Acta Bot. Neerl. 22(1), February 1973, p. 79–80

MEETINGS OF THE ROYAL BOTANICAL SOCIETY OF THE NETHERLANDS

MEETING OF THE SECTION FOR PLANT TAXONOMY AND GEOGRAPHY ON APRIL 17, 1971

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Taxonomy and life history of Acrochaetium species (Nemaliales, Rhodophyta)

Acrochaetium is a genus of very small marine red algae with a heterotrichous habit. Individuals are found on or in plants and animals in the lower littoral and sublittoral regions. The genus includes about 250 species. Many of the species descriptions are incomplete and inadequate, since they are based on minute morphological differences only, whereas information concerning life histories is scarce.

Recent investigations show that *Acrochaetium* taxa hitherto regarded as separate species may represent either phases of a single life history or even phases in the life history of red algae placed in other genera (reviewed by DIXON 1970; WEST 1968; WOELKERLING 1970). A second factor which casts some doubt on existing classification is the lack of knowledge concerning modifications due to the environment.

The above problems were investigated by means of culture experiments and field observations. Life histories of *A. virgatulum* and *A.* cf. *dasyae*, studied in unialgal cultures, kept at different daylengths (8, 12 or 16 hrs of light per 24 hours) and temperatures (4, 8, 12 or 16 °C), turned out to be diplobiontic with a heteromorphic alternation of generations.

Acrochaetium virgatulum, a rather robust species with a parenchymatous basal system, produced tetrasporangia under short-day conditions at 8–16 °C. Under all conditions tetraspores gave rise to small heterothallic gametophytes with unicellular bases. Until now, the presence of gametophytes in this species was unknown. Full-grown female plants also produced spermatia in addition to carpogonia. The fertilized carpogonium was observed either to divide transversely or to form carposporangia directly. Carpospores developed into tetrasporophytes. Both tetrasporophytes and gametophytes reproduced asexually by monospores under all conditions. The gametophytes of *A. virgatulum* resemble earlier described taxa such as *A. rhipidandrum*, *A. maluinum*, and those of the *A. hallandicum-parvulum* complex. Under long-day conditions the tetrasporophytic generation also produced spermatia. This suggests that polyploidy may occur within populations of *A. virgatulum*.

The second *Acrochaetium* taxon studied was observed to be strictly confined along the Dutch coast to the host *Dasya pedicellata*. It was provisionally identified as *A.* cf. *dasyae*. Only heterothallic gametophytes with a multicellular filamentous basis and a persistent basal spore were found. Curiously, there is no overlap in the distribution of the male and the female gametophytes. It is even impossible that there is any contact between the two relevant Dutch populations, since one of them is found in an inland water-basin. Fertilization was effected in culture. Carpospores gave rise to tetrasporophytes, also with a multicellular filamentous basis, but with a non-persistent basal spore. In this case the production of tetraspores in culture was not influenced by special daylength conditions. Both the tetrasporophyte and the gametophyte reproduced by monospores. As yet it was impossible to assign the tetrasporophytic generation to one of the known *Acrochaetium* taxa.

The above examples suggest that a diplobiontic life cycle may be of common occurrence within the genus *Acrochaetium* and also support the assumption that at least some of its taxa have wrongly been described as separate species.

The morphology of the basal system of an *Acrochaetium* taxon can vary considerably with the substrate. Thus the basal system of *A. daviesii* growing on firm substrates (e.g. *Ceramium rubrum*, hydroids) consists of branched filaments which may become so densely interwoven that they form a pseudoparenchymatic disc. On the other hand, if *Codium* is the substrate,

the basis consists of an extensive loose mass of endophytic filaments between the utriculi, and identification of material from *Codium* leads to *A. codii*. This shows again that the present classification of the genus *Acrochaetium* is unsatisfactory.

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POLLEN SYMPOSIUM ON OCTOBER 30, 1971

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Pollinosis and pollen allergens

The syndrom which is called hay-fever, hay-asthma, or even better, pollinosis, is an allergic reaction mostly affecting the mucous membranes of the eyes and of the ductus respiratorius. This clinical picture is caused by contact with pollen grains of certain species. The pathogenesis is to be cleared up in each special case. Some persons have a special disposition to pollinosis. Morbidity in the Netherlands is about 1% of the population. Allergic predisposition is higher in towns than in rural populations, and more frequent among white collar workers than among the handworking population. The etiology shows about 100 plant species capable of causing the disease. Most allergen producing plants are anemophilic with high amounts of small dry pollen. This explains the strong periodicity of hay-fever. Normally, 40–50 pollen grains, in extreme cases 3–5 pollen grains were sufficient to produce the pollinosis syndrom. Many allergen producing plants are found in the Gramineae and Ambrosiaceae families and sometimes contain highly sensitizing antigens. For diagnostic purposes epicutan and intracutan tests as well as ophthalmo and passive anaphylaxy experiments are used. It was demonstrated that many patients have a highly specific sensitivity to certain plant species. Considering the chemical nature of pollen allergens there is no unanimity. According to the theory of Berrens there is a spectrum of different allergens which consist of a carrier molecule and an identical determinant molecule. The carrier molecule is different for various pollen species and has an MW of about 30,000. By reaction with another molecule the antigen determinant arises, which causes the allergenic activity. Recent analysis, in cooperation with Dr. Jorde (Moers), showed that in *Seale* pollen the allergenic component is a protein, which is localized in the 100,000 $\times$ g fraction and for some part in the wall fraction. This is in agreement with recent findings of Knox and Heslop-Harrison using immunofluorescent microscopy, which showed a localization in the intine layer.