Aphids collected in Iceland in August, 1961. (Homopt., Aphididae).

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While on a travel from Europe to U. S. A. the writer made a stop-over in Reykjavík for a few days (August 1—4, 1961) using this opportunity to do some collecting work in Reykjavík and the surrounding area. This paper presents the result of this collecting work, which includes 23 species. Five species and one subspecies new to Iceland are recorded. So the number of aphid species known as occurring in Iceland now has increased from 37 (Hille Ris Lambers 1955: 27 species, Prior & Stroyan 1960: further 9 species, and Beier Petersen 1960: 1 species) to 42.

I want to thank Dr. Eyþór Einarsson, Museum of Natural History (Nattúrugripasafnið), Reykjavík, for determination of some plants (Salix herbacea, Leontodon autumnalis, and Alchemilla alpina), Mr. Hákon Bjarnason, director, and Mr. Baldur Thorsteinsson, master of forestry, both at Iceland Forest Service (Skogrækt ríkisins), Reykjavík, who showed me aphid attacks on Picea sitchensis and Pinus in Reykjavík, Dr. C. F. Smith, North Carolina State College, Raleigh, N.C., U. S. A., who offered me working space and admission to his library of aphid reprints and laboratory equipment, and Dr. Hille Ris Lambers, Bennekom, Netherlands, for determination of *Thuleaphis acaudata* H. R. L. The funds that yielded me sources making my trip to U.S.A. possible, The Conference Board of Associated Research Councils, Committee on International Exchange of Persons, Washington, D.C., The Danmark-Amerika Fond, Copenhagen, and University of Copenhagen, ought to be thankfully mentioned, also in connection with the present paper.

Most of the material is in the writer's collection, a part of it in Dr. C. F. Smith's collection.

The localities.

Collecting was done in Reykjavík, in the area east of Reykjavík, at Vífilstaðahlið 5 km south of Reykjavík, at Hveragerði between Þingvallavatn and the south coast of Iceland, and at Þingvellir.

A large part of Iceland, especially in the south-west, has an average temperature of July just above 10°C., which usually indicates the northern limit of coniferous forest with birch. There are no natural forests in Iceland to-day, only scrubs with birch (Betula pubescens), willow (Salix) and a few other woody plants, much lower than on more southern latitudes. Real birch forest obviously was present at the time of the first colonisation of the country, however. The trees were felled or destroyed by fires, and the sheep prevented the forest from being renewed by eating every green sprout. While most of the area near Reykjavík is covered partly by a poor vegetation of grasses, Dryas, Empetrum, Vaccinium, and some other low plants, partly by lichens and mosses or no vegetation at all, so that the black or dark brown colour of the rocks and lava fields is the dominant colour of the landscape, it may, however, be possible to find rather tall and abundant vegetation of birches, willows, and large herbs on places fenced in, so that the sheep cannot feed there.

In the urban area of Reykjavík, sheltered not only from the sheep, but also from the wind, a lot of trees and herbs thrive in the gardens and parks. Here many imported and introduced plants may grow and develop very well. Iceland Forest Service (Skogrækt ríkisins) tries the growing possibilities of different trees, for instance different coniferous trees as Picea sitchensis and Pinus. Ulmus and some other trees may reach a considerable tallnes and age in the gardens.

Several of the aphids hitherto collected in Iceland feed on imported or introduced plant species, but it was expected that more aphid species belonging to this ecological group might occur. During my short visit in the country I concentrated on collecting in the urban area of Reykjavík in order to add a few species of this group to the faunistic list, though collecting in "wild nature" was made, too, as much as possible.

A short description of the localities, where collecting was done, is given below.

Reykjavík

Several weeds grew along walls in the streets and in small backyards: Stellaria media, Capsella bursa-pastoris, and Matricaria, often rather tall plants. Pavement is often missing in small streets, so that these plants are abundant nearly everywhere in the town. In some areas Leontodon, Achillea, Chamaenerium, and grasses occurred in fields or in the road-side. In gardens and parks in the city and just south of it collecting was made on Ulmus, Ribes spp., Salix spp., Betula pubescens, Pinus, and Picea sitchensis and on cultivated herbs as Myrrhis odorata and Sedum sp. Some of the collecting on these plants was done in an experimental field just south of Reykjavík, owned by Iceland Forest Service.

