

MUSEUM RERUM NATURALIUM REYKJAVIKENSIS
NÁTTÚRUGRIPASAFNIÐ Í REYKJAVÍK

*Notes on
the Vegetation of Árskógsströnd
North Iceland*

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WITH 1 FIGURE IN THE TEXT

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Árskógsströnd is situated on the west coast of Eyjafjörður, between Svarfaðardalur and Galmarströnd. Its geographical position is about 66° 55' N. lat. and 18° 40' W. long. On the north side the district is separated from Svarfaðardalur by Hámundarstaðaháls, the southern boundaries being Kötlufjall and Hillur, that stretch into the sea in rocky projections. North of Hillur there are low ridges near the sea, and farther north there are two pretty high capes Birnunesborgir and Fagurhöfði. Between the capes and ridges and farther inland there is considerable lowland with patches of moor, grass mo and dwarf shrub mo. To the west the boundaries of this lowland are mountains of ca. 900 m height, which are broken by the valley Þorvaldsdalur.

Árskógsströnd faces north and north-east and has more snowfall and more severe winters than up the fjord. Cold winds from the sea blow there frequently, stunting the vegetation. There is no meteorological station in Árskógsströnd. The nearest station is at Möðruvellir in Hörgárdalur, situated ca. 10 km. farther up the fjord. The climatic conditions there are shown in Table 1.

Table 1.

The climatic conditions at Möðruvellir in Hörgárdalur.

	January	February	March	April	May	June	July	August	September	October	November	December	The year
Mean temp. °C	+3.4	+3.7	+3.4	0.1	4.6	9.1	10.3	8.9	6.6	2.2	+1.3	+2.9	2.3
Mean precipitation in mm.	34	29	27	26	24	23	22	25	29	28	30	39	336
Hours of sunshine (Akureyri)	5.8	32.7	89.5	125.4	179.2	147.3	181.9	115.9	94.1	44.9	20.6	0.3	1037.6

The precipitation is undoubtedly greater and the mean temperature a little lower on Árskógsströnd than at Möðruvellir, especially in winter. There is by far most vegetation in the sheltered places, which in winter are covered by snow. In places exposed to the wind, mountain vegetation is observed right down to the sea, but on the other hand sheltered spots in the mountains have much vegetation, especially where there is sufficient moisture. Winds and snow cover have thus great influence on the vegetation.

The chief plant formations in the lowland are moor (mýri) and dwarf shrub mo (Betula nana — Empetrum — Vaccinium — mo). Let us take here as an example of the dwarf shrub mo the Litla-Árskógsmóar, which were formerly overgrown with birch copse-wood. There I measured the distribution of the species according to Raunkiær's method (see table 2). The number 100 means that the species has been found in all 10 localities examined. Each locality is $\frac{1}{10} \text{ m}^2$.

Table 2.

Distribution of the Species in Litla-Árskógsmóar (in %)

Betula nana	100	Juncus trifidus	20
Vaccinium uliginosum	100	Selaginella selaginoides	20
Empetrum nigrum	100	Alchemilla alpina	20
Calluna vulgaris	80	Poa glauca	20
Kobresia Bellardi	80	Salix glauca	20
Anthoxanthum odoratum	70	Parnassia palustris	20
Luzula multiflora	60	Galium pumilum	20
Polygonum viviparum	60	Galium verum	20
Luzula spicata	40	Festuca ovina	10
Festuca rubra	40	Cerastium cæspitosum	10
Salix herbacea	40	Equisetum hyemale	10
Dryas octopetala	30	Juncus balticus	10
Equisetum variegatum	20	Coeloglossum viride	10
Deschampsia cæspitosa	20	Armeria vulgaris	10
Agrostis tenuis	20	Sagina nodosa	10
Carex rigida	20	Thymus Serpyllum	10
Tofieldia palustris	20	Euphrasia frigida	10
Pinguicula vulgaris	20	Erigeron borealis	10

Most conspicuous in this formation is Betula nana (CH A2). This species together with Vaccinium uliginosum (Ch E4) and Calluna vulgaris (CH E2) grow especially on the sides of the knolls. On the

