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Sauteria 9, 1998 IAL 3 - Proceedings 25-36

TAXONOMY OF *STEREOCAULON PASCHALE* AND ALLIED SPECIES IN FINLAND

Zur Taxonomie von *Stereocaulon paschale* und den benachbarten Arten in Finnland

by

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Key words: Finland, lichens, *Stereocaulon*, taxonomy.
Schlagwörter: Finnland, Flechten, *Stereocaulon*, Taxonomie.

Summary: An overlooked lichen species which has usually been referred to *Stereocaulon paschale* (L.) HOFFM. is recognized as *S. taeniarum* (H. MAGN.) KIVISTÖ, comb. *nova*. In comparison to *S. paschale* it is characterized by absence or scarcity of cephalodia, thick axis, few branchlets and phyllocladia that cover the pseudopodetia all around. It has a southwestern distribution in Finland, and is also reported from Sweden, Poland, and Quebec and Ontario in Canada. The status of *S. grande* (H. MAGN.) H. MAGN. and *S. alpinum* var. *erectum* FREY is also discussed. The Finnish distribution of *S. alpinum* var. *erectum*, *S. grande* and *S. taeniarum* is presented with maps. *S. saxatile* f. *paschaleoides* (HAV.) I. M. LAMB is referred to *S. grande*. Bourgeanic acid is reported to be constant in *S. alpinum* var. *erectum*, but inconstant in *S. grande*.

Zusammenfassung: Eine übersehene Flechtenart, die gewöhnlich zu *Stereocaulon paschale* (L.) HOFFM. gerechnet worden ist, wird als *S. taeniarum* (H. MAGN.) KIVISTÖ, comb. *nova*, erkannt. Im Vergleich mit *S. paschale* ist sie durch das Fehlen oder die Knappheit der Cephalodien, die dicken Achsen und die wenigen Ästchen gekennzeichnet, und ihre Phyllokladien bedecken die Pseudopodetien ringsum. Die Art hat in Finnland eine südwestliche Verbreitung und wird auch aus Schweden, Polen sowie aus Quebec und Ontario in Kanada mitgeteilt. Der Status von *S. grande* (H. MAGN.) H. MAGN. und *S. alpinum* var. *erectum* FREY wird besprochen. Die finnische Verbreitung von *S. alpinum* var. *erectum*, *S. grande* und *S. taeniarum* wird mit Karten dargestellt. *S. saxatile* f. *paschaleoides* (HAV.) I. M. LAMB wird zu *S. grande*

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verwiesen. Bourgeansäure wird als konstant in *S. alpinum* var. *erectum* aber als nicht konstant in *S. grande* angegeben.

Introduction

The published parts of LAMB's (1977, 1978) global monographic treatment form the major taxonomic and nomenclatural basis for the North European *Stereocaulon* species. His treatment has been slightly modified in regional surveys made in Denmark (ALSTRUP 1978), Sweden (CARLIN & CARLIN-SILVÄNG 1982, SANTESSON 1993), Norway (KROG et al. 1992), and NW Russia (e.g., DOMBROVSKAYA 1985). For instance, most of the varieties and forms recognized by LAMB have not been accepted by later authors, since they apparently mostly represent environmental modifications rather than real taxa. However, several recognized species are still very imperfectly known, and the determinations in herbaria are largely in need of revision.

During a revision of Finnish *Stereocaulon* species several taxonomic problems have turned up. One of them is the status of a morph common in SW Finland, which has usually been referred to *S. paschale* (L.) HOFFM., or sometimes to *S. grande* (H. MAGN.) H. MAGN. or *S. saxatile* H. MAGN. The observed taxon has been described from Sweden as *S. paschale* f. *taeniarum* H. MAGN., and is here recognized as a distinct species. It is briefly described below. The chemistry was studied with thin-layer chromatography (TLC), using the standard methods described by WHITE & JAMES (1985).

***Stereocaulon taeniarum* (H. MAGN.) KIVISTÖ, *comb. nova* (Fig. 2d)**

Stereocaulon paschale f. *taeniarum* H. MAGN., Göteborgs K. Vetensk. Vitterh.-Samh. Handl., ser. 4, 30 (7): 48. 1926.

Type. Sweden. Bohuslän: Öckerö, Björkö, 1916 Magnusson (UPS, lectotype, designated by LAMB 1977: 313).