Field East of Reykjavík

In the road-side a few km from Reykjavik collecting was done on Filipendula ulmaria and Salix herbacea on a rather flat area far from buildings and gardens, but in the neighbourhood of grass fields and a stream.

Vífilstaðahlið

A slope exposed to the sun, with volcanic rocks which yielded shelter from the wind. It was surrounded by fences, so that the sheep did not spoil the vegetation any more. The vegetation consisted of Betula pubescens, Dryas, Empetrum, Alchemilla, Thymus, Galium, and many other plants.

Hveragerði

Vegetables, fruits, and flowers are grown in glass-houses heated from numerous hot springs in the town. Collecting was partly done on vegetables and weeds indoors, partly out-of-doors in the town (on Salix and Polygonum) and on the bank of a stream with grass, Cerastium, Euphrasia, and several other herbs.

Þingvellir

A lava field with clefts, far from urban areas, near the shore of the lake, Þingvallavatn. There were some small birches, Betula pubescens, but most of the area was partly covered by low plants as Dryas, Betula nana, Vaccinium uliginosum, Hieracium, Alchemilla alpina, and grasses, partly barren rocks. The most vigorous vegetation occurred near the water in the lava clefts.

List of the species.

1. ***Macrosiphum cholodkovskyi*** Mordvilko.

Hille Ris Lambers 1955, p. 2; Prior & Stroyan 1960, p. 270. Additional records: East of Reykjavík, 4-VIII-61, on Filipendula ulmaria; eastern part of Reykjavík, 1-VII-61, on Chamaenerium angustifolium; Reykjavik, 2-VIII-61, on Salix caprea (one alata accidentally landed).

Chamaenerium (Chamaenerion) angustifolium has not been recorded as a host plant of *M. cholodkovskyi* before. I found several apterous viviparous females and their larvae, both green

and red specimens. In the key to *Macrosiphum* in Meier (1961, p. 180) they run down to the *cholodkovskyi-gei-epilobiellum* group (apterous virgines with 3-4 secondary rhinaria; apical segment of rostrum as long as second segment of hind tarsus). As there are only 2 hairs on the anterior half of the subgenital plate, it cannot be *gei*. The number of caudal hairs is the same as in *cholodkovskyi* (viz. 15), whereas processus terminalis is longer than the IIIrd antennal segment as in *epilobiellum*. Though Chamaenerium belongs to the same plant family as Epilobium (Oenotheraceae), I do not believe that the aphid is *epilobiellum*, because the last-mentioned character (the relative length of processus terminalis) has no value, at least in northern countries. In Denmark it is very common to find apterous females of *M. cholodkovskyi* (on Filipendula) whose processus terminalis is longer than the IIIrd antennal segment.

Measurements of one apterous female from Chamaenerium: Body 3.29 mm, antenna 3.39 mm, 3 & 4 secondary rhinaria on ant. III, proportions of ant. segm. III-VI 58 : 44 : 41 : (13+63), siphunculus 0.96 mm, cauda 0.44 mm, 15 caudal hairs, 2 hairs on anterior half of subgenital plate, 8 hairs on VIIIth abdominal tergite, length of apical segment of rostrum 99 % of second segment of hind tarsus (but 107 % in another specimen), length of hair on antennal segment III about 80 % of basal diameter of that segment.

2. ***Macrosiphum euphorbiae*** Thomas.

Occurrence in Iceland: Reykjavík, 1-VIII-61, on Achillea millefolium. They were green all of them.

This is a new species record for Iceland. *M. euphorbiae* is a polyphagous species, especially known as a potato aphid in Europe and North America. Achillea millefolium is not a common host plant, but it has been recorded before (Essig 1917, p. 329).

Though the apical segment of the rostrum is about 99-100 % of the second segment of the hind tarsus (Meier gives for *M. euphorbiae* only 86-96 %), it cannot be the only other *Macrosiphum* species hitherto known from Iceland, viz. *cholodkovskyi*, because the cauda is rather acute, the number of hairs on VIII abdominal tergite is only 6, and the hairs upon and between the frontal tubercles are shorter than the basal diameter of IIIrd antennal segment.

Measurements of one apterous female: Body 3.09 mm, antenna 3.31 mm, 4 & 4 secondary rhinaria on ant. III, proportions of ant. segm. III-VI 52 : 47 : 39 : (11+63), siphunculus 0.90 mm, cauda 0.44 mm, 11 caudal hairs, 2 hairs on anterior half of subgenital plate, length of hair on ant. segm. III 75 % of basal diameter of that segment.

