Mallotus pleiogynus Pax & K.Hoffm. (Euphorbiaceae), a new species record and range extension for Australia from Cape York Peninsula, Queensland

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Summary

Forster, P.I. (2016). *Mallotus pleiogynus* Pax & K.Hoffm. (Euphorbiaceae), a new species record and range extension for Australia from Cape York Peninsula, Queensland. ***Austrobaileya* 9(4): 534–538.** *Mallotus pleiogynus* is confirmed from five locations on Cape York Peninsula, Queensland, and represents a new species record for both Australia and Queensland. Notes for this species are provided in relation to its distribution and habitat, key characters to distinguish it from similar species, and conservation status. The occurrence of *M. pleiogynus* in Australia can be considered as peripheral to the main distribution elsewhere on New Guinea. The importance of peripheral populations for otherwise widespread species is briefly reviewed; however, it is concluded that the Australian populations of this species should be classified as Least Concern.

Key Words: Euphorbiaceae, *Mallotus*, *Mallotus discolor*, *Mallotus nesophilus*, *Mallotus pleiogynus*, Australia flora, Queensland flora, New Guinea flora

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Introduction

The genus *Mallotus* Lour. was last revised for Australia nearly 20 years ago wherein 13 species were recognised as native (Forster 1999). *M. pleiogynus* Pax & K.Hoffm., otherwise previously recorded from the island of New Guinea, is documented here as a new species record and range extension for Queensland and Australia.

In June 1995 and June 1996 botanical exploration, mainly for vascular plants occurring in rainforest communities, was undertaken in the southern McIlwraith Range on Cape York Peninsula, specifically in the area of Station Creek and the access tracks to the abandoned Klondyke ('Klondike' by some collectors) mine. In addition to herbarium collections, some live material of diverse plants were also collected on these occasions and subsequently cultivated.

One such collection of a *Mallotus*, that was encountered in a sterile state at the time, has subsequently been flowered in cultivation (**Figs. 1 & 2**) enabling its identification as *M. pleiogynus*, a moderately to large sized tree that can grow up to 30 m high. This species is superficially similar to both *M. discolor* F.Muell. ex Benth. and *M. nesophilus* Müll. Arg. that are widespread and endemic to Australia (Forster 1999) and a critical examination of holdings of these species at BRI has enabled identification of several other collections of *M. pleiogynus* from Cape York Peninsula. This species is otherwise widespread on the island of New Guinea, both in Indonesia and Papua New Guinea (Kulju *et al*. 2007). Together with *M. chromocarpus* Airy Shaw from New Guinea, these four species form a strongly supported clade, albeit with weaker interspecific relationships, based upon molecular analyses (Kulju *et al*. 2007; Sierra *et al*. 2010; van Welzen *et al*. 2014). The veracity of this clade is supported by the shared morphological features of "stipules absent, anther connectives conspicuously broadened (umbrella-like) and fruits indehiscent" (Kulju *et al*. 2007).

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Fig. 1. ***Mallotus pleiogynus***. Flowering branchlet (*Tucker MCT6037c*, BRI). Photo: G. Leiper.

Fig. 2. ***Mallotus pleiogynus***. Racemes of male flowers (*Tucker MCT6037c*, BRI). Photo: G. Leiper.

Taxonomy

Mallotus pleiogynus Pax & K.Hoffm., *Das Pflanzenr.* IV,147: 187 (1914); *Octospermum pleiogynum* (Pax & K.Hoffm.) Airy Shaw, *Kew Bull.* 19: 312 (1965). **Type:** Papua New Guinea ["Kaiser-Wilhelmsland"]. Augusta Station, *[U.M.] Hollrung 782* (holo: B†; iso: K).

***Illustrations*:** Airy Shaw (1974: t. 3716); Kulju *et al.* (2007: 129).

Refer to Kulju *et al.* (2007) for a comprehensive description (also available online). As yet, the Australian collections are sterile or only have male flowers available.

