

Copyright and Reprint Permission: This is the official Journal of the ooi Academy, the academic unit of the ooi Consortium for Teaching, Research, Learning and Development (ooiCTRLD) – A Non-profit Global Professional Academic Organization. Abstracting is permitted with credit to the source. Libraries are permitted to photocopy for private use. Instructors are permitted to photocopy isolated articles for non-commercial classroom use without fee. For copy, reprint, or republication permission, write to ooi Copyright Manager, P. O. Box 1392, Ruston, LA 71273, U. S. A.

All rights reserved. Copyright Spring 2011 © by ooiCTRLD.

ISBN 0-9703797-7-3

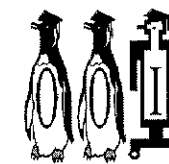
Citation Index: This publication is listed in Cabell's Journal Citation Index and also included in Cabell's database.

Editorial Note: Both American and British English spellings are allowed in this Journal.

How to list an article that appears in this Journal in a REFERENCE section of any document: The following is the appropriate APA Editorial Style format for listing a multiple-authors article published in this Refereed Journal. **Sample:**

Ryan, J. C. (2011). Leaves Of A Tree: Interweaving The Many Narratives Of Southwest Australian Flora. *Research Journal of the ooi Junior Academy, Transactions On Nature, vol.11(1), pg 43-60.*

Publication: This is a blind-peer-reviewed refereed research Journal.



THE PUBLISHER

ooi for PUBLISHING
P. O. Box 1392
Ruston, Louisiana 71273, U. S. A.

**The list of the current official Blind Peer Reviewers and Referees of the
ooi Consortium for Teaching, Research, Learning and Development (ooiCTRLD):
A Global Professional Academic Organization**

AFRICA.

Mr. Samuel Ekhaton, Institute of Continuing Education, Benin City, Nigeria.
Mr. Francis Igberaese, Institute of Continuing Education, Benin City, Nigeria.
Dr. Titos Khalo, Tshwane University of Technology, Pretoria, South Africa.
Dr. Hassan E. Oaikhenan, University of Benin, Benin City, Nigeria.
Dr. David Okoedo-Okojie, University of Benin, Benin City, Nigeria.
Dr. Dickson Oriakhi, University of Benin, Benin City, Nigeria.
Mr. Sam Osadolo, Nelson Mandela Metropolitan University, Port Elizabeth, South Africa.
Mr. Afutendem Lucas Nkwetta, University of Dschang, Cameroon.

AUSTRALIA.

Dr. William W. Bostock, University of Tasmania, Tasmania, Australia.
Dr. Bella Butler, Curtin University of Technology, Perth, Australia.
Dr. Kalaly Chu, Researcher, Sylvania, NSW, Australia.
Dr. Abdel Halabi, Monash University Gippsland Campus, Churchill, Australia.
Dr. (Mrs.) Ashraf U. Sarah Kazi, Monash University Gippsland Campus, Churchill, Australia.
Ms. Judy Lancaster, University of Technology, Sydney, Australia.
Dr. Jinghui (Jackie) Liu, Southern Cross University, Tweed Heads/Gold Cost Campus, Australia.
Mr. Shane Motlap, Charles Darwin University, Northern Territory, Australia.
Mr. Steve F. Lovett, University of Auckland at Manukau, Manukau City, New Zealand.
Mr. John C. Ryan, Edith Cowan University, Perth, Western Australia.

CANADA.

CHINA.

Mr. Steven I-Shuo Chen, National Chiao Tung University, Taipei, Taiwan.
Ms. Meng Fan, Hong Kong Baptist University, Hong Kong, China.
Dr. Rita Yi Man Li, Hong Kong Shue Yan University, Hong Kong, China.

CIS Countries.

The Peace Corp, Armenia Community and Business, Yerevan, Armenia.
Dr. Hasmik Hovhanesian, Yerevan State University, Yerevan, Armenia.
Dr. Heggine Manasyan, Director CRRC_Armenia, Yerevan State University, Yerevan, Armenia.
Ms. Iskuhi Mkrtychyan, Yerevan State University, Yerevan, Armenia.

EUROPE.

Mr. Dev Pramil Audsin, King's College London, UK.
Dr. Xiao Bai, University of Bath, Bath, UK.
Mr. Kunjan Patel, University College Dublin, Dublin, Ireland.
Mr. Hugo P. Proença, University of Beira Interior, Covilhã, Portugal.
Dr. Eng. Mauro Sammarco, University of Salerno, Fisciano, Italy.
Dr. Dubravka Simunovic, University of Applied Health Studies, Zagreb, Croatia.

RJooiJA, T

Research Journal of the ooi Junior Academy,
Transactions on

IN THIS ISSUE

DISCIPLINES

ACTUARY STATISTICS
Li-Fei Huang

Page 1.

ECONOMICS

Basem Mohammed Lozi, Associate Fellow of the ooi Senior Academy

Page 15.

MATERIAL SCIENCE AND METALLURGY

Suren Aghbalyan
Anna Petrosyan
& Tatevik Safaryan

Page 33.

NATURE

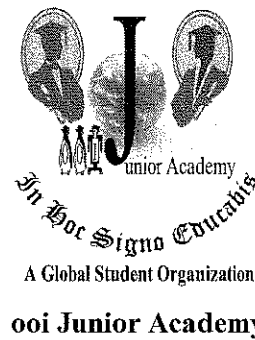
John C. Ryan

Page 43.

APPENDIX

The Publication Guideline (Journal Paper Format) for this Journal.

Page 61.



Blind-peer-reviewed Refereed Multidisciplinary Research Journal

RJooiJA, T

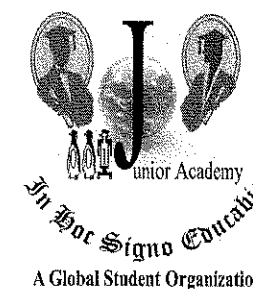
Research Journal of the ooi Junior Academy,
Transactions on

IN THIS ISSUE

• **NATURE**

Leaves Of A Tree: Interweaving The Many Narratives Of Southwest Australian Flora
Page 45

By John C. Ryan



ooi Junior Academy

A Blind-peer-reviewed Refereed Multidisciplinary Research Journal

LEAVES OF A TREE: INTERWEAVING THE MANY NARRATIVES OF SOUTHWEST AUSTRALIAN FLORA

John C. Ryan
Edith Cowan University, Western Australia, AUSTRALIA

ABSTRACT

The narratives of plants offered by science, history, poetry, mythology and direct personal experience are often thought to contradict one another and are thus held as separate. Like leaves of a tree, however, the posthumous botanical works of nineteenth-century American naturalist and philosopher Henry David Thoreau gather together the diverse stories that give meaning to plants. Drawing from the concept of multiple narrative streams as a method of writing natural history inspired by Thoreau, this article explores many accounts of the flora of the biodiverse Southwest corner of Western Australia. Botanical science, Aboriginal spirituality, nature poetry and colonial histories offer versions that explain the natural histories of Southwest plants using different, though complementary, perspectives. The meandering together of narrative streams ensures the perpetuity of non-scientific stories and the potential for cross-pollination between disciplines and diverse ways of knowing the natural world.

INTRODUCTION

*Take their cold seed and set it in the mind,
and its slow root will lengthen deep and deep
till, following, you cling on the last ledge
over the unthinkable, unfathomed edge
beyond which man remembers only sleep.*

-'The cycads,' Judith Wright (1971/1994, pp. 39-40)

As an approach to nature writing, it is vital to consider how the various stories of plants, including poetic and scientific accounts, complement each other, rather than reiterate divisiveness between human nature and botanical culture. Through verse instead of science, Australian poet Judith Wright evokes the primordial character of plants known as cycads, survivors of the age of the dinosaurs and older than the human species. The final line of the poem '*beyond which man remembers only sleep*' intimates the qualities of adaptation and co-evolution that may distinguish the cycads from recently introduced plant species to Australia. Convergent Aboriginal, poetic and scientific perspectives are etched in the slow-growing fibres of cycads. A multi-vocal account of the natural histories of plants, such as cycads, weaves together technical accounts, cultural histories, mythological imagination, emotional narratives, indigenous worldviews, and multi-sensory experience. The greater cohesion of narratives produces a confrontation of knowledge forms, but at productive angles for writers of nature, botanical history, and environmental issues.

Through nineteenth-century American philosopher and naturalist Henry David Thoreau's (Thoreau 1854/1966, 1862/2010, 1906/1962, 1993 and 2000) sense-rich writings on flora, this paper outlines an approach to the different accounts of the flora of the Southwest of Western Australia through the

concept of 'multiple narrative streams.' Indeed, this approach to flora could be applied to any account of natural history, from animals to birds and rocks. Barker (2008, p. 483) defines narrative as:

a sequential account or purported record of events ordered across time into a plot. The concept of narrative refers to the form, pattern or structure by which stories are constructed and told.