Measurements of one alate female: Body 3.12 mm, antenna 3.54 mm, 14 & 13 secondary rhinaria on ant. III, prop. of ant. segm. III-VI 54:49:43:(13+72), siphunculus 0.79 mm, cauda 0.37 mm, 11 caudal hairs, 2 hairs on anterior half of subgenital plate, length of hairs on ant. III about 50 % of the basal diameter of III.

3. ***Acyrthosiphon auctus*** (Walker).

Hille Ris Lambers 1955, p. 4 (silenicola); Prior & Stroyan 1960, p. 272.

Additional record: Reykjavik, 1-VIII-61, on Matricaria sp. (? matricarioides).

The sample consists of one specimen only, collected as a nymph on August 1, killed on August 4 after its last moult. Both as a nymph and as an alate adult it was red.

The alate viviparous females of this species seem to be rather rare. In Walker's original description (Walker 1849, p. XXXIII) he describes both an aptera and an alata, but the latter is *Myzus persicae* (Sulz.). Recently the species has been rediscovered in Iceland (Hille Ris Lambers 1955 (originally described as *A. silenicola*), Prior & Stroyan 1960), Scotland (Stroyan 1957 (originally described as *A. shawi*)), Denmark (Heie 1958), and Sweden (Ossianilsson 1961), but only one alate female has been collected, a rather damaged specimen described by Hille Ris Lambers, found by Sv. G. Larsson in a window in Akureyri, 18-VII-29. Flagellum of the antennae was completely absent, and it was impossible to make out sclerotization or pigmentation of abdomen. Therefore, a redescription will be given here:

Alate viviparous female.

Morphological characters: Head and thorax dark sclerotic. Abdomen membraneous with rather big marginal sclerites and small irregular pleural intersegmental sclerites (fig. 1). Antennae dusky, darker against the apex, with dark apices of segments III, IV, V and base of VI; segment III with 11-12 secondary rhinaria in one irregular row covering most of the segment. Length of hairs on IIIrd antennal segment about $^1/_2$-$^2/_3$ of the basal diameter of that segment. Siphunculus nearly cylindrical, pale dusky. Cauda slender, a little constricted in the middle, rather acute, with 10 hairs. One fore wing normal (3 branches of media), the other fore wing with only 2 branches of media. First tarsal segments with 3, 3, 3 hairs.

Colour: Red. As a nymph reddish with powder except on the borders between the body segments.

Measurements (in mm): Length of body 2.71; antenna 1.76; antennal segments III-VI: 0.45 : 0.36 : 0.30 : (0.15 + 0.32); siphunculus 0.29; cauda 0.25; apical segment of rostrum 0.14; 2nd segment of hind tarsus 0.18.

Matricaria has not been recorded as a host before, and probably its occurrence on this plant has been only accidental. The

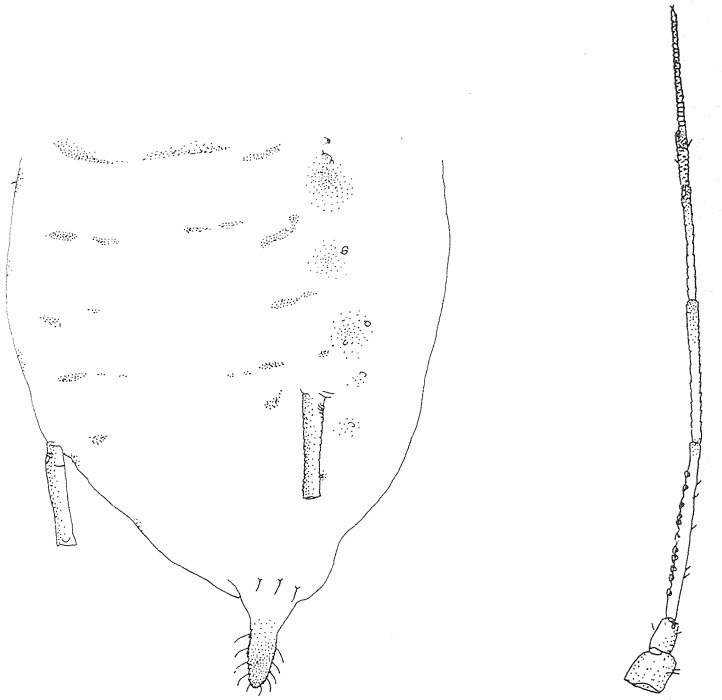

Fig. 1. *Acyrthosiphon auctus* (Walker), alate viviparous female: a) dorsum of abdomen; b) antenna; × 50.

usual hosts are Honckenya peploides and Cakile maritima, but the host records from Iceland hitherto published (Silene, Stellaria, Capsella, Gentiana) show that it is a rather polyphagous species, as pointed out by Prior & Stroyan (1960, p. 272).