Pseudopodetia loosely attached to the substratum, usually dispersed among mosses or other lichens; (2) 3-6 (7.5) cm tall, creeping to erect, main axis stout, 1-2.5 mm thick, with a white to roseate, thin tomentum at the base, thicker tomentum above; phyllocladia covering the podetia all round, basal phyllocladia sitting straight on the axis, apical phyllocladia crowded in stalked clusters, whitish or bluish grey, rarely dark grey, verruciform squamulose or digitately squamulose; true cephalodia not found, cephalodioid structures without cyanobacteria rare or absent, pale brown, stalked, 0.6-1.3 mm large; apothecia found in few specimens in juvenile condition, terminal on main or short side branches, less than 1 mm broad; pycnidia numerous, dark brown, crowded in the apices, conidia (MAGNUSSON 1926) straight, 5-6 x 0.8 µm.

Chemistry: Contains atranorin and lobaric acid.

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Distribution and habitat: In Finland (Fig. 1c) clearly southwestern, being common along the north coast of Gulf of Finland, especially in the archipelago, in the floristic provinces Åland, Varsinais-Suomi, Uusimaa, Etelä-Karjala, Satakunta and Etelä-Savo. A more northern record is in Etelä-Pohjanmaa, on the Gulf of Bothnia. All the localities are present in the hemiboreal or southern boreal bioclimatic zone. It is a characteristic component in chomophytic communities on the pine-clad rock outcrops (mainly granitic) that are frequent in the area, normally on thin, acidic soil rather than on bare rock or deeper soils.

It is also found in southern and central Sweden, though is relatively little collected there (no thorough revision of Swedish herbaria was conducted). A record from northern Poland is remarkable because the lichen is growing there on bare sand in pine forest. The few records from Quebec and Ontario, Canada, come from areas with Precambrian granitic rock outcrops very similar to those in SW Finland.

Representative specimens examined: Canada. Ontario: Sudbury Dist., Long Lake, 13 km S of Sudbury,1944 CAIN 19689 (H). Quebec: Laurentide Park, N of Lac Jacques-Cartier, 1965 SCOTTER 6894 (H).

Finland. Åland. Lemland, Nåtö, 1986 HAEGGSTRÖM 6147 & SKYTÉN 5074 (H); Hammarland, Hellesby, ALAVA 16110 (TUR). Varsinais-Suomi: Korpo, Brunskär, Bärskär 1988 SKYTÉN 5424 (H). Uusimaa. Sibbo, Kitö, 1995 KIVISTÖ 101 (H). Etelä-Karjala: Kotka, Pernoo, 1967 ULVINEN (H). Etelä-Häme: Kalvola, Könnölä, 1969 UOTILA (H). Etelä-Savo: Sulkava, Pulkkila, 1988 VITIKAINEN 12168 (H). Etelä-Pohjanmaa: Korsholm, Replot, 1995 KIVISTÖ 122 (H).

Poland. Bydgoszcz: Tuchola Forest, 1990 FALTYNOWICZ & MIADLIKOWSKA, Lich. Polon. Exs. 14, as *S. paschale* (H).

Sweden. Västerbotten: Holmsund, 1988 CARLIN 88-19, Lich. Sel. Exs. Upsal. 73, as *S. grande* (H).

Discussion

Stereocaulon paschale f. *taeniarum* was originally described on the basis of two specimens from Bohuslän, west coast of Sweden, by MAGNUSSON (1926). He regarded it as possibly an accidental form due to the extreme conditions close to the sea, but at the same time he pointed out that this form is worthy of further observation. LAMB (1977) considered this form belong to *S. saxatile*, being an environmentally produced modification due to development among erect moss-stems and lichens which constrain the pseudopodetia to grow separate and vertically. My discussion with Gunnar CARLIN, who has studied *Stereocaulon* species in Sweden, revealed that he regarded this taxon as *S. grande*.

Most similar to *S. taeniarum* is actually *S. paschale*. Their general habit is „pine-like" due to the phyllocladia clustered on the apices. A difference is that

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the phyllocladia of *S. taeniarum* are covering the pseudopodetia all over, while the axis of *S. paschale* is mostly naked. The shape of the phyllocladia is usually the same but the phyllocladia of *S. taeniarum* are more robust. There are no distinct cephalodia in *S. taeniarum*, but in *S. paschale* conspicuous blackish cephalodia are usually abundant (Fig. 2c). The distribution of these two taxa is clearly different in Finland; *S. taeniarum* is mainly found on the SW coast while *S. paschale* occurs throughout Finland, increasing northwards.

Many *S. taeniarum* specimens in the Finnish herbaria have been determined as *S. saxatile* f. *paschaleoides* (HAV.) I. M. LAMB, and such an opinion has also been published (e.g., VITIKAINEN 1991). However, an isotype specimen (UPS) of *S. evolutoides* var. *paschaleoides* HAV. from SW Norway seems to be in fact *S. grande*. In Sweden CARLIN & CARLIN-SILVÄNG (1982) adopted *S. saxatile* var. *paschaleoides* (this combination has probably never been validly published!) for a morph of true *S. saxatile*.

