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A REPORT ON SEED POLYMORPHISM IN *CROTALARIA BURHIA* BUCH.-HAM. IN INDIAN DESERT

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THE prevailing conditions in desert are not congenial for plant survival. Among various methods of adaptations, seed polymorphism is a common feature in plants of arid zone[1]. This includes production of viable seeds different in size, shape, weight, seed coat pattern, dormancy and germination requirement[2]. The variability in size and weight, which is genetically controlled, is often influenced by food during embryo development and seed maturation accentuated by the prevailing environmental conditions.

Crotalaria burhia is a characteristic leguminous species of sand dunes and sandy plains of Indian desert. It is a small bushy plant with bunches of erect stiff branches, equipped with deep root system, dense pubescent leaves and flattened stem during dry periods. Prakash and Sen[3] reported two forms in *C. burhia* based on distinct morphological variations as erect-bushy (EB) and suberect-spreading (SS). The present investigation reports the occurrence of adaptive polymorphism in the seeds of EB form in *C. burhia*.

Seeds from individual plants were collected separately and stored in polythene containers in laboratory. Germination experiments were conducted in continuous light. Since seeds possess hard seed coat, acid scarification for different durations was provided to remove the seedcoat[4].

Based on the distinct colour variation, the seeds were separated into four categories: A-yellow, B-brown, C-greyish black, and D-black (figure 1). The shape of the seeds ranged from round, semilunar to compressed. There is a clear notch near the hilum. The seeds of categories C and D are larger in size but lighter in weight, when compared with categories A and B. There was not much variation in seedling vigour and in the size of 1st cotyledonary leaf (table 1).

The four categories of seeds displayed primary dormancy, and did not show any germination in control. Pretreatment with concentrated sulphuric acid for 60 min gave optimum percentage of seed germination in categories A and D, whereas in categories B and C, it was in 40 and 10 min respectively. The germination percentage declined in seeds of categories B and C, when duration of acid pretreatment was increased. Clearly, seeds of categories A and D possess harder seed coat than B and C (table 2).

The arid zone seeds possess bizarre strategies for better establishment of plant species[4,5]. Probably arid zone is the only habitat where seeds are