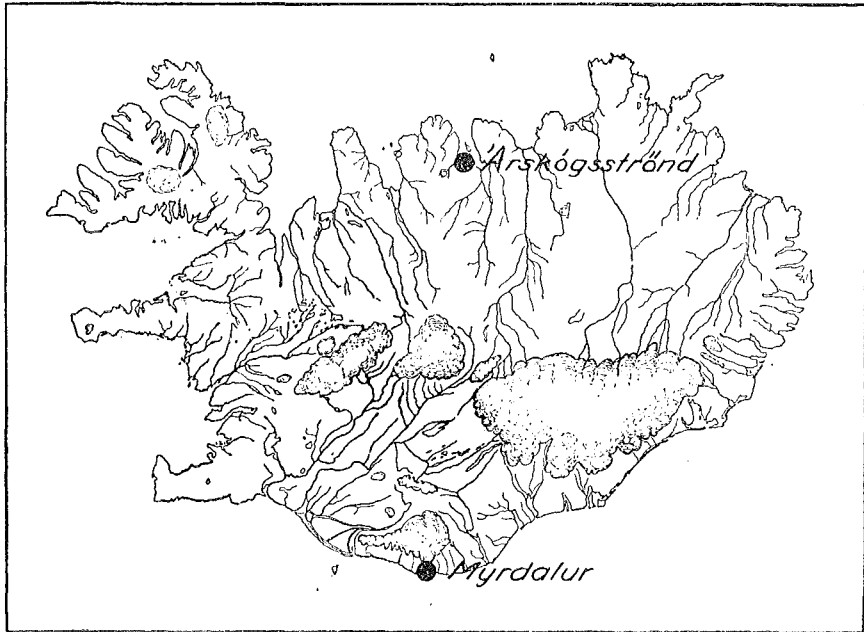


Fig. 1. — Map of Iceland showing the situation of Árskógsströnd and Mýrdalur.

tops of the knolls *Empetrum nigrum* (CH E4) and *Kobresia Bellardi* (H A3) are dominant, but in the hollows between the knolls *Anthoxanthum odoratum* (H E3) and *Luzula multiflora* ((H E3) are most noticeable. The mo consists of great knolls and the species are grouped in three Zones: Chamaephytes and Hemicryptophytes occur in equal quantities at the top of the knolls, Chamaephytes on the sides, and Hemicryptophytes between the knolls. The A group predominates at the top, but the E group in the hollows, where there is most shelter and moisture.

In many places in the dwarf shrub mo (in Árskógsströnd) *Betula nana* is absent. *Vaccinium uliginosum* and *Empetrum nigrum* are then predominating side by side, but sometimes only one of them. Then *Empetrum* is often predominating in the most exposed places with least snow cover, for instance on elevated banks near the sea. Patches of *Calluna vulgaris* also occur here and there in the dwarf shrub mo.

Grass mo is also frequently found in the lowland. There *Deschampsia cæspitosa* (H E2) is dominant, and *Agrostis tenuis* (H E2), *Poa*

pratensis (G E4) and *Festuca rubra* (H E4) subdominating. This is the formation of the Hemicryptophytes and of the southern species (E). The same species are also the main species in the old home fields. But in more arid and barren places brownish spots are common, where *Kobresia Bellardi* (H A3), *Juncus trifidus* (H A2) and *Carex rigida* (G A3) predominate.

Along the coast dry areas are often overgrown with *Festuca ovina* (H E4), *Leontodon autumnalis* (H E3), *Armeria vulgaris* (Ch A3), *Polygonum viviparum* (G A3) and *Rhinanthus minor* (Th E2). Mounds with the same kind of vegetation are also found in the home fields. This is a mixture of life forms and species groups.

Moors (mýri) cover considerable areas in Árskógsströnd. They are mossy and boggy and usually a little sloping and somewhat knolly. Let us take as an example *Búðarmýri* down by the sea at Hámundarstaðir (see table 3).

Table 3.

Distribution of the Species in Búðarmýri (in %)

<i>Carex Goodenoughii</i>	100	X <i>Festuca rubra</i>	30
X <i>Equisetum palustre</i>	100	<i>Parnassia palustris</i>	30
X <i>Carex capillaris</i>	70	.. <i>Eriophorum angustifolium</i> ..	20
<i>Scirpus caespitosus</i>	70	<i>Eriophorum Scheuchzeri</i>	20
<i>Vaccinium uliginosum</i>	60	<i>Carex vaginata</i>	20
<i>Menyanthes trifoliata</i>	60	X <i>Empetrum nigrum</i>	20
X <i>Thalictrum alpinum</i>	60	<i>Triglochin palustris</i>	20
X <i>Polygonum viviparum</i>	60	X <i>Salix glauca</i>	20
<i>Carex chordorrhiza</i>	50	<i>Epilobium palustre</i>	20
<i>Comarum palustre</i>	50	<i>Equisetum fluviatile</i>	20
X <i>Selaginella selaginoides</i>	50	X <i>Galium verum</i>	20
X <i>Tofieldia palustris</i>	40	<i>Juncus alpinus</i>	20
<i>Carex rariflora</i>	40	X <i>Coeloglossum viride</i>	10
<i>Pinguicula vulgaris</i>	30	<i>Cardamine pratensis</i>	10
X <i>Luzula multilora</i>	30	X <i>Vaccinium microcarpus</i>	10

The most predominant species in the moor are *Carex Goodenoughii* (G E3) and *Equisetum palustre* (G E2). *C. Goodenoughii* grows between and on the sides of the knolls, but *E. palustre* on the top. The species marked X grow almost exclusively on the knolls, but the others mainly between and in the lower parts of the knolls. This is due to difference in moisture and snow cover.

