



Cytomixis and meiotic abnormalities during microsporogenesis are responsible for male sterility and chromosome variations in *Houttuynia cordata*

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ABSTRACT. *Houttuynia cordata* (Saururaceae) is a leaf vegetable and a medicinal herb throughout much of Asia. Cytomixis and meiotic abnormalities during microsporogenesis were found in two populations of *H. cordata* with different ploidy levels ($2n = 38, 96$). Cytomixis occurred in pollen mother cells during meiosis at high frequencies and with variable degrees of chromatin/chromosome transfer. Meiotic abnormalities, such as chromosome laggards, asymmetric segregation and polyads, also prevailed in pollen mother cells at metaphase of the first division and later stages. They were caused by cytomixis and resulted in very low pollen viability and male sterility. Pollen mother cells from the population with $2n = 38$ showed only simultaneous cytokinesis, but most pollen mother cells from the population with $2n = 96$ showed successive cytokinesis; a minority underwent simultaneous cytokinesis. Cytomixis and irregular meiotic divisions appear to be the origin of

the intraspecific polyploidy in this species, which has large variations in chromosome numbers.

Key words: *Houttuynia cordata*; Cytomixis; Microsporogenesis; Meiosis; Polyploidy