Table 1. *Effect of various concentrations of salts on percentage seed germination of S. fruticosa.*

Concentration (ppm)	NaCl		Na_2SO_4		$MgSO_4$		$CaCl_2$		Mannitol	
	EC	G	EC	G	EC	G	EC	G	EC	G
0 (control)	–	62.5 ± 2.5	–	62.5 ± 2.5	–	62.5 ± 2.5	–	62.5 ± 2.5	–	62.5 ± 2.5
100	0.2	71.6 ± 2.9	0.2	71.6 ± 2.9	0.2	67.5 ± 17.6	0.2	73.3 ± 14.2	–	65.0 ± 8.6
500	0.8	68.5 ± 8.5	0.9	60.0 ± 5.0	0.8	67.5 ± 3.5	0.9	76.6 ± 12.6	–	67.5 ± 3.5
1,000	1.8	60.0 ± 5.0	1.8	65.0 ± 10.0	1.4	56.7 ± 7.6	2.3	73.3 ± 2.9	–	80.0 ± 0.0
5,000	7.7	23.3 ± 10.4	6.5	53.3 ± 2.8	4.0	41.7 ± 2.9	8.9	51.7 ± 15.2	–	75.0 ± 7.0
10,000	15.5		12.2	26.7 ± 7.6	7.2	33.3 ± 7.6	17.1	30.0 ± 7.0	<0.1	31.6 ± 2.9

EC = Electrical conductivity of the solutions at 25°C (milimhos/cm) and G = Germination (%)
– = EC not measurable.

utions, separately. The additional germination, found after transferring the seeds from saline to non-saline media, is described below. In the case of NaCl, germination raised to 50%, 65%, and 45% respectively, from zero, proving that higher concentration of NaCl retards germination because of osmotic effects. Similarly, in the case of Na_2SO_4, the additional germination was 20%, 50% and 15% respectively, indicating that because of the lowering of osmotic potential of surrounding medium, the seeds failed to germinate at 10,000 ppm concentration. However, the immersion in the corresponding concentration of $MgSO_4$ and $CaCl_2$ was found toxic, as the additional germination was found to be 10%, 5%, 5% and 10%, zero, zero, respectively. The rate of seed germination was also speeded up after the transfer to non-saline medium. This may be of some significance under natural conditions because seeds that could not germinate under extreme salinity stress may have evolved a mechanism to rapidly germinate when the salt stress is relieved[3].

It is, therefore, evident from the data obtained that it is because of the combination of the two factors osmotic and ionic, that the seed germination is controlled. Since, the seeds of *S. fruticosa* can tolerate the moderate concentrations of different salts, it grows well in the salines of Indian desert.

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A BROOMRAPE (*OROBANCHE AEGYPTIACA*) FEEDING ON COTTON

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BROOMRAPES are achlorophyllus parasitic seed plants. They are leafless herbs of the family Orobanchaceae living on roots of other plants and produce whitish, yellowish, brownish or purplish stems above the ground. More than 130 species are recorded mostly from north temperate regions[1].

The parasite consists of stout fleshy stems covered by small, thin scaly leaves. The flowers appearing in the axil of leaves produce very small and black coloured seeds which remain viable in the soil for several years.

The radicular apex of the broomrape seedlings is directly transformed into the haustorial organ, which penetrates into the roots of the host from where it draws nourishment. The growth of the host is checked and it remains stunted and may even die as the parasite obtains all the nutrients from host.

Orobanche species feeding on Cotton

On cotton parasitic *Orobanche* is not known. We report here an *Orobanche* species which was observed

on cotton in the fields around Surendranagar (Gujarat) during February 1983. Broomrapes were observed around the plants of cotton as well as in the furrows between the plants. Some of the broomrape plants growing away from the host, extended their roots upto 25–30 cm to reach the host roots. The pale yellow coloured stem of this parasite was 12–35 cm in height with scaly leaves. The flowers were funnel-shaped and yellow in colour. This is identified as *Orobanche aegyptiaca* (Orobanchaceae) (figure 1).

Figure 1. The *O. Aegyptiaca* feeding on cotton.

Control measures

—Removal of *Orobanche* shoots carefully before the seed formation.

—If seeds have already formed, then long dry period during summer may help in reducing the soil population of seeds.

—Few workers[2,3] have reported that *O. cernua* var. *desertorum* on tobacco are stimulated to germinate in presence of roots of several crops like chilly, mothbean, sorghum, cowpea etc and hence they may be used as trap crops to reduce the *Orobanche* population.

—Spraying the soil with 25% copper sulphate solution has been reported to be successful in destroying the parasite[4].

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IN VITRO PRODUCTION OF INTERSPECIFIC HYBRIDS IN COTTON

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THE genus *Gossypium* (cotton) has four cultivated (*G. arboreum*, *G. herbaceum*, *G. hirsutum* and *G. barbadense*), and 35 short-fibred or lintless, wild diploid ($2n = 26$) and tetraploid species, and thus there is a lot of scope for its improvement through interspecific hybridization. However, routine methods of cotton breeding often fail due to incompatibility barriers like embryo or endosperm abortion[1]. Even in cases where hybridization is effective, the frequency of hybrid formation is very low and eventually there is a hybrid breakdown[2] Therefore, the desirable traits like fibre length and fineness, and resistance to blackarm disease, wilt and insects which though present in various species can not be transferred into cultivated types. In the present investigation the successful production of interspecific hybrids by utilizing the techniques of culture of hybrid embryos and ovules is reported.

The flower buds of appropriate size in the field-grown plants of various species (table 1) were emasculated and pollinated with pollen from desired parent. To prevent early shedding, distilled water solution of growth regulators (naphthalene acetic acid 100mg/l+gibberellic acid 50mg/l) was applied at the