On the swampiest spots Geophytes are predominant, especially *Eriophorum angustifolium* (G E4), *Carex rariflora* (G A2), *Carex chordorrhiza* (G A1) and in some places *Carex saxatilis* (G A3). Such swampy, plane spots are rather frequent in Árskógsströnd. There *Betula nana* often grows on the knolls leaving its impress on the vegetation. *Carex Lyngbyei* covers small spots here and there in the moor formation but it is absent in great areas.

Where shallow water is standing in pools during the first half of the summer *Ranunculus reptans*, *Ranunculus hyperboreus*, *Subularia aquatica* and *Veronica scutellata* occur frequently. These pools usually dry up during the latter part of the summer.

Ponds occur rarely and aquatic vegetation is poor. *Carex Lyngbyei* and *Carex inflata* often form a fringe of vegetation along the banks, but farther out in the ponds we find *Hippuris vulgaris*, *Equisetum fluviatile*, *Potamogeton alpinus*, *Sparganium hyperboreum* and *Ranunculus trichophyllus*.

On the border line between moor (mýri) and mo conspicuous brownish spots are frequently observed, where *Juncus balticus* (G A1) grows in great quantities. In such places, small clayey flats frequently occur with sparse vegetation of *Juncus triglumis* (H A3), *Koenigia islandica* (Th A3) and *Sedum villosum* (H A2) as a dominant species (A, H and Th vegetation).

The coast is mostly steep and rocky and the beach covered with big stones. Yet small sandy creeks are here and there. The strand vegetation is very monotonous. Only three species grow exclusively along the beach, i. e. *Mertensia maritima* (H A3), *Atriplex glabriuscula* (Th E3) and *Minuartia peploides* (H E4). The sea cliffs are the habitat of *Cochlearia officinalis* (H E4).

By far the most extensive plant formations in the lowland are as above mentioned the moor and mo formations. In the tables 4 and 5 a comparison is made between the life forms and species groups in Búðarmýri and Litla-Árskógsmóar. As to the species groups Møhlholm Hansen's method is employed (Studies on the Vegetation of Iceland. Copenhagen 1930).

Table 4.

Distribution of the Life Forms in Búðarmýri and Litla-Árskógsmóar (in %).

	Ch	H	G	HH	Th
Búðarmýri	16.67	43.33	26.67	13.33	0
Litla-Árskógsmóar	33.33	52.78	11.11	0	2.78

Table 5.¹⁾

Distribution of the Species Groups in Búðarmýri and Litla-Árskógsmóar (in %).

	A Group	E Group	A 3	A 2	A 1	E 4	E 3	E 2	E 1
Búðarmýri	36.67	63.33	36.36	27.27	36.36	52.63	26.32	15.79	5.26
Litla-Árskógsmóar	52.78	47.22	47.37	31.58	21.05	35.29	29.41	23.53	11.76

The tables show a distinct difference between mo and moor. The mo has a great number of species and the arctic species have a higher percentage than in the moor. In the mo H and Ch are the most conspicuous life forms. Sheets of ice protect the moor a good deal against the cold in winter and in early spring, when the weather is changeable and unfavourable to the vegetation. Therefore the European species (E) have a higher percentage in the moor than in the mo, where there are considerably greater fluctuations in temperature and moisture. Yet the most southern group E 1 is almost entirely absent in the moor, which has comparatively cool soil in summer. H and G are the most common life forms in the moor. Th is absent. E

1)

A 3. Arctic Species common in North Greenland north of 76° N.

A 2. Arctic Species whose Northern limit in West Greenland lies between 66° and 76° N.

A 1. Arctic-Subarctic Species whose Northern limit in West Greenland lies between 60° and 66° N.

E 4. European Species whose Northern Limit in West Greenland lies north of 66° N.

E. 4. European Species whose Northern Limit in West Greenland lies between 60° and 66° N.

E 2. European Species absent from Greenland but without any Northern Limit in Scandinavia.

E 1. European Species with a distinct Northern Limit in Scandinavia.

4 is the most common species group in the moor, but A 3 in the mo. In winter the tops of the knolls in the mo are frequently lightly covered by snow, and in summer they are getting very dry. Therefore the conditions are most unfavourable to vegetation here.

In the tables 6 and 7 the difference is shown between the lowland moor Búðarmýri and another moor (Stóri Hjalli) situated 300 m higher.

Table 6.

Distribution of the Life Forms in Búðarmýri and Stóri Hjalli (in %).

