

testes of the adult cockroach is teased in normal salt solution (0.75 gm. in 100 c.c. of distilled water) and examined under the high power of the microscope, the spermatozoa are seen to be actively motile. Quite a number of adult male specimens of *Periplaneta americana* has been dissected and examined microscopically, in all cases active spermatozoa were found and the testes did not show any sign of atrophy, nor were smaller in size. We have also compared their minute structure with those of younger stages, and we are of opinion that the testes in the adult stage do not materially differ from those of the younger stages in which alone the previous authors¹ observed the existence of developed reproductive glands. Details will be published elsewhere.

D. P. RAICHOUDHURY.

HARIDAS MITRA.

Department of Zoology,
University of Calcutta,
February 6, 1941.

¹ Balfour Browne, F., *A Text-book of Practical Entomology*. 1932.

² Lloyd, R. E., *An Introduction to Biology* 1910.

³ Wheeler, W. F., *Text-book of Zoology*, 1938.

⁴ Miall and Denny, *The Cockroach*, 1886.

A STATISTICAL EXAMINATION OF TASTE DIFFERENCES IN BAJRA VARIETIES

BAJRA (*Pennisetum typhoideum*) is one of the important food crops of the population in Baroda State. Several varietal trials have therefore been conducted at the Baroda Agricultural Experimental Station for finding out the most suitable variety for the tract. Jamnagar Giant, an African variety, introduced from Jamnagar State in 1935, was one of the varieties included in these trials; but it was found that public opinion was much against it in the matter of taste, which is one of the factors against its extensive cultivation. Since taste is an important factor in any new introductions of food crops an experiment was conducted to determine the taste differences in the different varieties quantitatively. It was further thought that

the result obtained would be of general scientific interest since it would show whether varietal differences in such a complex character as taste could be objectively studied by the application of the modern statistical methods.

The material for the test consisted of seven varieties of *bajra* grown at the Baroda Agricultural Experimental Station. These seven varieties were further mixed together to make a bulk and thus eight samples in all were studied. The different samples were finely ground in a common household *chakki* under as uniform conditions as possible. The flour was used in two separate trials.

In trial A, bread was prepared from the flour of the eight samples by a woman expert in this operation. Care was taken to ensure all possible uniformity in such matters as the amount of water used to make the dough, the thickness of the bread and the degree of roasting. The samples of bread were then alphabetically labelled. Eighteen members of the farm staff were invited to taste the samples and put the varieties in the order of their tastefulness. The samples were served hot, first in a random order and then as desired by each taster until he came to a definite conclusion. No consultation or any discussion between the tasters was allowed. The varieties were ranked from the least tasteful upwards so that the most tasteful variety was ranked eighth.

In trial B, the flour of the eight samples was given to two intelligent families, one that of a District Judge with five adult members, and the second, a College Professor's family with three adult members. The names of the varieties were not disclosed. In this trial it was possible to score each variety independently with a maximum of ten marks for the most tasteful sample.

The results obtained were statistically examined by the analysis of variance in the two trials.

Trial A.—The varietal totals arranged in a descending order, the standard error percentage of the mean and the significant difference between the total scores of any two varieties are given below:—

Name of the variety	Amreli	Baroda	Jamnagar Giant	Akola 136	Akola 14D	Sathi	Jagudan	Bulk
Total marks	121	108	94	82	80	70	49	44

Standard error % of the mean, 9.8.

Significant difference between variety totals, 22.5.

Fisher and Yates¹ have given tables for converting such ranked data into normal scores for the purpose of statistical analysis. The data were therefore re-examined after transformation into normal scores but the resulting analysis of variance and the significance of the difference between varieties were very similar to those obtained by the analysis of the original data and confirmed the validity of the conclusions to be drawn.

The analysis of variance clearly shows that varietal differences were quite distinctly significant. The locally favoured varieties Amreli and Baroda occupy the first two places. It is remarkable that Jamnagar Giant, against which there is a considerable amount of prejudice, takes the third place and is thus classified along with the best varieties. Another interesting result is that the bulk which is a mixture of all the varieties in the trial occupies the lowest place. It is clear that due to its heterogenous composition its taste was not appreciated. The comparatively low standard error attained indicates that it is possible to perform experiments of this kind with a considerable degree of accuracy.

Trial B.—The varieties are arranged below according to their total scores:—

Name of the variety	Baroda	Jamnagar Giant	Akola 14D	Akola 136	Amreli	Jagudan	Sathi	Bulk
Total scores	71	70	59	45	35	28	25	18

Standard error % of the mean, 13.4.

Significant difference between variety totals, 16.6.

It will be seen that except for the change in the position of the Amreli variety the results of these two independent trials agree with each other very closely. An explanation of the discrepancy with regard to Amreli may be found in the fact that the majority of the persons taking part in trial A belong to the farming community in Gujerat who show a general preference for the Amreli variety, whereas the members of families in trial B have no reasons for such preference. There is little doubt that there is no ground for the prejudice against Jamnagar Giant as far as its taste is concerned.

The results have demonstrated that taste can be studied objectively by the application of modern statistical methods, that Jamnagar Giant variety of *bajra* was consistently classed among the best varieties and that the local prejudice against this variety was not well founded.

I am indebted to Mr. R. G. Allan, Commissioner of Agriculture, for his encouragement in undertaking this investigation, to Dr. V. G. Panse of the Institute of Plant Industry, Indore for his help in the statistical analysis of results and to the various persons who co-operated in the investigation.

G. K. GOVANDE.

Economic Botanist to Government,
Baroda,
February 13, 1941.

¹ Fisher, R. A., and Yates, F., *Statistical Tables for Biological, Agricultural and Medical Research*, Oliver and Boyd, London, 1938.

A QUICK AND SIMPLE PROCEDURE FOR THE ESTIMATION OF VITAMIN B₁ IN RICE

THE vitamin B₁ content of Co. 9 raw husked (wooden huller) rice was determined by the biological method according to the technique of Scheunert and Schieblich.¹ The rice contained 200 I.U. or 600 γ per 100 grams. The results of the biological assay are given below