Acacia bivenosa group of Wattles on Airlie & Thevenard Islands Pilbara region WA

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BY B. R. MASLIN

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The *Acacia bivenosa* group of Wattles on Airlie and Thevenard Islands, Pilbara region, W.A.

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INTRODUCTION

The purpose of this study was to investigate taxonomic variation within plants referable to the *Acacia bivenosa* group on Airlie and Thevenard islands with a view to clarifying the circumscription and relationships of the taxa. In turn this resolution will help facilitate both surveys and environmental assessments of these two fragile maritime ecosystems.

For the past 20 years some plant specimens of *Acacia* (Wattles) collected on Airlie and Thevenard islands have presented problems of identification. Most of this material had been collected by Mrs Vicki Long (Principal Botanist, Astron Environmental Services) while working as an environmental consultant to Apache Energy Ltd and Cheveron Australia Pty Ltd. An entity that was commonly encountered by Mrs Long was subsequently treated as the Airlie Island variant of *A. bivenosa* by Chapman and Maslin (1992). However, this was a very provisional determination because at that time I had not inspected the plants in the field.

During 2006 I was afforded the opportunity of visiting both Thevenard Island (27-28 July 2006) and Airlie Island (on 21 August 2006) through support provided by Cheveron Australia Pty Ltd and Apache Energy Ltd respectively. I was accompanied on both trips by Mrs Long whose knowledge of the islands and their plants greatly facilitated my work. These trips were undertaken at a time when the plants were in flower.

The text which follows is based on (1) information and specimens gathered during the two above-mentioned island visits, (2) previously-collected specimens housed at the W.A. Herbarium and (3) personal communications from Mrs Long.

CAVEAT

Because of the limited time I had available for this study together with the relative dearth of fruiting (pod) material available for examination, and the complete absence of genetic information for the plants under consideration, the findings and recommendations contained in this Report must be considered preliminary and provisional.

ACACIA BIVENOSA GROUP: GENERAL FEATURES

The *Acacia bivenosa* group is a taxonomically complex assemblage of 12 species that is distributed Australia-wide. A revision of *A. bivenosa* and its allies was published by Chapman and Maslin (1992) who documented that (1) many of the species were extremely variable, (2) the boundaries between some of the species were not well marked and (3) hybridity between some of the species was common.

The Pilbara region is one of the centres of species richness for the *Acacia bivenosa* group with four species (*A. ampliceps, A. bivenosa, A. ligulata* and *A. sclerosperma* subsp. *sclerosperma*) and three hybrids (*A. ampliceps* x *bivenosa*, *A. ampliceps* x *sclerosperma* subsp. *sclerosperma* and *A. bivenosa* x *sclerosperma* subsp. *sclerosperma*) being recorded from the region. As will be discussed below, a number of these species and hybrids occur on Airlie and/or Thevenard islands.

A second centre of species richness for the *A. bivenosa* group is the Shark Bay region to the south of the Pilbara.

ACACIA BIVENOSA GROUP ON AIRLIE AND THEVENARD ISLANDS

Members of the *Acacia bivenosa* group (along with a completely unrelated species, *Acacia coriacea* subsp. *coriacea*) dominate the woody flora of both Airlie and Thevenard Islands. Six taxonomic entities referable the *Acacia bivenosa* are now recognized as occurring on these two islands, namely:

- *Acacia* ? *ampliceps*: Thevenard Island (uncommon).
- *Acacia bivenosa* (typical variant): Airlie Island (uncommon).
- *Acacia bivenosa* (Airlie Island variant): Airlie Island (common) and Thevenard Island (uncommon).
- *Acacia sclerosperma* subsp. *sclerosperma* (typical variant): Airlie & Thevenard Island (uncommon on both).
- *Acacia sclerosperma* subsp. *sclerosperma* (island variant 1): Airlie & Thevenard Island (uncommon on both).
- *Acacia sclerosperma* subsp. *sclerosperma* (island variant 2): Airlie Island (uncommon) & Thevenard Island (common).

A population believed to be *A. ampliceps* occurs on Thevenard Island; however, most of the specimens seen are without flowers and none has pods, therefore, the identification of these individuals still requires confirmation. As has already been noted, *A. ampliceps* has been implicated in hybridity with both *A. bivenosa* and *A. sclerosperma*: one of the characteristics of these hybrids is that the flower heads are a distinctive pale lemon yellow colour (*A. ampliceps* has white heads and the other two species have golden heads). As no plants with pale lemon flower heads are

known to occur on either Airlie or Thevenard islands it is very unlikely that *A. ampliceps* is contributing in any way to the variation in plants of the *A. bivenosa* group from these islands. For this reason, and because of the uncertain determination, *A. ampliceps* is not further considered in this Report.

Relevant information concerning the other five taxonomic entities listed above is presented under **TAXON DETAILS** below.

The two most common members of the *Acacia bivenosa* group on the islands are *Acacia bivenosa* (Airlie Island variant), which is common on Airlie Island (uncommon on Thevenard Island), and *Acacia sclerosperma* subsp. *sclerosperma* (island variant 2), which is scattered but common on Thevenard Island and seemingly uncommon on Airlie Island.