S. grande (Figs. 1b, 2b) is confirmed to be a distinct, primarily middle to northern boreal species, but it can be difficult to distinguish from *S. alpinum* var. *erectum* FREY (Figs. 1a, 2a), which has verrucose and thickly crenate-squamulose phyllocladia, while in *S. grande* they are usually more digitate. *S. alpinum* var. *erectum* is more strictly northern boreal to arctic in its distribution. A TLC analysis revealed that the material *S. alpinum* var. *erectum* studied constantly contained bourgeanic acid (earlier very rarely reported in *Stereocaulon*), in addition to atranorin and lobaric acid. In *S. grande* bourgeanic acid is not constant (present in ca. 50 % of specimens).

Acknowledgements

I am most grateful to Prof. Teuvo AHTI and Dr. Soili STENROOS for invaluable advice and guidance in my study. I also want to thank Mr. Gunnar CARLIN and Mr. Unto LAINE for sharing their experience and knowledge with me. I am indebted to the staff of the herbaria in TUR and UPS for loaned material.

References

ALSTRUP, V. (1978): Lichen genera *Stereocaulon* and *Leprocaulon* in Denmark. - Bot. Tidsskr. **73**: 185-190.

CARLIN, G. & U. CARLIN-SILVÄNG (1982): De svenska *Stereocaulon*-arterna (påskrislavar). - Svensk Bot. Tidskr. **76**: 289-307.

DOMBROVSKAYA, A. V. (1985): Species of the genus *Stereocaulon* (SCHREB.) HOFFM. in Murmansk region. Distribution and variability. - Byull. Mosk. Obshch. Ispyt. Prirody, Otd. Biol. **90**: 118-130. (In Russian).

KROG, H., ÖSTHAGEN, H. & T. TÖNSBERG (1994): Lavflora. Norske busk- og bladlav.

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Universitetsforlaget, Oslo: 368 pp.

LAMB, I. M. (1977): A conspectus of the lichen genus *Stereocaulon* (SCHREB.) HOFFM. J. Hattori Bot. Lab. **43**: 191-355.

LAMB, I. M. (1978): Keys to the species of the lichen genus *Stereocaulon* (SCHREB.) HOFFM. J. Hattori Bot. Lab. **44**: 209-250.

MAGNUSSON, A. H. (1926): Studies on boreal *Stereocaula*. Göteborgs K. Vetensk. Vitterh.-Samh. Handl., ser. 4, **30** (7): 1-89.

SANTESSON, R. (1993): The lichens and lichenicolous fungi of Sweden and Norway. - SBT-förlaget, Lund: 240 pp.

VITIKAINEN, O. (1991): Lichens recorded during the 8th Nordic lichen excursion in archipelago of SW Finland, 1989. - Graphis Scripta **3**: 35-43.

WHITE, J. & P. W. JAMES (1985): A new guide to microchemical techniques for the identification of lichen substances. - Bull. British Lich. Soc. **57** (Suppl.): 1-41.

