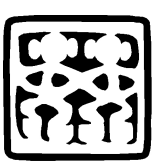
The lexicon of Proto Oceanic

The culture and environment of ancestral Oceanic society

3 Plants

edited by
Malcolm Ross, Andrew Pawley and Meredith Osmond



Pacific Linguistics
Research School of Pacific and Asian Studies
The Australian National University

Published by Pacific Linguistics
Research School of Pacific and Asian Studies
The Australian National University
Canberra ACT 0200
Australia

First published 2008

National Library of Australia Cataloguing-in-Publication entry:

Title:	The lexicon of Proto Oceanic. The culture and environment of ancestral Oceanic society / Volume 3, Plants / editors, Malcolm Ross, Andrew Pawley and Meredith Osmond.
ISBN:	9780858835894 (v. 3 : pbk.)
Notes:	Bibliography.
Subjects:	Proto-Oceanic language. Ethnology–Oceania. Oceania–Social life and customs.
Other Authors/ Contributors:	Ross, Malcolm (Malcolm D.) Pawley, Andrew Osmond, Meredith Evans, Bethwyn. Australian National University. Research School of Pacific and Asian Studies. Pacific Linguistics.
Dewey Number:	499.4

Copyedited by Meredith Osmond and Bethwyn Evans
Maps and diagrams by Malcolm Ross
Typeset by Malcolm Ross using XeTeX and the Memoir class of LaTeX
Cover design by Julie Manley/Addcolour Digital Pty Ltd
Cover photograph by R. Michael Bourke
Printed and bound by Addcolour Digital Pty Ltd, Fyshwick, Canberra

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1 *Introduction*

MALCOLM ROSS, ANDREW PAWLEY AND MEREDITH OSMOND

1 Aims

This is the third in a series of volumes bringing together the results of recent work on the lexicon of the Proto Oceanic (POc) language.[1] POc is the immediate ancestor of the Oceanic subgroup of the Austronesian language family (see Map 1). This subgroup consists of all the Austronesian languages of Melanesia east of 136° E, together with those of Polynesia and (with two exceptions) those of Micronesia—more than 450 languages in all.[2] Extensive arguments for the existence of Oceanic as a clearly demarcated branch of Austronesian were first put forward by Otto Dempwolff in the 1920s, and the validity of the subgroup is now recognised by virtually all scholars working in Austronesian historical linguistics.

The development and break-up of the POc language and speech community were stages in a truly remarkable chapter in human prehistory—the colonisation by Austronesian speakers of the Indo-Pacific region in the period after about 2000 BC. The outcome was the largest of the world's well-established language families and (until the expansion of Indo-European after Columbus) the most widespread. The Austronesian family comprises more than 1,000 distinct languages. Its eastern and western outliers, Madagascar and Easter Island, are two-thirds of a world apart, and its northernmost extensions, Hawaii and Taiwan, are separated by 70 degrees of latitude from its southernmost outpost, Stewart Island in New Zealand.

It is likely that the divergence of Oceanic from its nearest relatives, which are the Austronesian languages spoken around Cenderawasih Bay and in South Halmahera (Blust 1978*a*), began when Austronesian speakers from the Cenderawasih Bay area moved eastwards along the north coast of New Guinea and into the Bismarck Archipelago. There is a strong school of opinion that associates the subsequent break-up of POc with the rapid colonisation of Island

[1] The project has been jointly directed by Andrew Pawley and Malcolm Ross, with research assistance from Meredith Osmond, in the Department of Linguistics, Research School of Pacific and Asian Studies at the Australian National University. Bethwyn Evans, who has contributed to the present volume, was employed as a Research Associate under a grant to the project from the Australian Research Council. Originally, five volumes were planned, but the large amount of material on plants and animals has led to the splitting of the planned volume 3 into two.

[2] The listing in Tryon (1995) contains 466 Oceanic languages, many of which are subdivisible into dialects.

Malcolm Ross, Andrew Pawley and Meredith Osmond, eds *The lexicon of Proto Oceanic*, vol. 3: *Plants*, 1–22.
Pacific Linguistics, 2008.

Melanesia and the central Pacific by bearers of the Lapita culture between about 1200 and 900 BC (see Map 2 and volume 2, chapter 2).

The present project aims to bring together a large corpus of lexical reconstructions for POc, with supporting cognate sets, organised according to semantic fields and using a standard orthography for POc. We hope that this thesaurus will be a useful resource for culture historians, archaeologists and others interested in the prehistory of the Pacific region. The comparative lexical material should also be a rich source of data for various kinds of purely linguistic research, e.g. on semantic change and subgrouping in the more than 400 daughter languages.

Volume 1 of *The lexicon of Proto Oceanic* dealt with material culture. Volumes 2, 3 and 4 examine relevant sets of cognate terms in order to gain insights into how POc speakers viewed and exploited their environment. Volume 2 dealt with the geophysical or inanimate environment, the present volume treats plants and volume 4 animals. Volume 5, as it is planned at the time of writing, will deal with terminologies centring on people and society, including the body and human conditions and activities, and social organisation, belief systems, rituals, recreation and other elements of non-material culture. Volume 6 will treat closed categories including adjectives, pronouns, and number. It will also include a review of the main findings of the project, especially comparing the evidence from archaeology and historical linguistics concerning the culture and dispersal of Austronesian speakers into and across the Pacific Islands. Volume 6 will also provide an index to the POc and other reconstructions presented in the whole work, as well as an English-to-POc finderlist and a list of all languages cited, together with their subgroups.[3]

The organisation of the present volume is as follows. Chapter 2 is an introduction to the present volume, discussing plant classifications and plant names. It also provides a rationale for the organisation of this volume. Chapter 3 reconstructs major categories of POc ethnobotanical classification. Chapter 4 deals with POc terms for the parts of trees and other plants. Chapters 5–8 present reconstructed names for wild trees and plants of the bush. They are organised according to vegetation habitat. Chapter 5 treats plants of the coastal strand, chapter 6 plants of the mangrove swamp, chapter 7 primary lowland rain forest plants and chapter 8 plants that are found mainly in secondary lowland rain forest and grassland. Chapters 9–12 present reconstructed names for cultivated food plants.[4] Chapter 9 deals with staple foods, chapter 10 with green vegetables, chapter 11 with nut- and fruit-bearing trees and plants and chapter 12 with the coconut palm and its products. Finally, chapter 13 treats trees and plants that are cultivated for purposes other than food production.

2 The relation of the current project to previous work

Reconstructions of POc phonology and lexicon began with Dempwolff's pioneering work in the 1920s and 1930s. Dempwolff's dictionary of reconstructions attributed to Proto Austronesian (PAn) (1938) — but equivalent in modern terms to Proto Malayo-Polynesian (PMP) — contains some 600 reconstructions with reflexes in Oceanic languages.

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[3] This Introduction incorporates much of the material in the Introductions to Volume 1 and 2. We replicate this material here in order that each volume can be used independently. There are, however, some changes in the subgrouping of Oceanic languages.

[4] Terms associated with horticultural practices are presented in chapter 5 of volume 1.

Since the 1950s, POc and other early Oceanic interstage languages have been the subject of a considerable body of research. However, relatively few new reconstructions safely attributable to POc were added to Dempwolff's material until the 1970s. In 1969 George Grace made available as a working paper a compilation of reconstructions from various sources amounting to some 700 distinct items, attributed either to POc or to early Oceanic interstages. These materials were presented in a new orthography for POc, based largely on Biggs' (1965) orthography for an interstage he called Proto Eastern Oceanic. Updated compilations of Oceanic cognate sets were produced at the University of Hawaii in the period 1977–1983 as part of a project directed by Grace and Pawley. These compilations and the supporting data are problematic in various respects and we have made only limited use of them.

Comparative lexical studies have been carried out for several lower-order subgroups of Oceanic: for Proto Polynesian by Biggs (resulting in Walsh & Biggs 1966, Biggs et al. 1970 and subsequent versions of the POLLEX file, including Biggs & Clark (1993) and Clark & Biggs (2006);[5] for Proto Micronesian by scholars at the University of Hawaii (Bender et al. 1983, Bender et al. 2003); for Proto North-Central Vanuatu by Clark (1996, 2008);[6] for Proto Southern Vanuatu by Lynch (1978, 1996, 2001); for New Caledonia by Ozanne-Rivierre (1992), Haudricourt & Ozanne-Rivierre (1982) and Geraghty (1989); for Proto SE Solomonic by Levy (1980) and František Lichtenberk (1988); for Proto Central Pacific by Hockett (1976), Geraghty (1983, 1986, 1996 together with a number of unpublished papers); for Proto Eastern Oceanic by Biggs (1965), Cashmore (1969), Levy & Smith (1970), and Geraghty (1990); and for Proto Central Papuan by Pawley (1975), Lynch (1978, 1980), and Ross (1994*b*).

Robert Blust of the University of Hawaii has, in a series of papers (1970, 1980, 1983–84, 1986, 1989) published extensive, alphabetically ordered, lexical reconstructions (with supporting cognate sets) for interstages earlier than POc, especially for Proto Austronesian, Proto Malayo-Polynesian and Proto Eastern Malayo-Polynesian. He has also written several papers investigating specific semantic fields (1980, 1982, 1987, 1994). At the time of writing, Blust has a major work in progress, the Austronesian Comparative Dictionary (ACD), which will bring together all his reconstructions for Proto Austronesian and lower-order stages. This is stored in electronic form at the University of Hawaii. The version to which we refer dates from 1998.

Several papers predating our project systematically investigated particular semantic domains in the lexicon of POc, e.g. Milke (1958), French-Wright (1983), Pawley (1982, 1985), Pawley & Green (1985), František Lichtenberk (1986), R. Walter (1989), and the various papers in Pawley & Ross (1994). Ross (1988) contains a substantial number of new POc lexical reconstructions, as well as proposed modifications to the reconstructed POc sound system and the orthography.

These earlier works have provided valuable points of reference, both inside and outside the Oceanic group, and we are indebted particularly to Biggs and Clark (1993), Clark (1996*a*), Lynch (2001*c*) and Blust (ACD). However, previous Oceanic lexical studies were limited both

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[5] We have mostly referred to Biggs & Clark (1993) in our work, as Clark & Biggs (2006) became available only late in the preparation of this volume. We have referred to the latter in just a few cases.

[6] The manuscript of Clark (2008) became available only after this volume was nearing completion, and is not otherwise referred to here.

by large gaps in the data, with a distinct bias in favour of 'Eastern Oceanic' languages, and by the technical problems of collating large quantities of data. Although most languages in Melanesia remain poorly described, there are now many more dictionaries and extended word lists, particularly for Papua New Guinea, than there were in the 1980s. And developments in computing hardware and software now permit much faster and more precise handling of data than was possible then. A list of sources and a summary of the Project's collation procedures is found in Appendix 1.

As the present project proceeded, we came to realise that the form in which preliminary publications were presented—namely as essays, each discussing cognate sets for a particular semantic field at some length—would also be the best form for the presentation of our final synthesis. A discursive treatment of individual terminologies, as opposed, say, to a dictionary-type listing of reconstructions with supporting cognate sets, makes it easier to relate the linguistic comparisons to relevant issues of culture history, language change, and methodology. Hence each of the present volumes has as its core a collection of analytic essays. Some of these have been published or presented elsewhere, but are printed here in revised form. In some cases we have updated the earlier versions in the light of subsequent research, and, where appropriate, have inserted cross-references between contributions. Authorship is in some cases something of a problem, as a number of people have had a hand in collating the data, doing the reconstructions, and (re)writing for publication here. In most chapters, however, one person did the research which determined the structure of the terminology, and that person appears as the first or only author, and where another or others had a substantial part in putting together the paper itself, they appear as the second and further authors.

3 Reconstructing the lexicon

The lexical reconstructions presented in these volumes are arrived at using the standard methods of comparative linguistics, which require as preliminaries a theory of subgrouping (§3.2) and the working out of systematic sound correspondences among cognate vocabulary in contemporary languages (§3.3). As well as cognate sets clearly attributable to POc, we have included some cognate sets which at this stage are attributable to various interstage languages, particularly Proto Western and Proto Eastern Oceanic (but see §3.2 for definitions). We have set out to pay more careful attention to reconstructing the semantics of POc forms than has generally been done in earlier work, treating words not as isolates but as parts of terminologies.

3.1 Terminological reconstruction

Our method of doing 'terminological reconstruction' is as follows. First, the terminologies of present-day speakers of Oceanic languages are used as the basis for constructing a hypothesis about the semantic structure of a corresponding POc terminology, taking account of (i) ethnographic evidence, i.e. descriptions of the lifestyles of Oceanic communities and (ii) the geographical and physical resources of particular regions of Oceania. For example, by comparing terms in several languages for parts of an outrigger canoe, or for growth stages of a coconut, one can see which concepts recur and so are likely to have been present in POc. Secondly, a search is made for cognate sets from which forms can be reconstructed to

match each meaning in this hypothesised terminology. The search is not restricted to members of the Oceanic subgroup; if a term found in an Oceanic language proves to have external (non-Oceanic) cognates, the POc antiquity of that term will be confirmed and additional evidence concerning its meaning will be provided. Thirdly, the hypothesised terminology is re-examined to see if it needs modification in the light of the reconstructions. There are cases, highlighted in the various contributions to these volumes, where we were able to reconstruct a term where we did not expect to do so and conversely, often more significantly, where we were unable to reconstruct a term where we had believed we should be able to. In each case, we have discussed the reasons why our expectations were not met and what this may mean for Oceanic culture history.

Blust (1987: 81) distinguishes between conventional 'semantic reconstruction', which asks, "What was the probable meaning of protomorpheme X?", and Dyen and Aberle's (1974) 'lexical reconstruction', where one asks, "What was the protomorpheme which probably meant 'X'?" At first sight, it might appear that terminological reconstruction is a version of lexical reconstruction. However, there are sharp differences. Lexical reconstruction applies a formal procedure: likely protomeanings are selected from among the glosses of words in available cognate sets, then an algorithm is applied to determine which meaning should be attributed to each set. This procedure may have unsatisfactory results, as Blust points out. Several reconstructions may end up with the same meaning; or no meaning may be reconstructed for a form because none of the glosses of its reflexes is its protomeaning.

Terminological reconstruction is instead similar to the semantic reconstruction approach. In terminological reconstruction the meanings of protomorphemes are not determined in advance. Instead, cognate sets are collected and their meanings are compared with regard to:

- their specific denotations, where these are known;
- the geographic and genetic distribution of these denotations (i.e. are the glosses from which the protogloss is reconstructed well distributed?);
- any derivational relationships to other reconstructions;
- their place within a working hypothesis of the relevant POc terminology (e.g., are terms complementary —'bow' implies 'arrow'; 'seine net' implies 'floats' and 'weights'? Are there different levels of classification—generic, specific, and so on?).

For example, it proved possible to reconstruct the following POc terms for tying with cords (vol.1, ch.9, §10):

POc **buku* 'tie (a knot); fasten'
POc **p*^{w}*ita* 'tie by encircling'
POc **paqu(s), *paqus-i-* 'bind, lash; construct (canoe +) by lashing together'
POc **pisi* 'bind up, tie up, wind round, wrap'
POc **kiti* 'tie, bind'

In each of the supporting cognate sets from contemporary languages there are a number of items whose glosses in the dictionaries or word lists are too vague to tell the analyst anything about the specific denotation of the item, and in the case of **kiti* this prevents the assignment of a more specific meaning. The verb **buku* can be identified as the generic term for tying a knot because of its derivational relationship (by zero derivation) with a noun whose denotation is clearly generic, **buku* 'node (as in bamboo or sugarcane); joint; knuckle; knot in wood, string or rope' (vol.1, ch.4, §3.2). Reconstruction of the meaning of **p*^{w}*ita* as 'tie by encircling' is supported by the meanings of the Lukep, Takia and Longgu reflexes, respectively

'tie by encircling', 'tie on (as grass-skirt)', and 'trap an animal's leg; tie s.t. around ankle or wrist': Lukep and Takia are North New Guinea languages, whilst Longgu is SE Solomonic. Reconstruction of the meaning of **paqu(s)*, **paqus-i-* as 'bind, lash; construct (canoe +) by tying together' is supported by the meanings of the Takia, Kiribati and Samoan reflexes, respectively 'tie, bind; construct (a canoe)', 'construct (canoe, house)', and 'make, construct (wooden objects, canoes +)': Takia is a North New Guinea language, Kiribati is Micronesian, and Samoan is Polynesian. The meaning of **pisi* is similarly reconstructed by reference to the meanings of its Mono-Alu, Mota, Port Sandwich, Nguna and Fijian reflexes.

Often, however, the contributors have often been less fortunate in the information available to them. For example, Osmond (vol.1, ch.8, §9) reconstructs six POc terms broadly glossed as 'spear'. Multiple terms for implements within one language imply that these items were used extensively and possibly in specialised ways. Can we throw light on these specialised ways? Unfortunately, some of the word lists and dictionaries available give minimal glosses, e.g. 'spear', for reflexes of the six reconstructions. What we need to know for each reflex is: what is the level of reference? Is it a term for all spears, or perhaps all pointed projectiles including arrows and darts? Or does it refer to a particular kind of spear? Is it noun or verb or both? If a noun, does it refer to both the instrument and the activity? Most word lists are frustratingly short on detail. For this kind of detail, ethnographies have proved a more fruitful source of information than many word lists.

Another problem is inherent in the dangers of sampling from over 450 languages. The greater the number of languages, the greater are the possible variations in meaning of any given term, and the greater the chances of two languages making the same semantic leaps quite independently. Does our (sometimes quite limited) cognate set provide us with a clear unambiguous gloss, or have we picked up an accidental bias, a secondary or distantly related meaning? Did etymon *x* refer to fishhook or the material from which the fishhook was made? Did etymon *y* refer to the slingshot or to the action of turning round and round?

3.2 Subgrouping and reconstruction

3.2.1 Subgrouping

Although the subgrouping of Austronesian languages and questions about which protolanguage was spoken where remain in some cases somewhat controversial, it is impossible to proceed without making some assumptions about these matters. Figures 1.1 and 1.2 are approximate renderings of our subgrouping assumptions. The upper part of the tree, shown in Figure 1.1, is due to Blust, originally presented in Blust (1977*b*) and repeated with additional supporting evidence in subsequent publications (1978, 1982, 1983–84, 1993).[7] The diagram of the lower (Oceanic) part of the tree in Figure 1.2 shows nine primary subgroups of Oceanic. Its rake-like structure indicates that no convincing body of shared innovations has been found to allow any of the nine subgroups to be combined into higher-order groupings. Sections 3.2.2, 3.2.3, and 3.2.4 offer some commentary on our subgrouping, and in §3.2.3 we explain how we handle the rake-like structure in making reconstructions.

[7] For commentaries on Austronesian subgrouping, see Ross (1995) and Adelaar (2005).

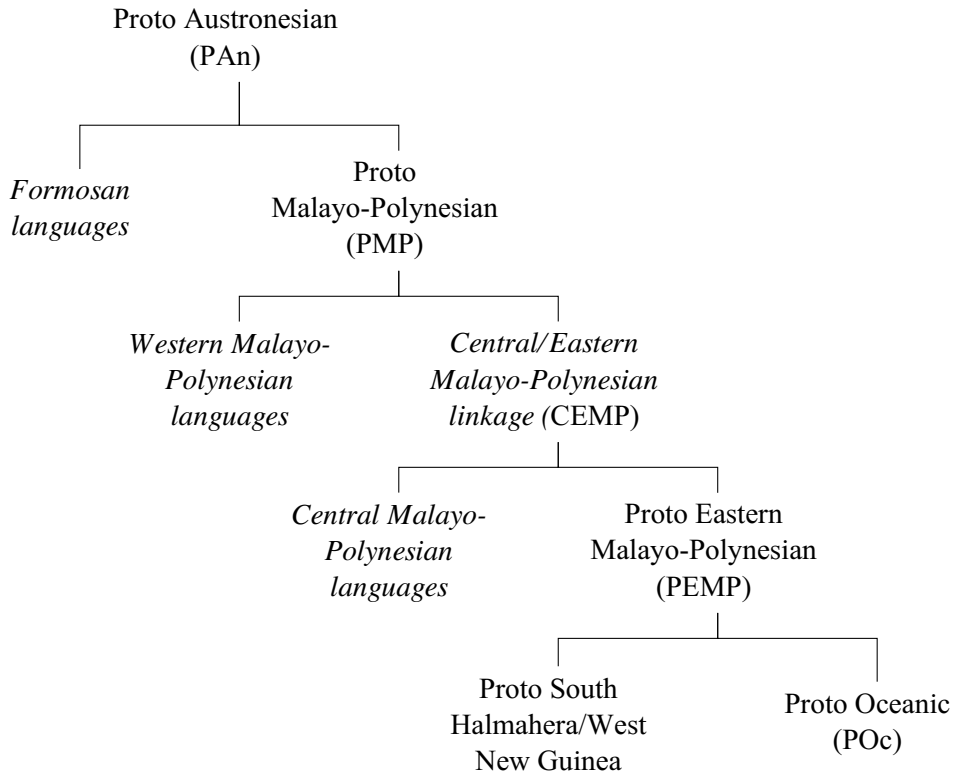

Figure 1.1 Schematic diagram showing higher-order subgroups of Austronesian languages.

3.2.2 Kinds of subgroup

In Figures 1.1 and 1.2 each node is either a single language,[8] usually a reconstructed protolanguage, or, in italics, a group of languages.

Where a node is a protolanguage, its descendants form a proper subgroup (in the technical sense in which historical linguists use the term 'subgroup'). A proper subgroup is identified by innovations shared by its member languages, i.e. it is 'innovation-defined' in the terminology of Pawley & Ross (1995). These innovations are assumed to have occurred just once in the subgroup's protolanguage, i.e. the exclusively shared ancestor of its members. Thus languages of the large Oceanic subgroup of Austronesian share a set of innovations relative to the earlier Austronesian stages shown in Figure 1.1 (Dempwolff 1934).[9] By inference these innovations occurred in their common ancestor, POc, and the claim that they are innovations is based on a comparison of reconstructed POc with reconstructed PMP. The innovations may be phonological (e.g. PMP **e*, pronounced [ə], and PMP **aw* both became POc **o*), morphological (e.g. POc acquired a morphological distinction between three kinds of possessive relationship: food, drink and default), or lexical (e.g. PMP **limaw* 'citrus fruit' was replaced by POc **molis*).

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[8] The two very closely related languages Mussau and Tench form a minor exception.

[9] Chapter 4 of Lynch et al. (2002) gives a recent account of these innovations.

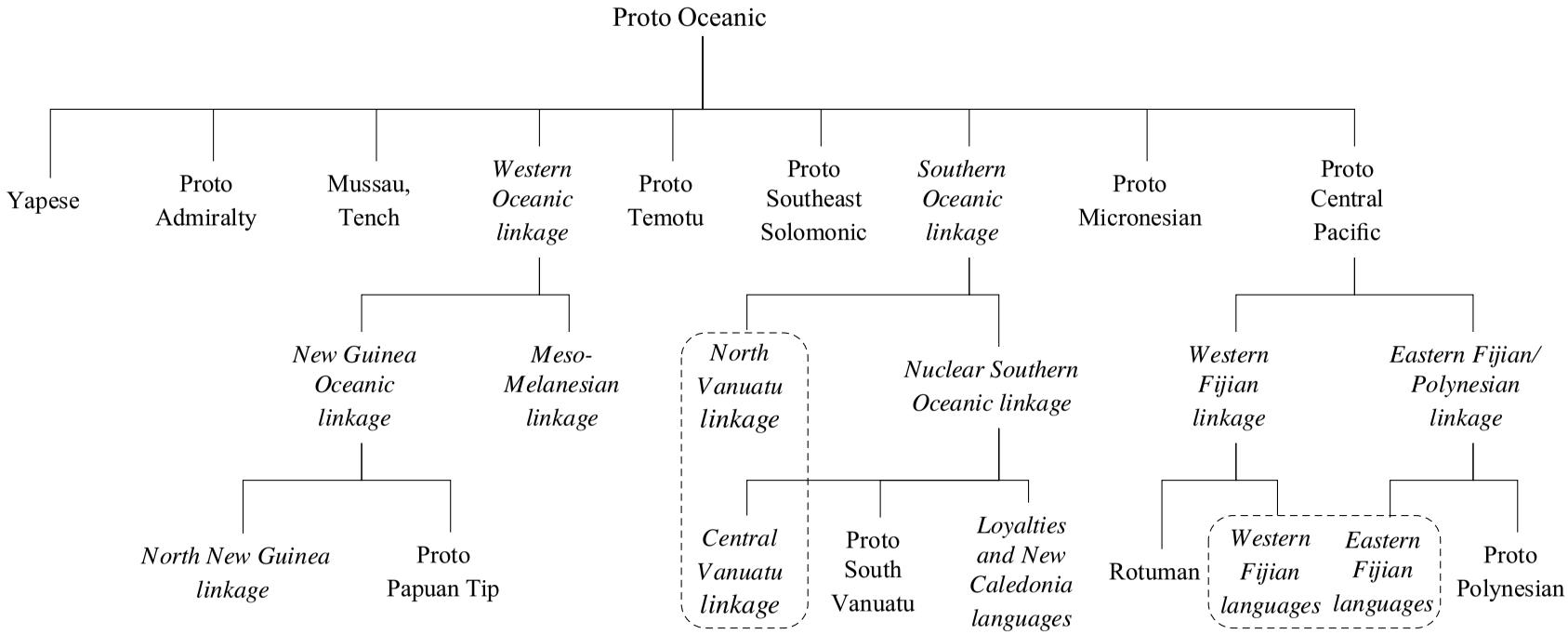

Figure 1.2 Schematic diagram showing the subgrouping of Oceanic Austronesian languages.

Italics are used in Figures 1.1 and 1.2 to indicate a group of languages which is not a proper subgroup, i.e. has no identifiable *exclusively* shared parent. Thus *Formosan languages* in Figure 1.1 indicates a collection of languages descended (along with PMP) from PAn. They are spoken in Taiwan, but do not form a subgroup. There was no 'Proto Formosan', as Formosan languages and language groups are all descended directly from PAn.

Some of the italicised labels in Figures 1.1 and 1.2 include the term *linkage*. A linkage (an 'innovation-linked group' in the terminology of Pawley & Ross 1995) is a collection of usually quite closely related languages or dialects,[10] speakers of which were in sufficient contact at one time or another during their history for innovations to pass from one language to the next, often resulting in a pattern such that the domains of various innovations overlap but are not coterminous.[11] A number of Oceanic linkages were recognised during the 1980s (Geraghty 1983, Pawley & Green 1984, Ross 1988).[12] A linkage may arise in at least three ways, but distinguishing between them is often impossible.

First, what would otherwise be a proper subgroup may happen to lack exclusively shared innovations, perhaps because the parent did not exist as a unit for long enough to undergo any innovations of its own.[13]

Second, a linkage may consist of some but not all of the languages descended from a single parent. The Western Oceanic linkage reflects the innovations of POc, but no innovation is common to the whole of Western Oceanic (although the merger of POc **r* and **R* comes close). However, the languages of its three component linkages—North New Guinea, Papuan Tip and Meso-Melanesian—display complex patterns of overlapping innovations. The Western Oceanic linkage appears to be descended from the dialects of POc that were left behind in the Bismarck Archipelago after speakers of the languages ancestral to the other eight primary subgroups in Figure 1.2 had moved away to the north or east. After these departures various innovations occurred. Each arose somewhere in the Western Oceanic dialect network and spread to neighbouring dialects without reaching every dialect in the network.

The third type of linkage is the result of contact among languages descended from more than one immediate parent. An example is the Fijian linkage, which represents a reintegration of parts of earlier Western and Eastern Fijian linkages (Geraghty & Pawley 1981, Geraghty 1983, Pawley 1996*b*).[14] Geraghty reconstructed the history of the Fijian linkage by painstaking analysis of innovations from at least two stages in its history. From the earlier period Western Fijian languages share innovations with Rotuman and Eastern Fijian with Polynesian. From a more recent period Western Fijian and Eastern Fijian languages share innovations

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[10] In what follows, 'language' is used to mean 'language or dialect'.

[11] One or more innovations may spread right across the languages of the linkage. In this case it becomes virtually impossible to distinguish it from a proper subgroup.

[12] Recent work in Indo-European appeals to the concept of linkage: Garrett (2006) suggests that the dialects ancestral to Greek were not dialects of 'Proto Greek' but a collection of Nuclear Indo-European dialects drawn together by relations between the communities ancestral to the Greek city states, across which spread the innovations which characterise Ancient Greek.

[13] A situation in which a subgroup is both proper (i.e. defined by exclusive innovations) and a linkage (displaying overlapping patterns of innovations) is of course possible, the exclusively shared innovations having occurred in the parent, the others after the break-up of the parent. It so happens that we have no need of this construct here.

[14] 'Eastern Fijian linkage' in Figure 1.2 is our label for Geraghty's (1983) 'Tokalau Fijian'.

with each other, reflecting their reintegration into a single linkage, within which the present Western/Eastern boundary has shifted relative to the (fuzzy) boundary of the earlier period.

For most of the linkages noted in Figures 1.1 and 1.2 this kind of analysis is not available. For example, Blust (1993) indicates that CEMP was a linkage. But its history is far from clear. Was there perhaps a PCEMP that was so shortlived that it underwent no innovations of its own? Or does CEMP perhaps include some languages that share history with languages to their west and others that share history with those to their north? The North/Central Vanuatu linkage, long assumed to be some sort of genealogical unit, appears to reflect the partial reintegration of at least two dialect networks, North Vanuatu and Central Vanuatu, that probably never diverged greatly from each other, but the details of this history are difficult to elucidate (Lynch 2000*a*).[15]

The languages of a linkage have no identifiable exclusively shared parent.Yet we have found many instances in which a cognate set is limited to one of the linkages in Figures 1.1 and 1.2: CEMP, Western Oceanic, New Guinea Oceanic, Southern Oceanic or the reintegrated North and Central Vanuatu linkage. As with PEOc and PROc (§3.2.3), we think it is preferable to attribute these reconstructions to a hypothetical protolanguage rather than to a higher node in the tree. Hence there are reconstructions labelled PCEMP, PWOc and so on. Again these apparent lexical innovations offer only the weakest evidence for the protolanguage to which they are attributed. In addition to the explanations of the kinds offered for PEOc and PROc etyma in §3.2.3 it is possible, for example, that an innovatory 'PWOc' etymon arose when the Western Oceanic dialect network was still close-knit, and spread from dialect to dialect before the network broke into the two networks ancestral to its present-day first-order subgroups.