Judging from morphological criteria alone it is suspected that *Acacia bivenosa* (Airlie Island variant) represents a hybrid between *A. bivenosa* and *A. sclerosperma*. Such hybrids occur on the adjacent Pilbara mainland (where they are not especially uncommon) and these specimens are morphologically similar to the island plants. If *Acacia bivenosa* (Airlie Island variant) is indeed a hybrid then its parent plants are not likely to be the same as those for the mainland hybrids, but this is nothing unusual, it is just the nature of most hybrids. The putative parents, *A. bivenosa* and *A. sclerosperma* subsp. *sclerosperma* (typical variant) are today uncommon on the islands and it is hypothesised that they have been replaced in the landscape by the hybrid vigor of *Acacia bivenosa* (Airlie Island variant). A genetic study of populations on the islands and Pilbara mainland would be needed to determine with certainty whether or not *Acacia bivenosa* (Airlie Island variant) is a hybrid. Such a study would be costly.

Acacia sclerosperma subsp. *sclerosperma* (island variant 2) is an unusual taxon that is characterized by an apparent common propensity to root sucker and by its relatively short, thinly textured phyllodes that are finely longitudinally wrinkled when dry. I am not aware of having seen this taxon anywhere other than on Airlie and Thevenard Islands. Root suckering is not reported for any of the mainland occurrences of subsp. *sclerosperma*. This characteristic may well have arisen in response to the harsh maritime environment in which subsp. *sclerosperma* (island variant 2) occurs. However, before considering subsp. *sclerosperma* (island variant 2) as endemic to these islands it would be necessary to survey other Pilbara islands and the mainland coastal areas, especially between Onslow and North West Cape. It is regrettable that only one fruiting sample of subsp. *sclerosperma* (island variant 2) has been seen because this sample suggests that subsp. *sclerosperma* (island variant 2) has (slightly) narrower pods than those of the other two variants of subsp. *sclerosperma*. This pod character may or may not be taxonomically significant: it can only be assessed properly if comprehensive fruiting collections of all three variants of subsp. *sclerosperma* are made. However, Mrs Long informed me that her observations suggest that subsp. *sclerosperma* (island variant 2) is a shy seeded so getting pods from this taxonomic entity is likely to be problematic.

Low seed production is commonly encountered in plants that have a propensity to reproduce by root suckers.

A genetic study of subsp. *sclerosperma* (island variant 2) may be helpful in determining the status this entity; in particular, it may help resolve its relationship to subsp. *sclerosperma* (typical variant) and subsp. *sclerosperma* (island variant 1). Indeed, the possibility that *Acacia sclerosperma* subsp. *sclerosperma* (island variants 1& 2) represent some sort of F2 backcross involving subsp. *sclerosperma* (typical variant) and *A. bivenosa* (Airlie Island variant) cannot be discounted: such a hypothesis could only be effectively tested with the use of genetic techniques.

However, genetic studies are very costly and it is suggested that in the first instance at least it would be preferable to try and collect more pod material from the three taxa of subsp. *sclerosperma* to see if carpological characters can lead to a better understanding of them and their relationships.

The phyllode textual characters of *Acacia sclerosperma* subsp. *sclerosperma* (island variant 1) suggest that this entity is most closely related to subsp. *sclerosperma* (island variant 2). Indeed, it is possible that these two entities represent slight variations of the same taxon. Subsp. *sclerosperma* (island variant 1) is apparently not very common on either Airlie or Thevenard islands.

One of the surprising things to arise from this island study was the amount and nature of variation observed in plants that are referable to *A. sclerosperma*. However, although some emphasis has been placed here on phyllode texture to distinguish the three variants of subsp. *sclerosperma*, it is possible that this character varies with environmental conditions, season of collection, or the age of the phyllodes. To check this character more thoroughly it would be necessary to make collections at times of the year other than during the flowering period (which is around July to September) and to take particular note of the oldest phyllodes that are found low down the stems.

Further study of the three variants of subsp. *sclerosperma* may well be taxonomically rewarding. The basic questions that need answering are: (1) are there significant taxonomic differences between the three variants of *A. sclerosperma* (focus should be on phyllode size and texture, and pod width), (2) does subsp. *sclerosperma* (island variant 1 and/or 2) occur elsewhere other than on Airlie and Thevenard islands and (3) is there a relationship between subsp. *sclerosperma* (island variants 1 & 2) and *A. bivenosa* (Airlie Island variant).

SUMMARY

1. Six taxa referable to the *Acacia bivenosa* group are present on Airlie and Thevenard Islands, namely:

- *Acacia* ? *ampliceps*: Thevenard Island (uncommon).
- *Acacia bivenosa* (typical variant): Airlie Island (uncommon).
- *Acacia bivenosa* (Airlie Island variant): Airlie Island (common) & Thevenard Island (uncommon).
- *Acacia sclerosperma* subsp. *sclerosperma* (typical variant): Airlie & Thevenard Island (uncommon on both).
- *Acacia sclerosperma* subsp. *sclerosperma* (island variant 1): Airlie & Thevenard Island (uncommon on both).
- *Acacia sclerosperma* subsp. *sclerosperma* (island variant 2): Airlie Island (uncommon) & Thevenard Island (common).

