tissue of the explants (figure 3). Although differentiation of shoots from stem internodes of *B. juncea*[5] and *B. napus*[6] and cotyledons of *B. campestris*[7] has also been reported differentiation occurred through callus formation. However, in hypocotyl segments of *B. campestris*[8] shoot bud differentiation occurred directly as in the present study.

On addition of 0.5–3 mg l of IAA/IBA/NAA, in MS medium having 5 mg l of kinetin or BAP, percentage of responding cultures decreased and differentiation was through callus formation. Directly differentiated shoot buds were isolated and cultured on filter paper bridges in 3–5 mg/l of IAA/IBA/NAA for induction of roots to get plantlets (figure 4). Best rooting was observed in 5 mg/l of IBA where rooting was observed in 100% cultures after 15–20 days of incubation. Roots formed on IAA and NAA were smaller and feeble.

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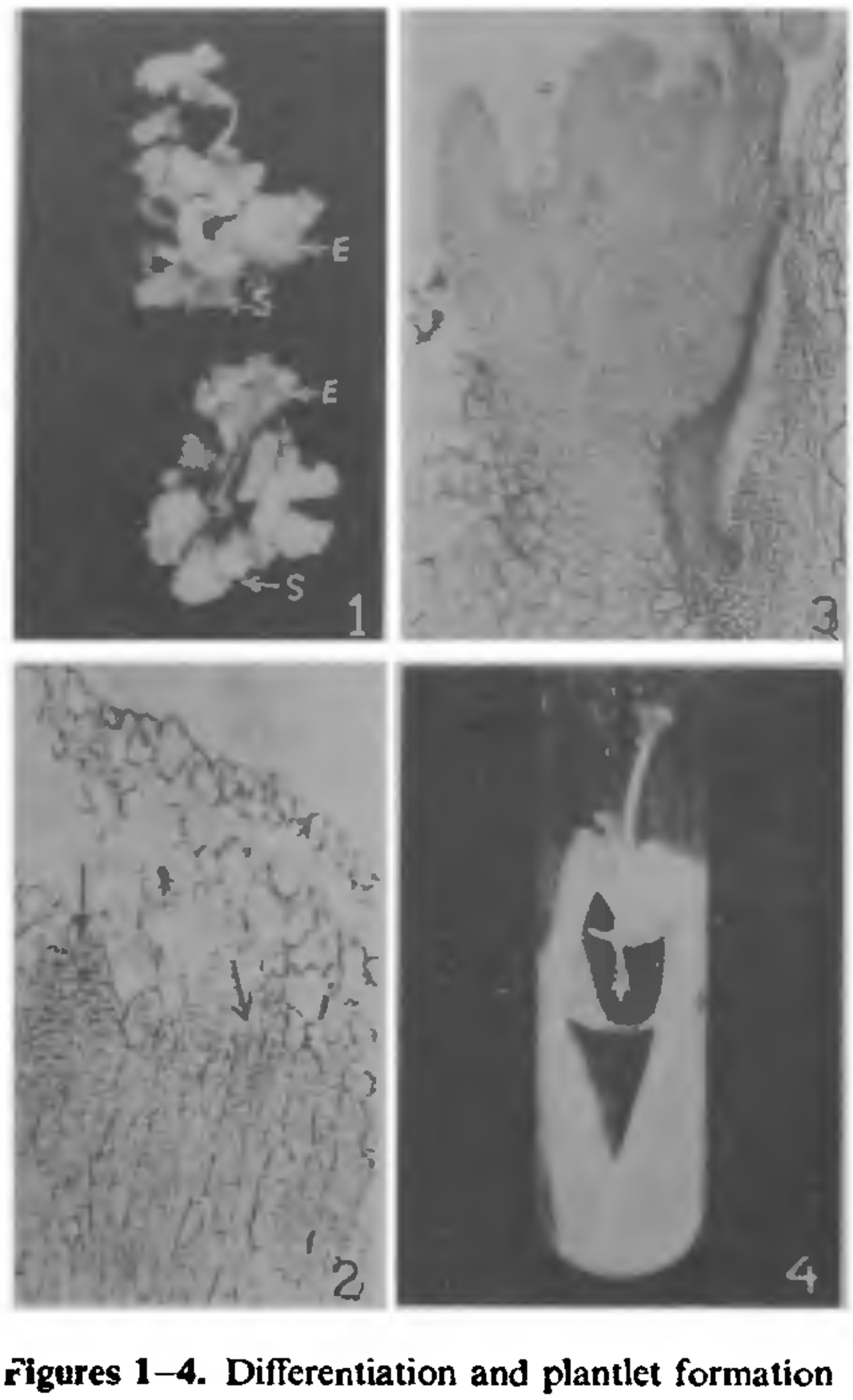