Although a technical term in literary theory, 'narrative' will be synonymous with story, account and history for the purpose of this discussion. Aboriginal histories, early colonial accounts, poetic interpretations and experiential impressions broaden the master narrative of science towards storied streams that diverge and converge productively. Through multiple narratives, disciplinary views that historicise plants, such as those offered by scientific natural history, are networked broadly within diverse ways of knowing. An orientation towards commingled streams minimises the potential erasure of displaced accounts in favour of the pre-eminent paradigm of botanical science (for a recent example of this approach, see Hopper, 2010).

THE FLORA OF THE SOUTHWEST

The Southwest corner of Western Australia (hereafter known as 'the Southwest'), including the metropolitan area of Perth, is a biodiversity hotspot of international significance and one of the most floristically diverse places in the world (Breedon & Breedon, 2010; Conservation International, 2007; Corrick & Fuhrer, 2002; Hopper, 1998, 2004). The region is the only officially-recognised hotspot in Australia; forty percent of its plant species occur nowhere else outside of cultivation (Conservation International, 2007). In the late nineteenth century, botanist Baron von Mueller identified the Southwest as a 'botanical province' due to the distinctiveness of the plant life (Beard, 1979, p. 107). Extending from Shark Bay in the upper northwest corner to Israelite Bay east of Esperance in the southeast corner, the Southwest exhibits an endemic array of indigenous plants well-adapted to nutrient-poor soils (Corrick & Fuhrer, 2002). Constraints of climate and soils have given rise to remarkable species diversity. The region has long been isolated from the rest of Australia by the aridity and limestone soils of the inner Nullarbor plains (Hopper, 1993; Seddon, 1972). The Western Australian biologist and author Barbara York Main (1967, p. 42) comments:

there is no landscape more ancient than this anywhere and, because of its age, it has been able, for aeons, to receive and support a fauna and vegetation, limited in variety and density only by the rigorous requirements set by the relatively barren nature of its soils and hazardous, climactic conditions.

Remarkably old plant communities have evolved in the Southwest through a rare combination of stable climate, geographic isolation and lateritic soils. The Darling Plateau that passes near Perth is a major physiographic feature of the province, and the relatively flat area of the Southwest exhibits a remarkable range of soil types, which have given genesis to the unusual diversity of plants (Corrick & Fuhrer, 2002, p. 13). There are over eight-thousand indigenous species, or more than fourteen times the number of species found in the entire United Kingdom (Merle Bennett, September 13, 2009). Of the eight thousand total classified plants, four thousand species are flowering plants, one-third of which have been scientifically described only in the past three decades (Hopper, 2008). Moreover, thirty-five percent of the plants in the Southwest are endemic—found to occur under natural, uncultivated

concept of 'multiple narrative streams.' Indeed, this approach to flora could be applied to any account of natural history, from animals to birds and rocks. Barker (2008, p. 483) defines narrative as:

a sequential account or purported record of events ordered across time into a plot. The concept of narrative refers to the form, pattern or structure by which stories are constructed and told.

Although a technical term in literary theory, 'narrative' will be synonymous with story, account and history for the purpose of this discussion. Aboriginal histories, early colonial accounts, poetic interpretations and experiential impressions broaden the master narrative of science towards storied streams that diverge and converge productively. Through multiple narratives, disciplinary views that historicise plants, such as those offered by scientific natural history, are networked broadly within diverse ways of knowing. An orientation towards commingled streams minimises the potential erasure of displaced accounts in favour of the pre-eminent paradigm of botanical science (for a recent example of this approach, see Hopper, 2010).

THE FLORA OF THE SOUTHWEST

The Southwest corner of Western Australia (hereafter known as 'the Southwest'), including the metropolitan area of Perth, is a biodiversity hotspot of international significance and one of the most floristically diverse places in the world (Breedon & Breedon, 2010; Conservation International, 2007; Corrick & Fuhrer, 2002; Hopper, 1998, 2004). The region is the only officially-recognised hotspot in Australia; forty percent of its plant species occur nowhere else outside of cultivation (Conservation International, 2007). In the late nineteenth century, botanist Baron von Mueller identified the Southwest as a 'botanical province' due to the distinctiveness of the plant life (Beard, 1979, p. 107). Extending from Shark Bay in the upper northwest corner to Israelite Bay east of Esperance in the southeast corner, the Southwest exhibits an endemic array of indigenous plants well-adapted to nutrient-poor soils (Corrick & Fuhrer, 2002). Constraints of climate and soils have given rise to remarkable species diversity. The region has long been isolated from the rest of Australia by the aridity and limestone soils of the inner Nullarbor plains (Hopper, 1993; Seddon, 1972). The Western Australian biologist and author Barbara York Main (1967, p. 42) comments:

there is no landscape more ancient than this anywhere and, because of its age, it has been able, for aeons, to receive and support a fauna and vegetation, limited in variety and density only by the rigorous requirements set by the relatively barren nature of its soils and hazardous, climactic conditions.

Remarkably old plant communities have evolved in the Southwest through a rare combination of stable climate, geographic isolation and lateritic soils. The Darling Plateau that passes near Perth is a major physiographic feature of the province, and the relatively flat area of the Southwest exhibits a remarkable range of soil types, which have given genesis to the unusual diversity of plants (Corrick & Fuhrer, 2002, p. 13). There are over eight-thousand indigenous species, or more than fourteen times the number of species found in the entire United Kingdom (Merle Bennett, September 13, 2009). Of the eight thousand total classified plants, four thousand species are flowering plants, one-third of which have been scientifically described only in the past three decades (Hopper, 2008). Moreover, thirty-five percent of the plants in the Southwest are endemic—found to occur under natural, uncultivated

conditions only within the region—and, additionally the Province holds eighty percent of the plant species of the vast state of Western Australian (Paczkowska & Chapman, 2000).

THOREAU'S APPROACH TO MULTIPLE NARRATIVES

Despite his criticism of the scientific discipline of botany, understandings such as those in the previous pages augmented Thoreau's experiential engagement with flora. Whilst Thoreau's writings led to the development of ecological theories like seed dispersion, they also opened a space for interrelation between scientific, sensuous, and indigenous modes of interacting with plant life. His works exemplify the seamless integration of narrative streams towards multi-faceted accounts of plants. Thoreau outlines an approach to flora in the posthumous works *Faith in a seed* (1993) and *Wild fruits* (2000), which mark his growing intrigue for scientific botany beginning in the early 1850s. Although his earlier work *Walden* (Thoreau, 1854/1966) alludes to local species, an interest in flora consumed his later writings:

I soon found myself observing when plants first blossomed and leafed, and I followed it up early and late, far and near, several years in succession, running to different sides of the town and into the neighboring towns, often between twenty or thirty miles in a day. (Thoreau, 1906/1962, p. 158)

Thoreau planned to colligate observations of flowering and leafing into a 'Kalendar', modelled after John Evelyn's 1664 *Kalendarium hortense* or *Gardener's almanack* (Dean, 2000). The 'Kalendar' would be a comprehensive account that would set out an archetypal year of all the events of natural history in the Concord environs. It would strive for the comprehensiveness characteristic of natural history, as well as an eclecticism spanning scientific botany, Native American ethnobotany, classic Greek and Roman philosophies and multi-sensorial experience set in prose.

Although Thoreau passed away before the 'Kalendar' could be fully realised, *Wild fruits* evidences his intention, and offers a framework for approaching Southwest plants through the concept of narrative streams. In his exposition of the strawberry, Thoreau (2000, pp. 10-17) begins with verses composed by the sixteenth-century poet Thomas Tusser and a description by the herbalist John Gerarde, writing in the pre-Linnaean 1500s. Thoreau (2000, p. 11) reflects upon his field observations of wild strawberries, stating 'by the thirtieth of May I notice the green fruit'. In this evocative passage, he expresses the olfactory sensuousness of wild strawberries as a quality that evades the visible prominence of flowers:

an indescribably sweet fragrance, which I cannot trace to any particular source. It is, perchance, that sweet scent of the earth of which the ancients speak. Though I have not detected the flower that emits it, this appears to be its fruit. It is natural that the first fruit which the earth bears should emit and be, as it were, a concentration and embodiment of that vernal fragrance with which the air has lately teemed. Strawberries are the manna found, ere long, where that fragrance has been. Are not the juices of each fruit distilled from the air? (Thoreau, 2000, p. 12)

Thoreau also conveys the impressions of early colonial explorers to North America, such as eighteenth-century Englishman Samuel Hearne's observations of the role of the strawberry in

indigenous North American culture. The name 'oteagh-minick' in the language of Native Canadians of the Churchill River signifies the resemblance of the fruit to a heart, while other interpretations of strawberry in the indigenous languages of North America, 'oteimeena' in Cree and 'o-da-e-min' in Chippeway, present a signature between the human heart and the shape of the fruit (Thoreau, 2000, p. 15).