2. The two most common taxa on the islands are *Acacia bivenosa* (Airlie Island variant) and *Acacia sclerosperma* subsp. *sclerosperma* (island variant 2). It appears that these two entities are spreading on the islands at the expense of the typical variants of *A. bivenosa* and A. *sclerosperma* subsp. *sclerosperma.*

3. *Acacia bivenosa* (Airlie Island variant) is probably a hybrid between *A. bivenosa* and *A. sclerosperma.* Genetic studies would be needed to if this matter is to be further investigated.

4. *Acacia sclerosperma* subsp. *sclerosperma* (island variant 2) is an unusual taxon and may possibly be endemic to the islands (it is not known from the mainland). Before any informed judgement can be made on the conservation value of this variant it would be necessary to undertake further study to better understand its taxonomic status and relationships (i.e. is it just an environmentally modified form of typical subsp. *sclerosperma* or are the observed differences genetically fixed and taxonomically significant).

5. The possibility exists that *Acacia sclerosperma* subsp. *sclerosperma* (island variants 1& 2) represent some sort of F2 backcross involving subsp. *sclerosperma* (typical variant) and *A. bivenosa* (Airlie Island variant).

6. To assess the taxonomic status and relationships between the three variants of subsp. *sclerosperma* the first, and most cost-effective, approach should be a morphological analysis of mature pods; studies of the nature of variation in phyllode textual differences between these three taxa would also be instructive.

7. The morphological studies noted under #6 would form the necessary foundation for follow-up genetic work which will quite possibly be needed to gain a resolution of the taxa currently referred to subsp. *sclerosperma*.

8. The island populations of the *A. bivenosa* group represent a most interesting (and geographically isolated) example of genetic variation within and between taxa that are known to hybridize on the mainland. The taxonomic complexities are such that morphology alone is unlikely to resolve the issues of taxon relationships, therefore genetic studies would most likely be necessary. However, genetic studies are expensive to undertake. A morpho-genetic study of these island plants would make an excellent student project.

9. From a conservation point of view *Acacia sclerosperma* subsp. *sclerosperma* (island variants 1& 2) appear to be the most important entities of the *Acacia bivenosa* group on Airlie and Thevenard islands. However, in the absence of clear knowledge concerning their taxonomic status it is difficult to say just how important they may be.

TAXON DETAILS

***Acacia bivenosa* (typical variant):** see Figures 1 & 2 in Appendix 2.

Typical *A. bivenosa* has been collected from Airlie Island where it is seemingly uncommon; only one plant was seen during my August 2006 trip; this species is not known to occur on Thevenard Island. *Acacia bivenosa* is common on the adjacent mainland where it extends from North West Cape to the Pilbara in Western Australia, then east into Northern Territory and Queensland.

Salient features: sprawling dense shrubs about 1.3 m tall and 3 m wide, suckering not recorded (and likely to be absent); phyllodes 5.5–7 cm long and 20–25 mm wide with l: w = 3 on plant from Airlie Island (see Table 1 for phyllode dimensions taken from range of specimens from adjacent Pilbara mainland), longitudinal nerves 2 (and +/- of equal prominence); inflorescences a mixture of racemes and simple axillary heads; pods unknown from the islands but are recorded as 5–8 (–9) mm from mainland plants.

Specimen seen: See Appendix 1.

***Acacia bivenosa* (Airlie Island variant):** see Figures 3 to 11 in Appendix 2.

This entity is common on Airlie Island but uncommon on Thevenard Island; it was first noted in literature as being something odd in Chapman and Maslin (1992: 258). *Acacia bivenosa* (Airlie Island variant) is very variable in its phyllode shape, size and nerve number (see below). There is a tendency for specimens attributed to this taxon to fall into two groups, one with slightly broader phyllodes than the other. Plants having narrower phyllodes occur on Airlie Island (e.g. *V. Long* 149 – see Figure 8, and *B.R.*

Maslin 8900 – see Figures 6 & 7) whereas plants with wider phyllodes occur on both Airlie Island (e.g. *B.R. Maslin* 8809 – see Figure 9) and Thevenard Island (e.g. *V. Long* VL 477 – see Figure 11, and *B.R. Maslin* 8814 – see Figure 10). However, there is a considerable overlap in phyllode width parameters between the two groups and it is unlikely that there is any taxonomic significance in this trend.

I tentatively suggest that *Acacia bivenosa* (Airlie Island variant) most probably represents a hybrid between *A. bivenosa* and *A. sclerosperma* but is distinguished from both by its phyllode proportions (see Table 1 below). In pod width *Acacia bivenosa* (Airlie Island variant) is also probably +/- intermediate between the two putative parents (however, as noted above, pods from island plants of *A. bivenosa* are unknown) but its inflorescences and phyllode nervature is pretty typical of the range of variation seen in *A. bivenosa*. This entity seems not to sucker or if it does then suckering appears to be rare (it is mentioned as a possibility on just two specimens, namely, *B.R. Maslin* 8814 – see Figure 10, and *B.R. Maslin* 8896 – see Figure 4). There are plants from the mainland that look very similar to *Acacia bivenosa* (Airlie Island variant) which are regarded, based on morphological feature and field observations, as *A. bivenosa* x *sclerosperma* hybrids. There is no record of these mainland putative hybrids suckering.

