

W. Galston, Yale University, USA for encouragement.

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INHERITANCE OF SMALL LEAF AND CRINKLED LEAF NATURE IN BLACKGRAM [*VIGNA MUNGO* (L.) HEPPER]

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In blackgram cultivars, normally the trifoliate leaf consists of three leaflets varying from obovate to linear in shape and fairly large in size. In the germplasm of blackgram preserved at this School, two distinct mutant phenotypes are maintained, one characterized by crinkled leaflets instead of leaflets with normal appearance and the other is distinct with small size of leaflets. Both the genotypes are small in plant stature and are true breeding. Both the types have been isolated as mutants. In this study, it was designed to understand the nature of inheritance of the two distinct leaf phenotypes.

In Rabi 1984-85, direct and reciprocal crosses were made between crinkled leaf type with cultivar, TMV.1 blackgram. Utilizing small leaf type, three sets of direct and reciprocal crosses namely, TMV.1 × small leaf mutant; CO.5 × small leaf mutant and CO.3 × small leaf mutant were made. Their F₂'s were studied during summer 1986 for segregation of leaf characters.

In all the crosses, the hybrids were normal in leaf shape and size. In F₂ generation, segregation was noticed for normal and small or crinkled leaf type.

Crinkled leaf: The segregation for normal and crinkled leaf types in F₂ of direct and reciprocal crosses involving crinkled leaf with cultivar TMV.1 is given in table 1.

Small leaf: In three sets of direct and reciprocal crosses TMV.1 × small leaf mutant, CO.5 × small leaf mutant and CO.3 × small leaf mutant, segregation was noticed for normal and small leaf in F₂ generation (table 2).

Table 1 Segregation for normal and crinkled leaf phenotypes

Parentage	Number of segregants for			χ^2
	Normal leaf	Crinkled leaf	Segregation ratio	
Crinkled leaf × TMV.1	50	13	13:3	0.150 ^{NS}
TMV.1 × crinkled leaf	43	6	13:3	1.370 ^{NS}

NS-Non significant.

Table 2 Segregation for normal and small leaf phenotypes

Cross	Number of segregants for			χ^2
	Normal leaf	Small leaf	Segregation ratio	
TMV.1 × small leaf	20	3	13:3	0.4830 ^{NS}
Small leaf × TMV.1	116	26	13:3	0.0167 ^{NS}
CO.5 × small leaf	83	29	13:3	3.7480 ^{NS}
Small leaf × CO.5	35	10	13:3	0.3748 ^{NS}
CO.3 × small leaf	137	55	3:1	1.3610 ^{NS}
Small leaf × CO.3	83	34	3:1	1.0280 ^{NS}

NS-Non significant.

The F_1 of normal \times crinkled leaf segregated for 13:3 ratio of normal leaf phenotype to crinkled leaf in F_2 of TMV.1 \times crinkled leaf and crinkled leaf \times TMV.1. The same ratio of 13:3 was again obtained in direct as well as reciprocal crosses of TMV.1 \times small leaf and CO.5 \times small leaf indicating digenic inheritance nature.

In respect of crosses with small leaf phenotype with CO.3 blackgram, the F_2 generation of normal \times small leaf phenotype and its reciprocal cross showed 3:1 segregation ratio for normal to small leaf phenotype.

The two distinct crosses of blackgram cultivar, TMV.1 \times crinkled leaf and TMV.1 \times small leaf gave segregation for digenic ratio of 13:3 only of normal to crinkled and normal to small leaf, respectively, indicating that genes controlling the two distinct phenotypes of crinkled leaf and small leaf are different from one another.

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QUANTITATIVE ESTIMATION OF RUTIN IN *RAUVOLFIA SERPENTINA* BENTH. EX KURZ

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RAUVOLFIA SERPENTINA, commonly known as *chotachand* or *sarpagandha* (Hindi), is a miracle drug-yielding plant of India because of its immense therapeutical value¹. In tissue culture experiments of *R. serpentina*, the main emphasis is on economically important primary and secondary chemical constituents^{2,3}. Generally the roots are administered orally to reduce blood pressure. This plant has not been studied for rutin estimation. Rutin is used to decrease the fragility of blood capillaries, as a herbal remedy acting as an antioxidant towards adrenaline and ascorbic acid and is also said to relax the smooth muscles⁴. A preliminary study has therefore been made to determine rutin in root, bark and leaves.

The plant material, collected from the Forest Research Institute, Dehra Dun was separated into roots, leaves and bark, dried under shade and powdered. The procedure for extraction, separation and identification of rutin was according to Uppal *et al*⁵ and quantitative determination has been done following Balandina *et al*⁶.

Table 1 Estimation of rutin in *R. Serpentina**

Parts	Per cent
Root	8.3
Stem bark	2.8
Leaves	1.5

*Mean of 50 replicates.

The extract gave a positive test for 3-hydroxy flavones. The compound so obtained was confirmed with the authentic sample of quercetin-3-rutinoside (rutin). The amount of rutin has been found to be maximum in root, minimum in leaves and medium in bark (table 1). Rutin has already been reported in *Polygonum*⁶, *Capparis spinosa*, *Fagopyrum cymosum*, *Lycopersicon esculentum*, and *Ruta graveolens*¹. This compound is also added in multivitamin preparations and possesses antibiotic properties since it inhibits germination of uredospores of *Puccinia graminis* f. *tritici*⁴.

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CYTOLOGY OF *CHRISTELLA MULTIAURICULATA* PUNETHIA

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A large genus of thelypteroid ferns, *Christella* Léveillé is represented by as many as 52 species¹ which are fairly common in the warmer parts of the world. Of the six species found in the Western Himalayas², *C. dentata* (Forssk.) Brownsey and