B-17: Effect of induced mutagenesis in rice tissue culture

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Objectives of the experiment were to study the influence of chemical mutagens (NMU & DES) and ionising radiation (γ & x) on growth, regenerative capacity of rice callus culture and the effect of mutagens on frequency and spectrum of mutant regenerants, derived from calli, as well as determination of approximate semi-lethal dose of each mutagen on rice calli. In the experiment intact mature de-husked grains and pieces of primordial panicles of 4 varieties were used as explants. MS media with additional 4 mg/l of 2,4-D and 10 g/l agar served as media for callus initiation and for sub-culture MS + 2 mg/l 2,4-D + 10g/l agar was used. Organogenesis was induced using the MS media supplemented with 5 g/l 6-benzyl amino purine + 10 g/l agar. Mutagenic treatment was supplied at the end of the 1st passage of 30 days. Calluses were exposed to varying concentrations/dosage of mutatagens. The effect of mutagens on growth of callus was stimulative in low concentration/doses at short exposure but oppresive in higher concentration/doses at longer exposure, except x-radiation treatment where all the studied doses showed only stimulative effect on growth. The effect of mutagenic treatment on regenerative capacity was negative though there was no clear pattern depending on concentration/dose or the mutagen. The effect of LD_{50} of chemical mutagens on frequency and spectrum of mutants was different depending on variety and even between 2 chemical mutagens could not find any specificity of their action on studied characters. The large number of valuable mutants obtained also did not show any specific effect of studied mutagenic treatments.

Based on the experiments for the PhD degree 1985 - 1989 and results were disclosed in the thesis and publications in USSR.