

ADDITIONS TO THE ALIEN FLORA OF SOUTH GEORGIA

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SINCE *Poa annua* was collected near Grytviken in 1902 (Skottsberg, 1905), a total of 27 species of alien vascular plant have been identified from South Georgia (Greene, 1964). Five species were recognized as naturalized and the remainder were classed as transient aliens, although it was pointed out that some of the latter might become naturalized in the future. Data collected by the present author during the 1963-64 season suggest that three additional species should be accepted as naturalized. In addition, five new species, classed as transient aliens, were added to the island's check list. Specimens supporting the new records described in this paper have been deposited in the British Antarctic Survey herbarium at the Department of Botany, University of Birmingham.

TRANSIENT ALIENS

A single plant of *Matricaria matricarioides* (Less.) Porter, one of the five species new to South Georgia, was seen during March 1964 on waste ground by a wharf in the whaling station at Grytviken. The four other new species, *Alchemilla monticola* Opiz, *Anthriscus sylvestris* (L.) Bernh., *Plantago major* L. and *Sagina procumbens* L., were recorded at Husvik during December 1963 and January 1964. Three occurred as single plants on waste ground in the whaling station, but *A. monticola* had formed a mat approximately 40 cm. in diameter on stony ground behind the station. It was growing in almost closed vegetation formed by *Acaena adscendens* and *Phleum alpinum*, and appeared to be competing successfully.

All five species had flowered on South Georgia. Two season's inflorescences were present on *Alchemilla monticola*, *Anthriscus sylvestris* and *Sagina procumbens*. *Matricaria matricarioides* was in flower and *Plantago major* bore a single inflorescence thought to have persisted from the 1962-63 season. No fruits had ripened in the old inflorescences of *P. major* or *S. procumbens*, and in those of *A. sylvestris* only the pedicels remained, so that it could not be determined whether seeds had developed. In *A. monticola*, however, inflorescences formed during the 1962-63 season contained seeds, some of which were successfully germinated under laboratory conditions during July 1964.

Unidentifiable material of a sixth alien species new to South Georgia, probably a species of *Carex*, was collected at Husvik and is under cultivation in Birmingham. The six new species are at present regarded as transient aliens.

It may be noted that of the alien vascular plants previously recorded at Grytviken or Husvik, all except nine species, i.e. *Alopecurus geniculatus*, *Avena fatua*, *Capsella bursa-pastoris*, *Phleum pratense*, *Pisum sativum*, *Senecio vulgaris*, *Thlipsis arvense*, *Urtica urens* and *Veronica persica*, were seen during the 1963-64 season. Most of the latter have only once been recorded in South Georgia and it seems likely that some of them no longer survive on the island.

NATURALIZED ALIENS

During January 1964 a collection of alien vascular plants was made in and around the former whaling station at Ocean Harbour. The station closed in 1920 (Bannister, 1964) and thus the aliens growing there in 1964 are likely to have persisted for at least 40 years. Five of the eight species recorded, i.e. *Cerastium holosteoides*, *Poa annua*, *P. pratensis*, *Ranunculus repens* and *Taraxacum officinale*, were accepted by Greene as naturalized. The remaining three species, *Agrostis tenuis*, *Deschampsia caespitosa* and *Rumex acetosella*, were treated as transient aliens, although all were recorded from at least three other whaling stations. It was also noted that in places the two grasses were competing with natural vegetation, while *Rumex acetosella* had persisted for a number of years at Grytviken, although it had not been seen there since 1958.

In 1964, *Agrostis tenuis* and *Deschampsia caespitosa* were both frequent in the whaling station at Ocean Harbour, where they occurred in grassland with *Poa annua* and *Deschampsia antarctica*, and at Husvik and Grytviken where they occupied waste ground in the stations.

Agrostis tenuis had extended into natural vegetation, occurring in *Rostkovia* bog by an old railway track approximately 0.5 km. from the station at Ocean Harbour, and among *Acaena adscendens* both in the south valley at Husvik, and between King Edward Point and Grytviken. In addition, it was particularly abundant on the slopes south of the station at Grytviken, where it formed numerous circular patches, several metres in diameter, in *Acaena-Tortula* heath. *Deschampsia caespitosa* was also seen in *Acaena-Tortula* heath, notably on the south shores of King Edward Cove.