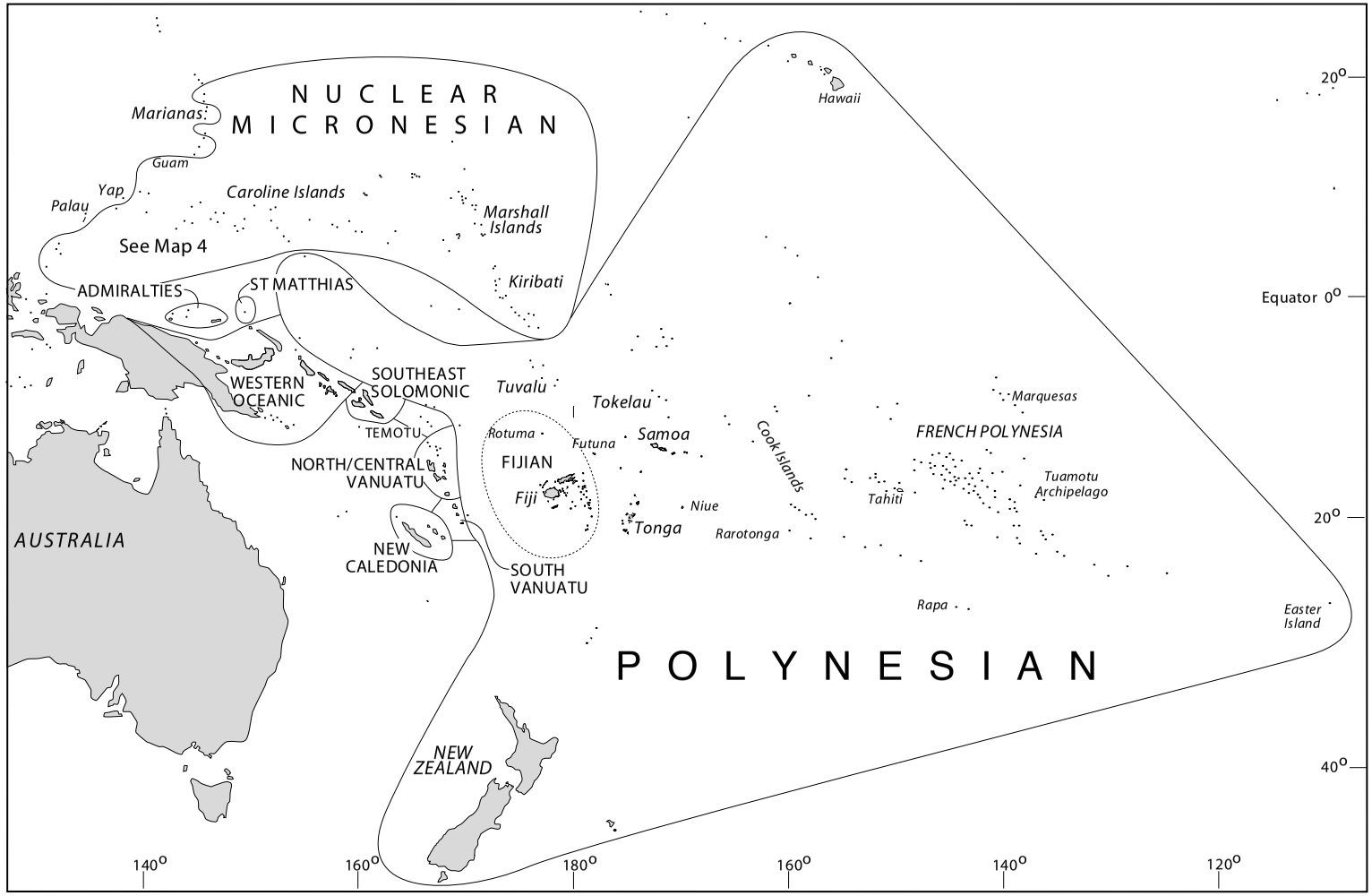
3.2.3 Criteria for reconstruction

The strength of a lexical reconstruction rests crucially on the distribution of the supporting cognate set across subgroups. The *distribution* of cognate forms and agreements in their meanings is much more important than the *number* of cognates. It is enough to make a secure reconstruction if a cognate set occurs in just two languages in a family, with agreement in meaning, provided that the two languages belong to different primary subgroups and provided that there is no reason to suspect that the resemblances are due to borrowing or chance. The PMP term **apij* 'twins' is reflected in several western Malayo-Polynesian languages (e.g. Batak *apid* 'twins, double (fused) banana') but only a single Oceanic reflex is known, namely Roviana *avisi* 'twins of the same sex'. Because Roviana belongs to a different first-order branch of Malayo-Polynesian from the western Malayo-Polynesian witnesses and because there is virtually no chance that the agreement is due to borrowing or chance similarity, this distribution is enough to justify the reconstruction of PMP **apij*, POc **apic* 'twins'.

The rake-like form of Figure 1.2 almost certainly reflects the very rapid settlement of Oceania out of the Bismarcks,[16] but it confronts us with a methodological question. If we follow the rubric that we make a reconstruction if a cognate set occurs in languages of just

[15] For a history of scholarly views of the subgrouping of North and Central Vanuatu languages see Clark (2008: §1.3). For arguments supporting a NCV grouping, see Clark (2008: ch.4).

[16] Approximate dates are as follows. The Bismarcks themselves were settled by around 1400 BC. Archaeology has the Lapita culture in the Temotu Archipelago by about 1200 BC, in New Caledonia by 1100 BC, in Fiji and Tonga by 1000 BC and in Samoa by 900 BC (Green 2003).



Map 3 Groups of Oceanic languages used in cognate sets

two primary subgroups, then reflexes of an etymon in, say, a SE Solomonic language and a Micronesian language would be sufficient evidence for a POc reconstruction and the absence of reflexes in Admiralty and Western Oceanic would be irrelevant. Given what we know about the location of the POc homeland (in the Bismarcks; vol.2, ch.2) and the early eastward spread of Oceanic speakers, this is too loose a criterion. Instead, we assume two hypothetical nodes not shown in the tree in Figure 1.2.[17] These are

- Remote Oceanic, comprising Southern Oceanic, Micronesian and Central Pacific;
- Eastern Oceanic, comprising SE Solomonic and Remote Oceanic.[18]

If a cognate set occurs in two or all three of the groups in Remote Oceanic, the reconstruction is attributed to Proto Remote Oceanic (PROc). If a cognate set occurs in one or more of the groups in Remote Oceanic and in SE Solomonic, it is attributed to Proto Eastern Oceanic (PEOc). In this way we acknowledge that such reconstructions may represent an innovation that postdates the spread of the early Oceanic speech community. There are enough PROc and PEOc reconstructions to suggest that such lexical innovations indeed occurred. This in turn provides weak evidence for Remote Oceanic and Eastern Oceanic subgroups, but evidence that is too weak to be relied on, for at least two reasons. First, it is quite possible that some of our PROc and PEOc reconstructions will be promoted to POc as more Admiralty and Western Oceanic data become available. Second, it is reasonable to assume that some of our PROc and PEOc etyma are of POc antiquity but happen to have been lost in Proto Admiralty and Proto Western Oceanic. Without supporting phonological or morphological evidence we are unwilling to treat PROc or PEOc as anything other than convenient hypotheses which allow us to retain rigorous criteria for a POc reconstruction.

In volumes 1 and 2 a reconstruction here labelled 'PROc' would have been labelled 'PEOc', but the absence of SE Solomonic reflexes from among its reflexes indicates that it has the same status as a PROc reconstruction in the present volume. Two factors have led to the distinction between PEOc and PROc here. One is that, because the primary biogeographic divide in Oceania is between Near and Remote Oceania (see vol. 2, Map 5), i.e. between the Solomon Islands and Vanuatu, the question of whether or not a plant name includes a SE Solomonic reflex is significant, and there are many plant names that do not (and are thus attributed to PROc). The other is that the historical separateness of SE Solomonic from both Western Oceanic and the groups treated as Remote Oceanic has become increasingly clear through recent research (Pawley 2007).

Our criterion for recognising a reconstruction as POc is that the cognate set must occur in at least two out of four criterial groupings: Admiralties (or Yapese or Mussau), Western Oceanic, Temotu and our hypothetical Eastern Oceanic. Both here and at the hypothetical interstages defined above, no reconstruction is made if there are grounds to infer borrowing

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[17] We included these nodes in the corresponding tree in Figure 1 of volumes 1 and 2, but this was too easily interpreted as a statement of our views on subgrouping, so we abandon it here and in Appendix 2.

[18] The term 'Eastern Oceanic' and the search for evidence of an Eastern Oceanic subgroup has a relatively long pedigree in Oceanic linguistics (Biggs 1965, Pawley 1972, Pawley 1977, Lynch & Tryon 1985, Geraghty 1990). However, by the time volume 1 of the present work was published in 1998 it was already evident that innovations supporting the existence of an Eastern Oceanic subgroup were not forthcoming, as Pawley & Ross (1995: 79) had mentioned in a footnote. Our use of the term here is more inclusive than most, resembling more closely the 'Central/Eastern Oceanic' of Lynch & Tryon (1983) (the published version of which, Lynch & Tryon 1985, presents a less inclusive version of Central/Eastern Oceanic) and of Lynch et al. (2002: 94–96), who also express reservations about its status.

from one of these groupings to another.[19] We also reconstruct an etymon to POc if it is reflected in just one of the four criterial groupings and in a non-Oceanic Austronesian language (a member of one of the subgroups on the left branches in Figure 1.1), as illustrated above by the reconstruction of POc **apic* 'twins'.

These criteria are identical to those applied in volumes 1 and 2 except for the addition of Temotu (which figures in very few cognate sets). The establishment of Temotu as a primary subgroup (Ross & Næss 2007) postdates the publication of volumes 1 and 2. Temotu comprises the languages of the Reef Islands, Santa Cruz, Utupua and Vanikoro, located 400 km east of the main Solomons archipelago and to the north of Vanuatu (Map 3).

There are indications that Yapese (a single-language subgroup) and Mussau and Tench (a subgroup with two closely related languages) may be more closely related to Admiralty than to any other Oceanic subgroup,[20] and for this reason they are treated as Admiralty languages for the purposes of reconstruction. That is, the presence of a reflex in one or more of these languages and in Admiralty does not support a POc reconstruction, but the presence of of a reflex in one or more of these languages and one of Western Oceanic, Temotu and Eastern Oceanic does support one.

In chapter 2 (§4) of volume 2 Pawley discusses Blust's (1998) proposal that the primary split in Oceanic divides Admiralty from a subgroup embracing all other Oceanic languages. Pawley dubs the latter 'Nuclear Oceanic'. If Blust's subgrouping were accepted, then an etymon which lacked cognates outside Oceanic would need to be reflected both in an Admiralties language and in a non-Admiralties language for a POc reconstruction to be made. Etyma with reflexes in both Western and Eastern Oceanic, but not in the Admiralties, would be reconstructed as Proto Nuclear Oceanic. Under the criteria outlined above, however, we attribute these reconstructions to POc. These criteria were used in volumes 1 and 2, and we have thought it wise to maintain them throughout the volumes of this work. The reader who wishes to single out reconstructions attributable to a putative Proto Nuclear Oceanic (rather than to POc) can easily recognise them, however. They are those POc reconstructions for which (i) there are no Admiralties reflexes, and (ii) there is no higher-order reconstruction (i.e. PEMP, PCEMP, PMP or PAn), since the latter would be based on cognates outside Oceanic.

3.2.4 Further notes on subgroups

This section brings together brief notes on the subgroups in Figure 1.2 beyond those mentioned in the discussion in §§3.2.3–3.2.2.

Admiralty is a proper subgroup (Ross 1988: ch.9).

Western Oceanic consists of the North New Guinea (NNG), Papuan Tip (PT), Meso-Melanesian (MM) linkages and the Sarmi/Jayapura (SJ) group (see Map 4). The last-named may belong to the NNG linkage, but this is uncertain (Ross 1996*b*). It is not shown in Figure 1.2 and its languages do not play a crucial role in reconstruction. It is likely that the

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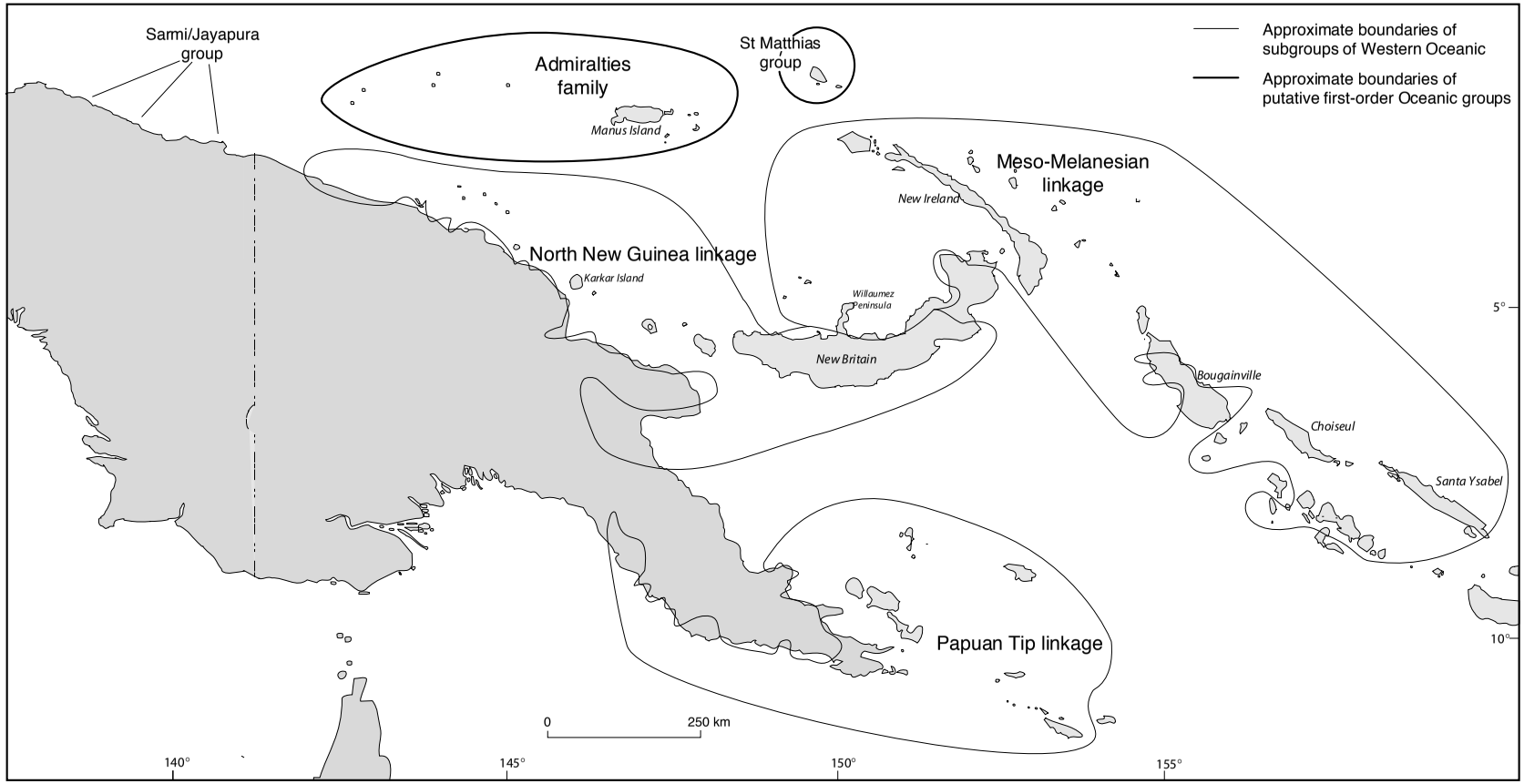
[19] Cases where such an inference can be made occur mostly at the boundary (in the Solomon Islands) between Western and Eastern Oceanic. Borrowing is likely (and is often reflected in unexpected sound correspondences) where an etymon occurs (i) in Western Oceanic and only in SE Solomonic languages or (ii) in SE Solomonic languages and only in the NW Solomonic languages (a subgroup within the Meso-Melanesian linkage of Western Oceanic).

[20] On the positions of Yapese and Mussau, see respectively Ross (1996*a*) and Ross (1988: 315–316, 331).



Map 4 Oceanic language groups in northwest Melanesia: the Admiralties and St Matthias groups and the subgroups of Western Oceanic

NNG and PT groups form a super-group, the New Guinea Oceanic linkage, and so etyma reflected only in NNG and PT languages are attributed to a putative Proto New Guinea Oceanic (Milke 1958, Pawley 1978), and etyma reflected in either NNG or PT (or both) and in MM are labelled PWOc.

SE Solomonic was established as a proper subgroup by Pawley (1972: 98–110). Further support was provided by Levy (1979, 1980, n.d.), Tryon & Hackman (1983) and František Lichtenberk (1988).

The *Southern Oceanic* linkage as proposed by Lynch (1999, 2000, 2001, 2004) is characterised by complex overlapping innovations, but by none that are reflected in all its member languages and would qualify it as a proper subgroup (see discussion in Lynch et al. 2002: 112–114).[21]

Micronesian is a proper subgroup (Jackson 1983, 1986, Bender et al. 2003).

Central Pacific is a proper subgroup, but one defined by only a handful of shared innovations, indicating that the period of unity was short (Geraghty 1996). The high-order subgrouping of Central Pacific is due to Geraghty (1983), except for the position of Rotuman, due to Pawley (1996*b*). Within Central Pacific is another long recognised proper subgroup, *Polynesian*, for which Pawley (1996*a*) lists diagnostic innovations.

3.3 Sound correspondences

As we noted above, reconstruction depends on working out the systematic sound correspondences among cognate vocabulary in contemporary languages and on having a working hypothesis about how the sounds of POc have changed and are reflected in modern Oceanic languages. Working out sound correspondences even for twenty languages is a large task, and so we have relied heavily on our own previous work and the work of others. The sound correspondences we have used are those given by Ross (1988) for Western Oceanic and Admiralties; by Levy (1979, 1980) and František Lichtenberk (1988) for Cristobal-Malaitan, by Pawley (1972) and Tryon & Hackman (1983) for SE Solomonic; by Ross & Næss (2007) for Temotu; by Tryon (1976) and Clark (1996, 2008) for North and Central Vanuatu; by Lynch (1978, 2001) for Southern Vanuatu; by Geraghty (1989) and Ozanne-Rivierre (1992) for New Caledonia; by Jackson (1986) and Ross (1996*a*) for Nuclear Micronesian; by Geraghty (1986) for Central Pacific; by Biggs (1978) for Polynesian; by Ross (1996*a*) for Yapese; and by Ross (1996*b*) for Oceanic languages of Irian Jaya.

For non-Oceanic languages we have referred to sound correspondences given by Tsuchida (1976) for Formosan languages; by Zorc (1977, 1986) and Reid (1982) for the Philippines; by Adelaar (1992) and Nothofer (1975) for Malay and Javanese; by Sneddon (1984) for Sulawesi; by Collins (1983) for Central Maluku; and by Blust (1978*a*) for South Halmahera and Irian Jaya.

We are well aware that regular sound correspondences can be interfered with in various ways: by phonetic conditioning that the analyst has not identified (see, e.g., Blust 1996*a*), by borrowing (for an extreme Oceanic case, see Grace 1996), or, as recent research suggests, by the frequency of an item's use (Bybee 1994). We have tried at least to note, and sometimes to account for, irregularities in cognate sets.

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[21] Because it has only been recently proposed, Southern Oceanic does not appear in Figure 1 of volumes 1 and 2.

Table 1.1 Reconstructed paradigm of POc phonemes

*p^w	*p	*t	*c	*k	*q
*b^w	*b	*d	*j	*g	
		*s			
*m^w	*m	*n	*ñ	*ŋ	
		*r			*R
		*dr			
		*l			
*w			*y		
	*i		*u		
	*e		*o		
		*a			

3.4 POc phonology and orthography

Work based on the sound correspondences of both Oceanic and non-Oceanic languages has resulted in the reconstructed paradigm of POc phonemes shown in Table 1.1. The orthography used here and in the POc reconstructions in this work is from Ross (1988), with the addition of ******p^w. POc phonology and its relationship to PMP is discussed in greater detail in Chapter 2 (§2) of volume 1. Since the publication of volume 1, articles by John Lynch have appeared on POc stress (2000) and POc labiovelar phonemes (2002).

Table 1.2 shows two POc orthographies. The first was established by Biggs (1965), for PEOc, and Grace (1969), who applied it to POc. It has been used with a number of variants, separated by a slash in Table 1.2. The second, introduced by Ross (1988), is the one generally used in this work. The terms 'oral grade' and 'nasal grade' were used by Grace (1969) and have become conventional among Oceanic linguists to refer to the outcomes of certain sound changes that occurred between PMP and POc (vol.1, ch.2, §2.4).

Table 1.2 POc orthographies after Grace (1969) and Ross (1988)

Grace	oral grade	*p	*pw	*t	*d/*r	*s	*j	*k			
Ross		*p	*p^w	*t	*r	*s	*c	*k			
Grace	nasal grade	*mp	*ŋp/*mpw	*nt	*nd/*nr	*nj		*ŋk			
Ross		*b	*b^w	*d	*dr	*j		*g			
Grace		*m	*ŋm/*mw	*n	*ñ	*ŋ	*w	*y	*l	*q	*R
Ross		*m	*m^w	*n	*ñ	*ŋ	*w	*y	*l	*q	*R
Grace		*i	*o	*e	*a	*u					
Ross		*i	*o	*e	*a	*u					

4 Conventions common to the series

4.1 Chapter format

Each of the contributions to these volumes concerns a particular POc 'terminology'. Generally, each contribution begins with an introduction to the issues raised by the reconstruction of its particular terminology, and the bulk of each contribution consists of reconstructed etyma with supporting data and a commentary on matters of meaning and form.

The reconstruction of POc **kayu* 'tree' below, adapted from Chapter 3, §4.2, shows how reconstructions and supporting cognate sets are presented. Above it is Dempwolff's earlier superordinate (PMP) reconstruction. Below it are supporting reflexes. Contributors vary in the degree to which they insert lower-order reconstructions like PPn **kau* below. Lower-order reconstructions are sometimes given to clarify the relationship of reflexes to the higher-order reconstruction: Southern Vanuatu languages, for example, have undergone so much phonological change that a Proto Southern Vanuatu reconstruction helps explicate the relationship between Southern Vanuatu reflexes and the POc reconstruction. In the set below the Proto Polynesian (PPn) reconstruction shows an extension in its meaning.

PMP **kayu* 'tree, wood, timber' (Dempwolff 1938)

POc **kayu* 'tree or shrub: generic name for plants with woody stems and branches, probably not including palms or tree-ferns; wood, stick'

Adm:	Loniu	*ke*	'tree, wood'
Adm:	Titan	*kei*	'firewood'
NNG:	Lukep (Pono)	*kai*	'tree, wood'
NNG:	Takia	*ai*	'tree (generic), wood, firewood, plant'
PT:	Iduna	*ai*	'tree, plant, wood, fire, light'
PT:	Motu	*au*	'tree, firewood'
MM:	Patpatar	*ai-*	'tree species, followed by name of species'
MM:	Mono	*au*	'tree'
SES:	Bugotu	*ɣai-*	'tree, shaft of spear'
SES:	Kwaio	*ʔai*	'branch, tree, stick; woody plant (shrub, tree)'
NCV:	NE Ambae	*kai*	'tree, wood'
NCV:	Nguna	*na-kau*	'tree'
SV:	Anejom̃	*in-ɣai*	'tree, wood, often used for relatively small bushes'
NCal:	Xârâcùù	*k^{w}ãã*	'wood, tree (general term)'
Mic:	Kiribati	*kai*	'wood (in general), tree, plant, stick'
Mic:	Ulithian	*-xæy*	'counting classifier for trees'
Fij:	Kadavu	*kaðu*	'tree, piece of wood, stick'
Fij:	Wayan	*kai*	'wood; generic for trees and shrubs, and occasionally also low bushy plants; used in certain compounds as generic for all plants; piece of wood, stick'

PPn **kau* 'wood, timber, stalk, stem, handle' (POLLEX)

Pn:	Tongan	*kau*	'stalk, stem'
Pn:	Hawaiian	*ʔau*	'handle, staff, stem, bone of lower arm or leg'

Because our supporting data are drawn from such a wide range of languages, the convention is adopted of prefixing each language name with the abbreviation for the genealogical or geographic group to which the language belongs, so that the distribution of a cognate set is more immediately obvious. Table 1.3 is a key to the labels. Figure §1.2 shows the positions of these groups in the Oceanic tree. We have sought to be consistent in always listing these groups in the same order, but contributors vary in the ordering of languages within groups.

Lynch's recent research on Southern Oceanic (§3.2.4) renders the NCV group mildly anomalous, although there is no doubt that it is an integrated dialect network. There are a number of etyma whose reflexes are confined to North and Central Vanuatu, and so we continue to make 'Proto North/Central Vanuatu' reconstructions, even though these perhaps represent a Southern Oceanic term that has been lost in southern Vanuatu and New Caledonia. Where the distribution of reflexes requires it, the chapters in this volume include reconstructions for PROc and for PSOc. Etyma with these distributions were attributed to PEOc in volumes 1 and 2, but the distributions are transparent, thanks to the presence of the group labels in cognate sets.

In the interests of space we have not given the history of the reconstructions themselves, as this would often require commentary on the modifications made by others and by us, and on why we have made them. Where a reconstruction is not new, we have tried to give its earliest source, e.g. 'Dempwolff 1938' above, but this is difficult when earlier reconstructions differ in form and meaning.

In general, the contributions to these volumes are concerned with items reconstructable in POc, PWOc, PEOc, PROc and occasionally Proto New Guinea Oceanic (PNGOc). Etyma for PWOc, PNGOc and PEOc are reconstructed because these may well also be POc etyma for which known reflexes are not well distributed (see discussion in §3.2.3). The contributors vary in the degree to which they reconstruct etyma for interstages further down the tree.

Table 1.3 Abbreviations for the genealogical or geographic groups

Yap:	Yapese (one language)
Adm:	Admiralty and Mussau/Tench
SJ:	Sarmi/Jayapura
NNG:	North New Guinea
PT:	Papuan Tip
MM:	Meso-Melanesian
SES:	Southeast Solomonic
TM:	Temotu
NCV:	North/Central Vanuatu, i.e. the reintegrated network formed by the North and Central Vanuatu linkages
SV:	Southern Vanuatu
NCal:	Loyalty and New Caledonia
Mic:	Micronesian
Fij:	Fijian, i.e. the reintegrated network formed by Western and Eastern Fijian dialects
Pn:	Polynesian

Reconstructions for lower-order interstages are decreasingly likely to reflect POc etyma and may be the results of cultural change as Oceanic speakers moved further out into the Pacific.

Contributors have usually not sought to make fresh reconstructions at interstages superordinate to POc. What they have done, however, is to cite other scholars' reconstructions for higher-order interstages, as these represent a summary of the non-Oceanic evidence in support of a given POc reconstruction. These interstages are shown in Figure 1.1, together with their abbreviations.

Sometimes non-Oceanic evidence has been found to support a POc reconstruction where no reconstruction at a higher-level interstage has previously been made. In this case a new higher-order reconstruction is made, and the non-Oceanic evidence is given in a footnote.

Whilst we have tried to use the internal organisation of the lexicons of Oceanic languages themselves as a guide in setting the boundaries of each terminology, we have inevitably taken decisions which differ from those that others might have made. There are, obviously, overlaps and connections between various semantic domains and therefore between the contributions here. We have done our best to provide cross-references, but we have sometimes duplicated information rather than ask the reader repeatedly to look elsewhere in the book. Indexes at the end of each volume and in the final volume are intended to make it easier to use the volumes collectively as a work of reference.

4.2 Data

Data sources are listed in Appendix 1.

For some reconstructed etyma only a representative sample of reflexes is given. We have endeavoured to ensure, however, that in each case this sample not only is geographically and genetically representative, but also provides evidence to justify the shape of the reconstruction. Where only a few reflexes are known to us, this is usually noted.

Although there are accepted or standard orthographies for a number of the languages from which data are cited here, all data are transcribed into a standard orthography based on that used by Ross (1988: 3–4) in order to facilitate comparison.[22] This means, for example, that the *j* of the German-based orthographies of Yabem and Gedaged becomes *y*, Yabem *c* becomes *ʔ*, Gedaged *z* becomes *ɬ* and so on; the *ng* of English-based orthographies becomes *ŋ*; and Fijian *g, q* and *c* become *ŋ, g* and *ð* respectively.

Unless otherwise indicated, the following symbols have their usual phonetic values: *ð, g, ɢ, ɣ, h, k, l, ɬ, ʎ, m, n, ŋ, ñ, p, q, χ, ɾ, r, s, t, w, x, z, ʔ, a, æ, e, ɛ, ə, i, ɨ, o, œ, ɔ, ʌ, u, ɯ*. The voiced stops *b, d, g* and the voiced bilabial trill *ʙ* are prenasalised in some languages, but prenasalisation is not written unless it is phonemically distinctive. Other orthographic symbols (with values in IPA) are:

f	[ɸ, f]	voiceless bilabial or (less often) labio-dental fricative
v	[β, v]	voiced bilabial or (less often) labio-dental fricative
c	[ts], [ʧ]	voiceless alveolar or palatal affricate
j	[ʣ], [ʤ]	voiced alveolar or palatal affricate
y	[j]	palatal glide
dr	[^{n}r]	prenasalised voiced alveolar trill (as in Fijian)

[22] The main reason for retaining Ross' orthography was that the electronic files initially used in this project were drawn in large part from those used in the research reported in Ross (1988).

ö	[ø]	rounded mid front vowel
ü	[y]	rounded high front vowel

Other superscripts and diacritics are as follows:

- contrastive long vowels are represented by a macron, e.g. *ā*;
- contrastive vowel nasalisation in New Caledonian languages is represented by a circumflex, e.g. *â*;
- labialisation is marked by a superscript *w*, e.g. p^{w};
- velarisation is marked by a superscript *ɯ*, e.g. $p^{ɯ}$;
- contrastive aspiration is marked by a superscript *h*, e.g. p^{h};
- apicolabials are represented by the corresponding apical symbol and the linguolabial diacritic (the 'seagull'), e.g. *t̼*;
- retroflexes are represented by the corresponding apical symbol with a dot beneath, e.g. *ṛ*.

