

1. Bhat, R. V., Nagarajan, V. and Tulpule, P. G., *State of Art Report on Food Contaminants in India*, Department of Science and Technology, New Delhi, 1981, p. 128.
2. Bhat, R. V., Nagarajan, V. and Tulpule, P. G., *Health Hazards of Mycotoxins in India*, Indian Council of Medical Research, New Delhi, 1978, p. 58.
3. Cucullu A. F., Pons, W. A. Jr. and Goldblatt, L. A. *J. Assoc. Anal. Chem.* 1972, 55, 1114.
4. Holaday, C. E., *J. Am. Oil Chem. Soc.* 1981, 58, 931 A.
5. Jemmali, M., *J. Assoc. Anal. Chem.* 1973, 56, 1512.
6. Scoppa, P. and Marafanti, E. *Experientia.*, 1971, 27, 414.

FOLIAR STOMATAL DEVELOPMENT IN THREE SPP. OF *ARISTOLOCHIA* L

TOMY PHILIP

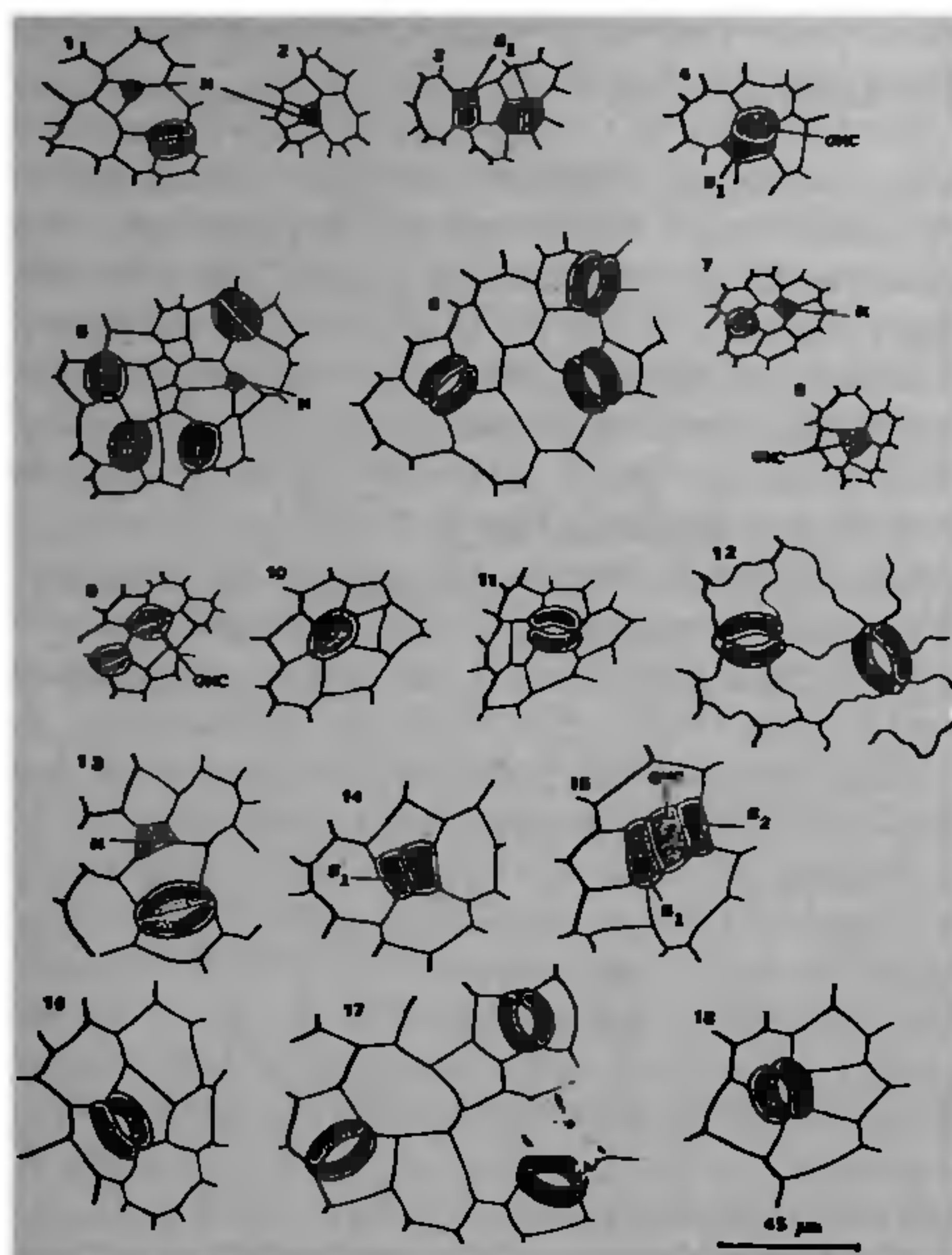
Centre for Advanced Studies in Botany,
University of Madras, Madras 600 005, India.

STRUCTURE and development of stomata in several families and plants have been studied by various workers¹⁻⁸. But there seems to be no epidermal and stomatal study in the family Aristolochiaceae, except what is mentioned by Metcalfe and Chalk⁹. In order to fill this gap, an epidermal study on five species of *Aristolochia* L. was undertaken earlier¹⁰. The present paper describes the development of stomata in three species of *Aristolochia* namely *A. bracteata* Retz., *A. indica* L., and *A. Leuconeura* Lindl.