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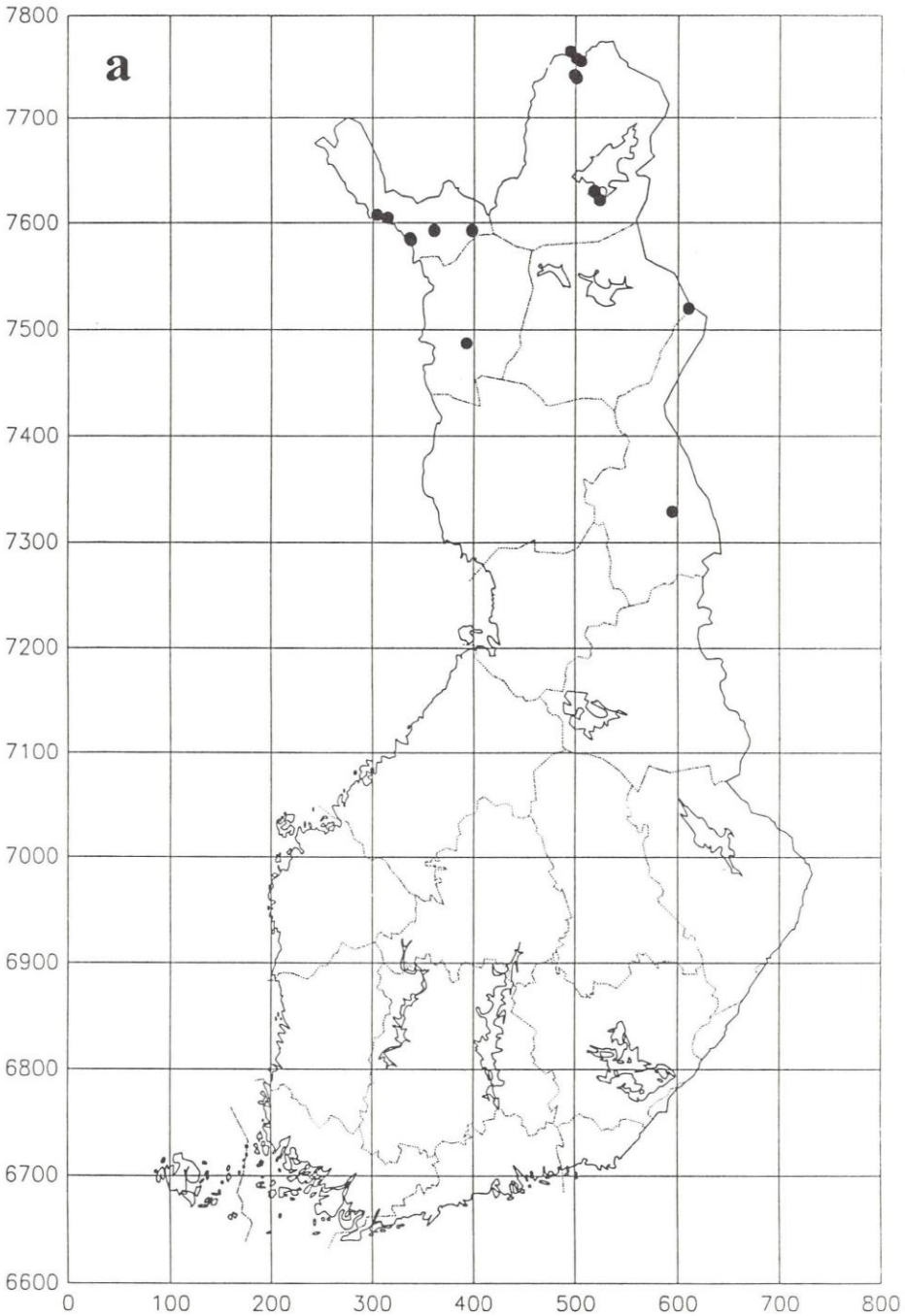


Fig. 1a: Distribution of *Stereocaulon alpinum* var. *erectum* in Finland.

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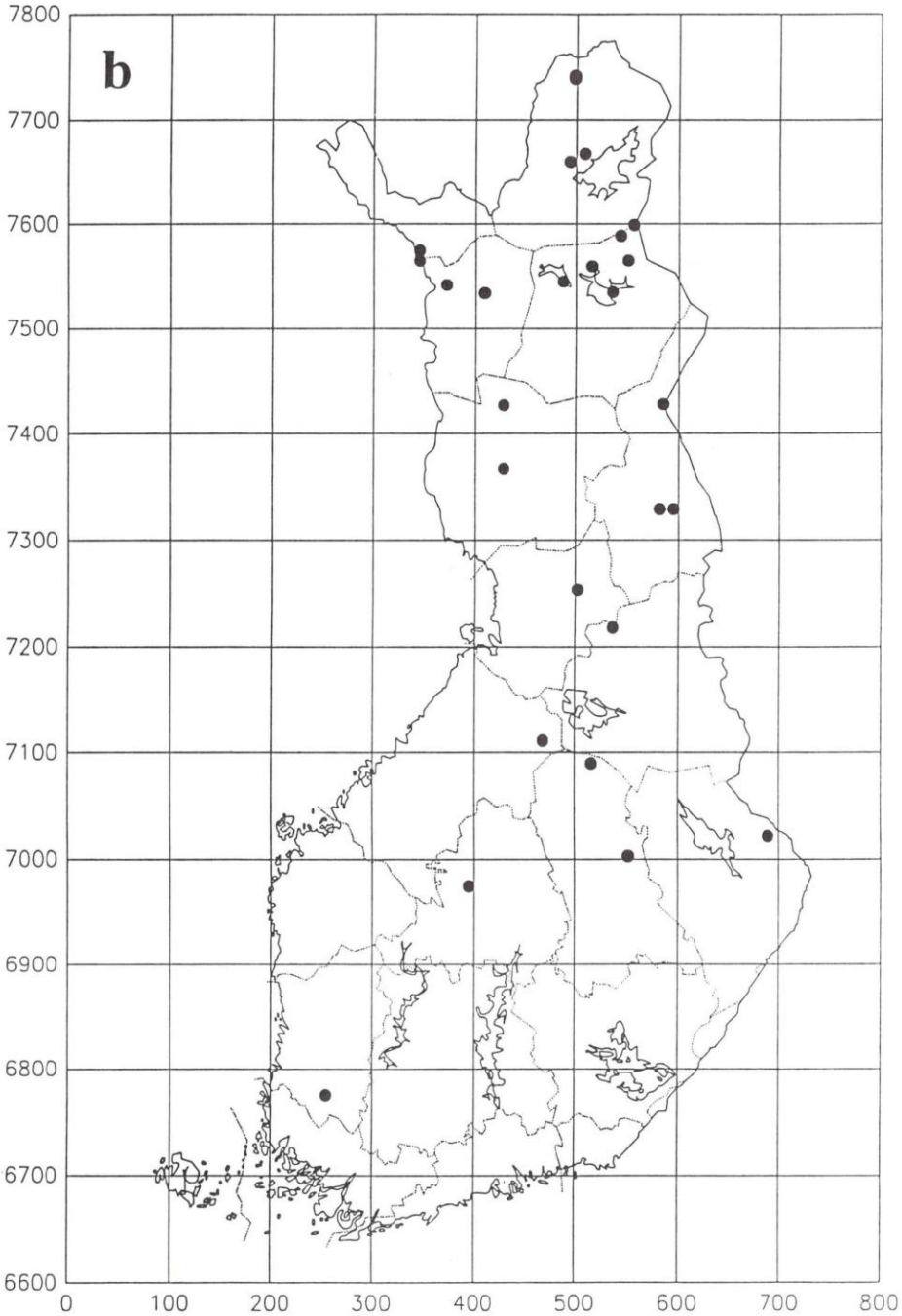