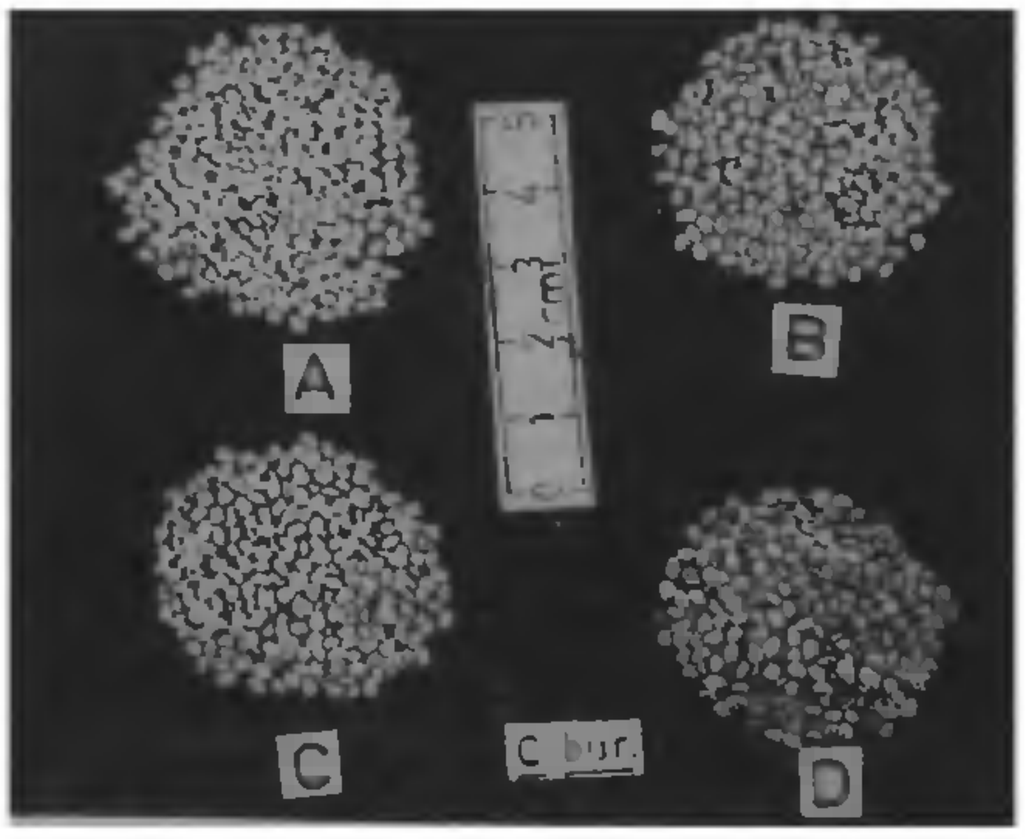

Figure 1. Four categories of seeds in *C. burhia*; yellow (A), brown (B), greyish black (C), and black (D).

Table 1 *Comparative morphological characters of seeds and seedlings in categories A-D of C. burhia*

Seed coat pattern (and category)	Shape of the seed	Seed size (mm) L	Seed size (mm) B	Weight of 100 seeds (mg)	*Seedling vigour (cm) Hypocotyl	*Seedling vigour (cm) Radicle	*Size of the 1st cotyledonary leaf (mm^2)
Yellow (A)	Round to compressed	2.6± 0.4	2.2± 0.4	1268± 0.1	3.5± 0.9	3.5± 0.3	28.0± 4.3
Brown (B)	Round to semilunar	2.8± 0.4	1.8± 0.4	1273± 0.0	3.9± 0.1	3.5± 0.2	21.5± 0.7
Greyish black (C)	Compressed	3.0± 0.0	2.8± 0.4	1107± 0.0	4.2± 0.1	4.86± 0.2	20.8± 2.9
Black (D)	Round to compressed	3.0± 0.0	2.8± 0.4	1145± 0.0	3.8± 0.1	3.0± 0.4	20.5± 2.1

*Observations taken after 15 days; L = length and B = breadth.

Table 2 *Effect of acid (conc. H_2SO_4) scarification on seed germination(%) in categories A-D of C. burhia (observations taken after 7 days)*

Treatment duration (min)	Germination (%) A	B	C	D
10	20±10	50±10	55±15.2	25±10.48
40	70±10	70±10	26±15.2	56± 5.77
60	90±10	40±10	10± 0.0	90± 0.0

subjected to such rigorous environmental conditions[6]. The production of polymorphic seeds having different germination behaviour has a great significance especially in the desert; hence it may be a preliminary step towards evolution.[7].

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INTERCEPTION OF *ASCOCHYTA PINODES* IN EXOTIC PEA GERMPLASM

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DURING 1981 a consignment of 84 pea germplasm was received from West Germany by the Pathology Section of Plant Quarantine Division of NBPGR for quarantine clearance. Dry examination of the germplasm revealed that, by and large, the seeds were shrivelled with slight discoloration and having dark brown spots of different shapes and sizes. Since the quantity of the germplasm was very small 20 seeds per sample were plated on moist blotters and incubated for a week at 20 ± 1°C under alternating cycles of 12 h of darkness and light[1].

Observation under stereobinocular microscope exhibited *Ascohyta* pycnidia which were globose to subglobose, solitary or in clusters, embedded to superficial, black to carbon black, covered with profuse, fine, white to bright web-like mycelium with slight to abundant cirrus formation. Ooze light buff to creamish in colour. Ostiole inconspicuous (figures 1 and 2). In all 19 samples were found to be infected showing 20–60% infection. In eight seed samples clear pycnidia were observed only when these were allowed to be incubated for 12–14 days as