2. Ganju, P. N., *J. Indian Bot. Soc., M. O. P. Iyengar Commemoration Volume*, 1946, p. 51.

PRE-ANTHESIS CLEISTOGAMY IN *OTTELIA ALISMOIDES*

R. INDRA and K. V. KRISHNAMURTHY*
Department of Botany, Seethalakshmi Ramaswami College, Tiruchirapalli 620 002, India.
* *Department of Botany, Bharathidasan University, Tiruchirapalli 620 024, India.*

OPINIONS differ with reference to the mode of pollination in *Ottelia*, a freshwater genus of the family Hydrocharitaceae. Ernst-Schwarzenbach[1] reported typical cleistogamy in *O. ovalifolia* where flowers fail to open. Sculthorpe[2] mentioned that *Ottelia* is characterized by entomophily. The present work was undertaken to ascertain the mode of pollination in *O. alismoides*, the common and cosmopolitan species of this genus.

O. alismoides produces axillary scapes, each bearing a solitary, fairly large, white coloured, bisexual and protandrous flower. The flowers are chasmogamous in that they open after coming out of water. Investigation revealed that each of the 6–15 anthers showed latrose and irregular dehiscence even before the flowers came out of the water surface and opened. By the time the flowers opened the pollen tubes in many cases had already reached the ovules and effected fertilization. In other words, *O. alismoides* is a good example of a plant showing pre-anthesis cleistogamy which is very common in some legumes. It differs from *O. ovalifolia* in having open flowers but resembles it in having cleistogamy, although of a different type. This is, therefore, the first report of pre-anthesis cleistogamy in Hydrocharitaceae.

24 June 1987

1. Ernst-Schwarzenbach, M., *Phytomorphology*, 1956, **6**, 296.
2. Sculthorpe, C. D., *The biology of aquatic vascular plants*, Edward Arnold Ltd, London, 1967.

INHERITANCE OF THREE NEW MUTANTS IN SESAME

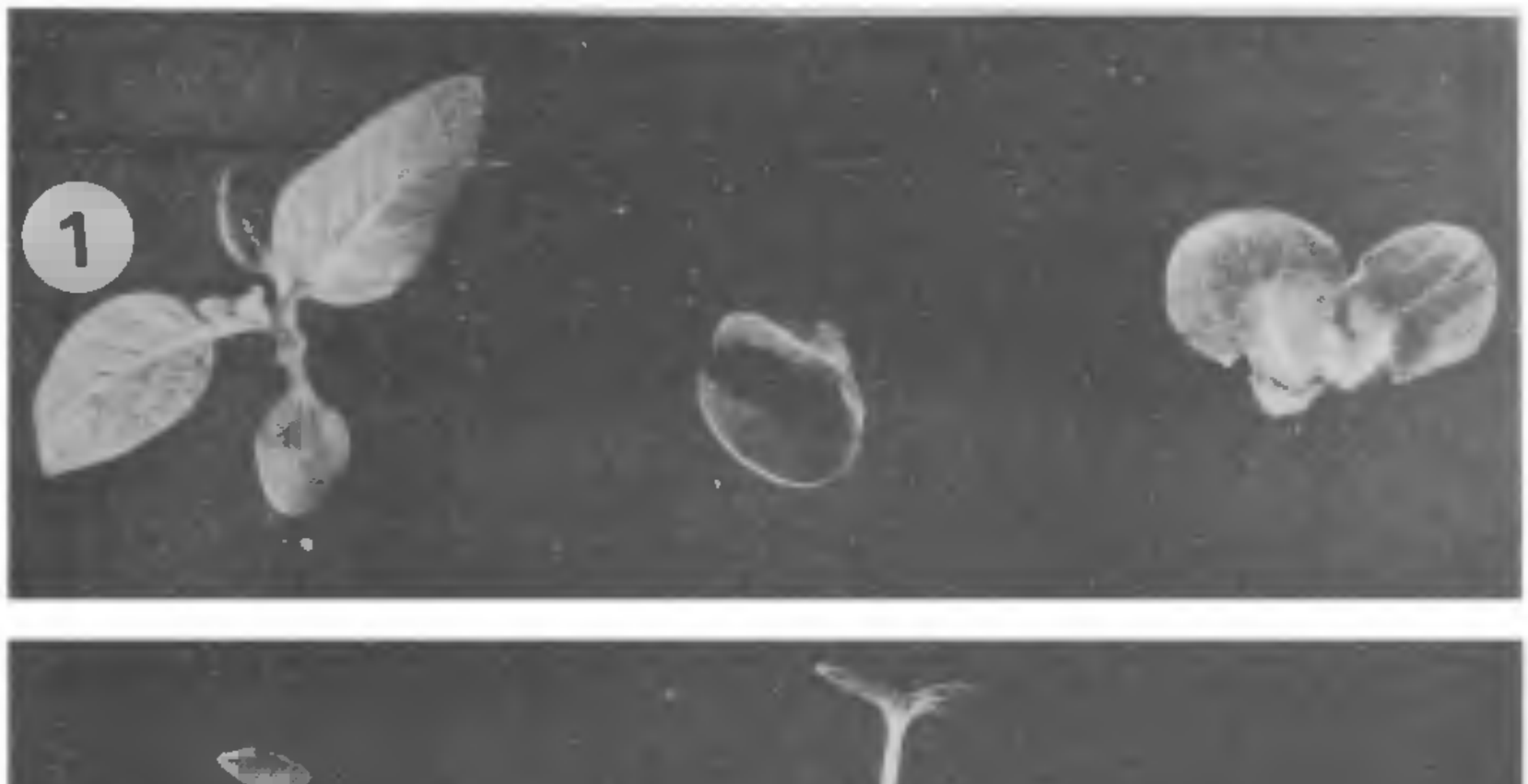
G. S. S. MURTY
Nuclear Agriculture Division, Bhabha Atomic Research Centre, Trombay, Bombay 400 085, India.