4. ***Acyrthosiphon brachysiphon*** Hille Ris Lambers.

Hille Ris Lambers 1955, p. 4; Prior & Stroyan 1960, p. 271.

Additional record: Þingvellir, 3-VIII-61, on Vaccinium uliginosum, a sample consisting of apterous viviparous females, larvae and one apterous male.

The colour of their body was green with wax powder. The borders of the segments appeared as green transversal lines in the powder. Eyes, feet, and apices of antennae were black. The aphids sat on the under side of leaves, which were a little reddish, especially along the edges. They fell to the ground when disturbed.

5. ***Nasonovia compositellae*** (Theobald).
Hille Ris Lambers 1955, p. 8; Prior & Stroyan 1960, p. 274.
Additional records: Þingvellir, 3-VIII-61, on Hieracium sp., on the basal leaves between the halves which have been flexed upwards towards each other. The sample consists of apterae, both viviparous and oviparous females.

6. ***Hyperomyzus (Hyperomyzella) rhinanthi*** (Schout.).
Prior & Stroyan 1960, p. 281.
Additional record: Reykjavík, 1-VIII-61, on Ribes rubrum and — accidentally fallen down from Ribes rubrum — on Matricaria and Capsella bursa-pastoris. Prior (Prior & Stroyan 1960) found this species on both Rhinanthus (Alectorolophus) and Ribes rubrum (alate gynoparae and some adult oviparae), thus showing that it has a heteroecious cycle in Iceland just as on the European continent, though the summer in Iceland is short. During the few days which I spent in Iceland I looked for aphids on Rhinanthus in Reykjavík in vain, but found severe attacks on Ribes rubrum in several gardens in the city. Usually it is of no importance as a pest on Ribes, neither in the Netherlands (Hille Ris Lambers 1949, p. 302), nor in Denmark. But in Reykjavík I saw shrubs with a great number of curled, bent leaves containing this aphid. The leaf-curling is caused by the spring forms, so migration will at least not always take place. In the curled leaves not only apterous viviparous females (about 8 per cent of the adults) and alate viviparous females (about 73 per cent) did occur, but also oviparous females (about 19 per cent). Besides, there were several nymphs with wing pads and other immature forms. Hille Ris Lambers (1949) counted 36-48 secondary rhinaria on antennal segment III, 12-22 on IV, and 0-3 on V in spring migrants, and 65-95 on III, 15-24 on IV, and 0-6 on on V in gynoparae. All my material of alatae from Iceland belongs to the autumnal form, as the number of secondary rhinaria on antennal segment III is 61-98, on IV 16-30, and

on V 0-3. As they were found in the leaf galls together with large nymphs with wing pads, they probably had developed on Ribes, the winter host, and not — as it has been found in other countries — on Rhinanthus, the summer host. In some nymphs it was possible approximately to estimate the number of secondary rhinaria which would develop in the adult stage, viz. in 6 specimens 53-88 on III, 12-21 on IV, and 0-1 on V. Obviously they were immature gynoparae. They were not male nymphs, because the male has 3-12 secondary rhinaria on V, and in my rather large samples there are no males at all. Perhaps the summer hosts are the only male-developing places, so that migration must be considered to be necessary, though the species is able to stay on the winter host all the year round producing the oviparous females in the end of the summer as shown by the observations mentioned above.

7. ***Aulacorthum solani*** (Kalt.)

Hille Ris Lambers 1955, p. 8.

Additional records: Reykjavík, 1-VIII-61, on Capsella bursa-pastoris; Hveragerði, 3-VIII-61, on Polygonum aviculare (only one larva, probably gone astray); Hveragerði, 3-VIII-61, on Stellaria media in a glasshouse.

