

NOTES ON SPHACELARIALES (PHAEOPHYCEAE) I  
On the identity of *Sphacelaria paniculata* Suhr

W. F. PRUD'HOMME VAN REINE  
Rijksherbarium, Leiden

SUMMARY

In the herbarium in Kiel the holotype of *Sphacelaria paniculata* was located. Australian material, known under the names *Halopteris hordeacea* (Harvey) Sauv., *H. spicigera* (Aresch.) Moore or *H. gracilescens* (J. Ag.) Womersl. has as correct name *Halopteris paniculata* (Suhr) P. v. R. *comb. nov.*

In 1840 J. N. von Suhr described several new species. One of these was *Sphacelaria paniculata* from 'Neuholland'. The diagnosis (p. 278) was: 'Die Basis ist ein dicker Wulst, wie bei *Sphacelaria scoparia* Ag., mit welcher sie auch in der Grösse (3—4 Zoll Höhe) ziemlich gleich kommt. An den Spitzen der Seitenzweige drängen sich, wie zu einem Kolben, eine Menge ganz kleiner Nebenzweige rund um den Hauptfaden und so enge zusammen, dass aus jeden Absatz mehrere Zweige kommen; in den Spitzen dieser Zweige zeigt sich die gesäumte Frucht. Die Glieder sind quadratförmig, auch wohl ein wenig mehr breit als lang; die Absätze verdunkelt, stellenweise durchscheinend'.

As no figure was given, the description caused much confusion. At that time all scientists interpreted the prominent elongate apical cell of most *Sphacelariales* (the sphacella) as the sporangium. In some other species (*Sphacelaria pennata*, *S. racemosa*, *S. radicans*) lateral sporangia were also known. For this reason a 'double fructification' was credited to *Sphacelaria*

It is not likely von Suhr was aware of the true nature of the 'gesäumte Frucht' that he found on top of the small branches. According to Sauvageau (1904, p. 416) and Womersley (1967, p. 203) this almost certainly refers to the apical cell with contracted contents. These authors did not study typematerial and rejected *Sphacelaria paniculata* as a *nomen dubium*.

One year after the publication of von Suhr's description, Decaisne (1841, p. 127) was the first author who pointed out that the apical cell is not a sporangium at all. In 1842 J. G. Agardh and Decaisne discussed the reproduction of the *Sphacelariales* in their publications. Agardh hesitated to reject the double fructification, but Decaisne refused to change his point of view. Meneghini followed Decaisne in this respect and he described in 1843 (p. 349) the real sporangia of *Sphacelaria scoparia*, a species closely related to *Sphacelaria paniculata* Suhr. Since that time most authors follow Decaisne in rejecting the apical cell as a sporangium.

J. G. Agardh (1841, p. 454) described a new species from Nova Hollandia from the herbarium Diesing under the name *Sphacelaria gracilescens*. In his description he did not mention sporangia. According to Sauvageau (who did not study the type) it was based on insufficient material.

Harvey (1844, tab. 614) was the next author who described a new species related to *Sphacelaria scoparia*. This material came from the Bay of Islands, New Zealand, *leg. Dr. Sinclair*. Harvey clearly depicted sporangia in groups in the axils of small, densely placed, twisted branches. These small branches form together the exerted fertile spikes resembling aers of barley or rye, and are characteristic for the species which he called for this reason *Sphacelaria hordeacea*.

Several other species of *Sphacelaria* were described in the middle of the 19th century. One of these is also important in connection with the nomenclatural problems this publication is trying to solve: *Sphacelaria spicigera* described by Areschoug (1854, p. 365).

Sauvageau (1904, p. 420) suggested abandoning the names *paniculata* and *gracilescens* and using Harvey's material as the type of the species. He then called it *Halopteris hordeacea* (Harvey) Sauvageau (*sphalm. hordeacea*).

Womersley (1967, p. 202) studied type-material of *S. gracilescens* in the Agardh herbarium. He found three small pieces with numerous fertile spikes, enough material to establish the concept of *Sphacelaria gracilescens* J. Ag. Then he denominated the species *Halopteris gracilescens* (J. Ag.) Womersley, including the Australian material of *H. hordeacea*, but excluding the New Zealand material of *H. hordeacea* which may be a separate taxon.

Moore (1953, p. 13) separated the robust plants with partly hidden fertile spikes from the slender plants with exerted spikes, accepting the name *Halopteris spicigera* (Aresch.) Moore as the name of the former and referring to the latter as *H. hordeacea*. Moore considered that the slender *hordeacea*-form occurs in Australia, but according to Womersley (1967, p. 203) the variation in robustness and gradation from hidden to exerted spikes appears in Australia to depend on age and perhaps habitat of the plant. He included the Australian plants of *H. spicigera* in *H. gracilescens*.

