

## On the variation of leaf border in *Rhizomnium* (Cinclidiaceae)

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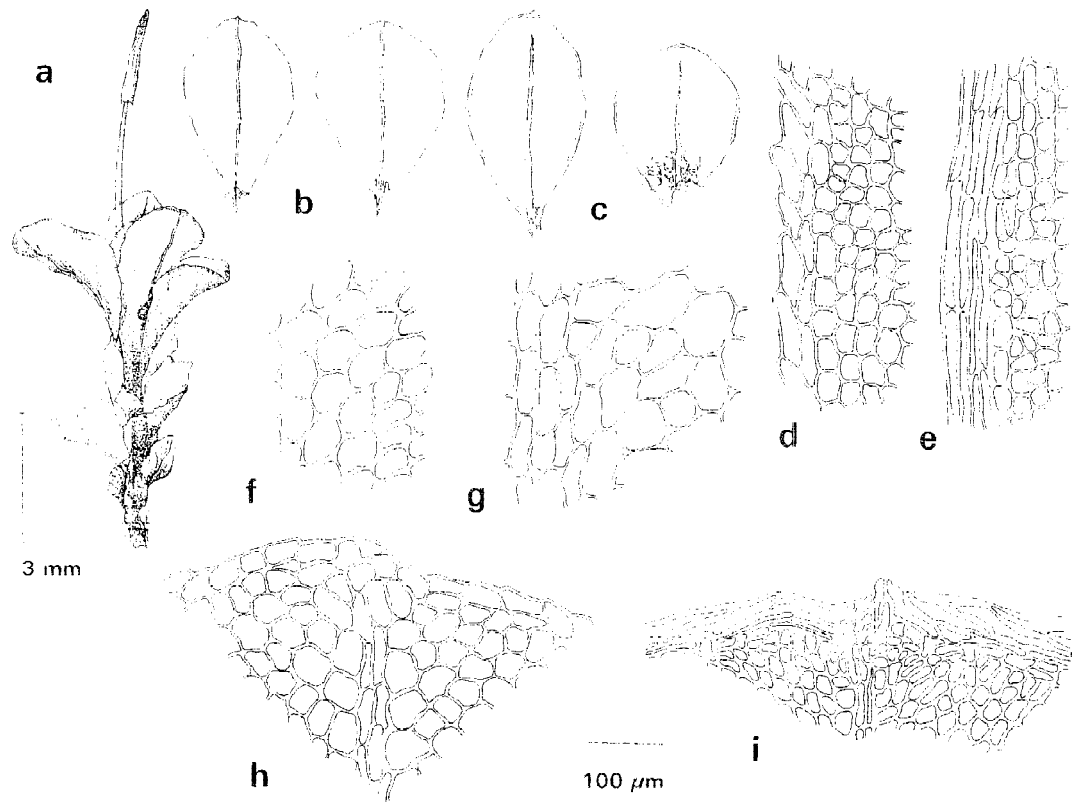
**Abstract.** In the genus *Rhizomnium* T. Kop. most taxa have a strong leaf border several cells broad and bi- to tristratose. *Rhizomnium striatulum* (Mitt.) T. Kop. belongs to that group. In Northeast China one population of *R. striatulum* was found with a very weak leaf border, and also the costa of these plants is weaker than is characteristic for the species. The deviating population is figured and its significance discussed. The distribution of *R. striatulum* is mapped.

William Buck collected in Liaoning Province of Northeast China a specimen of *Rhizomnium*, which does not very well fit any known species. It has a weak leaf border composed of only one row of elongated cells. Plants are small-sized but since they have young sporophytes, they are vigorous plants and not merely malformed. The details of the specimen are:

China. Liaoning Prov. Kuandian County: Bai-shi-la-ji Mountains, Bai-shi-la-ji Natural Reserve, along trail through Hei-gou (Black Valley) to Hou-shi Peak, mixed hardwood-conifer forest with *Acer* spp., *Larix* and *Picea*, on rock in stream, 40°51'N, 124°49'E, 560-1100m, 20 August 1993, *Buck23615* (NY).

According to Gao & Chang (1983), *Rhizomnium pseudopunctatum* (Bruch & Schimp.) T. Kop., *R. punctatum* (Hedw.) T. Kop., and *R. striatulum* (Mitt.) T. Kop. are known from Northeast China. However, Koponen & Luo (1982) only saw specimens of *R. magnifolium* (Horik.) T. Kop. and *R. striatulum*. The presence of *R. pseudopunctatum* and *R. punctatum* in China is not probable on the basis of their general distribution in Asia (Koponen & Afonina 1992). Two other species of *Rhizomnium* known from neighbouring areas are *R. hattorii* T. Kop., which occurs in Korea (Koponen 1977), and *R. parvulum* (Mitt.) T. Kop. (distribution map in Koponen 1973).

