ISSN 2229-5518

HOW TO KNOW AGE OF A POPULATION AND HOW TO VERIFY DARWIN'S THEORY OF EVOLUTION

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Abstract: We knew the genetics of X-linked diseases for the population existing in reality in Roy,S. From this we have tried here to know the age of a popuation and to verify Darwin's theory of evolution mathematically.

INTRODUCTION AND SOLUTION OF THE PROBLEM:

If one gene in X-chromosome is defective, we can classify a population into five possible states: XY, XY, XX, XX, XX where $\overline{X}$ denotes X-chromosome containing defective gene. Let the frequency ratios of these states be $p_1(0)$, $p_2(0)$, $p_3'(0)$, $p_3''(0)$ and $p_4(0)$ respectively.

Assuming that in the time of selection one normal male will not select an abnormal female or normal female carrying the X-linked disease if the normal male gets a normal female. Similarly a normal female will not select an abnormal male if she gets a normal male in the time of selection. Then the frequency of the above five states depends upon the following five cases:

1). $P_1(0) < P_3'(0) + P_3''(0)$, $P_1(0) = P_3'(0)$

2). $P_1(0) < P_3'(0) + P_3''(0)$, $P_1(0) > P_3'(0)$

3). $P_1(0) < P_3'(0) + P_3''(0)$, $P_1(0) < P_3'(0)$

4). $P_1(0) = P_3'(0) + P_3''(0)$

5). $P_1(0) > P_3'(0) + P_3''(0)$

We shall consider only the first two cases. The other cases will convert to case 1 aftern 1 or 2 generations. We have seen in Roy,S.for the first case,for even generations:

$$p1(2n) = p1(0) + \frac{1}{3}\left(1-\frac{1}{2^{2n}}\right)p3''(0)$$

$$p2(2n) = p4(0) + p3''(0)\frac{2}{3}\left(1+\frac{1}{2^{2n+1}}\right)$$ Here $p1(0) = p3'(0)$

$$p3'(2n) = p1(0) + \frac{1}{3}\left(1-\frac{1}{2^{2n}}\right)p3''(0)$$

$$p3''(2n) = \frac{1}{2^{2n}}p3''(0)$$

$$p4(2n) = p4(0) + p3''(0)\frac{2}{3}\left(1-\frac{1}{2^{2n}}\right)$$

Similarly for the odd generations:

$$p1(2n+1) = p1(0) + p3''(0)\frac{1}{3}\left(1+\frac{1}{2^{2n+1}}\right)$$

$$p2(2n+1) = p4(0) + p3''(0)\frac{2}{3}\left(1-\frac{1}{2^{2n+2}}\right)$$ Here $p1(0) = p3'(0)$

$$p3'(2n+1) = p1(0) + p3''(0)\frac{1}{3}\left(1-\frac{1}{2^{2n}}\right)$$

$$p3''(2n+1) = \frac{1}{2^{2n+1}}p3''(0)$$

$$p4(2n + 1) = p4(0) + p3''(0) \frac{2}{3}\left(1-\frac{1}{2^{2n+2}}\right)$$

From the above equations knowing p1(2n) ………etc.or p1(2n+1) …….etc. p1(0),p2(0),p3′(0) p3″(0),p4(0) and n (number of generations)can be calculated. Obviously alongwith the above equations we shall consider the equation p1(0)+p2(0)+p3′(0)+p3″(0)+p4(0)=1.Similarly from the equations for other case n can be obtained.

If the character starts with the beginning of the population then this value of n will give he age of the population. Calculating age of every population in this way we can say that which population has come from which population.In this way we can verify Darwin's theory of evoution.

Reference:

Roy.S. – "Mathematical Genetics of some sex-linked diseases" – Ind. journal of **Genetics** and Plant Breeding (1976) vol. 36(3), P-384-395.