

Empetraceae

Empetrum nigrum L.—prostrate on shallow soil over igneous rock; common; 1401.

Onagraceae

Epilobium latifolium L.—fairly common in shallow soil among igneous boulders; 1413.

Epilobium davuricum Fisch. var. **arcticum** (Samuelsson) Polunin—found only in muck in springy areas on igneous rocky hillside; 1484.

Pyrolaceae

Pyrola grandiflora Radius—one flowering specimen and about fifty rosettes were found in shallow black soil in an exposed position on top of an igneous ridge; 1507.

Ericaceae

Ledum palustre L. var. **decumbens** Ait.—fairly common in shallow soil over igneous rock; 1404.

Rhododendron lapponicum (L.) Wahl.—moist springy area on rocky hillside; 1486.

Cassiope tetragona (L.) D. Don—decumbent on shallow soil over igneous rock; very common; 1417.

Arctostaphylos alpina (L.) Spreng.—forming a mat in shallow soil over boulders, and in moss over igneous rock; 1489, 1461.

Vaccinium uliginosum L. var. **alpinum** Bigel.—along the banks of a small freshet this

species reached a height of 6 inches, elsewhere in shallow soil over the rocks it was prostrate; 1435.

Vaccinium vitis-idaea L. var. **minus** Lodd.—shallow soil over igneous rock; 1436.

Scrophulariaceae

Pedicularis sudetica Willd.—in wet muck in a sedge meadow beside a small inland lake; 1465.

Pedicularis capitata Adams—common in moist shallow soil on the hillsides; 1418.

Campanulaceae

Campanula uniflora L.—in shallow soil among boulders; rare; 1395.

Compositae

Erigeron eriocephalus Vahl—found only in churned up manured sandy soil around ground squirrel burrows; 1478.

Antennaria ekmaniana A. E. Porsild—in churned up manured sandy soil around ground squirrel burrows and in shallow soil over igneous rock; 1479, 1499.

Chrysanthemum integrifolium Rich.—scattered to rare in rich moist shallow soil over igneous rocks and in shallow soil among boulders; 1490, 1397.

Taraxacum phymatocarpum Vahl—a number of very luxuriant specimens were collected from rich moist soil on the hillside; rare; 1409.

TWO NEW SPECIES OF OENOTHERA¹

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IN CONNECTION with an extensive monograph of the genus *Oenothera* which is now in preparation, two distinctive forms are here described as new species. The status of species, microspecies and varieties in this genus has been considered at length in that monograph, to which reference should be made. These two species are by-products which were not prepared in time for inclusion in the monograph, where they are simply referred to by name. Their description is as follows:

***O. apicaborta* n. sp.**

This remarkable species was grown at the Courtauld Genetical Laboratory, Regents

Park, London, in 1938 and 1939 from seeds collected between the railway and St. Maurice, near Les Piles, Champlain County, Quebec, by the late Prof. Marie-Victorin and Rolland-Germain on August 12, 1936. It is represented in their collections by Herb. Sheet 51, Aug. 12, 1936. In 1938, 35 plants were grown by me from seeds in capsules on this sheet, as culture 42.38. They were uniform, with short, narrow leaves. From seeds of one of these plants selfed, 18 seedlings germinated in 1939 and 17 came to flower as culture 45.39. They were of the same type as the parent culture. The following description is from notes on the rosettes in both years and a full study of the 1938 culture by Dr. W. R. Philipson, of the British

¹ Received for publication April 18, 1951.



Fig. 1 *O. apicaborta* n.sp.
Les Piles (Champlain Co.), Que. Culture 45.39.

Museum (Natural History), and myself. The photograph (Fig. 1) was taken in 1939.

Rosette leaves medium green, subspatulate, acute, 19-25 cm x 39-44 mm, smooth, midrib broad, white or $\pm$ pink, margin finely waved, distantly repand-denticulate with obscure red teeth, repand-dentate with green teeth below, narrowed to almost unmarginated petiole *ca.* 8 cm long. Bearing scattered minute appressed puberulence, more sparse on lower surface, no long hairs; rare liver-coloured spots.

Central stem erect, short (*ca.* 2 ft.) with dense terminal inflorescence *ca.* 5 cm long, which aborts, leaving a dead stem end, so that only 1 or 2 or frequently no flowers are produced on the central stem. This is true of every plant, but of no other *Oenothera*. A ring of short, ascending basal branches is produced. Following abortion of the stem apex, a short cauline branch is developed from every leaf axil, those just below the aborted apex being exceptionally long (see Fig. 1). These bear numerous flowers. The cauline branches are $\pm$ red and bent at the tip, although the central (aborted) stem-tip remains erect.