	Ch	H	G	HH
Búðarmýri	16.67	43.43	26.67	13.33
Stóri Hjalli	33.33	8.33	41.67	16.67

Table 7.

Distribution of the Species Groups in Búðarmýri and Stóri Hjalli (in %)

	A Group	E Group	A 3	A 2	A 1	E 4	E 3	E 2	E 1
Búðarmýri	36.67	63.33	36.36	27.27	36.36	52.63	26.32	15.79	5.26
Stóri Hjalli	50.0	50.0	66.66	16.67	16.67	66.66	16.67	16.67	0

Table 8.

Distribution of the Species in Stóri Hjalli (in %).

Carex Godenoughii	100	Salix herbacea	40
Carex rariflora	100	Vaccinium uliginosum	40
Eriophorum angustifolium	80	Comarum palustre	40
Equisetum palustre	60	Eriophorum Scheuchzeri	20
Salix glauca	60	Empetrum nigrum	20
Polygonum viviparum	60	Epilobium Hornemanni	10

The tables show a great difference between the lowland moor Búðarmýri and the moor in Stóri Hjalli. The number of species has fallen from 30 in the lowland moor to 12 in the moor, situated 300 m higher. There the soil is more mossy and the vegetation more sparse. Carex rariflora takes here the place of Equisetum palustre as second in predominance. The northern (arctic) species are comparatively much increasing but the southern (European) ones are

decreasing to the same extent. E 4 is the most common species group in the lowland moor, but E 4 and A 3 are equally predominant in the higher situated moor, where E 1 has completely disappeared. Ch and G are comparatively increasing and are the most common life forms in 300 m. height, but H is decreasing.

We have now described the main vegetation formations in the lowland of Árskógsströnd besides the moor in Stóri Hjalli. In table 9 there is a systematic list of the Phanerogamae and Pteridophyta found in Árskógsströnd, both in the lowland and at higher levels. In the lowland (0—100 m.) and in Hámundarstaðahlíð and Krossafjall in 400, 600 and 900 m. height the species were counted, to study the influence of height above sea level on the vegetation with a view to life forms and species groups.

The slopes of Hámundarstaðahlíð and Krossafjall are facing the east and they are rather steep. In the lower parts of the slopes occur dwarf shrub mo, sloping moors and grassy hollows as in the lowland. Snow often covers the hollows for a long time. These snow patches have a characteristic vegetation. The slopes of the hollows are usually overgrown with *Vaccinium Myrtillus* (Ch E2) or *Nardus stricta* (H E3). Other common species in the hollows are *Alchemilla minor* (H E4), *Alchemilla alpina* (H A2), *Anthoxanthum odoratum* (H E3) and *Hierochloë odorata* (G E2). The bottom of the hollows is usually without knolls. In deep hollows or in hollows high up in the mountains *Salix herbacea* (Ch A3), *Sibbaldia procumbens* (H A2) and *Gnaphalium supinum* (Ch A2) are predominant species. Along the upper margin of the hollows a fringe of *Vaccinium uliginosum*, *Salix glauca* and *Empetrum nigrum* is frequently observed.

Vegetation around cold springs is conspicuous in many places in the slopes and at the base of the mountains. Mosses, especially *Philotis fontana* and *Mniobryum albicans*, give the spots around the cold springs a light green colour, so that they are discernible at a long distance. Some Phanerogamae are growing scattered in the moss, especially *Cerastium Cerastoides* (Ch A2), *Montia lamprosperma* (Th — HH E4), *Epilobium alsinifolium* (H A1) and *Saxifraga stellaris* (H A3). The cold springs have a rather even temperature all the year round.

Higher up the mountain slopes the vegetation grows more scanty. The plants grow there in stripes along brooks and in hollows. At the height of 400 m there is still much continuous vegetation, where

landslips have not ruined it. There the number of species is 101 as against 212 in the lowland. At 600 m height the number of species is 75. The vegetation is not continuous any longer being of arctic character. But still there occur patches of luxuriant vegetation in suitable localities. On the top of Krossafjall at the height of 900 m there are only found tufts of vegetation among the stones, the physiognomy of the country being much more determined by bare rocks than vegetation. The weather here is very stormy and characterized by much fluctuating temperatures. At this height only 34 species were observed.

Table 9.

Systematic list of the Phanerogamae and Pteridophyta found in Árskógsströnd in the lowland (0—100 m) and in 400, 600 and 900 m height above sea level.