Thoreau read extensively the writings of North American explorers and early ethnographers, citing the American theologian Roger Williams's landmark study of Native American linguistics, *A key into the language of America* (Williams, 1643/1997). On the strawberry, Williams (quoted in Thoreau, 2000, p. 16) reveals ethnobotanical interest and possible participant observation: 'The Indians bruise them in a mortar, and mix them with meal, and make strawberry bread...having no other food for many days'. Further in his exposition, Thoreau draws from the records of naturalists, such as the missionary George Loskiel, to ascertain changes to the distribution of strawberries in the eastern United States. Through this vignette, Thoreau exemplifies the use of narrative streams by juxtaposing historical texts, ethnographic accounts, first-hand multi-sensorial interaction and astute field observations. This syncretism augments scientific conjecture, a method he perfects in *Faith in a seed* (Thoreau, 1993).

Similar to his approach to the strawberry, the essay 'Wild apples' (Thoreau, 1862/2010) synthesises field science, references to Classical writers and direct physical experience with flora. The scope of Thoreau's reading on wild apples is wide-ranging, including allusions to Tacitus, Niebuhr, Palladius, Pliny, Michaux and Bodaeus. Multi-sensoriality mingles with the voices of previous writers to create a cultural botany of the wild apple. Thoreau (1862/2010, p. 25) qualifies some apple varieties as 'acrid and puckery, genuine verjuice', whilst a particular wild tree on Nawshawtuck Hill in Concord produces 'a peculiarly bitter tang, not perceived till it is three-quarters tasted. It remains on the tongue. As you eat it, it smells exactly like a squash-bug' (Thoreau, 1862/2010, p. 27). The essay celebrates the sensuous experience of wild apples in an age of increasingly homogenised sizes, shapes, tastes, colours and smells of fruit. Thoreau (1862/2010, p. 28) beseeches us to 'let your condiments be in the condition of your senses. To appreciate the flavor of these wild apples requires vigorous and healthy senses, papillae firm and erect on the tongue and palate'. Although a sensuous naturalist, he relied on emerging botanical science of the nineteenth-century. In the section 'The naming of them,' Thoreau (1862/2010, p. 30) states the advantages of taxonomic nomenclature:

I find myself compelled, after all, to give the Latin names of some for the benefit of those who live where English is not spoken, --for they are likely to have a world-wide reputation.

As suggested by these essays, Thoreau approached flora by querying manifold streams of knowledge without rationalising how they might lock together epistemologically. The writing emanating from Thoreau's transdisciplinary framework is a confluence of knowledge modes towards cross-fertilisation between personal, poetic, multi-sensorial, historic, indigenous and scientific ways of knowing.

THE NARRATIVE STREAMS OF THE ZAMIA PALM

A case study will illustrate the concept of narrative streams as suggested by Thoreau but in the context of Southwest Australia. The Zamia palm (*Macrozamia riedlei*) is a member of the Zamiaceae family of cycads distributed throughout Australia, Africa and warm temperate areas of North and South America (Figure 1.).

indigenous North American culture. The name 'oteagh-minick' in the language of Native Canadians of the Churchill River signifies the resemblance of the fruit to a heart, while other interpretations of strawberry in the indigenous languages of North America, 'oteimeena' in Cree and 'o-da-e-min' in Chippeway, present a signature between the human heart and the shape of the fruit (Thoreau, 2000, p. 15).

Thoreau read extensively the writings of North American explorers and early ethnographers, citing the American theologian Roger Williams's landmark study of Native American linguistics, *A key into the language of America* (Williams, 1643/1997). On the strawberry, Williams (quoted in Thoreau, 2000, p. 16) reveals ethnobotanical interest and possible participant observation: 'The Indians bruise them in a mortar, and mix them with meal, and make strawberry bread...having no other food for many days'. Further in his exposition, Thoreau draws from the records of naturalists, such as the missionary George Loskiel, to ascertain changes to the distribution of strawberries in the eastern United States. Through this vignette, Thoreau exemplifies the use of narrative streams by juxtaposing historical texts, ethnographic accounts, first-hand multi-sensorial interaction and astute field observations. This syncretism augments scientific conjecture, a method he perfects in *Faith in a seed* (Thoreau, 1993).

Similar to his approach to the strawberry, the essay 'Wild apples' (Thoreau, 1862/2010) synthesises field science, references to Classical writers and direct physical experience with flora. The scope of Thoreau's reading on wild apples is wide-ranging, including allusions to Tacitus, Niebuhr, Palladius, Pliny, Michaux and Bodaeus. Multi-sensoriality mingles with the voices of previous writers to create a cultural botany of the wild apple. Thoreau (1862/2010, p. 25) qualifies some apple varieties as 'acid and puckery, genuine verjuice', whilst a particular wild tree on Nawshawtuck Hill in Concord produces 'a peculiarly bitter tang, not perceived till it is three-quarters tasted. It remains on the tongue. As you eat it, it smells exactly like a squash-bug' (Thoreau, 1862/2010, p. 27). The essay celebrates the sensuous experience of wild apples in an age of increasingly homogenised sizes, shapes, tastes, colours and smells of fruit. Thoreau (1862/2010, p. 28) beseeches us to 'let your condiments be in the condition of your senses. To appreciate the flavor of these wild apples requires vigorous and healthy senses, papillae firm and erect on the tongue and palate'. Although a sensuous naturalist, he relied on emerging botanical science of the nineteenth-century. In the section 'The naming of them,' Thoreau (1862/2010, p. 30) states the advantages of taxonomic nomenclature:

I find myself compelled, after all, to give the Latin names of some for the benefit of those who live where English is not spoken, --for they are likely to have a world-wide reputation.

As suggested by these essays, Thoreau approached flora by querying manifold streams of knowledge without rationalising how they might lock together epistemologically. The writing emanating from Thoreau's transdisciplinary framework is a confluence of knowledge modes towards cross-fertilisation between personal, poetic, multi-sensorial, historic, indigenous and scientific ways of knowing.

THE NARRATIVE STREAMS OF THE ZAMIA PALM

A case study will illustrate the concept of narrative streams as suggested by Thoreau but in the context of Southwest Australia. The Zamia palm (*Macrozamia riedlei*) is a member of the Zamiaceae family of cycads distributed throughout Australia, Africa and warm temperate areas of North and South America (Figure 1.).



Figure 1. *Zamia palm* in Bold Park, Perth, Western Australia (2011, photo by the author)

First classified by Government Botanist Charles Gardner, *M. riedlei* is endemic to the lower Southwest corner from Hutt River near Perth to Albany. The plant contains macrozamin, a toxin found in most cycads that is responsible for 'Zamia staggers,' a fatal affliction of the nervous systems of cattle (Carr & Carr, 1981 p. 18). In the Southwest, Zamia palms are thought to be found only in iron-rich lateritic soils and as understory plants in jarrah forests. However, other botanists argue that the species is common on all soil types throughout the Perth area (Marchant et al., 1987, p. 57). Its anatomical features include a short trunk, usually no more than three metres high, rigid fronds one to two metres in length with broadly cylindrical or ovoid seeds, reddish brown and fleshy when ripe (Marchant, et al., 1987). Reflecting the condensed structure of most taxonomic descriptions, Paczkowska and Chapman (2000 p. 27) offer this morphological snapshot:

Macrozamia riedlei (Gaudich.) C.A.Gardner
ZAMIA
Cycad, 0.5-3 m high; small, usually trunkless; leaves few, glossy,
flat or openly keeled, narrow leaflets; short cones. Fertile
plants recorded Sep-Oct. Lateritic soils, jarrah forests.
Distribution: SW:ESP, GS, JF, SWA, WAR.

When the Dutch explorer William de Vlamingh landed in December 1696 on Rottneest Island, adjacent to the mouth of the Swan River near Perth, his party encountered the nuts of the Zamia palm. Vlamingh reported the initial palatability of the roasted fruits, likening them to 'Dutch broad beans, or, when ripe, like hazelnuts,' but three hours after consuming them, his crew 'began to vomit so violently that there was hardly any distinction between death and us' (Vlamingh, 1985, p. 155). In January 1802, with similar indiscretion provoked by hunger and curiosity, members of the Flinders expedition at Lucky Bay were drawn to eat the Zamia fruits, but with equally disastrous consequences:

A party of gentlemen were upon the top, eating a fruit not unlike green walnuts in appearance...Mr. Thistle and some others who had eaten liberally were taken sick and remained unwell all the day afterwards' (Flinders, 1814, p. 80).

Beaton (quoted in Carr & Carr, 1981, p. 17) concludes that nearly every European party, 'known for not reading each other's journals and accounts' including Vlamingh in 1696, Grey in 1839 and McDouall Stuart in 1864, suffered the consequences of cycad poisoning.

