

Solve the Ques.

In a cross between Tall (TT) and dwarf (tt) 1574 tall and 554 dwarf were obtained. Suggest if a ratio of 3:1 is suitable or not.

Ans →

$$\text{Total number} = 1574 \text{ Tall} + 554 \text{ Dwarf} \\ = 2128.$$

$$\text{Therefore expected 3:1 will be } 2128 \times \frac{3}{4} : 2128 \times \frac{1}{4} \\ = 1596 : 532.$$

$$\text{Observed ratio} = 1574 : 554$$

- Considering the two classes tall and dwarf (T and t).

NOW,

$$X^2 = \sum \left\{ \frac{(f_o - f_e)^2}{f_e} \right\}$$

$$= \frac{(1574 - 1596)^2}{1596} + \frac{(554 - 532)^2}{532}$$

$$= \frac{(-22)^2}{1596} + \frac{(22)^2}{532}$$

$$= \frac{484}{1596} + \frac{484}{532}$$

$$= 0.303 + 0.909$$

$$= 1.212 \text{ Ans}$$

(2)

$$\begin{aligned} \text{Here d.f.} &= 2-1 \\ &= 1 \end{aligned}$$

Significance:

At 5% level, at 1 degree of freedom the table value of $\chi^2 = 3.84$.

The calculated value of χ^2 is 1.212.

This shows that the two series of frequencies, observed and expected is in almost agreement with the theoretical ratio of 3:1

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