

Leskea polycarpa Hedw., new to the moss flora of Alaska.

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Abstract: *Leskea polycarpa* Hedw., is reported from near Kavet Creek, north of the Great Kobuk Dunes, Kobuk River Valley, in Arctic Alaska. The species is described and illustrated, and its morphology discussed.

Short summer seasons in high northern latitudes, remoteness and huge scale, and logistic difficulties limit access to much of the Arcto-Boreal and true tundra regions. Over several field seasons we have been based at a remote riparian camp site near Kavet Creek, a small entrant stream on the southern banks of the Kobuk River at 67°07.724'N, 159°02.163'W, carrying out biodiversity and ecological studies of fungi and their vascular plant and bryophyte associations. The locality is at the northern end of the Greater Kobuk Sand Dunes, within the Kobuk National Park and Wilderness.

The Greater Kobuk Sand Dunes in the central Kobuk River Valley of north western Alaska are a 62 sq. km remnant area of a once much larger (650 sq. km) sand deposit formed probably during the Late Pleistocene Wisconsin and earlier glaciations. Glacial erosion of quartzose rocks of the Brooks Range followed by transport and deposition by glaciolacustrine, alluvial and eolian processes contributed to the origin of the present day sand deposits (Pewe 1975; Dijkmans and Koster 1990; Hamilton and Ashley 1993). A combination of open, lichen woodland, white spruce (*Picea mariana*) forest, and riparian tall shrub now covers much of the former extensive sand sheet. Several active dune systems - the Greater Kobuk, Little Kobuk (8 sq. km), and a smaller 2 sq. km system near the mouth of the Hunt River - now represent visible remnant islands within the greater Boreal ecosystem (Parker & Mann, unpublished).

Mean annual precipitation in the central Kobuk Valley is of the order of 300-500mm, based on data obtained from weather stations along the southern slopes of the Brooks Range. Further inland the climate is significantly drier. Mean annual temperature is around -6°C and mean July (mid-summer) temperature is 15°C. The Kobuk Valley is windier than many other parts of interior Alaska with mean yearly wind speeds of 6.0-6.4 m.s⁻¹ being recorded from the central and lower Kobuk Valley (DeHarpporte 1983).

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The Kavet Creek area, where we have been based, drains along the north western edge of the Greater Kobuk Sand Dunes. Above the limits of spring thaw ice erosion and summer floods the sand flats and river banks are fringed with *Equisetum fluviatile* associated with a variety of forbs and grasses. Behind this occur dense *Salix alaxensis*-dominated thickets with scattered *Populus trichocarpa* and *Alnus crispa*, which are then supplanted by a complex shrub-heath-Boreal forest community, dominated by *Picea mariana*, with scattered fens and wet depressions.

Fruiting specimens of *Leskea polycarpa* were found at a number of locations, predominantly in the *Salix* thickets. The sites are subject to periodic ephemeral flooding following heavier rain falls but do not appear to be inundated by flooding from either the Kobuk River or Kavet Creek. It is possible that early Spring thaw overflow from Kavet Creek, when the release and flow of flood waters in and into the Kobuk River is inhibited by ice, may contribute to seasonal inundation.

Considering the size, the remoteness and difficulty of access of much of the State, it is to be expected that not only new records but, potentially, new species will be found in Alaska. As a result of previous field work in the Greater Kobuk Dunes area, we reported as new, both to Alaska and the Arctic, the occurrence of the hepatic *Riccia cavernosa* Hoffm. emend Raddi from several locations along the Kobuk River shore (Seppelt & Laursen 1999). Amongst the collections we have made are other significant new Alaskan records which will be the subject of subsequent reports.

Description of *Leskea polycarpa*:

Plants have been found on silt and litter and at the base of *Salix* saplings, forming loose procumbent mats; stems subpinnately branched, both stems and branches densely foliate (Fig. 1). The tips of the stem and branches are often slightly curved. Stem leaves (Figs. 5, 6) are ovate-lanceolate, subsecund, 1-1.3mm in length, 0.4-0.45mm wide, tapering to an acute apex; the costa ceases shortly below the apex of stem leaves. Branch leaves are ovate-oblong to ovate-lanceolate, up to 0.9mm in length, 0.3-0.45mm in width, of similar shape (Figs. 2, 3) to stem leaves or, in shorter and more ovate-oblong leaves (Fig. 4), the leaf apex is more obtuse. In these shorter leaves the costa reaches barely to mid-leaf and may be weakly forked toward the tip. Perichaetial leaves (Fig. 7) are up to 1.5mm in length, oblong-lanceolate, long-sheathing, with the costa extending almost to the apex.

