A List of Danish Aphids.

2.: *Macrosiphum* Pass., *Metopeurum* Mordv., *Delphiniobium* Mordv., *Corylobium* Mordv., *Acyrthosiphon* Mordv., *Metopolophium* Mordv., *Impatientinum* Mordv., and *Aulacorthum* Mordv.

By Ole Heie
(Skive Seminarium, Skive).

This paper is a continuation of the first part of the list (dealing with the genera *Macrosiphoniella* and *Dactynotus*) published in Entom. Medd. 29: 193—211 (1960).

Notes concerning the distribution of aphid species in North Europe are based upon the papers of Wahlgren and Tambs-Lyche referred to in the first part, besides on Marie Jørgensen's list of aphids from the Faroes (1932), D. Hille Ris Lambers' list of aphids from Iceland (1955), supplemented by Prior & Stroyan (1960), and the recent papers of F. Ossiannilsson (1959a, 1959b) on Swedish aphids, published since the first part of "A list of Danish aphids" was compiled.

The writer wishes to thank dr. Walter Meier, Zürich, who most kindly sent valuable information about *Macrosiphum* spp., the commitees of Dansk Naturhistorisk Forenings Rejse- og Ekskursionsfond and Japetus Steenstrup's Legat for financial support to the collecting work in different parts of the country in 1959-60 and professor, dr. H Thamdrup and dr. C. Overgaard Nielsen for the opportunity of the writer to stay at The Mols Laboratory, Strandkjær at Femmøller, in August 1959 and July 1960 studying the aphid fauna of Mols. Furthermore I want to thank lektor K. Juhl Christensen, Skive, for help with translation into English.

List of the species.

24. *Macrosiphum cholodkovskyi* (Mordv., 1909).
25. *M. epilobiellum* Theob., 1923.
26. *M. euphorbiae* (Thomas, 1878).
27. *M. funestum* (Macchiati, 1885).
28. *M. gei* (Koch, 1855).

29. *M. rosae* (L., 1758).
30. *M. silenium* Theob., 1913.
31. *M. stellariae* Theob, 1912.
32. *M. (Sitobion) avenae* (Fabr., 1775).
33. *M. (S.) fragariae* (Walker, 1848).
34. *Metopeurum fuscoviride* Stroyan, 1950.
35. *Delphiniobium junackianum* (Karsch, 1887).
36. *Corylobium avellanae* (Schrank, 1801).
37. *Acyrthosiphon auctus* (Walker, 1849).
38. *A. caraganae* (Cholodk., 1907).
39. *A. chelidonii* (Kaltenbach, 1843).
40. *A. loti* (Theob., 1912).
41. *A. malvae* (Mosley, 1841).
42. *A. pisum* (Harris, 1776).
43. *A. spartii* (Koch, 1855).
44. *Metopolophium dirhodum* (Walker, 1848).
45. *M. festucae* (Theob., 1917).
46. *Impatientinum balsamines* (Kaltenbach, 1862).
47. *Aulacorthum cylactis* Börner, 1942.
48. *A. knautiae* Heie, 1960.
49. *A. majanthemi* F. P. Müller, 1956.
50. *A. solani* (Kaltenbach, 1843).
51. *A. (Neomyzus) circumflexum* (Buckton, 1876).

Genus **MACROSIPHUM** Passerini, 1860.
Subgenus **MACROSIPHUM** s. str.

24. *Macrosiphum cholodkovskyi* (Mordvilko, 1909).
Macrosiphum cholodkovskyi Hille Ris Lambers, 1939, p. 80.
Macrosiphon cholodkovskyi Börner, 1952, p. 160, no. 604.

Distribution: Europe and Western Asia. Known from Sweden and Iceland.

Occurrence in Denmark: Found on Filipendula ulmaria (= Ulmaria palustris) at Byrum on Læsø (6-8-57), Grejsdal at Vejle (10-7-58), Nørre Vinge at Tjele Lake (13-7-59), and Tulstrup at Rye, Jutland (21-7-59). Taken on unknown host at Skive (3-9-56, among a bunch of flowers from the meadow), too.

The life cycle is passed on Filipendula ulmaria. The colour of the body most often is green, but red larvae were observed at Nørre Vinge.

The Danish aphids are a little different from those described by Hille Ris Lambers, who states that the body length of the apterous viviparous female is 3,5—4 mm, processus terminalis of VIth antennal segment normally shorter than IIIrd antennal segment, and the number of secondary rhinaria on III 3-8. Many of the

Danish specimens are smaller with a relatively longer processus terminalis and sometimes only 2 rhinaria. Some measurements of apterous viviparous females from Denmark are given below (table 1).

Table 1.

Measurements of apterous viviparous females of *Macrosiphum cholodkovskyi* Mordv. (mm).

No.	*Length of body*	*IIIrd ant. segment*	*Proc. term.*	*Rhin on III*
1	3,19	0,86	0,92	2+2
2	3,13	0,92	1,06	4+3
3	3,12	0,92	0,97	2+3
4	3,07	0,96	1,09	3+3
5	3,85	1,10	1,06	3+4
6	3,72	1,19	—	4+5
7	3,37	1,11	—	4+4
8	3,26	1,01	1,06	3+4
9	3,10	1,20	1,06	5+5
10	2,90	0,84	0,97	3+3
11	2,72	0,74	0,92	2+3
12	2,29	0,74	0,92	3+3
13	3,34	0,96	0,97	3+3
14	2,00	0,79	0,92	2+2

(1: Skive, 3-9-56; 2—4: Læsø, 6-8-57; 5—12: Nørre Vinge, 13-7-59; 13—14: Tulstrup, 21-7-59).

25. *Macrosiphum epilobiellum* Theobald, 1923.

Macrosiphon epilobii Börner, 1952, p. 160, no. 605.

Distribution: France, England, Germany, Netherlands, Austria (Weis 1955), Switzerland (Meier in litt.), Sweden, and Denmark.

Occurrence in Denmark: Collected on Epilobium sp. at Ålsgårde on Sealand (2-8-17, Math. Thomsen leg.) and on Epilobium montanum at Holte on Sealand (16-8-58), at Nyborg on Funen (9-7-58), and in Jutland in Krabbesholm Forest at Skive (23-7-58) and in Lyngballe Forest near Århus (21-7-59).

