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SPECIES OF *PLEISTODONTES* FROM THE AUSTRALIAN CONTINENT (HYMENOPTERA, AGAONIDAE)

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ABSTRACT

Review of the Australian species of *Pleistodontes* Saunders (Hymenoptera Chalcidoidea, Agaonidae: fig insects), with description of new species *Pleistodontes cuneatus* (from *Ficus leucotricha* Miq.) and *P. proximus* (from *F. platypoda* A. Cunn. ex Miq.), both collected in E. Kimberley, W. Australia, and redescription of *P. nigriventris* Girault (from *F. watkinsiana* F. M. Bailey), collected at Sydney.

INTRODUCTION

In his revision of the Australasian Chalcidoidea, Bouček (1988: 190-192) listed seventeen species of *Pleistodontes* Saunders, nine of which (or their host fig) are known from Australia, mainly Queensland. For three, synonymy was suggested with *P. froggatti* or *P. imperialis*, the pollinators of the Moreton Bay fig (*Ficus macrophylla* Desf. ex Pers.) and the Port Jackson fig (*Ficus rubiginosa* Desf. ex Vent.), respectively (for the fig names and classification, see Corner, 1965 and Chew, 1989). This would leave six species for the mainland, one of which needs redescription, viz., *P. nigriventris* (Girault) from *Ficus watkinsiana* F. M. Bailey. New species were collected from the sycones of *Ficus leucotricha* Miq. and Western Australian *F. platypoda* A. Cunn. ex Miq., and are described below. The identity of *P. liszti* Girault remains unknown to me, as does its host. Fig wasps are now known from seven out of the twelve mainland species of fig belonging to three

subseries of the *Ficus*-section *Malvanthera* Corner. By now, the host relations of the Australian species of *Pleistodontes* are as listed in table I, but possible exceptions are mentioned with *P. imperialis*. I do not find the tripartition of the figs reflected in the wasps, but rather a bipartition instead (table I: i and ii). Although the males of group ii are quite distinct, those of group i are all alike: see Wiebes (1963: 308-309) for a description, which is not repeated for the species mentioned in the present paper.

The present samples were collected by Professor J. Galil from Tel-Aviv University, during a trip to Australia in 1978, and by Dr. K. F. Kenneally of the Western Australian Herbarium, Perth, during trips—either by himself or by students—to Kimberley. I thank both for placing the material at my disposal. The material is part of the collection of the Rijksmuseum van Natuurlijke Historie, Leiden, The Netherlands (abbreviated RMNH) and that of the Hawaiian Sugar Planters' Association, Honolulu, Hawaii, USA: the Williams

Table I. The host relations of the Australian species of *Pleistodontes* (*P. greenwoodi*, extra-limital)

<i>Ficus</i>	<i>Pleistodontes</i>	group:
subseries <i>Malvanthereae</i>		
<i>F. watkinsiana</i> F. M. Bailey	<i>nigriventris</i> (Girault)	i
<i>F. macrophylla</i> Desf. ex Pers.	<i>froggatti</i> Mayr	ii
subseries <i>Platypodeae</i>		
<i>F. rubiginosa</i> Desf. ex Vent.	<i>imperialis</i> Saunders	i
<i>F. leucotricha</i> Miq.	<i>cuneatus</i> spec. nov.	i
<i>F. obliqua</i> Forst.f.	<i>greenwoodi</i> (Grandi)	i
<i>F. platypoda</i> A. Cunn. ex Miq.	<i>proximus</i> spec. nov.	i
subseries <i>Hesperidiiformes</i>		
<i>F. pleurocarpa</i> F.v.M.	<i>nitens</i> (Girault)	ii

collection (abbreviated HSPA); duplicates of the larger samples are deposited in the Western Australian Museum, Perth, Australia.