Fig. 1b: Distribution of *Stereocaulon grande* in Finland.

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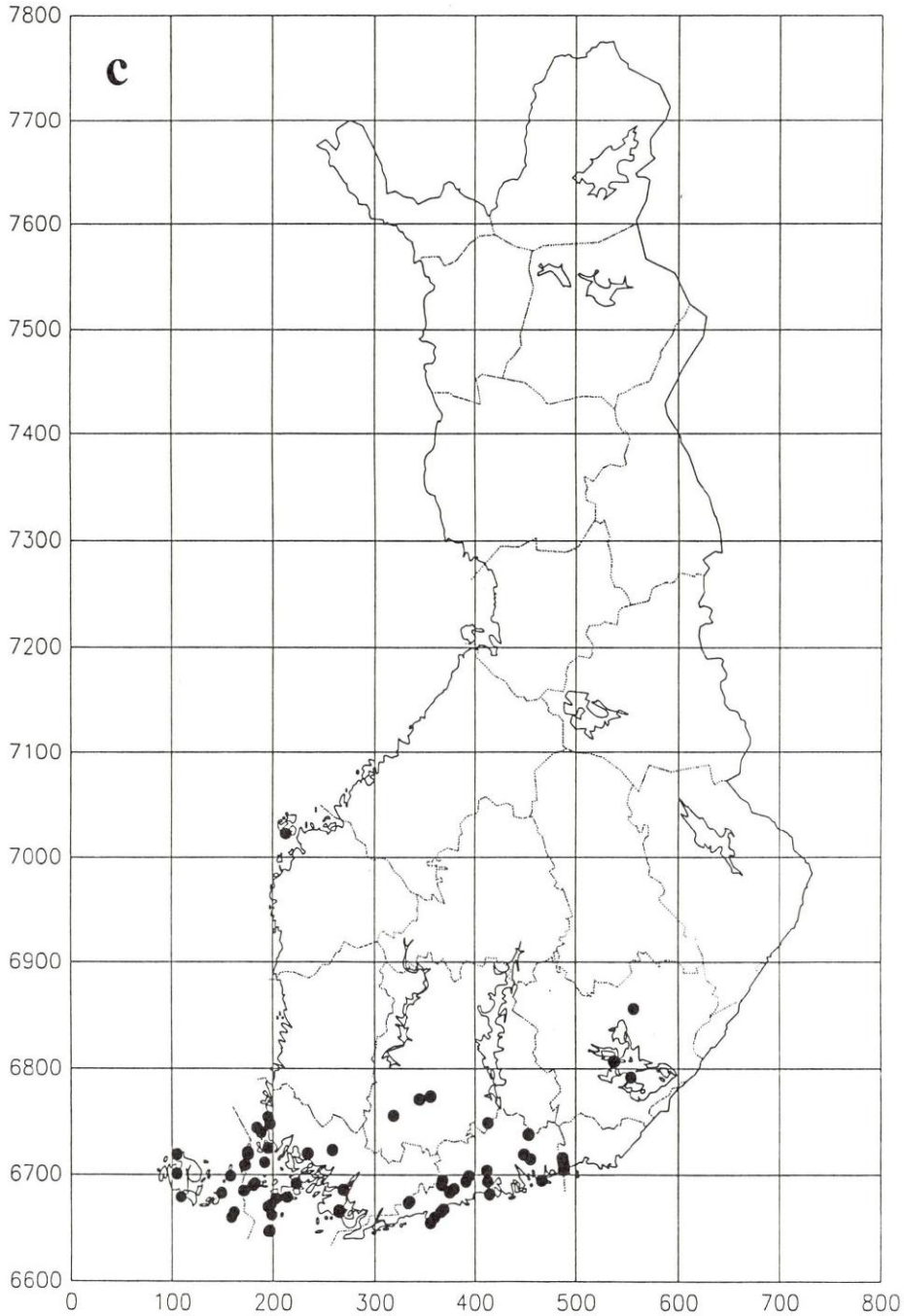


