordt onderverdeeld in de volgende superfamilies: Pentamoidea Reut., 1910, Coreoidea Reut., 1910, Lygaeoidea Stål, 1865, Aradoidea Reut., 1910 en Saldoidea Stich., 1935.

Na de eerste 14 pagina's, gewijd aan een algemene inleiding, de morfologie en de biologie, volgen de determinatietabellen tot de soorten. Naast een beschrijving van de geslachten en soorten zijn ook gegevens opgenomen over de levenswijze, de voedselplant, het verspreidingsgebied etc.

Het boek maakt een zeer verzorgde indruk. De vele fraaie tekeningen, die een belangrijk hulpmiddel zijn bij de determinatie, komen op het goede papier uitstekend tot hun recht. Zeer praktisch is de vermelding van de vergrotingsfactor bij de tekeningen.

Een opgave van de belangrijkste nieuwe literatuur bij de diverse superfamilies is vooral van betekenis voor degenen die zich willen bezighouden met de studie van de wantsenfauna van het gehele palaearktische gebied.

Hopelijk zal dit nieuwe determinatiewerk, ook voor de Nederlandse entomologen, een stimulans zijn voor de bestudering van de palaearktische wantsenfauna. Met belangstelling zien we de resterende twee delen tegemoet, waarin de overige Heteroptera, Cimicomorpha Lest., Pend. et Southw., Hydrocorisae Latr. en Amphibiocorisae Lest., Pend. et Southw., een plaats zullen vinden. — J. P. DUFFELS.

Apocheima hispidaria Schiff. (Lep., Geom.). Waar ik in 1965 doelbewust op stammen naar de soort zocht, vond ik hem: Oldenzaal, De Lutte, Apeldoorn, Amersfoort. Te Soesterberg was de vlinder op een lichtreclame 's avonds gewoon.

M. W. CAMPING, Achterstraat 23, Putten-Gdl.

Personalia. Dr. J. G. BETREM vertrok wederom voor verscheidene maanden naar Amerika om zijn studies over de Scolliden voort te zetten. Zijn adres is daar: Department of Entomology, College of Agriculture, Cornell University, N.Y., 14850, U.S.A.

Dr. J. J. LAARMAN is benoemd tot lector in de parasitologie aan de Leidse Universiteit.