KEY TO THE MAINLAND SPECIES OF *PLEISTODONTES*

1. The female mandibular appendage with ridges or lamellae, not rows of small teeth or crenulations. The female fore tarsus without conical spines. The male genitalia with claspers 2
 - The mandibular appendage with rows of small teeth or crenulations. The first segment of the female fore tarsus with conical spines. The male genitalia without claspers 6
2. The female mandibular appendage with ca. fifteen (full) ridges or lamellae 3
 - The mandibular appendage with ca. twenty-five ridges or lamellae 5
3. The female antennal scape slender (length: width, ca. 2.5); the compound eye half as long as the cheek *P. cuneatus*
 - The antennal scape more robust (length: width, ca. 2); the compound eye two-thirds of the length of the cheek 4
4. The female epistomal edge with a pointed median prominence (as in fig. 12) *P. greenwoodi*

- The median part of the epistomal edge straight (fig. 11) *P. proximus*
- 5. The fourth segment of the female antenna long (length:width, ca. 2.75; fig. 8); the head over 1.75 times as long as wide across the compound eyes (fig. 4) *P. nigriventris*
 - The fourth antennal segment shorter, approximately as long as wide; the length: width ratio of the head about 1.5 (fig. 1) *P. imperialis*
- 6. The female mandibular appendage with ca. forty rows of teeth; the fore tarsus with ca. twenty conical spines. The male head half as high as long; colour yellow-brown *P. froggatti*
 - The mandibular appendage with ca. seventy rows of teeth; the fore tarsus with ca. forty conical spines. The male head as high as long; colour dark brown *P. nitens*

***Pleistodontes nigriventris* (Girault, 1915)**
(figs. 4-6, 8-9)

Material. — 22 ♀ 2 ♂, New South Wales, Sydney, ix.1978, ex *Ficus watkinsiana* F. M. Bailey, leg. J. Galil no. 21, coll. RMNH no. 3699.

Redescription. — Female. Head (fig. 4) over 1.75 times as long as wide across the compound eyes (34:19), the width at the stomal edge three-quarters of that across the eyes (14:19): the head almost rectangular in shape; three ocelli. Longitudinal diameter of the compound eye two-fifths of the length of the cheek. Antenna (fig. 8): the scape expanded, twice as long as wide; the pedicel short; the third segment with its attenuated apex reaching to the base of the fifth; the fourth segment 2.75 times as long as wide, with long apical setae; from the fifth segment onwards, which is almost twice as long as wide, the segments bear about five long sensilla per facies; the three segments of the club are subquadrate. Mandible (fig. 5) with ten ventral ridges, five of which are produced into teeth; the apical tooth has a small auxilliary and both have a gland; the appendage is four times as long as wide and bears almost twenty-five ven-