Some of the best-preserved records of Aboriginal uses of plants come from the published accounts of early European explorers and settlers (Grey, 1841a, 1841b; Moore, 1846). Contrary to Beaton's assertion, these records indicate familiarity with the botanical observations of previous explorers and naturalists, and document positive interactions between explorers and Aboriginal communities. Along the Arrowsmith River north of Perth, George Grey (1841a, p. 61), guided by an Aboriginal expert Kaiber, was made well aware of the toxicity of the *Zamia* palm: 'Kaiber brought in some nuts of the *Zamia* tree; they were dry, and therefore in a fit state to eat.' The rest of Grey's party indulged impetuously in insufficiently dried fruits, leading to 'violent fits of vomiting accompanied by vertigo, and other distressing symptoms' (Grey, 1841a). Grey's party exhibited the potentially fatal condition 'Zamia staggers' (Carr & Carr, 1981).

Aboriginal cultures throughout Australia, including the Nyoongar of the Southwest to whom *Zamia* fruit is known as *by-yu*, have evolved strategies of detoxification, such as roasting, soaking and fermenting, or a combination of techniques, to convert the *Zamia* nut into a staple food. In the Southwest, explorers and writers, including botanist James Drummond in 1839, naturalist and Quaker missionary James Backhouse in 1843, HMS Beagle officer John Lort Stokes in 1846 and chronicler J.E. Hammond in 1933, have observed the significance of *Zamia* palm in Aboriginal culture (Meagher, 1974 p. 25). Moore (1846, p. 17) observed Nyoongar use of the cycad fruit and the process of detoxifying the fruit:

This in its natural state is poisonous; but the natives, who are very fond of it, deprive it of its injurious qualities by soaking it in water for a few days, and then burying it in sand, where it is left until nearly dry, and is then fit to eat. They usually roast it, when it possesses a flavour not unlike a mealy chestnut; it is in full season in the month of May. It is almost the only thing at all approaching to a fruit which the country produces.

Western Australian settler and creator of one of the first Nyoongah to English dictionaries George Fletcher Moore (1846 p. 22) lists the term 'djiriji' for the *Zamia* as containing 'a farinaceous matter, which, when prepared, has been used as sago, but is dangerous without preparation.' 'Gargoin' denotes the pit of the *Zamia* fruit, 'edible after being steeped in water or buried in moist earth for a time; but the kernel is considered unwholesome by some persons' (Moore, 1846 p. 28). The complexity of the Nyoongar vocabulary surrounding *Zamia* signifies its cultural importance as food stuff. According to Moore's dictionary, the Nyoongar language differentiates between coastal species of *Zamia*, such as *kundāgor*, and between the outer kernal *d-yundo* and the inner kernel *wi-dā* of the nut or *kwinin*.

The poisonous nuts symbolise the progressive understanding of the endemic flora of the Southwest by settler society, a process of conciliation that continues with contemporary botanists who engage the revisioning of botany to explicate how Southwest species adapt to the specific ecological constraints of the region (George, 2002a; Hopper, 1998). This brief account of the *Zamia* palm illustrates the potential meeting of multiple narrative streams including poetic, scientific and Aboriginal realities, each of which contains sensuous histories. Nyoongar narratives of plants express the edibility and palpability of plant life with direct influence on human bodily sustenance and longevity, whereas

Beaton (quoted in Carr & Carr, 1981, p. 17) concludes that nearly every European party, 'known for not reading each other's journals and accounts' including Vlamingh in 1696, Grey in 1839 and McDouall Stuart in 1864, suffered the consequences of cycad poisoning.

Some of the best-preserved records of Aboriginal uses of plants come from the published accounts of early European explorers and settlers (Grey, 1841a, 1841b; Moore, 1846). Contrary to Beaton's assertion, these records indicate familiarity with the botanical observations of previous explorers and naturalists, and document positive interactions between explorers and Aboriginal communities. Along the Arrowsmith River north of Perth, George Grey (1841a, p. 61), guided by an Aboriginal expert Kaiber, was made well aware of the toxicity of the Zamia palm: 'Kaiber brought in some nuts of the Zamia tree; they were dry, and therefore in a fit state to eat.' The rest of Grey's party indulged impetuously in insufficiently dried fruits, leading to 'violent fits of vomiting accompanied by vertigo, and other distressing symptoms' (Grey, 1841a). Grey's party exhibited the potentially fatal condition 'Zamia staggers' (Carr & Carr, 1981).

Aboriginal cultures throughout Australia, including the Nyoongar of the Southwest to whom Zamia fruit is known as *by-yu*, have evolved strategies of detoxification, such as roasting, soaking and fermenting, or a combination of techniques, to convert the Zamia nut into a staple food. In the Southwest, explorers and writers, including botanist James Drummond in 1839, naturalist and Quaker missionary James Backhouse in 1843, HMS Beagle officer John Lort Stokes in 1846 and chronicler J.E. Hammond in 1933, have observed the significance of zamia palm in Aboriginal culture (Meagher, 1974 p. 25). Moore (1846, p. 17) observed Nyoongar use of the cycad fruit and the process of detoxifying the fruit:

This in its natural state is poisonous; but the natives, who are very fond of it, deprive it of its injurious qualities by soaking it in water for a few days, and then burying it in sand, where it is left until nearly dry, and is then fit to eat. They usually roast it, when it possesses a flavour not unlike a mealy chestnut; it is in full season in the month of May. It is almost the only thing at all approaching to a fruit which the country produces.

Western Australian settler and creator of one of the first Nyoongah to English dictionaries George Fletcher Moore (1846 p. 22) lists the term 'djiriji' for the zamia as containing 'a farinaceous matter, which, when prepared, has been used as sago, but is dangerous without preparation.' 'Gargoin' denotes the pit of the zamia fruit, 'edible after being steeped in water or buried in moist earth for a time; but the kernel is considered unwholesome by some persons' (Moore, 1846 p. 28). The complexity of the Nyoongar vocabulary surrounding Zamia signifies its cultural importance as food stuff. According to Moore's dictionary, the Nyoongar language differentiates between coastal species of Zamia, such as *kundāgor*, and between the outer kernel *d-yundo* and the inner kernel *wi-dā* of the nut or *kwinin*.

The poisonous nuts symbolise the progressive understanding of the endemic flora of the Southwest by settler society, a process of conciliation that continues with contemporary botanists who engage the revisioning of botany to explicate how Southwest species adapt to the specific ecological constraints of the region (George, 2002a; Hopper, 1998). This brief account of the Zamia palm illustrates the potential meeting of multiple narrative streams including poetic, scientific and Aboriginal realities, each of which contains sensuous histories. Nyoongar narratives of plants express the edibility and palpability of plant life with direct influence on human bodily sustenance and longevity, whereas

botanical observation represents the apotheosis of natural history as a science. What matters most in the post-colonial context in Australia and elsewhere is the co-existence of narrative streams towards the possibility of dialogue.

SPIRITUAL CONCEPTS OF PLANTS

Before the recent history of European colonisation of Southwest flora, there is the cultural richness of fifty-thousand years of Nyoongar interaction with indigenous plants as food, medicine, tools, ornamentation and totems (Paczkowska & Chapman, 2000). Nyoongar culture and the history of indigenous flora are inseparably united because plants have enabled spiritual and material sustenance and, conversely, Aboriginal people have ensured the longevity of plant populations (Hallam, 1975). Joe Northover (1998, p. 40) expresses eloquently the relationship between Nyoongar people and the land:

we don't have Cathedrals or built monuments to celebrate our culture, we have landscape and the very landscape is a reflection on us and we are a reflection on our landscape. (Figure 2.).



Figure 2. Tingle forest in Walpole, Western Australia (2011, photo by the author)

In Nyoongar belief, plants belong to a spiritual landscape. However, a spiritual alignment with plants may contradict the imperatives of managerialism of conservation science (for example, see McCabe, 1998).

Through acts of sustenance, Nyoongar people have developed complex bodily understandings of flora that deepen the visually constructed plant of Linnaean thought. Indeed, the histories of Aboriginal people throughout Australia interweave with the histories of plants (Clarke, 2007). Whereas knowledge systems of science rely on universalised two-dimensional structuring that exclude subjective sensuous experience of plants, Aboriginal knowledge are contingent upon edibility,

palpability, aroma and the elaborate interstices between the senses and eco-cultural meanings. Nyoongar history intertwines plants with the Aboriginal Dreaming, the complex stories and proscriptions that engender acts to ensure the sustained health and productivity of the landscape (personal communication, Noel Nannup, July 21, 2010). Robert Bropho (1998, p. 31) claims that *'all the Dreaming stories are within the roots of that tree, coming from the ground and [the stories and the roots] can never be separated.'* Bropho (1998, p. 31) aligns human and tree bodies through visceral empathy founded in commiseration:

when I see those photos in the papers of the logs laying there with no limbs on them [I think] that's a body of a Blackman there from the neck down to his ankles and everything's been trimmed, and...that hurts me.

