VI. SUMMARY AND CONCLUSIONS
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1. An inter-varietal cross between Telikirisal-4 and Sagisali-44-1 was made for the first time.

2. Inheritance of 15 qualitative characters such as pigment in coleoptile, leaf sheath, ligule, auricle, juncture, leaf blade, leaf axil, internode, glume, lemma and palea, stigma and apiculus as also panicle density, scent and habit of growth was studied.

3. Grain length, grain breadth, grain weight, panicle exertion, panicle length, plant height and tillering were studied quantitatively. Flowering duration which also was studied was found to behave both as a qualitative and as a quantitative character.

4. Non pigmented condition was found to be recessive to pigmented condition in the above characters. lax type of panicle, earliness, scentenedness and erect habit of growth were dominant to dense panicle, lateness, non-scentenedness and spreading growth habit respectively.

5. Colour in the leaf sheath, ligule, leaf blade and apiculus was caused by the basic anthocyanin gene A.

6. Inheritance of colour in auricle, leaf axil, internode, glume, lemma and palea and stigma was conditioned by two complementary genes. One of them was A, the other being specific for each of the above plant organs.
7. Junctura colour gave an \( F_2 \) ratio of 45:19 of colour : colourlessness indicating trigenic interaction.

Of these three genes the gene for leaf sheath (\( A \)) was common and the second gene (\( A_n \)) was the same as that for auricle colour. The third one (\( J_p \)) was specific for junctura colour.

8. Density of panicle was caused by two complementary genes \( L_xa \) and \( L_xb \). Two duplicate genes (\( O_1 \) and \( O_2 \)) were found to be responsible for scent. The habit of growth was shown to be controlled by two complementary genes (\( L_xa \) and \( L_xb \)).

9. Flowering duration gave a monogenic inheritance and it was designated as \( P \).

10. The probable minimum number of genes involved in the inheritance of the eight characters showing quantitative inheritance was calculated and found to range from two to six.

11. Heterosis was negative in respect of flowering duration, grain length, grain breadth, and 100-grain weight. It was found to be positive in the case of panicle exertion, panicle length, plant height and tillering.

12. The factor \( A \) was found to be linked with one of the genes responsible for scent, probably forming part of linkage group II of Jodon (1956) and 'A' linkage group of Nagao and Fekahashi (1960).
13. The specific colour factors of stigma ($S_p$), leaf axil ($Lx_p$), lemma and palea ($ Hp$), glume ($G_p$) and internode ($St_p$) were found to form a single linkage group so far unreported.

14. Genetic constitution of the parents in regard to their major genes was determined.

15. Significant association was found between $S_p$, specific for juncture colour and the genes for panicle length; $Mp$ responsible for colour in both auricle and juncture and the genes for tillering and $Sc_a$ and/or $E_b$ conditioning habit of growth and the genes for tillering which constitute three linkage groups.

16. Correlation coefficient was calculated to ascertain the relationship and the association between the eight characters studied quantitatively and as a result 9 linkages were newly established.

17. Partial correlation coefficient was also worked out.