Except for inflexional morphemes, non-cognate portions of reflexes, i.e. derivational morphemes and non-cognate parts of compounds, are shown in parentheses (…). Where an inflexional morpheme is an affix or clitic and can readily be omitted, its omission is indicated by a hyphen at the beginning or end of the base. This applies particularly to possessor suffixes on directly possessed nouns (vol.1, ch.2, §3.2). Where an inflexional morpheme cannot readily be omitted, then it is separated from its base by a hyphen. This may happen because of complicated morphophonemics or because the morpheme is always present, like the adjectival *-n* in some NNG and Admiralties languages and prefixed reflexes of the POc article **na* in scattered languages. When a reflex is itself polymorphemic (i.e. the morphemes reflect morphemes present in the reconstructed etymon) or contains a reduplication, the morphemes or reduplicates are also separated by a hyphen.

Languages from which data are cited in this volume are listed in Appendix B in their subgroups, together with an index allowing the reader to find the subgroup to which a given language belongs. Appendix B also includes alternative language names. The difficulty of deciding where the borderline between dialect and language lies, combined with the fact that these volumes contain work by a number of contributors, has resulted in some inconsistency in the naming of dialects in the cognate sets (cf the cognate set supporting POc **kayu* on ch.3, §4.2). Some occur in the form 'Kara (E)', i.e. the East dialect of the Kara language, or 'Lukep (Pono)', i.e. the Pono dialect of the Lukep language, whilst others are represented simply by the dialect name, e.g. Iduna, noted in Appendix B as 'Iduna (= dialect of Bwaidoga)'.

4.3 Conventions used in representing reconstructions

Reconstructions are marked with an asterisk, e.g. **kayu* 'tree', in keeping with the standard convention in historical linguistics. POc reconstructions, and also PWOc, PEOc and PNGOc reconstructions, are given in the orthography of §3.4. For reconstructions at higher-order interstages the orthographies are those used by Blust in his various publications and the ACD. Reconstructions at lower-order interstages are given in the standard orthography adopted for data (§4.2). Geraghty's (1986) PCP orthography, for example, is based on Standard Fijian spelling, and is converted into our standard orthography in the same way as Fijian spelling is. In practice, this means that the orthographies for PROc and PCP are the same as for POc, except that a distinction between **p* and **v* is recognised and **R* is absent. Biggs and Clark's PPn

Table 1.4 Bracketing and segmentation conventions in protoforms

(x)	it cannot be determined whether *x* was present
(x,y)	either *x* or *y* was present
[x]	the item is reconstructable in two forms, one with and one without *x*
[x,y]	the item is reconstructable in two forms, one with *x* and one with *y*
x-y	*x* and *y* are separate morphemes
x-	*x* takes an enclitic or a suffix
‹x›	*x* is an infix

reconstructions are in any case written in an orthography identical to our standard. Bracketing and segmentation conventions in protoforms are shown in Table 1.4.

PMP final consonants are usually retained in POc. However, it happens fairly often that the final consonant in a higher-order reconstructed etymon (e.g. *-*R* in PMP **kamaliR* 'men's house') is not evidenced in any Oceanic reflex because POc final consonants are regularly lost in all the daughter languages from which reflexes are drawn, and we therefore have no evidence as to whether or not the final consonant was retained in the POc etymon in question. In such cases the consonant is reconstructed in brackets (e.g. POc **kamali(R)*).

In presenting words that display anomalies of form, it is often necessary to posit an expected form. For example, in ch.2, §5, the Gela form *ao* is presented in support of PEOc **wao* 'forest'. Given the reconstruction, however, we would expect the Gela form to be *wao*. In this volume we use a less widely employed convention and mark expected forms with a dagger, e.g. †*wao*, to distinguish them both from reconstructions and real data.[23]

There are occasions on which we need to posit a hypothetical form in a reconstructed protolanguage. In such cases the dagger and asterisk conventions are used together. For example in ch.4, §2.4, POc **lali(c,t)* 'buttress roots' is reconstructed. This is a reflex of PMP **dalij*, but the first consonant has undergone assimilation to the second in POc: the expected (but unattested) POc form would be †**ralic*.

When historical linguists compile cognate sets they commonly retain word for word the glosses given in the sources from which the items are taken. However, again in the interests of standardisation, we have often reworded (and sometimes abbreviated) the glosses of our sources, while preserving the meaning. Where glosses were in a language other than English we have translated them. In the interests of space and legibility, and because data often have multiple sources, we have given the source of a reflex only when it is not included in the listings in Appendix A.

In glosses we use the conventional abbreviations 'k.o.' (as in 'k.o. yam') for 'kind of', 's.o.' for 'someone', 's.t.' for 'something', 'sp.' for a species and 'spp.' for more than one species.

In putting together cognate sets we have quite often found apparent reflexes which do not quite 'fit' the set: either they display an unexplained phonological irregularity or their meaning is just a little too different from the rest of the set for us to assume cognacy. Rather

[23] Another convention sometimes used for this purpose is a double asterisk, e.g. ***wao*: we prefer the dagger on aesthetic grounds.

than eliminate them our authors often include them below the cognate set under the rubric 'cf. also'.

5 Data sources and conventions specific to this volume

5.1 Cognate sets and reconstructions

As explained in §4.1, a cognate set is almost always headed by a reconstruction for the highest-order Oceanic protolanguage that the set allows us to infer. In this volume these reconstructions are mostly for Proto Oceanic, Proto Western Oceanic, Proto Eastern Oceanic or Proto Remote Oceanic, and less often for Proto Southern Oceanic or Proto Central Pacific. Since Oceanic speakers spread across the Pacific from the Bismarck Archipelago to Fiji with remarkable speed, reconstructions at any of these interstages are likely to be early. Proto Admiralty, Proto New Guinea Oceanic and Proto Meso-Melanesian reconstructions are also listed in the few cases where they occur, as there is a fair probability that they are also of early Oceanic antiquity. 'Proto North/Central Vanuatu' reconstructions are given where reflexes are restricted to North/Central Vanuatu, even though it is improbable that these languages form an exclusive subgroup (§3.2.2). A PNCV reconstruction is more likely to represent a PSOc term that has not survived in southern Vanuatu and New Caledonia.

Proto Polynesian and Proto Micronesian terms that are not reconstructable to an earlier interstage are not given here, partly because they are likely to represent significantly later developments than the interstages enumerated in the previous paragraph, and partly because they are available elsewhere (Proto Polynesian in POLLEX and Proto Micronesian in Bender et al. 2003).

Lower-order reconstructions are also given *within* a cognate set in certain circumstances. If a term has undergone formal change or has been reapplied to a different plant at a particular point in its history, then a reconstruction is given for the relevant interstage. Also often included are Proto Southern Vanuatu reconstructions from Lynch (2001*c*, 2004*a*), as the phonological histories of Southern Vanuatu languages are far from transparent and the reconstruction often helps to illuminate the cognacy of SV items.

5.2 Botanical and ethnographic information and vernacular names

Sources of the Oceanic plant-name data used to make the reconstructions in this volume are listed in Appendix 1 after general data sources. Four works which provide Austronesian plant names in non-Oceanic languages have been of particular use in the search for cognates which allow the reconstruction of higher-order (PCEMP and PMP) plant names. These works are:

- *A dictionary of Philippine plant names* by Domingo A. Madulid (= Madulid 2001*a*, Madulid 2001*b*);
- *De nuttige planten van Indonesië* [The useful plants of Indonesia] by K. Heyne (= Heyne 1950): this is a catalogue of the useful plants of Indonesia, and includes indigenous plant names from various Indonesian languages of Indonesia;
- *Dictionary of Manggarai plant names* by Jilis A.J. Verheijen (= Verheijen 1982);
- *Dictionary of plant names in the Lesser Sunda Islands* by Jilis A.J. Verheijen (= Verheijen 1990).

Certain works which catalogue plants and give information about their forms, habitats and uses have been consulted over and over again, as will be obvious from the recurrence of certain references. They are:

- *Flora of the Bismarck Archipelago for naturalists* by P.G. Peekel (= Peekel 1984), translated by E.E. Henty from the unpublished German manuscript *Illustrierte Flora des Bismarck-Archipels für Naturfreunde*, compiled by Peekel in New Ireland during the 1930s and completed at Vunapope (Gazelle Peninsula, New Britain) in 1947.
- *A guide to the useful plants of Solomon Islands* by C.P. Henderson and I.R. Hancock (= Henderson & Hancock 1988)
- *Na masu'u 'i Kwara'ae—Our forest of Kwara'ae* by Michael Kwa'ioloa and Ben Burt (= Kwa'ioloa & Burt 2001)
- *Kiladi oro vivineidi ria tingitonga pa idere oro pa goana pa Marovo—Reef and rainforest: An environmental encyclopaedia of Marovo Lagoon, Solomon Islands* by Edvard Hviding (= Hviding 2005)
- *Some common trees of the New Hebrides and their vernacular names* by Sheila Gowers (= Gowers 1976)
- *A guide to the common trees of Vanuatu: With lists of their traditional uses and ni-Vanuatu names* by J.I. Wheatley (= Wheatley 1992)

All six works contain vernacular plant names. Since the Bismarck Archipelago is central to the study of POc plant names, it is a pity that there is no modern work dealing with the plants of the region parallel to, say Henderson & Hancock (1988) for the Solomons or Wheatley (1992) for Vanuatu. The *Guide to the trees of Papua New Guinea* website (Conn & Damas 2006) has been helpful, but still has many gaps in its coverage of the Bismarck Archipelago. Peekel's coverage is excellent and includes all plants (even seagrasses). Indeed his coverage is considerably better than that of either Henderson & Hancock (1988), which covers 'useful plants', or Wheatley (1992), which is restricted to trees. The ethnobotanical works on the Solomons, Kwa'ioloa & Burt (2001) and Hviding (2005), also provide good coverage, but this is balanced by rather thin information about many plants.

Pacific food plants have a literature of their own, and here three works were extensively consulted in addition to those listed above:

- *Les plantes alimentaires de l' Océanie : origines, distribution et usages* [Food plants of Oceania: origins, distribution and uses] by Jacques Barrau (= Barrau 1962)
- *Food plants of Papua New Guinea* by Bruce R. French (= French 1986)
- *Fruits of Oceania* by Annie Walter and Chanel Sam (= Walter & Sam 2002)

Of these only the last provides vernacular terms, with a strong bias towards Vanuatu.

5.3 Scientific plant names

The scientific names of plants are a minefield for the non-botanist, as there are often synonyms and the accepted name for a plant may change over time. In order to keep track of synonyms frequent use was made of the *International plant names index* (IPNI = IPNI 2004) and the *Australian plant names index* (APNI = APNI 1991).

Linnaean families have undergone recent changes. For present purposes the most important is that Leguminosae are subdivided into Cisalpiniaceae (formerly Cisalpinioideae), Fabaceae (formerly Papilionatae) and Mimosaceae (formerly Mimosoideae). Other changes relevant here are that Gramineae (grasses) are now Poaceae, and Palmae are now Arecaceae.

5.4 English and Pacific pidgin plant names

Wherever plant names in English and/or one of the three major Pacific pidgins are available, they are included in the section titles in chapters 5 to 13. Names in the three pidgins are marked with an abbreviation. Together with major sources of names, these are:

TP: Tok Pisin (New Guinea pidgin), Mihalic (1971), French (1986)
P: Pijin (Solomons pidgin), Jourdan (2002)
B: Bislama (Vanuatu pidgin), Gowers (1976), Wheatley (1992), T. Crowley (1995)

The pidgin names are given to help some readers to recognise the plant under discussion. In Papua New Guinea it is common for both indigenous people and expatriates to know a plant by its Tok Pisin name but to know neither an English nor a scientific name. The situation is presumably similar in the Solomon Islands and Vanuatu.

5.5 Indexes

The volume has four indexes. The first, as in previous volumes, is an index of reconstructions arranged by their protolanguages. The second is an alphabetical list of reconstructions, the third an index of plants by genus and species, the fourth by botanical family.

3 Ethnobotanical classification

BETHWYN EVANS

1 Introduction

This chapter examines the ways in which Proto Oceanic speakers classified their knowledge of plants through the reconstruction of semantic categories and their associated labels for higher-order taxa and the hierarchical taxonomies they imply. Five Proto Oceanic terms (**kayu* 'tree, shrub', **waroc* 'vine', **pali[s,j]i* 'grass', **taliŋa* 'mushroom' and **limut* or **lumut* 'moss, algae') are clearly reconstructable based on reflexes in a wide range of Oceanic languages, but the semantic scope of these terms and other possible higher-order taxa that denote types of plants not encompassed by these five taxa are more difficult to reconstruct.[1]

2 Ethnobiological classifications

It seems to be a human universal to classify flora and fauna into what can be described as hierarchies of labelled taxa. For example, in Wayan Fijian *bau leke* (dwarf *bau*), the name for *Planchonella gabari*, a tree that grows in mid-altitude forests, is one of four kinds of *bau*, the generic term that refers to the *Burckella*, *Manilkara*, *Palaquium* and *Planchonella* species of the Sapotaceae family, woody trees used for making boats, chests and house posts. In turn *bau* is one of 200 or more kinds of *kai*, the generic name for trees and shrubs (Pawley & Sayaba Forthcoming). Thus *kai*, *bau* and *bau leke* form part of a hierarchy of decreasing inclusiveness of botanical terms in Wayan Fijian, schematised in Figure 3.1, and shown in more detail in Figure 3.2 below.

Not only is the hierarchical classification of flora and fauna an apparent human universal, but the striking similarities in ethnobiological taxonomies across different societies from different parts of the world suggest the presence of universal or general principles of ethnobiological classification. Berlin (1992) argues that these general principles have a cogni-

[1] Thanks to Ian Scales for his help with describing the Nduke ethnobotanical classification and to Andrew Pawley for his detailed comments on earlier versions of this chapter, including help with the description of the Wayan Fijian system of classifying plants. Thanks also to Malcolm Ross for comments on earlier versions of this chapter. This paper has also benefited from the comments and suggestions of various people at the Oceanic conference in 2004 where an earlier version of the paper was presented.

Malcolm Ross, Andrew Pawley and Meredith Osmond, eds *The lexicon of Proto Oceanic*, vol. 3: *Plants*, 55–87.
Pacific Linguistics, 2006.

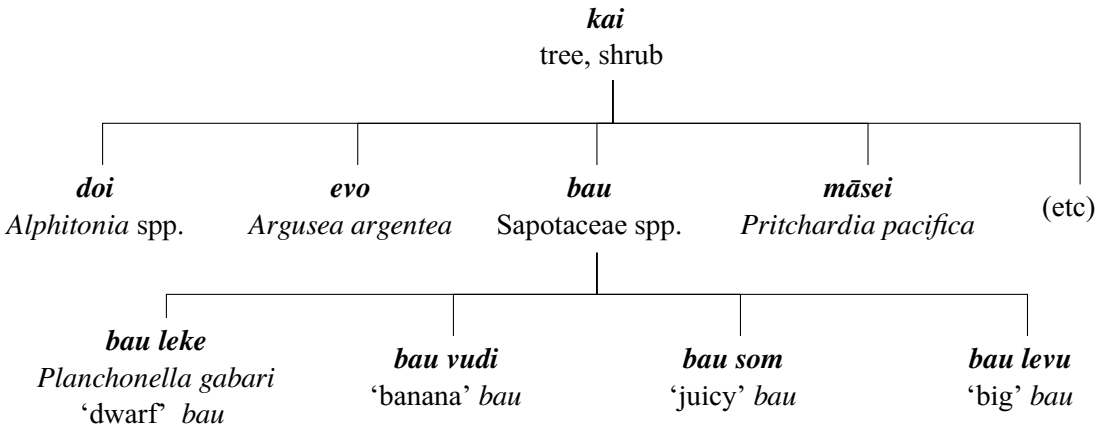

Figure 3.1 The hierarchical structure of ethnobiological classifications, exemplified by Wayan Fijian

tive explanation. He proposes that within the biological reality of a local habitat there are readily definable 'chunks' that are recognised within folk taxonomies. That is, ethnobiological taxonomies result from the human ability to recognise the single pattern of morphological similarities within a local flora and fauna that stands out from all other patterns (Berlin 1992:9, 13). Others, such as Diamond (1966) and Hunn (1982), argue that ethnobiological classifications are more culturally specific and based on utilitarian principles. Perhaps more realistically, Hays (1982:93) proposes that ethnobiological classifications are 'products of a number of complex interacting factors: biological discontinuities in nature, chance historical events, 'utilitarian' human concerns, human cultural concerns in a broader sense, intellectual curiosity, and constraints deriving from the nature of human perception and cognition'.

One of the general principles of folk taxonomies proposed by Berlin et al. (1973), and revised in Berlin (1992), is that they all comprise taxa distributed across no more than six mutually exclusive ranks, such that the taxa within each rank show certain similarities to each other and are separate from other taxa within the rank by perceptual gaps. The six ranks, in order of decreasing inclusiveness are: kingdom, life-form, intermediate, generic, specific and varietal, and it is often the case that only the life-form, generic and specific ranks within a taxonomy will be named.

Kingdom is a unique primary taxon, a single taxon that incorporates all taxa of lesser rank. In terms of ethnobotanical classification such a category will tend to correspond to the biological taxon plantae; the English term *plant*, in its broad sense. Life-form taxa are not included in any taxa other than that of the kingdom and mark a small number of types (between 5 and 10) based on the recognition of distinctive morphological structure. English *tree*, *grass* and *vine* are life-form taxa. Folk generics will comprise the largest number of taxa within a system, with some communities distinguishing as many as 500 to 600 generics. The total will depend on how closely the community interacts with their plant environment and on how rich the flora is in the region. These taxa denote categories that are considered distinct on the basis of their shared morphological structure and ecological behaviour. The majority of taxa within the generic rank are monotypic and form the lowest level within the classification, and although most folk generics are included within a life-form rank, some are

unaffiliated, usually because of their morphological uniqueness or sometimes their economic significance. Taxa of the specific rank are directly subordinate to the folk generics and are usually few in number. Berlin (1992:24) suggests that subgeneric taxa are in part motivated by cultural considerations, and tend to refer mainly to domesticated plants and animals.

Berlin (1992:26-35) also argues that there are cross-cultural similarities in the ways in which the taxa of each rank within a taxonomy are named. The kingdom rank, which Berlin implies is a generally recognised one, will often be an implicit category without an overt label.[2] If labelled it will often be with terms that are polysemous with some subordinate rank. Life-form taxa are generally labelled by non-compound lexical units, although as with the kingdom rank, they are sometimes covert (non-labelled) taxa. Folk generics are also labelled by non-compound lexical units, in contrast to the subordinate specific rank which tends to have compound labels. Berlin (1992:29-30) notes two conditions under which taxa below the level of folk generic may be labelled by non-compound lexical units. The first is when one taxon of a folk generic is considered to be the prototype of the generic taxon, in which case a primary name may be polysemous denoting both the generic and subgeneric taxa. Taxa below the folk generic level may also be labelled with a primary name if they represent a plant or animal of major cultural importance.

These typical naming strategies can be demonstrated by the Wayan terms in Figure 3.1. The taxa *kai* 'tree, shrub' and *bau* 'Sapotacae species', apparently life-form and generic taxa respectively, are labelled by non-compound lexical units, whereas the specific rank, for example *bau leke* '*Planchonella gabari*', is labelled by a compound that incorporates the term for the folk generic. As expected the kingdom level taxon in Wayan is not overtly labelled, although *kai* 'tree, shrub' is sometimes used to refer to all plants, most commonly in phrasal expressions, such as *vūniwai ni kai* 'a doctor (i.e. scholar) of trees/plants, botanist' (Gardner & Pawley 1992:9). Wayan Fijian *uvi* is a non-compound term that labels a taxon below the level of the folk generic. Most specifically *uvi* denotes a particular type of cultivated yam, *Dioscorea alata*. However, as the most prestigious cultivar, this label also denotes the more general taxon that encompasses the various species of *Dioscorea* (Gardner & Pawley 1992:12, 14).

There are a number of ways in which the above description of ethnobiological taxonomies is too simplistic. Gardner & Pawley (1992), for example, note a number of problems with assigning taxa within the Wayan Fijian folk classification of plants to ranks within Berlin's (1992) model. As mentioned Wayan *kai* 'tree, shrub' can be treated as a life-form category; it denotes a highly distinctive morphotype, incorporates a large number of taxa of a lesser rank, which are apparent folk generics with primary names, and it is named by a primary (non-compound) lexeme. Wayan *kai* 'tree, shrub' contrasts with two other major categories *ō* 'grass' and *wā* 'vine'. However, these two taxa behave somewhat differently from *kai*, raising questions about the notion that they are of equivalent status within the system of classification. While *ō* 'grass' and *wā* 'vine' denote highly distinctive morphotypes and incorporate a reasonably large number of lesser ranked and heterogeneous taxa, subtaxa of these categories often have binominal labels that include the generic labels *ō* and *wā* (see §3). Although Gardner & Pawley (1992:13) conclude that *ō* 'grass' and *wā* 'vine' can be analysed as equivalent ranks to *kai* 'tree, shrub', it is important to note that not all taxa representing

[2] Berlin (1992:190-194) presents both linguistic and behavioural evidence which can be used to determine the presence of covert kingdom rank categories.

the same rank within a taxonomy will behave in the same way.

Hunn (1982:836), on the other hand, argues that the notion of taxonomic rank is 'a purely formal distinction imposed by the analyst' and questions whether a taxonomic hierarchy model is an appropriate way to describe and explain ethnobiological classification systems. He presents a number of arguments against a model of folk biological classification based on categories distinguished by general morphological characteristics and in favour of one based more on the practical significance of the classification within the culture. Hunn presents data that point to a cultural basis for life-form taxa in a number of languages. For example, in Sahaptin (Columbia Plateau, United States) the boundaries of the taxa *c'íc'k* 'grass' and *latít* 'flower' are best defined in terms of cultural practices rather than morphological characteristics alone. So *c'íc'k* 'grass' encompasses all herbaceous plants (which are not *latít* 'flowers') that are not otherwise named. All such named plants are considered useful in some way, and so plants encompassed by *c'íc'k* 'grass' (or *latít* 'flower') are defined as non-useful and are grouped together 'only by virtue of having been passed over in the process of cultural recognition' (Hunn 1982:834-5, 838). Thus Sahaptin *c'íc'k* 'grass' and *latít* 'flower' are residual categories, a notion which is problematic within Berlin's 1992 model of taxonomic ranks.

Speakers of a language may also have more than one way of classifying plants. The Wayan taxonomy described in most detail by Gardner & Pawley (1992) is one that conforms to Berlin's model of folk taxonomies based on general biological criteria. It is a taxonomy which at each level recognises a number of apparently mutually exclusive categories based primarily on morphological and ecological features. However, they also note the presence of a second system of classification, based mainly on the uses and cultural status of plants, which comprises categories that cut across those of the other taxonomy (Gardner & Pawley 1992:15, see also §3 for more details of the Wayan classification of plants). Randall (1976) demonstrates the presence of apparently contradictory categories in folk taxonomies in both English and Samal, a language of the Philippines. Following the expected hierarchy of increasing inclusiveness, in Samal *sagbot tahik* 'seaweed' is classified as a type of *sagbot* 'non-woody vegetation', which in turn is a category of *tumbutumbuhan* 'vegetation' which is a taxon of *isi gumi* 'flesh of the land'. But *sagbot tahik* 'seaweed' is not actually a kind of land flesh (Randall 1976:546-547). Kwa'ioloa & Burt (2001), on the other hand, describe the higher levels of the ethnobotanical taxonomy of Kwara'ae (Southeast Solomonic) as a continuum such that particular labelled folk generics or species may be referred to by different higher level taxa under different circumstances.

Hays (1976) goes further and notes that individual speakers of a language will not all have the same knowledge and classification of plants, thus questioning what the description of a folk taxonomy is really representing. Is it a description of a taxonomy comprising the elements that are shared by the majority of speakers? Or a taxonomy comprising the combination of elements from the majority of speakers? Hays demonstrates how amongst the Ndumba speakers of the New Guinea Highlands the knowledge of plant names and classification is variably distributed. Hays has recorded 1,247 plant names in Ndumba, but only 970 items or 77.8% were known to all ten speakers within his sample. However, both these figures are misleading in terms of the number of plant names known by individual speakers, which are less than the combined lexicon of 1,247 and greater than the shared lexicon of 970 items (Hays 1976:493-494). Interestingly, Hays found that the variation in individuals' taxonomic models occurred in the middle of the hierarchy with the folk generic and species ranks, while all speakers agreed on life-form and varietal ranks.

Nevertheless the following descriptions of ethnobotanical classifications in modern Oceanic languages are presented within Berlin's (1992) model, as it provides a clear and consistent way of presenting such classifications cross-linguistically. Also for the majority of Oceanic languages the data is not available to me to present more realistic classifications based on the range of factors noted by Hays (1982) as relevant, including the utilitarian factors described by Hunn (1982). The folk classification of plants for five Oceanic languages, Wayan Fijian, Kwara'ae (Southeast Solomonic), Nduke (Meso-Melanesian), Arosi (Southeast Solomonic) and Samoan (Polynesian), are described below. Gardner & Pawley (1992) present the classification of plants in Wayan following Berlin's model and this description is closely followed in the account of Wayan given below. For the other languages, however, the description of a folk classification of plants within Berlin's model is a reinterpretation of data presented in other sources. Kwa'ioloa & Burt (2001), a detailed catalogue of plant names and their uses, also presents information on the traditional Kwara'ae classification system which is described here in terms of the ranks within Berlin's model. For Nduke, Arosi and Samoan the data on ethnobotanical categories has been collated from dictionaries (Scales n.d., Fox 1978 and Milner 1966, respectively) and thus the reinterpretation of the data within Berlin's model entailed not only decisions on the rank of particular terms, but also on the hierarchy itself and the inclusiveness of particular lexemes.

In line with Hays' (1982:93) range of explanations for folk taxonomies, the similar types of categories found within ethnobotanical classifications in Oceanic languages are unsurprising for a number of reasons. First, many features of the botanical classifications in Oceanic languages are those that would be predicted on the basis of what Berlin (1992) proposes as universal tendencies. For example, the life-form taxa of many Oceanic languages distinguish between woody plants, climbing or creeping plants and grass-like plants, morphological characteristics that form the basis of life-form taxa in many folk taxonomies (see also Brown 1984). Further, since Oceanic languages are spoken within regions having more or less similar flora and fauna, it is not unexpected that more specific details of ethnobotanical classifications would be similar across Oceanic languages. Traditional Oceanic societies also share similar foraging-horticultural lifestyles, and thus certain utilitarian aspects of botanical folk taxonomies would also be expected to be similar. And finally, since all Oceanic languages are related, their systems of ethnobotanical classification might be expected to be similar because they have a common origin. Cognate lexical labels across modern Oceanic languages provide evidence for the common origin of certain taxa, and their reconstruction for Proto Oceanic.

Pawley (2000) describes differences in the stability of terms denoting different types of taxa within ethnobiological classifications of Oceanic languages. He finds that the modifying terms in binomial names for folk specifics are much less stable than the terms for folk generics, and suggests that one explanation for this is that species show a wide range of distinctive morphological and ecological characteristics from which one is picked out and named by the modifier in a binomial label, and such modifiers are liable to be replaced by competing labels (Pawley 2000:37). Higher-order generics (for example, life-form taxa) tend to be just as stable in form as folk generics, but less stable in meaning. The reason for this, Pawley (2000:37) suggests, is that these higher-order taxa form much less homogeneous categories than lower-order taxa. They tend to consist of a disparate class of animals or plants which are linked by relatively few distingushing characteristics, a situation which allows speakers to extend or contract the boundaries of the class for certain purposes more easily. This can

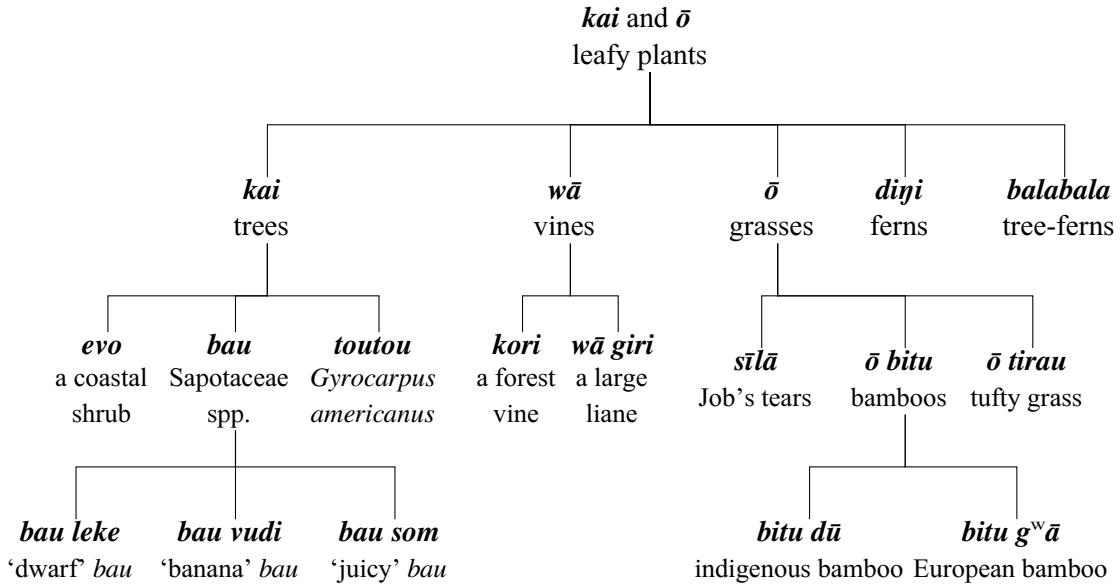

Figure 3.2 A partial ethnobotanical taxonomy of Wayan Fijian

be seen particularly with the descriptions of Kwara'ae *ʔai* and Wayan *ō* below which have both broad and narrow conventionalised meanings.[3] It is important to note that here, perhaps more that in other semantic domains, the reconstructions represent only a part of the original system and project a uniformity that is most likely unrealistic in a number of respects.

Pawley (2000:3–4) proposes that detailed reconstructions of lexical semantics are best made using what can be called the 'terminological method of reconstruction'. Thus hypotheses about the meanings of reconstructed lexical items are made within a particular semantic field and with reference to semantic relationships between terms within a semantic domain on the basis of the semantic field in modern Oceanic languages (see also Ross et al. 1998:4–6). In accord with the terminological method the following section examines the ethnobotanical classifications found in a number of modern languages as a preliminary to reconstructing botanical life-form taxa for Proto Oceanic. Section 4 presents cognate sets which suggest the reconstruction of terms expected to have ocurred in Proto Oceanic. The meanings of the Proto Oceanic etyma reconstructed are based on both the meanings of the reflexes in daughter languages and on the apparent contrasts within the Proto Oceanic systems of ethnobotanical classification.