A kindredness between plants and Nyoongar people suggests the shared consequences for both. Ted Wilkes (1998, p. 45) observes that *'the trees in the forest in the southwest of Australia have gone through exactly the same thing that Aboriginal people gone through – annihilation, dispossession.'*

Nyoongar interaction with plants exemplifies *'embodied spatiality,'* a term forwarded by Rose and Robin (2004) to encapsulate the physical connection of Aboriginal people to the land through physical acts of sustenance, such as the gathering of plant foods and medicines. Visual cues overlay deeper cultural resonances. Dorothy Collard (1998, p. 34) reflects on the difference between Nyoongar traditional knowledge and the practices of modern forest management concerning the belief in the restoration of cleared old growth forests: *'[The forest] will never, never be the same. [It] might look good, with their eyes but the spirits [are] not there.'* Whilst an ecosystem may be reconstructed visually, the soul of the forest is irreplaceable. Furthermore, regarding the consequences of clear-felling old growth forests in the Southwest, Mike Hill (1998, p. 18) alludes to the interdependencies Nyoongar people have maintained with flora and the bodily histories that become endangered when ecosystems are altered.

Edible roots, bulbs, and tubers have been culturally significant to the Nyoongar, as elder Ken Colbung (1998, p. 53) observes:

if you ate the food that was around the area, and that was what you had to do is eat the food that was in the region where you went, your... magnetic being was more present.

According to Colbung, interactions with wild foods resonate culturally and spiritually through bodily participation in the land. Sense of place, as such, becomes palpable and tasted *'embodied spatiality.'* The wild yam (*Dioscorea hastifolia*), known as *adjikoh* or *ijjecka*, influenced the degree of sedentism of particular Southwest Aboriginal communities (Carr & Carr, 1981 p. 14; Hallam, 1975) (Figure 3.).

palpability, aroma and the elaborate interstices between the senses and eco-cultural meanings. Nyoongar history intertwines plants with the Aboriginal Dreaming, the complex stories and proscriptions that engender acts to ensure the sustained health and productivity of the landscape (personal communication, Noel Nannup, July 21, 2010). Robert Bropho (1998, p. 31) claims that 'all the Dreaming stories are within the roots of that tree, coming from the ground and [the stories and the roots] can never be separated.' Bropho (1998, p. 31) aligns human and tree bodies through visceral empathy founded in commiseration:

when I see those photos in the papers of the logs laying there with no limbs on them [I think] that's a body of a Blackman there from the neck down to his ankles and everything's been trimmed, and...that hurts me.

A kindredness between plants and Nyoongar people suggests the shared consequences for both. Ted Wilkes (1998, p. 45) observes that 'the trees in the forest in the southwest of Australia have gone through exactly the same thing that Aboriginal people gone through – annihilation, dispossession.'

Nyoongar interaction with plants exemplifies 'embodied spatiality,' a term forwarded by Rose and Robin (2004) to encapsulate the physical connection of Aboriginal people to the land through physical acts of sustenance, such as the gathering of plant foods and medicines. Visual cues overlay deeper cultural resonances. Dorothy Collard (1998, p. 34) reflects on the difference between Nyoongar traditional knowledge and the practices of modern forest management concerning the belief in the restoration of cleared old growth forests: '[The forest] will never, never be the same. [It] might look good, with their eyes but the spirits [are] not there.' Whilst an ecosystem may be reconstructed visually, the soul of the forest is irreplaceable. Furthermore, regarding the consequences of clear-felling old growth forests in the Southwest, Mike Hill (1998, p. 18) alludes to the interdependencies Nyoongar people have maintained with flora and the bodily histories that become endangered when ecosystems are altered.

Edible roots, bulbs, and tubers have been culturally significant to the Nyoongar, as elder Ken Colbung (1998, p. 53) observes:

if you ate the food that was around the area, and that was what you had to do is eat the food that was in the region where you went, your... magnetic being was more present.

According to Colbung, interactions with wild foods resonate culturally and spiritually through bodily participation in the land. Sense of place, as such, becomes palpable and tasted 'embodied spatiality.' The wild yam (*Dioscorea hastifolia*), known as *adjikoh* or *ijjecka*, influenced the degree of sedentism of particular Southwest Aboriginal communities (Carr & Carr, 1981 p. 14; Hallam, 1975) (Figure 3.).

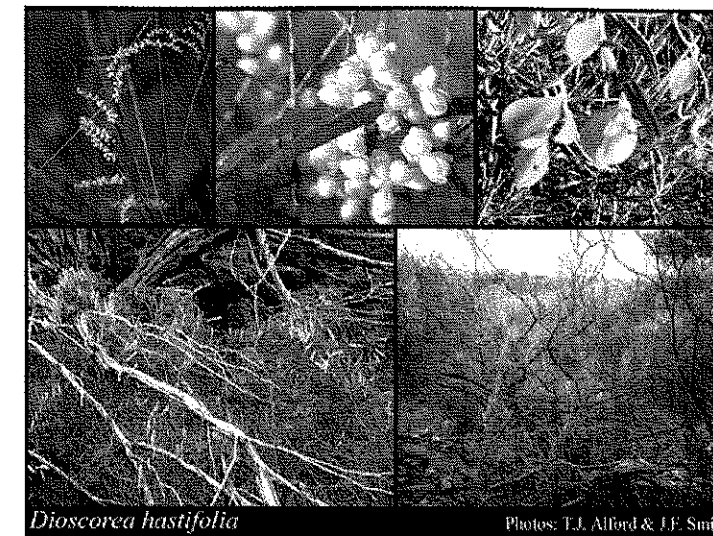


Figure 3. Wild yam in the kwongan region of Western Australia (2011, photo by T.J. Alford and J.F. Smith, FloraBase, retrieved July 20, 2011 <<http://florabase.calm.wa.gov.au/browse/profile/1509>>)

Bain (1975, p. 151) suggests that the agricultural practices of Nyoongar settlements along the Irwin Valley south of Geraldton were strongly centred around the cultivation of root crops:

the people in the vicinity of the Bowes River lived mainly on ijjecka root...it appeared [to settlers] to be a delectable and valuable yam, worth cultivating.

Settler Lockier Burges was of the opinion that the variety of edible root crops, like the *ijjecka* growing prolifically and to great sizes, fostered a diet consisting mainly of plant foods amongst the Nyoongar people of the Irwin Valley north of Perth (Bain, 1975, p. 46) (Figure 4.).

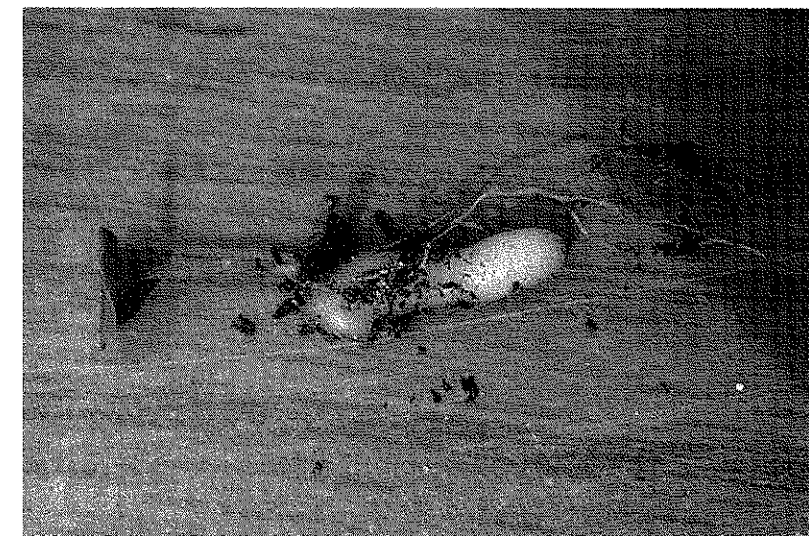


Figure 4. Wild yam root (2011, photo from *Dioscorea's* photostream, retrieved July 20, 2011 <<http://www.flickr.com/photos/64228893@N08/5893654376/>>)

In the sand plains near the modern suburb of Wanneroo, Colbung (Graham, 1990) demonstrates the edible and medicinal potential of the kwongan, including the *bayu* (zamia fruits), *bera* (banksia flower), *boron* (bush red onion), *kojibut* (balm of the melaleuca), *kollookal* (pig face), *bayini* (wild fig), *mundar* (Christmas Tree) and *balga* (*Xanthorrhoea*). Rather than a sterile landscape, the *kwongan* is a place of nurturing and sustaining life. The edible and curative influences of particular species depend on bodily openness to the seasonal life patterns of people and plants. Specific procedures for detoxifying certain plant parts, such as the fruits of the *by-yu* cycad, have been generated as part of Nyoongar cultural legacy (Figure 5.).



Figure 5. *Zamia* cycad fruit cone (2011, photo by the author)

The bodies of plants intermesh with human bodies towards relationships of mutual benefit within specific ecological parameters (for a classic regional study, see Hallam, 1975).