Rumex acetosella was scattered over open stony ground by a stream near the railway track at Ocean Harbour and had spread into stony *Festuca-Acaena* grassland at an altitude of approximately 75 m. in the valley running south-west from the harbour. It was not seen at Grytviken during the 1963-64 season but it occupied a large area of storm beach near the river mouth south of the station at Husvik.

Agrostis tenuis, *Deschampsia caespitosa* and *Rumex acetosella* have thus shown their ability to survive in South Georgia independently of human settlement and to spread into the island's natural vegetation. They should therefore be regarded as naturalized aliens. Their recorded distribution in 5 km. squares of the South Georgia grid is as follows:

Agrostis tenuis, 115135, 120140, 130120, 145115;

Deschampsia caespitosa, 115135, 130120, 145115;

Rumex acetosella, 115135, 130120, 145115.

During the 1963-64 season further evidence was obtained for the spread of *Taraxacum officinale* from Grytviken, thus confirming its naturalized status. Greene showed that between 1948 and 1961 *T. officinale* had spread around both shores of King Edward Cove from a single locality near the whaling station. In February 1964 the present author saw nine plants of *T. officinale* in *Rostkovia* bog in an inland locality on Hestesletten, approximately 3 km. from the whaling station, while a single plant occurred among *Acaena adscendens* near Gull Lake, at an altitude of approximately 100 m. It was also noted that *Poa annua* was an almost ubiquitous constituent of open *Poa flabellata* communities throughout much of the Cumberland and Stromness Bay areas, and it is clear that *P. annua* is the most successful species of alien vascular plant so far established on South Georgia.

DISCUSSION

Thirty-two species of alien vascular plant have so far been recorded on South Georgia and, in addition to the possible *Carex* species mentioned above, unidentifiable material of at least 13 other species has been collected (Greene, 1964). Thus compared with the 24 native species known from the island, the aliens form a substantial numerical group in the flora. Most, however, are only known from single, usually small, populations confined to waste ground in and around the whaling stations and, in spite of the number of species, the aliens are not yet an important constituent of the vegetation.

Eight species are now classed as naturalized but only four, *Cerastium holosteoides*, *Poa annua*, *P. pratensis* and *Taraxacum officinale*, have yet been recorded more than 1 km. from human settlement. Of the latter, *C. holosteoides*, *P. annua* and *P. pratensis* are widely distributed on other sub-Antarctic islands, while *P. annua* and *P. pratensis* have been recorded from Deception Island in the South Shetland Islands, and *P. pratensis* from the Danco Coast, Graham Land (Greene and Greene, 1963). These species are clearly among the most successful alien plants in Antarctic regions as a whole.

Little effort has so far been made to cultivate plants at the whaling stations in South Georgia and the aliens at present recorded, most of which are widespread in northern Europe, were probably accidentally introduced by British and Norwegian whaling industries. The advent of Japanese whalers to the island led to efforts to grow vegetables and during the 1963-64 season plants were grown under cover at both Grytviken and Leith. In addition, seeds were sown in an open bed at Grytviken during November 1963. Five species germinated and survived in the bed until March 1964, when two species of *Brassica*, including *B. napus* L., were in flower. The continuation of these experiments by the Japanese could lead to an increase in the South Georgian alien flora, with the possibility that some Asiatic species may become established.

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REFERENCES

- BANNISTER, J. L. 1964. Whaling Stations in South Georgia. *Polar Rec.*, **12**, No. 77, 207-09.
GREENE, S. W. 1964. The Vascular Flora of South Georgia. *British Antarctic Survey Scientific Reports*, No. 45, 58 pp.
——— and D. M. GREENE. 1963. Check List of the Sub-Antarctic and Antarctic Vascular Flora. *Polar Rec.*, **11**, No. 73, 411-18.
SKOTTSBERG, C. 1905. Die Gefässpflanzen Südgeorgiens. *Wiss. Ergebn. schwed. Südpolarexped.*, Bd. 4, Lief. 3, 1-12.