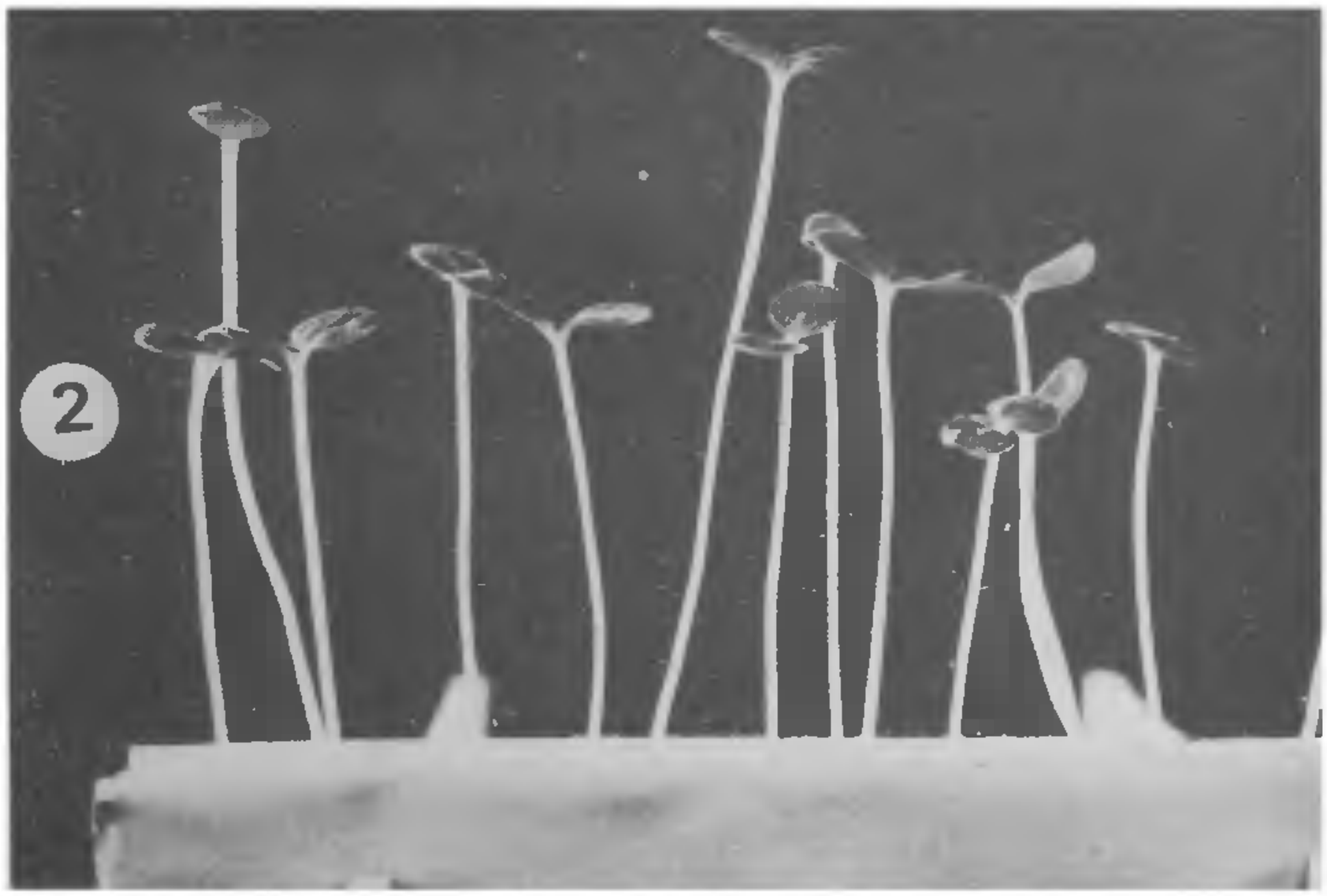
PHENOTYPICALLY distinct mutants are a prerequisite to develop stocks for genetic mapping. Such stocks have been painstakingly developed in crop plants like barley[1], maize[2], pea[3], tomato[4] and wheat[5] but are generally lacking for plants predominantly grown in the tropics. Inheritance of several characters in sesame (*Sesamum indicum* L.) has been reported and reviewed periodically[6–8]. Towards the genetics of sesame, inheritance of three new, hitherto unreported, mutant phenotypes—fasciated cotyledons (*fcl*), tall seedling (*ts*) and dotted corolla tube (*dtf*) is reported here.

