

ROOT BARK EATING IN SOUTHWESTERN AUSTRALIA

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Root bark is a little understood bush tucker that was once consumed by the indigenous Nyoongar people of inland southwestern Australia.¹ The bark was collected to extract nutritious plant sugars found in the inner bark and vascular cambium of the roots of certain species of *Eucalyptus* trees. The living inner bark and vascular tissue forms a thin actively dividing layer of gelatinous sweet cellular tissue that separates the bark from sapwood. It is responsible for transporting sugars and other organic substances to all parts of woody shrubs and trees.

Only a handful of anecdotal accounts allude to this form of comestible among the traditional inhabitants of southwestern Australia (Drummond 1839, 1843, Grey 1840, Moore 1842, Ketoun 1849, Salvado 1851 and Bates 1938). James Drummond, the Colonial Botanist, in a letter to Sir William Hooker in 1839 was the first to record indigenous root bark eating.² He states:

‘The Eucalyptus found on the sandy loam, is called by the settlers *York Gum*, by the natives *Doalta*;³ they use the bark of the root as food in the dry season chewing it along with the gum of the *Manna*.’⁴

Drummond (1839) states that it was chewed ‘until they separate the saccharine matter which the root contains.’ They then ‘spit out the refuse, which is generally to be seen near their bivouacs.’⁵

Grey (1840:117) records *tdowt-ta* as ‘a root eaten by the natives.’ He clearly did not observe the tree first-hand as he provides no identifying names or details and does not include any reference to the consumption of root bark. It was the root bark, not the root, of the *tdowt-ta* that was eaten.

Both Moore (1842: 97) and Drummond (1839) identify *twotta* or *doatta* as York Gum (*Eucalyptus loxophleba*). Moore (1842: 70) states:

‘A Eucalyptus, of which the natives chew the bark of the roots, wrapped about gum, or pounded up with it into a cake. Colonially, the York gum-tree, being the principal timber which characterizes that district. The lands whereon it is found are generally good for sheep pasture.’

Bishop Salvado (1851), in his memoirs, records *Duotta* as ‘the roots of certain types of trees’ but he does not name these trees. He comments:

‘The fibrous outer covering of the roots of certain types of trees forms one of their food-stuffs. They heat it over the fire and crush it, and then eat it with gum. Normally they suck the substance out of it and spit out the residue.’ (Salvado in Stormon 1977: 161)

‘The outside tegument of the roots of this tree forms one of the native foods; they scorch and grind it, and then chew it and spit out the residue.’ (Salvado in Storman 1977: 212).

Storman (1977: 212, 294) when interpreting Salvado’s work makes an assumption (based on the phonetic resemblance between *duotta*, *dward* and *tuart*) that the tree being referred to by Salvado is the *tuart* (*Eucalyptus gomphocephala*). However, it is our view that Salvado’s description of *duotta* matches the *wandoo* (*Eucalyptus wandoo*) because he

describes the white trunk of the tree, notes its susceptibility to termites and its usefulness as a water reservoir in the dry months- all of which are features of the white gum or *wandoo*. Salvado's description of *duotta* is as follows:

'...a species of eucalypt of which the wood is white, and extremely hard, but particularly subject to white ants... The hollow parts of these trees often retain supplies of rainwater from the winter months till summer; and the native make it squirt out by boring a hole through one of the knots of the trunk, and quenching their thirst as at a clear fountain, afterwards blocking up the hole to preserve the water for later on. I have often drunk this way, and found the water fresh but not very palatable. The outside tegument of the root of this tree forms one of the native foods; they scorch and grind it, and then chew it and spit out the residue. Moreover, they find in these roots certain yellow worms, as long as a man's index finger, and they eat these in the way earlier described.' (Salvado 1857 in Stormon 1977: 212)



Eucalyptus wandoo, Toodyay (Photo by B. Dobson)

Eucalyptus wandoo is unique in that it has the same scientific species name, common name and Nyoongar name. Very rarely are Nyoongar names incorporated into the Latin based Linnaean binomial nomenclature. It is our opinion that Stormon (1977:294) may have erroneously interpreted Salvado's *duotta* as meaning *tuart* when in fact Salvado was probably describing the wandoo.⁶ Bird and Beeck (1988: 118) refer to the indigenous chewing of the roots of both *dward* (*Eucalyptus loxophleba* or York gum) and *wornd* (*Eucalyptus wandoo* or wandoo). They state that at the time of their fieldwork they:

‘collected wandoo or white gum roots which turned out to be very dry and unpalatable. This was attributed to the fact that the tree was growing on laterite gravel rather than sandy ground’ (Bird and Beeck 1988: 119). What Bird and Beeck (1988) do not consider is that it was the root bark, rather than the root, that was chewed, and usually after considerable processing. Bird and Beeck (1988) include the roots of *Eucalyptus wandoo* in their list of foods consumed by the inland Nyungars of lower southwestern Australia, based on information provided by one of their senior Aboriginal informants. However, apart from noting that these were eaten in season, they do not provide any details as to when or how the roots (or root bark) were procured, prepared or consumed.⁷

The few fragments of ethnographic information provided by Drummond (1839,1843), Moore (1842) and Salvado (1851) when collectively analysed suggest that the root bark of at least two species of *Eucalyptus* was consumed. These were *Eucalyptus loxophleba* (the York gum) known by Drummond and Moore as ‘*doalta*,,’ ‘*doatta*’ or ‘*twotta*’ and *Eucalyptus wandoo* (what Salvado calls ‘*duotta*’).⁸ Both are inland *Eucalyptus* species that often co-exist within the same locality but in different soil types. Drummond (1839) points out that the York gum is found in alluvial ‘sandy loam’ whereas the white gum or *wandoo* is generally found in ‘hard clay.’ Like his contemporaries, Drummond fails to give any precise time, place or contextual description for indigenous root bark eating, except to say that it was eaten during ‘the dry season’.