Concerning another root vegetable significant to Nyoongar culture, Moore (1884, p. 301) reported the usage of *konno* or *Platysace cirrosa*:

I have discovered a bulbous root like a dark-coloured potatoe, called by the natives konno, which I mean to endeavour to cultivate, and which may be very useful if it succeeds. The taste is something like the meat of a cocoanut, or between that and a carrot taste. One specimen is as large as your fist.

In 1842 in the Wongan Hills, the naturalist John Gilbert (quoted in Carr & Carr, 1981) reported a harvest festival based on *konno*:

not the slightest chance of getting up another party to go to the Eastward, nor can I procure even natives, for their season of meeting in great numbers to dig the edible root called by them Wargae is now in full force. (Figure 6.).

In the sand plains near the modern suburb of Wanneroo, Colbung (Graham, 1990) demonstrates the edible and medicinal potential of the kwongan, including the *bayu* (zamia fruits), *bera* (banksia flower), *boron* (bush red onion), *kojibut* (balm of the melaleuca), *kollookal* (pig face), *bayini* (wild fig), *mundar* (Christmas Tree) and *balga* (*Xanthorrhoea*). Rather than a sterile landscape, the *kwongan* is a place of nurturing and sustaining life. The edible and curative influences of particular species depend on bodily openness to the seasonal life patterns of people and plants. Specific procedures for detoxifying certain plant parts, such as the fruits of the *by-yu* cycad, have been generated as part of Nyoongar cultural legacy (Figure 5).



Figure 5. *Zamia cycad* fruit cone (2011, photo by the author)

The bodies of plants intermesh with human bodies towards relationships of mutual benefit within specific ecological parameters (for a classic regional study, see Hallam, 1975).

Concerning another root vegetable significant to Nyoongar culture, Moore (1884, p. 301) reported the usage of *konno* or *Platysace cirrosa*:

I have discovered a bulbous root like a dark-coloured potatoe, called by the natives konno, which I mean to endeavour to cultivate, and which may be very useful if it succeeds. The taste is something like the meat of a cocoanut, or between that and a carrot taste. One specimen is as large as your fist.

In 1842 in the Wongan Hills, the naturalist John Gilbert (quoted in Carr & Carr, 1981) reported a harvest festival based on *konno*:

not the slightest chance of getting up another party to go to the Eastward, nor can I procure even natives, for their season of meeting in great numbers to dig the edible root called by them Wargae is now in full force. (Figure 6.).

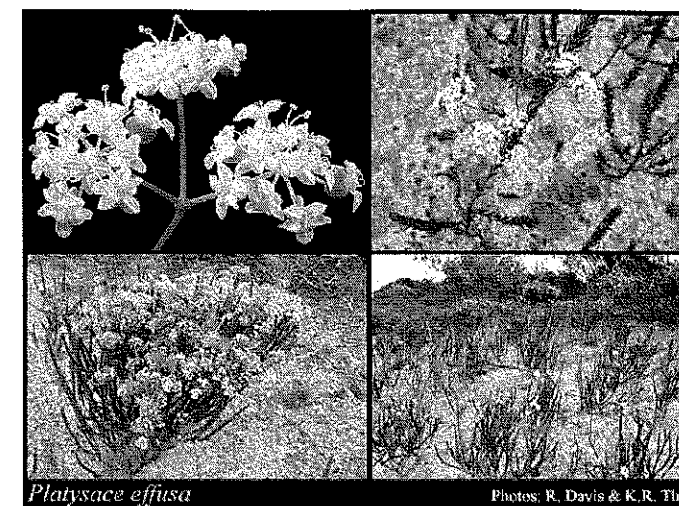


Figure 6. *Platysace effusa*, a close relative of *konno* (photo by R. Davis and K.R. Thiele, FloraBase, retrieved July 20, 2011 < <http://florabase.calm.wa.gov.au/browse/photo/6252>>)

One-hundred and twenty-five years later, Meagher (1974, p. 26) observed the collection of *karno* (*konno* in Moore's dictionary) near Mingenev:

The tubers are about half a metre below the ground and are dug up with a digging-stick... These tubers are available throughout the year and, besides being roasted in the ashes, are sometimes eaten raw to quench the thirst.

Nyoongar narratives of indigenous flora comprise bodily sensations of hunger, thirst and sickness and are therefore bodily-engaged accounts of plants.

Similarly, the endemic West Australia Christmas Tree, known as *mudjar* in the Nyoongar language and *Nuytsia floribunda* to scientists, is a conspicuous Southwest plant with significant cultural meanings (Hopper, 2010) (Figure 7.).



Figure 7. *Mudjar*, the West Australian Christmas Tree (2010, photo by the author)

The Christmas Tree exhibits a variety of shapes and sizes and generally flowers around the middle of December (Figure 8.).

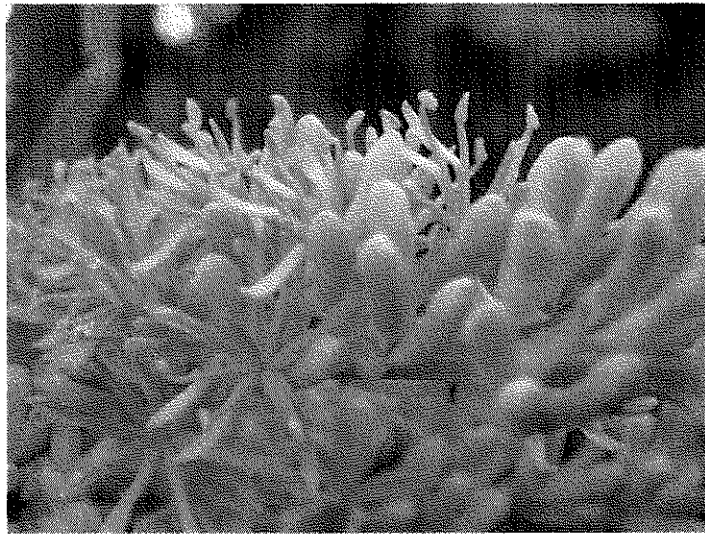


Figure 8. Detail of mudjar, the West Australian Christmas Tree (2010, photo by the author)

Modern botanical science classifies *Nuytsia* as a mistletoe endemic to the Southwest. As a root and rhizome hemi-parasite, it parasitises a number of hosts but also has the ability to make its own food through photosynthesis (Paczkowska & Chapman, 2000). The parasitising rootlets coming off the main roots of the *Nuytsia* are so tenacious that they have been known to burrow into underground utility lines.

In the 1930s, the ethnographer Daisy Bates (1992, p. 86) noted the associations between the spirit world and the Christmas Tree in Nyoongar belief:

the tree-Moojarr, or Moodurt...was to the Bibbulmun the 'Kaanya Tree' 'the tree of the souls of the newly dead.' From time immemorial the soul of every Bibbulmun rested on the branches of this tree on leaving its mortal body for its heavenly home, Kurannup, the home of the Bibbulmun dead which lay beyond the western sea.

Nuytsia facilitated the passage of souls to the after world, but as Bates claimed, the tree was feared and avoided. Other early ethnographers recorded the use of *Nuytsia* as food, water and decoration, suggesting that within the Southwest, there have been variable spiritual beliefs about the tree (Cunningham, 2005).

Moore (1846, p. 80) described the Christmas Tree as '*Mut-yal, s. – Nuytsia floribunda; colonially, cabbage-tree. The only loranthus or parasite that grows by itself. Another anomaly in this land of contradictions. It bears a splendid orange flower.*' As the world's largest parasitic plant, the Christmas Tree epitomised the baffling growth habits of New World plants in the eyes of botanists. It represented the departure of the West Australian landscape from European norms. Even the name 'Christmas Tree,' flowering in yellow as it does in the heat of the late spring and early summer months of

The Christmas Tree exhibits a variety of shapes and sizes and generally flowers around the middle of December (Figure 8).

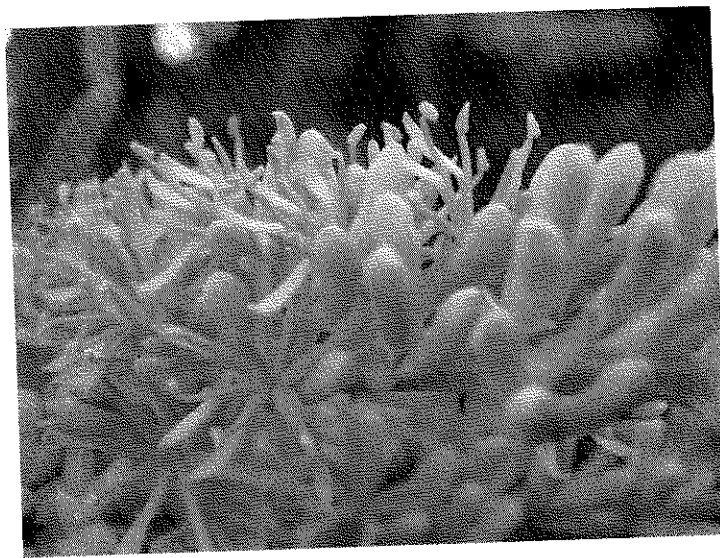


Figure 8. Detail of mudjar, the West Australian Christmas Tree (2010, photo by the author)

Modern botanical science classifies *Nuytsia* as a mistletoe endemic to the Southwest. As a root and rhizome hemi-parasite, it parasitises a number of hosts but also has the ability to make its own food through photosynthesis (Paczkowska & Chapman, 2000). The parasitising rootlets coming off the main roots of the *Nuytsia* are so tenacious that they have been known to burrow into underground utility lines.