		0-100 m	400 m	600 m	900 m
Ophioglossaceae					
1.	<i>Botrychium Lunaria</i>	H E4	×	×	×
Polypodiaceae					
2.	<i>Cystopteris fragilis</i>	H E4	×	×	×
3.	<i>Polystichum Lonchitis</i>	H A1	×	×	×
4.	<i>Dryopteris Linnaeana</i>	G E3	×		
Equisetaceae					
5.	<i>Equisetum arvense</i>	G E4	×	×	
6.	„ <i>pratense</i>	G E4	×	×	×
7.	„ <i>palustre</i>	G E2	×	×	
8.	„ <i>variegatum</i>	H A3	×	×	
9.	„ <i>hyemale</i>	H E3	×	×	×
10.	„ <i>fluviatile</i>	HH E2	×		
Lycopodiaceae					
11.	<i>Lycopodium Selago</i>	Ch E4	×	×	×
12.	„ <i>annotinum</i>	Ch E4	×	×	
13.	„ <i>alpinum</i>	Ch A2	(X) ¹	×	×
Selaginellaceae					
14.	<i>Selaginella Selaginoides</i>	Ch A1	×	×	

1) A cross between brackets (X) means that the species is rarely met with below 100 m height above sea level.

Table 9 (continued).

		0-100 m	400 m	600 m	900 m
Cupressaceae					
15.	<i>Juniperus communis</i>	Ch E4	×		
Juncaginaceae					
16.	<i>Triglochin palustre</i>	G E4	×		
Potamogetonaceae					
17.	<i>Potamogeton alpinus</i>	HH E4	×		
18.	„ <i>gramineus</i>	HH E2	×		
Juncaceae					
19.	<i>Juncus balticus</i>	G A1	×		
20.	„ <i>filiformis</i>	G E3	×		
21.	„ <i>triglumis</i>	H A3	×	×	
22.	„ <i>trifidus</i>	H A2	×	×	×
23.	„ <i>biglumis</i>	H A3	×		
24.	„ <i>nodulosus</i>	H E3	×		
25.	<i>Luzula spicata</i>	H A2	×	×	×
26.	„ <i>multiflora</i>	H E3	×	×	
27.	„ <i>arcuata</i>	H A3	(×)	×	×
Cyperaceae					
28.	<i>Eriophorum Scheuchzeri</i>	G A3	×	×	
29.	„ <i>angustifolium</i>	G E4	×	×	
30.	<i>Scirpus caespitosus</i>	H E4	×		
31.	„ <i>pauciflorus</i>	H E3	×		
32.	<i>Kobresia Bellardi</i>	H A3	×	×	
33.	<i>Carex dioica</i>	G E4	×		
34.	„ <i>capitata</i>	H A2	×		
35.	„ <i>microglochin</i>	G A2	×		
36.	„ <i>chordorrhiza</i>	G A1	×		
37.	„ <i>echinata</i>	H E1	×		
38.	„ <i>Macloviana</i>	G A2	×		
39.	„ <i>canescens</i>	H E4	×		
40.	„ <i>Lachenalii</i>	H A2		×	×
41.	„ <i>glareosa</i>	H A3	×		
42.	„ <i>Halleri</i>	H A2	×	×	
43.	„ <i>atrata</i>	H A1	×	×	
44.	„ <i>capillaris</i>	H A3	×		
45.	„ <i>glacialis</i>	H A3	(×)		×
46.	„ <i>panicea</i>	G E3	×		
47.	„ <i>vaginata</i>	G A1	×		
48.	„ <i>rariflora</i>	G A2	×	×	

Table 9 (continued).

		0-100 m	400 m	600 m	900 m
49.	„ inflata	HH E3	×		
50.	„ saxatilis	G A3	×		
51.	„ Goodenoughii	G E3	×	×	
52.	„ Lyngbyei	HHG E3	×		
53.	„ rigida	G A3	×	×	
Gramineae					
54.	Nardus stricta	H E3	×	×	
55.	Elymus arenarius	G E4	×		
56.	Anthoxanthum odoratum	H E3	×		
57.	Alopecurus aequalis	H E4	×		
58.	„ geniculatus	H E2	×		
59.	Phleum alpinum	H A2	×	×	
60.	Poa annua	Th E3	×		
61.	„ nemoralis	H E3	×		
62.	„ glauca	H A3	×	×	×
63.	„ alpina	H A2	×	×	×
64.	„ pratensis	G E4	×		
65.	„ trivialis	H E2	×		
66.	Catabrosa aquatica	H E3	×		
67.	Puccinellia retroflexa	H E4	×		
68.	Festuca rubra	H E4	×		
69.	„ ovina	H E4	×	×	×
70.	Trisetum spicatum	H A3	×		
71.	Deschampsia caespitosa	H E2	×		
72.	„ alpina	H A2	×	×	×
73.	„ flexuosa	H E3	×		
74.	Hierochloë odorata	G E2	×		
75.	Calamagrostis neglecta	H E4	×		
76.	Agrostis canina	H E3	×	×	
77.	„ tenuis	H E2	×	×	×
78.	„ stolonifera	H E3	×		
Sparganiaceae					
79.	Sparganium hyperboreum	HH A2	×		
Colchicaceae					
80.	Tofieldia palustris	H A2	×	×	
Orchidaceae					
81.	Habenaria hyperborea	G E3	×		
82.	Coeloglossum viride	G A1	×		
83.	Leucorchis albidus	G E4	×		