Fig. 1c: Distribution of *Stereocaulon taeniarum* in Finland.

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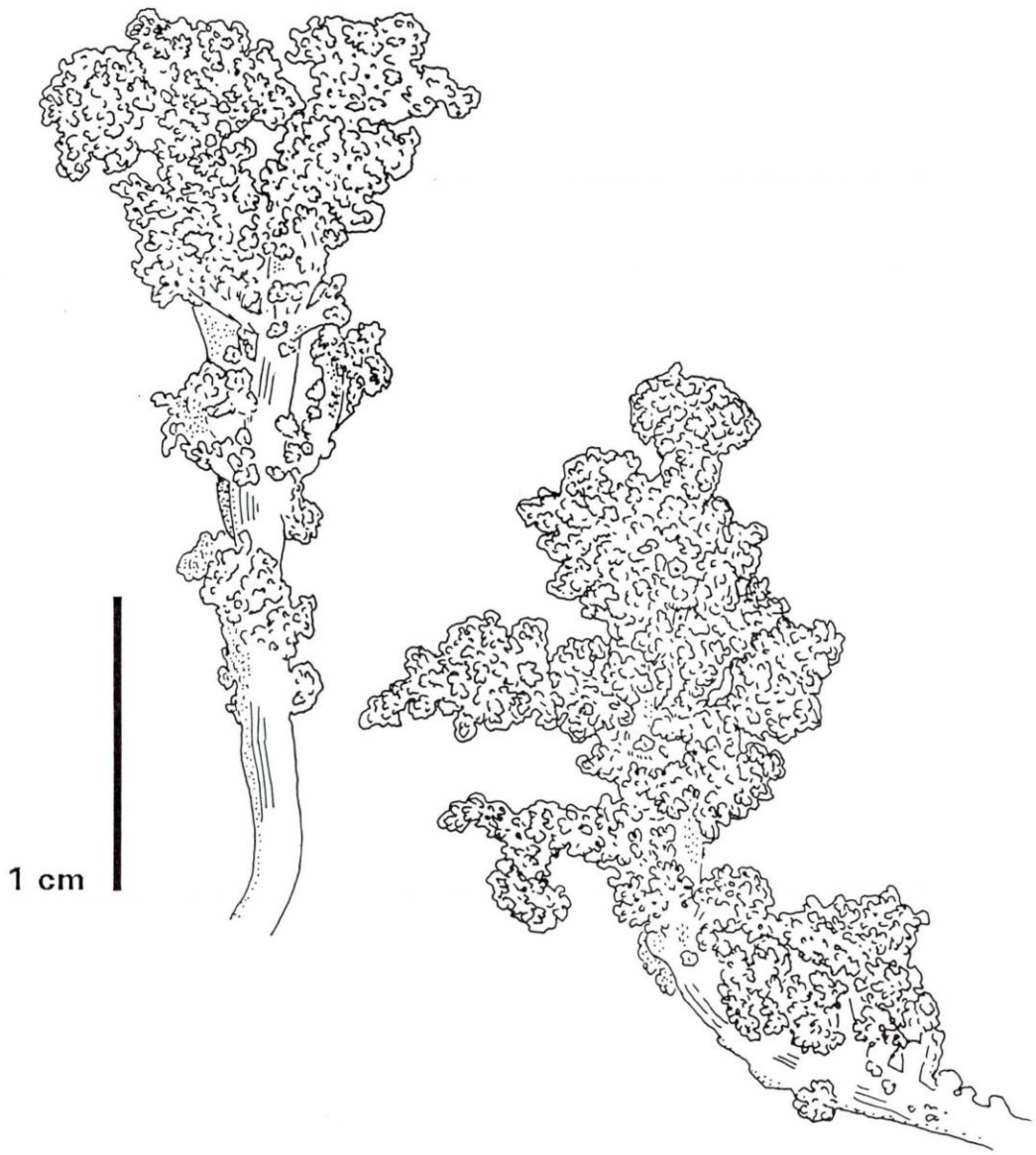