The *Macrosiphum* occurring on Epilobium has been regarded as belonging to the same species as the *Macrosiphum* on potato already by Theobald (1926), who let his own *M. epilobiellum* sink as a synonym of his *M. gei* Koch (= the potato aphid), and by Hille Ris Lambers (1939), placing *epilobiellum* as a synonym of *M. euphorbiae* Thomas. Eastop (1958) thinks the form on Epilobium best regarded as a subspecies: *M. euphorbiae* Thomas subsp. *epilobiellum* Theob., whereas Börner (1952) and Meier (in litt.)

consider it to be a genuine species. Börner used the name *epilobii* Kittel, 1827, but according to Hille Ris Lambers (1959) Kittel's paper must be left out of consideration, because many of his names are polynominals. Perhaps *Aphis tincta* Walker, 1849, is the same species, as supposed by Börner, but the meaning of this name is not quite clear.

Probably Epilobium is the only host. The possible faculty of infesting potatoes, too, ought to be examined, however. If the hypothesis concerning interbreeding with *M. euphorbiae,* proposed by Eastop (1958), is true, then *epilobiellum* must be regarded a subspecies of *euphorbiae.* But there are some small differences, indeed (Meier in litt.), viz. f. inst. the length of the apical joint of rostrum compared with the length of the second joint of the hind tarsi (table 2).

I have only seen green specimens. Börner found red ones, too.

Table 2.

Some *Macrosiphum* ssp.: Measurements (in mm) and proportions of antennal segments III—VI of apterous viviparous females.

Species	*Host*	*Body*	*Ant. I-IV*	*Siph.*	*Cau.*	*Apic. jt. rostr.*	*2. jt. hind tars.*	*Prop. ant. segm. III:IV:V:(VIa+VIb)*	*Rhin. on III*	*Cdl. hairs*
M. epilobiellum	Epilobium	3,14	3,66	0,96	0,52	0,14	0,14	65:49:44:(13+ 68)	6+5	11
		2,72	3,07	0,71	0,40	0,14	0,14	51:37:38:(10+ 64)	6+4	11
		2,93	3,37	0,79	0,47	0,14	0,13	56:43:40:(12+ 70)	5+4	11
M. euphorbiae	Lactuca	3,79	3,72	1,06	0,54	0,14	0,15	60:47:47:(15+ 74)	8+6	8
		3,09	3,45	0,93	0,47	0,13	0,14	55:43:43:(13+ 72)	6+5	11
		3,94	3,79	1,09	0,57	0,15	0,16	64:49:47:(14+ 74)	6+5	10
M. gei	Geum	3,72	4,32	1,06	0,57	0,16	0,16	72:56:53:(17+ 82)	5+4	11
		3,85	4,52	1,20	0,54	0,16	0,16	72:60:54:(16+ 90)	4+4	13
		3,50	4,96	1,09	0,50	0,16	0,16	75:64:62:(18+104)	4+4	16
M. silenium	Silene	3,44	—	1,07	0,57	0,15	0,16	66:47:49:(13+ ?)	5+3	12
		3,93	3,87	0,96	0,54	0,14	0,15	70:48:49:(13+ 71)	5+3	11
M. stellariae	Stellaria	4,33	4,04	1,17	0,59	0,14	0,16	69:58:45:(14+ 78)	8+4	15
		4,29	4,27	1,11	0,54	0,14	0,16	74:60:48:(15+ 82)	5+5	12
		4,34	4,40	1,23	0,59	0,14	0,16	73:63:50:(13+ 88)	6+6	11

26. *Macrosiphum euphorbiae* (Thomas, 1878).

Macrosiphum euphorbiae Hille Ris Lambers, 1939, p. 84, pl. V, fig, 18 (partim).

Macrosiphon solanifolii Börner, 1952, p. 160, no. 606.

Macrosiphon solani Börner & Heinze, 1957, p. 243.

Distribution: Europe and North America. It occurs in Norway and Sweden. It is more common in the north than in the south of Sweden (Ossiannilsson 1959b).

Occurrence in Denmark: The species is mentioned among the aphids occurring on potatoes in Denmark by Thomsen & Bovien (1933, and in S. Rostrup 1940). I have observed it on potatoes 1948—56 on Sealand, Lolland, Funen, and in Jutland, but the only slides in my collection are from Lactuca sativa in glass-house at Sophiehøj on Lolland (9-12-52, Børge Petersen leg.), from Beta vulgaris (cult.) at Skelstofte on Lolland (12-6-51), and from a yellow Moericke-tray at Ørslev on Sealand (10-8-56).

Dr. Sv. G. Larsson, Copenhagen, collected the species on potato in 1944 on the following localities: On Sealand: Lyngby (9-7, 12-7), near Holbæk (16-7), Ågerup near Holbæk (16-7), Skibby (16-7), K. Hyllinge (16-7), Jægerspris (16-7); in Jutland: Tarm (24-7), Nr. Nebel (24-7), Hadsund (31-7). His collection belongs to the Zoological Museum of Copenhagen.

Only green specimens have been seen by the writer. It is not a rare aphid in Denmark, but on potatoes *Myzus persicae* (Sulzer), *Aphis nasturtii* Kalt., and *Aulacorthum solani* (Kalt.) are much more common.

27. *Macrosiphum funestum* (Macchiati, 1885).

Macrosiphum funestum Hille Ris Lambers, 1939, p. 90.
Macrosiphon funestus Börner, 1952, p. 158, no. 592.

Distribution: Outside Denmark known from England, Germany, Austria, Switzerland, Italy, and Russia.

Occurrence in Denmark: On Funen it has been collected on its host, bramble (Rubus fruticosus s. lat.), at Svendborg (2-7-57), Fåborg (13-7-57), Hylkedam near Gelsted (6-7-58), Nyborg (9-7-58), Bovense between Kerteminde and Nyborg (9-7-58), Morud (10-7-58), Gerskov (2-7-60), and Middelfart (2-7-60). In the southern part of Jutland the species has been found at Grejsdal (10-7-58, partly on bramle, partly on Geranium robertianum) and at Juelsminde (28-6-59, not collected). In the northern part of Jutland the species has been taken only few times, viz. in Krabbesholm Forest at Skive (5-8-58, 1 apt.) and at Strandkjær, Mols (5-7-60, 1 al.), though most of my collecting work has been done here. Colonies have been seen in the south of Denmark, only. The species has not been found in Sweden, and probably the northern limit of its European distribution goes through Denmark.

Both green and red specimens have been seen, often in the same colony.

28. *Macrosiphum gei* (Koch, 1855).

Macrosiphum gei Hille Ris Lambers, 1939, p. 92, pl. V, fig. 19.
Macrosiphon gei Börner, 1952, p. 160, no. 603.

