



## A revision of *Mezoneuron* (Leguminosae: Caesalpinioideae) in New Caledonia, with perspectives on vegetation, geology, and conservation

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### Abstract

*Mezoneuron* is a genus segregated from *Caesalpinia s.l.* There are five species of *Mezoneuron* in New Caledonia, all of which are endemic to this island group. Full descriptions of the species are provided here, together with an identification key, a composite illustration, and distribution maps. Preliminary conservation assessments have been produced using distribution data from herbarium specimens in combination with knowledge of habitats and threats. These reveal a level of threat to each species ranging from Vulnerable to Critically Endangered. Three new combinations are proposed.

**Key words:** Fabaceae, *Mezoneuron*, *Mezoneurum*, ultramaphic

### Introduction

The genus *Mezoneuron* Desfontaines (1818: 245) (orthographic variants *Mezonevron*, *Mezoneurum*: see note below) comprises c. 25–30 species, and has been considered by various authors either to be a subgenus of *Caesalpinia* Linnaeus (1753: 380) (Hattink 1974, Larsen *et al.* 1980, Hou 1996), or a distinct genus (Prain 1892, Lewis *et al.* 2005).

In its broadest sense, the pantropical genus *Caesalpinia* comprises c. 140 spp., and contains 25 generic names in synonymy (Lewis 2005). However, various studies have provided evidence demonstrating that *Caesalpinia s.l.* as thus circumscribed is polyphyletic (e.g. Lewis & Schrire 1995; Simpson *et al.* 2003; Gagnon *et al.* 2013), and Lewis *et al.* in 2005 reinstated eight genera from within *Caesalpinia s.l.*, one of which was *Mezoneuron*. The monophyly of *Mezoneuron* and five other of these genera has been supported in more recent studies, such as that of Gagnon *et al.* (2013).

*Mezoneuron* is distinguished morphologically from *Caesalpinia s.s.*, and from the other genera recently segregated from *Caesalpinia s.l.*, by its laterally compressed, indehiscent fruits, which have a wing along the upper suture. The fruits of *Caesalpinia s.s.*, and the genera segregated from within *Caesalpinia s.l.*, by comparison, vary from being woody and dehiscent in *Caesalpinia s.s.*, and otherwise inflated or laterally compressed, dehiscent or indehiscent, sometimes spiny, but always lacking the sutural wing.

The centre of diversity of *Mezoneuron* is South East Asia, with approximately 15 species distributed from China to Papua New Guinea and into Australia. In addition, there are two species in continental Africa, one endemic in Madagascar, one endemic in Hawaii, and five species endemic to New Caledonia. Fossils of *Mezoneuron* fruits have been found in North America and Europe, from formations of the middle Eocene, c.45 Mya, demonstrating that *Mezoneuron* was distinct from *Caesalpinia* by this time (Herendeen & Dilcher 1991, Herendeen & Crane 1992). There are no extant species of *Mezoneuron* in either of these regions.

The species of *Mezoneuron* are scrambling shrubs or lianas (or in the case of the Hawaiian endemic, *M. kauaiense* Hillebrand (1888: 110), a small tree), with bipinnate leaves, and usually with recurved prickles on the stems and leaf rhachises. The flowers are usually yellow with red markings on the standard petal, or occasionally entirely pink to red (*M. kauaiense*, *M. sumatranum* (Roxburgh) Wight & Arnott ex Miquel (1855: 105) or white (*M. hildebrandtii* Vatke (1882: 338)), varying in size from a few millimetres in length up to c. 3 cm. The fruits range in length from 2 to 20