Figures 1–4. Differentiation and plantlet formation from the stem internode explants of *Brassica campestris Cv.* yellow sarson. **1.** Differentiation of shoots from stem internode on MS + BAP (5 mg/l). E = Explant, S = Shoots **2.** Section of stem internode showing divisions in inner cortical cells (× 120). **3.** Section of stem internode through well-developed shoot bud (× 120). **4.** Plantlet from differentiated shoots on MS + 3 mg/l of IAA.

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A REPORT ON GERMINATION BEHAVIOUR IN DIMORPHIC SEEDS OF *INDIGOFERA HOCHSTETTERI* BAKER, IN INDIAN ARID ZONE

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AMONG the various methods of adaptations, seed polymorphism is a common feature, which includes production of seeds, different in colours, sizes, shapes and dormancies. 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. Some arid zone plant species have been reported to produce polymorphic seeds which not only differ in their seed coat patterns but also in germination behaviour, primarily due to hard seed coatedness[1–6]. The hard seed coat dormancy inhibits imbibition and the germination. Among the known methods devised for enhancing germination and imbibition, acid and mechanical scarifications are the

most commonly followed[4]. The present study reveals the varying germination behaviour of the dimorphic seeds in *Indigofera hochstetteri*, a common rainy season legume in the Indian desert.

During seed collection of legumes of Indian desert, two types of seeds were discovered in this species which differed in seed coat pattern as yellow and yellow-mottled. The results on imbibition and germination of seeds are presented in tables 1 and 2.

Table 1 *Weight (mg) and imbibition (%) in dimorphic seeds of I. hochstetteri.*

Seed type	Seed colour	Weight (mg) (100 seeds)	Imbibition % (in hours) 3	6	24	48
A	Yellow	141	0	1.4	10.0	–
B	Yellow-mottled	156	0	0	5.1	–

Table 2 *Effect of varying conditions and pretreatments on germination behaviour of dimorphic seeds of I. hochstetteri.*

Treatment	Duration	Seed type	Percent germination after days 1	2	3	4	5	6	7
Continuous light	–	A	–	10	20	–	–	–	–
		B	–	–	–	–	–	–	–
Continuous dark	–	A	–	–	–	–	–	–	–
		B	–	–	–	–	–	–	–
Mechanical scarification	–	A	–	100	–	–	–	–	–
		B	–	100	–	–	–	–	–
Acid scarification	5 min	A	35	50	55	–	–	–	60
		B	–	10	35	50	–	–	–
	10 min	A	20	30	75	80	–	–	–
		B	–	–	50	55	–	–	60

The two types of seeds (types A & B) differed in their weight, imbibition and germination (table 1). In continuous light, germination was 20% in type A, while it was nil in type B. Also there was no imbibition. In continuous darkness, no germination was observed in any of the types. The germination increased to 100% when seeds were mechanically scarified. Pre-treatment with concentrated sulphuric acid also enhanced germination, which varied in the two types (table 2). This shows that type B had harder seed coat than type A. This chemical scarification for 10 min increased the germination to 80% in type A after 4 days, while it was 60% in type B only after 7 days. Moreover, 20% germination in type A could be observed after 1 day; while in type B this happened only after 3 days. This further proved that seeds of type B possessed harder seed coat.

Owing to this variability in seeds, the occurrence of polymorphism can lead to better establishment of the plant species in varied ecological conditions, especially in deserts; and hence a preliminary step toward evolution[8, 9]. Further work is in progress.

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FUNGAL INFECTION OF PEARL MILLET SEEDS THROUGH COLONISATION OF PERSISTENT ANTHERLOBES—A HITHERTO UNRECORDED ASPECT

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STIGMA[1], Nectory[2], ovary wall, pericarp and the integuments of the seed coat[3,4] have been reported as entry points of seed infection for several fungi. Mclean[5] reported that the drying petals of crucifers