

LOMATOGONIUM ROTATUM (GENTIANACEAE) AND
PRIMULA LAURENTIANA (PRIMULACEAE)
IN MAINE: NEW LOCALITIES AND
GENERAL DISTRIBUTIONS

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ABSTRACT

Two herbaceous plant species, *Lomatogonium rotatum* and *Primula laurentiana*, are known to occur in the United States only on the offshore islands of eastern Maine. Both species grow in full sun and in thin, circumneutral soil just above the upper splash zone of the ocean. We report new localities and discuss the overall geographic distribution for these two species.

Key Words: *Lomatogonium rotatum*, *Primula laurentiana*, Maine, range limit, offshore islands

Several plant species reach the southern limit of their range along the coastal headlands and islands of the west coast of the Bay of Fundy (Fernald and Wiegand, 1910; Hodgdon and Pike, 1964; Olday et al., 1982). A maritime climate of cool summer temperatures, extensive rainfall and fog, and low evapotranspiration rates account, in part, for this phytogeographic pattern. In this region, two boreal species, *Lomatogonium rotatum* (L.) Fries, the star gentian or marsh felwort, and *Primula laurentiana* Fern., the bird's-eye-primrose, are now known from only one location each in New Brunswick and a total of 16 offshore islands in eastern Maine. We report discovery of eight of these stations during our field work on a more detailed study of the reproductive biology of *P. laurentiana*. We also characterize the local habitat and overall distribution of these two taxa.

Stebbins (1929) first discovered *Lomatogonium rotatum* in Maine at Schoodic Point. This population has not been seen recently, but this species has since been found on nine islands in eastern Maine (Table 1; Figure 1). In 1982 and 1983 we discovered five of them and verified those previously reported. In all of these localities, *L. rotatum* grows in full sun and in thin, granitically derived, mineral soil and organic duff in a narrow belt between the forest edge and the upper splash zone above the intertidal zone. It also occurs in areas of high soil moisture near brackish pools and in rock crevices serving as drainage tracks from the upland. This plant

Table 1. Historic, current and new localities of *Lomatogonium rotatum*¹ and *Primula laurentiana* in eastern Maine. (Numbers correspond to map locations indicated in Figure 1.)

Island	<i>L. rotatum</i>	Estimated number of individuals of <i>P. laurentiana</i>
1. Sand Island (outer)	extant, new	
2. Seal Rock		0
3. Curlew Rock	extant, new	15, new
4. Crumple Island	extant	100's
5. Great Wass Island	extant	100,000
6. Unnamed Island North of Water Island	extant, new	400, new
7. Water Island (inner)	extant, new	400, new
8. Water Island (outer)	extant, new	
9. Mistake Island	extant	1,000
10. Knight's Island		unknown ⁵
11. Head Harbor Island		unknown ²
12. North Scabby Island		100,000 ³
13. Little Scabby Island		no estimate ²
14. Ram Island		0 ³
15. South Libby Island		10,000 ⁴
16. North Libby Island		0 ⁴

¹Also extant, but not shown on Figure 1, on Little Moose Island (Olday, Gawler & Vickery, 1982); also known historically from Schoodic Point (Stebbins, 1929).

²Olday, et al., 1982.

³Lewis (1983).

⁴Lewis (pers. comm.)

⁵Norton (pers. comm.)

has probably been overlooked because it is small and rather inconspicuous, occupies a specialized habitats, and flowers after the peak of summer field work by botanists. Undoubtedly it grows on other islands east of Frenchman's Bay. Species associated with *L. rotatum* include: *Agrostis stolonifera* L., *Aster novi-belgii* L., *A. nemoralis* Ait., *Campanula rotundifolia* L., *Carex canescens* L., *C. viridula* Michx., *Deschamsia flexuosa* (L.) Trin., *Empetrum nigrum* L., *Euphrasia canadensis* Townsend, *E. randii* Robins., *Festuca rubra* L., *Iris hookeri* Penny, *Juncus filiformis* L. (vel aff.), *Plantago juncooides* Lam. var. *decipiens* (Barnéoud) Fern., *Prenanthes trifoliata* (Cass.) Fern., *Primula laurentiana*, *Sagina nodosa* (L.) Fenzl. ssp.