Distribution: Europe. It is known from Sweden.

Occurrence in Denmark: In Jutland collected on Geum urbanum in Lyngballe Forest (21-7-59), and at Strandkjær (5-8-59), and on Anthriscus silvestris at Skive (2-9-56, 25-7-58). Often observed on Geum urbanum in Krabbesholm Forest. On Funen collected on Geum urbanum at Svendborg (2-7-57), at Refsvindinge (8-7-58), and on Torilis japonica at Fåborg (13-7-57), and furthermore observed on Geum urbanum at Fåborg (13-7-57) and Nyborg (8-7-58). On Sealand collected on Comarum palustre (probably gone astray from another plant) at Holte (16-8-58).

The species feeds on Geum and various Umbelliferae. Torilis has not been recorded as host plant before. The colour may be green or red as being the case with other *Macrosiphum* spp. Whereas green mothers only produce green larvae in *M. rosae*, it has been noticed that they may bring forth red offspring in *M. gei*.

29. *Macrosiphum rosae* (Linné, 1758).

Macrosiphum rosae Hille Ris Lambers, 1939, p. 99.
Macrosiphon rosae Börner, 1952, p. 159, no. 593.

Distribution: Most of the world. It is known from Sweden.

Occurrence in Denmark: Very common in all parts of the country on its hosts, Rosa spp. and Dipsacaceae. According to Bovien & Thomsen (1945) it is a common pest to roses in Denmark. It has been observed by the writer on the following localities:

Jutland: On Rosa at Flavenskjold (22-9-58), Blokhus (17-7 and 7-8-60), Aalborg (8-9-57, collected), Skive (4-6-54, 20-7-56, coll.; every summer obs.), Legind Bjerge on Mors (3-6-58, coll.), Spøttrup (19-7-59), Højslev (19-7-58), Resen at Skive (23-7-58), Jebjerg in Salling (26-7-58), Lemvig (4-7-59), Randers (25-5-59), Kjellerup (14-6-59), Brund near Horsens (28-6-59), Strandkjær at Femmøller (4-7-60), Kolding (5-7-58, coll.), and Løgumkloster (5-7-58). On Knautia arvensis at Glyngøre (10-7-59), Ø. Lyby in Salling (19-7-56, coll.), Dølby near Skive (19-7-57, coll.), Dalgas Plantation (16-6-59), Sejstrup (16-6-59), Fly near Skive (25-7-59), Dronninglund Forest in Vendsyssel (22-9-58, coll.), Haderup (9-7-59), Varhede near Aulum (9-7-59), Brunshåb near Viborg (12-7-59), Nørre

Vinge at Tjele (13-7-59), Tulstrup at Rye (21-7-59), Strandkjær (3-8-59), Brund (28-6-59), and Juelsminde (28-6-59). On Dipsacus silvestris at Spøttrup (19-7-59, coll.).

Funen: On Rosa at Bjerne (15-7-57), Fåborg (16-7-57), Nyborg (8-7-58), Hesselager (8-7-58), Bovense between Kerteminde and Nyborg (9-7-58), and at Middelfart (2-7-60).

Sealand: On Rosa at Holte (28-6-50, 16-5-60, coll.). Collected by Math. Thomsen in Copenhagen (22-6-17).

Other islands: Samsø on Rosa (10-8-58, coll.), Læsø on Knautia arvensis (6-8-57), Lolland (Guldborg) on Rosa (15-8-58), Ærø (Marstal) on Rosa (7-7-57), and Avernakø and Lyø on Rosa (11-7-57).

The eggs hibernate on Rosa, and the fundatrices develop from the last days of March (according to observations in 1957) maturing about the middle of April. They bring forth young ones from ultimo April until May. During summer colonies occur on Rosa, but a migration, which is not obligatory, takes place from July or — if the weather conditions of spring and summer will be favouring the development of aphids as being the case in 1959 — from June, already. The main summer host in Denmark is Knautia arvensis, whereas *M. rosae* not has been found on Chamaenerium angustifolium, which is a common summer host of this aphid in central and northern Sweden (Ossiannilsson 1959b).

Some specimens are green, and some are red, the green ones bearing green larvae, the red ones red larvae. The green variety usually seems to be the more common.

30. *Macrosiphum silenium* Theobald, 1913.

Macrosiphum silenium Theobald, 1913, p. 143.
Macrosiphum montanum Hille Ris Lambers, 1939, p. 95.
Macrosiphum hartigi Hille Ris Lambers, 1947, p. 319.
Macrosiphon silenius Börner, 1952, p. 162, no. 607.

Distribution: England, Italy, Switzerland, and Denmark.

Occurrence in Denmark: Collected on Silene cucubalus at Bryrup in Jutland (11-7-58), apterous viviparous females and larvae.

Specimens in my collection have 6 hairs on the anterior half of the subgenital plate just as *M. gei*. But the cauda is thick and blunt, whereas it is rather acute in *gei*. Some measurements of apterous viviparous females are given in table 2.

31. *Macrosiphum stellariae* Theobald, 1912.
Macrosiphum stellariae Theobald, 1913, p. 141.

Distribution: England and Denmark. If *M. incertum* Mordv., 1919, is a synonym as supposed by Börner (1952, p. 163), then the species occurs in Russia, too.

Occurrence in Denmark: Found on Stellaria holostea in Hellum Forest in Himmerland (11-6-58), at Buderupholm in Himmerland (19-6-58), and perhaps at Strandkjær, Mols (5-8-59, only one parasitized specimen), all in Jutland.

This green aphid species belongs to the *euphorbiae-cholodkovskyi*-group. Respecting the number of caudal hairs (11-15) it occupies an intermediate position. Measurements (in mm) of apterous viviparous females are given in table 2 (p. 79). Measurements (in mm) of an alate viviparous female: Body 4,16, antenna (I-VI) 4,57, siphunculus 1,06, cauda 0,56, apical joint of rostrum 0,16, 2nd joint of hind tarsus 0,17; III with 18+20 secondary rhinaria, cauda with 15 hairs, proportions of antennal segments III-VI: 77:67:54:(15+87).

Subgenus **SITOBION** Mordvilko, 1914.

32. *Macrosiphum (Sitobion) avenae* (Fabr. 1775).
Macrosiphum (Sitobion) avenae Hille Ris Lambers, 1939, p. 108.
Sitobium granarium Börner, 1952, p. 164, no. 610.
Sitobium granarium Börner & Heinze, 1957, p. 248.