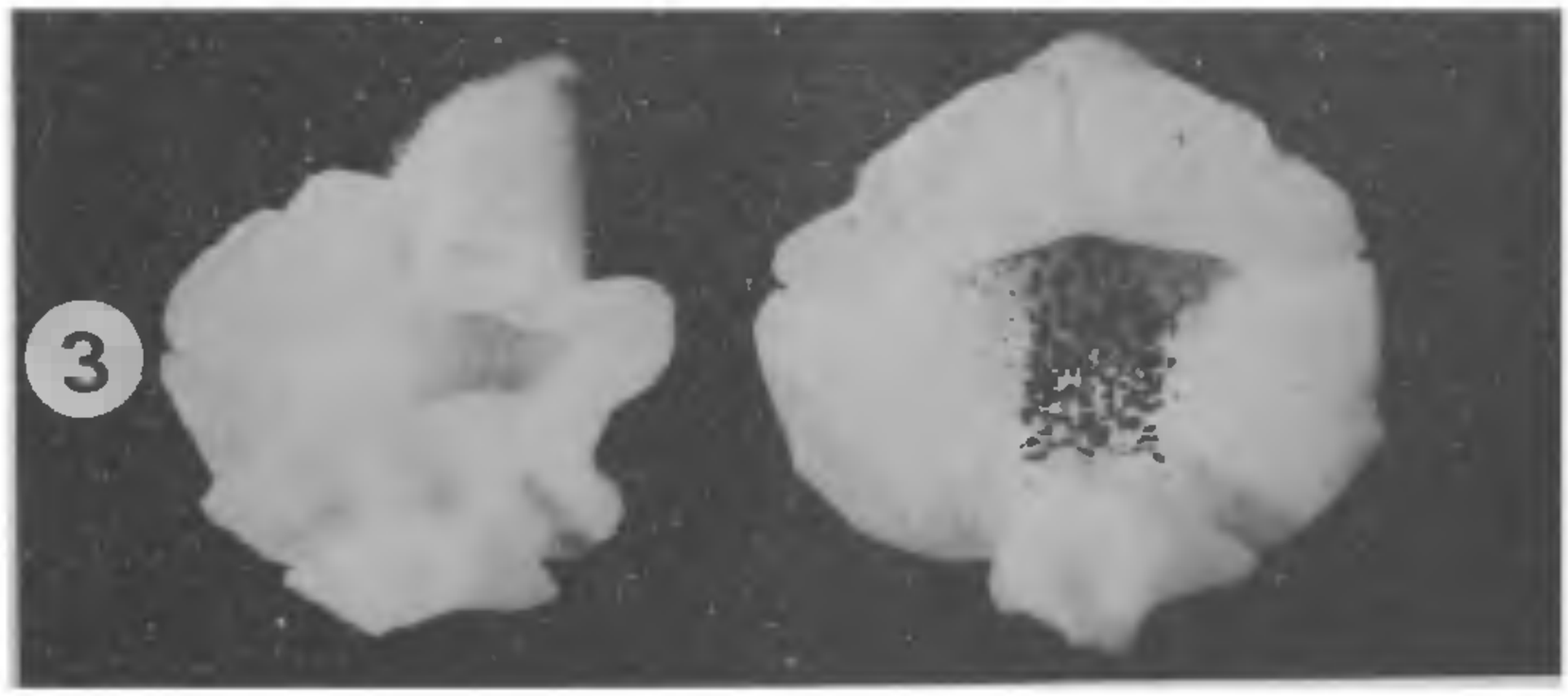
Fasciated cotyledonary leaves mutant (FCL): This mutant was observed among ten-day-old seedlings in one of the M_4 progenies (NY–21) derived from 1% E.M.S. treatment of cultivar N–8 seeds. The fasciation in these seedlings was either complete, giving a cup-shaped appearance or partial. The FCL seedlings increased in size up to 20–25 days, but failed to develop the first pair of leaves (figure 1), as they were devoid of the terminal bud. Thus the mutant was lethal. Seeds from five sib plants were sown in the seedling racks[9] and were scored for the mutant phenotype. Segregation of 3 normal : 1FCL phenotype was observed (table 1). From one of the segregating families, 55 single plants were progeny tested. The genotypic and phenotypic segregations in the M_5 (table 1), confirmed that the character of the fasciated cotyledonary leaves is controlled by single recessive gene factor (*fcl*).

