

The Possible Oceanic Dispersal of Seed  
and Other Plant Parts to Surtsey

by

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Seed and other parts of vascular plants have been observed among the debris constantly being washed ashore on Surtsey. These plant parts are mostly of coastal species, nine of which have been found growing on the smaller neighbouring islands. All parts that could be identified are of species found growing on Heimaey as well as the mainland of Iceland. The various plant parts are listed in Table I. The records are based on the author's findings as well as those of Einarsson (1965).

Some of these plant fragments have been collected to test their viability after their apparent immersion in salt water, (see also Einarsson, this report).

A laboratory experiment with freshly collected seed immersed in sea water for different length of time allows the suggestion that seeds of some of these species could keep their germinating ability after oceanic dispersal.

This experiment was performed in order to determine for how long seeds of some Icelandic plants could survive in sea water.

Seeds from three coastal plants and three Arctic plants were collected. The seeds were stored in covered glass flasks containing sea water at 2°C. At regular time intervals 25 seeds were removed from each flask, washed in fresh water and their germination ability tested. (See Table II).

It should be noted that the seed of all the coastal species had not fully entered dormancy when this experiment was started. Their germination ability was therefore low during the first weeks but increased gradually as time advanced.

At the end of a four months' period the effect of the salt water exerted but minor changes on the viability of the seed. At the end of an eight months' period the viability of the seed began to decrease and Cardaminopsis petrea had apparently completely lost its germination ability.

In Table II the salinity of the sea water is recorded in the last column. Salinity has increased slightly from the original 3.09% due to evaporation. The deviation, however, does not exceed that of the ocean surrounding Iceland.

The experiments indicates that seeds of these species can keep their viability immersed in sea water up to 224 days. This time would allow them to be carried by currents great distances even from one continent to another where they could germinate if conditions allowed.

#### BIBLIOGRAPHY

- Fridriksson, Sturla (1964): The Colonization of the Dryland Biota on the Island of Surtsey off the Coast of Iceland. *Náttúrufræðingurinn* 34, p. 83-89.
- Einarsson, Eythór (1965): Report on dispersal of plants to Surtsey. The Surtsey Biology Conference, Proceedings, p. 19-21.

TABLE I

Species and parts of vascular plants recorded drifted ashore in Surtsey

Species	May 21st-64	Aug. 1st-64	Aug. 19th-64	Oct. 15th-64	Nov. 25th-64	Jan. 21st-65
<i>Alopecurus pratensis</i>				Panicle with seeds		
<i>Angelica archangelica</i>				Old stem		
<i>Anthorantum odoratum</i>				Panicle with seeds		
<i>Atriplex patula</i>			Plant with seeds			
<i>Cakile edentula</i>					4 seeds	
<i>Cochleria officinalis</i>	Plant parts with flowers		One green leaf			
<i>Elymus arenarius</i>	1 seed				1 seed	
<i>Euphrasia</i> sp.				1 inflorescence		
<i>Festuca rubra</i>			Leaves and culms	2 stems and leaves. Panicle		Leaves
<i>Galium boreale</i>				1 stem and leaves		
<i>Ligusticum scotium</i>	3 leaves					
<i>Matricaria maritima</i>	25 leaves Young plant		2 umbels with seed			Leaves
<i>Mertensia maritima</i>				1 plant part		
<i>Poa pratensis</i>	Leaves, stolons	Plant part				
<i>Polygonum viviparum</i>					1 seed	
<i>Sedum rosae</i>	Leaves and stem		Flower stalk	Plant part		
<i>Silene maritima</i>				1 calyx		

TABLE II

Percentage of germinating seed following storage in seawater at 2°C

Species	Number of weeks in sea water						NaCl %
	1 %	2 %	4 %	8 %	16 %	32 %	
<u>Silene acaulis</u>	70.3	100.0	92.1	84.0	57.0	42.3	3.18
<u>Cardaminopsis petrea</u>	83.2	38.4	15.6	52.0	52.0	0.0	3.12
<u>Cerastium alpinum</u>	100.0	91.3	46.7	90.0	90.0	74.0	3.12
<u>Matricaria maritima</u>	6.6	10.0	30.0	24.1	40.0	54.5	3.26
<u>Plantago maritima</u>	5.1	20.0	66.7	72.0	72.0	50.5	2.61
<u>Cakile edentula</u>	0.0	30.0	20.0	60.0	85.4	37.5	3.27