The stem is strongly ribbed, the ribs red, especially below, subglabrous with sparse long hairs from green papillae and sparse puberulence. Leaves horizontal, narrow = lanceolate, 13.5 cm x 25 mm, margin repand-denticulate above, repand-dentate below, glands green, midrib pink in lower half of leaf, pubescence same as on rosette leaves. The leafy short shoots arising in every axil each bear a terminal inflorescence of many young buds. The terminal rosette of the main stem always aborts, the lateral branches then grow out. The inflorescence is dense, never expanding. Ovary 16 x 2.5 mm, with scattered long hairs without papillae, scattered erect pubescence and sparse puberulence. Hypanthium 16-20 x 2 mm, yellowish green, subglabrous. Bud-cone 14 x 5 mm, squarish, yellowish below, greenish above, pubescence as on ovary, but with rare, very small, pink spots; sepal tips 2 mm, green, very slender, touched with red. Flower opening out, petals flabby, 15 x 17 mm, overlapping; filaments *ca.* 10 mm, arcuate, anthers 4 mm; stigma lobes 5 mm, 14 mm above hypanthium, a unique condition for flowers of this size.

This extraordinary species is easily recognized by the aborting stem tip and the

many short cauline branches, as well as the narrowish leaves with frequently waved margins. The aborted stem tip was at first regarded as the effect of some disease produced by a fungus or a virus. But this interpretation was finally excluded, because (1) the condition applies equally to every plant, (2) it was repeated in exactly the same way in the second generation from seeds, (3) it was confined always to the central stem and never appeared on a side branch and (4) such a condition has never been seen among the tens of thousands of *Oenotheras* grown from a hundred or more other localities. This spontaneous abortion appears to be unique among flowering plants. It can only be compared with various hereditary diseases in man, in which certain muscles or certain parts of the central nervous system, or both, undergo spontaneous degeneration. Examples are peroneal atrophy, macular degeneration, cerebellar degeneration, Huntington's chorea and various forms of muscular dystrophy (see Gates, 1946, Chapters XXII and XXIII). Inherited degeneration of the stem apex when the plant has reached a certain height appears to be directly comparable with the degeneration of certain muscular or nervous tissues when the individual has reached a certain age which may be long after adulthood. It would be of great interest to see how this condition in *Oenothera* is inherited in crosses. The original culture has been lost but can probably be obtained again from the original locality. Herbarium sheets from these cultures were destroyed in the war.

Although this is perhaps the first time that apical stem abortion has been described as a specific character, yet tissue abortion undoubtedly takes place normally in plants to an extent not previously realized. My friend, Prof. R. H. Wetmore, has recently directed my attention to a condition in *Cercidiphyllum japonicum* in which, on all the branches, the terminal portion (several inches in length) regularly aborts, followed by outgrowth of lateral shoots from the axils below. Bell (1950) has described a somewhat similar condition in the Canadian blueberry, *Vaccinium angustifolium* Ait. var. *laevifolium* House. The growth of vegetative branches is terminated by the death of the apical meristem accompanied by rapid development of adjacent meristematic tissue into a shoot, while the flowering branches remain short and abort after producing a cluster of berries.

Diagnosis : *O. apicaborta* sp. nov.

Folia radicalia mediocriter viridia, subpathulata, acuta, circa 20 cm longa x 40 mm lata, levia; costa lata, alba vel punicea; margo remote repando-denticulata; cum maculis raris coloris jecoris. Caulis erectus, brevis; inflorescentia terminalis, ca. 5 cm longa, demoriens, tunc in axillis omnium foliorum caulnorum excrescat ramus. Folia anguste lanceolata, circa 13.5 cm longa, 25 mm lata. Petala flaccida, 15 mm longa; stigma 14 mm supra hypanthium.

O. magdalena n. sp.

This distinct species is described from two cultures (65.38 and 50.39) grown from seeds collected by Miss Marcelle Gauvreau in 1934 at Havre-aux-Maisons in the Magdalen Islands in the Gulf of St. Lawrence. The descriptive notes are partly by Dr. W. R. Philipson. The rosette leaves are dark green, rather long and narrow (23 cm x 35 mm) with white midribs, blotches of pale green on margin and rare large liver spots. The margin is strongly waved, especially in the younger leaves, subentire with small green marginal glands. In the petiole the broad midrib is very narrow-margined. Stem short, 31-34 in., erect or slightly bent at tip, ribbed, not brittle. A ring of very long basal branches, suberect, equalling the central stem, as in *O. Hazelae* var. *parviflora* (Fig. 24 in Gates 1936). Stem light green, with faint patches of pale red, scattered long hairs from small red papillae and appressed puberulence. Leaves smooth, elliptical-lanceolate, ascending or horizontal, 13-19 cm x 29 mm, midribs white, margin obscurely repand-denticulate above, repand-dentate below with obscure

green glands, both surfaces subglabrous with minute appressed puberulence. Apex of inflorescence flat, not comose. Ovary 14-15 x 3 mm, with long ascending hairs from minute red papillae and appressed puberulence. Hypanthium 20-22 x 2 mm, pink throughout before and after anthesis, sparse long hairs without papillae, erect and appressed puberulence. Bud-cone 10-12 x 4.5 mm, green becoming yellow with small red patches. Sepal tips 4 mm, green, subterminal, erect or spreading. Petals 12-13 x 12 mm, filaments 7-9 mm, anthers 4-5 mm, stigma lobes 3-5 mm, 5 mm above hypanthium.

