IN SITU GERMINATION OF SPORES IN *ASPLENIUM RUTAEFOLIUM*

ASHOK K. BHARGAVA, SHOBHANA BHARGAVA AND S. N. SINGH
Department of Botany, Institute of Advanced Studies, Meerut University, Meerut 250 005, India.

A SPECIMEN of *Asplenium rutaefolium* was collected from Kuntze near Kathmandu (Nepal) and the *in situ* germination of spores forming prothallus, which gives rise to young Sporophyte on parent plant, was studied.

There are 12–16 pairs of pinnate leaves, the pinnae being opposite at the base of the rachis but become alternate towards apex. Dark black bodies were present on the adaxial surface of the pinnae. Laboratory observation, revealed that these dark bodies represent fern prothalli (gametophyte). Some of these young prothalli have also formed rhizoids. These prothalli eventually develop into young sporophytic plants, which seems to arise from the pinnae. This seems to be first observation in a fern.

We thank Drs. Y. S. Murty, D. Banerji and V. Singh for constant encouragement and help.

3 January 1983; Revised 5 February 1983

EFFECT OF SELECTION ON SEEDLING HANDEDNESS IN PIGEON PEA

K. LOKENDAR RAO, BIR BAHADUR AND A. SATYANARAYANA*

Department of Botany, Kakatiya University, Warangal 506 009, India.

*Department of Botany, A. U. College, Hyderabad, India.

THIS note describes the results of selection experiments conducted from 1977 to 1980 to establish the left or right-handed character in the seedlings of pigeon pea described earlier by Rao and Bahadur[1].

To study the effect of continuous selection on seedling handedness, a cultivar bearing ICRISAT accession No. 7406, obtained from ICRISAT, Hyderabad, was used. The selection experiments were conducted following the procedure of Kundu and Sarma[2].

Seeds were sown in earthern flats during June 1977, and left and right-handed seedlings were sorted out as described by Rao and Bahadur[1]. Ten seedlings each of left and right-handed were transplanted in the field in separate rows. One plant each from left and right-handed type from this lot was randomly selected and a total of 89 pods from left-handed plant and 94 pods from the right-handed were obtained. The total number of seeds produced from these pods were 322 and 352 respectively. All these were used as parents in the succeeding generation (1978–79). Seeds were sown and on germination the left and right-handed seedlings were sorted out. The left and right-handed seedlings produced from left handed parents showed a ratio of 1:1, while those from right handed seedlings showed an excess of RH type ($X^2 = 3.9$, $p < 0.05$) which is significant.

The procedure of selecting one plant and selfing 100 flowers was repeated. During 1979–80, these seeds were sown and left and right-handed seedlings were sorted out. Seedling produced from first three parents were in the ratio of 1:1, while those of the 4th parent showed a deviation. The X^2 for deviation from equality is high and is highly significant. (Table 1).

During subsequent generation, seeds from parents of extreme selection type (LLL & RRR) were used to determine the ratio of left and right-handed seedlings. It was observed that the seedlings produced from the parent type LLL, showed an excess of RH type of 21 but the deviation from equality is statistically insignificant. Thus the ratio of left and right-handed seedlings in the pigeon pea derived from the parents selected in successive generation did not appear to reflect the progressive purity of the character with regard to seedlings handedness.

Kundu and Sarma[2] have tried to establish the handedness with regard to the leaf spiral in *Corchorus* species and obtained similar results. Davis[3] and Allard[4-6] have also reported similar results with regard to the phyllotaxy handedness in *Cocos nucifera* and *Nicotiana* species respectively.

To date no satisfactory explanation of handedness is available although it follows Mendelian inheritance in *Medicago tuberculata*[7] but elsewhere it is hereditary[8]. The exact mechanism that controls handedness in plants is eluding botanists and merits further study.

23 November 1982

1. Rao, K. L. and Bahadur, B. *Curr. Sci*, 1980, **49**, 201.

TABLE 1

Results of continue selection experiments in C. cajan

Year	Parent	L-handed seedlings		R-handed seedlings		X^2 1 : 1 deviation	*P* value
1977–1978	Unknown	93		96		0.047	>0.75
	L-handed	122	(LL)	137	(LR)	0.868	>0.25
1978–1979	R-handed	131	(RL)	165	(RR)	3.9	<0.05
	LL-handed	117	(LLL)	5	(LLR)	102.8	<0.005
	LR-handed	104	(LRL)	114	(LRR)	0.454	>0.50
1979–1980	RL-handed	115	(RLL)	125	(RLR)	0.416	>0.50
	RR-handed	103	(RRL)	185	(RRR)	23.3	<0.005
	LLL-handed	141		151		0.34	>0.50
	RRR-handed	140		161		1.46	>0.10

Key : LL= Left-handed plants produced from left-handed parents.
LR= Left-handed plants produced from right-handed parents.
LLL= Left-handed plants produced in third generation from left-handed parents in the previous two generations etc.

2. Kundu, B. C. & Sarma, M. S. *Bose Res. Inst.*, 1965, **28**, 107.
3. Davis, T. A. *FAO Technical working party on Coconut production protecting and processing.*, 1964, **2**, 59.
4. Allard, H. A. *J. Agric. Res.*, 1942, **64**, 49.
5. Allard, H. A., *J. Agric. Res.*, 1946, **73**, 237.
6. Allard, H. A. *Castanea.*, 1951, **16**, 1.
7. Lilienfeld, F. and Kihara, H. *Proc. Jpn. Acad. Sci.*, 1956, **32**, 8.
8. Compton, R. H., *J. Genet.*, 1912, **2**, 53.

TRANSFER OF MALE STERILITY FROM *GOSSYPIUM HIRSUTUM* TO *G. BARBADENSE*

M. V. THOMBRE
Department of Botany, Mahatma Phule Agricultural University, Rahuri 413 722, India.

THOMBRE and Mehetre[1] reported a source of cytoplasmic genetic male sterility in *G. hirsutum* cotton, and it was indicated that the fertility restoration can be controlled by a pair of duplicate dominant genes. The original source used in this case *G. hirsutum* okra male sterile 572/76 was pollinated by pollen from the *G. barbadense* cotton S.B. 289-E to see if sterility can be transferred in *G. barbadense* cotton. The F_1 plants obtained from the cross were all male-sterile but segregated for Okra and normal leaf in 1:1 ratio. The normal-leaved male sterile plants were subsequently back-crossed with S.B. 289-E as a recurrent parent and subsequent back crosses were grown in summer and rabi seasons respectively. After four back crosses the ms *G. barbadense* line was carefully observed for normal pollen/anther formation. In both the seasons the line maintained male sterility.

The original *G. barbadense* line S.B. 289-E showed variability in the length of style, anther number and length of staminal column. The *G. hirsutum* ms has uniform style length. In the ms *G. barbadense* SB 289-E line, the style length is fairly uniform. This is considered advantageous for uniform natural cross pollination to take place.

The development of ms *G. barbadense* from cytoplasmic genic interaction between GA 572/16 and S.B. 289-E indicates that the sterility mechanism in *G. hirsutum* also operates in *G. barbadense* cotton. The nature of fertility restoration in this line is under study.

12 November 1982

1. Thombre, M. V. and Mehetre, S. S., *Curr. Sci.*, 1979, **48**, 172.