Salient features: Dense, spreading, +/- rounded shrubs (0.5) 1–2.5 m tall and 2–5 (–10) m across, normally with the crown extending to ground level, suckering absent or rare; phyllodes: 4–9 cm long, (4–) 5–11 (–14) mm wide, l: w = (3–) 4–12, either wholly 1-nerved (not common) or more normally a mixture of both 1- and 2-nerved (with the second nerve not as well-developed as the midrib, and commonly present only on broadest phyllodes); inflorescences normally a mixture of simple, axillary heads and racemes (typical of *A. bivenosa*); pods (7–) 8–9 (–10) mm wide.

Specimens seen: See Appendix 1.

Acacia sclerosperma* subsp. *sclerosperma

Specimens attributed to subsp. *sclerosperma* are characterized by relatively long, narrow, 1-nerved phyllodes and golden, round flower heads. Three entities are recognized within this subspecies on Airlie and Thevenard islands but the differences separating them are not great. Nevertheless, using mainly phyllode dimensions and texture, and peduncle length, the following three entities are recognized: subsp. *sclerosperma* (typical variant), subsp. *sclerosperma* (island variant 1), subsp. *sclerosperma* (island variant 2). Based on phyllode texture the island variants 1 and 2 are more closely related to one another than either is to the typical variant of subsp. *sclerosperma*.

Some plants of *A. sclerosperma* on these islands display characters that are rare or absent from plants of this species on the mainland; the most

significant of these are: a propensity to root sucker (suckering has never been recorded in subsp. *sclerosperma* on the mainland), and inflorescence racemes usually grow out at the apex into a leafy shoot which has simple (not racemose) inflorescences within the axils of the developing phyllodes (this inflorescence character is rarely found on plants of subsp. *sclerosperma* on the mainland where the racemes normally do not grow out with simple inflorescences; the character, however, is commonly found in plants of *A. bivenosa*).

The following notes refer to the three variants of *A. sclerosperma* that have been recognized as occurring on Airlie and Thevenard Islands.

***Acacia sclerosperma* subsp. *sclerosperma* (typical variant):** see Figures 12 & 13 in Appendix 2.

Typical *A. sclerosperma* subsp. *sclerosperma* has been collected both from Airlie Island and Thevenard Island but it is seemingly uncommon on both islands; there are no pod collections of this subspecies from either island (subsp. *sclerosperma* pods are typically large, being at least 10 mm wide). *Acacia sclerosperma* subsp. *sclerosperma* (typical variant) is common on the mainland in the Pilbara, Ashburton and Murchison districts.

Salient features: rounded dense shrubs about 1 m tall, suckering propensity of the island plants is unknown; phyllodes narrowly linear, 7–9 cm long (a few phyllodes only 5 cm long), 1.5–2 mm wide, l: w = 30–50, thick and fleshy, drying smooth or sparingly coarsely wrinkled; peduncles c. 15 mm long; pods unknown (but on the mainland the pods of this variant are normally at least 10 mm wide).

Specimens seen: See Appendix 1.

***Acacia sclerosperma* subsp. *sclerosperma* (island variant 1):** see Figures 14 & 15 in Appendix 2.

Acacia sclerosperma subsp. *sclerosperma* (island variant 1) has been collected both from Airlie Island and Thevenard Island but it is seemingly uncommon on both islands. It is not known with certainty whether or not this variant occurs on the mainland.

Salient features: sprawling, rounded, dense shrubs 0.5–2.5 m tall and 1–4 m across, sometimes (?often) root suckering with the ramets remaining close to the parent plant so that a large, localized clump of individuals results; phyllodes narrowly linear, 6–9 (–11) cm long, 3–5 (–7) mm wide, l: w = (8–) 15–30 (–40), sub-fleshy and smooth when fresh, thin-textured and finely longitudinally wrinkled when dry; peduncles (8–) 15–25 (–30) mm long; pods 10 mm wide.

Comparison: This variant is closely allied to subsp. *sclerosperma* (island variant 2) which differs primarily in having slightly shorter phyllodes; there

may possibly also be pod differences (see discussion below under island variant 2). Subspecies *sclerosperma* (island variant 1) differs from subsp. *sclerosperma* (typical variant) in having generally slightly wider phyllodes that are more thinly textured and which are finely longitudinally wrinkled when dry; also, its peduncles are often longer.

Specimens seen: See Appendix 1.

***Acacia sclerosperma* subsp. *sclerosperma* (island variant 2):** see Figures 16 to & 23 in Appendix 2.

This variant is scattered by fairly common on Thevenard Island but seemingly rare on Airlie Island.

Salient features: dense and rounded or erect shrubs (0.3–) 0.5–1.5 (–2) m tall and 1–4 m across, the largest plants occur in disturbed, open sites, seemingly commonly root suckering; phyllodes narrowly linear, 4–7 cm long, 2–4 mm wide, l: w = (9–) 15=30, thin-textured, finely longitudinally wrinkled when dry; peduncles 10–15 (–20) mm long; pods (slightly immature) 6–8 mm wide.

Comparison: This variant is distinguished the other two variants of subsp. *sclerosperma* by its generally slightly shorter phyllodes and perhaps by its narrower pods (see discussion below). It is further distinguished from subsp. *sclerosperma* (typical variant) in having more thinly textured phyllodes that are finely wrinkled when dry. There is only a single fruiting collection of this variant known (*B.R. Maslin* 8904 – see Figures 19 & 21) and although the pods are slightly immature it is probable that they will not exceed 8 mm wide when mature. If this is the case then pod width may possibly be a 'good' character to separate this variant from the other two variants of subsp. *sclerosperma* on Airlie and Thevenard islands. It is therefore regrettable that subsp. *sclerosperma* (island variant 2) is apparently a very shy seeder (V. Long *pers. comm.*).

