



Sexual reproduction development in apomictic *Eulaliopsis binata* (Poaceae)

J.J. Li¹, L. Liu², Y.D. Ouyang¹ and J.L. Yao¹

¹College of Life Science and Technology,
Huazhong Agricultural University, Wuhan, China

²College of Horticulture and Forestry Science,
Huazhong Agricultural University, Wuhan, China

Corresponding author: J.L. Yao
E-mail: yaojlmy@mail.hzau.edu.cn

Genet. Mol. Res. 10 (4): 2326-2339 (2011)

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

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