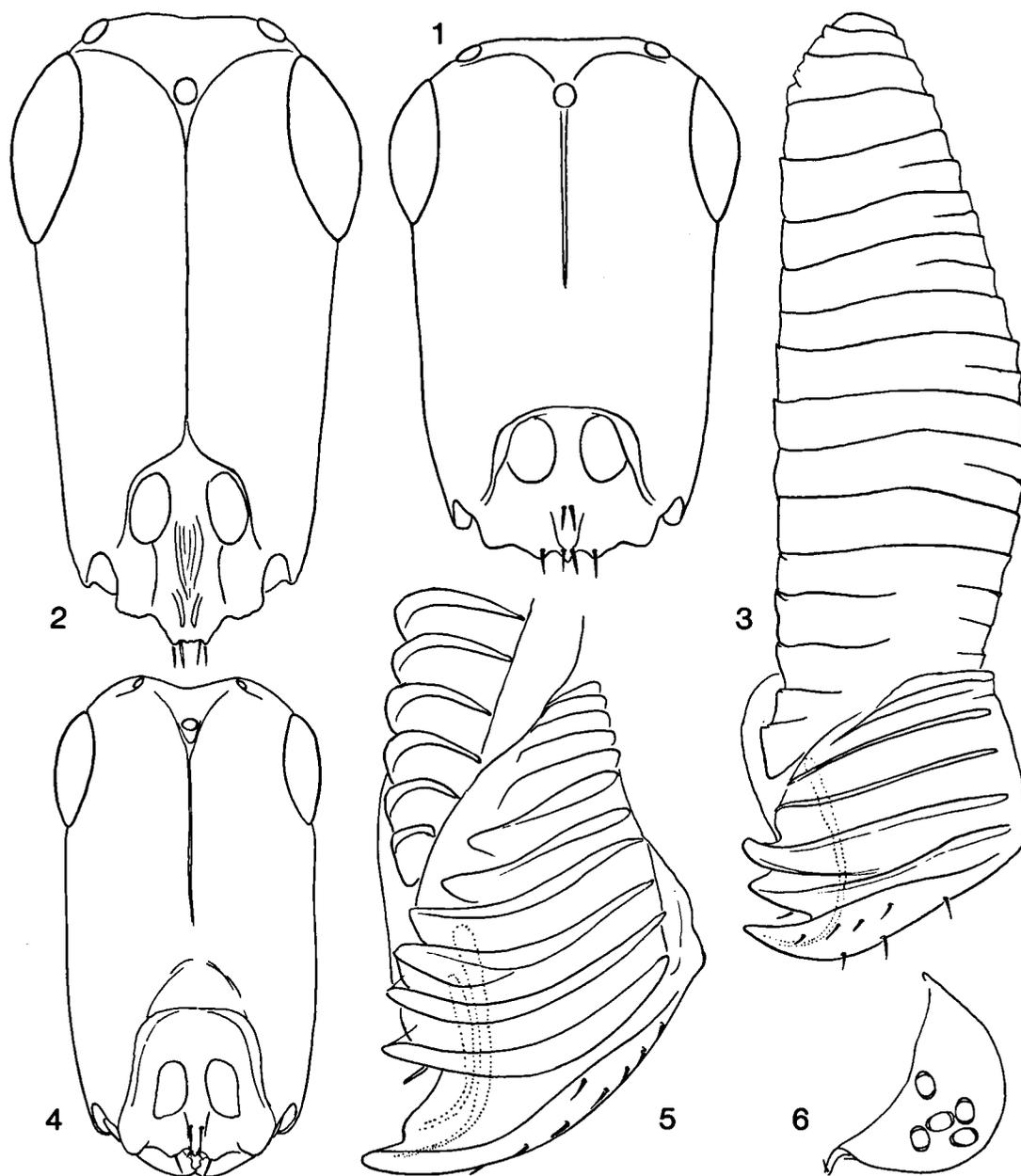


Fig. 1. *Pleistodontes imperialis*, female head. Figs. 2-3. *P. cuneatus*, female: 2, head; 3, mandible and appendage. Figs. 4-6. *P. nigriventris*, female: 4, head; 5, mandible and part of appendage; 6, pollen pocket. Figs. 1, 2, 4, dorsal aspect; 3, 5, 6, ventral aspect. Magnification: 1, 2, 6, $\times 105$; 3, 5, $\times 215$; 4, $\times 65$.

tral lamellae. The labium has apical setae, the maxillae five lateral setae and some smaller more proximally.

Thorax with sternal pollen pockets (fig. 6). Fore wing (7:3) 2.2 mm long, the submarginal, marginal, stigmal and postmarginal veins

approximately in ratio 7:2:2:4, the stigmal vein produced into a beak-like prominence with four sensilla; the disk bears densely set microtrichia. Hind wing (22:5) 1.2 mm long. Fore leg: the coxa with a ventro-apical patch of setae, but no regular corbicula; the tibial armature consists of

two sharp dorso-apical teeth and one ventral; antiaxially, there is a row of long setae, axially there are many stout spines and one long spur; the tarsal segments are approximately in ratio 13:5:4:4:10. Mid leg slender, the femur shorter than the tibia (11:13), which is about as long as the tarsus; the tarsal segments approximately in ratio 11:5:4:3:5. Hind leg with a short tibia, fitting in a groove at the ventral edge of the femur; the tibial armature consisting of two ventral teeth, the axial one simple, the antiaxial one bidentate; the tarsal segments approximately in ratio 14:5:4:3:5.

Gaster. The hypopygium (fig. 9) with a blunt spine and with a single row of setae along either arm of the V. The spiraculum of the eighth urotergite is large, subcircular; the pygostyle long and slender, with four apical and subapical setae.

Total length (head, thorax and gaster) 2.7 mm; the valves of the ovipositor 0.9 mm, i.e., almost as long as the gaster. Colour yellowish, but blackish on: the antennal flagellum, the posterior third of the head, a bell-shaped patch over the pronotum and the anterior half of the scutum, the axillae, the parascutellum, the posterior fifth of the scutellum, the metanotum and most of the propodeum; the gastral tergites, from the second onwards up to the sixth, each bear four black patches.