8. ***Cryptomyzus galeopsidis*** (Kalt.)

Hille Ris Lambers 1955, p. 9; Prior & Stroyan 1960, p. 283.

Additional records: Reykjavík, 1-VIII-61, on Ribes rubrum (oviparous females, alate males, and larvae), on R. nigrum (apterous viviparous females, one oviparous female, and larvae), and on Matricaria sp. (two alate viviparous females).

Hille Ris Lambers (1955) supposed that subsp. *citrinus* H.R.L., which is the non-migrating form on Ribes rubrum, occurred in Iceland, but colour notes of his material were not available. *C. galeopsidis* ssp. *citrinus* does not differ morphologically from *C. galeopsidis* s. str., which migrates between Ribes and Galeopsis, but may only be recognized by the lemon yellow colour of the apterous forms (Hille Ris Lambers 1953, p. 101). Prior & Stroyan (1960) record a sample from Ribes rubrum consisting of 6 apt., 1 al., 1 ovip. and 1 larva collected on 8-VIII-58, which they referred only to *C. galeopsidis* s. lat., the apterae collected being either "yellowish with green markings" or "whitish". The apterae in my collection (all oviparae) were partly white with a

more or less distinct green, longitudinal, dorsal stripe, partly all yellow, while alive, and therefore it may be considered that at least some of them (the yellow apterae) represent *citrinus*.

The specimens from Ribes nigrum belong to subsp. *dickeri* H. R. L., which has not been recorded for Iceland before. The primary rhinarium of antennal segment V is placed rather far from the apex of the segment, and the hind tibiae of the oviparous female are not swollen. The colour of the living specimens was yellowish, sometimes with a very indistinct greenish, longitudinal, dorsal stripe.

As pointed out by Prior & Stroyan there is a reasonable probability of the occurrence of the migratory form, *galeopsidis* s. str., in Iceland, but it may be pointed out too, that until now only the nonmigrating forms have been recorded with certainty.

9. ***Ericaphis latifrons*** (Börner).

Hille Ris Lambers 1955, p. 9; Prior & Stroyan 1960, p. 283.

Additional record: Þingvellir, 3-VIII-61, on Dryas (one aptera, probably accidentally, going astray from Vaccinium uliginosum, which was very abundant on the locality).

10. ***Myzus ascalonicus*** Doncaster.

Occurrence in Iceland: Reykjavík, 1-VIII-61, on Capsella bursa-pastoris (1 apt.), 2-VIII-61, on Leontodon autumnalis (1 apt.), 4-VIII-61, on Stellaria media (1 apt., 3 larvae).

This is a new species record for Iceland. Since about 1940, when it probably was introduced to northwestern Europe, it has been discovered nearly all over Europe and in some parts of North America, too (see Heie 1961), especially in areas with maritime climate, where it may pass through the mild winter in the parthenogenetical stage. It is a polyphagous species with Stellaria media as one of its most usual hosts. This plant is very common in the streets and back-yards of Reykjavík, along the walls and other sheltered and often shaded places. The aphid was not common at the time of collecting, but in August and the other summer months it usually is rather rare in Denmark and other countries, too.

All the localities in Reykjavík mentioned above are out-of-doors, but *M. ascalonicus* is a common glass-house aphid, too, and probably it may be found in glass-houses also in Iceland, doing harm to different vegetables and flowers.

11. ***Myzus polaris*** Hille Ris Lambers.

Hille Ris Lambers 1955, p. 10; Prior & Stroyan 1960, p. 284.

Additional records: Reykjavík, 1-VIII-61, on ?Cerastium sp. (1 larva); Hveragerði, 3-VIII-61, on Cerastium sp. (2 apt., 4 larvae).

12. ***Jacksonia papillata*** Theobald.

Hille Ris Lambers 1955, p. 11; Prior & Stroyan 1960, p. 285.

Additional record: Þingvellir, 3-VIII-61, accidental on Alchemilla alpina on a nearly vertical rock wall (1 al.). The hosts of this species are grasses.

13. ***Liosomaphis abietina*** (Walker).

Beier Petersen 1960, p. 513, 515.

Additional record: Reykjavík, 2-VIII-61, on Picea sitchensis (apt. and larvae).

