

## OCCURRENCE OF ATYPICAL EMBRYOSAC LIKE STRUCTURES IN *ARACHIS GLABRATA* BENTH

M. BHARATHI, P. B. KIRTI, U. R. MURTY AND N. G. P. RAO

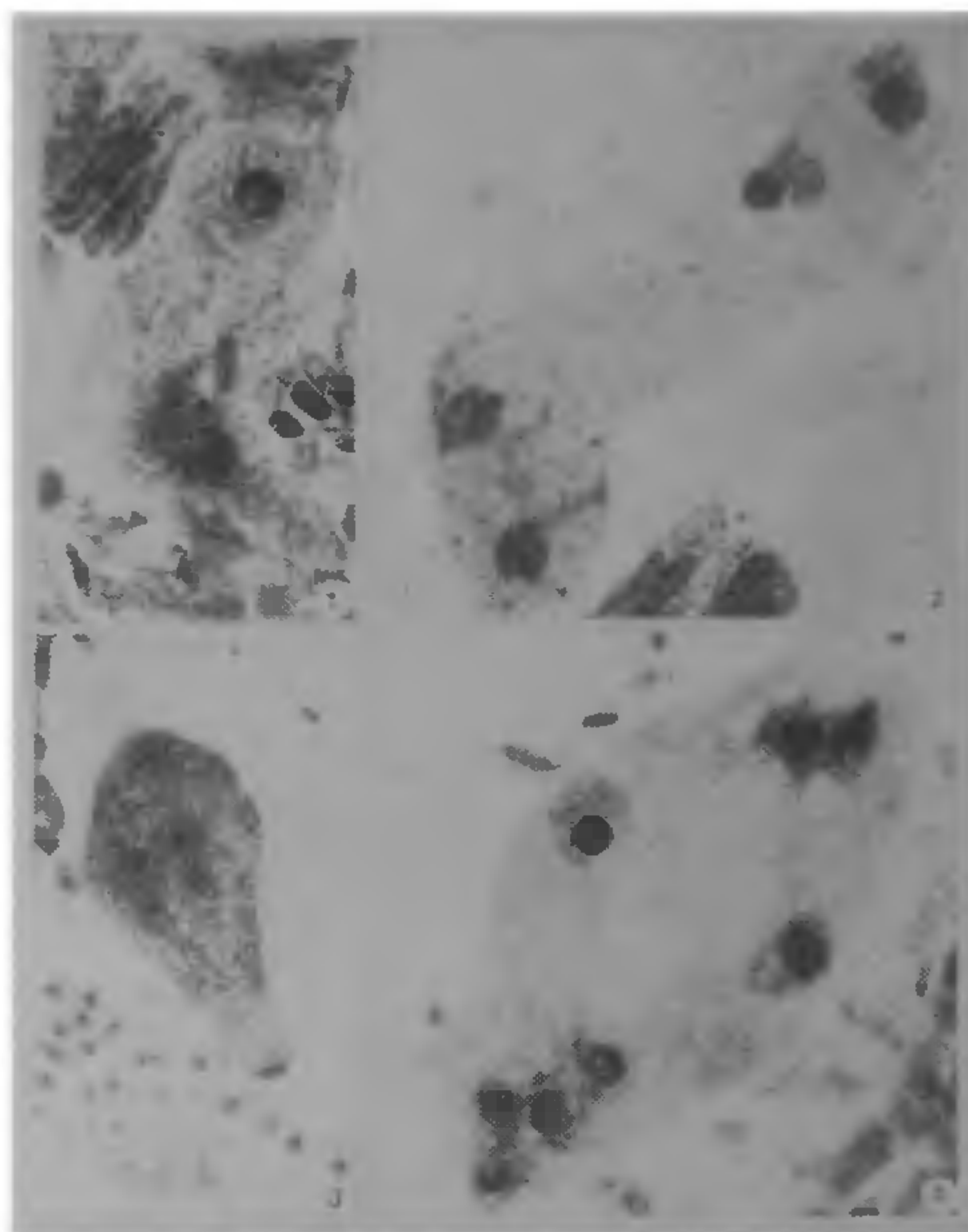
IARI-Regional Station, Rajendranagar, Hyderabad 500 030, India.

THE genus *Arachis* to which the cultivated groundnut *Arachis hypogaea* (L) belongs, contains at least 22 species. Species of one of the 7 sections of the genus<sup>1</sup>, the rhizomatosae, do not set seed although they flower profusely. During embryological studies to understand the seed failure mechanisms in one such species, *A. glabrata*, peculiar embryosac-like structures were encountered. The present note gives an account of the occurrence, structure and significance of such structures.

Rhizomes of *A. glabrata* Benth. were obtained from the oil seeds section of Tamilnadu Agricultural University, Coimbatore and grown under field conditions at Hyderabad. The plants were very vigorous and flowered profusely. Some of the flowers gave rise to 'pegs' (fruit-bearing gynophores). However, no fully formed pods were recovered at any time. For the study of pre and post fertilisation events, young flower buds and ovaries at 6 hourly intervals after anthesis were fixed in acetic alcohol and the ovaries were squashed using the technique of Murthy and Rao<sup>2</sup>.

At anthesis, 80% of ovules had typical polygonum type of embryosacs. In 20% embryosac-like structures were observed which had nuclei ranging, from one to 16. The nuclei of all these embryosac-like structures were unorganised. Some of these structures are illustrated in figures 1 to 4. Such unorganised embryosacs were also encountered at various stages of pollination upto 48 hr and also in the aerial and subterranean pegs, and were not fertilised.

Such abnormally organised embryosacs were reported previously in *Ochna Serrulata*, *Atraphaxis frutescence* and *Rudbeckia* spp<sup>3</sup> and in the facultative apomictic lines of *sorghum bicolor* L Moench<sup>4</sup>. These are normally associated with apomictic type of reproduction. Species like *A. glabrata* Benth. will be faced with extinction because they are seed sterile. To overcome such a catastrophe, some genotypes at least may be preserved in nature if they evolved apomictic type of reproduction. Such a type of reproduction may not occur in the collections of *A. glabrata* presently studied, but the occurrence of these atypical embryosacs may represent the beginning of the evolution of apospory. The range of genotypes now studied is to meagre since they trace back to a few rhizomes introduced originally into India. Study of different collections of species will be useful to know whether some of them are capable of sub-sexual reproduction



Figures 1-4. 1. 2-nucleate embryosac 6 hr after pollination. 2. 4-nucleate embryosac at 2 hr after pollination. 3. A 4-nucleate undifferentiated embryosac 12 hr after pollination. 4. A 8-nucleate undifferentiated embryosac 24 hr after pollination.

and whether they help in groundnut breeding in the fixation of partial or complete heterozygosity.

The authors thank the ICAR for supporting this investigation in their scheme of creation of professorial chairs.

31 October 1981

1. Gregory, W. C., Gregory, M. P., Krapovicas, A., Smith, B. W. and Yarbrough, J. A., In *Peanut-culture and uses* pp. 47, 1973.
2. Murthy, U. R. and Rao, N. G. P., *Curr. Sci.*, 1979, 48, 492.
3. Battaglia, E. *Apomixis in recent advances in embryology of Angiosperms*, (ed) P. Maheswari, International Society of Plant Morphologist, New Delhi, 1963.
4. Murthy, U. R., Schertz, K. F. and Bashaw, E. C., *Indian J. Genet.*, 1979, 39, 271.