

perianth, on the other hand, is found whether fertilization has taken place or not. So far as observed, innovations are never produced where fertilization has occurred. The leaves of *L. Sahlbergii* exhibit considerable variation but the antical lobe is almost invariably sharper and a little smaller than the postical; in the perichætical bracts, however, this difference tends to disappear.

9. LOPHOZIA RUTHEANA, (Limpr.) M. A. Howe, Bull. New York Bot. Garden, 26 : 102. 1901. (Plate II.)

Bonanza Creek (14), also collected by Williams at the same locality; Hunker Creek (46). These are the only known American stations, but the range of the species extends through northern Europe into Siberia.

Two very full descriptions of *L. Rutheana* have already been published, the first being Limpricht's original description,<sup>1</sup> the second Lindberg's description of his *Jungermannia lophocoleoides*,<sup>2</sup> which is now acknowledged to be a synonym of *L. Rutheana*. At the same time the species resembles *Mesoptychia Sahlbergii* so closely, especially when sterile, that it may be well to emphasize the more important differential characters. Of course fruiting specimens are very distinct, and, even in the case of sexual individuals where fertilization has not taken place, the parocious inflorescence of *L. Rutheana* and the dioicous inflorescence of the *Mesoptychia* may usually be demonstrated without much trouble.

The two species are of about the same size and they resemble each other in color. Both species, moreover, have bifid leaves and conspicuous underleaves and both show distinct trigones in their leaf-cells and a strongly verruculose cuticle. In *L. Rutheana*, however, the leaves are not folded and are sometimes gibbous at the bottom of the sinus. The apices of the lobes are very variable, being sometimes rounded, sometimes obtuse and sometimes acute, but they are rarely or never distinctly apiculate. If there is any inequality in the size of the lobes or any difference in their

<sup>1</sup> Jahresb. Schles. Gesell. vaterl. Cultur, 61 : 207. 1884.

<sup>2</sup> Lindb. & Arnell, Kongl. Sv. Vet. Akad. Handl. 23<sup>5</sup> : 41. 1887.