During my work on the European *Sphacelariales*, I also looked through collections of extra-European material. In KIEL I found a herbarium sheet (fig. 1) annotated by Reinke in the following manner:

*Sphacelaria paniculata* Suhr  
 Styppocaulon panicul.  
 Original exemplar !  
 Golf von Carpentaria  
 Ex. herb. Suhr

The material consists of the terminal parts of one fertile plant. There is a label on which the text reads as follows: '*Sphacelaria* ("*paniculata* S" added by Reinke). Vom Meerbusen von Carpentaria an der Nordseite Neuhollands. Geo Ludwig brachte ein einziges Exemplar hierher; wovon dieses ein Zweig ist. Es war gross, radice stuposa, wenn (one word unreadable) der zügänglichen *Sph. scoparia* von Biariz ähnlich". At the back of the label, with another pen and in a handwriting easily identified as that of von Suhr, we find a description that is nearly the same as the published one (von Suhr, 1840, p. 278).

Reinke (1891, p. 27 and Tafel VII f. 6—9) described the species and depicted type-material of *Sphacelaria paniculata* under the name *Styppocaulon paniculatum* (Suhr) Kützing. The figures clearly show that the 'gesäumte Frucht' of von Suhr was not the large, dark, terminal cell. The small branches in the fertile spikes (and in fact all branches in the type) are determinate and did already finish their growth before they were collected. Since the sporangia in the type-specimen are not to be found on top of the branches and not even on top of small stalks, but are growing together in stalkless clusters, it is not clear what Von Suhr intended when he described the supposed fructification. The type-material establishes the concept of *Sphacelaria paniculata* Suhr, and is synonymous with the Australian *Halopteris hordeacea* and with *H. gracilescens*.

## HALOPTERIS OR STYPOCAULON?

In 1843 Kützing split the genus *Sphacelaria* Lyngbye into several new genera, among which *Halopteris* (p. 292) and *Stypocaulon* (p. 293). The type-species of *Halopteris* is *H. filicina* (Grat.) Kütz. (= *Ceramium filicinum* Grateloup), and *Stypocaulon* has as type-species *S. scoparium* (L.) Kütz. (= *Conferva scoparia* L.). Later Sauvageau (1913, p. 382—383) united *Halopteris* and *Stypocaulon* with *Anisocladus* Reinke under the name *Halopteris* Kütz. emend. Sauv.

The differences between the European *Halopteris filicina* and *Stypocaulon scoparium* are quite distinct. The Australian species present more difficulties, and that is the reason why Sauvageau united the genera.

Since I did not study the extra-European species in great detail, I will not split the genus *Halopteris* again. So a new combination has to be made:

***Halopteris paniculata*** (Suhr) P. v. R., *comb. nov.* — *Sphacelaria paniculata* Suhr (1840) 278; Sauvageau (1904) 416, as *nom. dubium*; Womersley (1967) 203, as *nom. dubium*. — *Stypocaulon paniculatum* Kützing (1849) 467; Reinke (1891) 27, t. VII. f. 6—9. — T y p e: Gulf von Carpentaria, *Ludwig s.n.* (KIEL, holo).

*Sphacelaria gracilescens* J. G. Agardh (1841) 454. — *Stypocaulon gracilescens* Kützing (1849) 468. — *Halopteris gracilescens* Womersley (1967) 202. — T y p e: Nova Hollandia, *ex herb. Diesing s.n.* (Agardh herbarium no 45899, LD, lecto).

*Sphacelaria hordeacea* Harvey in Hook., *lc. Pl.* (1844) t. 614. — *Stypocaulon hordeaceum* Kützing (1849) 467. — *Halopteris 'hordeacea'* Sauvageau (1904) 432; Moore (1953) 13. — T y p e: Bay of Islands, New Zealand, *Sinclair s.n.* (K, holo, now in BM; TCD).

*Sphacelaria spicigera* Areschoug (1854) 365. — *Halopteris spicigera* Moore (1953) 13; Womersley (1967) 203, *pro syn.* — T y p e: Port Phillip, Victoria, *Gavin s.n.* (not seen; in S according to Womersley).

## NOTE

According to Womersley (personal communication) the type-locality of *S. paniculata* is not correct. I tried to make inquiries about the Ludwig mentioned on the label. In that time the Gulf of Carpentaria was not visited very often. In fact I know only of the Flinders' expeditions having reached this point some time before the date of publication of the description. Thus a wrong transcription of labels can not be excluded.

## ACKNOWLEDGEMENTS

The writer wishes to express his thanks to the director of the Botanical Institute in Kiel for loan of material and to the director and the curator of the Botanical Institute in Lund for their hospitality and for permission to examine specimens. His acknowledgements are especially due to Mr. C. L. Marks, who made the photograph; to Prof. Dr. C. den Hartog for his helpful criticism, and to Mr. E. P. Woolsey for correcting the English text.

## REFERENCES

- AGARDH, J. G. 1841. In *historiam Algarum symbolae*. *Linnaea* 15: 442—457.  
 — 1842. *Algae maris mediterranei et adriatici*.  
 ARESCHOUG, J. E. 1854. *Phyceae novae et minus cognitae in maribus Extraeuropaeis collectae*. *Acta R. Soc. Sci. Upsal. ser. 3, 1*: 329—372.