Table 9 (continued).

		m 0-100	m 400	m 600	m 900
84. <i>Corallorhiza trifida</i>	G A2	×			
Salicaceae					
85. <i>Salix glauca</i>	Ch A3	×	×	×	×
86. „ <i>lanata</i>	Ch A1	×			
87. „ <i>phylicifolia</i>	Ph A1	×			
88. „ <i>herbacea</i>	Ch A3	×	×	×	×
Betulaceae					
89. <i>Betula nana</i>	Ch A2	×	×	×	
90. „ <i>pubescens</i>	Ph E3	×			
Polygonaceae					
91. <i>Rumex acetosa</i>	H E3	×	×	×	
92. „ <i>domesticus</i>	H E3	×			
93. <i>Koenigia islandica</i>	Th A3	×			
94. <i>Polygonum viviparum</i>	G A3	×	×	×	×
95. „ <i>aviculare</i>	Th E4	×			
96. <i>Oxyria digyna</i>	H A3	×	×	×	×
Alsiniaceae					
97. <i>Stellaria media</i>	Th E4	×			
98. „ <i>crassifolia</i>	H A1	×			
99. <i>Cerastium olpinum</i>	Ch A3	×	×	×	×
100. „ <i>caespitosum</i>	Ch E3	×	×	×	
101. „ <i>Cerastoides</i>	Ch A2	×	×		
102. <i>Minuartia peploides</i>	H E4	×			
103. „ <i>rubella</i>	Ch A3	×	×	×	
104. <i>Minuartia biflora</i>	Ch A3 (X)	×	×	×	×
105. <i>Arenaria norvegica</i>	Ch A3	×	×		
106. <i>Sagina procumbens</i>	Ch(-H) E3	×			
107. „ <i>saginoides</i>	Ch A1	×			
108. „ <i>nodosa</i>	H E3	×			
Silenaceae					
109. <i>Silene maritima</i>	H(-Ch) A1	×			
110. „ <i>acaulis</i>	Ch A3	×	×	×	×
111. <i>Viscaria alpina</i>	H A2	×	×		
Chenopodiaceae					
112. <i>Atriplex glabriuscula</i>	Th E3	×			
Portulacaceae					
113. <i>Montia lamprosperma</i>	Th-HH E4	×			

Table 9 (continued).

		0-100	400	600	900
		m	m	m	m
Ranunculaceae					
114.	<i>Ranunculus acer</i>	H E4	×	×	
115.	„ <i>pygmaeus</i>	H A3 (×)	×	×	×
116.	„ <i>hyperborus</i>	H-HH A3	×		
117.	„ <i>reptans</i>	H-HH E4	×		
118.	„ <i>glacialis</i>	H A3	×	×	×
119.	„ <i>trichophyllus</i>	HH E4	×		
120.	<i>Caltha palustris</i>	H E2	×		
121.	<i>Thalictrum alpinum</i>	H A2	×	×	×
Cruciferae					
122.	<i>Erophila verna</i>	Th E1	×		
123.	<i>Draba incana</i>	H A2	×		
124.	„ <i>nivalis</i>	Ch A3	×	×	×
125.	„ <i>rupestris</i>	Ch A1	×	×	
126.	<i>Cochleria officinalis</i>	H E4	×		
127.	<i>Subularia officinalis</i>	Th E3	×		
128.	<i>Capsella Bursa-pastoris</i>	Th E3	×		
129.	<i>Rorippa islandica</i>	H-Th E4	×		
130.	<i>Cardamine pratensis</i>	H E4	×		
131.	<i>Arabis alpina</i>	Ch(-H) A2	×	×	
132.	<i>Cardaminopsis hispida</i>	Ch A1	×	×	×
Violaceae					
133.	<i>Viola palustris</i>	H E3	×		
134.	„ <i>canina</i>	H E3	×		
135.	„ <i>tricolor</i>	Th E1	×		
Geraniaceae					
136.	<i>Geranium sylvaticum</i>	H E3	×		
Callitrichaceae					
137.	<i>Callitriche hamulata</i>	HH E3	×		
138.	„ <i>verna</i>	HH E4	×		
Empetraceae					
139.	<i>Empetrum nigrum</i>	Ch E4	×	×	×
Crassulaceae					
140.	<i>Sedum acre</i>	Ch E1	×	×	
141.	„ <i>annuum</i>	Th (-H) A1	×		
142.	„ <i>villosum</i>	H A2	×		
143.	„ <i>rosea</i>	H A2	×	×	

Table 9 (continued).