Distribution: Europe, America, India, Japan. It is known from Sweden and Norway.

Occurrence in Denmark: This species is known as a noxious insect doing harm to cereals, especially wheat and oats (S. Rostrup 1900; Års- og månedsoversigterne over plantesygdomme fra Statens plantepatologiske Forsøg; syn. *Siphonophora cerealis, Macrosiphum cereale, Aphis granaria, Macrosiphum granarium,* in Danish: kornlus, kornbladlus). Math. Thomsen collected it on Hordeum at Kongelunden on Amager (27-7-17) and on Setaria in Copenhagen (10-10-17). It has been found on grasses and cereals in all parts of the country. The writer found it on the following localities:

Jutland: On Triticum sativum at Borris (25-7-56) and Haderslev (27-7-56, not collected), on Avena sativa at Haderslev (27-7-56) and Dølby near Skive (19-7-57), on Hordeum distichum at Hornum (10-7-59), on Bromus sp. at Legind Bjerge on Mors (21-5-60), on Zea mays at Skive (Oct., 1960), going astray from a bunch

of flowers taken at Skive (21-8-58), and in yellow trays at Tylstrup, Borris, and Jyndevad (in summer, 1956). From the State Experimental Station, Lyngby, I got material from Avena sativa taken at Grejsdal near Vejle (16-7-10).

Funen: On Avena sativa at Årslev (26-7-55, 28-7-56) and on Poa annua at Sinebjerg (15-7-57, not coll.). At Årslev it has been taken in a yellow tray in summer, 1956.

Sealand: On grass at Holte (12-7-49), on Triglochin maritima at Boserup (4-9-51), on panes of a glass-house at Rødovre (16-5-52), and in a yellow tray at Ørslev in summer, 1956.

The aphids feed at the base of the spikelets. Red and green individuals may be found in the same colony. The insects live from spring till autumn on grasses and other monocotyledones and do not migrate.

33. *Macrosiphum (Sitobion) fragariae* (Walker, 1848).

Macrosiphum (Sitobion) fragariae Hille Ris Lambers, 1939, p. 113, pl. VI, fig. 21.

Sitobium avenae Börner, 1952, p. 163, no. 609.

Distribution: England, Netherlands, Germany, Austria (Weis 1955), Sweden, the Faroes, and Denmark.

Occurrence in Denmark: It has been collected on the following localities:

Jutland: On grass at Kongsø near Bryrup (11-7-58) and at Juelsminde (28-6-59), on Rosa at Hald Lake near Viborg (20-5-59), on Anthoxanthum odoratum in Lyngballe Forest near Århus (21-7-59), on Fragaria at Ø. Lyby in Salling (21-12-59), and in a yellow Moericke-tray at Borris (13-7-56).

Funen: On Rubus fruticosus s. lat. (bramble) at Svendborg (2-7-57) and Hylkedam near Gelsted (6-7-58).

Sealand: On Fragaria at Lyngby (24-10-58) and on Rosa at Holte (16-5-60).

The species migrates in the spring from Rubus and Rosa, the winter hosts, to grasses, the summer hosts, and return in autumn. Hille Ris Lambers cleared up the life cycle and indicated that Theobald's opinion that Galium serves as summer host is wrong. He discovered that Glyceria fluitans is the main summer host. Its occurrence on Fragaria seems to be accidental.

Genus **METOPEURUM** Mordvilko, 1914.

34. *Metopeurum fuscoviride* Stroyan, 1950.

Pharalis tanaceti Hille Ris Lambers, 1939, p. 129, pl. VI, fig. 23, and 1947, p. 183.

Metopeurum fuscoviride Börner, 1952, p. 174, no. 680.

Distribution: Europe. It is known from Sweden.

Occurrence in Denmark: Very common on Tanacetum vulgare. Found in Jutland at Ø. Lyby (19-7-56), Lyby Strand (22-7-57), Jebjerg (26-7-58), Spøttrup (19-7-59), Juelsminde (28-6-59), Brøns (3-7-58), and on Rømø (5-7-58); on Funen at Svendborg (2-7-57), Fåborg (13-7-57), Horne (14-7-57), Dyreborg (15-7-57), Nyborg (8-7-58), and Morud (10-7-58); on Tåsinge (3-7-57); on Turø (4-7-57); on Langeland at Frellesvig (6-7-57); on Strynø (7-7-57); on Ærø at Drejet (8-7-57); on Avernakø and Lyø (11-7-57); on Læsø at Byrum (6-8-57); on Sealand at Ålsgårde (16-8-16, Math. Thomsen leg.).

The aphids infest the upper parts of Tanacetum vulgare, on which they feed from spring to autumn. The colonies always are visited by ants. The colour of the body most often is red with a big, black spot on the dorsum, but individuals with green colour instead of red may occur, even among the red individuals (f. inst. at Juelsminde).

Genus **DELPHINIOBIUM** Mordvilko, 1914.

35. *Delphiniobium junackianum* (Karsch, 1887).

Delphiniobium aconiti Hille Ris Lambers, 1947, p. 200.

Delphiniobium junackianum Börner, 1952, p. 177, no. 695.

Delphiniobium junackianum Börner & Heinze, 1957, p. 255, Abb. 100.

Distribution: England, Netherlands, Germany, Russia, Austria, Sweden, and Denmark.

Occurrence in Denmark: Collected on Aconitum commarum at Lyngby (23-6-58, sent from The State Experimental Station) and on Aconitum sp. at Skive (22-5-59), Lemvig (4-7-59), and Studsgård (9-7-59). The species has also been seen on Delphinium at Viborg (21-7-59).

The aphids feed in the inflorescences of Aconitum and Delphinium. Migration does not occur.

Genus **CORYLOBIUM** Mordvilko, 1914.

36. *Corylobium avellanae* (Schrank, 1801).

Corylobium avellanae Hille Ris Lambers, 1947, p. 208, pl. XII, fig. 3.

Corylobium avellanae Börner, 1952, p. 158, no. 590.

Distribution: Europe, Russia. It is known from Sweden.

Occurrence in Denmark: Found in Jutland at Strandkjær, Mols (7-8-59), on Funen at Fåborg (16-7-57), and on Sealand in Copenhagen (1-7-18, Math. Thomsen leg.). All finds on Corylus avellana, which is the only host plant of this aphid species. It seems to prefer shadowy places.

Genus **ACYRTHOSIPHON** Mordvilko, 1914.

37. *Acyrthosiphon auctus* (Walker, 1849).