The pink hyanthia have not been observed in any other *Oenothera*, but Bartlett (1914) described *O. rubescens* from Nantucket with reddish buds and hypanthia. In foliage and habit *O. magdalena* shows resemblance to *O. ammophiloides* Gates and Catcheside (see Gates, 1933) to which it is no doubt related. *O. ammophiloides* was originally described from Guysborough, Nova Scotia, from seeds collected by Prof. Jacques Rousseau. *O. magdalena* differs in (1) the pink hypanthium, (2) smaller flowers (petals 12-13 x 12 mm instead of 18 x 23 mm), (3) sepals green, without red papillae, (4) stems erect or suberect. It belongs to the series of forms in Eastern Canada, which is adapted to coastal conditions, extending along the coast of Nova Scotia and the Gulf of St. Lawrence. *O. Hazelae* and its var. *parviflora* (see Gates, 1936) are also related to *O. magdalena* but they are partly coastal and partly inland.

A number of specimens belonging to this species from the Magdalen Islands are in the Gray Herbarium, from collections made

Table 1. Measurements of eight specimens of *O. magdalena* in Gray Herbarium

	Bud cone	Sepal tips	Midleaf
1.	10 mm	2 mm	8 cm x 24 mm
2.	20 mm	4 mm	15 cm x 27 mm (long petiole)
3.	14 mm	4 mm	9.5 cm x 35 mm (long petiole)
4.	9 mm	5 mm	5.5 cm x 9-11 mm (very short petiole)
5.	8 mm	2 mm	4 cm x 6 mm (very short petiole)
6.	8 mm	1 mm	7.5 cm x 8 mm (very short petiole; liver spots on leaves; red stripes on buds)
7.	6 mm	2 mm	7.5 cm x 10 mm (no liver spots; few red papillae on buds)
8.	12 mm	2 mm	6-8.5 cm x 10-12 mm (no liver spots on leaves; few red papillae on buds)

in 1912 by Messrs. Fernald, Long and St. John. They show numerous variations which are listed in the accompanying table. These plants differed mainly in length of bud cone and of sepal tips; also in leaf measurements, length of petiole, presence of red stripes or red papillae on the buds, and presence or absence of liver spots on the leaves. These variations are all within the local population, but none of them, except the red papillae on the buds in certain specimens, bring the phenotype nearer to *O. ammophiloides* or any other species. Superficially they resemble a hybrid swarm, but owing to the self-pollination and chromosome catenation in *Oenothera* they cannot be a hybrid swarm in the usual sense of a freely intercrossing population. *O. magdalena* belongs with the coastal species and varieties extending from Guysborough, Nova Scotia, around the Gulf of St. Lawrence and the Gaspé Peninsula. The detailed description applies particularly to one microspecies.

Diagnosis: *O. magdalena* sp. nov.

Folia radicalia atroviridia, sublonga et subangusta (23 cm longa x 35 mm lata); cum maculis raris magnis coloris jecoris; costa alba, infra lata; margo valde undulata

praecipue in folia juvenilia, subintegra cum glandulis parvis viridibus. Caulis brevis, erectus vel apice leviter declinatus, ramis radicalibus longis instructus, leucoviridis, rare rubrotuberculatus. Folia plana, elliptico — lanceolata (13-19 cm longa, 29 mm lata). margine obscure repando-denticulata supra repando-dentata infra cum glandulis viridibus obscuris, utrinque subglabra. Apex in florescentiae planus, non comosus. Ovarium minute rubropapillatum, hypanthium ante et post anthesium puniceum. Alabastra viridia demum lutea, cum maculis parvis rubris. Petala 12-13 mm longa, stigma 5 mm supra hypanthium.

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FLORAL LIST OF THE MORTLACH DISTRICT, SOUTHERN SASKATCHEWAN¹

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THE DISTRICT COVERED in this list centres in the village of Mortlach, about 30 miles west of the city of Moose Jaw, Sask. It includes eight whole (twps. 16 and 17, range 29, W. 2nd meridian; twps. 16, 17 and 18, ranges 1 and 2, W. 3rd) and two broken townships half a mile wide (twps. 16 and 17, range 30 W. 2nd). A map showing the topographical features of the area and its position in Saskatchewan accompanies the list (fig. 1).

The list is based on collections made by the writer in the summer of 1950, and at present in his possession. It contains 491 species and varieties, although it is felt that the genera *Salix*, *Carex* and *Poa* are not fully covered.

Relief. The dominant topographical feature is the Missouri Coteau, a range of morainic hills extending northwest across southern Saskatchewan from the American boundary, in this area forming a semicircle a few miles south and west of Mortlach. At its foot the plains of the second prairie steppe extend northeastward, while beyond its crest a morainic upland continues southwestward to the basin of the former glacial lake now occupied by Lakes Chaplin and Johnstone. The Coteau rises considerably above the second steppe: elevation of steppe at Mortlach station, 1985 feet; base of Coteau, 2100; lowest crest of Coteau, 2300; average for the crest, 2400 to 2500; highest summit in the area, 2600 feet.

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