Note. — The species was recorded from Queensland: Mt. Tambourine, the type-locality, and Lamington National Park (ex *F. watkinsiana*); New South Wales: Tweed, and from Wilson's Peak in Western Australia. The host fig *Ficus watkinsiana* was recorded from New South Wales (Bellinger River) to north Queensland (Corner, 1965: 25).

Pleistodontes imperialis Saunders, 1883
(figs. 1, 12)

New material. — 13 ♀ 2 ♂, New South Wales, Sydney, ix.1978, ex *Ficus rubiginosa* Desf. ex Vent., leg. J. Galil no. 27, coll. RMNH nos. 3695, 3696, 3708.

2 ♀ 1 ♂, Queensland, Brisbane, ix.1978, ex *Ficus obliqua* Forst.f., leg. J. Galil no. 58, coll. RMNH no. 3700.

12 ♀ 4 ♂, Queensland, Brisbane, ix.1978, ex *Ficus platypoda* A. Cunn. ex Miq., leg. J. Galil no. 46, coll. RMNH no. 3702.

Note. — The samples from Brisbane, from *Ficus obliqua* and *F. platypoda*, are morphologically identical to *P. imperialis* from *F. rubiginosa*, as were those earlier recorded from Australian *F. obliqua* (Wiebes, 1963: 308). They do differ in size.

Recorded localities for *P. imperialis* are Sydney, Adelaide, and in Queensland: Buderim (as *Proceratosolens medionigra* Girault, 1933) and Childers, to which now Brisbane is added. It was introduced to Hawaii (Swezey, 1923). *Ficus rubiginosa* is wide-spread along the eastern coast: New South Wales from Eden and Bateman's Bay to the northern rivers (Corner, 1965: 26). It was introduced to New Zealand, where it seeds abundantly (Corner, 1985a: 190). *Ficus platypoda* and especially *F. obliqua* (see also Corner, 1967: 70-71) are even more wide-spread than is *F. rubiginosa*, also outside Australia, and both vary considerably. When the manuscript of this paper already was submitted, I had the opportunity to collect more material in New South Wales and Queensland. I shall have to return to the subject, but for the time being, I keep the host-relations indicated in table 1 (for which I have well-identified material) for normal.

Pleistodontes greenwoodi (Grandi, 1928)

New material (extra-limital). — Series ♀♂, Samoa, Pago Pago, 19-20.ix.1923, ex *Ficus* spec. ("red figs 0.25 inch" and "no. 2"), leg. O. H. Swezey, coll. Williams, HSPA.

Note. — Corner (1985a: 189, 1985b: 153) speculated about the provenance of the pollinators of *Ficus obliqua* in various parts of its range and suggested that it picked up insects opportunely. Although it turned out that the "Blastophaga" of *F. obliqua* in Fiji actually is a