Additional specimens examined. **Indonesia.** Papua: Andai, SW of Manokwari, Nov 1961, *Koster BW11915* (BRI); Warsamson Valley, E of Sorong, Aug 1961, *Schram BW12446* (BRI). **Papua New Guinea.** East Sepik Province: Near Melawei, Ambunti subdistrict, Jun 1966, *Hoogland 10348 & Craven* (BRI). Milne Bay Province: M.I. road to Mt Suckling, Rabaraba, Jun 1972, *Katik NGF46918* (BRI); Junction Ugat & Mayu Rivers, near Mayu Island, Jun 1972, *Streimann & Katik NGF28607* (BRI). Northern Province: near Budi Barracks, Tufi subdistrict, Aug 1954, *Hoogland 4522* (BRI). West Sepik Province: Aitape, Nov 1944, *McAnalan NGF526* (BRI). **Australia: Queensland.** Cook District: Haggerstone Island, May 1995, *Le Cussan 338* (BRI); 5.5 km WNW of Olive River mouth, 55.6 km NE of Moreton H.S., Bromley Holding, Jun 1994, *Fell DGF4460 & Buck* (BRI); Head of Swamp Creek, Table Range, 11.9 km SW of Lockhart River community, Lockhart River Aboriginal Reserve, Apr 1994, *Fell DGF4290 & Daunt* (BRI); Ex Rocky River Scrub, Silver Plains (cultivated at Cooroy), May 2016, *Tucker MCT14071* (BRI); Ex Klondyke, Station Creek track, McIlwraith Range (cultivated at Cooroy), Dec 2010, *Tucker MCT6037* (BRI); *ibid.*, Dec 2014, *Tucker MCT6037b* (BRI, CNS, MEL); *ibid.*, Mar 2016, *Tucker MCT6037c* (BRI, MEL).

***Distribution and habitat*:** In Australia, *Mallotus pleiogynus* is currently known from five localities on eastern Cape York Peninsula, Queensland. Outside of Australia it is widespread on the island of New Guinea both in Indonesian Papua and Papua New Guinea (Kulju *et al.* 2007). The Australian populations occur in semi-deciduous to evergreen notophyll vineforest on substrates derived from granite, lateritic or metamorphic rocks at altitudes between 20 and 420 m.

***Notes*:** In the identification key to Australian *Mallotus* (Forster 1999), material of *M. pleiogynus* will confound the character choices at couplet 7. By replacing couplet 7 with the following, material of this species can now be keyed out.

7. Lamina with interlateral (3°) veins poorly developed below (± obscured) . . . . **M. discolor**
Lamina with interlateral (3°) veins strongly developed below (clearly visible) **7a**

7a. Lamina with marginal extrafloral nectaries 6–10; stamens 50–60; fruit not longitudinally ribbed . . . . . .**M. nesophilus**
Lamina with marginal extrafloral nectaries 9–20; stamens 15–50; fruit longitudinally ribbed . . . . . **M. pleiogynus**

***Conservation status*:** *Mallotus pleiogynus* joins the group of Euphorbiaceae species that are known in Queensland from a handful of populations but that are otherwise widespread in New Guinea or greater Malesia, namely: *Croton caudatus* Geiseler, *C. choristadenius* K.Schum. (Forster 2003), *Omphalea papuana* Pax & K.Hoffm., *Pimelodendron amboinicum* Hassk. and *Wetria australiensis* P.I.Forst. (Forster 1994; van Welzen 1998). Van Welzen *et al.* (2014) hypothesised that "*Mallotus* disperse well across water barriers as several contemporary species are very widespread". Cooper & Cooper (2004) note for *M. discolor* that "fruit [are] eaten by many bird species".

