

云南红豆杉传粉生物学研究

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摘要: 云南红豆杉(*Taxus yunnanensis*)是分布于我国西南部及不丹和缅甸北部的红豆杉属植物。用石蜡切片法、电镜扫描和整体透明染色法观察了云南红豆杉成熟小孢子和胚珠的结构,在野外观测了云南红豆杉的花期及传粉滴的活动规律。结果显示:云南红豆杉为单核小孢子,没有气囊,有(无)活力的小孢子水合后都急剧膨胀,胚珠单个生于叶腋。云南红豆杉雄株的散粉期在11月中旬到12月中旬,胚珠下弯期从11月下旬持续到2月中旬。在雄株散粉期内及人工授粉的传粉滴持续存在的时间较短,而且授粉后不再出现,在非散粉期内的传粉滴持续存在的时间较长,而且在消失后又会重新出现。红豆杉属植物可能的传粉机制:(1)传粉滴大而且裸露,持续存在的时间较长,有助于提高传粉效率。(2)小孢子能在常温下较长时间的保持活性,不具备远距离飞行的特征,有利于在一定范围内保持较高的小孢子密度;(3)虽然小孢子散粉期短且易变,但胚珠的成熟期较长,从而保证了花期可遇。传粉期内的降水和低的种群密度可能是影响红豆杉传粉效率的主要因素。

关键词: 云南红豆杉; 小孢子叶球散粉期; 胚珠成熟期; 传粉滴; 传粉机制

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Pollination Biology in *Taxus yunnanensis*

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Abstract: *Taxus yunnanensis*, its distribution extends from Burma through southwest China to Bhutan. The structure of mature ovules and microspores were examined using paraffin embedded samples, SEM and stain-clearing. The pollen drops' activities were observed in the field. The results show that: The mature microspores were uninucleate, non-saccate, with numerous orbicules, and live and dead microspores expanded rapidly after hydration *in vitro*. A single ovule is borne in axil of a leaf. The microspores were shed from mid-November to mid-December, and base-bend ovules are found from late-November to mid-February. The existed duration of pollen drops was shorter in shedding period or with hand-pollination, and the pollen drop didn't reoccur once pollinated. The existed duration of pollen drops was longer after shedding time, and the pollen drops could reoccur after disappeared. The pollination mechanisms in *Taxus* are considered as follows: (1) The pollen drops are big and naked, and its duration is long, these can improve the pollination efficiency. (2) Microspores can keep alive in room temperature a long time, and can't fly in long distance, this is beneficial to keep higher concentration. (3) Long duration of ovules' maturity can meet variable shedding period. Raining in pollination and low population density may be major factors that affect pollination efficiency.

Key words: *Taxus yunnanensis*; Duration of pollen cone shedding; Duration of ovules mature; Pollination drops; Pollination mechanism

云南红豆杉(*Taxus yunnanensis*)是分布于我国西南部及缅甸和不丹北部的红豆杉属植物。因其富含抗癌药物紫杉醇而倍受关注。也正是因为其具有重要的药用价值,使原本濒危的云南红豆杉自然资

源遭到严重破坏,濒危状态日益加剧,其保护地位也不但攀升,分别于1986年、1993年和1999年被列为云南省二级保护植物、林业部二级保护植物和国家一级保护植物。红豆杉科植物起源古老,与罗汉

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