Seedlings of *Papaver rhoeas* showed symptoms when they were one month old. The infection started from lower leaves and gradually covered the upper leaves, stems, petioles and flower stalks and finally the whole plant got infected. The infection spots were always hypophyllous with restricted colony growth and were delimited by vainlets. The growth of the fungus was similar to downy mildew with fluffy mycelial outgrowth. On the corresponding upper side paler and necrotic lesions were produced.

On *Moringa oleifera* the initial symptoms appeared as slight yellowing of the leaves either from the margin or towards the midrib on the lower side of the leaves. Growth of the fungus was very scanty with sparse production of conidiophores and conidia. The infection spots tend to become yellow and corky in advanced stages.

Healthy seedlings of papaya variety 'Washington', highly susceptible to *L. taurica* and seedlings of *Papaver* and *Moringa*, were raised in pots in the glass house. Cultures of papaya, *Papaver* and *Moringa* powdery mildew were raised on their respective hosts. Subsequently cross inoculations were made to check their pathogenicity. Papaya seedlings were dusted with the spores collected from infected leaves of *Papaver* and *Moringa* separately and similarly leaves of *Papaver* and *Moringa* seedlings were cross-inoculated with spores collected from infected papaya leaves. The infection was noticed on papaya, *Papaver* and *Moringa* leaves within 5–7 days. Distinct symptoms were noticed on all the hosts with each culture. It is thus clear that *L. taurica* infecting *Papaver* and *Moringa* is identical to the one of Papaya. Hence it is shown that *Papaver* and *Moringa* act as Collateral hosts of papaya powdery mildew due to *L. taurica*. Besides being *Papaver rhoeas* and *Moringa oleifera* are two collateral hosts of *L. taurica*, its occurrence on these two hosts is reported for the first time from India, which are being deposited at HCIO, IARI, New Delhi under Nos. 35001, 35000, respectively.

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INTERSPECIFIC CROSS BETWEEN *ATYLOSIA ALBICANS* AND *ATYLOSIA SCARABAEOIDES*

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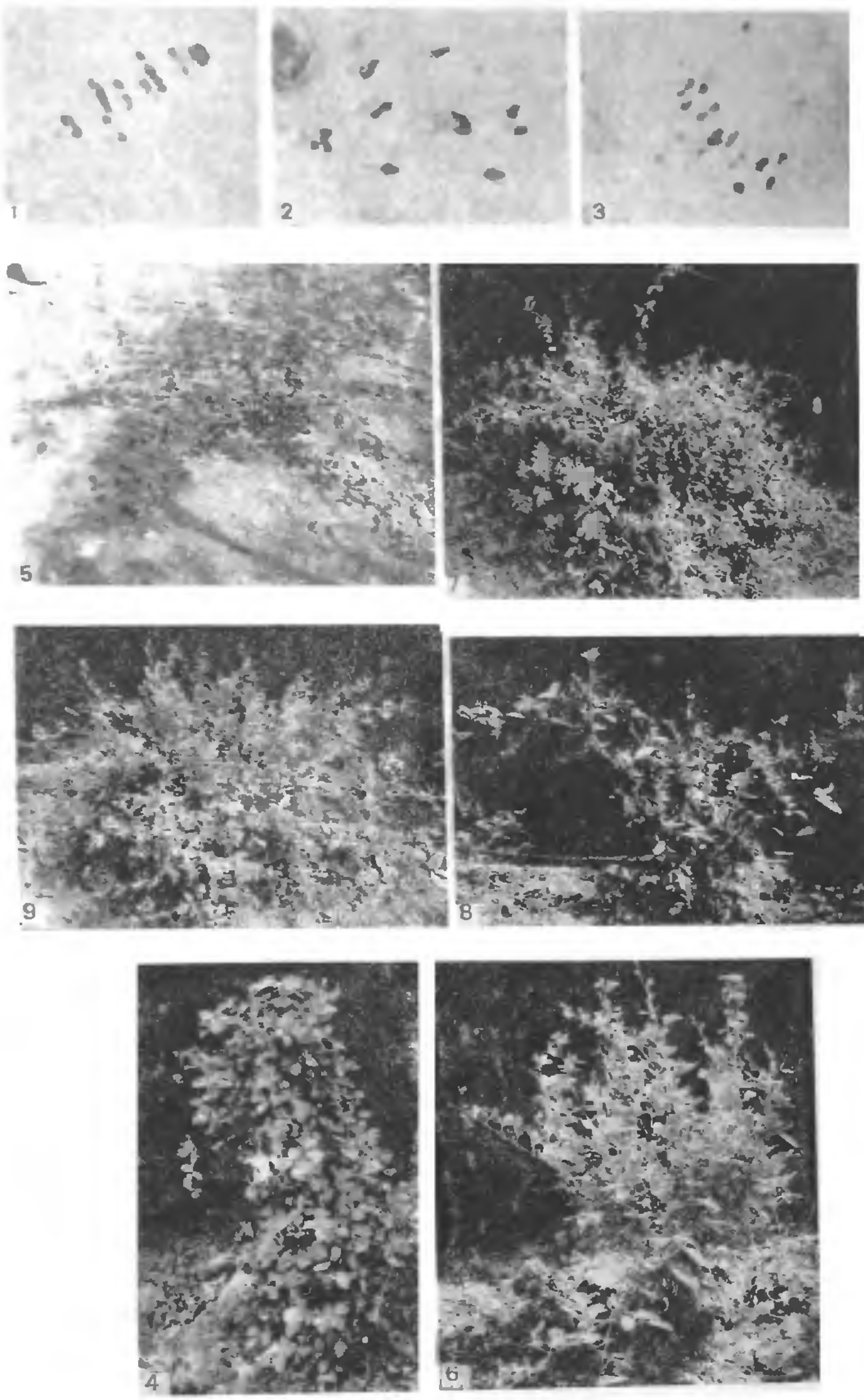
A CROSS between *Atylosia albicans* and *Atylosia scarabaeoides* was successfully attempted. One F_1 plant was obtained, which was semi-fertile and showed the intermediate plant characters. F_2 progeny raised, have shown plants with different morphological traits. Unlike F_1, some of the F_2 plants were fertile.