The isolated occurrences of this tree (and numerous others) in far north Queensland begs a number of questions, namely (1) are the populations relictual from a time when these habitats was more widespread in Australia and contiguous New Guinea (i.e. the land masses comprising the Sahul shelf (Crayn *et al.* 2015)?, or (2) are the populations an example of long range dispersal from other non-Australian parts of the species area of occurrence? It is widely recognised that considerable dispersal of plants occurred in the past when megathermal biomes were more widespread (Morley 2003) and landmasses were joined or much closer to one another

(Hall 2002). Many of these ancient dispersal events are now represented by relictual populations of taxa in small areas of suitable habitat. Given that *M. pleiogynus* is known from at least five localities, some of which are some distance from the sea, it is feasible that the species has been in Australia for some time with subsequent local dispersal.

The ancestral point of origin for *Mallotus* is hypothesised to be Borneo with dispersal to Africa in one direction and through Malesia to Australia in the other (van Welzen *et al.* 2014). These authors also present a dating analysis that places *M. pleiogynus* as putatively 'younger' than both *M. discolor* and *M. nesophilus*, thus supporting the hypothesis that the Australian populations are from subsequent dispersal events, rather than the result of an older lineage dispersal and speciation event as is the case with the other two species. Determination of whether the Australian populations are from single or multiple dispersal events from New Guinea can only be determined with further scientific study using molecular techniques.

Through evolutionary and spatial time, peripheral populations of widespread species have come and gone. They pose conceptual problems for jurisdictions when they occur in different political regions, particularly where conservation of natural systems may be valued in one area and not in others, and where conservation management is restricted to the level of species. Peripheral populations of widespread species are important for conservation if they show evidence of genetic divergence. "Peripheral populations are expected to diverge from central populations as a result of the interwoven effects of isolation, genetic drift, and natural selection….[and] are potentially important sites of future speciation events [disjunct speciation, *cf.* Levin 2000]. Conservation of peripheral populations may be beneficial to the protection of the evolutionary process and the environmental systems that are likely to generate future evolutionary diversity. Distinct traits found in peripheral populations may be crucial to the species, allowing adaptation in the face of environmental change" (Lesica & Allendorf 1995). Genetic differentiation is to be expected in peripheral populations as they are often in habitats that are dissimilar to those where the species is widespread. Conservation of genetically distinct populations also enhances capture of the range of genetic variation within a species (Millar & Libby 1991).

Peripheral populations (within a state or territory political context) of species that are otherwise widespread on the Australian continent are less significant in terms of conservation than those that are predominantly widespread outside of Australian jurisdiction and regulation control. This particularly applies to species that may be recorded as widespread in the Western Pacific or in Malesia (including New Guinea), yet are known from only a handful of populations in Australia and are markedly disjunct from where the species may be common. In this case *Mallotus pleiogynus* is disjunct by at least 350 km from other populations in New Guinea and it is perhaps unlikely that regular genetic exchange with those populations can occur. Hence, the restricted Australian populations of this species have high value for conservation (most are already within the National Park estate), not only in terms of their potential genetic divergence, but because they may represent the only sites where *in situ* conservation can be achieved.

Within the Australian context, *Mallotus pleiogynus* could be classified as **Vulnerable** or **Near Threatened** under a number of the IUCN (2001) criteria sets. To do so would be to ignore the low level of rainforest survey that has been undertaken on Cape York Peninsula, where large tracts of rainforest have never been examined by botanical collectors and in particular documentation of canopy trees is especially deficient. The five known localities for this species on Cape York Peninsula are not closely clustered; the widespread occurrence of these rainforest communities, together with an apparent non-specific substrate affinity, are all indications that the species may be found to be relatively common now that its identification has been resolved. It is also highly likely that

many collectors have dismissed plants of *M. pleiogynus* as being merely the abundant and widespread *M. nesophilus*. Unless clear threatening processes can be demonstrated, a conservation status of **Least Concern** is recommended for the Australian populations of *M. pleiogynus.*

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