Plant hormones - The probable link in the chain of processes leading to the phenomenon of "mucillagine" (Amorphous Aggregates)

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There are different inorganic and organic compounds in the sea water. Some of them, such as vitamins, enzymes, plant hormones, show the biological activity even if present at very low concentrations.

The presence of phytohormones in marine environment has heen confirmed by PEDERSEN (1973) and KENTZER (1980).

Growth regulators are mainly of physiological in origin as they are produced by some algae and bacteria.

According to MARUYAMA (1989) marine sediments and microorganisms living in them are the principal sources of plant hormones in the sea.

Agriculture and horticulture, in particular, also act as possible sources of these compounds since they are widely used, and may be transported by rainfall into the groundwater and thus by river to the sea.

The present work is an attempt, to explain the mechanism of mucillagine formation by means of a physiological study of marine algae.

Some of the plant hormones and their relationship with the mucopolysaccharides production was examined. We suggest that hormonal activity plays an important role as an ecological factor in the complex system of processes leading to the phenomenon of mucillagine.

Plant hormones, on one hand, derive from certain processes and, on the other hand, influence and regulate them, therefore in the following schema : **eutrophication... algal bloom... marine snow... filaments... mucillagine**, they may act, directly or indirectly.

Thus phytoplankton blooms, may cause an increase in plant hormone concentration in the sea water (as they are produced by algae) as well as having other ecological consequences.

At the same time the decay products of descending dead cells become a substrate for hormone production eg.some bacteria living in marine sediments are able to use tryptophane from algal cells as a precursor to the synthesis of auxin.

We studied the stimulating activity of plant hormones on the mucus production by the algal cells.

The preliminary results show that: the strongest effect is obtained with gibberellin GA3 at a concentration of 10 E-6 mg/dmc and with auxin IAA at a concentration of 1 mg/dmc.

Together with the increase in mucus content within the flocks of marine snow, there is also an increase in their stickiness which influences their potential for combining in larger aggregates.

These aggregates form filaments of so called mucillagine, whose biological activity may also play a certain role in this chain of processes.

As a result of our laboratory experiments on the biological activity of mucillagine, the increasing amount of mucus added to the diatom cultures caused a very significant increase in cell number, but didn't enhance the exudation of new mucus. However, it doesn't exclude the possibility of an indirect influence on the phenomenon of mucillagine since new cells appearing in great number may produce hormones.

The stimulation of algal mucus production by plant hormones together with other environmental factors result in a model which could explain the phenomenon of mucillagine formation.

However, care should be taken in drawing conclusions based on laboratory results about natural processes taking place in the marine environment because much greater number of environmental parameters should be considered (eg chemical, biological, physical, meteorological factors).

In addition one should remember the importance of cell sensibility which, of course, changes within their life cycle.

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