Floral characteristics and reproductive biology of the medicinally significant, dioecious rainforest tree, *Fontainea picrosperma* (Euphorbiaceae)

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**INTRODUCTION**

*Fontainea picrosperma* (Euphorbiaceae), is a dioecious species endemic to the tropical rainforests of northern Australia. *F. picrosperma* is of commercial interest following the recent discovery of the putative anti-cancer agent, EBC-46, in its seed. Production of EBC-46 will rely on purification from harvested fruit. Therefore, an understanding of the reproductive characteristics that determine fruit set of this species is critical.

**OBJECTIVE**

To describe the floral morphology, flowering phenology and reproductive biology of *F. picrosperma*.

**RESULTS**

**Floral morphology**

- *F. picrosperma* had unspecialised planar flowers with a shallow receptacle and white coloured petals (Fig. 1). Male and female inflorescences have paniculate and flat umbel forms, respectively (Fig.3).

- Pollen grains were spheroidal monads (singular) approximately 40um in diameter (Fig. 2).

**Flowering phenology**

- Male inflorescences contained significantly more flowers (25.8 ± 1.5) than female inflorescences (4.9 ± 0.2) (*t*(68) = 19.217, *p* < 0.01).

- Individual male flowers opened for 1 to 2 d (1.6 ± 0.1 d).

- Stigmas were receptive until at least 11 days after opening.

**Controlled pollinations and fruit set**

- Hand pollinating female flowers almost doubled fruit set relative to open pollinated flowers indicating that fruit set was limited by pollen loads under natural conditions.

**CONCLUSION**

- *F. picrosperma* possesses small, white, unspecialised flowers that are often associated with generalist insect pollination and is typical of many dioecious rainforest species.

- Male *F. picrosperma* inflorescences contained more flowers and opened for much longer than female inflorescences to ensure that pollen is available across the entire female flowering period.

- Individual flowers within the male inflorescence opened sequentially and individual flowers senesced 1 to 2 days after opening to encourage pollen movement within the population.

- Female *F. picrosperma* flowers persist for long periods of time when excluded from pollinators which suggests an adaptation to low pollinator activity.

- *F. picrosperma* is pollen limited, which is a ubiquitous feature of species in tropical rainforests where pollination is dependent on the highly unpredictable nature of pollinator abundance and co-flowering species.

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