Paraphyllia (Figs. 8-10) are present but are, in the specimens examined, very few in number, inconspicuous and very easily overlooked. The cells are smooth, but occasionally a few cells may bear a single papilla (Fig. 10). Lack of observation of the paraphyllia leads immediately to misidentification of the moss.

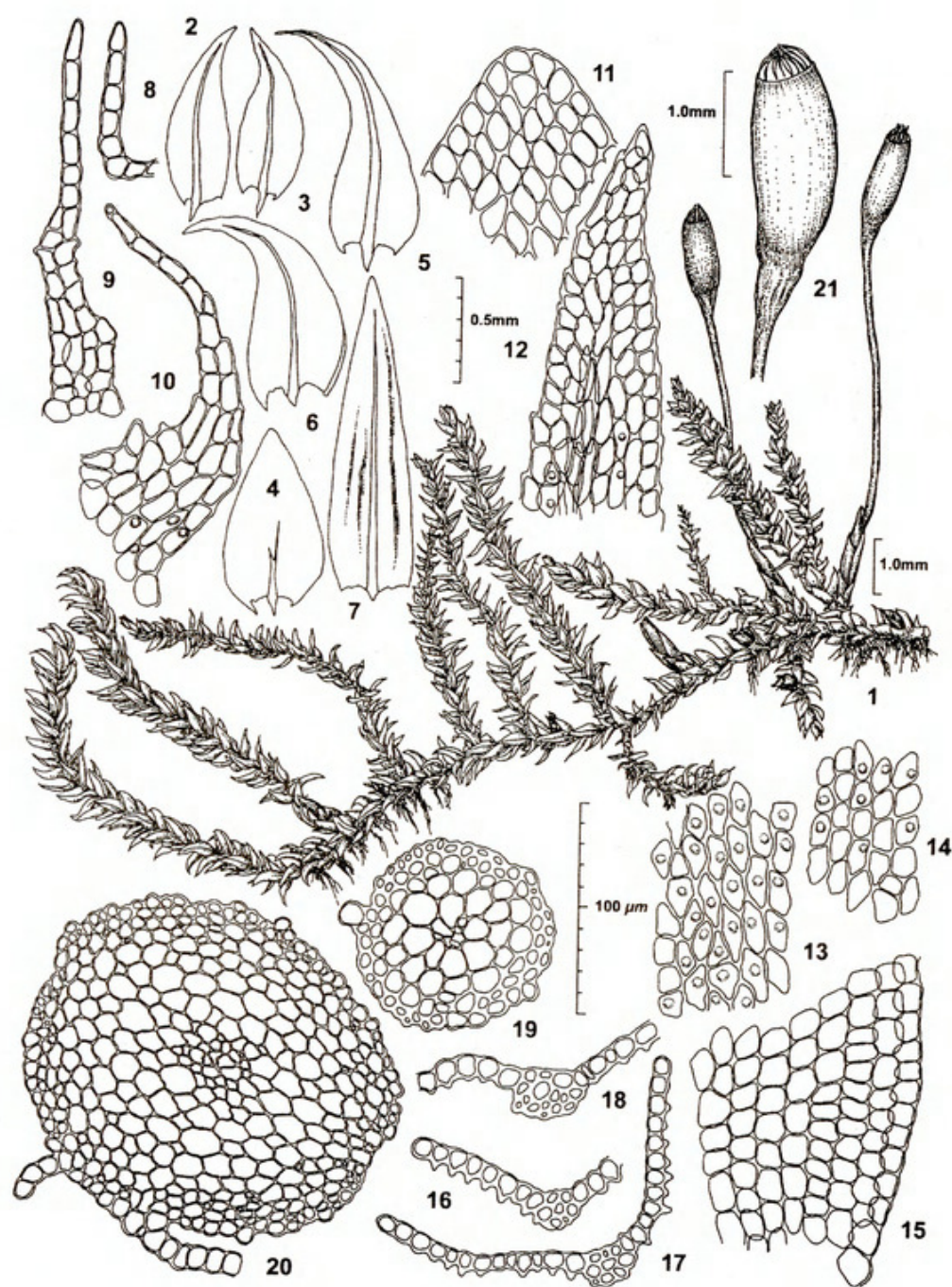


Fig. 1 - Habit of plant. 2-4 - Branch leaves. 5,6 - Stem leaves. 7 - Inner perichaetial leaf. 8-10 - Paraphyllia. 11,12 - Leaf apices. 13,14 - Cells from mid to upper lamina showing single abaxial papilla. 15 - Basal cells of leaf. 16-18 - Leaf and costal sections. 19 - Section of branch. 20 - Section of stem. 21 - Capsule, drawn wet. Scales: = 1.0mm for habit and wet capsule; 0.5mm for leaves; 100μm for cells and sections.

Leaf margins are smooth to weakly denticulate near the apex by projecting cell ends (Fig. 12), and plain or revolute to near the middle.

Leaf cells are papillose with a single abaxial papilla (Figs. 13, 14), but are smooth near the apex and base (Fig. 15). Occasionally, adaxial papillae occur around the middle of the leaf. Cell shape (Figs. 11-14) varies from rounded to rhomboid or ovate-hexagonal, becoming longer towards the base. There is a group of more or less quadrate alar cells (Fig. 15).

The costa ends below the apex in all leaves. It is weakly prominent on the abaxial surface and lacks stereids or deuter cells (Figs. 16-18).

In section, stems (Fig. 20) and branches (Fig. 19) have a small central strand of smaller and thinner-walled cells than the surrounding medullary cells. The outer few rows of cells are slightly smaller and thicker-walled.

Gynoecia and capsules (Figs. 1, 21), as the epithet indicates, are numerous along the stems. In the Alaskan specimens examined the capsules are 1.5-1.6mm in length, cylindric to weakly arcuate, erect to slightly inclined, and borne at the end of a reddish seta 5-6mm in length. The double peristome is a pale whitish-brown.