Acyrthosiphon silenicola Hille Ris Lambers, 1955, p. 4, fig. 1.
Acyrthosiphon shawi Stroyan, 1957, p. 313, fig. 1.
Acyrthosiphon auctus Heie, 1958, p. 214.

Distribution: England, Iceland, and Denmark.

Occurrence in Denmark: Found on Honckenya peploides at Thyborøn (22-6-57, 25-7-57, 16-7-59), Langer Huse (22-6-57), Knopper near Thyborøn (25-7-57), Læsø (7-8-57), Svinkløv (5-10-57), Agger (21-6-59), and Sælvig on Samsø (12-8-58).

The alate form has not yet been observed by the author. Oviparous females were found at Svinkløv in October. Obviously sandy biotopes as dunes are preferred.

38. *Acyrthosiphon caraganae* (Cholodkovsky, 1907).

Acyrthosiphon caraganae Hille Ris Lambers, 1947, p. 222, pl. XIII, fig. 6.
Metopolophium caraganae Börner, 1952, p. 155, no. 573.

Distribution: Russia, Poland, Germany, Netherlands, Switzerland, Sweden, and Denmark.

Occurrence in Denmark: Found on Caragana arborescens at Jebjerg in Salling (26-7-58) and at Skive (17-9-58).

39. *Acyrthosiphon chelidonii* (Kaltenbach, 1843).

Acyrthosiphon (Liporrhinus) chelidonii Hille Ris Lambers, 1947, p. 257, pl. XIII, fig. 8.
Aulacorthum chelidonii Börner, 1952, p. 155, no. 570.

Distribution: Germany, Netherlands, Hungary, Latvia, Poland, Austria, France, Sweden, and Denmark.

Occurrence in Denmark: Found on Chelidonium majus at Bjerne on Funen (14-7-57).

The aphids feed on the upper stems.

40. *Acyrthosiphon loti* (Theobald, 1912).

Acyrthosiphon loti Hille Ris Lambers, 1947, p. 231, pl. XIII, fig. 7.
Acyrthosiphon loti Börner, 1952, p. 151, no. 559.

Distribution: England, Netherlands, Germany, France, Austria, Switzerland, Sweden, and Denmark.

Occurrence in Denmark: Found on Lotus corniculatus at Thyborøn (22-6-57), on Læsø (6-8-57), at Aulum in Jutland (9-7-59), and in yellow Moericke-trays at Årslev on Funen (27-7-56) and at Ørslev on Sealand (June—August, 1956).

I have found green specimens only. The species feeds on Lotus and a few other herbaceous species within Papilionaceae (Meier 1958: Onobrychis sativa, Anthyllis vulneraria, Phaca frigida, Hippocrepis comosa).

41. *Acyrthosiphon malvae* (Mosley, 1841).

Acyrthosiphon malvae Hille Ris Lambers, 1947, p. 233.

Distribution: Outside Denmark known from Netherlands, Germany, Austria, England, Sweden, U.S.A., and South Africa.

Occurrence in Denmark:

The Geranium-form (= *A. malvae* subsp. *geranii* (Kalt.) Hille Ris Lambers = *Aulacorthum geranii* Börner, 1952, p. 154, no. 566) has been found on Geranium sanguineum at Strandby near Frederikshavn (24-8-56) and on Læsø (9-8-57), on G. robertianum on Turø (4-7-57) and at Fåborg (13-7-57), on G. molle at Resen near Skive (21-7-57), at Skive (18-7-58, 24-12-59), in Krabbesholm Forest (7-4-60), and on Samsø (13-8-58), and on Erodium cicutarium in Krabbesholm Forest (21-7-57). Geranium sanguineum seems to be a new recorded host.

The Agrimonia-form (= *A. malvae* subsp. *potha* (Börner) Ossiannilsson, 1959b = *A. malvae* subsp. *agrimoniellus* (Cock.) Hille Ris Lambers = *Aulacorthum agrimoniellum* Börner, 1952, p. 154, no. 568) has been found on Agrimonia on Læsø (10-8-57).

The Fragaria-form (= *A. malvae* subsp. *rogersii* (Theobald) Hille Ris Lambers = *Aulacorthum rogersii* Börner, 1952, p. 155, no. 569) has been found on cultivated strawberries in Jutland on Mors (29-5-58), at Thisted (29-5-58), at Jebjerg (26-7-58), in Krabbesholm Forest (14-9-58), at Spangsbjerg (17-9-58, K. Lindhardt leg.), at Studsgård (9-7-59), and at Ø. Lyby (21-12-59), on Funen at Søhus near Odense (14-5-58), on Sealand at Bagsværd (15-8-58) and Lyngby (24-10-58, 22-6-59), and on Lolland at Sophiehøj (15-8-58).

Furthermore an apterous *A. malvae* s. lat. has been collected on Althaea rosea at Onsbjerg, Samsø (10-8-58).

It seems impossible to find any morphological differences between the forms here mentioned. The length of processus terminalis exceeds six times the length of the base of the VIth an-

tennal segment in several individuals from Geranium, Agrimonia, and Fragaria, a character hitherto supposed to occur in *A. malvae* s. str., the Pelargonium-form, only.

It is a common aphid on strawberries (subsp. *rogersii*). The eggs will hatch in April. Adult fundatrices have been noticed in the middle of May (1958), apterous males in October. The oviparous female of subsp. *geranii* was collected on December, 24th, on Geranium molle at Skive.

Description of the fundatrix of *A. malvae* subsp. *rogersii*:

Morphological characters: Very much like apterous viviparous female. Antennae a little shorter than body; processus terminalis shorter than IIIrd antennal segment, about 3-3½ times as long as base of VIth segment. Cauda rather broad, not constricted.

Colour: Light green body, red eyes.

Measurements in mm: Body 2,7, antenna 2,3, siphunculus 0,67, cauda 0,30; 3-4 rhinaria on III; proportions of antennal segments III-VI: 48:25:26:(12+35); 9 caudal hairs.

42. *Acyrthosiphon pisum* (Harris, 1776).

Acyrthosiphon pisum Hille Ris Lambers, 1947, p. 247, pl. XIII, fig. 5.
Acyrthosiphon onobrychis Börner, 1952, p. 151, no. 560.
Acyrthosiphon onobrychis Börner & Heinze, 1957, p. 230, Abb. 93.

Distribution: All over the world. It is known from Sweden and the Faroes.

