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Holgate, P.

Selfing in genetic algebras.

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In this paper the author applies the theory of genetic algebras to mating systems which involve self-fertilization. (This applies primarily to plants but mathematically, this is equivalent to complete assortative mating by genotype.) Specifically, the author considers the situation where a fixed proportion θ of the population undergoes random mating and the remaining proportion $1-\theta$ is self-fertilized. He obtains an algebra which is not commutative. The concept of genetic algebra is extended to the case where the algebra is not commutative. It is shown that such an algebra is obtained in the following cases: (1) the zygotic algebra for a diploid locus with multiple alleles, (2) the zygotic algebra for polyploidy, (3) the zygotic algebra for k independently segregating loci with no distinction between the partitions of genes between chromosomes. However, such an algebra is not obtained if there is nontrivial linkage in case (3).

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