

Cytological studies on *Piper barberi*- a rare species endemic to Western Ghats

P J MATHEW

Tropical Botanic Garden & Research Institute, Palode,
Trivandrum - 695 562, Kerala - India

P M MATHEW

Environmental Resources Research Centre,
P.B. No. 1230, Trivandrum -695 005, Kerala- India

ABSTRACT

Piper barberi, a rare species of *Piper* from Western Ghats, is having a somatic chromosome number of $2n = 52$. The meiosis is normal, pollen fertility is high.

Key words: *Piper barberi*, chromosome number.

Piper barberi Gamble, is included in the 'Red Data Book' of Indian Plants (Nayar & Shastry 1988). This dioecious species is remarkable by its peculiar morphological features and it can be distinguished from other *Piper* species by its long filiform peduncles (Subramanyam & Henry 1970). The distribution of *Piper barberi* is very restricted, occurring only in a few pockets, in southern parts of Western Ghats.

The present cytological studies were undertaken with a view to present chromosomal data of the species, which is hitherto unreported. It is also aimed at investigating whether or not the low percentage of seed setting observed in the species - one of the probable factors for its rari-

ties is due to infertile pollen produced as a result of meiotic abnormalities.

The male and female plants of the species were collected in June 1989, from the evergreen forests of Cheenikal, located on the foot hills on the north-eastern side of 'Ponmudi' mountains in Trivandrum District of Kerala. The voucher specimens (TRGRI -5698, 5699) were deposited at the Herbarium of the Tropical Botanic Garden & Research Institute (TBGRI). The plants are being grown in the 'Field Gene Bank' for *Piper* species at TBGRI. Mitosis and meiosis were studied from root tips and PMCs respectively. The root tips and young spikes were fixed in 3:1 Carnoy's fluid and chromosome preparations were made by acetocarmine

squash method. The root tips were pre-treated with 0.002M solution of 8-hydroxyquinoline for 3 h at 4°C. Pollen fertility was determined by acetocarmine staining technique.

The root tip cells showed 52 small sized chromosomes, and they range from 1.5-

0.5 μ in length (Fig. 1). Twenty six bivalents were observed in PMCs (Fig. 2). Meiosis was strikingly normal except for the occurrence of two, two-bivalent secondary associations at metaphase-I. A sizable number of pollen grains were fully stained by acetocarmine, and there was good pollen fertility (93%).

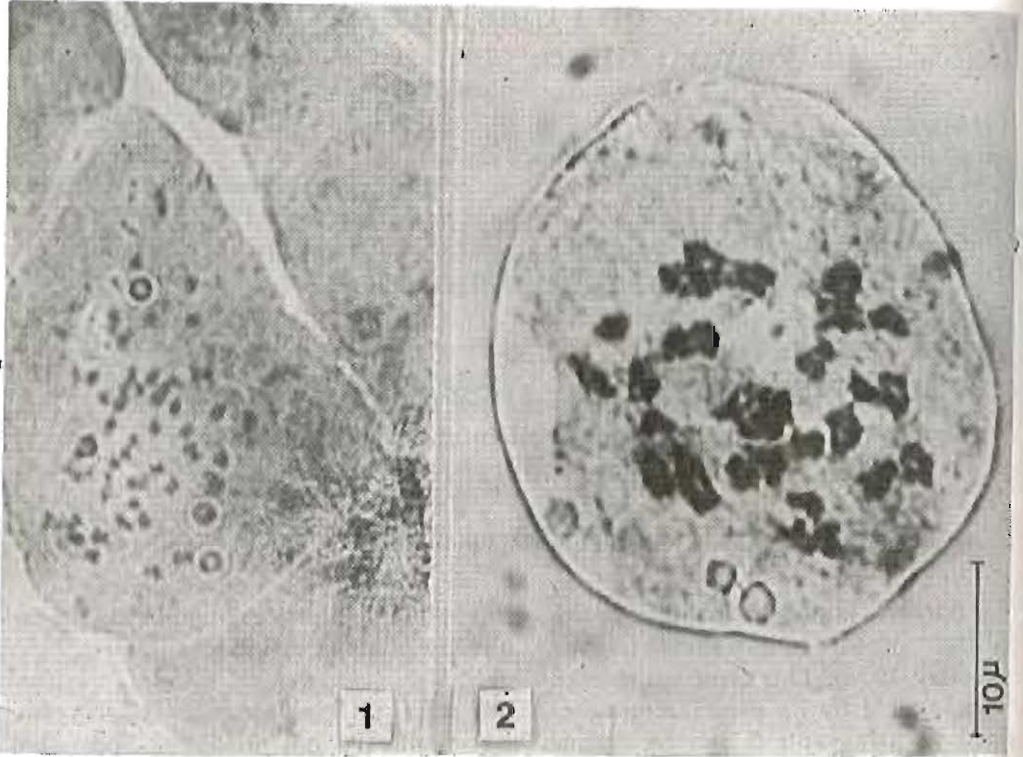


Fig. 1. Root tip cell showing $2n = 52$

Fig. 2. PMC of *Piper barberi* at diakinesis showing 26 bivalents

The $2n = 52$ condition and the size and morphology of the chromosomes of this species show similarity with karyological features of most of the other *Piper* species of Western Ghats. The present chromosome report reconfirms that the basic number of the genus is 13, reported for the first time by one of the authors (Mathew 1958) and supported by later workers (Samuel & Bavappa 1981, Jose 1981, Mathew & Mathew 1982, Samuel

1986, Samuel & Morawetz 1989). The normal meiosis with more number of bivalents except a few secondary associations suggest that this species is probably of allotetraploid origin.

Despite very normal meiosis and good pollen fertility, seed set is very poor in this species. It is found that the hermaphrodite *P. nigrum* is self pollinated and that light rains enhances the effi-

ciency of pollination (Purseglove *et al* 1981). This species being dioecious, may be lacking in effective pollination mechanism and this may be the reason for the low percentage of seed set.

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