Occurrence in Denmark: Well known in Denmark as a pest to peas and other cultivated species of Papilionaceae (S. Rostrup 1900; Thomsen & Bovien 1933; Års- og månedsoversigter over plantesygdomme fra Statens plantepatologiske Forsøg; syn.: *Siphonophora pisi, Macrosiphum pisi, Aphis pisi,* in Danish: ærtelus, ærtebladlus). The writer collected *A. pisum* s. str. on the following hosts and localities:

Jutland: On Pisum sativum at Ø. Lyby (19-7-56) and Studsgård (13-7-60), on Trifolium arvense at Bruddals Bakker (3-8-57), on T. pratense on Gjøl (29-9-59, Øvlisen leg.), on T. dubium in Krabbesholm Forest (1-7-59), on unknown host (possibly Trifolium) at Madum Lake (17-6-58), on Vicia hirsuta at Skive (28-6-58), on V. cracca at Rydhave (30-6-58), on Caragana arborescens at Jebjerg (26-7-58), on cultivated Lathyrus at Skive (7-10-58, N. J. Vinther leg.), on Lotus uliginosus on Rømø (4-7-58), on Capsella bursa-pastoris at Skive (24-7-57) and Ellidshøj (27-6-59),

and — presumably accidentally — on Potentilla argentea on Rømø (3-7-58) and on Daucus carota at Jebjerg (26-7-58).

The Danish islands: On Capsella bursa-pastoris at Lyngby (3-7-58) and on Trifolium pratense on Læsø (9-8-57).

Alate specimens flew into yellow Moericke-trays at Ørslev on Sealand, Årslev on Funen, and Tylstrup, Borris, and Jyndevad in Jutland in 1956 (Heie 1960b).

A. pisum subsp. *ononis* (Koch) Meier, 1957, has been collected on Ononis repens at Bruddals Bakker (3-8-57), in Oksholm Forest on Øland (31-7-60), at Strandkjær on Mols (5-7-60), at Nyborg (8-7-58), on Ærø (8-7-57), and on Læsø (10-8-57).

A. pisum subsp. *ononis* lives on Ononis, exclusively. A great number of species of Papilionaceae, especially herbs, and Capsella bursa-pastoris belonging to Cruciferae serve as host plants of *A. pisum* s. str. Caragana arborescens seems to be a new host of *A. pisum*. I found it at Jebjerg together with green *A. caraganae*. On peas only green specimens of *A. pisum* occur, but on Caragana arborescens, on cultivated Lathyrus (observed on Ærø, 10-7-57), on Medicago sativa (obs. at Studsgård, 9-7-59), on Vicia hirsuta, and on Capsella bursa-pastoris both green and red specimens have been observed. This is also the case in *A. pisum* subsp. *ononis*.

43. *Acyrthosiphon spartii* (Koch, 1855).

Acyrthosiphon spartii Börner, 1952, p. 153, no. 561.

Acyrthosiphon spartii Börner & Heinze, 1957, p. 230.

Distribution: Europe. Known from Sweden.

Occurrence in Denmark: Found on Sarothamnus scoparius at Holstebro (1-7-59), Studsgård (9-7-59), and Himmelbjerget (21-7-59), all in Jutland.

All specimens observed were green.

Genus **METOPOLOPHIUM** Mordvilko, 1914.

44. *Metopolophium dirhodum* (Walker, 1848).

Metopolophium dirhodum Hille Ris Lambers, 1947, p. 281, pl. XVI, figs. 19—20.

Metopolophium dirhodum Börner, 1952, p. 156, no. 580.

Metopolophium dirhodum Börner & Heinze, 1957, p. 238.

Distribution: Europe and northern Asia, perhaps America too. It is known from Norway, Sweden, and Iceland.

Occurrence in Denmark: In Jutland collected on Rosa villosa at Resen near Skive (27-10-57), on Rosa sp. at Skive (11-

5-59), Legind Bjerge (3-6-58), and Hald Lake (20-5-59), on grass at Juelsminde (28-6-59), on Polygonatum multiflorum at Lemvig (4-7-59), on Iris at Studsgård (9-7-59), and caught in the air on Mols (30-6-59). On Funen collected on grass near Fåborg (15-7-57). On Sealand collected on Rosa rugosa in Copenhagen (1-11-17, Math. Thomsen leg. et det.) and on R. eglanteria at Holte (17-10-57). Alate specimens have been caught by yellow trays at Ørslev, Årslev, Tylstrup, Borris, and Jyndevad in 1956. A great number of alate specimens were found in the air and on random plants in the early summer, 1959. That year it was seen, but not collected, on roses at Skive and Århus in May, on various grasses (Agropyrum repens, Dactylus glomerata, Avena sativa) in Krabbesholm Forest, at Mellerup near Randers, at Ranum, and at Studsgård. About 40 % of the aphids swarming in the air at Holte about July 1st were *M. dirhodum*, on Mols 100 %.

It migrates between Rosa and grasses (occasionally also other monocotyledones). Oviparous females have been observed in October on Rosa.

45. *Metopolophium festucae* (Theobald, 1917).

Metopolophium festucae Hille Ris Lambers, 1947, p. 287, pl. XV—XVI, figs. 16—17.

Metopolophium festucae Börner, 1952, p. 157, no. 583.

Distribution: England, Netherlands, Germany, Sweden, the Faroes, Iceland, and Denmark.

Occurrence in Denmark: Collected on meadows at Skive (27-6-58) and Kongsø near Bryrup in Jutland (11-7-58).

The species lives on grasses and does not migrate.

Genus **IMPATIENTINUM** Mordvilko, 1914.

46. *Impatientinum balsamines* (Kaltenbach, 1862).

Impatientinum balsamines Hille Ris Lambers, 1947, p. 305, pl. XIV, fig. 10.

Impatientinum balsamines Börner, 1952, p. 136, no. 517.

Distribution: England, Netherlands, Germany, Austria, Russia, and Denmark.

Occurrence in Denmark: Collected on Impatiens nolitangere at Grejsdal near Vejle (10-7-58), at Strandkjær at Femmøller (9-9-60), and in Krabbesholm Forest at Skive (28-9 and 11-10-58, 7-9 and 3-10-60).

Hille Ris Lambers (1947) describing the summer forms considers migration improbable though he did not find the sexuales

and though the host is an annual, disappearing completely in winter, throwing its seed far away, so that it is difficult to understand how young fundatrices hatched from the eggs in spring may find their food. I happened to discover the oviparous female and the alate male on the usual host plant in autumn (about first part of October) thus confirming the conception of Hille Ris Lambers. Egg-laying has been observed in a glass tube, but I did not succeed in finding eggs in the open. The search for the species on young hosts early in the year had no result, either.