In the 1930s, the ethnographer Daisy Bates (1992, p. 86) noted the associations between the spirit world and the Christmas Tree in Nyoongar belief:

the tree-Moojarr, or Moodurt...was to the Bibbulmun the 'Kaanya Tree' 'the tree of the souls of the newly dead.' From time immemorial the soul of every Bibbulmun rested on the branches of this tree on leaving its mortal body for its heavenly home, Kurannup, the home of the Bibbulmun dead which lay beyond the western sea.

Nuytsia facilitated the passage of souls to the after world, but as Bates claimed, the tree was feared and avoided. Other early ethnographers recorded the use of *Nuytsia* as food, water and decoration, suggesting that within the Southwest, there have been variable spiritual beliefs about the tree (Cunningham, 2005).

Moore (1846, p. 80) described the Christmas Tree as 'Mut-yal, s. - *Nuytsia floribunda*; colonially, cabbage-tree. The only loranthus or parasite that grows by itself. Another anomaly in this land of contradictions. It bears a splendid orange flower.' As the world's largest parasitic plant, the Christmas Tree epitomised the baffling growth habits of New World plants in the eyes of botanists. It represented the departure of the West Australian landscape from European norms. Even the name 'Christmas Tree,' flowering in yellow as it does in the heat of the late spring and early summer months of

November and December, runs contrary to the image of the evergreen Christmas tree brought indoors from the cold and deep snow of the English countryside.

Early European colonists to Western Australia reported mixed admiration and disdain for *Nuytsia*. The tree in flower was first recorded by the crew of Dutch explorer Pieter Nuyt's vessel *Gulden Zeepaard* in 1627 (Cunningham, 2005). *Nuytsia* was assigned as its scientific name in 1831 by the botanist Robert Brown and the tree was referred to as 'Fire Tree' (Lindley, 1840, p. xxxix) amongst the colonists. In the journals of Western Australian surveyors Alfred Hillman and Septimus Roe, *Nuytsia* indicated infertile country and was described disparagingly as part of the intolerable scrubbiness of the landscape (Hopper, 2010). In 1880, peripatetic artist Marianne North painted 'Study of the West Australian Flame-tree or Fire-tree,' now part of the botanical art collection at Kew Gardens in England. The tree depicted in the painting looks more like a European elm tree with its pleasant vase-like form than most Christmas Trees found in the Western Australian wild.

For some Nyoongar people, the Christmas Tree has been considered a sacred plant linked to the souls of the deceased. The writings of early settlers and ethnographers point to some of the spiritual beliefs and material practices surrounding *Nuytsia*. In the 1930s, Bates (1992, p. 153) reported the view of *Nuytsia* as a home for disembodied spirits when she wrote that the Nyoongar people 'did not fear the tree; they loved it, but held it sacred for its spiritual memories. The souls of all their forbears had rested on the spirit tree on their way to Kurannup.' Writing in the 1880s, Ethel Hassell (1975, p. 26) reported the use of *Nuytsia* root as a candy:

They gave me one of the roots to taste, telling me it was called mungah. The outer skin was pale yellow but easily stripped off leaving a most brittle centre tasting very like sugar candy.

A ghoulish creature called a *gnolum*, in the form of a very tall, very thin man, enticed boys away by offering them the roots of the *mungah* tree (Hassell, 1975, p. 65) (Figure 9).



Figure 9. Flower of mungah, another spelling of the Nyoongar name for the West Australian Christmas Tree (2010, photo by the author)

CONCLUSION

Springing from Thoreau's expositions of strawberries and wild apples, this article has presented the concept of multiple narrative streams as a way to conceptualise the convergence of the diverse stories of plants. Particular emphasis has been given to the narratives of plants of the Southwest corner of Western Australia. Science has a functional view of plant life aligned to its classificatory prerogatives. In comparison, traditional Nyoongar stories of plants revolve around corporeal engagement through the seasons towards cultural and spiritual sustenance. As suggested by Wright's poem about cycads, poetry has the potential to bring metaphor and myth to our understandings of the natural world. A hybridity of narratives of indigenous plants in the Southwest reclaims the sensuous and intellectual histories of interactions between flora and culture. Through the concept and technique of narrative streams, nature writing orients towards scientific, poetic, Aboriginal and experiential ways of knowing. Such stream of knowledge meander together in writing of all forms towards productive confluences is more important than their potential epistemological differences.

REFERENCES

- Bain, M. A. (1975). *Ancient Landmarks: A Social and Economic History of the Victoria District of Western Australia 1839-1894*. Nedlands, W.A.: University of Western Australia Press.
- Barker, C. (2008). *Cultural Studies: Theory and Practice* (3 ed.). London: Sage.
- Bates, D. (1992). *Aboriginal Perth Bibbulmun Biographies and Legends*. (Ed. S. Bridge). Victoria Park, W.A.: Hesperian Press.
- Beard, J. S. (1979). Phytogeographic Regions. In J. Gentili (Ed.), *Western Landscapes* (pp. 107-121). Nedlands, W.A.: University of Western Australia Press.
- Bennett M. (2009, September 13). Personal communication.
- Breeden, S., & Breeden, K. (2010). *Wildflower Country: Discovering Biodiversity in Australia's Southwest*. Fremantle, W.A.: Fremantle Press.
- Bropho, R. (1998). Interview 17: Robert Bopho. Swan Valley Aboriginal Community, Circle of Elders. 9:30am, 17:06:98. In T. McCabe (Ed.), *Nyoongar Views on Logging Old Growth Forests* (pp. 30-32). West Perth, W.A.: Wilderness Society W.A.
- Carr, D. J., & Carr, S. G. M. (1981). The Botany of the First Australians. In D. J. Carr & S. G. M. Carr (Eds.), *People and Plants in Australia* (pp. 3-44). Sydney & New York: Academic Press.
- Clarke, P. (2007). *Aboriginal People and Their Plants*. Dural Delivery Centre, N.S.W.: Rosenberg Publishing.
- Colbung, K. (1998). Interview 30: Ken Colbung. Elder. Joondalup. 9:30am. 10:07:98. In T. McCabe (Ed.), *Nyoongar Views on Logging Old Growth Forests* (pp. 51-56). West Perth, W.A.: Wilderness Society W.A.
- Collard, D. (1998). Interview 19: Dorothy Collard. Actress and Great Grandmother. In T. McCabe (Ed.), *Nyoongar Views on Logging Old Growth Forests* (pp. 32-35). West Perth, W.A.: Wilderness Society W.A.
- Conservation International. (May, 2007). Southwest Australia.
<http://www.biodiversityhotspots.org/xp/hotspots/australia/Pages/default.aspx>
- Corrick, M. G., & Fuhrer, B. A. (2002). *Wildflowers of Southern Western Australia*. Noble Park, VIC: The Five Mile Press.
- Cunningham, I. (2005). *The Land of Flowers: An Australian Environment on the Brink*. Caringbah, N.S.W.: Otford Press.
- Dean, B. P. (2000). Introduction. In B. P. Dean (Ed.), *Wild Fruits: Thoreau's Rediscovered Last Manuscript*. New York and London: W.W. Norton & Company.

CONCLUSION

Springing from Thoreau's expositions of strawberries and wild apples, this article has presented the concept of multiple narrative streams as a way to conceptualise the convergence of the diverse stories of plants. Particular emphasis has been given to the narratives of plants of the Southwest corner of Western Australia. Science has a functional view of plant life aligned to its classificatory prerogatives. In comparison, traditional Nyoongar stories of plants revolve around corporeal engagement through the seasons towards cultural and spiritual sustenance. As suggested by Wright's poem about cycads, poetry has the potential to bring metaphor and myth to our understandings of the natural world. A hybridity of narratives of indigenous plants in the Southwest reclaims the sensuous and intellectual histories of interactions between flora and culture. Through the concept and technique of narrative streams, nature writing orients towards scientific, poetic, Aboriginal and experiential ways of knowing. Such stream of knowledge meander together in writing of all forms towards productive confluences is more important than their potential epistemological differences.

