

## Somatic chromosome number in nutmeg (*Myristica fragrans* Houtt.)

K P M DHAMAYANTHI & B KRISHNAMOORTHY

Indian Institute of Spices Research  
Calicut - 673 012, Kerala, India.

### Abstract

The somatic chromosome number in nutmeg (*Myristica fragrans*) was determined to be 38 in root tips, using squash technique.

**Key words :** chromosomes, *Myristic fragrans*, nutmeg.

Nutmeg (*Myristica fragrans* Houtt.) (Myristicaceae), an important tree spice, is usually dioecious, but female trees with few male flowers and male trees with few female flowers and hermaphrodite trees are occasionally seen. The aim of the present study was to determine the chromosome number of nutmeg, as little information on the same is available.

The materials for the study were selected from IISR Experimental Farm, Peruvannamuzhi (Kerala, India). Root tips of 0.5 to 1 cm length were excised from nutmeg seedlings at 10.30 am and treated with 0.5% colchicine for 3 h at 11°C. After washing with tap water, they were fixed in 1:3 acetic acid-ethanol mixture for 24 h followed by hydrolysis at 60°C for 15 to 20 min and squashed in 2% lactopropino orcein. Microphotographs were taken from the selected plates and suitably enlarged for confirming the chromosome number. All the plates showed a chromosome number of 38. The chromosomes were extremely small and their differences in size were

also small. No centromere could be located. Little information is available on the number and size of chromosomes in Myristicaceae. Simmonds (1954) counted chromosomes of *M. fragrans* from Sri Lanka and reported the number to be 42 (2n) and gave no further information on their size and shape. Flach (1966) reported that the diploid chromosome number of nutmeg was 44 (2n), but his results were not obtained by using squash technique, but with fixation in a CRAF - mixture, followed by embedding in paraffin, and then sectioning mostly at 14 µm and staining with crystal violet or haematoxylin. He also mentioned that the squash method was less satisfactory due to the small size of chromosomes. His results of counts differed and it was not possible to see any details, as various known methods of staining proved inadequate.

Mangenot & Mangenot (1957) found in an African member of the family of Myristicaceae, *Pyrenanthes angolensis*, 38 (2n) small, short-rod like chromosomes, appearing as grains. Whitaker

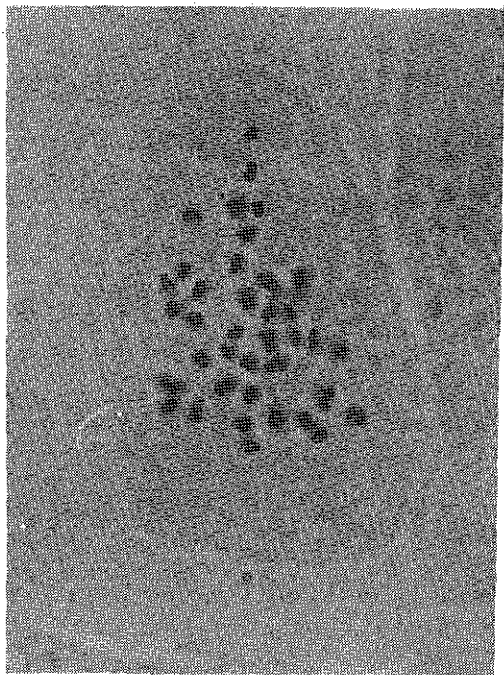


Fig. 1. Somatic metaphase plate in nutmeg showing  $2n=38$

(1933) suggested a relationship between the shape and number of chromosomes and nodal structure in stem within a group of families of Ranales. The genera studied with trilacunar nodes (Winteraceae, Tetracentraceae and Cercidiphyllaceae) have a basic chromosome number of 19 small, short, rod like chromosomes. Flach (1966) investigated the stem nodes of *M. fragrans* with respect to Whitaker's hypothesis. In all

20 nodes Flach examined, they were trilacunar with one trace from each gap. This places *M. fragrans*, as to nodal anatomy, into the same group with the Winteraceae, Tetracentraceae and Cercidiphyllaceae. Shape and number of chromosomes of *P. angolensis* ( $2n=38$ ) also fits into this picture. The present mitotic study of nutmeg seedling's root tips also fits into this clearly. However, Simmond's (1954) and Flach's (1966) report on chromosome number of *M. fragrans* ( $2n=41$  and  $42$  respectively) does not fit into this. The mitotic study of nutmeg root tips convincingly proved that the somatic chromosome number of *M. fragrans* is  $2n=38$ .

### References

- Flach M 1966 Nutmeg cultivation and its sex problem. Mededelingen-vande Landbouwhogeschool 66-1, Wageningen.
- Mangenot S & Managenot G 1957 Nombres chromosomiques nouveaux chez diverses dicotyledons at monocotyledons d' Afrique Occidentale. Bull. Jard. Bot. Brux. 27 : 639-654.
- Simmonds N W 1954 Chromosomal behaviour in some tropical plants. Heredity 8 : 139-146.
- Whitaker T W 1933 Chromosome number and relationship in the magnoliales. J. Am. Arbor. 14 : 376-385.