[3] Randall (1976) argues that taxonomic tree hierarchies are probably not stored directly in the memory, but rather when necessary people can recall the perceptual characteristics of classes of flora and fauna to be used for different purposes, including gardening, foraging, naming plants and creating classification schema. If this is indeed the case, then a reason for changes in the meaning and scope of higher-order taxa within a classification may also be the result of changes in speakers' views of what fits within a taxon each time it is used for a particular purpose.

3 Botanical taxonomies in modern Oceanic languages

Comparison of ethnobotanical classifications across modern Oceanic languages is rather difficult since there are few detailed descriptions of such systems. Nonetheless, from the descriptions I've found and from dictionary searches it can be seen that a number of Oceanic societies have similar, though by no means identical, types of ethnobotanical taxonomies.

3.1 Wayan Fijian

One of the better described Oceanic systems of ethnobotanical classification is that of Wayan Fijian, as presented in Gardner & Pawley (1992) and Pawley & Sayaba (Forthcoming). Figure 3.2 shows schematically the major parts of the higher order botanical taxa in Wayan Fijian.

As in many Oceanic languages, in Wayan there is no single lexical item that conventionally denotes all plants in contrast to non-plants. Rather this is a covert category which is occasionally overtly expressed through the extension of the terms *kai* or *ō*, which primarily denote life-form categories (Gardner & Pawley 1992:8–9). When used in a broad sense *ō* denotes all leafy plants including bamboos, trees, reeds and vines, but does not include mosses, lichens and mushrooms. Wayan Fijian has general terms *taliŋa* 'generic, includes various kinds of fungi, eg. mushrooms, bracket fungi' and *lumelume* 'algae, green slime which grows on reefs and keels of boats, and in rivers and ponds'. However, there is no evidence in Wayan for a taxon that is higher than the broad uses of *kai* and *ō* which would encompass 'leafy plants' as well as fungi, mosses and lichens (Andrew Pawley pers.comm.). The primary taxa of plants in Wayan, and those which appear to represent Berlin's (1992) life-form rank, include three major categories, *kai*, *wā* and *ō*, as well as a number of smaller taxa. The taxon *kai*, defined in the Wayan dictionary (Pawley & Sayaba Forthcoming) as 'generic for trees and shrubs, and occasionally low bushy plants', includes plants with vertical woody stems and branches. Palms are classified as *kai*, but bamboos and bananas are not. The term *wā* is the generic for plants which creep, scramble or climb above the ground, regardless of whether they have woody stems or not (Gardner & Pawley 1992:9). The term *ō* is the generic for grasses and herbs, including grasses and grass-like plants, as well as small flowering plants that lack woody stems (herbs). Also classified as *ō* are grass-like plants with woody stems such as bamboo, sugarcane and reeds. Wayan also has a couple of other primary taxa which cover much smaller groups of named plants including *diŋi*, generic for medium-sized terrestrial ferns and *balabala*, generic for tree-ferns and sometimes also other large ferns. These taxa of plants in Wayan Fijian are primarily defined by morphological and ecological characteristics of the plants.

kai 1. Wood 2. Generic for trees and shrubs (and occasionally low bushy plants) 3. Used in certain compounds as a generic for all plants.

wā 1. Generic for scrambling and climbing plants; creeper, vine. 2. Cord, rope, string.

ō 1. Generic term includes mostly non-bambusoid grasses and a few sedges and herbs. 2. Used as first element in compounds as a generic term for any leafy plant including bamboo, trees, reeds, and vines. Plants which are not *ō* in sense 2 include mosses, lichens and mushrooms.

diŋi Generic for ferns, includes at least the following two medium-sized terrestrial ferns: *Nephrolepis biserrata* (Davalliaceae) and *Sphaerostephanos invisus* (Thelypteridaceae).

balabala Generic for tree ferns (*Cythea* species), sometimes extended to include other large ferns.

Wayan *kai* 'tree, shrub' encompasses about 200 named subtaxa which are again classified on the basis of shared morphological and ecological features. It is the names of these subtaxa which Wayan speakers tend to use when identifying particular plants (Gardner and Pawley 1992:10), and nearly all are folk generics. Generally the subtaxa of *kai* are the lowest-level of classification and denote a particular species within a 'scientific' classification. For example, *evo*, *māsei* and *toutou* (defined below, Pawley & Sayaba Forthcoming) are all subtaxa of *kai* which are not further subclassified in Wayan.

evo *Argusia argentea* (Boraginaceae). Large broad-leaved shrub of coastal sands, uncommon on Waya, young parts densely grey-silver hairy, small white flowers on curving branches, small black berries. Useful only for firewood.

māsei *Pritchardia pacifica* (Arecaceae/Palmae). A native fan-palm, cultivated for ornament around houses. The immature seeds are sometimes eaten by children.

toutou *Gyrocarpus americanus* (Hernandiaceae). Tree of coastal slopes and rocky places inland, pale smooth bark, large oval or 5-lobed leaves with a rather strong bean-like odour, bunches of hanging 2-winged fruit. The soft wood is used for fires; it is good for carving, and formerly was used to make *ulatoka* (inshore fishing raft platforms). A medicine of some kind is made from bark, for treating internal organs.

There are also subtaxa of *kai* which are further subclassified into apparent folk specifics, as can be seen from the dictionary entries given below for *araro* and *doi* (Pawley & Sayaba Forthcoming).

araro *Premna* sp. or spp. (*P. serratifolia, P. protrusa*) (Verbenaceae). Small coastal tree with entire leaves. Hard wood, much used for posts.

araro alewa *Premna serratifolia* (Verbenaceae). Small bushy tree, occasional in scrub near coast. Leaves opposite, rounded-oblong to pointed and heart-shaped, flowers smallish, green-white, small dark fleshy fruit with a hard 4-chambered stone.

araro taŋwane *Premna protrusa*. A larger tree than *P. serratifolia*, with flower parts more protruding, usually found inland. Hard wood, much used for posts.

doi Generic for *Alphitonia* spp. (Rhamnaceae). Trees of open dryish forest.

doi dū *Alphitonia zizyphoides*. Tree of open dryish forest, bark and leaves smelling of oil-of-wintergreen when crushed, leaves white below, small white flowers, purplish fruit capsules.

doi drā *Alphitonia franguloides*. Uncommon tree of dryish slopes, leaves smaller and more pointed than those of *A. zizyphoides*.

The names for folk specifics tend to be binominals which include the generic followed by a modifier indicating some distinctive characteristic of the folk specific. For example, Wayan

distinguishes four kinds of *bau* '*Sapotaceae* varieties': *bau leke*, literally 'dwarf *bau*', denotes the smaller *Planchonella garberi* (Pouteria, cf.Wheatley 1992) species; *bau levu*, 'big *bau*' which presumably denotes larger species of Sapotaceae; *bau som*, where *som* means 'to suck or eat juicy, soluble or soft, moist foods', denotes the various Sapotaceae species which have milky juice; and *bau vudi*, 'banana *bau*' which denotes varieties with elongated (i.e. banana-like) fruit.

bau Generic, includes species of *Burckella*, *Manilkara*, *Palaquium* and *Planchonella* (Sapotaceae). Wood of some of these trees is used for boats, chests and house posts. Applied to the following species growing on Waya: 1. *Burckella richii*. large tree of low- to middle-altitudes, fruit green, fleshy, cylindrical, 4cm long; 2. *Manilkara vitiensis*, smallish tree, often in exposed situations on coastal slopes; 3. *Palaquium fijiense*. smallish uncommon tree of higher-altitude forest; 4. *Planchonella garberi* (Sapotaceae). 5. *Planchonella grayana*, a tree of coastal and inland forest, leaves larger and rounder than those of *P. garberi*.

bau leke *Planchonella garberi* (Sapotaceae). Occasional in mid-altitude forest.

bau levu One or more species of Sapotaceae, application of name not clear.

bau som Name applied to various (perhaps most or all) members of the Sapotaceae, in reference to their milky juice.

bau vudi Name applied on mainland to members of Sapotaceae (spp. of *Burckella* and *Manilkara*), presumably because of their large and elongate fruits.

The *wā* 'vine, creeper' taxon includes upwards of fifty subtaxa, virtually all of which occur either optionally or obligatorily with the generic *wā* as a classifier, for example, *wā giri* or *giri* '*Entada phaseoloides*' and *wā bitubitu* 'Smilaceae species' (Gardner & Pawley 1992:9, 12, Pawley & Sayaba Forthcoming). Subtaxa of *wā* form the lowest level of classification, and the majority denote a single species, as can be seen from the following dictionary definitions of *alu*, *kori* and *wā giri* (Pawley & Sayaba Forthcoming).

alu *Epipremnum pinnatum* (Araceae). Common forest climber, the young plant with simple oval leaves, creeping on ground, the climbing adult with stout stems and large deeply-cut leaves. Leaves provide a medicine for stomach-ache.

kori *Mucuna gigantea* (Leguminosae). Forest vine, broad bean-like leaves, flowers green, curved, broad dark pods at first with golden-brown irritant hairs, the discoid reddish grey seeds found in the drift.

wā giri *Entada phaseoloides* (Leguminosae). Large high-climbing liane of inland forest with huge leathery pods, the large discoid dark red-brown seeds common in the drift. Stems are used to tie thatching.

A small number of subtaxa of *wā* denote more than one species, but here too these subtaxa appear to be the lowest level of named classification, as with *rautolu* and *wā bitubitu*.

rautolu Generic, includes various *wā* and shrub taxa with 3-partite leaves. 1. *Canavalia rosea*. Common vine of sandy foreshore, flowers pink-purple, pods about 10 x 2 cm, often wrinkled. Leaves said to have been used after childbirth in some way. 2. *Canavalia sericea*. Local on sandy foreshore, the leaves silver-hairy. 3. *Jasminum degeneri*. 4. (obsolete) *Melicope cucullata*.

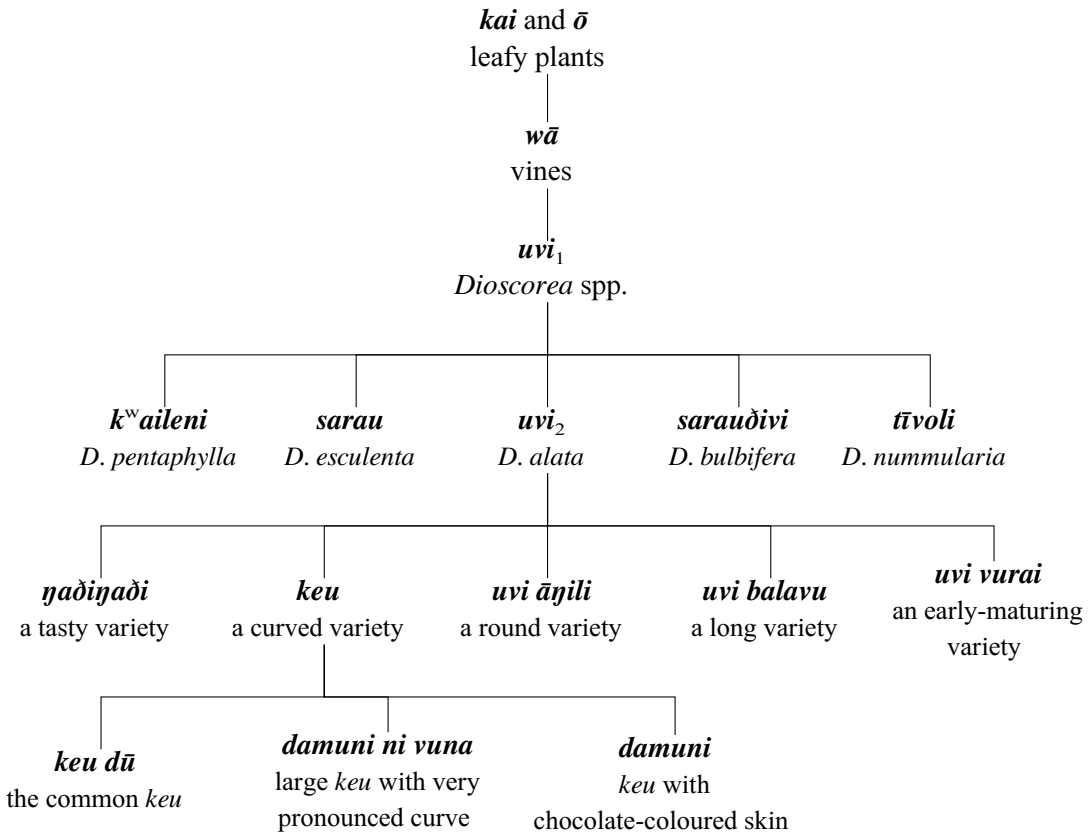

Figure 3.3 A partial plant taxonomy of Wayan Fijian, showing taxonomic depth of some cultivated food plants

wā bitubitu Generic, includes two species of strong-stemmed vines. 1. *Smilax vitiensis* (Smilacaceae). Forest vine, stems strong, round, sometimes with a few prickles, leaves oval to heart-shaped, leathery, with a pair of tendrils at the stem, red to black 1-3-seeded berries hanging together from a dangling stalk. Used for binding rafters and making fish-traps. 2. *Geitonoplesium cymosum* (Smilacaceae). Slender but strong vine of forest understorey, small orange fruit with black glossy seeds.

The Wayan term *ō* is somewhat harder to describe. Typical *ō*-type plants are non-bambusoid grasses and some sedges and herbs. However, *ō* can also occur as the initial element in names of reeds (*ō sina*) and bamboo (*ō bitu*), suggesting that *ō* includes not only grasses and herbs, but also woody-stemmed plants that are grass-like. There are about fifty subtaxa of grasses, herbs, reeds and bamboos that are denoted by the life-form *ō* (Gardner & Pawley 1992:12), and most of these subtaxa appear to be the lowest level of classification, whether denoting a single species as with *ō ðaŋiðaŋi* and *ō tirau*, or denoting several species as with sīlā.

ō ðaŋiðaŋi *Cymbopogon coloratus*. Lemon grass. Stout tussocky uncommon grass of dry hill-sides. Leaves smell of lemon, and are used to make tea, and for padding under house mats.

ō tirau *Imperata cylindrica* (Gramineae). Occasional grass of hillsides, tufts to about knee-height, flower heads silky, cylindrical. Used for thatching.

sīlā Generic, includes two large-seeded grasses (Gramineae). 1. *Coix lacrymajobi*. Job's tears. Coarse grass, fertile parts with tear-shaped blueish bony structures that enclose the true seeds. 2. *Zea mays*. Maize or sweet corn. Occasionally cultivated.

As can be seen from Figure 3.2, the taxonomy of wild plants in Wayan Fijian is quite shallow, including four named levels. The naming of cultivated food plants, however, comprises a deeper taxonomy. Thus while labels for particular species, and more commonly genera, form the lowest level of classification among wild plants, for cultivated food plants there will often be a number of named varieties below the folk species level. In fact, as shown by Figure 3.3, if cultivated food plants are incorporated in the Wayan ethnobotanical classification, the taxonomy includes at least six levels. Figure 3.3 shows this with a selection of the named types of yams. Yams are considered to be part of the *wā* 'vine' taxon, one group of which, the *Dioscorea* species are denoted by the generic term *uvi*. More specifically *uvi* denotes *Dioscorea alata* yams and encompasses a large number of named varieties, some of which are themselves further subclassified. Thus *keu* 'a variety of *uvi* with a curved tuber' has three varieites: *damuni* 'with chocolate-coloured skin'; *damuni ni vuna* 'large, with very pronounced curve' and *keu dū* 'the common variety'.

Gardner & Pawley (1992:15) also note other categories of plants in Wayan which cut across the taxonomy presented above. For example, while in one sense *uvi* '*Dioscorea* species of yams' would be categorised as *wā* 'vines', they can also be classified as *mārawa* 'ground crops, food plants other than trees'. The system of classification that includes *mārawa* 'ground crops' is partially shown in Figure 3.4. *Mārawa* 'ground crops' contrasts with *vuata* 'tree crops, trees that bear edible fruit', and encompasses not only root crops such as yam, taro and sweet potato, but also other non-tree food crops such as melons, maize, sugarcane and bananas (Gardner & Pawley 1992:15), and thus is not a category that fits within the taxonomy presented in Figure 3.2. This latter taxonomy is based primarily on the use and cultural status of the plants, in contrast to the former taxonomy that is based mostly on the morphological and ecological characteristics of the plants.

3.2 Kwara'ae

Kwa'ioloa & Burt (2001) present a classification and description of *rū bulao kī* 'growing things' in Kwara'ae, and this classification is shown schematically in Figure 3.5. Their classification is as much to present a catalogue of Kwara'ae plant names and uses as to describe the Kwara'ae folk botanical taxonomy, and so descriptive names have been given to groups of plants that are recognised as similar by Kwara'ae speakers, but that did not necessarily form labelled taxa originally. In developing Figure 3.5 only those labels from Kwa'ioloa and Burt which denote traditionally overt or covert categories have been included. Terms that were traditionally used by Kwara'ae speakers are in bold and those that have been developed for Kwa'ioloa and Burt's book but appear to reflect originally covert categories are in plain text. As can be seen the Kwara'ae folk taxonomy is quite shallow with only four or five levels.

The nominal use of *bulao* 'to grow' in *rū bulao kī* 'growing things' is a way to refer to the kingdom category of all plants. Most growing things can also be denoted by *ʔai* 'tree', although more commonly *ʔai* has a narrower meaning. It is not clear if Kwara'ae speakers traditionally recognised a category of all plants or if this category results from the need for

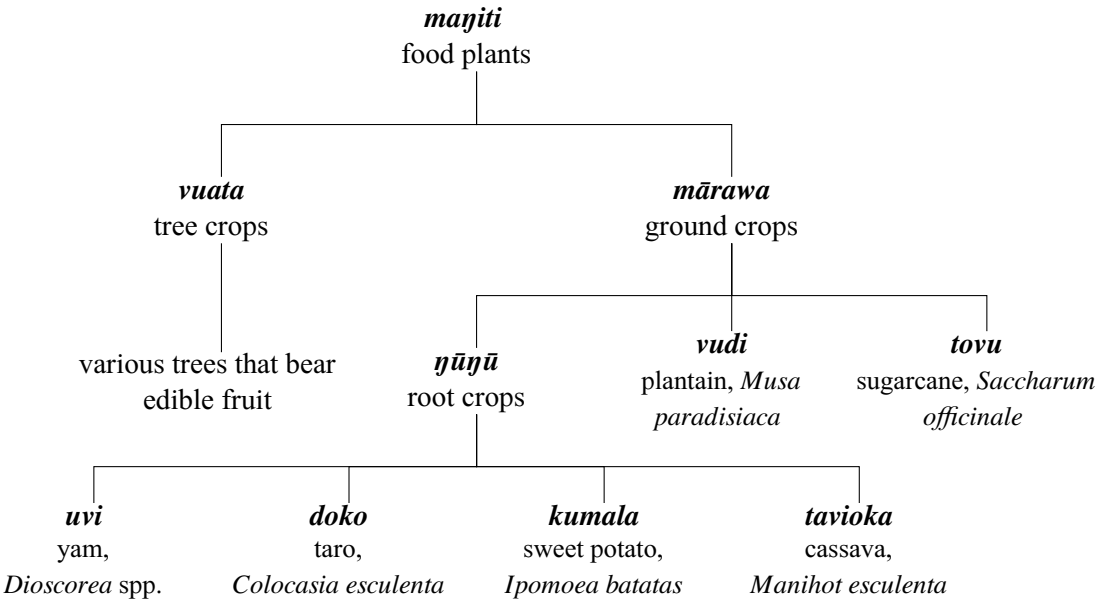

Figure 3.4 A partial classification of foods in Wayan Fijian

a way to talk of all plants when working on Kwai'oloa and Burt's book. Burt notes that the classification of plants by Kwara'ae speakers is mainly for 'pragmatic and utilitarian purposes' and that not all categories are mutually exclusive, but rather the categories overlap in various ways (Kwa'ioloa & Burt 2001:16). Kwara'ae speakers appear to classify the majority of r*ū bulao kī* 'growing things' into three categories: *ʔai* 'tree', *fiʔi-rū* 'clumps' and *kʷalo* 'vines'. The distinguishing characteristics of *ʔai* plants are a hard trunk and a branching growth structure. Kwara'ae *ʔai* can also be used more broadly to denote palms, soft-cored trees (eg. pawpaw), cordyline shrubs, gingers and ferns, which are not considered *ʔai* 'tree' in the narrow sense of the word. *fiʔi-rū* 'clumps' is the descriptive term, comprising the classifier *fiʔi* and the noun *rū* 'things', to denote plants that grow as a cluster of stems. Thus *fiʔi-rū* 'clumps' encompasses plants like gingers, bamboos and ferns. The term *fiʔi-rū* 'clumps' is listed as a possible life-form taxon in Figure 3.5, although it is not entirely clear if this is a traditional Kwara'ae taxon. However, Burt notes that this category of plants includes those which can be indicated by the classifier *fiʔi*, and so traditionally *fiʔi-rū* 'clumps' may have been a covert category. The term *kʷalo* 'vines' denotes plants with a climbing or creeping growth structure, that is those plants used as cordage, a secondary meaning of *kʷalo*. However, *kʷalo* does not include the vines of edible tubers which are referred to as *kʷala*. While they appear to form the basis of botanical classification in Kwara'ae, these three life-form taxa are not mutually exclusive but rather seem to be labelled groups along a continuum of morphological characteristics, such that *ʔai* 'tree' normally referring to plants with single hard stems and branches may sometimes be used to refer to cordyline shrubs, which under other circumstances may be referred to as *fiʔi-rū* 'clumps'.

Palms do not fit within this three-way classification at all. As noted, palms may be referred to as *ʔai*, but only in its broad sense that denotes all plants, and not in its more narrow sense. Burt (Kwa'ioloa and Burt 2001:17) describes palms as a covert category. Kwara'ae speakers generally refer to palms by the individual names, but recognise and readily acknowledge

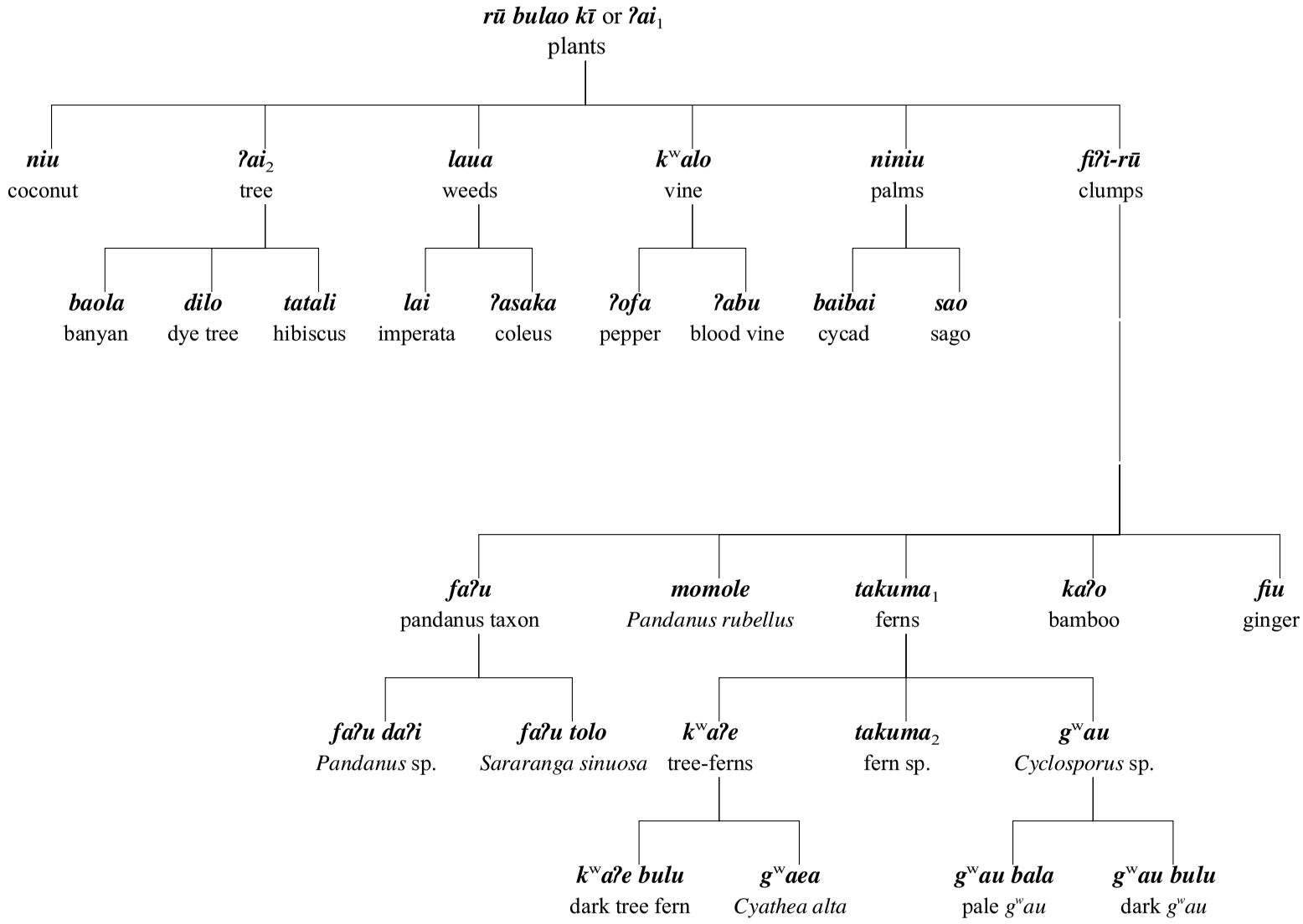

Figure 3.5 A partial ethnobotanical taxonomy of Kwara'ae

the similarities amongst them. Palms may be described as *rū ki gasiʔi rebani* 'things we tear into flat pieces', denoting their shared use for slatting and battens. This is a function that characterises palms, but is not restricted to them. Kwa'ioloa and Burt (2001:186) use the word *niniu* to label the category of palms, describing it as denoting kinds of trees (*ʔai*) that are similar in being tall and erect with leaves that emerge from a stave or mid-rib. Members of the *niniu* taxon are not eaten or burnt as fuel, but are important in making platforms and walls as well as battens for thatching, and their fronds are used for making brooms. The term *niniu*, an apparent reduplication of *niu* 'coconut, *Cocos nucifera*' suggests that this category may be based on resemblance of form and use of palms to *niu* 'coconut'. However, *niu* 'coconut' itself is not referred to as *niniu*, probably because of its common occurrence and importance (Kwa'ioloa and Burt 2001:17).

The other small category of plants that does not fit within any of the three major categories is *laua* 'weeds'. It denotes small plants that 'can (and often should) be 'pulled up' when they grow in places like gardens' (Kwa'ioloa and Burt 2001:17). However, the term *laua* can also be used to refer to seedlings or saplings.

Kwara'ae *ʔai* 'tree' is a large category with over 200 named types described in Kwa'ioloa and Burt (2001:102-181). They classify *ʔai* into three groups: (i) *ʔai doe kī* 'big trees'; (ii) *ʔai neʔe kesi doe liu goʔo kī* 'trees which don't get very big'; and (iii) *ʔai neʔe tiʔitiʔi goʔo kī* 'trees which are just small'. These descriptive labels and the groups they represent appear to have been established for the convenience of Kwa'ioloa and Burt's (2001) book, and it is unclear if they are in common usage amongst Kwara'ae speakers. Thus they are not listed in Figure 3.5. The majority of the named types of *ʔai* appear to denote single scientific species and form the lowest level of classification. However, a few are further subclassified. For example, *lami-lami* 'archidendron, *Archidendron oblongum*' denotes two named varieties of *Archidendron oblongum* that appear to be distinguished on the basis of morphological characteristics. The small tree, *ʔalaʔala* '*Codiaeum variegatum*' also encompasses a number of named varieties (Kwa'ioloa and Burt 2001:134, 175).

lamilami A very big tree, archidendron, *Archidendron oblongum*.

> ***etana lamilami*** First archidendron. A big tree with brown trunk, wide leaves and a yellow flower that has an acute smell, which grows in the lowlands and beside big bodies of water. Used for making canoes, cooking houses and for fuel.
>
> ***ruana lamilami*** Second archidendron. A very big tree with buttress roots and a whiteish trunk that grows in swamps and mangroves. Used for building houses and for fuel.

ʔalaʔala Croton, *Codiaeum variegatum* species. A small tree that grows wild in the lowlands and by the sea and is planted around homes. Fronds used for decorating houses and people.

> ***ʔalaʔala marako*** Green *ʔalaʔala*, with really green leaves
>
> ***ʔalaʔala sako*** Yellow *ʔalaʔala*, with yellow leaves.
>
> ***ʔalaʔala meo*** Red *ʔalaʔala*, with red leaves
>
> ***ʔalaʔala fiʔirodo*** Getting-dark *ʔalaʔala*, with red and darkish leaves
>
> ***ʔalaʔala ogamu*** Wants-to-break *ʔalaʔala*, with a leaf that has breaking points.

Kwa'ioloa & Burt (2001:193-219) divide *fiʔi-rū* 'clumps' into a number of groups. The group *fiʔi-rū neʔe boeboena ka ofi fafia faʔina kī* 'clumps with leaf-tubes sheathing the stem'

encompasses plants like gingers, bananas and alpinas. That is, leafy plants with soft-core stems that are sheathed with leaves. The group *fiʔi-rū neʔe kasirūʔa kī* 'clumps which are sectioned' is the descriptive term used for plants like bamboos and reeds that have stems with nodes and can thus be cut into internode sections. These two categories are not listed in Figure 3.5 as they represent groups of plants that can be seen as similar in form and use, but are apparently not categories traditionally recognised by Kwara'ae speakers. Kwa'ioloa & Burt (2001:207-213) use the term *takuma* to denote all ferns. Strictly speaking *takuma* refers to *Diplazium proliferum* and other ferns are referred to by their individual names. However, *takuma* would also be used to refer to a bundle of different edible ferns that included *Diplazium proliferum*, suggesting the traditional presence of a covert category at least. Thus *takuma* as a category denotes *Diplazium proliferum*, an important fern, and other plants considered similar in terms of morphological characteristics, namely a short dark bole, long curled over leaves and the lack of flowers or fruit. Kwa'ioloa and Burt (2001:212) also include in this category *kʷaʔe*, the generic term for tree-ferns, which also denotes the 'proper' or important tree-fern *Cyathea lunulata*. Tree-ferns are plants with leaves like ferns but trunks like trees. The young leaf-shoots are eaten and the trunks used for building. The term *kʷaʔe* encompasses a number of different named varieties.