Specimens seen: See Appendix 1.

REFERENCE

Chapman, A.R. and Maslin, B.R. (1992). *Acacia* Miscellany 5. A review of the A. *bivenosa* group (Leguminosae: Mimosoideae: Section Phyllodineae). *Nuytsia* 8(2): 249–283.

Taxon	Suckering	Phyllodes			
		Length (cm)	Width (mm)	L: W	Number of nerves
Ac. bivenosa (typical variant)*	Unknown (but probably Absent)	5.5–7 [2–5.5 (–7)]	20–25 [6–20 (–27)]	3 [2–5 (–7)]	2 (rarely 1)
Ac. bivenosa (Airlie Is. variant)	Absent (possibly rarely Present)	4–9	(4–) 5–11 (–14)	(3–) 4–12	1 or 1 + 2
Ac. sclerosperma subsp. *sclerosperma* (typical)	Unknown (but probably Absent)	(5–) 7–9	1.5–2	30–50	1
Ac. sclerosperma subsp. *sclerosperma* (island variant 1)	Sometimes (?often) Present	6–9 (–11)	3–5 (–7)	(8–) 15–30 (–40)	1
Ac. sclerosperma subsp. *sclerosperma* (island variant 2)	Commonly Present	4–7	2–4	(9–) 15–30	1

Table 1. *Acacia* taxa of the *A. bivenosa* group (excluding *A. ampliceps*) found on Airlie and Thevernard Islands showing suckering propensity and phyllode proportions & nerve number. (See Appendix 1 below for list of specimens examined.)

*Because *A. bivenosa* is known from only a single collection (from Airlie Island) the range of phyllode dimensions for this species from the Pilbara mainland are given in square brackets below the island plant dimensions.

Appendix 1. List of specimens of the *A. bivenosa* group from Airlie and Thevenard Island examined for this assessment; arranged by taxon name. Scans of a representative sample of each taxon (marked with an * on list below) are presented in Appendix 2.

Acacia bivenosa (typical variant). Airlie Island: near middle of island, 21° 19' 22.2"S, 115° 09' 57"E, 21 August 2006, *B.R. Maslin* 8898*.

Acacia bivenosa (Airlie Island variant). Airlie Island: no specific plain language location given, 21° 20'S, 115° 10'E, 23 June 1987, *V. Long* A; no specific plain language location given, 21° 20'S, 115° 10'E, *V Long* B; no specific plain language location given, 21° 20'S, 115° 10'E, *V Long* C; no specific plain language location given, 21° 20'S, 115° 10'E, 23 June 1987, *V. Long* D; 100 m NW of tower toward middle of island, 21° 20'S, 115° 10'E, 15 June 1987, *V. Long* VL 149*; southeast end, 21° 20'S, 115° 01'E, 20 July 1987, *V. Long* VL 162; south side 150 m SW from tower (on foredune), 21° 20'S, 115° 10'E, 20 July 1987, *V. Long* VL 163; south side foredune 150 m SW from tower, 21° 20'S, 115° 10'E, 20 July 1987, *V. Long* VL 164; middle island 125 m west of tower on EW track, 21° 21'S, 115° 10'E, 20 July 1987, *V. Long* VL 165; N end of island c. 100 m N of Oil storage tanks, 21° 19' 20.2"S, 115° 10' 02.3"E, 21 August 2006, *B.R. Maslin* 8894; N end of island c. 100 m N of Oil storage tanks, 21° 19' 19.3"S, 115° 10' 02.7"E, 21 August 2006, *B.R. Maslin* 8895; shallow depression in middle of island, 21° 19' 22"S, 115° 9' 58.8"E, *B.R. Maslin* 8896; near middle of island, 21° 19' 22.2"S, 115° 9' 57"E, 21 August 2006, *B.R. Maslin* 8897 (possibly wrongly attributed to this taxon); near centre of island, 21° 19' 22.9"S, 115° 9' 57.2", 21 August 2006, *B.R. Maslin* 8900*; near centre of island, 21° 19' 23.8"S, 115° 9' 59.2"E, 21 August 2006, *B.R. Maslin* 8901; near centre of island, 21° 19' 23.5"S, 115° 10' 0.9"E, 21 August 2006, *B.R. Maslin* 8902. Thevenard Island: northern edge of barge set-down area on WAPET boundary (S of airstrip), no lats and longs, 27 October 1995, *M. Blackwell s.n.*; solitary bush on hinddunes 75 m NW of barge landing at intersection of tracks to laydown area, 21° 28'S, 115° 01'E, 30 August 1988, *V. Long* VL 299; no specific plain language location given or lat and long details, *V. Long* VL 477*; about 0.5 km W of tourist resort at eastern end of island, 21° 27' 44"S, 115°1' 09.6"E, 27 July 2006, *B.R. Maslin* 8805; northern side around middle of airstrip at eastern end of island, 21° 27' 30.2"S, 115° 01' 0.900"E, 27 August 2006, *B.R. Maslin* 8809*; about 0.5 km W of tourist resort at eastern end of island, 21° 27' 44"S, 115° 1' 9.6"E, 28 August 2006, *B.R. Maslin* 8814*; near Yamamderry pipeline at eastern end of Island, 21° 28'S, 115° 01'E, 2 June 1991, *M White* MRW 062.