Fig. 2a: Habit of *Stereocaulon alpinum* var. *erectum* (AHTI 29985, H).

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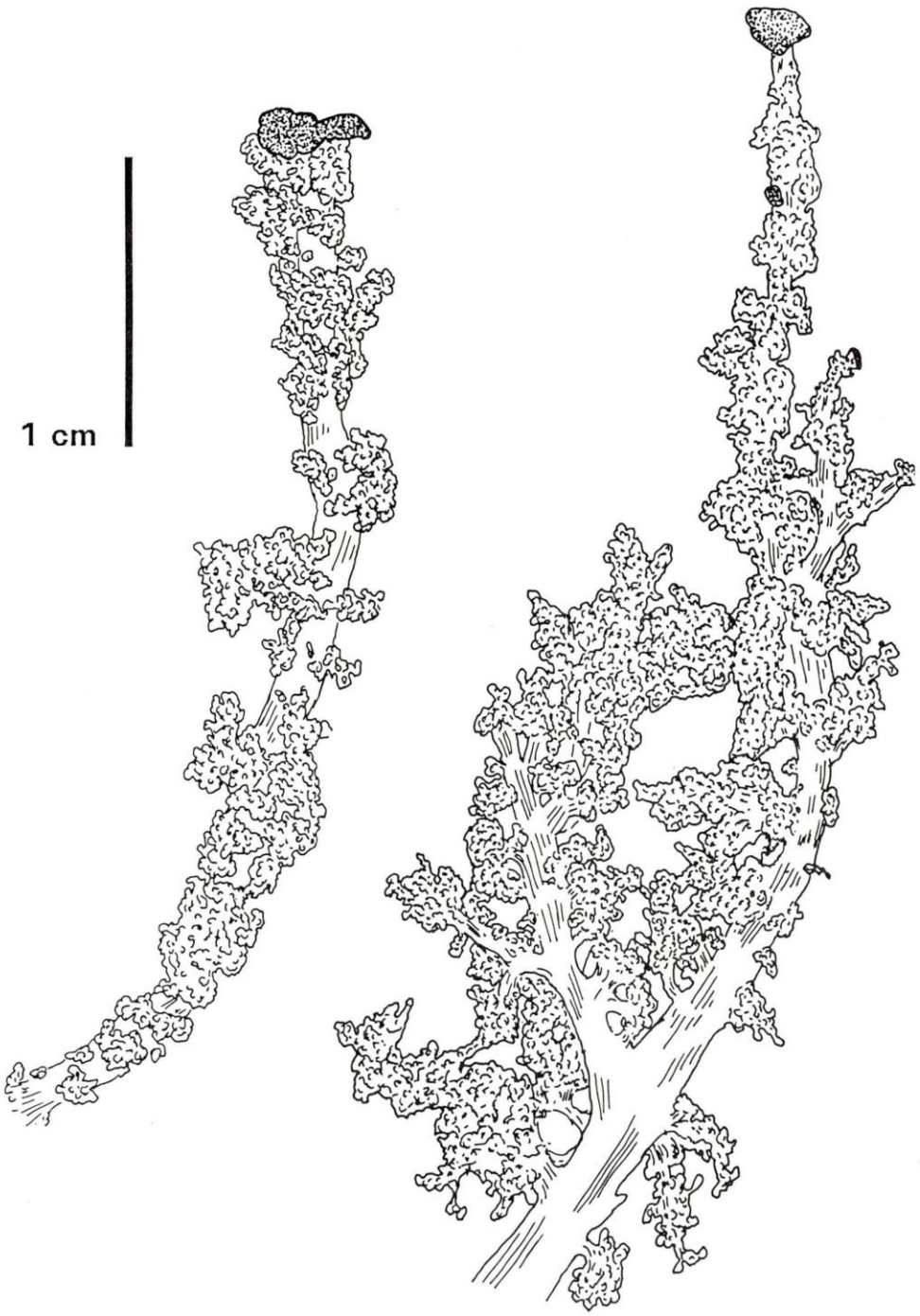


Fig. 2b: Habit of *Stereocaulon grande* (left: AHTI 23244, H, right: KIVISTÖ 174, H).

