Sexual reproduction development in apomictic

_Eulaliopsis binata_ (Poaceae)

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Received November 5, 2010
Accepted May 23, 2011
Published October 5, 2011
DOI http://dx.doi.org/10.4238/2011.October.5.3

**ABSTRACT.** Apomixis is a particular mode of reproduction that allows progeny formation without meiosis and fertilization. _Eulaliopsis binata_, a tetraploid apomictic species, is widely used for making paper, rope and mats. There is great potential for fixation of heterosis in _E. binata_ due to autonomous endosperm formation in this species. Although most of its embryo sac originates from nucellus cells, termed apospory, we observed sexual reproduction initiation in 86.8 to 96.8% of the ovules, evidenced by callose deposition on the walls of cells undergoing megasporogenesis. However, only 2-3% mature polygonum-type sexual embryo sacs were confirmed by embryological investigation. Callose was not detected on aposporous initial cell walls. The aposporous initial cells differentiated during pre- and post-meiosis of the megaspore mother cell, while the sexual embryo sac degenerated at the megaspore stage. DNA content ratio of embryo and endosperm in some individuals was 2C:3C, based on flow cytometry screening of seed, similar to that of normal sexual seed. These results confirm that apomictic _E. binata_ has conserved sexual reproduction to a certain degree, which may contribute to maintaining genetic diversity. The
The finding of sexual reproduction in apomictic _E. binata_ could be useful for research on genetic mechanism of apomixis in _E. binata_.

**Key words:** Apomixis; Callose; Embryology; Sexual reproduction; Flow cytometry screen seed