- DECAISNE, J. 1841. Plantes de l'Arabie heureuse, recueillies par M. P.-E. Botta. Arch. Mus. Hist. Nat. 2: 89—193.
- 1842. Essais sur une classification des Algues et des Polypiens calcifères de Lamouroux. Ann. Sci. Nat. Bot. ser. 2, 17: 297—380.
- HARVEY, W. H. 1844. In: Hook. Ic. Pl. ser. 2, 3: tab. 614.
- KÜTZING, F. T. 1843. Phycologia generalis.
- 1849. Species Algarum.
- MENEGHINI, G. 1842—1846. Alghe italiane e dalmatiche illustrate.
- MOORE, L. B. 1953. Some distribution problems illustrated from brown Algae of the genus *Halopteris*. Proc. 7th Pacif. Sc. Congr. 5: 13—18.
- REINKE, J. 1891. Beiträge zur vergleichenden Anatomie und Morphologie der Sphacelariaceen. Bibl. Bot. 23: 1—40.
- SAUVAGEAU, C. 1900—1914. Remarques sur les Sphacélariacées (partly in J. de Bot. Paris).
- SUHR, J. N. VON, 1840. Beiträge zur Algenkunde. Flora 23: 273—282.
- WOMERSLEY, H. B. S. 1967. A critical survey of the marine algae of Southern Australia II, Phaeophyta. Aust. J. Bot. 15: 189—270.



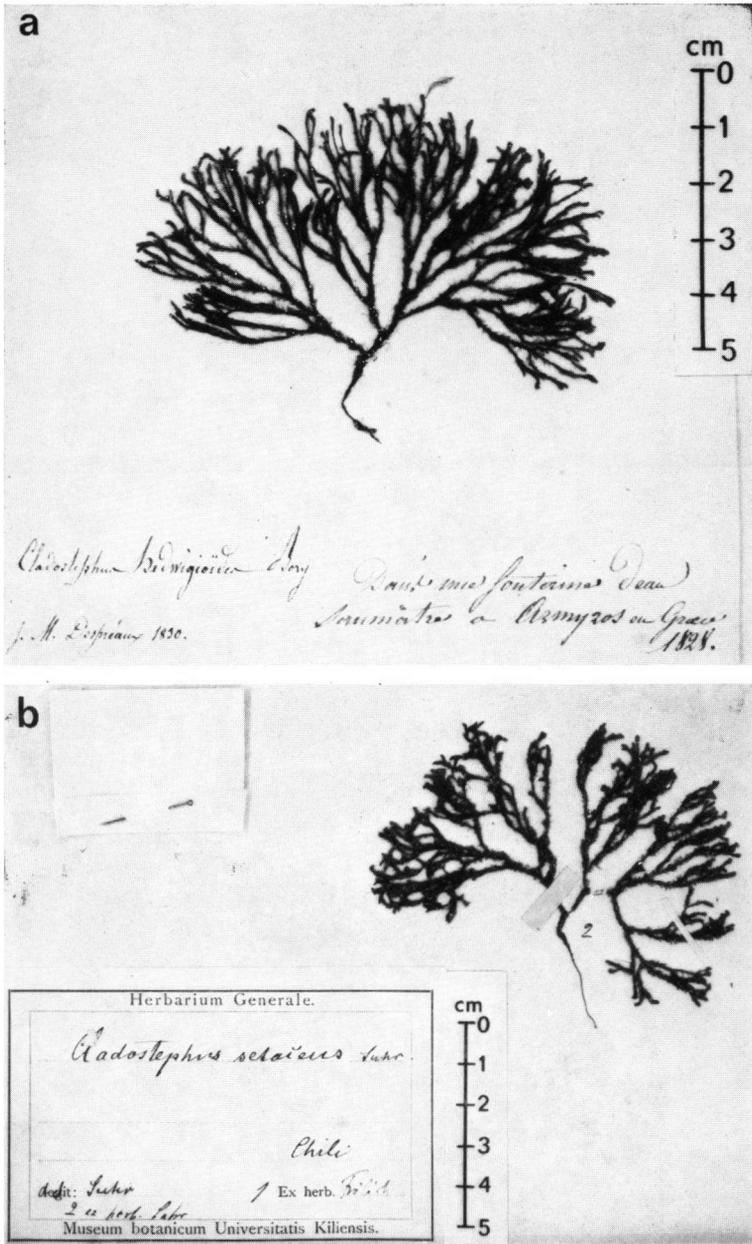


Plate II. — a. Type duplicate of *Cladostephus hedwigioides* Bory in BR. Labelled by Lenormand. — b. Part of the sheet with type material of *Cladostephus setaceus* Suhr in KIEL. Labelled by J. Reinke. Only specimen numbered '2' (from the herb. von Suhr) is shown. The other specimen and the specimen from the herbarium Frölich give exactly the same impression.