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Fig. 2c: Habit of *Stereocaulon paschale* (HÄMET 19.VIII.1959, H).

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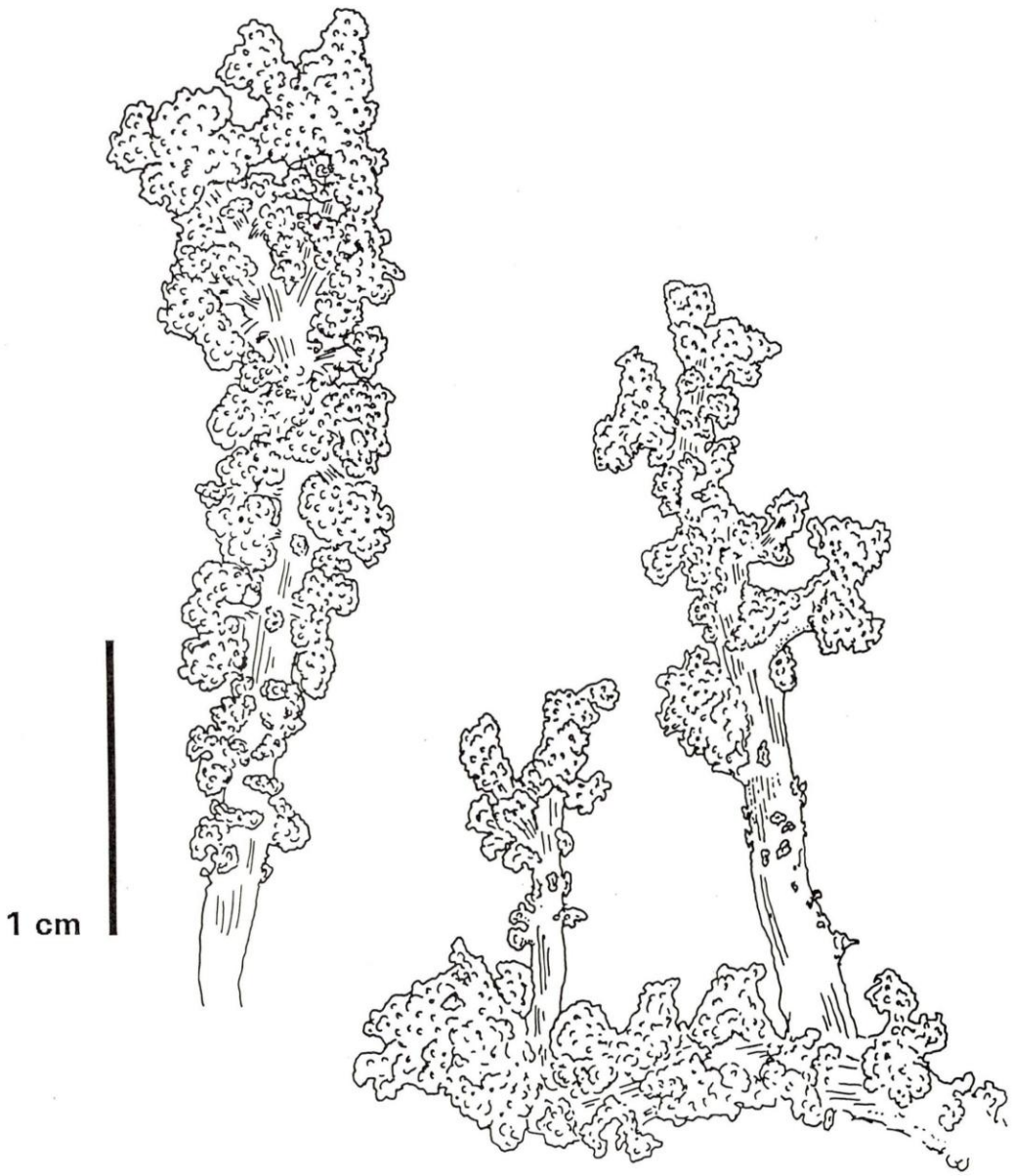


Fig. 2d: Habit of *Stereocaulon taeniarum* (KIVISTÖ 103, H).

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Jahr/Year: 1998

Band/Volume: 9

Autor(en)/Author(s): Kivistö Laura

Artikel/Article: Zur Taxonomie von Stereocaulon paschale und den benachbarten Arten in Finnland 25-36