Description of the oviparous female:

Morphological characters: Very much like the apterous viviparous female, but the sclerotic area of tergum is smaller, sometimes only consisting of ante- and postsiphuncular sclerites and marginal sclerites. On some specimens small pleural intersegmental sclerites may be seen, too. Antennae as long as or a little shorter than body. IIIrd segment with 3—8, IVth with 0—2, and Vth without secondary rhinaria. Apical segment of rostrum constricted at base, length about 75 % of second joint of hind tarsi. Cauda thick and blunt with 6—9 hairs. The proximal $^2/_3$ of hind tibiae swollen with a large number of pseudosensoria.

Colour: Reddish black. The immature oviparous females are red.

Measurements are given in table 3.

Table 3.

Oviparous females of *Impatientinum balsamines*: Measurements (in mm), proportions of antennal segments, and number of secondary rhinaria.

No.	*Body*	*Ant. I-VI*	*Siph.*	*Cauda*	*Prop. ant. segm. III : IV : V : (VI a+VI b)*	*Rhin. on III*	*Rhin. on IV*
1	2,44	2,20	0,34	0,23	35 : 32 : 25 : (10+40)	5+4	0+0
2	2,53	2,36	0,37	0,23	40 : 32 : 28 : (11+49)	5+5	0+0
3	2,53	2,45	0,37	0,24	41 : 30 : 27 : (11+47)	7+6	2+1
4	2,59	2,59	0,36	0,24	41 : 32 : 28 : (11+45)	6+5	0+0

(Nos. 1—2: 28-9-58; no. 3: 3-10-60; no. 4: 11-10-58; all from Krabbesholm Forest, Skive).

Description of the alate male (based on one specimen only):

Morphological characters: Much like the alate viviparous female. IIIrd antennal segment with 26-33, IVth with 20-21, and Vth with 16-18 secondary rhinaria. The abdomen dorsally with 5-6 sclerotic transversal bands, furthermore with rather large marginal sclerites and with ante- and postsiphuncular sclerites. Wings normal.

Colour: Nearly black.

Measurements (in mm): Body 2,62, antenna (I-VI) 3,30, siphunculus 0,37, cauda 0,21. Cauda with 7 hairs. Proportions of antennal segments III-VI: 61:46:42:(15+72).

Genus **AULACORTHUM** Mordvilko, 1914,

Subgenus **AULACORTHUM** s. str.

47. *Aulacorthum cylactis* Börner, 1942.

Dysaulacorthum cylactis Börner, 1952, p. 150, no. 550.
Aulacorthum cylactis Ossiannilsson, 1959a, p. 36.

Distribution: Germany, Austria, Sweden, Netherlands, and Denmark.

Occurrence in Denmark: Found on Rubus saxatilis at Buderupholm in Himmerland (12-6-58, R. Uhre leg.).

The aphids feed on the underside of leaves which become strongly curled.

48. *Aulacorthum knautiae* Heie, 1960.

Aulacorthum knautiae Heie, 1960a, p. 304, figs. 1—4.

Distribution: Outside Denmark known from England. Dr. J. P. Doncaster, British Museum, London, most kindly told me that he took this species from Knautia arvensis at Harpenden, Hertfordshire, on 20th June 1945.

Occurrence in Denmark: It has hitherto only been found in Jutland on Knautia arvensis. Collected at Dronninglund (22-9-58), Addit Forest (28-6-59), Haderup (9-7-59), Studsgård (9-7-59), Brunshåb (12-7-59), Handbjerg (27-9-59), Dalgas Plantation (15-10-59), and Strandkjær at Femmøller (5-7-60). It has been observed, but not collected at Aulum (9-7-59), Glyngøre (10-7-59), and Studsgård (13-7-60).

Sexuales appear in September-October.

49. *Aulacorthum majanthemi* F. P. Müller, 1956.

Aulacorthum majanthemi F. P. Müller, 1956, p. 501, fig. 1.

Distribution: Germany (Rostock) and Denmark.

Occurrence in Denmark: Collected on Majanthemum bifolium at Store Økssø in Rold Forest in Himmerland (4-9-58). Among the individuals collected was an oviparous female.

50. *Aulacorthum solani* (Kaltenbach, 1843).

Aulacorthum solani Hille Ris Lambers, 1949, p. 182.

Distribution: Europe, U. S. A., Australia, and New Zealand. It is known from Iceland, Norway, and Sweden.

Occurrence in Denmark: Very common all over the country. It has been recorded for Denmark previously as *Macrosiphum pelargonii* on plants in glass-houses and as *Myzus pseudosolani* on potato (Bovien & Thomsen 1945). In glass-houses it is a pest to various plants, e. g. tulips. It is a polyphagous species attacking a great number of plants belonging to different families. It has been observed by the writer on potato on the following localities: Jutland: Store Vildmose, Hov at Thisted, Tylstrup, Hornum, Hadsund, Mors, Struer, Ø. Lyby in Salling, Skive, Studsgård, Ødum, Djursland, Borris, Videbæk, Vandel, Vejen, Esbjeg, Højer, Jyndevad, Haderslev; Funen: Årslev, Korinth; Sealand: Glostrup, Virum, Tåstrup, Tystofte, Skelskør, Ringsted, Stevns, Høng, Lammefjord; other islands: Amager, Falster, Bornholm, Als.

The species has been collected on Borrago in Copenhagen (24-10-17, Math. Thomsen leg.), on potato at Fjelstervang near Studsgård (9-58-56), on strawberries at Skive (3-5-58), Holstebro (5-5-58), Bjørndrup on Mors (29-5-58), Sophiehøj on Lolland (15-8-58), and Holte (24-10-58), on Aegopodium podagraria at Horne on Funen (14-7-57) and at Nyborg (9-7-58), on Stellaria media at Dyreborg on Funen (15-7-57), on S. nemorum in Krabbesholm Forest (16-7-58), on Lysimachia vulgaris on Læsø (7-8-57), on Urtica urens at Skive (5-12-57, one oviparous female), on Beta vulgaris (red-beet) at Sophiehøj on Lolland (7-7-51), on Veronica agrestis at Skive (30-7-58), on Althaea at Lemvig (4-7-59), on Galium aparine at Harboøre (16-7-59), and on Capsella bursa-pastoris at Kjellerup (2-8-59).

Single alate specimens were found in yellow trays at Årslev on Funen and at Borris and Jyndevad in Jutland in 1956.