Acacia sclerosperma subsp. sclerosperma (typical variant). Airlie Island: adjacent to office building at N end of island, 21° 19' 25.3"S, 115° 10' 03.1"E, 21 August 2006, *B.R. Maslin* 8906* (sterile but seems to be typical subsp. *sclerosperma*). Thevenard Island: 300 m W of windsock, 10 m S of airstrip, 21° 28'S, 115° 01'E, 23 June 1988, *V. Long* VL257* (in flower); 21° 27' 32.9"S, 115° 01' 51.2"E, 23 June 2000, *V. Long* VL335 04 (in flower).

Acacia sclerosperma subsp. sclerosperma (island variant 1). Airlie Island: northern end of island about 100 m N of the Oil storage tanks, 21° 19' 20.2"S, 115° 10' 02.3"E, 21 August 2006, *B.R. Maslin* 8893; N end of island ca 100 m N of oil storage tanks, 21° 19' 20.2"S, 115° 10' 2.3"E, 21 August 2006, *B.R. Maslin* 8893A; near centre of island, 21° 19' 22.8"S, 115° 09' 56.6"E, 21 August 2006, *B.R. Maslin* 8899; adjacent to office building at N end of island, 21° 19' 25.3"S, 115° 10' 03.1"E, 21 August 2006, *B.R. Maslin* 8905. Thevenard Island: eastern end of the island near Chevron Oil camp and plant, 21° 27' 28.0"S, 115° 01' 24.3"E, 28 July 2006, *B.R. Maslin* 8813*.

Acacia sclerosperma subsp. sclerosperma (island variant 2). Airlie Island: near centre of island, 21° 19' 23.5"S, 115° 10' 00.9"E, 21 August 2006, *B.R. Maslin* 8903*; near centre of island, 21° 19' 23.5"S, 115° 10' 00.9"E, 21 August 2006, *B.R. Maslin* 8904*. Thevenard Island: 21° 27' 33.8"S, 115° 05' 51.4", 23 June 2000, *V. Long* VL 335 03; E about 0.5 km W of tourist resort at eastern end of island, 21° 27' 44.0"S, 115° 01' 09.6"E, 21 August 2006, *B.R. Maslin* 8806; W side of oil storage tanks at E end of island, 21° 27' 22.7"S, 115° 01' 06.6"E, 21 August 2006, *B.R. Maslin* 8807*; western end of airstrip at eastern end of island, 21° 27' 29.4"S, 115° 00' 40.1"E, 21 August 2006, *B.R. Maslin* 8810; around middle of island, 21° 27' 21.2"S, 115° 59' 50.3"E, 21 August 2006, *B.R. Maslin* 8811*.

Appendix 2. Photographs of taxa and scans of selected herbarium sheets of members of the *Acacia bivenosa* group from Airlie and Thevenard Islands.

Acacia bivenosa (typical variant)

Figure 1. Scan of W.A. Herbarium sheet *B.R. Maslin* 8898 (Airlie Island).

Acacia bivenosa (typical variant)

Figure 2. Branch system showing broad, 2-nerved phyllodes and long peduncles. Photographed by B.R. Maslin on Airlie Island, 20 August 2006 (B.R. Maslin 8898).

Acacia bivenosa (Airlie Island variant)

Figure 3. Habit showing dense, sprawling growth form in exposed site. Photographed by B.R. Maslin on Thevenard Island, 27 July 2006 (B.R. Maslin 8805).

Acacia bivenosa (Airlie Island variant)

Figure 4. Habit showing rounded growth form in dense scrub. Photographed by B.R. Maslin on Airlie Island, 21 August 2006 (B.R. Maslin 8896).

Acacia bivenosa (Airlie Island variant)

Figure 5. Flowering branch with immature pods and phyllodes imperfectly 2-nerved. Compare phyllode width with those shown in Figure 6. Photographed by B.R. Maslin on Airlie Island, 21 August 2006 (*B.R. Maslin* 8896).

Acacia bivenosa (Airlie Island variant)

Figure 6. Flowering branch with near-mature pods and phyllodes 1-nerved and imperfectly 2-nerved. Compare phyllode width with those shown in Figure 5. Photographed by B.R. Maslin on Airlie Island, 21 August 2006 (*B.R. Maslin* 8900).

Acacia bivenosa (Airlie Island variant)

Figure 7. Scan of W.A. Herbarium sheet *B.R. Maslin* 8900 (Airlie Island).

Acacia bivenosa (Airlie Island variant)

Figure 8. Scan of W.A. Herbarium sheet *V. Long* 149 (Airlie Island).

Acacia bivenosa (Airlie Island variant)

Figure 9. Scan of W.A. Herbarium sheet *B.R. Maslin* 8809 (Thevenard Island).

Acacia bivenosa (Airlie Island variant)

Figure 10. Scan of W.A. Herbarium sheet *B.R. Maslin* 8814 (Thevenard Island).