The category of *fiʔi-rū* 'clumps' also includes a number of other plants that do not fit into any of these three smaller categories, including the various types of named pandanus. Within the scope of the book, Kwa'ioloa & Burt (2001:214) use the term *faʔu* for all types of pandanus. However, it is not clear that this is a traditional Kwara'ae category, and so it is not inlcuded in Figure 3.5.

The term *kʷalo* 'vines' appears to be a smaller taxon than either *ʔai* 'trees' or *fiʔi-rū* 'clumps', with only 38 subtaxa listed by Kwa'ioloa and Burt. A few of these are further subclassified, but the majority are terminal taxa. It is not clear where grasses and grass-like plants fit into the Kwara'ae classification, as they are not mentioned by Kwa'ioloa and Burt, although one grass, *lai* '*Imperata conferta*' is classified as *laua* 'weeds'.

3.3 Arosi

The determination of ethnobotanical taxonomies in other modern Oceanic societies has been based on dictionaries and lexicons and so the conclusions are less certain. However, such dictionary searches do suggest that a number of other Oceanic languages, including Nduke (Meso-Melanesian, Scales n.d.), Arosi (Southeast Solomonic, Fox 1978) and Samoan (Polynesian, Milner 1966), have systems of ethnobotanical classification that are not greatly different from that of Kwara'ae and Wayan Fijian. Figure 3.6 shows schematically an Arosi taxonomy that can be constructed from plant names in Fox's dictionary.[4]

Again, Arosi appears to have no form which denotes all plants in contrast to non-plants. There is a general term which denotes uncultivated plants, namely *hara* 'a wild plant that grows of itself, is not planted by man'. However, a contrasting term for cultivated plants was not found. Arosi has at least four major life-form categories of plants which seem to be based on morphological characteristics similar to those defining the life-form categories in Wayan Fijian.

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[4] It is not clear from the dictionary definitions which other plants would be classified as *rari*.

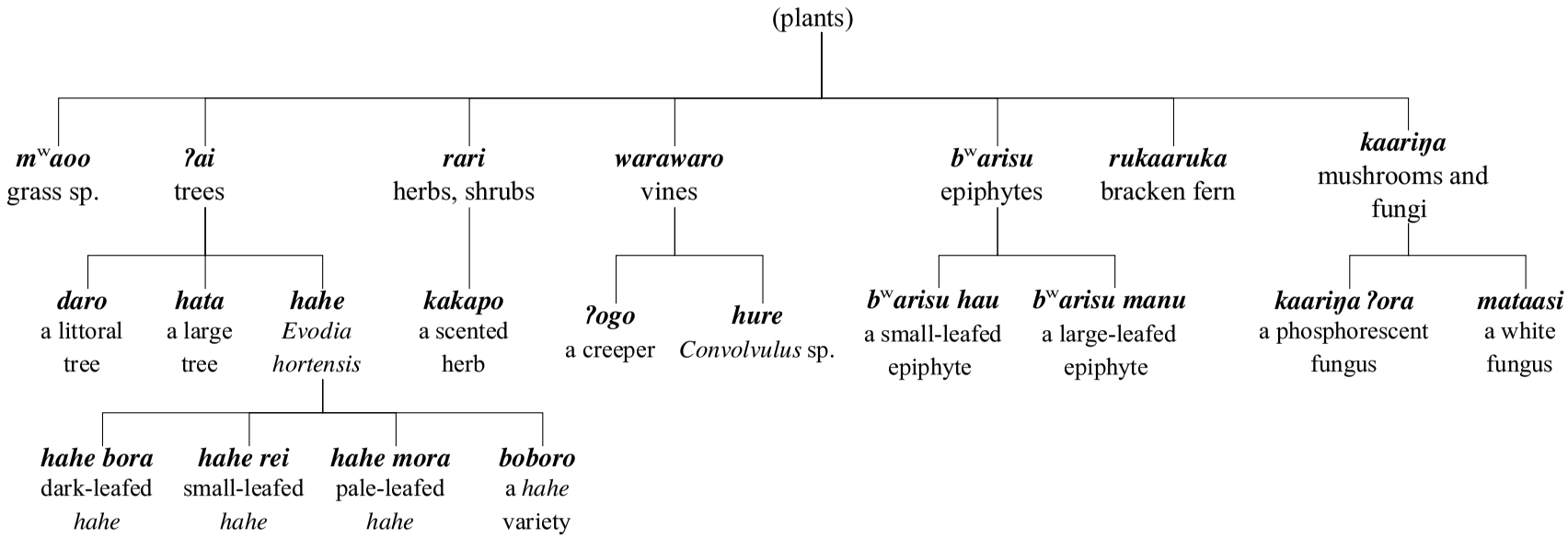

Figure 3.6 Arosi ethnobotanical classification

ʔai A tree or plant having stems and branches; not used of fern, cycad, sago palm, coconut etc., but used of small plants, eg. balsam.

rari Any herb or shrub which has no main stem, as flax.

warawaro Vines.

kaariŋa Mushroom, fungus.

The important morphological characteristic of *ʔai*-type plants is apparently the presence of a main stem and branching structure, but Fox (1978) notes that *ʔai* can also be used 'loosely' to refer to coconut palms and tree-ferns, plants which lack branching structure but do have a distinct main stem. In contrast to Wayan, *ʔai* in Arosi does not in its primary meaning include palms. The term *rari* denotes herbs and shrubs that lack a main stem, and since 'as flax' is included in the definition, it is possible that this taxon may also include grass-like plants. However, as I did not find an Arosi term that appeared to denote a life-form taxon encompassing grasses, in Figure 3.6 various names of grasses have been represented as primary taxa. Plant types that could be labelled ferns and epiphytes in English also do not appear to be included in any of the other four life-form categories and have been represented as primary taxa.

The subtaxa of the four major life-form categories generally form the lowest level within the classification. However, of the 200 or more plant names which are encompassed by the *ʔai* taxa, there are at least five which are further subclassified. For example,

hahe (mahe) A shrub, sweet-smelling and sacred, planted in *hera*, burial grounds, and used to decorate armlets; long glossy leaves, four sepals, petals and stamens in the white flowers, *Evodia hortensis*.

hahe bora with dark leaves

hahe mora with pale leaves

hahe rei with very small leaves

boboro a species of *hahe*

ʔoʔo A species of tree

ʔoʔomaradaro variety used for gong making

ʔoʔorawaraha another variety

ʔoʔoriʔi a variety used for making outrigger canoes

Arosi *warawaro* 'vines' is another category that includes a large number of subtaxa, with between 50 and 100 named items occurring in the dictionary. However, all of the subtaxa of *warawaro* 'vines' form the lowest level of classification. The same is true of the subtaxa of *rari* 'herbs and shrubs' and *kaariŋa* 'mushrooms'.

3.4 Nduke

Nduke speakers distinguish seven primary taxa of plants. The term *ɣae*, primarily used to denote 'trees' can also be used to refer to all plants (Scales n.d.).

ɣae A general name for any kind of tree, bamboo, tree-ferns and other tall plants (except grass) that have woody stems.

veve A general name for vines and creepers.

heheu A general name for all kinds of grass (mostly Poaceae family). Also used to refer to dicot herbs.

lulumutu A general name for green algae that grows inside concrete tanks etc. and moss that grows on trees.

roɣa A general name for plants which grow as brambles or thickets.

havoro Flower, also used as the general name for flowering plants such as orchids.

pureke A general name for mushrooms. Often refers to a kind of edible mushroom that grows on rotting sago palm trunks in swamps.

The category *ɣae* 'tree' is the largest in Nduke with over 200 subtaxa. Many of these are terminal taxa, but some are further subclassified. Unusually amongst Oceanic languages bamboos and tree-ferns are classified as *ɣae* 'tree' in Nduke. *Veve* 'vines and creepers' consists of about 20 subtaxa and *heheu* 'grasses and dicot herbs' over 10, all of which are terminal taxa. *Roɣa*, a 'general term for plants which grow as brambles and thickets,' refers more to areas where the vegetation is characterised by thicket-type growth, than particular types of plants that are characterised by thicket-type growth (Ian Scales, pers.comm.).

3.5 Samoan

In Samoan there appear to be at least six primary taxa of plants, as shown below with the terms and definitions from Milner (1966). Samoan *lāʔau*, as well as being the generic term which denotes 'trees', also appears to be used as the generic term for all plants and occurs as the initial element in a number of plant names, including trees (*lāʔau lōpā* 'red sandalwood, *Adenanthera* species'), shrubs (*lāʔau failafa* 'candelabra bush, *Cassia* species'), herbs (*lāʔau faimoti* 'herb, *Euphorbia* species'), and woody vines (*lāʔau ʔie* 'liane, *Freycinetia* species').

lāʔau Plant, tree

ʔoliʔolī General name given to large ferns

pupuvao Tall grass, weeds

mutia Grass

fue General name given to creepers and lianas

taliŋa Name given to several types of fungus, including Jew's-ear

limu General name given to mosses, lichens, algae, and seaweeds

4 Botanical taxa in Proto Oceanic

A number of the primary botanical taxa that are shared by many modern Oceanic languages have cognate labels and are reconstructable for Proto Oceanic. Clearly reconstructable for Proto Oceanic are the following five terms that denoted broad categories of plants, apparently based on particular morphological characteristics.

****kayu*** Tree or shrub - generic name for plants with woody stems and branches, probably not including palms or tree-ferns (§4.2).

****waRoc*** Generic term for vines and creepers, plants with creeping or climbing growth structure (§4.4).

****pali[s,j]i*** Generic term for grasses and other 'grass-like' plants (§4.5).

****limut, *lumut*** Generic term for mosses, algae and seaweeds (§4.6).

****taliŋa*** Generic term for mushrooms and fleshy fungi (§4.7).

4.1 Plant

A term denoting all plants is not reconstructable for Proto Oceanic. A number of modern Oceanic languages do have a general term for plants, but these terms appear to be post-Proto Oceanic innovations. The list below gives the general terms for 'plant' in a number of languages, but none are cognate. In North-East Ambae and Anejom̃ these general terms for 'plants' are nominalisations of verbal terms. For example, North-East Ambae *rivurivu* 'plant' is a reduplicated form of the transitive verb *rivu* 'to plant s.t.', and Anejom̃ *nita-awañ* is formed from the verb *awañ* 'to plant' with the instrumental prefix.

Adm:	Lou	*koe*	'plant (N)'
NNG:	Poeng	*kinkiniŋ*	'(all) growing things; grass, tree'
NNG:	Sissano-Arop	*oraman*	'plants (generic)'
SES:	Bugotu	*jou*	'to plant, a plant'
NCV:	Ambae	*rivurivu*	'plant (N)'
SV:	Anejom̃	*nita-awañ*	'plant, s.t. planted or to be planted'
Mic:	Chuukese	*pətəwər*	'plant (general term), vegetation (uncultivated); tree, bush, shrub, fern, grass'

A Proto Micronesian form **fadoka* 'planted thing, cultivated plants' is reconstructable (Bender et al 2003:24), but appears to be restricted to meaning something that has been planted rather than all plants. This form looks to be a nominalisation of a Proto Micronesian verbal **fadoki* 'to plant'.[5]

PMic **fadoka* 'planted thing, cultivated plants'

Mic:	Kiribati	*aroka*	
Mic:	Chuukese	*fɔtā-*	(from *fɔto-* 'planting' and a noun-forming suffix)
Mic:	Carolinian	*fɔto*	'generic term for plants'
Mic:	Woleaian	*fato*	'plant (N)'
Mic:	Ulithian	*fa-faxu*	'plant (N)'

PMic **fadok(-i)* 'to plant (s.t.)'

Mic:	Kosraean	*yuki*	
Mic:	Mokilese	*pɔtok*	'to work at planting, to set in the ground (VT)'
Mic:	Chuukese	*fɔtuki*	
Mic:	Carolinian	*fɔtoxi*	
Mic:	Woleaian	*fatoxi*	

If Proto Oceanic speakers did have a category that included all plants, then it appears to have been covert. In this respect Proto Oceanic would have been like most modern Oceanic languages which lack a general term 'plant'. Gardner and Pawley (1992:8-9) note that in

[5] Osmond (1998:132) reconstructs Proto Oceanic **asok* 'plant in holes in the ground', along with a Proto Western Oceanic form **pasok-i-* 'to plant sth (tubers etc)' that looks to be a form derived with the causative prefix **pa-*. The Micronesian forms below are likely cognates of Proto Western Oceanic **pasok-i-*, suggesting the reconstruction of **pasok-i-* 'to plant something' for Proto Oceanic.

Wayan the category 'plant' is best considered covert as no term has 'plant' as its central meaning. Wayan *kai* 'generic for trees and shrubs (and occasionally low bushy plants)' is sometimes used as a generic for all plants. It is difficult to assert the presence or absence of a covert kingdom category in Proto Oceanic. From meanings of reflexes in the daughter languages, it is not clear that the general meaning of 'plants' can be reconstructed as a secondary meaning of terms denoting other more specific categories of plants.

4.2 Tree

The most stable primary taxon label, in that it is reflected most widely amongst the modern languages is **kayu*, the general term for trees and other plants with woody stems and branches. While some languages, like Bing, appear to have retained the original vowel-glide-vowel sequence, the majority have simplified it in some way. These changes appear to have occurred reasonably late in the development of this form, since there are closely related languages that show different types of changes. For example, **kayu* is reflected as *au* in Mono, but as *ɣae* in Nduke, two Northwest Solomonic languages, and as *kau* in Bauan and *kai* in Wayan, two Fijian languages.

PMP **kayu* 'tree, wood, timber' (Dempwolff 1938)

POc **kayu* 'tree or shrub: generic name for plants with woody stems and branches, probably not including palms or tree-ferns; wood, stick'

Adm:	Loniu	*ke*	'tree, wood'
Adm:	Titan	*kei*	'firewood'
NNG:	Lukep (Pono)	*kai*	'tree, wood'
NNG:	Mangap	*ke*	'wood, tree (generic)'
NNG:	Bing	*ayuw*	'firewood, fallen tree ready for firewood'
NNG:	Takia	*ai*	'tree (generic), wood, firewood, plant'
NNG:	Manam	*ʔai*	'tree, stick'
NNG:	Sissano-Arop	*ai*	'tree, stick, wood'
PT:	Motu	*au*	'tree, firewood'
PT:	Iduna	*ai*	'tree, plant, wood, fire, light'
PT:	Muyuw	*kay*	'tree'
PT:	Misima	*ai*	'tree, wood'
MM:	Patpatar	*ai-*	'tree species, followed by name of species'
MM:	Mono	*au*	'tree'
MM:	Nduke	*ɣae*	'general name for any kind of tree, bamboo, tree-ferns and other tall plants (except grass) that have woody stems'
SES:	Gela	*ɣai*	'branching plant, shrub or tree (i.e. balsam, croton and banyan are all *ɣai*, but not palm or coconut); wood, timber; firewood.'
SES:	Bugotu	*ɣai-*	'tree, shaft of spear'
SES:	Kwaio	*ʔai*	'branch, tree, stick; woody plant (shrub, tree)'
SES:	Arosi	*ʔai*	'tree or plant with stem and branches; not used of a fern cycad, sago palm, coconut etc, but used of small plants, eg. balsam.'

NCV:	NE Ambae	*kai*	‘tree, wood’
NCV:	Paamese	*āi*	‘tree, wood, stick’
NCV:	Nguna	*na-kau*	‘tree’
SV:	Anejom̃	*inɣai*	‘tree, wood, often used for relatively small bushes’
NCal	Xârâcùù	*kwãã*	‘wood, tree (general term)’
Mic:	Kiribati	*kai*	‘wood (in general), tree, plant, stick’
Mic:	Chuukese	*eyi-*	‘stick, tree, pole’ (only used in compounds)
Mic:	Ulithian	*-xæy*	‘counting classifier for trees’
Fij:	Rotuman	*ʔai*	‘tree, plant; wood, timber, piece of wood’
Fij:	Bauan	*kau*	‘tree, piece of wood, stick’
Fij:	Kadavu	*kaðu*	‘tree’
Fij:	Wayan	*kai*	‘wood; generic for trees and shrubs, and occasionally also low bushy plants; used in certain compounds as generic for all plants; piece of wood, stick’
Pn:	Tongan	*kau*	‘stalk, stem’
Pn:	Tikopia	*kau*	‘stalk, stem supporting bunch of fruit’
Pn:	Samoan	*ʔau*	‘stalk; shaft, axle; handle’
Pn:	Hawaiian	*ʔau*	‘handle, staff, stem, bone of lower arm or leg’

Many reflexes of **kayu* have additional senses besides ‘tree or shrub’, namely ‘wood, timber’, ‘stick’ and ‘firewood’. For the Proto Oceanic term both ‘tree or shrub, general name for plants with woody stems and branches’ and ‘wood, timber’ are reconstructed as they seem to be the best supported by the modern reflexes. The descriptions in a number of modern languages suggest that woodiness and a main stem, along with branching growth structure are likely to have been the salient characteristics of **kayu* plants in Proto Oceanic.

In Polynesian languages there has been a semantic shift and the reflexes of **kayu* have the meaning of stem or stalk. The Proto Polynesian term for tree or woody plant was **raʔakau*. This form was a compound of reflexes of Proto Oceanic **raqan* ‘branch’ and **kayu* ‘tree’, supporting the idea that the presence of a main stem and branching growth structure were the salient features of this category.

PPn **raʔakau* ‘generic term for tree or woody plant; wood, timber; generic for all plants’ (POLLEX)

Pn:	Niuean	*akau*	‘wood, tree’
Pn:	Tongan	*ʔakau*	‘tree, plant; wood’
Pn:	E Futunan	*laʔakau*	‘tree, bush, shrub; wood, plant’
Pn:	Rennellese	*gaʔakau*	‘tree, bush, shrub, log, stick’
Pn:	Tikopia	*rakau*	‘generic term for member of vegetable kingdom, usually woody plant, including tree, shrub, herb, but not applied to root vegetable or grass’.
Pn:	Samoan	*lāʔau*	‘plant, tree’
Pn:	Hawaiian	*lāʔau*	‘tree, plant, wood, timber’
Pn:	Maori	*rākau*	‘tree; wood, timber; stick’

4.3 Palms

Were palms considered **kayu*? For the majority of reflexes of Proto Oceanic **kayu* it is not clear from the dictionary definitions whether palms are included within the category. For languages where the definitions are explicit about the status of palms, in some cases palms are included and in others not. For example, in Gela and Arosi (Southeast Solomonic) the categories denoted by *ɣai* and *ʔai*, respectively, do not include palms. In Wayan Fijian, on the other hand, *kai* does appear to encompass palms, with a number of different palms, including *māsei* 'fan palm (*Pritchardia pacifica*)', *niu* 'coconut (*Cocos nucifera*)' and *soŋa* 'palm used for thatching (*Sagus vitiensis*, Palmaceae)' defined as part of the *kai* taxon in Pawley and Sayaba (2003). In a few languages palms appear to form labelled categories of their own. Thus Anejom̃ *nak*^{w}*ai* is the generic term for palms, though excluding coconuts (Lynch 2001a:173). In Samoan *niu* is a 'general name for palms, especially the coconut palm' (Milner 1966:156-7). Also in Tongan there is evidence that *niu* 'coconut tree or fruit' can be used to refer to palms more generally since it optionally occurs as part of the name for fan palm (*niu piu* or *piu* 'fan palm, *Eupritchardia pacifica*', Churchward 1959). Burt describes palms as a covert category in Kwara'ae (Kwa'ioloa & Burt 2001:17). That is, while Kwara'ae speakers recognise and acknowledge the similarities amongst palms, they do not name such a category.[6]

A term denoting palms as a category does not appear to be reconstructable for Proto Oceanic, and it seems likely that palms were considered primary taxa within the system. But was 'palm' a covert category for Proto Oceanic speakers, as it is today for Kwara'ae speakers? There is some evidence for this in that terms for different parts of palms, such as **bala(p,b)a(q)* 'palm branch' and **[pa]paq[a-]* 'frond of palm' are reconstructable, suggesting the recognition of a category of plants with similar morphological characteristics (Malcolm Ross pers. comm.). It is of course possible that the variation in the treatment of palms amongst the modern languages reflectes variation in Proto Oceanic. Thus it could be that palms were considered **kayu* 'tree, shrub' by some speakers of Proto Oceanic and not others and in some circumstances and not others. Such a situation would not be unexpected in the light of studies on ethnobotanical classifications.

4.4 Vine, creeper

Proto Oceanic **waRoc* denoted plants with creeping or climbing growth structure, that is vines and creepers. As reflexes of **waRoc* in Gedaged and Wayan encompass lianes, or woody vines, it seems likely that Proto Oceanic **waRoc* did too. But further evidence that creepers and woody vines were treated as part of the same taxon is needed.[7]

The final consonant of the Proto Oceanic form is reconstructed as **c* rather than **s*, as although the internal Oceanic evidence cannot disambiguate the choice between **c* and **s*,

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[6] To solve the problem of explicitly describing such a covert category in their classification and description of plants in Kwara'ae, Kwa'ioloa and Burt (2001:17, 186) label palms as *niniu* 'kinds of trees that are similar in being tall and erect and that are used for platforming and walling and for battens for thatching', but this does not appear to be a conventional Kwara'ae usage.

[7] A third meaning, 'vein' is found in reflexes from a number of subgroups (Adm, NNG, PT, NCV, SV, Mic). Similar meanings are also found with some cognates in non-Oceanic Austronesian languages, such as Simalur *olor* 'root, vein, tendon' (Blust ACD).

the external evidence points to **c*.

PMP **waRej* 'vine, creeper' (ACD)

POc **waRoc* 'generic term for vines and creepers, plants with creeping or climbing growth structure; string, rope'

Adm:	Wuvulu	*wao*	'rope, vein, tendon'
NNG:	Bing	*war*	'vine (generic)'
NNG:	Gedaged	*wa̧l*	'vine, liana'
PT:	Idunaduna	*waloga-*	'vein'
PT:	Misima	*wal*	'stem (of mustard vine)'
PT:	Motu	*varovaro*	'vines of all kinds'
MM:	Nakanai	*ualo*	'cord, thread'
MM:	Roviana	*aroso*	'general name for vines and creepers'
MM:	Marovo	*adoso*	'vine, creeping or climbing, general term; climbing vines of *Calamus* types (lawyer cane)'
SES:	Gela	*alo*	'a creeper, string'
SES:	Bugotu	*aðo*	'rope, cord, creeper'
SES:	Tolo	*alo*	'generic name for vines; rope, string'
SES:	Lau	*k^{w}alo*	'a vine of yam, sweet potato etc'
SES:	Kwaio	*k^{w}alo*	'vine, string, rope'
SES:	'Are'are	*waro*	'a liana, string, rope'
SES:	Sa'a	*walo*	'a creeper, rope, string, line, vine'
SES:	Arosi	*waro*	'a piece of string, twine; prefix to names of creepers'
		waro-waro	'vines'
SV:	Anejom̃	*inwau*	'vine; rope (traditional), string; sinew, tendon, vein' Also occurs as initial element in a number of names of vine species.
Fij:	Bauan	*wā*	'a vine, creeper of any kind' (also occurs as initial element in a number of names of vine species)
Fij:	Wayan	*wā*	'generic for scrambling and climbing plants; creeper, vine'

4.5 Grass

Proto Oceanic **pali[s,j]i* appears to have been the generic for plants lacking a main stem and with narrow-leafed foliage, that is grasses and grass-like plants.

PMP **bali(j,z)i* '(type of ?) grass' (ACD)

POc **pali[s,j]i* 'generic term for grasses and other grass-like plants' Grace 1961: **palisi*)

Adm:	Nauna	*pelic*
Adm:	Pak	*penit*
NNG:	Poeng	*paili*
NNG:	Tami	*ijili*
MM:	Lihir	*palic*

MM:	Ramoaaina	*wali*	
MM:	Halia	*halisi*	
SES:	Kwaio	*falisi*	‘grassy undergrowth (generic); yam harvest’
SES:	‘Are’are	*harisi*	‘grass, small clover’
SES:	Sa’a	*ha-halisi*	
SES:	Ulawa	*hälisi*	‘grass, onion (late use)’
NCV:	Mota	*valis*	‘a tall coarse grass; in recent use grass generally and onions’
NCV:	Mwotlap	*vlih*	‘grass, turf (Gramineae), *Thuarea involuta*’ (*na-plih*)
NCV:	Wusi	*palihi*	
NCV:	Morouas	*ßalisi*	
SV:	Sye	*(novl)ovsi*	‘buffalo grass (*Stenotaphrum secundatum*). (cf. *novol* ‘kind of plant; initial element for plant names including a grass, a fern and two tree-ferns’)
SV:	Southwest Tanna	*nə-vhiləkˀ*	‘a kind of grass’[8]
SV:	Anejom̃	*ne-ptʃes*	‘a kind of grass’
Mic:	Chuukese	*fetiri*	
Mic:	Carolinian	*fitili, fetili*	
Mic:	Woleaian	*fatili*	‘grass (*Thuarea involuta* or *Stenotaphurum*)’
Pn:	Samoan	*falī*	‘kind of grass (? *Scirpodendron* species)’[9]

The cognate set given above reflects both Proto Oceanic **palisi* and **paliji*. In many languages Proto Oceanic **s* and **j* have merged. However, Nauna, Pak, Southwest Tanna and Anejom̃ reflect **j* while Poeng, Halia and the Southeast Solomonic languages reflect **s*. In the Micronesian languages this form appears to have undergone metathesis of the two medial consonants, giving Proto Micronesian **fadili* ‘generic term for grass’. A parallel change has occurred in the North New Guinea languages. I take these metatheses to be independent innovations.[10]

The semantic scope of **pali[s,j]i* in Proto Oceanic is not totally clear. Poeng, Kwaio, Chuukese and Carolinian support the reconstruction of this term as a generic for grasses, but there are also several languages where reflexes of **pali[s,j]i* denote particular, but different, types of grass, including Mota, Sye, Anejom̃, Woleaian and Samoan. Thus while a generic meaning is reconstructed for Proto Oceanic **pali[s,j]i*, it needs to be noted that it is not so well-supported as the reconstruction of other life-form taxa.

On the basis of modern languages it seems likely that Proto Oceanic would have had a primary taxon that included at least grasses and/or herbs. In Wayan Fijian *ō* usually denotes non-bambusoid grasses, but does occur as the initial element in the names of reeds (*ō sina*)

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[8] Southwest Tanna *nəvhiləkˀ* ‘grass’ leads Lynch (2001b:246) to reconstruct Proto Southern Vanuatu **na-(p,v)alijiɣ*, suggesting that the Proto Oceanic form was **pali[s,j]ik* with a final **-k*. However, there is no other evidence for Proto Oceanic **-k*, and so I do not reconstruct it.

[9] The loss of Proto Oceanic **s* in Samoan is irregular.

[10] One language, Simalur (WMP), reflects Proto Malayo-Polynesian **j*, suggesting Proto Oceanic **c* (Blust ACD).

and bamboos (*ō bitu*). In Nduke *heheu* is glossed as 'grasses and dicot herbs' and appears to be restricted to soft grasses, bamboos being part of the *ɣae* 'tree' taxon. In other languages, like Gumawana, Lau and Mokilese, apparently generic terms for grass are also glossed weeds. Arosi, on the other hand, does not appear to have a generic term for grasses, although *rari* 'herbs and shrubs with no main stem' may encompass grasses as well. Such a category would also appear to fit within the system of the other, better-supported, higher-order taxa of Proto Oceanic. At this stage **pali[s,j]i* appears to be the most likely label for such a category, but further data and research may lead to different conclusions.

4.6 Moss, algae, seaweed

There also appears to have been variation in the Proto Oceanic term that denoted mosses, algae and seaweeds, such that **lumut* and **limut* are both reconstructable. This life-form taxa seems to have been characterised by the morphological characteristic of 'leaflessness', thus including mosses, lichens and algae, and extended to other plants which share with algae the ecological characteristics of growing underwater. That both forms were present in Proto Oceanic and many lower level proto-languages can be seen from the way reflexes of each occur in quite closely related languages. For example, Tinputz and Roviana are both Northwest Solomonic languages, and Tinputz has a form *nimus* reflecting Proto Oceanic **limut* and Roviana a form *lumu-lumutu*, reflecting Proto Oceanic **lumut*. The same is true of the Micronesian languages, where Woleaian has a form *ɾumʷu̱* and Mokilese a form *limʷ*. It is also possible that there were fully-reduplicated variants of these forms in Proto Oceanic, thus **limulimut* and **lumulumut*, since languages from a range of subgroups have reduplicated reflexes.

Evidence from non-Oceanic languages suggests that **lumut* may have been the older form meaning 'moss'. For example, Indonesian *lumut* '1. moss, lichen, bryophyte; 2. algae', Ilokano *lúmot* 'moss, a slippery river seaweed; fine freshwater algae', Tagalog *lúmot* 'moss'. Ilokano and Tagalog also have forms *límu* 'seaweed' without the final *-t*, and it is possible that pre-Proto Oceanic **lumut* 'moss' and **limu* 'seaweed' were conflated in Proto Oceanic.

