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The survival value of conjugation in the life history of Spathidium spathula.

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In a former communication it has been shown that in our pedigree cultures of *Spathidium spathula*, exconjugant lines, in the great majority of cases, exhibit a higher rate of division during the first fifteen days than the parent lines.[1] The purpose of the present paper is to summarize briefly the results to date with respect to the effects of conjugation as exhibited later in the life history of the pedigree lines.

1. Conjugation in the majority of cases increases the length of life of the exconjugant line, so that it lives after the death of the parent so-called "non-conjugant" line. This is shown by the fact that of forty-seven exconjugant lines, thirty lines lived longer; four lines lived to essentially the same date; and thirteen lines died before their respective parent lines.

2. The total number of generations attained by the exconjugant exceeds those attained by the parent from the date when the exconjugant arose to the death of the parent in about eighty per cent. of the lines. Of fifty-two comparable lines, forty-one lines exceeded their respective parent lines in number of fissions; two practically equalled; and nine lines did not attain so many generations. The fact is evident that conjugation increases the number of fissions to a total which could not otherwise have been reached.

3. If the period be considered during which both lines were alive, the results are even more conclusive. Forty-four lines attained more generations than the parent; four equalled the parent; and four completed a smaller number of fissions. Thus over eighty per cent. of the exconjugant lines attained more generations than their respective parent lines.

[1] L. L. Woodruff and Hope Spencer, PROC. SOC. EXP. BIOL. AND MED., 1921, xviii, 240–241.

4. By analysis of the data from an entirely different angle the same general conclusion is apparent. The total number of generations attained before the F_1 generation appeared, plus those from the F_1 to the origin of the F_2, and so on to the F_5 generation, amounts to date to from 450 to 550 generations, according to the series followed. The first line reached 234 generations without conjugation, therefore by conjugation it thus far has been possible more than to double the number of fissions obtainable without conjugation.

In brief, all the data thus far secured indicate that in this pedigree culture, under the conditions of the experiment, the survival value of conjugation in the majority of cases is marked—the exconjugant lines exhibiting a higher division rate and outliving the non-conjugant lines.

The complete paper will appear in the Journal of Experimental Zoology.

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The precipitation of botulinus toxin with alcohol.

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While attempting to purify botulinus toxin by precipitation with ethyl alcohol, we found that the alcohol causes destruction of this toxin. Even a weak solution (20–30 per cent.) of ethyl alcohol is capable of quickly destroying many thousand lethal doses of botulinus toxin in vitro. This destruction takes only five to ten minutes if the mixture is kept at 37° C. On the other hand the toxins of tetanus and diphtheria are much more resistant to the destructive effects of alcohol.

It had been observed in several outbreaks of botulism that those who had partaken freely of alcoholic beverages while eating the incriminated food were not severely affected or remained entirely well, whereas others eating as much or even less of the same food were severely and sometimes fatally poisoned.