Picea sitchensis has been grown for several years in Reykjavík, in gardens and cemeteries, but the occurrence of the aphid has been known by Iceland Forest Service in Reykjavík only since 1959 (the destruction of the needles observed) and 1960 (the aphid itself recognized). Only a few specimens were found during my visit, but it is quite usual that the aphids nearly disappear in the middle of the summer. As victims of the severe attacks in the beginning of the summer some trees stood nearly without needles.

Ecologically there is some similarity between *M. ascalonicus* and *L. abietina,* both of them wintering anholocyclically in areas with a mild winter and being rather rare in the proper summer months, both widely distributed with their hosts. Presumably both species — quite recently having been introduced to Iceland — have good life conditions there. Already now *L. abietina* is a serious problem for the growing of Picea sitchensis in Reykjavík.

14. ***Cavariella aegopodii*** (Scopoli).

Hille Ris Lambers 1955, p. 11; Prior & Stroyan 1960, p. 285.

Additional records: Hveragerði, 3-VIII-61, on Apium graveolens and Petroselinum crispum in a glass-house; east of Reykjavík, 4-VIII-61, on Salix herbacea.

See also remarks under no. 16.

15. ***Cavariella archangelicae*** (Scopoli).

Hille Ris Lambers 1955, p. 12; Prior & Stroyan 1960, p. 286.

Additional record: Reykjavík, 1-VIII-61, on Myrrhis odorata in a garden (1 al., 5 apt.) together with *C. konoi* Tak.

See also remarks under no. 16.

16. ***Cavariella konoi*** Takahashi.

Prior & Stroyan 1960, p. 286.

Additional records: Reykjavík, 1-VIII-61, on Salix lanceolata (huge numbers of al., apt., and larvae), 2-VIII-61, on Salix sp. (al. and larvae), 2-VIII-61, on Salix caprea (1 nymph), 1-VIII-61, on Myrrhis odorata in a garden (several al. and apt., together with *C. archangelicae*); Hveragerði, 3-VIII-61, on Salix lanceolata (large colonies of apt. and larvae, al. occurred too).

It has been known for several years that one or more of the *Cavariella* species had the ability of migrating from willow to umbellifers in the short Iceland summer, but a record from Archangelica officinalis by Lindroth (Hille Ris Lambers 1955) and an observation of green aphids on an unknown umbellifer (Prior & Stroyan 1960) may relate to more than one species of *Cavariella*, and as all species can feed on Salix, the winter host, also during summer, has it hitherto been impossible to say with certainty how the life cycle of each species really is in Iceland.

Now all three species have been found on summer hosts, *aegopodii* on Apium and Petroselinum, *archangelicae* and *konoi* on Myrrhis, and it has thereby been established that all of them are migratory in Iceland as well as at more southern latitudes.

17. ***Brachycaudus helichrysi*** (Kalt.).

Prior & Stroyan 1960, p. 282.

Additional record: Reykjavík, 1-VIII-61, on Matricaria sp. (?matricarioides).

A small colony of the species was found by Prior in 1958 on Matricaria ambigua near Reykjavík, and it was assumed that the find might represent the offspring of a single wind-blown migrant, because the primary host, Prunus, was said to be absent in Iceland (Prior & Stroyan 1960). My sample of this species consists of several specimens (9 al., 5 apt., 10 nymphs, 4 larvae), and I did not take every individual I saw. The plants actually were very heavily attacked. The aphids may of course originate from one wind-blown migrant also in this case, but it seems more likely to trace them from glass-houses, where anholocyclical wintering occasionally may take place according to Börner and Heinze (1957, p. 158), or from Prunus in a garden. Hille Ris Lambers (1955, p. 16) remarks in connection with the occurrence of *Rhopalosiphum padi* (L.) in Iceland that the winter hosts of this species, Prunus padus and other Prunus spp., are

absent, but this is not true for the urban area of Reykjavík, where Prunus padus occurs according to information I have got at Iceland Forest Service in Reykjavík. Plum trees, the most important winter hosts of *Brachycaudus helichrysi*, do not occur in Iceland, but it has been tried to introduce them. The absence of a plant is much more difficult to decide than the presence of it, and it cannot be said with certainty that one or more small specimens of Prunus spp., which are suitable hosts, may not occur on sheltered places in the urban areas of Iceland. Even beech trees, but very small ones of course, do occur.