POc **lumut* 'generic term for mosses, algaes and seaweeds' (Capell 1943)

Adm:	Lou	*lum*	'seaweed; weed/grass growing in sea water'
NNG:	Manam	*lumta*	'moss'
NNG:	Mangap	*lum*	'algae, green slimy growth on trees, stones etc under water'
PT:	Iduna	*nunu(bʷana)*	'moss, slime on ground' (cf. *bʷana* 'phlegm')
PT:	Muyuw	*numt*	'moss'
MM:	Nakanai	*lumu*	'moss, incl. *Psilotum nudum*, Microsorium species'
MM:	Nduke	*lu-lumutu*	'a general name for green algae that grows inside concrete tanks etc. and moss that grows on trees'
MM:	Roviana	*lumu-lumutu*	'a variety of moss; a marine alga'
SES:	Gela	*lumu*	'moss, weeds on keel'
SES:	Bugotu	*lumu(sa)*	'moss'
SES:	Tolo	*lumu-lumu*	'moss'
SES:	Longgu	*lumu-lumu*	'moss'

SES:	Kwaio	*lumu*	‘moss’
SES:	Lau	*lu-lumu*	‘moss, lichen growth on ship’s keel’
SES:	‘Are’are	*rumu*	‘seaweed, moss on trees, used in ceremonial purification’
SES:	Sa’a	*lumu(te)*	‘moss’
NCV:	Mota	*lumu(ta)*	‘moss’
NCV:	NE Ambae	*lumu(si)*	‘moss’
NCV:	Malo	*lum-lum*	‘moss, lichen; k.o. seaweed’
NCV:	Vurës	*lum-lum*	‘moss, seaweed, algae’ (cf. *mölumlum* ‘soft, slow’)
NCV:	Lewo	*lum-lum*	‘slime in sea’
NCV:	Nguna	*na-lumu-lumu*	‘moss, sponge, algae’
NCV:	Paamese	*lum-lum*	‘moss, slime, seaweed’
SV:	Anejom̃	*ne-lom^{w}*	‘moss, hanging algae’
SV:	Lenakel	*ləmus*	‘moss, algae, seaweed’
Mic:	Woleaian	*ɾum^{w}u̱*	‘moss, seaweed; to be covered with moss, having moss’
Mic:	Carolinian	*lūm^{w}*	‘moss; seaweed variety that grows luxuriantly on rocks and sunken vessels and that breaks off and washes onto shore’
Mic:	Chuukese	*ɾūm^{w}*	‘seaweed, moss; sea algae, scum’
Fij:	Rotuman	*lumu*	‘seaweed, moss’

POc **limut* ‘generic term for mosses, algaes and seaweeds’ **?**: **limu*

PT:	Misima	*nimút*	‘moss’
MM:	Tolai	*limut*	(N) ‘green colour or mossy growth on a canoe which has been standing in the water, seaweed, slime’. (ADJ) ‘green, blue, moss-green, colour of moss’
MM:	Ramoaaina	*limut*	‘seaweed, slime; blue’
MM:	E Kara	*limut*	‘tree moss’
MM:	Sursurunga	*milut*	‘moss’ (metathesis)
MM:	Tinputz	*nimus*	‘moss’
NCV:	Namakura	*limi-lim*	‘seaweed, sea moss’
SV:	Southwest Tanna	*ləmus*	‘moss, algae’
Mic:	Mokilese	*lim^{w}*	‘seaweed, sponge, moss’
Mic:	Marshallese	*limu-limu*	‘moss’
Fij:	Bauan	*lumi*	‘moss, adhering to a rock or a boat; a kind of edible seaweed’
Fij:	Wayan	*lume-lume*	‘algae, green slime which grows on reefs and keels of boats, and in rivers and ponds’
Pn:	Tongan	*limu*	‘seaweed, moss, lichen’. (cf. *limu tahi* ‘seaweed’, *limu ʔuta* ‘moss, lichen’)

Pn:	Samoan	*limu*	'general name given to mosses, lichens, algae, and seaweeds' Also initial element in a number of plant names.
Pn:	Hawaiian	*limu*	'a general name for all kinds of plants living under water, both fresh and salt, also algae living in any damp place in air, as on ground, on rocks and on other plants; also mosses, liverworts, lichens'
Pn:	Maori	*rimu, rimu-rimu*	'seaweed; moss, mildew'

4.7 Mushrooms, fungi

In a number of modern Oceanic languages the life-form term for mushrooms and other fleshy fungi is homophonous with the bodypart term 'ear'. For example, in Wayan Fijian *taliŋa* denotes fleshy fungi such as mushrooms and bracket fungi as well as 'ear'. The polysemy of 'mushroom' and 'ear' is also found with non-cognate forms in a number of Oceanic languages, such that innovative terms can be seen to have both meanings. For example, in North-East Ambae *g*^{w}*ero* has both the meaning of 'ear' and of 'mushroom', and the same is true for the Nakanai term *gavusa* '(a) mushroom (Agaricaceae); ear'. The cognate set for Proto Oceanic **taliŋa* below supports the reconstruction of this same polysemy. That the 'mushroom' meaning is not a post-Proto Oceanic innovation is supported by the fact that reflexes of **taliŋa* occur in a number of languages with 'mushroom' meanings, but not with the 'ear' meaning. Of the languages in the cognate set below, the four North New Guinea languages, Nakanai, Gela and Tolo are all languages where the reflex of **taliŋa* no longer has the meaning of 'ear', but has retained the 'mushroom' meaning. In Anejom̃ *in-titʃŋa-*, the reflex of **taliŋa*, retains only the 'ear' meaning, but the historical presence of the 'mushroom' meaning is indicated by the occurrence of *in-titʃŋa-* in a number of compounds referring to mushrooms. In Rotuman, Bauan Fijian, a number of Polynesian and Micronesian languages terms for mushrooms literally mean 'ear of spirit/ghost'. The Rotuman form *faliŋa ne ʔatua* and the Tikopian form *tariŋa ŋa a tua* look to be cognate compounds, but in other languages the second part of the compound does not appear to be cognate.

POc **taliŋa* 'generic term for mushrooms and fleshy fungi; ear' (ACD)

NNG:	Poeng	*taliŋ*	'mushroom'
NNG:	Dami	*talik*	'fungus, mushroom'
NNG:	Hote	*taliŋ*	'mushroom'
NNG:	Sissano-Arop	*tɛlin*	'mushrooms, edible'
MM:	Nakanai	*taliga*	'a small edible fungus, *Lensites*'
SES:	Gela	*taliŋa*	'fungus, mushroom on mbiluma tree'
SES:	Tolo	*taliŋe*	'generic name for mushrooms'
SES:	Kwaio	*aliŋa*	'mushroom'
SES:	Sa'a	*ʔäliŋe*	'mushroom, large fungus'
NCV:	Paamese	*raliŋen asu*	'kind of fungus which grows on dry wood'
SV:	Anejom̃	*intitʃŋa-*	'ear; initial element in a number of compounds denoting mushrooms'

		intitʃŋanɣai	'mushroom (arboreal)' (cf. *in-ɣai* 'tree')
		intitʃŋapwohtan	'mushroom (terrestrial)'
		intitʃŋanumu	'kind of edible mushroom' (cf. *numu* 'fish, marine creature')
Mic:	Kiribati	*taniŋaniba*	'mushroom-like fungus growing on tree trunks. *Myxomycetes*: slime fungus'
Mic:	Woleaian	*tariŋeripaç*	'mushroom' Underlying form: *taliŋali-paça*.
Mic:	Satawalese	*saliŋanipaç*	'kind of toadstool'
Mic:	Mortlockese	*sæliŋananu*	'mushroom (lit. ear of ghost)'
Fij:	Bauan	*daliŋa ni kalou*	'fungus (lit: ear of spirit)'
Fij:	Wayan	*taliŋa*	'generic, includes various kinds of fleshy fungi, eg. mushrooms, bracket fungi'
Fij:	Rotuman	*faliŋa*	'ear; toadstool or fungus'. Also *faliŋa ne ʔatua* 'ear of dead/ghost'
Pn:	Tongan	*taliŋeliŋa*	'fungus'
Pn:	Tikopia	*tariŋa (ŋa a tua)*	'ears of spirits; traditional name applied to a tree fungus (unidentified)'
Pn:	Samoan	*taliŋa*	'Name given to several types of fungus, including Jew's-ear'
Pn:	Maori	*tariŋa (rakau)*	'a fungus'
		tariŋa (o tiakiwai)	'Jew's ear fungus, *Auricularia auricula-judea*' Also called *tariŋa kuri* (dog), *tariŋa hakeke*

4.8 Other terms

The five primary taxa reconstructed here do not appear to have encompassed all plants that would have been known to Proto Oceanic speakers, or indeed, for which terms can be reconstructed. The contrast between Proto Oceanic **kayu* 'plants with woody stems and branches', **pali[s,j]i* 'grass-like plants' and **waRoc* 'plants with creeping or climbing growth structure' leaves open the question of how non-woody leafy plants, such as alpinias or gingers and the like, would have been classified by a Proto Oceanic speaker. In Kwara'ae *fiʔi-rū* is the descriptive category that encompasses plants which grow as a cluster of stems, including plants like ginger with leaf-tubes sheathing the stem, plants with sectioned stems like bamboo, plants like ferns and pandanus (Kwa'ioloa and Burt 2001:193-219). Hawaiian appears to have a similar category, *pū* which denotes plants with a 'cluster of several stalks, as of banana, pandanus, kava; clump, as of sugarcane' (Pukui & Elbert 1971:317). In Marovo (Meso-Melanesian), there is a general term *rokoroko* for leafy shrubs which may have a similar range, and in Anejom̃ the term *nathancai*, literally 'young tree' is used to denote saplings and plants smaller than trees, including ferns and crotons (Lynch 2001a:189). However, as far as I am aware there does not appear to be a general term for non-woody leafy plants which can be reconstructed for Proto Oceanic.

Ferns and tree-ferns are also plants which do not appear to fit into any of the life-form categories reconstructed for Proto Oceanic. In Kwara'ae there is a general term for tree-ferns, *kʷaʔe*, and a number of other Oceanic languages also have general terms that denote tree-ferns:

Mic:	Kosraean	*po*	‘kind of plant: tree fern’
Fij:	Wayan	*balabala*	‘generic for tree ferns (*Cyathea* spp.), sometimes extended to include other large ferns, such as *Pteris tripartita*. (i) *Cyathea lunulata* (Cyatheaceae); (ii) *Cyathea* sp., perhaps *C. propinqua*; (iii) *Calochlaena straminea* (Dicksoniaceae); (iv). *Pteris tripartita* (Adiantaceae).
Pn:	Hawaiian	*ʔamaʔu*	‘all species of an endemic genus of ferns (*Sadleria*), with trunk more or less evident’.

From this it seems possible that tree-ferns formed a higher-order taxon in Proto Oceanic, but no term appears to be reconstructable to back up such a hypothesis.

In Wayan *balabala* ‘tree-ferns’ contrasts with another primary taxon *diŋi*, a generic for at least two types of terrestrial ferns. In Kwara’ae *takuma* ‘*Diplazium proleferum*’ is sometimes used to denote a collection of edible ferns that includes *Diplazium proleferum*, though more commonly ferns are referred to by their individual names. In other languages, such as Iduna, Kosraean, Samoan and Hawaiian there are terms that may denote ferns more generally, but it is not clear from the dictionary definitions. A generic term for ferns does not appear to be reconstructable for Proto Oceanic, and it seems likely that the individual names of ferns were considered to be primary taxa.

PT:	Idunaduna	*maiwa*	‘(edible) ferns’
Mic:	Mokilese	*pʷɔ*	‘fern’
Mic:	Kosraean	*fa*	‘a kind of plant: fern’
Fij:	Wayan	*diŋi*	‘generic that includes at least the following two medium-sized terrestrial ferns: *Nephrolepis biserrata* (Davalliaceae), ladder fern, locally common in open mid-altitude forest; *Sphaerostephanos invisus* (Thelypteridaceae), common on dry grassy hillsides.
Pn:	Samoan	*ʔoliʔolī*	‘(i) general name given to large ferns; (ii) tree-fern (*Alsophila* species)’
Pn:	Hawaiian	*kupukupu*	‘general name for ferns on a single stem’ (also name for sword fern)

Proto Oceanic **qauR* appears to have been the general term for bamboos, with a number of more specific terms also reconstructable (ch.13, §3.1). Kwa’ioloa and Burt (2001) use the descriptive term *fiʔi-rū* ‘clumps’ or ‘plants which grow as several stems’, or more narrowly *fiʔi-rū neʔe kasirūʔa kī* ‘clumps which are sectioned’ to represent a group of plants including bamboos which have similar growth patterns and uses. In Kwara’ae *kaʔo* ‘bamboo, *Nastus obtusus*’ is called ‘proper bamboo’, but this term does not appear to be used as a generic for all bamboos (outside of Kwa’ioloa and Burt’s book). In Wayan Fijian, bamboos and reeds are included in the *ō* ‘grasses’ taxon. But there is no clear evidence that bamboos were considered part of any larger category that can be reconstructed for Proto Oceanic.

It is unclear how pandanus were classified by Proto Oceanic speakers. In Kwara’ae, pan-

danus are considered to be part of the larger category of *fiʔi-rū* 'clumps', whereas in Wayan Fijian pandanus are considered part of the *kai* 'trees and shrubs' taxon. In ch.11, §2.5 Ross reconstructs a number of terms for different types of pandanus and suggests that **padran* 'coastal pandanus, *Pandanus tectorius*' was also the generic term for pandanus. This is supported most strongly by Carolinian where the reflex of **padran*, *fāṣ*, is the generic term for pandanus (Jackson & Marck 1991:59). Thus it seems likely that pandanus in Proto Oceanic were either: (a) usually known by their individual names and were unaffiliated primary taxa; or (b) were classified as a distinct taxon known as **padran* 'pandanus (generic)'.

A number of modern Oceanic languages have a category of plants that is glossed as 'weeds', as can be seen from the following list. In a number of languages, including Poeng, Gela and Kwara'ae this category appears to denote plants growing unwanted in garden plots. However, these categories do not have cognate labels. Proto Oceanic **talu(n)* 'old garden, fallow land, land returning to secondary growth' (vol.1, ch.5, §3.2) may have denoted land with this type of vegetation, but a term for the vegetation itself does not appear to be reconstructable.

NNG:	Buang	*vavɔ̄ŋ*	'scrub, brush, weeds'
NNG:	Labu	*wahe*	'weeds'
NNG:	Poeng	*kilanna*	'weed; growing in old garden spot'
NNG:	Takia	*ud*	'weed, wild grass (generic)'
NNG:	Mangap	*momotia*	'weed (N)'
PT:	Idunaduna	*boya*	'small weeds'
PT:	Gumawana	*nauna*	'weeds, grass'
PT:	Misima	*mʷawín*	'grass; weeds, to have weeds'
MM:	Ramoaaina	*bual*	'full of weeds'
		palep	'weeds, rubbish; in a plantation'
MM:	Teop	*subui*	'weeds'
SES:	Gela	*makiri*	'small weeds in a garden'
SES:	Lau	*ʔoroʔoro*	'weeds, grass, anything small growing up'
		murua	'weeds and grass'
SES:	Kwaio	*fufulu*	'weed, grass'
SES:	Kwara'ae	*laua*	'weeds, plants that can (and often should) be 'pulled out' when they grow in places like gardens; seedlings, saplings'
Mic:	Mokilese	*tipwtipw*	'grass, weeds; overgrown with grass or weeds, littered (with objects)'
Mic:	Chuukese	*wərɨŋŋaw*	'useless plant, weed' (cf. *wərɨ* 'bush, vegetation generally', *ŋŋaw* 'bad, ugly, unfitting, unsuitable')
Pn:	Maori	*otaota*	'herbs in general, weeds, litter'

5 Conclusions

Figure 3.7 shows schematically a partial ethnobotanical classification for Proto Oceanic based on the reconstruction of higher-order taxa presented here and plant names presented in chap-

ters 5–13. The kingdom rank category of 'plant' had no name in Proto Oceanic, and it is unclear if it was an implicit category or not. Proto Oceanic appears to have had five major life-form taxa: **kayu* 'tree or shrub, generic name for plants with woody stems and branches, probably not including palms or tree-ferns'; **waRoc* 'general term for vines and creepers, plants with creeping or climbing growth structure'; **pali[s,j]i* 'generic term for grasses and possibly also sedges and other grass-like plants'; **limut* or **lumut* 'generic term for mosses, algaes and seaweeds'; and **taliŋa* 'generic term for mushrooms and fleshy fungi'.

Ross's reconstructions of plant names in chapters 5–13 suggest that the subtaxa of these life-form categories tended to be terminal taxa. However, as folk generics tend to be more stable than specifics (Pawley this volume), it is not surprising that Ross is unable to reconstruct many terms for specifics. Rather, it is likely that Proto Oceanic behaved like contemporary languages in similar environmental and cultural contexts and had named folk taxa within many of the folk generics that Ross reconstructs.

In chapters 5–13 of this volume Ross reconstructs Proto Oceanic names for over 80 plants which were most probably considered subtaxa of the **kayu* 'tree, shrub' category. The majority of these reconstructions, like **tuRi-tuRi* 'candlenut tree, *Aleurites moluccana*', **putun* '*Barringtonia asiatica*', **aRu* 'a shore tree, *Casuarina equisetifolia*', **paRu* 'a small shore tree, *Hibiscus tiliaceus*', **qatita* 'the putty nut, *Parinarium laurinum*' and **quRis* 'Polynesian plum, *Spondias dulcis*', denote a single 'scientific' species. A few reconstructions, such as **kalaqabusi* 'a shrub, *Acalypha* species' and **kapika* 'Malay apple and rose apple, *Eugenia* species' denote two or more 'scientific' species, but still appear to have formed the lowest level within the classification. It is only with a few types of **kayu* 'tree, shrub' that Ross found evidence to reconstruct a folk generic that denoted several different species and terms for folk species within the generic category. For example, the Proto Oceanic term **[ka]ŋaRi* was polysemous, denoting both *Canarium* species in general and *Canarium indicum* in particular. A second Proto Oceanic term **qalip* 'canarium almond, *Canarium* species' may have denoted a separate species (ch.11, §2.1). There are also a few types of **kayu* 'tree, shrub' for which Ross can reconstruct more than one Proto Oceanic term, such as **ñoñum* and **kurat* both denoting the Indian Mulberry tree (*Morinda citrifolia*), which may reflect cases where Proto Oceanic speakers distinguished by name different varieties of a single 'scientific' species, but often the difference between these terms in Proto Oceanic is not entirely clear.

As expected from the comparative evidence, Proto Oceanic speakers appear to have had more levels within the classification of food plants than with non-food plants. Thus, although it appears that for most plants folk generics denoting a particular 'scientific' species formed the lowest level of classification, for some food plants Proto Oceanic speakers appear to have used folk generics to refer to a cluster of similar species and other more specific terms to denote single species. This was seen above with **[ka]ŋaRi* 'canarium almond, *Canarium indicum*; *Canarium* species in general', and can be seen in Figure 3.7 with regards to types of yams. Alongside the terms for specific species of yams, Proto Oceanic speakers also appear to have used **qupi* 'greater yam, *Dioscorea alata*; yam (generic)' to denote yams in general (ch.9, §2.1). The fine grade distinctions made in the naming and classification of food plants in Proto Oceanic can perhaps best be seen in the reconstructions of different types of edible **pudi* 'bananas' (ch.9, §3), and several different growth stages for **niuR* 'coconut (generic)' (ch.12, §3). It is also likely that, like Wayan Fijian speakers, Proto Oceanic speakers had other systems of classifying plants, such as in terms of food categories. For example, Ross (ch.10, §2) reconstructs a term **wasa* which denoted *Abelmoschus manihot*, but also appears

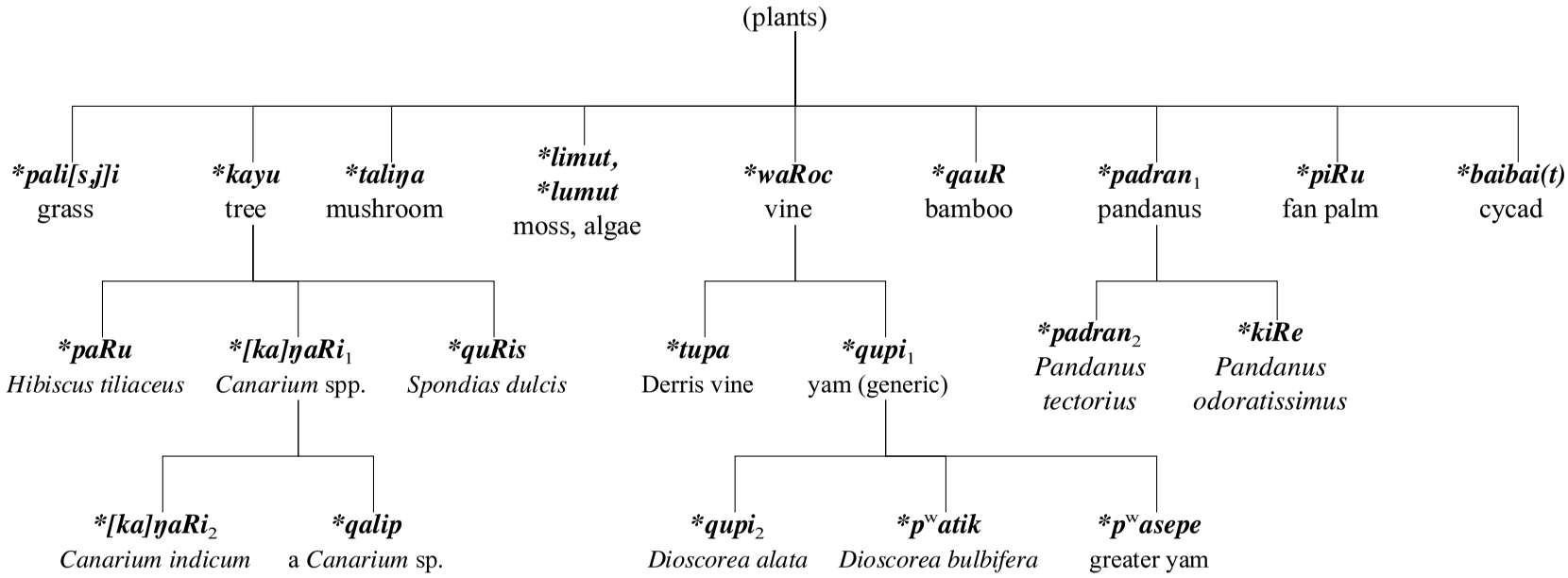

Figure 3.7 Partial Proto Oceanic ethnobotanical classification

to have referred to the general category of 'edible greens'.

The form **qauR* 'bamboos (generic)' (ch.13, §3.1) denoted an additional life-form taxon, and **padran* 'coastal pandanus, *Pandanus tectorius*' (ch.11, §2.5.1) may have also been used as a generic for all pandanus and thus been a life-form taxon. Palms may have formed a covert category, but it seems likely that they were referred to by their individual names and were unaffiliated to any other primary taxa. Ferns and tree-ferns also appear to have been unaffiliated taxa.

References

Abo, Takaji, Byron Bender, Alfred Capelle & Tony DeBrum, 1976. *Marshallese-English Dictionary*. Honolulu: University of Hawaii Press.

Aburu, K., 1982. Notes on some fruit and nut treets in the Keravat area of East New Britain. In Bourke & Kesavan 1982, 101–122.

Adelaar, K. Alexander, 1992. *Proto-Malayic*. Canberra: Pacific Linguistics. (*Pacific Linguistics* C-119).

—, 2005. The Austronesian languages of Asia and Madagascar: a historical perspective. In K. Alexander Adelaar & Nikolaus P. Himmelmann, eds, *The Austronesian languages of Asia and Madagascar*. London: Routledge.

Ajamiseba, Daniel C., August Kafiar & Peter J. Silzer, 1987. *Pempenye'se fenti den Sobeiuse: Perbendaharaan kata bahasa Sobei: Sobei vocabulary*. Abipura: Universitas Cenderawasih/Summer Institute of Linguistics.

Allen, Bryant J., Robin L. Hide, R. Michael Bourke, Daniel Fritsch, Peter Hobsbawm, M.P. Levett, Ian Saem Majnep, V. Mangi, T. Nen & Sem G., 1994. *Madang Province: Text summaries*. Canberra: Department of Human Geography, Research School of Pacific and Asian Studies, The Australian National University. (*Agricultural Systems of Papua New Guinea Working Paper* 7).

Allen, James A. & Norman C. Duke, 2006. *Bruguiera gymnorrhiza* (large-leafed mangrove). In Whistler & Elevitch 2006d, 139–152.

Allen, Jim, 1993. Notions of the Pleistocene in Greater Australia. In M. Spriggs, D.E. Yen, W. Ambrose, A. Jones, A. Thorne & A. Andrews, eds, *A community of culture: The people and prehistory of the Pacific*, 139–151. Canberra: Department of Prehistory, Research School of Pacific Studies, The Australian National University. (*Occasional Papers in Prehistory* 21).

Ambrose, Wal, 1991. Manus, mortars and the kava concoction. In Pawley 1991, 461–469.

Anderson, Michael, 1990. *Sudest field notes*. Ukarumpa: SIL. (*Dictionaries of Papua New Guinea* 11).

APNI, 1991. *The Australian Plant Name Index*. Canberra: Australian National Herbarium, Australian National Botanic Gardens, and Australian Biological Resources Study. `http://www.anbg.gov.au/index.html`.

Arentz, F., R.J. Johns, J. Matcham, E, J. Simaga & R. Taurareko, 1989. Traditional uses of flora and vegetation of the Talasea, Hoskins, Kapiura and Ania-Fullerborn timber areas. In Unitech Development and Consultancy Pty Ltd, ed., *Scientific reports for the Environmental Plan: Talasea, Hoskins, Kapiura and Ania-Fullerborn timber areas*, 89–96. Lae: Unitech Development and Consultancy (Forestry, Environment and Ecology Unit).

Arnold, John K, 1931. *A grammar of the language of Edugaura*. Port Moresby: Government Printer.

Baker, J.R. & T.H. Harrison, 1936. The seasons in a tropical rain forest. *Journal of the Linnaean Society (Zoology)* 39:443–463.

Ball, Eldon E. & Ian M. Hughes, 1982. Long Island, Papua New Guinea: People, resources and culture. *Records of the Australian Museum* 34:463–525.

Barrau, Jacques, 1955. *Subsistence agriculture in Melanesia*. Noumea: South Pacific Commission.

—, 1959. The sago plants and other food plants of marsh dwellers in the South Pacific islands. *Economic Botany* 13:151–162.

—, 1962. *Les plantes alimentaires de l' Océanie : origines, distribution et usages*. Marseille: Faculté des Sciences de Marseille. (*Annales du Musée colonial de Marseille*).

—, ed., 1963. *Plants and the migrations of Pacific peoples: A symposium*. Honolulu: Bishop Museum Press.

—, 1965. Witnesses of the past: notes on some food plants of Oceania. *Ethnology* 4:282–294.

Barton, H. & J. P. White, 1993. Use of shell and stone artifacts at Balof 2, New Ireland, Papua New Guinea. *Asian Perspectives* 32:169–181.

Beard, Stephan, n.d. Khehek dictionary. Unpublished electronic file, Summer Institute of Linguistics, Ukarumpa.

Bell, F. L. S., 1946. The place of food in the social life of Tanga. *Oceania* 17:139–172, 310–326.

—, 1947. The place of food in the social life of Tanga. *Oceania* 18:36–60, 233–248.

Bellwood, Peter & Colin Renfrew, eds, 2002. *Examining the farming/language dispersal hypothesis*. Cambridge: MacDonald Institute for Archaeological Research, University of Cambridge.

Bender, Byron, Ward H. Goodenough, Frederick H. Jackson, Jeffrey C. Marck, Kenneth L. Rehg, Ho-min Sohn, Stephen Trussel & Judith Wang, 2003. Proto-Micronesian reconstructions. *Oceanic Linguistics* 42:1–109, 271–358.

Bender, Byron, Robert W. Hsu, Frederick H. Jackson, Kenneth L. Rehg, Stephen Trussell & Judith Wang, 1983. *Micronesian cognate sets.* Dept of Linguistics, University of Hawaii.

Benders-Hyde, Elisabeth M., 2000. Tropical rainforest. In Elisabeth M. Benders-Hyde & Karl Nelson, eds, *Blue Planet biomes.* `http://www.blueplanetbiomes.org/rainforest.htm`. Accessed 31 October 2007.

Beney, J.K., 1980. Coastal subsistence of the mainland, Kavieng District. *Extension Bulletin (Department of Primary Industry, Port Moresby)* 11:45–64. (*Six studies in subsistence agriculture*).

Bennett, Doug, n.d. Bing dictionary. Unpublished electronic file.

Berlin, Brent, 1992. *Ethnobiological classification: Principles of categorization of plants and animals in traditional societies.* Princeton, NJ: Princeton University Press.

Berlin, Brent, Dennis E. Breedlove & Peter H. Raven, 1973. General principles of classification and nomenclature in folk biology. *American Anthropologist* 75:214–242.

Biggs, Bruce, 1965. Direct and indirect inheritance in Rotuman. *Lingua* 14:383–415.

—, 1978. The history of Polynesian phonology. In Wurm & Carrington 1978, 691–716.

—, 1991. A linguist revisits the New Zealand bush. In Andrew Pawley, ed., *Man and a half: Essays in Pacific anthropology and ethnobiology in honour of Ralph Bulmer*, 67–72. Auckland: The Polynesian Society.

Biggs, Bruce & Ross Clark, 1993. POLLEX: Polynesian lexicon. Unpublished electronic files, Department of Anthropology, University of Auckland.

Biggs, Bruce, D. S. Walsh & Jocelyn Waqa, 1970. *Proto-Polynesian reconstructions with English to Proto-Polynesian finder list.* Department of Anthropology, Archaeology and Linguistics, University of Auckland. (*University of Auckland Working Papers in Anthropology*).

Blackwood, Beatrice, 1935. *Both sides of Buka passage*. Oxford: Clarendon Press.

Blewett, Stephen & Kim Blewett, n.d. Manam dictionary. Unpublished electronic file.

Blust, Robert A., 1969. Some new Proto-Austronesian trisyllables. *University of Hawaii Working Papers in Linguistics* 1:27–62.

—, 1970. Proto-Austronesian addenda. *Oceanic Linguistics* 9:104–162.

—, 1972a. Additions to 'Proto-Austronesian addenda' and 'Proto-Oceanic addenda with cognates in non-Oceanic Austronesian languages'. *University of Hawaii Working Papers in Linguistics* 4:1–17.

—, 1972b. Proto Oceanic addenda with cognates in non-Oceanic Austronesian languages: A preliminary list. *University of Hawaii Working Papers in Linguistics* 4:1–41.

—, 1976. Austronesian culture history: Some linguistic inferences and their relations to the archaeological record. *World Archaeology* 8:19–43.

—, 1977a. The Proto-Austronesian pronouns and Austronesian subgrouping: a preliminary report. *University of Hawaii Working Papers in Linguistics* 9/2:1–15.

—, 1977b. A rediscovered Austronesian comparative paradigm. *Oceanic Linguistics* 14:1–51.

—, 1978a. Eastern Malayo-Polynesian: A subgrouping argument. In Wurm & Carrington 1978, 181–234.

—, 1978b. *The Proto-Oceanic palatals.* Auckland: Polynesian Society. (*JPS Monograph* 43).

—, 1980a. Austronesian etymologies. *Oceanic Linguistics* 19:1–182.

—, 1980b. Early Austronesian social organization: The evidence of language. *Current Anthropology* 21:205–226.

—, 1981a. Some remarks on labiovelar correspondences in Oceanic languages. In Hollyman & Pawley 1981, 229–254.

—, 1981b. Variation in retention rate among Austronesian languages. Paper presented to the Third International Conference on Austronesian Linguistics, Denpasar.

—, 1982. The linguistic value of the Wallace Line. *Bijdragen tot de Taal-, Land- en Volkenkunde* 138:231–250.

—, 1983-84a. Austronesian etymologies II. *Oceanic Linguistics* 22–23:29–149.

—, 1983-84b. More on the position of the languages of Eastern Indonesia. *Oceanic Linguistics* 22–23:1–28.