		0-100	400	600	900
		m	m	m	m
Saxifragaceae					
144.	<i>Saxifraga caespitosa</i>	Ch A3	×	×	
145.	„ <i>hypnoides</i>	Ch A1	×	×	
146.	„ <i>cernua</i>	H A3	×	×	×
147.	„ <i>rivularis</i>	H A3	×	×	
148.	„ <i>oppositifolia</i>	Ch A3	×	×	×
149.	„ <i>nivalis</i>	H A3	×	×	×
150.	„ <i>stellaris</i>	H A3	×		
151.	<i>Parnassia palustris</i>	H E2	×		
Rosaceae					
152.	<i>Geum rivale</i>	H E2	×		
153.	<i>Potentilla Crantzii</i>	H A2	×	×	×
154.	„ <i>anserina</i>	H E4	×		
155.	<i>Comarum palustre</i>	H-HH E4	×		
156.	<i>Sibbaldia procumbens</i>	H-(Ch) A2	×	×	×
157.	<i>Alchemilla alpina</i>	H(-Ch) A2	×	×	
158.	<i>Alchemilla minor</i>	H E4	×	×	
159.	<i>Rubus saxatilis</i>	H E3	×		
160.	<i>Dryas octopetala</i>	Ch A3	×	×	×
Papilionaceae					
161.	<i>Trifolium repens</i>	H E2	×		
Oenotheraceae					
162.	<i>Chamaenerion latifolium</i>	H A3	×		
163.	<i>Epilobium palustre</i>	H E3	×		
164.	„ <i>alsinifolium</i>	H A1	×		
165.	„ <i>Hornemanni</i>	H A1	×	×	
166.	„ <i>collinum</i>	H E1	×	×	
167.	„ <i>anagallidifolium</i>	H A2	(×)	×	
168.	„ <i>lactiflorum</i>	H A2	×		
Haloragidaceae					
169.	<i>Hippuris vulgaris</i>	HH E4	×		
Umbelliferae					
170.	<i>Archangelica officinalis</i>	H A2	×		
Pyrolaceae					
171.	<i>Pyrola minor</i>	H E4	×	×	

Table 9 (continued).

		0-100 m	400 m	600 m	900 m
Ericaceae					
172.	<i>Calluna vulgaris</i>	Ch E2	×		
173.	<i>Cassiope hypnoides</i>	Ch A2	×	×	×
Rhodoraceae					
174.	<i>Loiseleuria procumbens</i>	Ch A2	×	×	
175.	<i>Phyllodoce coerulea</i>	Ch A2	×	×	
Vacciniaceae					
176.	<i>Vaccinium Myrtillus</i>	Ch E2	×		
177.	„ <i>uliginosum</i>	Ch E4	×	×	
178.	„ <i>microcarpus</i>	Ch E3	×		
Primulaceae					
179.	<i>Primula stricta</i>	H A1	×		
Plumbaginaceae					
180.	<i>Armeria vulgaris</i>	H-Ch A3	×	×	×
Scrophulariaceae					
181.	<i>Rhinanthus minor</i>	Th E2	×		
182.	<i>Bartsia alpina</i>	H A2	×	×	
183.	<i>Euphrasia frigida</i>	Th A2	×		
184.	<i>Pedicularis flammea</i>	H A3	(×)	×	×
185.	<i>Veronica serpyllifolia</i>	H E2	×		
186.	„ <i>alpina</i>	H A2	×	×	×
187.	„ <i>fruticans</i>	Ch A2	×	×	
188.	„ <i>scutellata</i>	H E2	×		
Utriculariaceae					
189.	<i>Pinguicula vulgaris</i>	H E4	×		
Plantaginaceae					
190.	<i>Plantago maritima</i>	H E4	×		
Boraginaceae					
191.	<i>Myosotis arvensis</i>	H-Th E2	×		
192.	<i>Mertensia maritima</i>	H A3	×		
Labiatae					
193.	<i>Thymus Serpyllum</i>	Ch E4	×	×	×
Gentianaceae					
194.	<i>Gentiana campestris</i>	H E1	×		
195.	„ <i>Amarella</i>	H E2	×		
196.	„ <i>tenella</i>	(H)-Th A2	×	×	×

Table 9 (continued).

