TABLE 1
Frequency and pollen viability of Crotaloria

Species	Normal plants			Plants showing interlocking		
	Chiasmata frequency		% pollen viability	Xta frequency		% pollen viability
	Diplotene	Metaphase		Diplotene	Metaphase	
C. retusa	23	15	96	22	15	98
C. spectabilis	22	16	99	21	16	97
C. laburnifolia	21	13	98	21	13	99

Frequency of PMC's with interlocked bivalents at diplotene and diakinesis is 40% each in *C. retusa* and *C. spectabilis* and 35% in *C. laburnifolia*. These cells do not constitute separate sector within the microsporangium but keep intermixed with normal cells. Chromosome number in the three species under discussion is $2n = 16$ (figure 1). At prophase and metaphase-I, the majority of the cells carry eight distinct bivalents in all the three species. In some cells two or three bivalents keep interlocked, with each individual bivalent of the association bearing two chiasmata, one at each end. Cells with two interlocked associations, each comprised of two bivalents, are also common (figure 2). Associations of three bivalents are restricted to *C. retusa* (figure 3). Break-up of pmc's with an association of 2 interlocked II's, 3 interlocked II's and two associations of 2 interlocked II's each is 60, 10 and 30% respectively in the case of *C. retusa*. In *C. spectabilis*, more than two bivalents are never involved in interlocking. PMC's may have one or two interlocked associations. Frequency of cells with one and two interlocked associations is 60 and 40% respectively. In *C. laburnifolia* all the 35% cells which exhibit the phenomenon of interlocking have a single interlocked association of two bivalents.

Interlocking continues throughout prophase and persists even up to metaphase. The interlocked bivalents aggregate with others at the equatorial plate. Disjunction of chromosomes from interlocked associations is delayed (figure 4), with the result they are still in the process of separation when other chromosomes have already reached the poles. Except for this anomaly interlocking does not effect any other aspect, including chiasmata frequency and chromosome distribution (figure. 5). Pollen viability and seed set also do not suffer any change (table 1).

Since interlocking is extremely infrequent, having been recorded in less than a dozen species, nothing is known about its causative factors. It is believed to represent accidental entanglement of bivalents during early prophase when chromosomes are least spiralized. Should this be so, interlocking would be more common in organisms with long chromosomes. Crotalarias, like other legumes, do not fall in this category. Plants of *C. retusa* were checked for three consecutive years and each time this anomaly appeared in a sizable number of pollen mother cells, which indicates that interlocking of bivalents may be gene controlled.

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OCCURRENCE OF MAIZE DWARF MOSAIC VIRUS IN INDIA

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DURING a survey for virus diseases of graminee in July 1980 a virus was found on maize (*Zea mays* L.) in a maize cultivating area of Faizabad, India. The disease showed stunting of plants with bunching of upper internodes forming a spike-like appearance (figure 1). The leaves of the infected plants showed clear mosaic symptoms consisting of yellowish blotches and flecks intermingled with greenish patches of the lamina (figure 2). The incidence of the disease was about 20%.

In the preliminary transmission experiments the disease was transmitted mechanically to *Zea mays*, thus proving its viral nature. Further it was transmitted to *Dactylotenium aegyptiacum, Digitaria sanguinalis, Echinochloa colonum, Euchlaena mexicana,*

Figure 1. Left, Infected plant, showing shortening of internodes and bunching of leaves. Right, healthy plant.

Eleusine coracana, Setaria italica, Sorghum vulgare, S.bicolor and *Saccharum officinarum.* Out of these *S.bicolor* produced local lesions. Attempts to infect *Avena sativa, Hordeum vulgare, Triticum valgare,* and *Nicotiana Tabacum* were unsuccesful.

Oryza sativa was found to be symptom-less-carrier of the virus.

The properties of the virus showed a dilution-end-point in between 1:1000–1:5000, a thermal-inactivation-point between 50-55° C (when heated for 10 min) and a longevity '*invitro*' for 65–75 hr at room temperatures (30 ± 1° C).

Figure 2. Left, Infected leaf showing mosaic, Right, Healthy leaf.

The virus was readily transmitted to *Zea mays* by aphid *Aphis gossypii Rhopalosiphum maidis* and *Myzus persicae* giving 40, 45 and 60% infections respectively. Aphid *R. maidis* was found colonizing the maizeplants, thus proving to be its natural vector.

The symptoms, host range, physical properties and insect vectors of the above virus suggest it to be maize dwarf mosaic virus (MDMV)[1,2]. This is probably the first record of MDMV in India.

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A PRODUCTIVE EARLY SALT-TOLERANT IR-8 MUTANT

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IR-8 is the most popular dwarf high yielding rice variety as it has revolutionized rice yields for the last two decades. But it is now losing its area under cultivation due to its late maturity, though in some parts of the country it is still accepted. Its grains are coarse, translucent with a 'white belly' in endosperm. Breakage in this white chalky portion leads to a low recovery of head rice. Since induction of mutations is a proven supplement to conventional breeding to confer specific improvement in a variety without altering its otherwise acceptable phenotype[1,2], mutagens singly and in combination were used to rectify the genetic defects in this variety. Using γ-rays, EMS and DES, Kaul[3] isolated 20 useful mutants of rice. Of these, IRm-6, obtained after 6 hr of 1.5% EMS treatment to 12 hr presoaked seeds of IR-8 rice appears most promising after five generations of testing.

This mutant is fine-grained (figure 1) early maturing, protein-rich and high-yielding (table 1). In addition, the shoot height, tiller number, kernel transparency and photosynthetic pigment contents are altered in the mutant. Besides, it exhibits better salt tolerance