—, 1984. A Mussau vocabulary, with phonological notes. In *Papers in New Guinea linguistics No. 23*, 159–208. Canberra: Pacific Linguistics. (*Pacific Linguistics* A-69).

—, 1986. Austronesian etymologies III. *Oceanic Linguistics* 25:1–123.

—, 1987. Lexical reconstruction and semantic reconstruction: The case of Austronesian ‘house’ words. *Diachronica* 4:79–106.

—, 1989. Austronesian etymologies IV. *Oceanic Linguistics* 28:111–180.

—, 1993. Central and Central-Eastern Malayo-Polynesian. *Oceanic Linguistics* 32:241–293.

—, 1994. Proto Malayo-Polynesian sibling terms. In Pawley & Ross 1994, 31–72.

—, 1996a. The linguistic position of the western islands, Papua New Guinea. In Lynch & Pat 1996, 1–46.

—, 1996b. The Neogrammarian Hypothesis and pandemic irregularity. In Durie & Ross 1996, 135–156.

—, 1998a. Austronesian comparative dictionary. Unpublished electronic files, University of Hawaii.

—, 1998b. A Lou vocabulary with phonological notes. In Darrell Tryon, ed., *Papers in Austronesian linguistics No. 5*, 35–99. Canberra: Pacific Linguistics. (*Pacific Linguistics* A-92).

—, 1998c. A note on higher-order subgroups in Oceanic. *Oceanic Linguistics* 37:182–188.

Borrell, O. William, 1989. *An annotated checklist of the flora of Kairiru Island, New Guinea*. Bulleen, Vic.: The author.

Bourdy, Genevieve & Annie Walter, 1994. Women's plants and maternity in Vanuatu. In Morrison et al. 1994, 7–34.

Bourke, R. Michael, 1982. Root crops in Papua New Guinea. In Bourke & Kesavan 1982, 51–63.

—, 1990. Subsistence food production systems in Papua New Guinea: old changes and new changes. In Douglas E. Yen & J. M. J. Mummery, eds, *Pacific production systems: approaches to economic prehistory: Papers from a symposium at the XV Pacific Science Congress, Dunedin, New Zealand, 1983*, 148–160. Canberra: Department of Prehistory, Research School of Pacific Studies, The Australian National University. (*Occasional papers in prehistory* 18).

—, 1994. Edible indigenous nuts in Papua New Guinea. Paper presented at the South Pacific Indigenous Nuts Workshop, Port Vila, Vanuatu.

—, In preparation. Environmental influences on food crop distribution and production in Papua New Guinea. Unpublished paper.

—, n.d. Indigenous fruit in Papua New Guinea. Unpublished paper, `http://www.icuc-iwmi.org/files/Publications/`, accessed 5 October 2007.

Bourke, R. Michael, Bryant J. Allen, P. Hobsbawm & J. Conway, 1998. *Papua New Guinea: Text summaries.* Canberra: Department of Human Geography, Research School of Pacific and Asian Studies, The Australian National University. (*Agricultural Systems of Papua New Guinea Working Paper* 1).

Bourke, R. Michael & V. Kesavan, eds, 1982. *Proceedings of the Second Papua New Guinea Food Crops Conference*. Port Moresby: Department of Primary Industry.

Bowern, Claire, 1999. Titan plant names. Unpublished ms, Research School of Pacific and Asian Studies, The Australian National University.

—, 2001. Titan vocabulary list. Unpublished ms.

Brookfield, H. C., 2001. *Exploring agrodiversity*. New York: Columbia University Press.

Brown, Cecil H., 1984. *Language and living things: Uniformities in folk classification and naming*. New Brunswick, NJ: Rutgers University Press.

Brunton, Ron, 1988. *The abandoned narcotic: Kava and cultural instability in Melanesia*. Cambridge: Cambridge University Press.

Bugenhagen, Robert D. & Salme Bugenhagen, 2007. Tuam dictionary. Unpublished electronic file, Summer Institute of Linguistics, Ukarumpa.

—, n.d. Mangap-Mbula dictionary. Unpublished electronic file.

Burley, Alana, 2006. Lihirian plant names. Unpublished Unpublished electronic file, University of Melbourne.

Bybee, Joan L., 1994. A view of phonology from a cognitive and functional perspective. *Cognitive Linguistics* 5:285–305.

Böhm, Karl, 1983. *The life of some island people of New Guinea*. Berlin: Dietrich Reimer Verlag.

Capell, Arthur, 1941. *A new Fijian dictionary*. Sydney: Australasian Medical Publishing Co.

—, 1943. *The linguistic position of South-Eastern Papua*. Sydney: Australasian Medical Publishing Company.

Cashmore, Christine, 1969. Some Proto-Eastern Oceanic reconstructions with reflexes in Southeast Solomon Islands languages. *Oceanic Linguistics* 8:1–25.

Charles, Matthew, 1973. Additional reconstructions to be added to Zorc and Charles (1971). Unpublished ms.

Chew, W. L., 1965. *Laportea* and allied genera (Urticaceae). *Gardens' Bulletin (Singapore)* 21:195–208.

Chowning, Ann, 1963. Proto Melanesian plant names. In Barrau 1963, 39–44.

—, 1996. Relations among languages of West New Britain: An assessment of recent theories and evidence. In Malcolm Ross, ed., *Studies in languages of New Britain and New Ireland*, vol. 1: *Austronesian languages of the North New Guinea cluster in northwestern New Britain*, 7–62. Canberra: Pacific Linguistics. (*Pacific Linguistics* C-135).

—, 2001. Proto Melanesian plant names reconsidered. In Andrew Pawley, Malcolm Ross & Darrell T. Tryon, eds, *The boy from Bundaberg*, 75–87. Canberra: Pacific Linguistics. (*Pacific Linguistics* 514).

Chowning, Ann & Ward H. Goodenough, n.d. Lakalai–English dictionary. Unpublished ms.

Christian, F. W., 1899. *The Caroline islands*. London: Methuen & Co.

Christiansen, Sofus, 1975. *Subsistence on Bellona Island (Mungiki): A study of the cultural ecology of a Polynesian outlier in the British Solomon Islands Protectorate*. København: C.A. Reitzel. (*Folia Geographica Danica* 13).

Churchward, C. Maxwell, 1959. *Tongan dictionary*. Oxford: Oxford University Press.

Clark, Ross, 1996a. North and Central Vanuatu languages: A comparative study. Manuscript.

—, 1996b. North and Central Vanuatu languages: A comparative study. Unpublished ms., University of Auckland.

Clark, Ross & Bruce G. Biggs, 2006. POLLEX: Polynesian lexicon. Unpublished electronic files, Department of Anthropology, University of Auckland.

Cleveland, Cutler J., ed., 2007. *Encyclopedia of Earth*. Washington DC: Environmental Information Coalition, National Council for Science and the Environment.

Codrington, R. H. & J. Palmer, 1896. *A dictionary of the language of Mota*. London: Society for Promoting Christian Knowledge.

Cohen, Mark Nathan, 2002. The economies of late pre-farming and farming communities and their relation to the problem of dispersals. In Bellwood & Renfrew 2002, 41–47.

Collins, J. T., 1983. *The historical relationships of the languages of Central Maluku*. Canberra: Pacific Linguistics. (*Pacific Linguistics* D-47).

Condra, Ed, n.d. Patpatar dictionary. Unpublished electronic file.

Conn, Barry J. & Kipiro Q. Damas, 2006. *Guide to the trees of Papua New Guinea*. `http://www.pngplants.org/PNGtrees`.

Crowley, Susan Smith, 1986. *Tolo dictionary*. Canberra: Pacific Linguistics. (*Pacific Linguistics* C-91).

Crowley, Terry, 1992. *A dictionary of Paamese*. Canberra: Pacific Linguistics. (*Pacific Linguistics* C-121).

—, 1994. Proto-Who drank kava? In Pawley & Ross 1994, 87–100.

—, 1995. *A new Bislama dictionary*. Suva and Port Vila: Institute of Pacific Studies and Pacific Languages Unit.

—, 2000. *An Erromangan (Sye) dictionary*. Canberra: Pacific Linguistics. (*Pacific Linguistics* 508).

Damon, Frederick, 2004. Tree list from field notebooks 1995–1996. Unpublished electronic file, University of Virginia.

Danielsson, Marie-Thérèse & Bengt Danielsson, 1983. Nut name study not so nutty. *Pacific Islands Monthly* 54/8 (August):18–21.

Deck, Norman C., 1934. *Grammar of the language spoken by the Kwara'ae people of Mala, British Solomon Islands*. New Plymouth, New Zealand: Thomas Avery & Sons. Reprinted from the *Journal of the Polynesian Society*, 42–43.

Defilipps, Robert A., Shirley L. Maina & Leslie A. Pray, 1988. The Palauan and Yap medicinal plant studies of Masayoshi Okabe, 1941-1943. *Atoll Research Bulletin* .

Dempwolff, Otto, 1925. Die L-, R- und D-Laute in austronesischen Sprachen. *Zeitschrift für Eingeborenen-Sprachen* 15:19–50; 116–138; 223–238.

—, 1934. *Vergleichende Lautlehre des Austronesischen Wortschatzes*, vol. 1: *Induktiver Aufbau einer indonesischen Ursprache*. Berlin: Dietrich Reimer. (*Beihefte zur Zeitschrift für Eingeborenen-Sprachen*).

—, 1938. *Vergleichende Lautlehre des Austronesischen Wortschatzes*, vol. 3: *Austronesisches Wörterverzeichnis*. Berlin: Dietrich Reimer. (*Beihefte zur Zeitschrift für Eingeborenen-Sprachen*).

Diamond, Jared, 1966. Zoological classification system of a primitive people. *Science* 151:1102–1104.

—, 1997. *Guns, germs and steel: a short history of everybody for the last 13,000 years*. London: Chatto and Windus.

Dixon, R. M. W., 1988. *A grammar of Boumaa Fijian*. Chicago: University of Chicago Press.

Duke, Norman C., 2006. *Rhizophora apiculata, R. mucronata, R. stylosa, R.* × *annamalai, R.* × *lamarckii* (Indo–West Pacific stilt mangrove), ver. 2.1. In Elevitch 2006a.

Durie, Mark & Malcolm Ross, eds, 1996. *The comparative method reviewed: Regularity and irregularity in language change*. Oxford: Oxford University Press.

Dutton, T.E., 1973. "Cultural" items of basic vocabulary in the Gulf and other Districts of Papua. In Karl Franklin, ed., *The linguistic situation in the Gulf District and adjacent areas, Papua New Guinea*, 414–588. Canberra: Pacific Linguistics. (*Pacific Linguistics* C-26).

—, 1985. *Police Motu: iena sivarai (its story)*. Port Moresby: University of Papua New Guinea Press.

Dutton, T.E. & Darrell Tryon, eds, 1994. *Language contact and change in the Austronesian world*. Berlin: Mouton de Gruyter.

Dyen, Isidore, 1953. Dempwolff's *R. *Language* 29:359–366.

Dyen, Isidore & David F. Aberle, 1974. *Lexical reconstruction: The case of the Proto-Athapaskan kinship system*. Cambridge: Cambridge University Press.

Early, Robert J., n.d. Lewo dictionary. Unpublished electronic file, Summer Institute of Linguistics, Port Vila.

Elbert, Samuel H., 1972. *Puluwat Dictionary*. Canberra: Pacific Linguistics. (*Pacific Linguistics* C-24).

—, 1975. *Dictionary of the language of Rennell and Bellona*. Copenhagen: National Museum of Denmark.

Elevitch, Craig R., ed., 2006a. *Species Profiles for Pacific Island Agroforestry*. Hōlualoa, Hawai'i: Permanent Agriculture Resources. `http://www.traditionaltree.org`.

—, ed., 2006b. *Traditional trees of Pacific islands: Their culture, environment and use*. Hōlualoa, HI: Permanent Agricultural Resources.

Evans, Bethwyn & Malcolm Ross, 2001. The history of Proto Oceanic *ma-. *Oceanic Linguistics* 40:269–290.

Evans, B.R., 1999. *Edible nut trees in Solomon Islands: a variety collection of Canarium, Terminalia and Barringtonia*. Canberra: Australian Centre for International Agrcultural Research. (*ACIAR Technical Reports* 44).

Firth, Raymond, 1985. *Tikopia-English dictionary*. Auckland: Auckland University Press, Oxford University Press.

Flavelle, Alix J., 1991. A traditional agroforestry landscape on Fergusson Island, Papua New Guinea. M.Sc. thesis, University of British Columbia.

Floyd, A.G., 1954. Final report on ethnobotanical expedition, West Nakanai, New Britain, July–August 1954. Unpublished report, Division of Botany, Department of Forests, Lae, Papua New Guinea.

Foale, Mike, 2003. *The coconut odyssey: The bounteous possibilities of the tree of life*. Canberra: Australian Centre for International Agrcultural Research. (*ACIAR Monographs* 101).

Foale, Simon, 2001. Lihirian plant names. Unpublished Unpublished electronic file, James Cook University, Townsville.

Fox, Charles E., 1924. *The threshold of the Pacific: An account of the social organisation, magic and religion of the people of San Cristoval in the Solomon Islands*. London: Kegan Paul, Trench, Trubner & Co.

—, 1955. *A dictionary of the Nggela language (Florida, British Solomon Islands)*. Auckland: Unity Press.

—, 1974. *Lau dictionary*. Canberra: Pacific Linguistics. (*Pacific Linguistics* C-25).

—, 1978. *Arosi dictionary*. Canberra: Pacific Linguistics. (*Pacific Linguistics* C-57). Rev. ed. with English-Arosi index.

François, Alexandre, 2002. *Araki: A disappearing language of Vanuatu*. Canberra: Pacific Linguistics. (*Pacific Linguistics* 522).

—, 2004. A few plant names in the Banks languages of Vanuatu. Unpublished ms., LACITO, CNRS, Villejuif.

Freedman, Michael P., 1967. The social and political organization of the Siassi Islands, New Guinea. Ph.D. dissertation, University of Michigan.

French, Bruce, 1986. *Food plants of Papua New Guinea*. Tasmania: The author.

French, Bruce & Cynthia Bridle, 1978. *Food crops of Papua New Guinea*. Kerevat: Vudal College of Agriculture.

French-Wright, Renwick, 1983. Proto-Oceanic horticultural practices. Master's thesis, University of Auckland.

Friday, J.B. & Dana Okano, 2006a. *Calophyllum inophyllum* (kamani). In Whistler & Elevitch 2006d, 183–198.

—, 2006b. *Cordia subcordata* (kou). In Whistler & Elevitch 2006d, 303–316.

—, 2006c. *Thespesia populnea* (milo). In Elevitch 2006b, 757–774.

Fritzell, Lisbeth & Robyn Davies, n.d. Ramoaaina dictionary. Unpublished electronic file.

Gardner, Rhys & Andrew Pawley, 1992. Wayan knowledge of plants. Paper presented at Science of Pacific Island Peoples Conference. Suva, Fiji.

—, 2006. Annotated list of local plant names from Waya Island, Fiji. *Records of the Auckland Museum* 43.

Garrett, Andrew, 2006. Convergence in the formation of Indo-European subgroups: Phylogeny and chronology. In Peter Forster & Colin Renfrew, eds, *Phylogenetic methods and the prehistory of languages*, 139–151. Cambridge: McDonald Institute for Archaeological Research.

Geerts, P., 1970. *'Are'are dictionary*. Canberra: Pacific Linguistics. (*Pacific Linguistics* C-14).

Geraghty, Paul, 1983. *The history of the Fijian languages.* Honolulu: University of Hawaii Press. (*Oceanic Linguistics special publication* 19).

—, 1986. The sound system of Proto Central Pacific. In Geraghty et al. 1986, 289–312.

—, 1989. The reconstruction of Proto-Southern Oceanic. In Harlow & Hooper 1989, 141–156.

—, 1990. Proto-Eastern Oceanic *R and its reflexes. In Jeremy H. C. S. Davidson, ed., *Pacific Island languages*, 51–93. London and Honolulu: School of Oriental and African Studies, University of London and University of Hawaii Press.

—, 1996. Problems with Proto Central Pacific. In Lynch & Pat 1996, 83–91.

Geraghty, Paul, Lois Carrington & S. A. Wurm, eds, 1986. *FOCAL II: Papers from the Fourth International Conference on Austronesian Linguistics.* Canberra: Pacific Linguistics. (*Pacific Linguistics* C-94).

Geraghty, Paul & Andrew Pawley, 1981. The relative chronology of some innovations in the Fijian languages. In Hollyman & Pawley 1981, 159–178.

Glennon, John & Ariana Glennon, 2005. Nehan dictionary. Unpublished PDF file. `http://www.pnglanguages.org/`.

Golson, Jack, 2002. Gourds in New Guinea, Asia and the Pacific. In Stuart Bedford, Christophe Sand & David Burley, eds, *Fifty years in the field:: Essays in honour and celebration of Richard Shutler Jr's archaeological career*, 69–78. Auckland: New Zealand Archaeological Association. (*New Zealand Archaeological Association Monograph* 25).

Goodenough, Ward H., 1997. Proto-Kimbe: A new analysis. *Oceanic Linguistics* 36:247–311.

Goodenough, Ward H. & Hiroshi Sugita, 1980. *Trukese-English dictionary.* Philadelphia: American Philosophical Society.

—, 1990. *Trukese-English dictionary. Supplementary volume: English-Trukese and index of Trukese word roots.* Philadelphia: American Philosophical Society.

Gosden, Chris, 1995. Arboriculture and agriculture in coastal Papua New Guinea. *Antiquity* 69:807–817.

Goulden, Rick J., 1996. The Maleu and Bariai languages of West New Britain. In Malcolm Ross, ed., *Studies in languages of New Britain and New Ireland*, vol. 1: *Austronesian languages of the North New Guinea Cluster in northwestern New Britain*, 63–144. Canberra: Pacific Linguistics. (*Pacific Linguistics* C-135).

Gowers, Sheila, 1976. *Some common trees of the New Hebrides and their vernacular names.* Port Vila: Forestry section, Department of Agriculture.

Grace, George W., 1961. Austronesian linguistics and culture history. *American Anthropologist* 63:359–368.

—, 1969. A Proto-Oceanic finder list. *University of Hawaii Working Papers in Linguistics* 2:39–84.

—, 1996. Regularity of change in what? In Durie & Ross 1996, 157–179.

Grant, R. V., 1953. *A school dictionary in the Dobu language.* Rabaul, PNG: Methodist Mission Press.

Green, Roger C., 2000. A range of disciplines support a dual origin for the bottle gourd in the Pacific. *Journal of the Polynesian Society* 109:191–197.

Griswold, Ralph E. & Madge T. Griswold, 1990. *The Icon programming language.* Englewood Cliffs, NJ: Prentice-Hall. 2 edn.

Guppy, H.B., 1896. The Polynesians and their plant names. Victoria Institute: Paper to be read at a meeting of the members and associates on Monday, March 2, 1896.

—, 1906. *Observations of a naturalist in the Pacific between 1896 and 1899*, vol. 2. London: Macmillan.

Hamel, Patricia J., 1994. *A grammar and lexicon of Loniu, Papua New Guinea*. Canberra: Pacific Linguistics. (*Pacific Linguistics* C-103).

Harlow, Ray & Robin Hooper, eds, 1989. *VICAL 1, Oceanic languages: Papers from the Fifth International Conference on Austronesian Linguistics, Auckland, New Zealand, January 1988*. Auckland: Linguistic Society of New Zealand.

Harrison, Sheldon P., 1994. Linguistic evidence for Polynesian influence in the Gilbert Islands. In Dutton & Tryon 1994, 321–49.

Harrison, Sheldon P. & Salich Albert, 1977. *Mokilese-English dictionary*. Honolulu: University of Hawaii Press.

Haudricourt, André, 1964. Nature et culture dans la civilisation de l'igname: l'origine des clones et des clans. *L'homme* 4:93–104.

Haudricourt, André G. & Françoise Ozanne-Rivierre, 1982. *Dictionnaire thématique des langues de la région de Hienghène (Nouvelle Caledonie), Pije, Fwâi, Nemi, Jawe: Thematic dictionary of the Hienghène languages, New Caledonia*. Paris: SELAF.

Hays, Terence E., 1976. An empirical method for the identification of covert categories in ethnobiology. *American Ethnologist* 3:489–507.

—, 1982. Utilitarian/adaptionist explanations of folk biological classification: some cautionary notes. *Journal of Ethnobiology* 2:89–94.

—, 2005. Vernacular names for tuber in Irian Jaya: implications for agricultural prehistory. In Pawley et al. 2005, 625–670.

Headland, Thomas N. & Alan Healey, 1974. Grammatical sketch of Dumagat (Casiguran). *Pacific Linguistics* A–43:1–54.

Henderson, C.P. & I.R. Hancock, 1988. *A guide to the useful plants of Solomon Islands*. Honiara: Ministry of Agriculture and Lands.

Henty, E.E., 1982. Some nut-bearing plants in Papua New Guinea. In Bourke & Kesavan 1982, 78–85.

Heyne, K., 1950. *De nuttige planten van Indonesië*, vol. 1. 's-Gravenhage: W. van Hoeve. 3rd printing.

Hide, Robin, 1985. Notes on subsistence agriculture (farming systems) in West New Britain and New Ireland Provinces: Report of a field trip to Papua New Guinea, 14 November to 14 December 1984. Unpublished ms, Division of Water and Land Resources. Commonwealth Scientific and Industrial Research Organisation, Canberra.

Hockett, C. F., 1976. The reconstruction of Proto Central Pacific. *Anthropological Linguistics* 18:187–235.

Holdsworth, David, 1975. Phytomedicine of the Gazelle Peninsula, New Britain. *Science in New Guinea* 3:32–40.

—, 1977. *Medicinal plants of Papua New Guinea*. Nouméa: South Pacific Commission.

Holdsworth, David, Chris L. Hurley & Sue E. Rayner, 1978. Medicinal plants of New Ireland, Papua New Guinea. *Science in New Guinea* 6:96–104.

Holdsworth, David, B. Pilokos & P. Lambes, 1982. A survey of plants used for medicinal purposes in New Hanover, Papua New Guinea. *Science in New Guinea* 9:103–109.

Holdsworth, David & Benedict Wamoi, 1981. Operation Drake phytochemical survey, Manus Island, Papua New Guinea. *Science in New Guinea* 8:181–191.

Hollyman, Jim & Andrew Pawley, eds, 1981. *Studies in Pacific languages and cultures: In honour of Bruce Biggs*. Auckland: Linguistic Society of New Zealand.

Holzknecht, Susanne, 1989. *The Markham languages of Papua New Guinea*. Canberra: Pacific Linguistics. (*Pacific Linguistics* C-115).

Hooley, Bruce, n.d. Mapos Buang dictionary. Unpublished electronic file.

Hooper, Robin, 1985. Proto-Oceanic *qi. In Pawley & Carrington 1985, 141–167.

Hopkins, Helen Fortune & James I. Menzies, 1995. *The flora of Matupore Island*. Port Moresby: University of Papua New Guinea Press.

Howes, David, 2003. *Sensual relations: Engaging the senses in culture and social theory*. Ann Arbor: The University of Michigan Press.

Huckett, Joyce, n.d. Iduna dictionary. Unpublished electronic file.

Hunn, Eugene S., 1982. The utilitarian factor in folk biological classification. *American Anthropologist* 84:830–847.

Hutchisson, Don, n.d. Sursurunga dictionary. Unpublished electronic file.

Hviding, Edvard, 1990. *Draft environmental dictionary, Marovo language*. Bergen: University of Bergen.

—, 1995. *Of Reef and Rainforest: A dictionary of environment and resources in Marovo Lagoon*. Bergen: Centre for Development Studies, University of Bergen and Western Province Division of Culture, Gizo, Solomon Islands.

—, 2005. *Kiladi oro vivineidi ria tingitonga pa idere oro pa goana pa Marovo—Reef and rainforest: An environmental encyclopaedia of Marovo Lahgoon, Solomon Islands*. Paris: UNESCO.

Hviding, Edvard & Tim Bayliss-Smith, 2000. *Islands of rainforest*. Aldershot: Ashgate.

IPNI, 2004. *The International Plant Names Index*. The Royal Botanic Gardens, Kew, The Harvard University Herbaria, and the Australian National Herbarium. `http://www.ipni.org`.

Ivens, Walter G., 1918. *Dictionary and grammar of the language of Sa'a and Ulawa, Solomon Islands, with appendices.* Washington: Carnegie Institution of Washington. (*Carnegie Institution of Washington publication* 253).

—, 1927. *Melanesians of the south-east Solomon Islands.* New York: Benjamin Blom. Reprinted 1972.

—, 1929. *A dictionary of the language of Sa'a (Mala) and Ulawa, South-east Solomon Islands.* London and Melbourne: Oxford University Press and Melbourne University Press.

—, 1940. *A dictionary of the language of Bugotu*. London: Royal Asiatic Society.

Jackson, Frederick H., 1983. The internal and external relationships in the Trukic languages of Micronesia. Master's thesis, University of Hawaii.

—, 1986. On determining the external relationships of the Micronesian languages. In Geraghty et al. 1986, 201–238.

Jackson, Frederick H. & Jeffrey C. Marck, 1991. *Carolinian-English dictionary*. Honolulu: University of Hawaii Press.

Jauncey, Dorothy, 1997. A grammar of Tamambo, the language of western Malo, Vanuatu. Master's thesis, Australian National University.

—, In progress. Tamambo dictionary. Unpublished ms, Australian National University.

Jebb, Matthew, 1992. Edible Barringtonias. *The Kew Magazine* 9:164–180.

Jennings, A. P., 1956. *Wedau-English dictionary*. Dogura, PNG: The Diocesan Printing Shop.

Jourdan, Christine, 2002. *Pijin: A trilingual dictionary (Pijin–Inglis–Franis)/(Pijin–English–French)/(Pjin–Anglais–Frane §ais).* Canberra: Pacific Linguistics. (*Pacific Linguistics* 526).

Jumelle, Henri, 1907. *Les cultures coloniales: Plantes alimentaires.* J.B. Baillière & Fils.

Kahn, Miriam, 1986. *Always hungry, never greedy: Food and the expression of gender in a Melanesian society*. Cambridge: Cambridge University Press.

Kaspruś, Alois, 1945. The languages of the Mugil District, NE-New Guinea. *Anthropos* 37–40:711–778.

Keesing, Roger M., 1975. *Kwaio dictionary.* Canberra: Pacific Linguistics. (*Pacific Linguistics* C-35).

—, 1985. *Kwaio grammar*. Canberra: Pacific Linguistics. (*Pacific Linguistics* B-88).

Kennedy, Jean, 2006. Bananas: towards a revised prehistory. Unpublished ms., Research School of Pacific and Asian Studies, The Australian National University.

Kennedy, Jean & William Clarke, 2004. *Cultivated landscapes of the Southwest Pacific*. Canberra: Resource Management in Asia–Pacific Program, Research School of Pacific and Asian Studies, The Australian National University. (*Resource Management in Asia–Pacific Working Paper* 50).

Kennedy, Raymond, 1934. Bark-cloth in Indonesia. *Journal of the Polynesian Society* 43:229–243.

Keppel, Gunnar, Jone Cawani Navuso, A. Naikatini, Nunia T. Thomas, Isaac A. Rounds, Tamara A. Osborne, Nemani Batinamu & Eliki Senivasa, 2005. Botanical diversity at Pavura, a lowland rain forest site along the PABITRA gateway transect, Viti Levu, Fiji. *Pacific Science* 59:175–191.

Kikusawa, Ritsuko, 2003. Did Proto-Oceanians cultivate *Cytrosperma* taro? *People and culture in Oceania* 19:29–54.

Kinch, Jeffrey P., 1999. Names of trees, shrubs, vines, and herbaceous plants from Brooker Island in the West Calvados Chain. Unpublished electronic file.

Kirch, Patrick V., 1989. Second millenium BC arboriculture in Melanesia: Archaeological evidence from the Mussau Islands. *Economic Botany* 43:225–240.

—, 1994. *The wet and the dry: Irrigation and agricultural intensification in Polynesia*. Chicago: University of Chicago Press.

Kononenko, Nina A., 2005. Database of plants used in the West New Britain. Unpublished electronic file, Australian Museum, Sydney.

Kooijman, Simon, 1972. *Tapa in Polynesia*. Honolulu: Bishop Museum Press.

Kwa'ioloa, Michael & Ben Burt, 2001. *Na masu'u 'i Kwara'ae/Our forest of Kwara'ae*. London: The British Museum Press.

Lane-Poole, C.E., 1925. The forest resouces of the Territories of Papua and New Guinea: Report. Unpublished manuscript.

Lanyon-Orgill, Peter A., 1962. *A dictionary of the Raluana language*. Victoria BC: The author.

Laycock, Donald, 2003. *A dictionary of Buin: A language of Bougainville*. Canberra: Pacific Linguistics. (*Pacific Linguistics* 537). Edited by Masayuki Onishi.

LeBlanc, Steven A., 2002. Conflict and language dispersal: issues and a New World example. In Bellwood & Renfrew 2002, 357–365.

Lebot, Vincent, 1989. L'histoire du kava commencé par sa découverte. *Journal de la Société des Océanistes* 88–89:89–114.

Lebot, Vincent, Mark Merlin & Lamont Lindstrom, 1992. *Kava: The Pacific drug.* Yale University Press. New haven edn.

Lee, Kee-Dong, 1976. *Kusaiean-English dictionary.* Honolulu: University of Hawaii Press.

Lentfer, C., 2003. Plants, people and landscapes in prehistoric Papua New Guinea: A compendium of phytolith (and starch) analyses. Ph.D. thesis, Southern Cross University.

Lepofsky, Dana, 1992. Arboriculture in the Mussau Islands, Bismarck Archipelago. *Economic Botany* 46:192–211.

Levy, Richard S., 1979. The phonological history of the Bugotu-Nggelic languages and its implications for Eastern Oceanic. *Oceanic Linguistics* 18:1–32.

—, 1980. Languages of the southeast Solomon Islands and the reconstruction of Proto-Eastern-Oceanic. In Naylor 1980, 213–222.

—, n.d. *Languages of the southeast Solomon Islands and the reconstruction of Proto-Eastern Oceanic.* Lexington: University of Kentucky.

Levy, Richard S. & Nathan Smith, 1970. *Proto-Eastern Oceanic reconstructions.* Dept of Anthropology, University of British Columbia.

Lichtenberk, František, 1998. Did speakers of Proto Oceanic chew betel? *Journal of the Polynesian Society* 107:335–363.

Lichtenberk, František, Lichtenberk, 1985. Possessive constructions in Oceanic languages and Proto-Oceanic. In Pawley & Carrington 1985, 93–140.