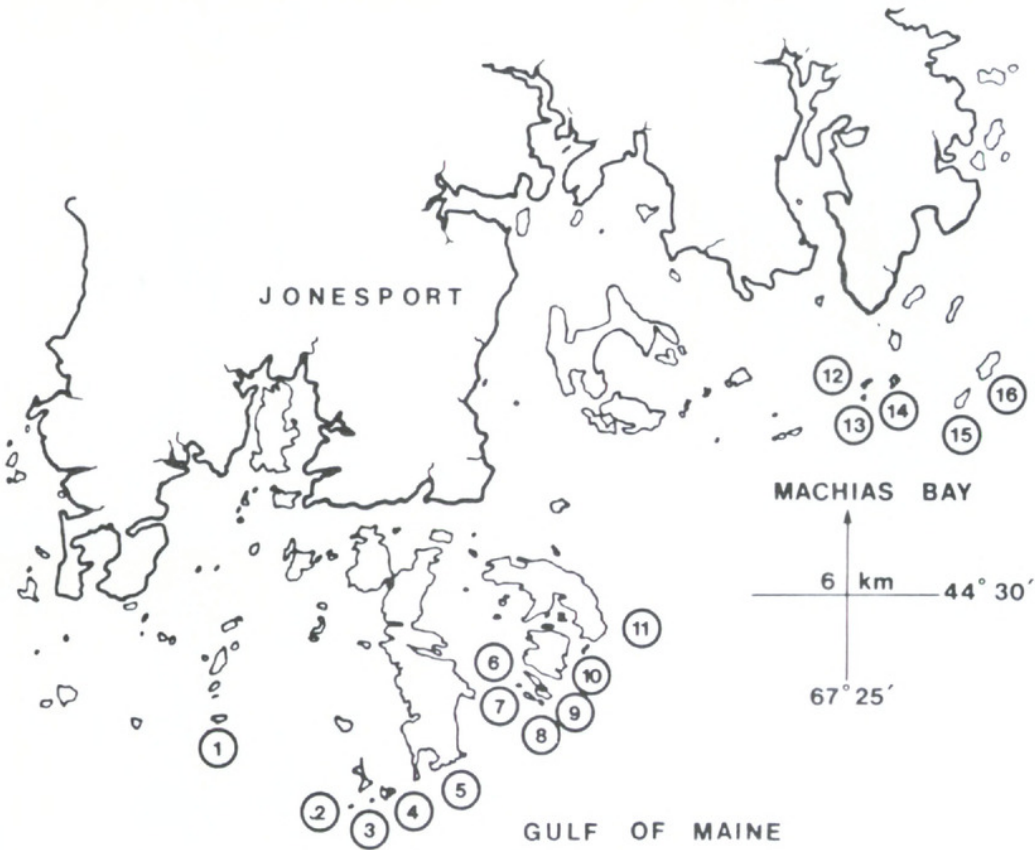


Figure 1. Map of Islands off Jonesport and in Machias Bay, Maine. See Table I for reference to numbered locations.

borealis Crow, *Solidago bicolor* L., *Triglochin maritima* L., and *Viola septentrionalis* Greene. Authorities are those of Fernald (1950).

At the two inland localities discovered in the nineteenth century, *Primula laurentiana* has not been seen in this century (Critical Areas Program, 1981). Cushman (1907) was the first to find coastal populations of the bird's-eye-primrose, and Norton (1913), Pike (1963) and Lewis (1983) added to our knowledge of its ecology and local distribution. We located three new island sites (Table I; Figure 1), uncovered one historical record (Knight's Island) and determined that this species no longer grows on Seal Rock. The plant is therefore now known to occur on nine islands and to be absent from three historic sites; Its status for two additional localities is unknown (Table I). The bird's-eye-primrose is more likely to have

attracted people's attention because of its striking, early summer flowers and light-green leaves than is the star gentian.

Primula laurentiana occupies the same habitats as *Lomatogonium rotatum*, although the primrose appears to prefer better soil drainage. The soils are derived from granitic bedrock, but soil tests from five *Primula* localities indicate circumneutral pH (from 5.9 to 7.5, mean = 6.6) and oftentimes an excessive level of calcium. Proximity to salt spray and shell clasts may account for this relatively high pH. These tests verify the generally held view that this species is a calciphile (Fernald, 1928; Lewis, 1983; Pike, 1963; Scoggin, 1979).

In the eastern United States, these two species are limited to eastern Maine and are threatened or endangered in New England (Crow *et al.*, 1981). In New Brunswick, the star gentian is known only from South Wolf Island (Hodgdon and Pike, 1963) and the bird's-eye-primrose only from one recently located population of about 150 individuals in the coastal town of Alma (H. R. Hinds, pers. comm.). *Primula laurentiana* is also rare in Nova Scotia (Maher *et al.*, 1978). Globally, *Lomatogonium* is a circumpolar halophyte while *Primula* occupies meadows, ledges and cliffs chiefly near the ocean over much of northeastern North America (Scoggin, 1979).

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