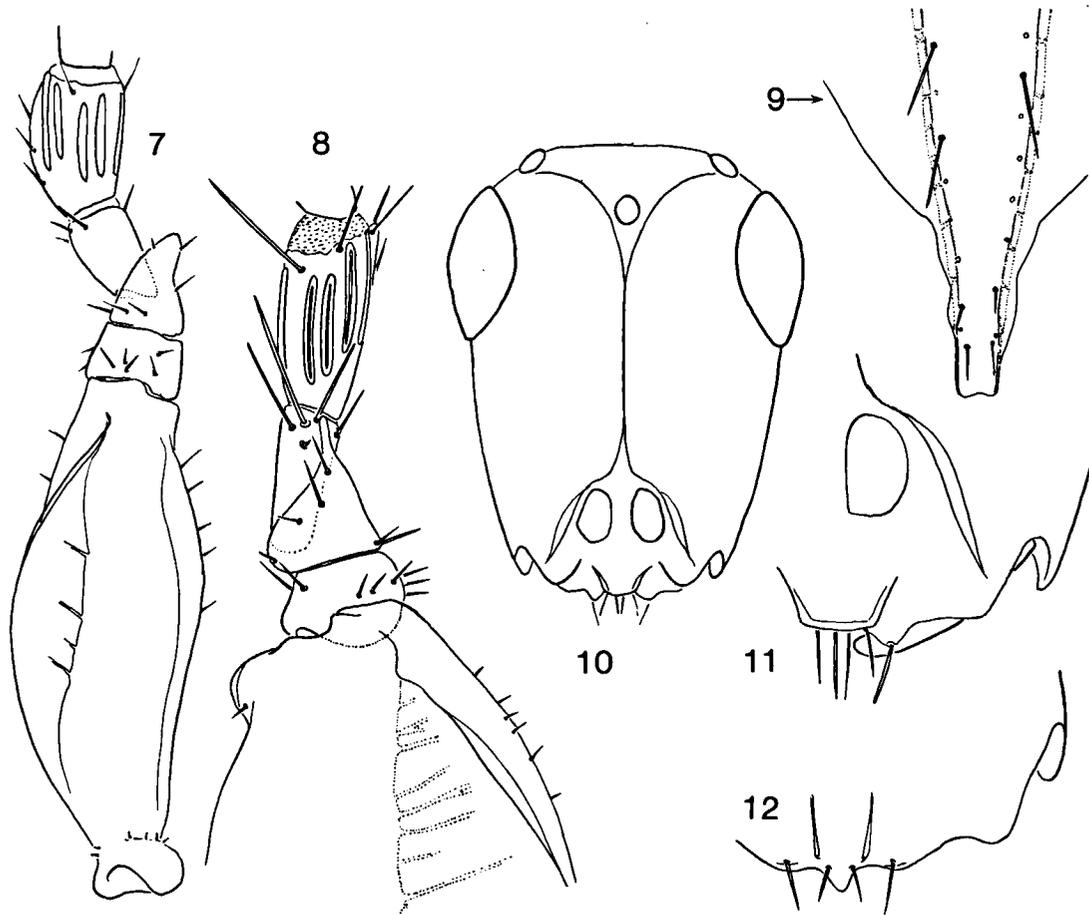


Fig. 7. *Pleistodontes cuneatus*, female scape and second to fifth antennal segments. Figs. 8-9. *P. nigriventris*, female: 8, apex of scape and second to fifth antennal segments; 9, hypopygium. Figs. 10-11. *P. proximus*, female: 10, head; 11, epistomal edge. Fig. 12. *P. imperialis*, female epistomal edge. Figs. 7-8, antiaxial aspect; 9, ventral aspect; 10-12, dorsal aspect. Magnification: 7-9, 11-12, $\times 215$; 10, $\times 105$.

species of *Pleistodontes*, the problem remains: it is different from the pollinator in Australia.

Except by their size, I cannot distinguish the Australian *obliqua*-insects (which differ from *P. greenwoodi*) from *P. imperialis*, the pollinator of *Ficus rubiginosa*.

***Pleistodontes proximus* spec. nov.**
(figs. 10-11)

Material. — 2 ♀ 2 ♂, W. Australia, Kimberley, Hidden Valley, 3.3 km E. Kununurra (15°47'S 128°46'E), 9.viii. 1981, ex *Ficus platypoda* A. Cunn. ex Miq., leg. K. F. Kenneally no. 7690, coll. RMNH no. 4575.

Description (in comparison with *P. imperialis*). — Female. Head (fig. 10) 1.25 times as long as wide across the compound eyes; the width at the stomal edge is ca. 0.6 of the width across the eyes, which are two-thirds of the length of the cheek. Epistomal edge (fig. 11) straight. Mandibular appendage with fifteen ridges. Fore tibia with three dorso-apical teeth, tarsal ratio 10:6:6:6:15; tarsal ratio of the mid leg 19:12:10:10:14, of the hind leg 14:8:7:4:8. Total length (head, thorax and gaster) ca. 1.5 mm (specimens taken out of their galls); the valves of the ovipositor 0.4 mm long, i.e., four-fifths of the length of the gaster.

Note. — The new species is close to *P. imperialis*, but it is distinct by the large compound eyes, the straight epistomal edge, the low number of ridges on the mandibular appendage, and the tridentate fore tibia. *Ficus platypoda* has a number of varieties, but that of the host fig of *P. proximus* was not noted.