—, 1986. Leadership in Proto Oceanic society: Linguistic evidence. *Journal of the Polynesian Society* 95:341–356.

—, 1988. The Cristobal-Malaitan subgroup of Southeast Solomonic. *Oceanic Linguistics* 27:24–62.

Lincoln, Peter C., 1976. Rai Coast Austronesian language survey data. Unpublished ms, University of Hawai'i.

Lister-Turner, R. & J. B. Clark, 1954. *A dictionary of the Motu language of Papua.* Sydney: NSW Government Printer. 2 edn. Ed. by Percy Chatterton.

Lithgow, David & Daphne Lithgow, 1974. *Muyuw dictionary.* Ukarumpa: SIL.

Lynch, John, 1977. *Lenakel dictionary.* Canberra: Pacific Linguistics. (*Pacific Linguistics* C-95).

—, 1978a. *Proto-Central Papuan: A reassessment.* Port Moresby: University of Papua New Guinea.

—, 1978b. Proto-South Hebridean and Proto-Oceanic. In Wurm & Carrington 1978, 717–779.

—, 1980. *Proto-Central Papuan phonology*. Port Moresby: University of Papua New Guinea.

—, 1984. On the Proto-Oceanic word for 'citrus'. *Journal of the Polynesian Society* 93:77–78.

—, 1996. South Vanuatu reconstructions. Unpublished Unpublished electronic file, University of the South Pacific, Port Vila.

—, 2000a. Linguistic subgrouping in Vanuatu and New Caledonia. In Bill Palmer & Paul Geraghty, eds, *SICOL: Proceedings of the Second International Conference on Oceanic Linguistics*, vol. 2: *Historical and descriptive studies*, 155–184. Canberra: Pacific Linguistics. (*Pacific Linguistics* 505).

—, 2000b. Reconstructing Proto-Oceanic stress. *Oceanic Linguistics* 39:53–82.

—, 2001a. *Anejom̃ dictionary. Diksonari blong Anejom̃. Nitasviitai a nijitas antas Anejom̃*. Canberra: Pacific Linguistics. (*Pacific Linguistics* 510).

—, 2001b. *The linguistic history of Southern Vanuatu*. Canberra: Pacific Linguistics. (*Pacific Linguistics* 509).

—, 2001c. Some shared developments in pronouns in languages of Southern Oceania. *Oceanic Linguistics* 40:33–66.

—, 2002a. Potent roots and the origin of kava. *Oceanic Linguistics* 41:493–513.

—, 2002b. The Proto Oceanic labiovelars: Some new observations. *Oceanic Linguistics* 41:310–362.

—, 2004a. The Efate-Erromango problem in Vanuatu subgrouping. *Oceanic Linguistics* 43:311–338.

—, 2004b. Southern Oceanic reconstructions of plant names and consolidated data. Unpublished Unpublished electronic files, University of the South Pacific, Port Vila.

Lynch, John & Fa'afo Pat, eds, 1996. *Oceanic studies: Proceedings of the First International Conference on Oceanic Linguistics, Port Vila, 1993*. Canberra: Pacific Linguistics. (*Pacific Linguistics* C-133).

Lynch, John, Malcolm Ross & Terry Crowley, 2002. *The Oceanic languages*. Richmond, UK: Curzon Press.

Lynch, John & Darrell Tryon, 1983. Central–Eastern Oceanic: A subgrouping hypothesis. Paper presented to the Fifteenth Pacific Science Congress, Dunedin, New Zealand.

—, 1985. Central-Eastern Oceanic: A subgrouping hypothesis. In Pawley & Carrington 1985, 31–52.

Madulid, Domingo A., 2001a. *A dictionary of Philippine plant names*, vol. 1: *Local name–scientific name*. Manila: Bookmark.

—, 2001b. *A dictionary of Philippine plant names*, vol. 2: *Scientific name–local name*. Manila: Bookmark.

Mager, John F., 1952. *Gedaged-English dictionary*. Columbus, Ohio: American Lutheran Church, Board of Foreign Missions.

Malinowski, Bronisław, 1935a. *Coral gardens and their magic: A study of the methods of tilling the soil and of agricultural rites in the Trobriand Islands*, vol. 2: *The language of magic and gardening*. London: George Allen and Unwin.

—, 1935b. *Coral gardens and their magic: A study of the methods of tilling the soil and of agricultural rites in the Trobriand Islands*, vol. 1: *The description of gardening*. London: George Allen and Unwin.

Manner, Harley I. & Craig R. Elevitch, 2006a. *Gnetum gnemon* (gentum). In Elevitch 2006b, 385–392.

—, 2006b. *Tournefortia argentea* (tree heliotrope). In Elevitch 2006b, 775–785.

Marck, Jeff, 2000. *Topics in Polynesian language and culture history*. Canberra: Pacific Linguistics. (*Pacific Linguistics* 504).

Margetts, Anna, 2005a. Plants, Saliba–English. Unpublished electronic file, Monash University.

—, 2005b. Saliba plant terms. Unpublished Unpublished electronic files, Monash University.

Matthews, Peter J. & Chris Gosden, 1997. Plant remains from waterlogged sites in the Arawe Islands, West New Britain Provinc3e, Papua New Guinea: implications for the history of plant use and domestication. *Economic Botany* 51:121–133.

May, R.J., 1984. *Kaikai aniani: a guide to bush foods, markets and culinary arts of Papua New Guinea*. Bathurst: Robert Brown.

McClatchey, W. C., M. Q. Sirikolo, H. Boe, E. Biliki & F. Votboc, 2005. A proposed PABITRA study area on Lauru Island, Western Solomon Islands. *Pacific Science* 59:213–239.

McClatchey, Will, Harley I. Manner & Craig R. Elevitch, 2006. *Metroxylon amicarum, M. paulcoxii, M. sagu, M. salomonense, M. vitiense, and M. warburgii* (sago palm): Arecaceae (palm family), ver. 2.1. In Elevitch 2006a.

McEldowney, Phyllis H., 1995. Subsistence intensification in the late prehistory of Manus. Master's thesis, Australian National University.

McGuckin, Ed & Catherine McGuckin, 1995. *Gapapaiwa field notes*. Ukarumpa: Summer Institute of Linguistics. (*Dictionaries in Papua New Guinea* 14).

Meijer, Th. M., 1940. The essential oil of Massoi bark. *Recueil des travaux chimiques des Pays-Bas* 59:191–201.

Merrill, Elmer D., 1946. *Plant life of the Pacific world*. New York: Macmillan.

Mihalic, Francis, 1971. *The Jacaranda dictionary and grammar of Melanesian Pidgin*. Milton, Queensland: Jacaranda Press.

Miklouchо-Maclay, Nikolai, 1975. *New Guinea diaries: 1871-1883*. Madang: Kristen Press.

Miklouchо-Maclay, Nikolai N., 1886. List of plants in use by the natives of New Guinea. *Proceedings of the Linnean Society of NSW for 1885* 10:346–358.

Milke, Wilhelm, 1958. Zur inneren Gliederung und geschtichtlichen Stellungder ozeanisch-Austronesischen Sprachen. *Zeitschrift für Ethnologie* 83:58–62.

—, 1961. Beiträge zur ozeanischen Linguistik. *Zeitschrift für Ethnologie* 86:162–182.

—, 1965. Comparative notes on the Austronesian languages of New Guinea. *Lingua* 14:330–348.

—, 1968. Proto-Oceanic addenda. *Oceanic Linguistics* 7:147–171.

Milner, G. B., 1966. *Samoan dictionary*. Oxford: Oxford University Press.

Morrison, John, Paul Geraghty & Linda Crowl, eds, 1994. *Science of Pacific Island peoples*, vol. 3: *Fauna, flora, food and medicine*. Suva: Institute of Pacific Studies, University of the South Pacific.

Mueller-Dombois, Dieter & F. Raymond Fosberg, 1998. *Vegetation of the tropical Pacific islands*. New York: Springer. (*Ecological Studies* 132).

Naylor, Paz Buenaventura, ed., 1980. *Austronesian studies: Papers from the Second Eastern Conference on Austronesian Languages*. Ann Arbor: University of Michigan, Center for South and Southeast Asian Studies.

Nenegemo, Tau & Larry Lee Lovell, 1995. *Minaveha field notes*. Ukarumpa: Summer Institute of Linguistics. (*Dictionaries in Papua New Guinea* 14).

Nevermann, Hans, 1934. *Admiralitäts-Inseln*. Hamburg: Friederichsen, de Gruyter and Co. (*Ergebnisse der Südsee-Expedition 1908-1910*).

Nothofer, Bernd, 1975. *The reconstruction of Proto-Malayo-Javanic*. The Hague: Martinus Nijhoff. (*Verhandelingen van het Koninklijk Instituut voor Taal-, Land- en Volkenkunde* 73).

—, ed., 1996. *Reconstruction, classification, description: Festschrift in honor of Isidore Dyen*. Hamburg: Abera.

O'Collins, Maev & Lorraine Lamothe, 1989. The Assessment of the Impact of Forest Operations on the Environment and Village Communities. Report of field work undertaken on the west coast of Manus by students of the Forestry Department, Papua New Guinea University of Technology, Lae.

Ohnemus, Sylvia, 1998. *An ethnology of the Admiralty Islanders: The Alfred Bühler Collection, Museum der Kulturen, Basel*. Bathurst: Crawford House.

Osmond, Meredith, 1998. Horticultural practices. In Ross et al. 1998, 115–142.

Ozanne-Rivierre, Françoise, 1992. The Proto-Oceanic consonantal system and the languages of New Caledonia. *Oceanic Linguistics* 31:191–207.

—, 1998. *Le nyelâyu de Balade (Nouvelle-Calédonie).* Paris: Editions Peeters.

Paijmans, K., ed., 1976. *New Guinea vegetation*. Canberra: CSIRO in association with ANU Press.

Palmer, Bill, 2004. Kokota dictionary. Unpublished HTML file, work in progress, University of Surrey.
`http://www.surrey.ac.uk/lcts/bill.palmer/NWS_site/Kok/dic.htm`.

Parham, H. B. R., 1943. *Fiji native plants with their medical and other uses.* Wellington: Polynesian Society. (*Memoirs of the Polynesian Society* 16).

Parham, J.W., 1972. *Plants of the Fiji islands.* Suva: Government Printer. Revised edition edn.

Parkinson, Richard, 1907. *Dreissig Jahre in der Südsee : Land und Leute, Sitten und Gebräuche im Bismarckarchipel und auf den deutschen Salomoninseln*. Stuttgart: Strecker & Schröder.

Pawley, Andrew, 1972. On the internal relationships of eastern Oceanic languages. In Roger C. Green & Marian Kelly, eds, *Studies in Oceanic culture history*, vol. 3, 1–142. Honolulu: Dept of Anthropology, Bishop Museum.

—, 1975. The relationships of the Austronesian languages of central Papua. In T. E. Dutton, ed., *Studies in languages of central and south-east Papua*, 3–106. Canberra: Pacific Linguistics. (*Pacific Linguistics* C-29).

—, 1977. On redefining 'Eastern Oceanic'. Unpublished mimeo.

—, 1978. The New Guinea Oceanic hypothesis. *Kivung* 11:99–151.

—, 1982. Rubbishman commoner, big-man chief: Linguistic evidence for hereditary chieftainship in Proto-Oceanic society. In J. Siikala, ed., *Oceanic studies*, 33–52. Helsinki: Finnish Anthropological Society.

—, 1985. Proto-Oceanic terms for 'person': A problem in semantic reconstruction. In Veneeta Z. Acson & Richard L. Leed, eds, *For Gordon H. Fairbanks*. Honolulu: University of Hawaii Press. (*Oceanic Linguistics special publication* 20).

—, ed., 1991. *Man and a half: Essays in Pacific anthropology and ethnobiology in honour of Ralph Bulmer*. Auckland: Polynesian Society. (*Memoirs of the Polynesian Society* 48).

—, 1996. On the position of Rotuman. In Nothofer 1996, 85–119.

—, 2000. Were turtles 'fish' in Proto Oceanic? Notes on the comparative study of taxonomies in Oceanic languages. In S. R. Fischer & W. B. Sperlich, eds, *Leo Pasifika*, 1–43. Auckland: Institute of Polynesian Languages and Literatures.

—, 2007. Was there early Lapita settlement of the Solomon Islands? Bringing linguistic evidence to an archaeological debate. Paper presented at 7th International Conference on Oceanic Linguistics, Nouméa.

—, Forthcoming. Marine invertebrates. Draft of chapter for Ross, Pawley and Osmond, eds, *The lexicon of Proto Oceanic: The culture and environment of ancestral Oceanic society*, 4: *Animals*.

Pawley, Andrew, Robert Attenborough, Jack Golson & Robin Hide, eds, 2005. *Papuan pasts: cultural, linguistic and biological histories of Papuan-speaking peoples.* Canberra: Pacific Linguistics. (*Pacific Linguistics* 572).

Pawley, Andrew & Lois Carrington, eds, 1985. *Austronesian linguistics at the 15th Pacific Science Congress.* Canberra: Pacific Linguistics. (*Pacific Linguistics* C-88).

Pawley, Andrew & Roger C. Green, 1973. Dating the dispersal of the Oceanic languages. *Oceanic Linguistics* 12:1–67.

—, 1984. The Proto-Oceanic language community. *Journal of Pacific History* 19:123–146.

—, 1985. The Proto-Oceanic language community. In Robert Kirk & Emöke Szathmary, eds, *Out of Asia*, 161–184. Canberra: The Journal of Pacific History.

Pawley, Andrew & Lawrence A. Reid, 1980. The evolution of transitive constructions in Austronesian. In Naylor 1980, 103–130.

Pawley, Andrew & Malcolm Ross, eds, 1994. *Austronesian terminologies: Continuity and change.* Canberra: Pacific Linguistics. (*Pacific Linguistics* C-127).

—, 1995. The prehistory of Oceanic languages: A current view. In Peter S. Bellwood, J. Fox & Darrell T. Tryon, eds, *The Austronesians*, 39–74. Canberra: Dept of Anthropology, RSPAS, Australian National University.

Pawley, Andrew & Timoci Sayaba, Forthcoming. *Words of Waya: An encyclopaedic dictionary of the Wayan dialect of the Western Fijian language.* Canberra: Pacific Linguistics. (*Pacific Linguistics*).

Peekel, P. G., 1984. *Flora of the Bismarck Archipelago for naturalists.* Lae: Division of Botany, PNG.

Powell, J. M., 1976. Ethnobotany. In Paijmans 1976, 106–199.

Powell, J.M., 1982. Traditional vegetables in Papua New Guinea: retrospect and prospect. In Bourke & Kesavan 1982, 64–77.

Pratt, George, 1893. *Pratt's Grammar and Dictionary: Samoan-English, English-Samoan*. London: London Missionary Society.

Preston, Stephen R., Bill Aalbersberg, Alan Brunt, Nicola Spence, Fred Dori, Rosa Kambuou, John Sowei, Paul Osilis, Louis Kurika, Susan Parkinson, Bernd Pett, Mary Taylor, Losavati Naivalulevu & Monica Raghwan, 1998. *Aibika/Bele Abelmoschus manihot (L.) Medik*. Rome: International Plant Genetic Resources Institute.

Price, David S. & Nataniel Merasi, n.d. Ambai Dictionary. Electonic file, SIL International (Papua branch).

Pukui, Mary Kawena & Samuel Elbert, 1971. *Hawaiian Dictionary*. Honolulu: University of Hawaii Press.

Randall, Robert A., 1976. How tall is a taxonomic tree? Some evidence for dwarfism. *American Ethnologist* 3:543–553.

Raymond, Mary & Debra McDougall, 2006. Kubukota plants and trees. Unpublished fieldnotes.

Record, Mary, 1945. A collection of woody plants from Melanesia. *Tropical Woods (Yale University School of Forestry)* 81:9–45.

Rehg, Kenneth L. & Damian G. Sohl, 1979. *Ponapean-English Dictionary*. Honolulu: University of Hawaii Press.

Reid, Lawrence A., 1982. The demise of Proto-Philippines. In Amran Halim, Lois Carrington & S. A. Wurm, eds, *Papers from the Third International Conference on Austronesian Linguistics*, vol. 2: *Tracking the travellers*, 201–216. Canberra: Pacific Linguistics. (*Pacific Linguistics* C-75).

Renner, Susanne S., Hanno Schaefer & Alexander Kocyan, 2007. Phylogenetics of *Cucumis* (Cucurbitaceae): Cucumber (*C. sativus*) belongs in an Asian/Australian clade far from melon (*C. melo*). *BMC Evolutionary Biology* 7:58. `http://www.biomedcentral.com/1471-2148/7/58`.

Rhoads, J.W., 1986. Sagopalm management in Melanesia: an alternative perspective. *Archaeology in Oceania* 17:20–27.

Rickard, R. H., 1888. *A Kuanua dictionary*. Rabaul, PNG: Methodist Mission Press. Additions by H. Fellman ca 1920, W.L.I. Linggood 1939; rev. and ed. by L.H. Wright 1964.

Rivierre, Jean-Claude, 1994. *Dictionnaire cèmuhî-français*. Paris: SELAF/Peeters. (*Langues et Cultures du Pacifique* 9).

Ross, Malcolm, 1988. *Proto Oceanic and the Austronesian languages of western Melanesia*. Canberra: Pacific Linguistics. (*Pacific Linguistics* C-98).

—, 1989. Proto-Oceanic consonant grade and Milke's */nj/. In Harlow & Hooper 1989, 433–495.

—, 1993. The sources of Austronesian lexical items in Tok Pisin. In Tom Dutton, Darrell Tryon & Malcolm Ross, eds, *The Language Game: Papers in memory of D.C. Laycock*, 361–384. Canberra: Pacific Linguistics. (*Pacific Linguistics* C-110).

—, 1994a. Areal phonological features in north central New Ireland. In Dutton & Tryon 1994, 551–572.

—, 1994b. Central Papuan culture history: Some lexical evidence. In Pawley & Ross 1994, 389–479.

—, 1995. Some current issues in Austronesian linguistics. In D.T. Tryon, ed., *Comparative Austronesian Dictionary*, vol. 1, 45–120. Berlin: Mouton de Gruyter.

—, 1996a. Is Yapese Oceanic? In Nothofer 1996, 121–166.

—, 1996b. On the genetic affiliations of the Oceanic languages of Irian Jaya. *Oceanic Linguistics* 35:259–271.

—, 1996c. Reconstructing food plant terms and associated terminologies in Proto Oceanic. In Lynch & Pat 1996, 163–221.

—, 1998. Possessive-like attribute constructions in the Oceanic languages of northwest Melanesia. *Oceanic Linguistics* 38:234–276.

—, 2001. Proto Oceanic *i, *qi, and *-ki. In Joel Bradshaw & Kenneth Rehg, eds, *Issues in Austronesian morphology*, 259–278. Canberra: Pacific Linguistics. (*Pacific Linguistics* 519).

—, 2005. The morphology of some Oceanic plant names. In Claudia Gross, Harriet D. Lyons & Dorothy A. Counts, eds, *A polymath anthropologist: essays in honour of Ann Chowning*, 197–204. Auckland: Department of Anthropology University of Auckland. (*Research in Anthropology and Linguistics Monograph Series 6*).

Ross, Malcolm & Åshild Næss, 2007. An Oceanic origin for Äiwoo, the language of the Reef Islands? *Oceanic Linguistics* 46:456–498.

Ross, Malcolm, Andrew Pawley & Meredith Osmond, eds, 1998. *The lexicon of Proto Oceanic: The culture and environment of ancestral Oceanic society*, vol. 1: *Material culture*. Canberra: Pacific Linguistics. (*Pacific Linguistics* C-152).

Ryan, Paddy, 1988. *Fiji's natural heritage*. Auckland: Southwestern Publishing Co.

Sabatier, E., 1971. *Gilbertese-English dictionary*. Sydney: South Pacific Commission Publications Bureau. Trans. by Sister Oliva.

Safford, William E., 1905. *The useful plants of the island of Guam, with an introductory account of the physical features and natural history of the island, of the character and history of its people, and of their agriculture*. Washington DC: Government Printing Ofiice.

Sauer, Jonathan D., 1993. *Historical geography of crop plants : a select roster*. Boca Raton: CRC Press.

Scales, Ian, 2003. Kwara'ae plant names. Unpublished electronic file, edited version of a 1993 file produced by Solomon Islands Forest Resources Information System and based on Henderson and Hancock (1988).

—, 2006. Plants in Nduke language. Unpublished electronic file, Research School of Pacific and Asian Studies, The Australian National University.

—, n.d. Nduke dictionary. Unpublished manuscript.

Senft, Gunter, 1986. *Kilivila: The language of the Trobriand islanders.* Berlin: Mouton de Gruyter.

Smits, L. & C. L. Voorhoeve, eds, 1992. *The J. C. Anceaux collection of wordlists of Irian Jaya languages: A. Austronesian languages.* Jayapura and Leiden: Irian Jaya Study Centre, Indonesia, and Leiden University.

Sneddon, J. N., 1984. *Proto-Sangiric and the Sangiric languages.* Canberra: Pacific Linguistics. (*Pacific Linguistics* B-91).

Sohn, Ho-min & Anthony F. Tawerilmang, 1976. *Woleaian-English Dictionary*. Honolulu: University of Hawaii Press.

Sorensen, T., 1950. Agricultural report of the Ninigo Reesearch and Rehabilitation Expedition, 26th April, 1950, to the 2nd August 1950. Unpublished ms., Department of Agriculture, Stock and Fisheries, Port Moresby.

Sperlich, Wolfgang, ed., 1997. *Tohi vagahau Niue: Niue language dictionary*. Honolulu: University of Hawaii Press.

Spriggs, Matthew, 1997. *The island Melanesians.* Oxford: Blackwell.

St John, Harold, 1937. Unpublished collecting notebook. Stored in the Bishop Museum, Honolulu.

Stober, Scot, 2005. Organised phonology data paper, Mato (Nenaya, Nengaya, Nineia) language, Wasu (Morobe Province). In Steve Parker, ed., *Phonological descriptions of Papua New Guinea languages*, 27–32. Ukarumpa: Summer Institute of Linguistics. (*Data Papers in Papua New Guinea Languages* 47).

Streicher, J. F., 1982. *Jabêm-English dictionary*. Canberra: Pacific Linguistics. (*Pacific Linguistics* C-68).

Swadling, Pamela & Robin Hide, 2005. Changing landscape and social interaction: looking at agricultural history from a Sepik–Ramu perspective. In Pawley et al. 2005, 289–327.

Thaman, R. R., 1987. Plants of Kiribati: a listing and analysis of vernacular names. *Atoll Research Bulletin* 296:1–43.

—, 1989. *Agrodeforestation and the neglect of trees : threat to the well-being of Pacific societies.* Nouméa: South Pacific Commission. (*South Pacific Regional Environment Programme occasional paper* 5).

—, 1994. Ethnobotany of Pacific island coastal plants. In Morrison et al. 1994, 147–184.

Thaman, R. R. & Temakei Tebano, n.d. *Kiribati plant and fish Names: A preliminary listing*. Atoll Research Programme, University of the South Pacific.

Thieberger, Nicholas, 2006a. *Grammar of South Efate, an Oceanic language of Central Vanuatu*. Honolulu: University of Hawai'i Press.

—, 2006b. *South Efate dictionary*. Honolulu: University of Hawai'i Press. CD-ROM included with Thieberger (2006a).

Thieret, J.W., 1958. Economic botany of the cycads. *Economic Botany* 12:3–33.

Thomson, Lex A.J., 2006a. *Endospermum medullosum* (whitewood). In Whistler & Elevitch 2006d, 317–328.

—, 2006b. *Flueggea flexuosa* poumuli. In Elevitch 2006b, 355–366.

Thomson, Lex A.J. & Randoph R. Thaman, 2006. *Alphitonia zizyphoides* (toi). In Whistler & Elevitch 2006d, 57–68.

Tomlinson, P.B., 1986. *The botany of mangroves.* Cambridge: Cambridge University Press.

Tryon, Darrell, 1976. *New Hebrides languages: An internal classification*. Canberra: Pacific Linguistics. (*Pacific Linguistics* C-50).

—, 1994. Oceanic plant names. In Pawley & Ross 1994, 481–509.

—, ed., 1995. *Comparative Austronesian dictionary*. Berlin: Mouton de Gruyter.

Tryon, Darrell & B. D. Hackman, 1983. *Solomon Islands languages: An internal classification*. Canberra: Pacific Linguistics. (*Pacific Linguistics* C-72).

Tsuchida, S., 1976. *Reconstruction of Proto-Tsouic Phonology*. Tokyo: Institute for the Study of Language and Culture in Asia and Africa. (*Study of languages and cultures of Asia and Africa. Monograph Series 5*).

Verdcourt, Bernard, 1979. *A manual of New Guinea legumes.* Lae: Office of Forests, Division of Botany. (*Botany bulletin* 11).

Verheijen, Jilis A.J., 1982. *Dictionary of Manggarai plant names.* Canberra: Pacific Linguistics. (*Pacific Linguistics* D-43).

—, 1984. Plant names in Austronesian linguistics. *Nusa* 20.

—, 1990. *Dictionary of plant names in the Lesser Sunda Islands.* Canberra: Pacific Linguistics. (*Pacific Linguistics* D-83).

Walsh, D. S. & Bruce Biggs, 1966. *Proto-Polynesian word list 1*. Auckland: Linguistic Society of New Zealand. (*Te Reo Monographs*).

Walsh, D.S, 2004. Raga names for trees. Unpublished electronic file.

Walter, Annie, 1994. Knowledge for survival: Traditional tree farming in Vanuatu. In Morrison et al. 1994, 189–200.

Walter, Annie & Chanel Sam, 2002. *Fruits of Oceania*. Canberra: Australian Centre for International Agrcultural Research. (*ACIAR Monograph* 85). Translated by Paul Ferrar.

Walter, Richard, 1989. Lapita fishing strategies: A review of the archaeological and linguistic evidence. *Pacific Studies* 13:127–149.

Warburg, O., 1899. Das Pflanzenkleid und die Nutzplanzen von Neu-Guinea. In Maximilian Krieger, ed., *Neu-Guinea*, 36–72. Berlin: Alfred Schall. (*Bibliothek der Länderkunde* 5–6).

Waterhouse, J.H.L, 1949. *Roviana and English dictionary. Revised and enlarged by L. M. Jones.* Sydney: Epworth.

—, 2005. Roviana-English Dictionary: Plant taxa. Unpublished ms, edited by Ian Scales, Research School of Pacific and Asian Studies, The Australian National University, incorporating all known plant identifications by Waterhouse.

Wedgwood, Camilla H., 1934. Sickness and its treatment in Manam Island. *Oceania* 280–307.

Wheatley, J.I., 1992. *A guide to the common trees of Vanuatu: With lists of their traditional uses and ni-Vanuatu names.* Port Vila: Department of Forestry.

Whistler, W. Arthur, 1990. The other Polynesian gourd? *Pacific Science* 44:115–122.

—, 1991. Polynesian plant introductions. In Paul Alan Cox & Sandra Anne Banack, eds, *Islands, plants, and Polynesians: an introduction to Polynesian ethnobotany*, 41–66. Portland: Dioscorides Press.

—, 1992. *Flowers of the Pacific Island seashore : a guide to the littoral plants of Hawai'i, Tahiti, Samoa, Tonga, Cook Islands, Fiji, and Micronesia*. Honolulu: Isle Botanica.

Whistler, W. Arthur & Craig R. Elevitch, 2006a. *Broussonetia papyrifera* (paper mulberry). In Whistler & Elevitch 2006d, 171–182.

—, 2006b. *Casuarina equisetifolia* (beach she-oak) and *C. cunninghamiana* (river she-oak). In Whistler & Elevitch 2006d, 227–142.

—, 2006c. *Erythrina variegata* (coral tree). In Whistler & Elevitch 2006d, 329–343.

—, 2006d. *Fagraea berteroana* (pua kenikeni). In Craig R. Elevitch, ed., *Traditional trees of Pacific islands: Their culture, environment and use*, 345–354. Hōlualoa, HI: Permanent Agricultural Resources.

White, Geoffrey M., Francis Kokhonigita & Hugo Pulomana, 1988. *Cheke Holo (Maringe/Hograno) dictionary*. Canberra: Pacific Linguistics. (*Pacific Linguistics* C-97).

Whiting, M.G., 1953. Toxicity of cycads. *Economic Botany* 17:271–302.

Whitmore, T. C., 1966. *Guide to the forests of the British Solomon Islands*. Oxford: Oxford University Press.

Williams, H. W., 1971. *A dictionary of the Maori language*. Wellington: A. R. Shearer, Government Printer. 7 edn.

Wivell, Richard, 1981. *Kairiru lexicon*. Auckland: University of Auckland. (*Working Papers in Anthropology, Archaeology and Linguistics* 59).

Wolff, John U., 1994. The place of plant names in reconstructing Proto Austronesian. In Pawley & Ross 1994, 511–540.

Wong, Carol, Ruth Kiew, George Argent, Ohn Set, Sing Kong Lee & Yik Tuen Gan, 2002. Assessment of the validity of the sections in *Musa* (Musaceae) using AFLP. *Annals of Botany* 90:231–238.

World Wildlife Fund, 2007a. Admiralty Islands lowland rain forests. In Cleveland 2007.

—, 2007b. New Britain-New Ireland lowland rain forests. In Cleveland 2007.

Wurm, Stephen A. & Lois Carrington, eds, 1978. *Second International Conference on Austronesian Linguistics: Proceedings*. Canberra: Pacific Linguistics. (*Pacific Linguistics* C-61).

Yen, Douglas E., 1974. Arboriculture in the subsistence of Santa Cruz, Solomon Islands. *Economic Botany* 28:247–284.

—, 1985. Wild plants and domestication in Pacific Islands. In V.N Misra & Peter Bellwood, eds, *Recent advances in Indo-Pacific prehistory: Proceedings of the international symposium held at Poona, December 19–21, 1978*, 315–326. New Delhi: Oxford and IBH.

—, 1991. Domestication: The lessons from New Guinea. In Pawley 1991, 558–569.

Z'Graggen, John A., 1980. *A comparative wordlist of the Northern Adelbert Range languages, Madang Province, Papua New Guinea*, vol. D-31. Canberra: Pacific Linguistics. (*Pacific Linguistics*).

Zorc, R. David, 1977. *The Bisayan dialects of the Philippines: Subgrouping and reconstruction*. Canberra: Pacific Linguistics. (*Pacific Linguistics* C-44).

—, 1986. The genetic relationships of Philippine languages. In Geraghty et al. 1986, 147–173.

Zorc, R. David & Matthew Charles, 1971. Proto-Philippine finder list. Typescript, Cornell University.