being significant enough to provoke a tendency for a decrease of gill surface area with age.

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A New Polymorphic Rhizopod related to *Pseudospora* found associated with a Colonial Hydroid

We have recently had the opportunity of examining an organism found living in close association with specimens of the colonial hydroid *Cordylophora lacustris* (Allman) in laboratory cultures which may throw light on a neglected group of rhizopods sometimes classed with, or as an appendage to, the Heliozoa. The organism is highly polymorphic and occurs in two amœboid phases, plus a 'heliozoan' phase, a flagellated phase, and an encysted phase.

The most common amœboid phase is a lobose amœba some 30–40μ in diameter when fully grown, with a generous ectoplasmic periphery and numerous hyaline lobose pseudopodia which may be long and slender, or short and blunt, or intermediate; such pseudopodia frequently branch. The endoplasm commonly contains many granular inclusions as well as food vacuoles; there is at least one contractile vacuole. The nucleus has a single conspicuous karyosome and resembles the vesicular nucleus seen in many soil amœbæ, such as *Naegleria* and *Hartmannella*.

A second type of amœba has long, irregularly disposed, tapering and pointed pseudopodia radiating from a small central body as in a 'radiosa' amœba. This phase is not necessarily an intermediate stage between the lobose and 'heliozoan' phases since transformations between these two phases have been observed without the intervention of the 'radiosa' phase. The process of transformation is brief and may be completed in 3–5 min; it appears to be completely reversible.

The 'heliozoan' phase is spherical to slightly ovoid, with a nucleus similar to the lobose phase, and numerous straight or slightly curved, very fine filose pseudopodia radiating from the periphery. Observations with bright field, phase contrast, and dark field microscopy have provided no evidence that these pseudopodia are continued into the body or that they have any differentiated axis. They occasionally branch. They are filopodia, not axopodia.

The flagellates are formed from smaller amœbæ (about 10μ in diameter) of the 'radiosa' or lobose types and when first formed they may display pseudopodia as well as a single flagellum. The fully developed flagellated stages are typically spherical, ovoid, or pyriform, with a smooth outline and bear two flagella of unequal length. The longer flagellum (10–20μ) is undulating and locomotory and the shorter flagellum (3–5μ) is usually curved against the body and rarely beats. When it does so it beats slowly and out of phase with the longer flagellum.

The organism was first observed in laboratory cultures of *Cordylophora* in New Orleans, Louisiana, in the summer of 1961. The hydroids were being cultured in dilute saline (1·5 parts per thousand) and the rhizopod was discovered almost simultaneously in hydroid cultures developed from material collected in brackish water sites near Antioch, California; Slidell, Louisiana; Falmouth, Massachusetts; and Vineyard Haven, Massachusetts. The rhizopod has not yet been found in Nature, but is believed to have been introduced into the laboratory with hydroids from one of these four sites.

Various stages of the rhizopod have been observed on the external surface of the hydroid and within the gastrovascular cavity. Large numbers have been found in association with occasional enlarged, hypertrophic growths on the stolon and uprights. Infested sporosacs of the hydroid also have sometimes displayed œdematous and degenerating embryos. These and other observations suggest that the rhizopod may be a facultative parasite on the hydroid. *Hydra littoralis* Hyman has also been experimentally infected. We have found it possible to culture the rhizopod in a free-living state on simple rice-agar plates overlaid with dilute saline. Pure cultures have not yet been established.

It would be premature without further investigation (now in progress) to offer a name and diagnosis for this new organism, but on the basis of our present observations we feel able to assert the following: (1) the organism is very close to the genus *Pseudospora* Cienkowski[1], and may be a new species of that neglected genus; and (2) it is no more clearly related to the Heliozoa than are any other rhizopods. The resemblance to the Heliozoa is superficial. So far as we are aware, *Pseudospora* and its relatives have previously been found only in association with algæ; the association with a colonial cœlenterate (or, indeed, with a metazoan animal) recorded here appears to be new.

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Effect of Gibberellic Acid on the Initiation of Buds in Lilac

The rhythmic alternation of leaves and bud scales in the growth of woody plants[1] appears to be due to the correlative influences of both leaves and scales[2] exerted by auxins and inhibitors[3]. This may be supported by the possible reduction of the correlative inhibition of leaves by GA_3 (gibberellic acid), as already shown in other cases[4].

On April 29, 1961, 0·5 per cent GA_3 lanoline paste was applied to the highest pair of leaves of lilac (*Syringa vulgaris*), on their basal surface, while they were still growing. At this time their axillary buds were very small and the terminal bud had already stopped growing. The leaves treated with GA_3 paste developed normally; their axillaries, however, formed throughout their whole period of growth, besides scales which decreased in length successively, only a few intermediate leaf structures. No real leaf and flower primordia, respectively, were initiated even at the vigorous highest shoots of the experimental shrubs, in contrast to the corresponding buds of the control shoots which became generative. The axis of the shoots treated with GA_3 grew in diameter, especially at the apical end.

A similar distal thickening occurred, however, without GA_3 treatment when the apical axillaries were excised very early[5]. In spring 1962 these buds so incompletely initiated after GA_3 treatment of their subtending leaves only grew following the removal of the lower expanding buds on the same shoot, of course with a great delay, as the missing primordia had first to be re-formed. Nevertheless, they developed thereafter into vigorous vegetative shoots with normal, but scattered, leaves grouped at the upper part in threes. As a rule, only one of the two opposite GA_3 buds grew out in this season. The other remained inactive until the former was cut off on March 17, 1963. Its development was quite similar, showing a considerable