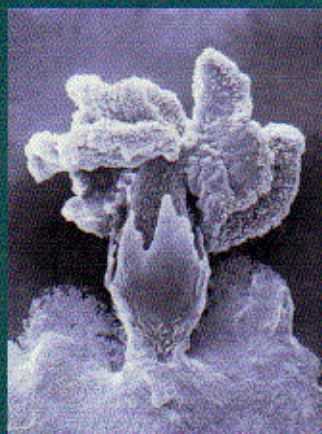




本书是“木本植物有性杂交生殖生物学”系列课题研究成果的总结，从积累的照片中精选了700多幅，组成80个图版。全书共10章，分为3个部分。第一部分为杨树杂交胚胎学，描述了杂交亲本种子发育胚胎学的途径，可作为以后研究的许多重要杂交组合的参考，确认了亲和组合的胚胎学证明，揭示了杂交困难组合的杂交障碍。第二部分探讨了松杉类远缘杂交的有性生殖生物学，包括亲和的*Cunninghamia*与*Cryptomeria*属间杂交和不亲和的*Cunninghamia lanceolata*与*Platycladus orientalis*的科间杂交，用软X射线和分子生物学技术（PCR和RFLP）评价所获杂种的真实性。第三部分将细胞生物学技术引用到树木育种中，如为挽救杂种胚败育的胚珠离体培养技术和为克服受精失败的离体受精（细胞-细胞水平）的准备工作——雌雄活配子分离技术等。

希望本书的出版能够有助于植物胚胎学家和树木育种工作者的工作，本书也可作为植物生物学和林学等相关专业高年级学生的参考书。

About This Book

This book represents a pictorial summary of the findings achieved from research program, "Reproductive Biology of Sexual Hybridization in Woody Plants", at the Chinese Academy of Forestry, Beijing, over the past two decades. Over 700 images were selected from the collections, from which 80 plates were generated. The materials are presented in 10 chapters that are grouped into three topics. The first one (Chapters 1 to 6, Plates 1 to 51) concerned with the hybrid-embryology in *Populus*: providing a documentation of the embryological pathway of seed development in parent plants, which serves as a reference for some important cross combinations that follow, conforming the embryological evidence for compatible cross combinations, and unveiling the barriers to hybridization for difficult cross combinations. The second topic (Chapters 7 and 8, Plates 52 and 53) deals with the sexual reproductive biology of distant hybridization in conifers, including a compatible intergeneric cross between *Cunninghamia* and *Cryptomeria* and an incompatible interfamilial cross between *Cunninghamia lanceolata* and *Platycladus orientalis*, by means of soft X-ray radiography and molecular approaches (PCR and RFLP) for assessing the genuineness of the hybrids obtained. In the last topic (Chapters 9 and 10, plates 54 to 80), cyto-biotechnological methods are introduced for tree breeding, such as *in ovulo* embryo culture for rescuing hybrid embryos from abortion, and isolation of viable male and female gametes towards *in vitro* fertilization at the cell-to-cell level to overcome fertilization failure.

We hope that this work will be helpful to plant embryologists and tree breeders. It may also be considered as a reference book for advanced students of plant biology and forestry.

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生命科学编辑部

联系电话: 010-64012501

<http://www.lifescience.com.cn>

e-mail: spbio@163.net

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