

Regular Article

## Effect of mutation on seed coat colour in groundnut (*Arachis hypogaea* L.)

R. A. Satpute and S. W. Suradkar\*

Department of Botany, Government Institute of Science and Research centre, Aurangabad-431004 (M. S.), India

**ABSTRACT:** The seed material of groundnut (*Arachis hypogaea* L.) variety namely TAG-24, is used in the present study. The mutagenized population showed significantly higher variability in the M<sub>2</sub> and M<sub>3</sub> generation. Mutation affecting seed coat colour were detected in M<sub>3</sub> generation. Highest mutation frequency was induced by 15 kR of gamma rays. The seed coat colour mutant showed diverse shades of colour.

**Key words:** Seed coat colour, mutation, *Arachis hypogaea*

### Introduction

The groundnut (*Arachis hypogaea* L.) is a member of family fabaceae comprises most important edible oil seed crop in the world. Recently, groundnut has been gaining importance as a food crop, due to its high content of digestible proteins (22-30%), vitamins (E, K & B group), minerals (Phosphorus, calcium, magnesium and potassium) and phytosterols to increased consumer preference after value addition (Savage and Keenan, 1994). Whole kernels of groundnut are used for table purpose by frying, soaking, roasting and boiling and in different types of namkeens. Roasted groundnut is the most popular way of eating. Kernels are also used as a spice in vegetables and as sprouts for salad.

Seed coat colour is an important agronomic character. A genetic understanding of peanut testa colour inheritance is very important in breeding of cultivar development and market acceptability (Branch, 1995). It is possible to induce change in seed coat colour through induction of mutation (Moh, 1971).

Mutation breeding alternative to conventional plant breeding as a source of increasing variability and could confer specific improvement without significantly altering its acceptable phenotype (Menshah and Obadoni, 2007).

### Materials and Methods

The germplasm was obtained from the Department of Crop Research Unit (Oilseeds), Dr. Panjabrao Deshmukh Krishi Vidhya peeth, Akola-444 104. (M.S.) was used in present study. Healthy and dry seeds of groundnut having uniform size and equilibrated to moisture level of 7% were packed in small polyethene bags and

irradiated to Co<sup>60</sup> at three different doses viz. 10 kR, 15 kR and 20 kR in the gamma chamber of Department of Biophysics, Government Institute of Science, Aurangabad. (M.S.) India.

Irradiated seeds of each treatment were sown in field for raising M<sub>1</sub> generation following randomized block design (RBD) with three replicate of each dose and variety, consisting 100 seeds of each along with control in the field. While sowing the seeds in field the spacing between plants was 15 cm and rows 35 cm were maintained. The experimental area for M<sub>2</sub> and M<sub>3</sub> and spacing are same as those used in M<sub>1</sub> generations.

Critical screening was done through the M<sub>1</sub>, M<sub>2</sub> and M<sub>3</sub> generation for seed coat colour.

### Results and Discussion

The M<sub>3</sub> progeny derived from irradiated seeds segregated the character seed coat colour. The frequency of plants carrying different seed coat colour was highest in 15 kR dose of gamma rays treated seeds (Table 1). The mutant seed coat phenotype and their number of plants in M<sub>3</sub> generation are highest as 09 (Table 2). The mutant's seed coat colour varied from off white to dark pink

Fig.1 Different colour mutant of groundnut (*Arachis hypogaea* L.) var. TAG-24. (a- dark pink-15kR, b-purple red-10 kR, c-control, d-yellowish pink-15 kR & e-off white-20 kR)

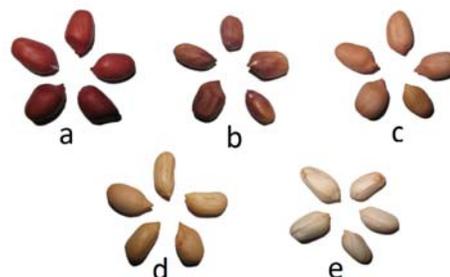


Table 1. Frequency of M<sub>3</sub> progenies segregating for seed coat colour

Dose	Number of Treated seeds	Number of plants observed	M <sub>3</sub> Progenies segregating seed coat colour	Frequency (%)
Control	300	00	00	0.00
10 kR	300	267	06	2.25
15 kR	300	261	14	5.36
20 kR	300	255	04	1.57

Table 2. Seed coat colour phenotypes in M<sub>3</sub> progenies

Dose	M <sub>3</sub> Progenies segregating seed coat colour	Mutant seed coat colour	Number of plants
Control	00	00	00
10 kR	06	Purple red	06
15 kR	14	Dark pink	09
		Yellowish pink	05
20 kR	04	Off white	04

\* Corresponding Author, Email: santoshbot214@gmail.com

Off white seed coat is found in only four plants of M<sub>3</sub> generation. In the present study 15 kR dose of gamma rays induced a highest frequency of seed coat colour mutants. More useful mutants are probably induced by low medium concentration of the mutagen, as suggested by Kawai (1961) and Yonezawa (1977). Liao and Lie (2004) reported about 28.8% protein present in black seed coat groundnut cultivar.

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