			0-100 m	400 m	600 m	900 m	
197.	„	<i>nivalis</i>	(H)-Th A2	×	×		
198.	„	<i>detonsa</i>	(H)-Th A2	×			
199.	„	<i>aurea</i>	(H)-Th A1	×			
200.		<i>Menyanthes trifoliata</i>	HH E4	×			
Rubiaceae							
201.		<i>Galium verum</i>	H E1	×			
202.	„	<i>pumilum</i>	H E1	×	×		
203.	„	<i>trifidum</i>	H A1	×			
Compositae							
204.		<i>Gnaphalium supinum</i>	Ch A2	×	×		
205.	„	<i>norvegicum</i>	H A2	×			
206.		<i>Achillea millefolium</i>	H E3	×			
207.		<i>Matricaria inodora</i>	H E3	×			
208.		<i>Erigeron borealis</i>	H A1	×	×		
209.	„	<i>uniflorus</i>	H A3		×	×	
210.		<i>Leontodon autumnalis</i>	H E3	×			
211.		<i>Taraxacum acromaurum</i>	H E2	×	×	×	
212.	„	<i>croceum</i>	H A2	×	×		
213.		<i>Hieracium islandicum</i>	H A1	×			
214.	„	<i>alpinum</i>	H A2	×	×		
Number of species				212	101	75	34

Table 10.

Distribution of the Life Forms in Árskógsströnd (in %).

	Ph	Ch	H	G	HH	Th
Lowland (0-100)	0.94	17.93	53.30	12.74	6.60	8.49
400 m.	0	32.67	56.44	8.91	0	1.98
600 —	0	37.33	57.34	4.00	0	1.33
900 —	0	38.24	58.82	2.94	0	0

Table 10 shows that H increases steadily with increasing height above sea level. Ch increases rapidly from the lowland up to the height of 400 m., but then more slowly. G and Th decrease with increasing height and Ph and HH are only found in the lowland. The absence of ponds at higher levels probably causes the disappearance of HH there rather than the climate. The scarcity of Ph in the lowland and its absence at higher levels is probably for the most part due to intensive sheep grazing.

Table 11.

Distribution of the Species Groups in Árskógsströnd (in %).

	A Group	E Group	A 3	A 2	A 1	E 4	E 3	E 2	E 1
Lowland (0—100 m.)	48.58	51.42	35.92	41.75	22.33	38.53	34.86	19.27	7.34
400 m.	68.32	31.68	42.03	46.38	11.59	46.87	25.00	15.63	12.50
600 —	73.33	26.67	45.45	45.45	9.09	50.00	25.00	15.00	10.00
900 —	79.41	20.59	66.67	29.63	3.70	57.14	14.29	28.57	0

Table 11 shows distinctly how the Arctic species (A) increase proportionally with increasing height above sea level, and how the European species (E) decrease correspondingly. In the A group A2 is most conspicuous in the lowland and up to 400 m. height. At the height of 600 m. A3 has the same percentage as A2, and at the height of 900 m. A3 has become predominant. In the E group E4 is prevailing everywhere, but increases proportionally from the lowland up to the top of that mountains. E3 comes next to E4, and has almost the same percentage as E4 in the lowland. At the height of 400—600 m. E3 is decreasing and at 900 m. height it is surpassed by E2. Of all the species groups A2 and E4 are most predominant in the lowland and up to the height of 600 m, but above 600 m A3 and E4 become prevailing. At the height of 600—900 m. we have practically reached the arctic zone as to the vegetation, and in some places already at the height of 400 m.

Finally in table 12 a comparison is made between *Árskógsströnd* in the north and *Mýrdalur*, the most southern part of Iceland, as to life forms and the two main species groups of the vegetation. The life forms and the two main species groups of the vegetation in the whole of Iceland are also included in the table. As to the genera *Taraxacum* and *Hieracium* only the species dealt with by Mølholm Hansen in his "Studies on the Vegetation of Iceland" are here taken into consideration.

Table 12.

Distribution of the Life Forms and the two main Species Groups in Árskógsströnd, Mýrdalur and the whole of Iceland (in %).

	Ph	Ch	H	G	HH	Th	A Group	E Group
Árskógsströnd	0.94	17.93	53.30	12.74	6.60	8.49	48.58	51.42
Mýrdalur	0.60	16.00	51.50	16.20	6.90	8.80	36.00	64.00
The whole of Iceland	1.47	13.76	50.86	12.29	9.09	12.53	40.05	59.95

As might be expected the vegetation in Mýrdalur has not only considerably more southern character than the vegetation in Árskógsströnd, but also more southern character than the vegetation of Iceland taken as a whole. In Mýrdalur the percentage of the European species (E) is 64.00, in the whole of Iceland 59.95 and in Árskógsströnd 51.42. Consequently the percentage of the Arctic species (A) is 36.00 in Mýrdalur, 40.05 in the whole of Iceland and 48.58 in Árskógsströnd. The comparatively high percentage of the life form G in Mýrdalur is due to the great extent of the moor formation there.

Yet the difference between the vegetation of southern and northern Iceland is of course not nearly so great as that between the lowland and mountain vegetation of the same district.