The materials comprised of *Atylosia albicans* (W & A) Benth., and *Atylosia scarabaeoides* (L.) Benth., used in the present investigation as female and pollen parent respectively. The seeds of the former were obtained through the courtesy of ICRISAT, Hyderabad. Both the species being perennial, have an advantage of providing more adequate dry season feed reserves. About one hundred crosses were attempted during the winter season of 1979. Meiotic studies were made following propionocarmine staining technique and studies on pollen stainability were made following acetocarmine staining technique.

Only one crossed pod containing two seeds was obtained. Out of the two F_1 seeds, one germinated. Meiotic studies revealed 11 II's in parents and 10 II's + 2 I's in the F_1 plant at metaphase-1 (figures, 1, 2, 3). However, in some of the F_2s the number of univalents at metaphase-1 were seen to be quite varying (table 1). Pollen stainability in F_1 plant was 53.7% while in the different F_2 plants it ranged from 30.85% to 93.26% (table 1). In contrast to the growth habits met with in parents (figures 4 and 5), enormous variabilities were noticed particularly in some of the F_2 segregants (figures, 6, 7, 8, 9).

Formation of univalents resulted in meiotic irregularity and thus led to varying degree of sterility. More so, in some of the F_2s, the low seed yield could be attributed to high pollen sterility accompanied by a high degree of univalent formation. However, increase of fertility and chromosomal pairing observed in some of the F_2s could possibly be due to the existence of close homology in their chromosome complements.

Plants with general growth vigour comprising of higher size of leaflets coupled with profuse branching do possess the forage potentialities and could add to the range land pasture production. As the wild relatives of crop species have been shown to be the source of high protein in broad bean[1]; oats[2,3] and *Atylosia*



Figures 1–9. **1.** 11 II's at metaphase I (*A. albicans*), **2.** 11 II's at metaphase I (*A. scarabaeoides*), **3.** 10 II's + 2 I's (F_1 plant), **4.** Twinning habit of female parent, **5.** Semi-erect-spreading habit of male parent, **6–9.** showing growth habits in some of the F_2 segregants. [**6.** erect, **7.** semi erect with profuse branching, **8.** semi erect with broad leaves and **9.** spreading habit.]

Table 1 *Cyto-morphological variation in Atylosia species hybrid*
(No. of PMCs studied were 30 for each plant)

Plant (No.)	Average chromosomal association at metaphase-I	Pollen stain-ability (%)	No. of primary branch	No. of secondary branch	Growth habit
A. albicans (female parent)	11 II	99.1	20.5	49.5	Twining shrub
A. scarabaeoides (Pollen parent)	11 II	98.2	17.5	38.5	Semi erect–spreading
F_1 (*A. albicans* × *A. scarabaeoides*)	10 II + 2.0 I	53.7	18	52	Semi erect–twiner
F_2 (Segregants)					
10	10.6 II + 0.8 I	93.26	20	59	Semi erect coupled with broad leaves
13	7.5 II + 7 I	30.85	18	40	Erect with branch end drooping
14	8.5 II + 5 I	37.07	17	58	Spreading
15	9 II + 4 I	58.29	16	39	Erect
18	10.6 II + 0.8 I	67.41	22	65	Semi erect with profuse branching

albicans[4], the scope extends further in isolating/selecting some of the highly nutritive cultivar in F_3s and onward generation population. Variabilities in morphological characters arose several biological interests towards understanding the relationship between two species on the one hand and its potentialities in breeding new plant types towards the improvement of *Atylosia scarabaeoides* on the other.

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RESPONSES OF ISOLATED FLORAL BUDS AND ANTHERS OF *ABUTILON INDICUM IN VITRO*

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CULTURED floral buds of several plants yield a callus capable of regenerating organs[1,2]. It is also well-demonstrated that in anthers grown *in vitro* the callus originates from wall layers, connective tissue or from pollen grains[3]. In many species, the pollen grains directly develop into plantlets[3]. This report describes the *in vitro* responses of floral buds and anthers of *Abutilon indicum* Sweet. The twigs bearing flower buds were surface-sterilised in chlorine water for 5 to 10 min. After washing in sterile distilled water, buds and anthers were dissected out aseptically and implanted on Bourgin and Nitsch's[4] medium with 2% sucrose (BM) with various growth adjuvants. The pH of the medium was adjusted to 5.8 and the cultures were maintained in diffuse light (150 to 200 lux for *ca* 10 hr daily) at 25 ± 2°C and 50 to 60% relative humidity.

The flower buds at the uninucleate pollen grain stage, did not callus on BM or BM + coconut water (CW, 15%) or casein hydrolysate (CH, 500 ppm). On BM + IAA (1 ppm) 25% of the explants showed callusing in 2 weeks. In response to IAA (1 ppm) + CW (15%) sepals and cut end of the pedicel showed proliferation