

Introduction.

This paper describes experiments on the inheritance of certain characters in the Cowpea, *Vigna sinensis*.

Except when crossed, the plants were all selfed by tying up the flowers with wooden loops immediately before maturity. The object of this was to exclude Carpenter Bees which are always active on the cowpea plots and which are responsible for natural crossing in these plants. When plants were to be crossed, the flowers were castrated the evening before opening and tied up as before. The male parents were also tied up to exclude foreign pollen. The best results were obtained by applying pollen to the stigma early in the following morning, not later than 8 or 9 A.M.

In some instances the numbers in the families are small. This is chiefly due to the attacks of the Pea Weevil (*Bruchus* sp.) which results in considerable loss of seed. Families are only combined where there is reason to believe that the parents are of the same genetic constitution. A few abnormal ratios are met with, but these are always found in the smaller families. Thus they do not vitiate the results seriously.

In each figure the ratio obtained by experiment

is compared with the expected ratio, on the assumption that the hypothesis presented to explain the results is correct. The expected ratio is always given as the highest expectation and not as the theoretical expectation. For example, if the total number of plants is 62, and the ratio 3:1, the expectation is given as 47:15 or as 46:16 and not as 46.5:15.5.

It is impossible to have .5 of a plant in a class and this form of presentation is an absurdity.

On the other hand the deviation from the expectation is always given to the first place of decimals and represents the deviation from the theoretical expectation (i.e. 15.5 or 46.5 in the above example). It can thus be compared with the standard deviation σ . For convenience the value 3σ is calculated for each ratio by using the formula:

$$\sigma = \sqrt{npq} \quad \left\{ \begin{array}{l} \text{where, } \sigma = \text{standard deviation} \\ n = \text{total number of results} \\ p = \text{expected percentage of successes} \\ q = \text{expected percentage of failures} \end{array} \right.$$

If the actual deviation from the expected ratio is less than three times the standard deviation, the probability is that the result is significant. This probability becomes greater as $\frac{3\sigma}{d}$ becomes ~~greater~~ greater. This ratio can be seen at a glance by comparing the fourth and fifth horizontal column in each figure.