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Diploid Gametes in *Ulva*

In the course of experiments on *Ulva mutabilis*¹ some gametophytes are occasionally found forming swarmer which copulate neither with + gametes nor with - gametes. These swarmer are diploid, as revealed by cytological and genetical examination. They are biflagellate and of normal size, and otherwise they fully resemble normal gametes. As do normal gametes, they also remain mobile for two days; then they fix themselves to the glass and develop into zoospore-forming plants. From the zoospores normal + and - gametophytes arise in equal numbers.

Genetical analysis has shown that some of the neutral gametophytes were homozygous for a gene for which the mother-sporophyte was heterozygous. Out of 2,047 gametophytes which developed from a sporophyte heterozygous for the dominant gene *Sl* (Slender)² three *Sl Sl*-gametophytes were found. In the same progeny also four *Sl Sl*⁺-gametophytes were present, of which, however, only one formed neutral gametes. As to the sex of the others, one was - and two were +. The individuals developing parthenogenetically at zoospore-formation segregated into Slender and wild-type gametophytes, all the same sex as the pristine gametophytes. Thus these gametophytes must have carried two sex chromosomes of the same kind.

Consequently in *Ulva* as in other organisms which have been tested in this respect, no causal relation exists between the alternation of the generations and the alternation between the haploid and diploid phase.

The diploid gametophytes may be caused by a failure of the mechanism separating the chromatids. If the view maintained by some authors³ is correct, that zoospores occasionally may fuse, the formation of diploid gametophytes may also be explained in this manner. This last possibility can be tested by putting together zoospores from wild-type sporophytes and from homozygous Slender sporophytes. A diploid heterozygous Slender individual arising among Slender and wild-type gametophytes will be seen immediately. Although this experiment has been made many times, no such individual has been found so far.

A description of tri- and tetra-ploid individuals will
be published elsewhere.

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¹ Föyn, B., *Arch. Protistenkd.*, **102**, 473 (1958).

² Föyn, B., *Arch. Protistenkd.*, **104**, 236 (1959).

³ Higgins, E. M., *Ann. Bot.*, **44**, 587 (1930); **45**, 533 (1931).