Indoors it has been collected on potato at Lyngby (9-2-50) and in Copenhagen (16-4-59), on Hortensia at Virum (12-5-50), on Anthorium at Skive (12-1-57, 12-2-58), on Tulipa at Skive (6-2-57), on Chrysanthemum in Copenhagen (16-2-51), on Fragaria vesca at Spangsbjerg near Esbjerg (April 1958, K. Lindhardt leg.), on Humulus lupulus, Calceolaria, and Lysimachia nummularia at Rebild (June 1958), and on Zantedeschia aethiopica and Setcreasea purpurea in Copenhagen (16-4-59). Furthermore it has been seen, but not collected, in glass-houses on Iris and Calla at Virum (9-2-52), on Tulipa at Vanløse (28-3-51), Virum (29-3-51), Vinde near Skive (10-1-57), and Skive (12-1-57, 29-3-57), on Cal-

ceolaria at Vinde (10-1-57), and on Pelargonium at Skive (29-2-60).

It has been found on beet (Beta vulgaris cult.) in clamps on Sealand at Baldersbrønde (29-5-54) and Herstedvester-Vallensbæk (29-6-54) by Petersen (1959, p. 129), who states that overwintering in clamps is rare.

Börner regards *A. solani* as several independent species, some of them infesting the same hosts. *Dysaulacorthum vincae* Walker (Börner's no. 544), never producing sexuales, *D. pseudosolani* Theob. (no. 546), with alate males, and *D. antirrhinii* Macch. (no. 548), with apterous males, are polyphagous and able to feed on potato. The morphological differences are small, and it is impossible to distinguish between the apterous females. I prefer to adopt the opinion of Hille Ris Lambers that it is one species.

Subgenus **NEOMYZUS** van der Goot, 1915.

51. *Aulacorthum (Neomyzus) circumflexum* (Buckton, 1876).

Aulacorthum (Neomyzus) circumflexus Hille Ris Lambers, 1949, p. 198; 1947, pl. XVII, fig. 24.

Neomyzus circumflexus Börner, 1952, p. 129, no. 486.

Distribution: Nearly all over the world. Known from Sweden.

Occurrence in Denmark: Collected on Cyclamen in hothouses at Skive (10-1-57, 23-5-59). It has been seen, but not collected, indoors on Iris and Calla at Virum (9-2-52), on Tradescantia and Primula at Rødovre near Copenhagen (16-5-52), on Hibiscus at Nørre Nissum near Lemvig (24-6-57), and on Ficus at Skive (16-4-60). It is mentioned by Bovien & Thomsen (1950).

It is a hothouse aphid, never producing sexuales, but breeding parthenogenetically all the year.

References

(continued from Entom. Medd. 29: 211, 1960).

Bovien, P. & Thomsen, Math. (1945): Haveplanternes Skadedyr og deres Bekæmpelse. København. — 1950: Ny udgave.

Eastop, V. F. (1958): The History of Macrosiphum euphorbiae (Thomas) in Europe. The Entomologist 91: 198—201.

Heie, O. (1958): About the Identity of Aphis aucta Walker. Entom. Medd. 28: 214—218.

— (1960 a): Aulacorthum knautiae n. sp. (Homopt. Aphid.) Ibid. 29: 304—311.

Heie, O. (1960 b) Aphids Caught in Moericke-trays on 5 Localities in Denmark in 1956. Ibid. 29: 329—359.

Hille Ris Lambers, D. (1947): Contributions to a Monograph of the Aphididae of Europe. III. The genera Pharalis etc. Temminckia, Leiden, 7: 179—320.

— (1949): Contributions to a Monograph of the Aphididae of Europe. IV. The genera Aulacorthum etc. Ibid. 8: 182—324.

— (1955): Hemiptera 2. Aphididae. The Zoology of Iceland III, 52 a, 29 pp. Copenhagen and Reykjavik.

— (1959): Scientific Names of Potato-Infesting Aphids. The Canad. Entom. 91: 321—328.

Jørgensen, Marie (1932): Aphidae. Zoology of the Faroes XLV, 9 pp. Copenhagen.

Kittel, M. (1827): Mémoire sur les Pucerons, suivi de la description de quelques espèces nouvelles. Mémoires de la Soc. Linn. de Paris 5: 133—155.

Meier, W. (1957): Über Acyrthosiphon pisum Harris 1776 (Hemipt. Aphid.). Mitt. d. Schweizerischen Entom. Ges. 30: 89—92.

— (1958): Beiträge zur Kenntnis der auf Papilionaceen lebenden Acyrthosiphon-Arten. Ibid. 31: 291—312.

Müller, F. P. (1956): Zwei neue Blattlausarten aus Norddeutschland. Beitr. z. Entom. 6: 501—510.

Ossiannilsson, F. (1959 a): Contributions to the Knowledge of Swedish Aphids. I. Descriptions of Some Apparently Undescribed Forms. Kungl. Lantbrukshögskolans Ann. 25: 1—46.

— (1959 b). Contributions to the Knowledge of Swedish Aphids. II. List of Species with Find Records and Ecological Notes. Ibid. 25: 375—527.

Petersen, B. (1959): Om ferskenbladlus (Myzus persicae Sulz.), bedebladlus (Aphis fabae Scop.) og virusgulsot (Beta virus 4 Smith) i Danmark. 5. beretning fra Virusudvalget. Akad. f. d. tekn. Vidsk. no. 33.

Prior, R. N. B. & Stroyan, H. L. G. (1960): On a New Collection of Aphids from Iceland. Entom. Medd. 29: 266—293.

Rostrup, Sofie (1900): Vort Landbrugs Skadedyr. Kjøbenhavn. — 1940: 5. udg. ved Bovien, P. & Thomsen, Math.

Stroyan, H. L. G. (1957): Further Additions to the British Aphid Fauna. Trans. R. ent. Soc. Lond. 109: 311—360.

Theobald, F. V. (1913): The British Species of the Genus Macrosiphum, Passerini. Pt. II. J. econ. Biol. (London) 8: 113—154.

Thomsen, Math. & Bovien, P. (1933): Haveplanternes Skadedyr. København.

Weis, S. (1955): Die Blattläuse Oberösterreichs I. (Homopt. Aphidoidea). Österreichische Zool. Zeitschr. 5: 464—559.

Statens forsøgsvirksomhed i plantekultur: Plantesygdomme i Danmark. Årsoversigter samlet ved Statens plantepatologiske Forsøg.

Statens plantepatologiske Forsøg: Månedsoversigter over plantesygdomme.