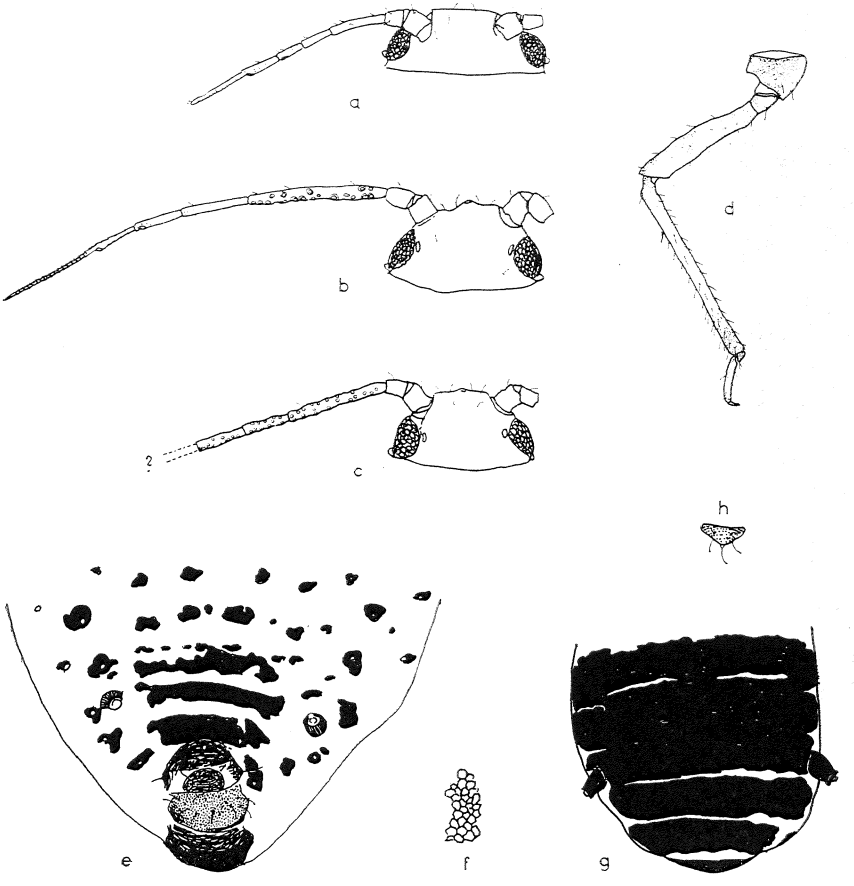

Fig. 2. *Thuleaphis acaudata* H. R. L. Head and one antenna of apterous viviparous female (a), alate viviparous female (b), and apterous male (c); apterous viviparous female: hind leg (d), abdomen of macerated specimen (e), reticulation of the dorsum (f); alate viviparous female: abdominal dorsum (g) and cauda (h); × 50.

18. ***Thuleaphis acaudata*** Hille Ris Lambers (fig. 2).

Prior & Stroyan 1960, p. 282.

Additional record: Reykjavík, 2-VIII-61, on Sedum sp. (1 apt., 1 al,, 2 apt. males).

Hille Ris Lambers, who described this species from Greenland (1960, p. 7—9), most kindly made the determination. Only few dead, dry specimens were found in a cemetery in the inflorescences of some probably cultivated Sedum plants, which were withering. They were found together with black, typical aphid eggs and a single living immature *Cavariella* sp., probably gone astray.

The specimens from Greenland were collected together with aphids from grasses and willow, but in Wales and Iceland the species has been found on its real host plant, Sedum (Rhodiola) roseum, according to Prior & Stroyan, who mention that these specimens have longer tarsi and a longer apical rostral segment than the Greenland specimens. It may be added too that the second segment of the hind tarsus of my Iceland material is relatively long, compared with the apical rostral segment. Hille Ris Lambers in his original description of the Greenland specimens tells that the last segment of rostrum is about $^{9}/_{10}$ of the second segment of hind tarsi, but in my Iceland specimen this ratio is $^{9}/_{13}$ (length of second segment of hind tarsus 0.13—0.15 mm).

19. ***Euceraphis punctipennis*** (Zetterstedt).

Hille Ris Lambers 1955, p. 16.

Additional record: Reykjavík, 1-VIII-61, on Betula pubescens.

20. ***Betulaphis quadrituberculata*** (Kalt.).

Hille Ris Lambers 1955, p. 18.