Tall seedling mutant : This was isolated[10] from cultivar N62–32. It is characterized by long hypocotyl (figure 2) due to which the seedlings grow taller than the parent. The mutant was crossed with cultivar TC–25. Phenotypic and genotypic segregations in the F_2 and F_3 generations (table 1) indicated that the mutant character is inherited as a monogenic recessive (*ts*).

Dotted flower mutant : A mutant with dark pink dots inside the corolla tube (figure 3) was isolated in the M_2 generation following 20 kR gamma ray treatment of cultivar Phule Til–1. Out of 23 plants in a M_2 family, 19 were of the parental type and 4 were of mutant type [χ^2 (3:1) = 0.7101, P = 30–50]. The mutant types bred true in the M_3 and M_4







Figures 1–3. 1. 20-day-old seedlings of : parent (left) and mutant with complete (middle) or partial (right) fasciation of cotyledons; **2.** Tall seedling mutant segregating in the cross, and **3.** Parent (left) and dotted flower mutant (right).

generations. It was crossed reciprocally with the parent cultivar. F_2 segregations for the parent and mutant phenotypes showed a good fit to 3:1 ratio respectively, confirming that the dotted flower character is controlled by a single recessive gene (*dtf*). Langham[11] reported the inheritance of a selection from Nicaragua with purple dots on the exterior portion of the corolla. However, the dotted flower mutant in the present study appears to be different, as dots are inside the corolla tube as a

Table 1 *Segregation of three induced seasame mutants*

Progeny no. or name of cross	Generation	No. of progenies studied	Frequency of phenotypes		χ^2 (3 : 1)	*P*
			NY-21	*FCL*		
NY-21	M_4	5	865	265	1.4454	20–30
	M_5	18	342	–	–	–
		37	519	165	0.2807	50–70
		[χ^2 (1:2) for 18:37 = 0.0091, P = 90–95]				
			TC-25	*N-129*		
N–129 × TC–25	F_2	15	699	208	2.0673	10–20
TC–25 × N–129	F_2	10	587	183	0.6251	30–50
Pooled	F_2	25	1286	391	2.5381	10–20
N–129 × TC–25	F_3	12	228	–	–	
		24	351	97	2.6786	10–20
	F_3	18	350	–	–	
		26	354	103	1.4770	20–30
Pooled		[χ^2 (1:2) for 30:50 = 0.6250, P = 30–50]				
TC–25 × N–129	F_3	9	175	–	–	
		27	378	107	2.2330	10–20
	F_3	6	116	–	–	
		22	291	80	2.3369	10–20
Pooled	F_3	[χ^2 (1:2) for 15:49 = 2.8203, P = 5–10]				
			PT-1	*Dotted*		
PT–1 × Dotted	F_2	34	3172	1001	2.2814	10–20
Dotted × PT–1	F_2	35	3813	1240	0.5706	30–40
Pooled	F_2	69	6985	2241	2.4801	10–20

FCL = fasciated cotyledonary leaves mutant, PT–1 = Phule Til–1 and dotted = dotted flower mutant.

band from the base of the corolla tube extending up to the base of labellum.

17 August 1987

1. Nilan, R. A., In: *Handbook of genetics*, (ed.) R. C. King, Plenum Press, New York and London, 1974, Vol. 2, p. 93.
2. Neuffer, M. G. and Coe, E. H. Jr.,*Ibid*, p. 3.
3. Blixt, S., *Ibid*, p. 181.
4. Rick, C. M., *Ibid*, p. 247.
5. Sears, E. R., *Proc. 2nd Int. Wheat Genet. Symp.*, Lund, 1963, *Heriditas Suppl.*, Vol. **2**, 370.
6. Joshi, A. B., In: *Sesamum*, Indian Oilseeds Committee, Hyderabad, 1961, p. 51.
7. Brar, G. S. and Ahuja, K. L., *Annu. Rev. Plant Sci.*, 1979, **1**, 246.
8. Kobayashi, T., *Sesame Safflower Newsl.*, 1986, p. 23.
9. Mikaelsen, M., *Mutations in plant breeding*, Proc. Panel, IAEA, Vienna, 1966, p. 249.
10. Murty, G. S. S. and Joshua, D. C., *Sesame Safflower Newsl.*, 1986, p. 16.
11. Langaham, D. G., *J. Hered.*, **38**, 221.