Acacia bivenosa (Airlie Island variant)

Figure 11. Scan of W.A. Herbarium sheet *V. Long* 477 (Thevenard Island).

Acacia sclerosperma subsp. sclerosperma (typical variant)

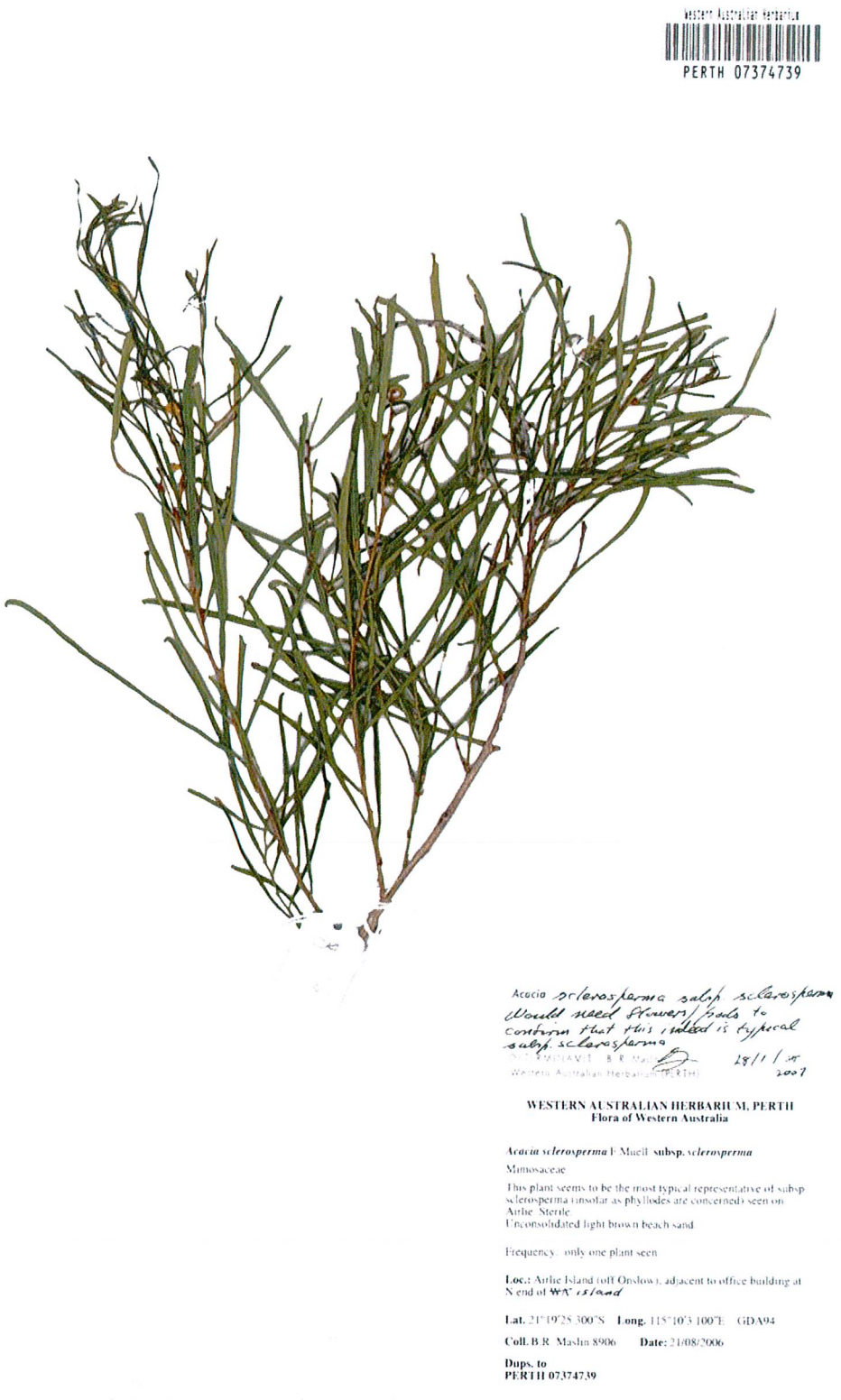

Figure 12. Scan of W.A. Herbarium sheet *B.R. Maslin* 8906 (Airlie Island).

Acacia sclerosperma subsp. sclerosperma (typical variant)