Leaves of *A. bracteata* were collected from Vishakapatnam (Andhra Pradesh), *A. indica* from Changanacherry (Kerala) and *A. leuconeura* from Bangalore (Karnataka) and Trivandrum (Kerala). Epidermal peels from young as well as old leaves were stained in alcoholic safranin and mounted in 20% glycerine.

The leaf of *A. bracteata* is amphistomatic while the leaves of the other two species are hypostomatic. Stomata in the family Aristolochiaceae have earlier been described as anomocytic⁹. But our study reveals the predominance of paracytic stomata in *A. leuconeura* along with a few anomocytic stomata¹⁰. The anomocytic stomata are often surrounded by 4 or 5 subsidiary cells and rarely by 6 cells (figures 6 & 12).

The stomatal meristemoids in all the species are scattered irregularly among the epidermal cells and can be distinguished from the latter by their smaller



Figures. 1-18. Development of stomata in *Aristolochia* leaves. 1-6. *A. bracteata*., 7-12. *A. indica*., 13-18. *A. leuconeura*. (GMC-gaurd cell mother cell, M - stomatal meristemoid, S₁ and S₂ - subsidiary initials).

size and deep staining cytoplasm. They are usually squarish, rectangular or triangular in shape (figures 1, 2, 7 & 13).

The development of anomocytic stomata in the investigated species follows two different patterns. In *A. bracteata* each meristemoid undergoes a vertical division forming two cells, one slightly smaller than the other (figure 3). The smaller one forms the first subsidiary cell (s₁) while the larger one directly functions as the gaurd cell mother cell (GMC), which is enlarged, assumes lenticular shape (figure 4) and divides into two equal-sized cells by a longitudinal wall (figure 5). These cells elongate, develop an intervening pore and form two bean shaped gaurd cells (figure 6). The remaining cells are formed from the surrounding epidermal cells. Since the stomatal meristemoid as well as the surrounding epidermal cells constitute the formation of stomatal complex, the development is mesoperigenous.

Anomocytic stomata in *A. indica* and *A. leuconeura* develops perigenously. In these species the stomatal meristemoids directly function as the GMC,

which enlarges and divides by a straight wall forming two guard cells (figures 7-12 & 18).

The majority of the stomata in *A. leuconeura* is paracytic (figure 17) which develops mesogenously. An oblique wall divides the meristemoid into two cells, one smaller and the other bigger (figure 14). The bigger one cuts off another small cell by a curved wall parallel to the first, thus forming a row of three cells (figure 15). The central one functions as the GMC, which forms two guard cells while the other two cells form the subsidiaries, (figures 13 & 16).

Thus it has been observed that all the three types of stomatal developments such as mesogenous, perigenous and mesoperigenous are met within the species of *Aristolochia* under consideration. Stomata in *A. bracteata* and *A. indica* follow mesoperigenous and perigenous type of development respectively. In *A. leuconeura* paracytic stomata develop mesogenously and anomocytic stomata perigenously, as in *A. indica*. This observation again supports the view of Tognini¹² who concludes in his studies on 30 species of dicotyledons that there are different modes of development of stomata in various organs in the same plant and sometimes on the same organ. Such variations in stomatal structure and development have also been reported by various Indian workers^{4,5,7,8,13}.

The author is grateful to Dr. E. K. Janaki Ammal, Emeritus Scientist, for valuable suggestions and to the Director, Centre for Advanced Studies in Botany for facilities.

29 May 1982

1. Stebbins, G. L. and Khush, G. S., *Am. J. Bot.*, 1961, 48, 51.
2. Paliwal, G. S. and Bhandari, N. N., *Phytomorphology* 1962, 12, 409.
3. Pant, D. D. and Mehra, B., *Flora Jena.*, 1964, 155, 179.
4. Pant, D. D. and Kidwai, P. F., *Curr. Sci.*, 1966, 33, 653.
5. Pant, D. D. and Banerji, R., *J. Indian Bot Soc.*, 1965, XLIV, 191.
6. Shah G. L., *J. Indian Bot. Soc.*, 1968, XLVII, 305.
7. Bir Bahadur, Rajagopal, T. and Ramayya, N., *J. Linn. Soc. Bot.* 1971, 64, 295.
8. Rajagopal, T., Ramayya, N. and Bir Bahadur., *J. Indian Bot. Soc.*, 1972, 51, 201.
9. Metcalfe, C. R., and Chalk, L., *Anatomy of dicotyledons*, Vol. 2 Clarendon Press, Oxford, 1950.
10. Singh, P., and Tomy Philip., *Herba Hung.*, 1981, 20, 1, 33.
11. Pant, D. D., *On the ontogeny of stomata and other homologous structures.*, Plant Sci, Ser., Allahabad, 1965.
12. Tognini, F., *Atti I Bot., Univ. Lab., Crittogam, Pavia*, 1897, 4, 1.
13. Ramayya, N. and Rao, V. J., *Curr. Sci.*, 1969, 38, 79.

ANNOUNCEMENT

NATIONAL CONFERENCE ON VIBRATIONAL SPECTROSCOPY

The National Conference on Vibrational Spectroscopy will be held at the Division of Applied Sciences, Anna University, Madras Institute of Technology, Chromepet, Madras 600 044, India during 16-18 May 1983. The broad areas to be covered include: Current and developing application of Vibrational Spectros-

copy and the development of equipment and instrumentation. Further details can be had from Dr. S. Mohan, Conference Organiser, Division of Applied Sciences, Anna University, Madras Institute of Technology, Chromepet, Madras 600 044.
