CORRIGENDUM TO

GENETIC POLYMORPHISM IN A SUBDIVIDED POPULATION*

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The above paper contains two errors. The criteria for polymorphism are altered by their correction, and indeed the true criteria are less restrictive and easier to interpret than those published in the original paper.

Equation (2) is incorrect in that it fails to take account of the changes in population distribution between niches following upon migration. The correct equation is

$$P_i = \sum_{j=1}^{n} k_{ji}c_j p_j \Big/ \sum_{j=1}^{n} k_{ji}c_j , \tag{2'}$$

or

$$P_i = k_i^{-1} \sum_{j=1}^{n} k_{ji}c_j p_j , \tag{2''}$$

where

$$k_i = \sum_{j=1}^{n} k_{ji}c_j$$

is the average probability of inward migration to the ith niche.

The second error in the original paper is that the transformation (8) does not lead, as claimed, to equation (9). However, such a transformation is unnecessary in any case. With equation (2) replaced by (2″), equation (6) becomes

$$\Delta p_i = V_i^{-1}k_i^{-1} \sum_{j} k_{ji}c_j p_j - p_i . \tag{6'}$$

The second half of equation (8) should thus read

$$l_{ij} = k_{ji}c_j / V_i k_i, \tag{8'}$$

so that equation (10) becomes

$$\Delta \mathbf{p} = (\mathbf{L}-\mathbf{I})\mathbf{p}. \tag{10'}$$

The condition on the maximal eigenvalue is

$$r < \max_{1<i<n} \sum_{j=1}^{n} l_{ij} < 1 ,$$

i.e.

$$\max_{1<i<n} (1/V_i k_i)k_i < 1 ,$$

i.e. $V_i > 1$ for all values of i. Thus the necessary condition for total stability of genetic polymorphism is

$$V_i < 1, \text{ for some } i. \tag{13'}$$

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In the same way it may be shown that the sufficient condition is

$$V_i < c_i k_{ii}/k_i, \text{ for some } i. \tag{14'}$$

The same conditions apply to the quantities W_j.

Condition (13′) is easily interpretable as "for polymorphism to be totally stable, the genotype *aa* must be selectively inferior to the heterozygote in at least one niche". A corresponding condition applies to the genotype AA.

If we set $k_{ij} = c_j$, the conditions of Levene's (1953) paper are reproduced. In particular, equation (14′) reduces to the condition derived by Deakin (1966) for that special case.

References

DEAKIN, M. A. B. (1966).—Sufficient conditions for genetic polymorphism. *Am. Nat.* **100**, 690–2.

LEVENE, H. (1953).—Genetic equilibrium when more than one ecological niche is available. *Am. Nat.* **87**, 331–3.