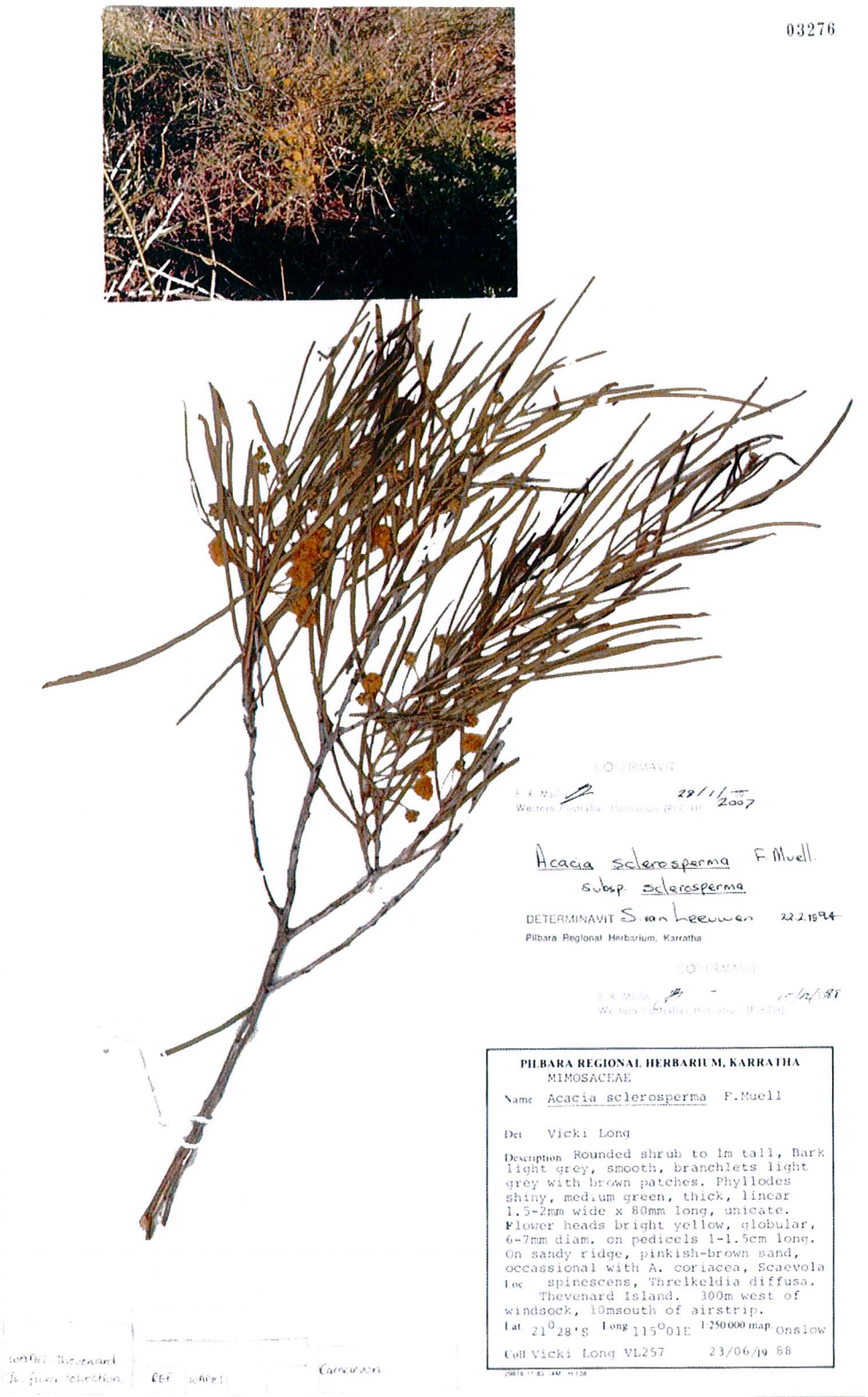

Figure 13. Scan of W.A. Herbarium sheet *V. Long* 257 (Thevenard Island).

Acacia sclerosperma subsp. sclerosperma (island variant 1)

Figure 14. Habit showing dense, sprawling growth form in exposed site. Photographed by B.R. Maslin on Thevenard Island, 28 July 2006 (*B.R. Maslin* 8813).

Acacia sclerosperma subsp. sclerosperma (island variant 1)

Figure 15. Scan of W.A. Herbarium sheet *B.R. Maslin* 8813 (Thevenard Island).

Acacia sclerosperma subsp. sclerosperma (island variant 2)

Figure 16. Habit showing dense, rounded growth form in exposed site (plants smaller when in dense scrub: see Figure 17). Photographed by B.R. Maslin on Thevenard Island, 27 July 2006 (*B.R. Maslin* 8806).

Acacia sclerosperma subsp. sclerosperma (island variant 2)

Figure 17. Habit showing low, suckering clump in dense scrub (plants taller in exposed sites: see Figures 16). Photographed by B.R. Maslin on Thevenard Island, 27 July 2006 (*B.R. Maslin* 8810).

Acacia sclerosperma subsp. sclerosperma (island variant 2)

Figure 18. Flowering branch showing narrow, green, 1-nerved phyllodes. Photographed by B.R. Maslin on Airlie Island, 21 August 2006 (*B.R. Maslin* 8903).

Acacia sclerosperma subsp. sclerosperma (island variant 2)

Figure 19. Flowering branch with immature pods. Photographed by B.R. Maslin on Airlie Island, 21 August 2006 (*B.R. Maslin* 8904).

Acacia sclerosperma subsp. sclerosperma (island variant 2)

Figure 20. Scan of W.A. Herbarium sheet *B.R. Maslin* 8903 (Airlie Island).

Acacia sclerosperma subsp. sclerosperma (island variant 2)

Figure 21. Scan of W.A. Herbarium sheet *B.R. Maslin* 8904 (Airlie Island).

Acacia sclerosperma subsp. sclerosperma (island variant 2)

Figure 22. Scan of W.A. Herbarium sheet *B.R. Maslin* 8807 (Thevenard Island).

Acacia sclerosperma subsp. sclerosperma (island variant 2)

Figure 23. Scan of W.A. Herbarium sheet *B.R. Maslin* 8811 (Thevenard Island).