Since our plant has both well developed female and male plants, it cannot be *Rhizomnium parvu-*



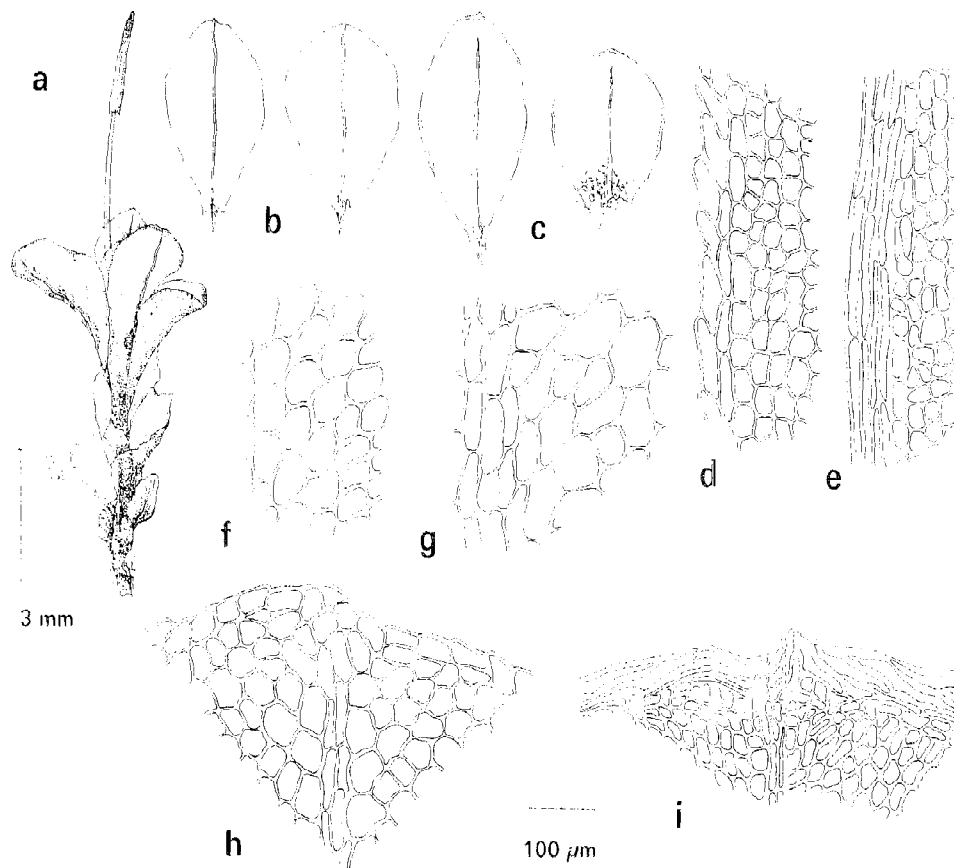
**Fig. 1.** *Rhizomnium striatulum* (Mitt.) T. Kop. - a: Growth habit. b, c: Leaves. - d, e: Leaf border. - f, g: Leaf cells. h, i: Leaf apex. - a, b, d, f, and h from Buck 23615 (NY) and c, e, g and i from Koponen 37065 (China, Jilin Prov., Mt. Changbai, H).

*lum* which has dwarf males (Koponen 1971a). Also, the leaf shapes do not fit that species. Since the plant has only macronemata, it belongs to the neighbourhood of *R. punctatum* and is not related to *R. magnifolium*, *R. pseudopunctatum* or *R. gracile* T. Kop. *Rhizomnium andrewsianum* (Steere) T. Kop. is the only taxon in *R. punctatum* group which has a weak leaf border. It has a different, nearly orbicular leaf shape, it is a high arctic taxon, and the habitat and substrate do not fit.

*Rhizomnium striatulum* is actually the only species of *R. punctatum* group which can occur in Bai-shi-la-ji area. The size and leaf shapes of our plant fit those of small plants of *R. striatulum*, but that

species has a very strong bi-tristratose border (Fig. 1). Old leaves have cells with corner thickenings like in *R. striatulum*, but leaf cells are larger than in *R. striatulum*. However, this may be caused by the wet habitat of a rock in a stream. The present plant also has a weaker costa than is usual for *R. striatulum*.

The author Koponen has seen much material of *Rhizomnium* from Japan and China, but this is the first specimen of its kind. However, we prefer to wait for more specimens before describing our plant at any taxonomic level, and consider it as a local modification of *R. striatulum* with a reduced border. This procedure is in accordance with the fact that in *Rhizomnium* local endemic species are



**Fig. 2.** Distribution of *Rhizomnium striatulum* (Mitt.) T. Kop.; based on the specimens in H, NICH and PE. Star = collecting locality of the present plant.

nonexistent but all taxa have rather wide distributions. *Rhizomnium striatulum* has a rather wide range from the Eastern Himalaya to the Russian Far East, and it is common in oroboreal and temperate zones in Japan (Koponen 1971b). The present locality is well inside this range (Fig. 2).

The strong versus weak border is usually a rather constant character. I have (Koponen 1982) earlier paid attention to the fact that in wet conditions plants with a weak leaf border or with non-bordered leaves seem to evolve in Mniaceae s. lat. This has happened both in the genera *Orthomnion* Wils. and *Plagiomnium* T. Kop. in humid tropics

(Koponen 1982). The genus *Rhizomnium* seems to be a similar case; all species with a reduced or weak border, *R. magnifolium*, *R. pseudopunctatum*, and *R. gracile* grow either in wet localities as springs, fens and on peat, or on wet mineral soil, as high arctic *R. andrewsianum* (Koponen 1973).

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