

ABSTRACTS

A. QUISPÉL, The mutual relations between algae and fungi in lichens. Diss. Groningen, 1943. Recueil des Trav. bot. Néerl. **40**, 413, 1943.

The lichen-symbiosis was investigated by means of experiments with pure cultures of the components. As lichen-algae some *Cystococcus* species were isolated, the only lichen-fungus investigated was *Xanthoriomyces parietinae*. As an orientation, however, a great many experiments were performed with the fungi which are living in symbiosis with the aerial algae *Pleurococcus* and *Apatococcus*, as it appeared that these fungi are closely related to true lichen-fungi, whilst their growth-velocity is much better. In consequence they are an excellent object for the study of the lichen-symbiosis. As far as possible the results obtained with the investigation of these fungi were tested upon *Xanthoriomyces*.

It appeared that the fungi did not develop in synthetic culture solutions without the addition of certain nutrilites (aneurin, β -alanin and other bios substances). The lichen-algae can provide the fungi with these nutrilites. These algae themselves were stimulated by the addition of asparagin, nicotinic acid and certain bios substances, when developing in organic culture solutions. In inorganic solutions a good development could only be obtained after the addition of a small amount of ascorbic acid. It is very probable that the lichen-fungi are able to stimulate the photosynthesis of the algae by the production of ascorbic acid or a related substance.

The fungi did not produce lichenic acids in cultures. On the other hand the alga *Apatococcus minor* synthesizes a remarkable metabolic product, called apatococcin, which most probably is related with certain aliphatic lichenic acids.

An investigation of the water-household of some lichens showed that the protective influence of the fungus against a desiccation of the algae is merely very small and can only be perceived when the desiccation is not too intense.

The final conclusion is that the lichen-symbiosis may be regarded as a „mutualistic symbiosis” in which the exchange of nutrilites plays an important role.

A. Q.