REFERENCES

- Bain, M. A. (1975). *Ancient Landmarks: A Social and Economic History of the Victoria District of Western Australia 1839-1894*. Nedlands, W.A.: University of Western Australia Press.
- Barker, C. (2008). *Cultural Studies: Theory and Practice* (3 ed.). London: Sage.
- Bates, D. (1992). *Aboriginal Perth Bibbulmun Biographies and Legends*. (Ed. S. Bridge). Victoria Park, W.A.: Hesperian Press.
- Beard, J. S. (1979). Phytogeographic Regions. In J. Gentili (Ed.), *Western Landscapes* (pp. 107-121). Nedlands, W.A.: University of Western Australia Press.
- Bennett M. (2009, September 13). Personal communication.
- Breeden, S., & Breeden, K. (2010). *Wildflower Country: Discovering Biodiversity in Australia's Southwest*. Fremantle, W.A.: Fremantle Press.
- Bropho, R. (1998). Interview 17: Robert Bropho. Swan Valley Aboriginal Community, Circle of Elders. 9:30am, 17:06:98. In T. McCabe (Ed.), *Nyoongar Views on Logging Old Growth Forests* (pp. 30-32). West Perth, W.A.: Wilderness Society W.A.
- Carr, D. J., & Carr, S. G. M. (1981). The Botany of the First Australians. In D. J. Carr & S. G. M. Carr (Eds.), *People and Plants in Australia* (pp. 3-44). Sydney & New York: Academic Press.
- Clarke, P. (2007). *Aboriginal People and Their Plants*. Dural Delivery Centre, N.S.W.: Rosenberg Publishing.
- Colbung, K. (1998). Interview 30: Ken Colbung. Elder. Joondalup. 9:30am. 10:07:98. In T. McCabe (Ed.), *Nyoongar Views on Logging Old Growth Forests* (pp. 51-56). West Perth, W.A.: Wilderness Society W.A.
- Collard, D. (1998). Interview 19: Dorothy Collard. Actress and Great Grandmother. In T. McCabe (Ed.), *Nyoongar Views on Logging Old Growth Forests* (pp. 32-35). West Perth, W.A.: Wilderness Society W.A.
- Conservation International. (May, 2007). Southwest Australia. <http://www.biodiversityhotspots.org/xp/hotspots/australia/Pages/default.aspx>
- Corrick, M. G., & Fuhrer, B. A. (2002). *Wildflowers of Southern Western Australia*. Noble Park, VIC: The Five Mile Press.
- Cunningham, I. (2005). *The Land of Flowers: An Australian Environment on the Brink*. Caringbah, N.S.W.: Otford Press.
- Dean, B. P. (2000). Introduction. In B. P. Dean (Ed.), *Wild Fruits: Thoreau's Rediscovered Last Manuscript*. New York and London: W.W. Norton & Company.

- Flinders, M. (1814). *A Voyage to Terra Australis*. London: G. and W. Nicol.
- George, A. (2002a). *The Long Dry: Bush Colours of Summer and Autumn in South-western Australia*. Kardinya, W.A.: Four Gables Press.
- Graham, D. (1990). *Nyoongar bush tucker with Ken Colbung* [VHS]. Mt. Lawley, W.A.: The Institute of Applied Aboriginal Studies.
- Grey, G. (1841a). *Journals of Two Expeditions of Discovery in North-west and Western Australia During the Years 1837, 38, and 39*. (Vol. 1). London: T. and W. Boone.
- Grey, G. (1841b). *Journals of Two Expeditions of Discovery in North-West and Western Australia During the Years 1837, 38, and 39*. (Vol. 2). London: T. and W. Boone.
- Hallam, S. J. (1975). *Fire and Hearth: A Study of Aboriginal Usage and European Usurpation in South-Western Australia*. Canberra: Australian Institute of Aboriginal Studies.
- Hassell, E. (1975). *My Dusky Friends*. Dalkeith, W.A.: C.W. Hassell.
- Hill, M. (1998). Interview 7: Mike Hill. RFA Nyoongar Action Group Chairperson. Public Meeting. In T. McCabe (Ed.), *Nyoongar Views on Logging Old Growth Forests* (pp. 18-20). West Perth, W.A.: Wilderness Society W.A.
- Hopper, S. (1993). *Kangaroo Paws and Catspaws: A Natural History and Field Guide*. Como, W.A.: Department of Conservation and Land Management.
- Hopper, S. (1998). An Australian Perspective on Plant Conservation Biology Practice. In P. Fiedler & P. Kareiva (Eds.), *Conservation Biology for the Coming Decade* (2 ed., pp. 255-278). New York: Chapman Hall.
- Hopper, S. (2004). Southwestern Australia, Cinderella of the World's Temperate Floristic Regions. *Curtis's Botanical Magazine*, 21(2), 132-180.
- Hopper, S. (October, 2008). What Lessons are Coming Out of Western Australia: Interview With Stephen Hopper. <http://media.geopix.net/seedsofhope/080717shopperkew.htm>
- Hopper, S. (2010). *Nuytsia floribunda*. *Curtis's Botanical Magazine*, 26(4).
- Lindley, J. (1840). *A Sketch of the Vegetation of the Swan River Colony*. London: James Ridgway.
- Main, B. Y. (1967). *Between Wodjil and Tor*. Brisbane and Perth: The Jacaranda Press and Landfall Press.
- Marchant, N. G., Wheeler, J. R., Rye, B. L., Bennett, E. M., Lander, N. S., & Macfarlane, T. D. (1987). *Flora of the Perth Region: Part One*. Perth, W.A.: Western Australian Herbarium, Department of Agriculture.
- McCabe, T. (1998). Nyoongar Kaarny - Nyoongar Spirituality. In T. McCabe (Ed.), *Nyoongar Views on Logging Old Growth Forests* (pp. 6). West Perth, W.A.: Wilderness Society W.A.
- Meagher, S. J. (1974). *The Food Resources of the Aborigines of the South-West of Western Australia*. W.A. Museum Records, 3(1).
- Moore, G. F. (1846). *Descriptive Vocabulary of the Language in Common Use Amongst the Aborigines of Western Australia*. Nedlands, W.A.: University of Western Australia Press.
- Moore, G. F. (1884). *Diary of Ten Years Eventful Life of an Early Settler in Western Australia*. Nedlands, W.A.: University of Western Australia Press.
- Nannup, N. (July 2010). Personal communication.
- Northover, J. (1998). Interview 21: Joe Northover. Police Officer. Collie. 4:30pm. 28:06:98. In T. McCabe (Ed.), *Nyoongar Views on Logging Old Growth Forests* (pp. 35-37). West Perth, W.A.: Wilderness Society W.A.
- Paczkowska, G., & Chapman, A. R. (2000). *The Western Australian Flora: A Descriptive Catalogue*. Perth, W.A.: Wildflower Society of Western Australia (Inc.), the Western Australian Herbarium, CALM and the Botanic Gardens & Parks Authority.

- Rose, D., & Robin, L. (2004). The Ecological Humanities in Action: An Invitation. Australian Humanities Review 31-32. Retrieved 11 July, 2010, from <http://www.australianhumanitiesreview.org/archive/Issue-April-2004/rose.html>
- Seddon, G. (1972). *Sense of Place: A Response to an Environment*. Perth, W.A.: University of Western Australia Press.
- Thoreau, H. (1854/1966). *Walden; and Civil Disobedience: Authoritative Texts, Background, Reviews, and Essays in Criticism*. New York: W.W. Norton.
- Thoreau, H. (1862/2010). *Wild Apples*. LaVergne, TN: Filiquarian Publishing.
- Thoreau, H. (1906/1962). *The Journal of Henry D. Thoreau*. New York: Dover Publications.
- Thoreau, H. (1993). *Faith in a Seed: The Dispersion of Seeds and Other Late Natural History Writings*. Washington, DC: Island Press.
- Thoreau, H. (2000). *Wild Fruits: Thoreau's Rediscovered Last Manuscript*. New York and London: W.W. Norton & Company.
- Vlamingh, W. (1985). *Voyage to the Great South Land* (C. De Heer, Trans.). Sydney, N.S.W: Royal Australian Historical Society.
- Wilkes, T. (1998). Interview 25: Ted Wilkes. Perth Aboriginal Medical Service, Director. 12:55pm. 29:06:98. In T. McCabe (Ed.), *Nyoongar Views on Logging Old Growth Forests* (pp. 44-45). West Perth, W.A.: Wilderness Society W.A.
- Williams, R. (1643/1997). *A Key Into the Language of America*. Bedford, MA: Applewood Books.
- Wright, J. (1971/1994). *Judith Wright: Collected Poems 1942-1985*. Sydney: Angus & Robertson.

Author:

John C. Ryan is a PhD candidate in the School of Communications and Arts at Edith Cowan University in Perth, Western Australia. He holds a B.A. in English and Environmental Design from the University of Massachusetts, a B.S. in Biology from Excelsior College and an M.A. in Environmental Philosophy from the University of Lancaster in the U.K. His current research areas include ecocriticism, the history and philosophy of botany, and nature writing. He is the author of the poetry collection Katoomba Incantation (2011).