Pleistodontes cuneatus spec. nov.
(figs. 2, 3, 7)

Material. — Series ♀♂, W. Australia, Kimberley, Hidden Valley, near Kununurra (15°47'S 128°46"E), 4.xii.1982, ex *Ficus leucotricha* Miq., leg. C. Glover no. 121, coll. RMNH no. 4985 (type-lot); series ♀♂, do., leg.: students K. distr. High School, fig preserved in W. Austr. Herb. KSH1, insects coll. RMNH no. 4660; 20 ♀ series ♂, W. Australia, E. Kimberley, 24 km E. Bungle Bungle Outcamp, 12.vii.1984, ex *Ficus leucotricha* Miq., leg. K. F. Kenneally no. 9276 (W. Austr. Herb. no. 4522/A), coll. RMNH no. 4989.

Description. — Female. Head (fig. 2) more than 1.5 times as long as wide across the compound eyes (21:13), the width at the stomal edge a bit more than 0.6 of the width across the eyes (8:13): the head more or less conical in shape; three ocelli. Longitudinal diameter of the compound eye half as long as the cheek. Epistomal edge rather prominent, but without the lobes characteristic for *P. nigriventris* (fig. 4) and *P. imperialis* (fig. 12). Antenna (fig. 7): the scape rather slender, 2.5 times as long as wide; the pedicel short; the third segment with a blunt apex not reaching to the base of the fifth; the fourth segment 1.5 times as long as wide; from the fifth onwards, the segments bear long sensilla, about four per facies; gradually, the segments diminish in length from the fifth, which is ca. 1.5 times as long as wide, to the three segments of the club, which are transverse. Mandible (fig. 3) with six ventral ridges, three of which are produced into teeth; one gland; the appendage is ca. three times as long as wide, bearing sixteen ventral ridges and

some five vestiges at the antiaxial side. The labium with two apical setae, the maxillae with three laterals.

Thorax with sternal pollen pockets. Fore wing (17:8) 1.3 mm long, as described for *P. nigriventris*, but the marginal, stigmal and postmarginal veins approximately in ratio 4:4:7. Hind wing (9:2) 0.9 mm long. Legs essentially similar to those of *P. nigriventris*, but the coxa with a more distinct corbicula, with a comb of ca. 30 setae; the fore tibia with three dorso-apical teeth; tarsal ratio of the fore leg 8:6:5:4:9, of the mid leg 9:4:4:3:5, of the hind leg 14:6:5:4:6.

Gaster. The hypopygium much as depicted for *P. nigriventris* (fig. 9), but the spine more slender and with less small setae.

Total length (head, thorax and gaster), ca. 2 mm; the valves of the ovipositor 0.7 mm long, i.e., as long as the gaster. Colour brown.

Note. — The new species can at once be recognized by the conical female head, from which it takes its name, by the slender antennal scape, and by the tridentate fore tibia.

Ficus leucotricha was recorded from Western Australia, from the Northern Territory and from New South Wales. Corner (1965: 26) distinguished three varieties, but that of the host fig of *Pleistodontes cuneatus* is not known.

Pleistodontes froggatti Mayr, 1906

Material. — 5 ♀, Queensland, Brisbane, ix.1978, ex *Ficus macrophylla* Desf. ex Pers., leg. J. Galil no. 23, coll. RMNH no. 3694.

Note. — Recorded localities for *P. froggatti* are Sydney, Lord Howe Island (as *P. semiruficeps* Girault, 1929), Brisbane (as *P. nigris* Girault, 1925) and Cairns. It was introduced to Hawaii (Swezey, 1923). *Ficus macrophylla* is known from the eastern coast, from New South Wales (Shoalhaven River) to Queensland (Rockingham Bay), and Lord Howe Island (Corner, 1965: 25).

Pleistodontes nitens (Girault, 1915)

Material. — 1 ♀ 4 ♂, Queensland, Malanda, jungle, 15.vi.1966, ex *Ficus pleurocarpa* F.v.M. (det. Corner), coll. RMNH no. 1018.

Note. — *P. nitens* was described (as *P. regalis* Grandi, 1952) from Atherton (not far from Malanda); *Ficus pleurocarpa* is known from North Queensland (Corner, 1965: 28).

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