The spores are greenish, papillose-verrucose and, in the specimens examined, range from 12.5-18.0 μ m, and are slightly larger than spores reported from elsewhere. Crum & Anderson (1981) give a diameter range of 9-13 μ m while Lawton (1971) gives 9-14 μ m. This increase in spore size contrasts with capsule length measurements: 1.5-1.6mm in the Alaskan specimens and 2-3mm elsewhere (Crum & Anderson 1981; Ireland 1982; Lawton 1971). Seta length is also shorter: 5-6mm in the Alaskan specimens and ranges of 7-12mm (Crum & Anderson 1981), 10-15mm (Ireland 1982), and 10mm (Lawton 1971).

Distribution of the species:

In North America the species has been reported from British Columbia, Washington, Oregon, Idaho, Montana, South Dakota, Minnesota, Iowa, Nebraska, Mississippi, Louisiana, Tennessee, Virginia and north to Maine, Nova Scotia, Newfoundland, New Brunswick, Quebec, Ontario and Manitoba (Crum & Anderson 1981; Ireland 1982; Ireland et al. 1980; Lawton 1971). The species is also known from Japan, Siberia, the Caucasus, and northern and central Europe (Crum & Anderson 1981; Noguchi 1991). Ireland (1982) also included Africa in the world distribution.

We consider the finding of this species in far north-west Arctic Alaska, some hundreds of kilometres from the nearest North American occurrence, may result more from a lack of collections from this large and logistically challenging area than being a biogeographic anomaly. It is perhaps surprising, however, that the species has so far not been reported from south-eastern Alaska.

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Specimens examined:

Seppelt 22245, 22246, 22251, 12.viii.2000. On silt, litter and bark at base of *Salix alaxensis* stems in *Salix* thickets. Near edge of Kavet Creek. 67°07.724'N, 159°02.163'W. [Duplicate specimens have been lodged in herbaria of the Australian Antarctic Division (ADT), University of Alaska Museum, Fairbanks (ALA), and University of British Columbia (UBC)].

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