Additional records: Reykjavík, 2-VIII-61; Vífilstaðahlið at Reykjavík, 2-VIII-61; Þingvellir, 3-VIII-61; all found on Betula pubescens.

21. ***Cinara pilicornis*** (Hartig).

Occurrence in Iceland: Reykjavík, 2-VIII-61, on Picea sitchensis.

Both greyish green and reddish individuals were collected from terminal twigs. Its host has been introduced several years ago, and the aphid has been observed by Mr. Bjarnason, Reykjavík, since about 1922. It is not a very noxious insect. It is re-

markable that this species opposite to most other *Cinara* spp. according to Börner & Heinze (1957, p. 55) not or only seldom is attended by ants. Aphids demanding protection by ants are not and will probably not be found in Iceland, where ants do not occur at all.

22. ***Schizoneura ulmi*** (Linné).

Occurrence in Iceland: Reykjavík, 1-VIII-61, on Ulmus, and 2-VIII-61, accidentally on Salix.

The determination most kindly has been confirmed by Dr. Hille Ris Lambers.

This aphid species has not been recorded from Iceland before, though it occurred in huge numbers in typical leaf galls on several elm trees in urban gardens. The galls contained nymphs and alate migrants. The species must have been introduced by man, as both hosts, Ulmus and Ribes rubrum, have been imported from the European continent.

Hille Ris Lambers (1955, p. 20) supposed that *Colopha compressa* Koch in Iceland is obliged to live permanently on Carex, "since Ulmus does not occur in Iceland". This is perhaps the case in northern Iceland, but it cannot be said with certainty. Migration may occur even here from elms in the towns. In Reykjavík in southern Iceland at least, Ulmus is very common as tree in gardens.

23. ***Pineus pini*** (Macq.).

Occurrence in Iceland: Reykjavík, 2-VIII-61, on Pinus.

The aphids sat covered by wax together with their red eggs on the branches in the nursery of Iceland Forest Service. They must have been introduced with the host, which is not native in Iceland.

General remarks.

Origin of the species new to Iceland.

The additions to the Icelandic fauna recorded in 1961 do not belong to the native fauna. Their hosts are introduced plants, the majority of them cultivated in the urban area of Reykjavík:

Ribes nigrum: *Cryptomyzus galeopsidis* ssp. *dickeri*
Ulmus and Ribes: *Schizoneura ulmi* (only found on Ulmus)
Picea sitchensis: *Cinara pilicornis*
Pinus: *Pineus pini*

Polyphagous species: *Macrosiphum euphorbiae* (found on Achillea) and
Myzus ascalonicus (found on Capsella, Leontodon, and Stellaria).

The finding of *Myzus ascalonicus* especially is interesting, but not surprising considering its rapid dispersal during the years since 1940 in Europe and North America in areas with temperate, maritime climate, where it often is able to winter out-of-doors, though only parthenogenetic propagation takes place. As it has only been collected in the urban area, not outside Reykjavík, it may be considered unlikely that the original home of this aphid is Iceland. Probably the species has been introduced.

Migration.

Prior & Stroyan (1960) recorded the possibility of migration for six Icelandic species, viz. *Metopolophium dirhodum, Hyperomyzella rhinanthi, Cryptomyzus galeopsidis, Cavariella aegopodii, C. archangelicae,* and *C. konoi;* but only *H. rhinanthi* and *Cavariella* sp. had been found on the winter host as well as on the summer host.

The 1961 collection raised the number of species, which presumably are migrating in Iceland, with one species, viz. *Schizoneura ulmi.*

The presence of Ulmus in Reykjavík makes it possible that *Colopha compressa,* which has been found on roots of Carex (Hille Ris Lambers 1955), may be host-alternating in Iceland. More doubtful, but not quite excluded is the migration of *Brachycaudus helichrysi* and *Rhopalosiphum padi.*

All three *Cavariella* spp. have been found both on Salix and on Umbelliferae. Thus the 1961 collection confirmed their suggested migration.

Hyperomyzella rhinanthi may go from Ribes to Rhinanthus and vice versa according to Prior & Stroyan, but it may also — at least in certain years — stay on Ribes all the summer producing oviparous females in the end of the summer according to my observations in August, 1961.

Cryptomyzus galeopsidis is in Denmark and other European countries represented by one migrating and two non-migrating subspecies, and only the non-migrating subspecies are known from Iceland with certainty.

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