Traditional Nyoongars were expert plant phenologists and fully aware of the seasonal timing and availability of fruits, seeds, flowers and roots, including the edible vascular cambium of the root bark of *twotta Eucalyptus*. It is our view, based on rudimentary iodine testing experiments of samples of *twotta* that this food would have been high in photosynthates (plant sugars) at the time of its collection and that it would have been relatively easy to procure using digging stick or *wanna* technology.

The fresh gum exudates found on *Acacia* species (most notably *Acacia microbotrya*) were added to the root bark chew. Sweet edible wattle gum known by Nyoongars as *galyang* or *menna*, to this day continues to be highly prized and sought after as a natural indigenous confection.⁹

Acacia microbotrya (colonially known as 'manna wattle') often grows in the vicinity of *Eucalyptus loxophleba* (York gum) and can still be seen amongst remnant vegetation on the road verge near Drummond's original property at Hawthornden, Toodyay. One could speculate that Drummond's account of this practice of root bark consumption related to indigenous practice in the Toodyay district and its surrounds.



York Gum (*Eucalyptus loxophleba*) at Hawthornden, Toodyay (Photo by B. Dobson)

The early colonial records provide little insight into the methods used by indigenous inhabitants to collect and prepare root bark. However, it is possible using anthropological imagination and examples of ethno-historical descriptions of Nyoongar root-gathering activities to reconstruct a picture of the process of root bark procurement and its preparation for consumption. Classic examples of root gathering and processing involved seasonal staples such as *yanjet* (*Typha domingensis*), *warrain* (*Dioscorea hastifolia* or native yam) and *bohrn, mein, or madje* (*Haemodorum* or “bloodroots”). The digging of these rhizomes, tubers, corms and bulbs (or “vegetable roots”) was customarily the work of women. It would seem logical to assume that the collecting and processing of root bark was also a primarily female task.

Ketoun (1849) refers to Aboriginal women bringing him some gum and ‘twotta’ when food was scarce during his expedition from Toodyay to Wongan Hills in April 1844 (see Ketoun’s diary entries which are cited later in this paper). The procurement of root bark would have involved laborious digging to excavate the roots using a *wanna* which is a long hardwood crowbar (with a fire hardened point) rounded on one side and flattened on the other. Commonly referred to as ‘the digging stick’ the *wanna* was an indispensable tool – sometimes weapon – which was individually manufactured, maintained and carried by its female user.¹⁰

Grey (1841:292-293) describes how Nyoongar women dug up roots using their *wannas*:

‘It is generally considered the province of women to dig roots, and for this purpose they carry a long pointed stick, which is held in the right hand, and driven firmly into the ground, where it is shaken, so as to loosen the earth, which is scooped up and thrown out with the fingers of the left hand, and in this manner they dig with great rapidity.’

Moore (1842: 24) provides a linguistic meaning for the above process, calling it:

‘*dtanbarrang-ijow* - to dig up; to dig out. A compound word, signifying literally, pierce (the ground), take (it; whatever is dug up, in your hand), put (it on one side), this being an exact description of the native style of digging.’

Root bark would have been simply removed by lifting the bark with the sharpened end of the *wanna* and peeling it away from the woody structure. Salvado (in Stormon 1977:212) points out that once the bark has been stripped from the root ‘they scorch and grind it.’ He further elaborated that once heated and crushed, it was eaten with gum.



The root bark of *duotta* (York Gum) before pounding (Photo by B. Dobson).

Many Noongar vegetable foods (*maryn*) were similarly cooked and ground to denature toxic or bitter substances as well as to soften the texture and to enhance the nutrient value.¹¹ After cooking, the root bark was pounded between two grindstones. This pounding action was known as ‘*yudang-winnan*’ (Moore 1842: 83,107). The grinding stones usually consisted of a round or oval flattened basal stone that was larger than the upper stone (or muller) which was held in the right hand of the user for pounding and grinding. The left hand was used for squeezing and shaping the crushed bark into the form of a cake. Oldfield (1865: 278) describes the grinding process as follows:

‘...she proceeds to pound the roots singly, after each blow squeezing up the mass with her fingers of the left-hand, and thus continues pounding until the substance assumes the form of a coherent cake, about two inches in diameter and one-third in thickness.



Root bark after heating and grinding becomes a moist fibrous mass
(Photo by B. Dobson)

When Oldfield refers to cake, he is not referring to a cake in the European sense but rather a mixture that has been cooked, pounded and shaped ready for chewing.

Drummond (1839), Moore (1842), Ketoun (1849) and Salvado (1851) refer to *Acacia* gum as a key ingredient of root bark chew. *Menna* (or “manna” the colonial term for wattle gum) was a gum exudate collected from the trunks and branches of *Acacia*, especially *A. microbotrya*.¹² The gum exudate was the result of insect burrowing activities.



Acacia gum (*menna*)
(Photos by K. Macintyre, October 2008)



Acacia microbotrya or *menna* wattle

Acacia gum was often used as an additive when preparing vegetable foods, especially if they were acrid, woody or difficult to chew. It would have enhanced the taste and sweetness of the root bark.¹³ We would suggest that when the *Acacia* gum was mixed with root bark, the added mucilage from the gum would have formed a bulking agent which would not only have made the root bark easier to chew but also would have acted as a dietary filler, helping to provide a feeling of satiation. It would seem that root bark combined with *Acacia* gum was at certain times of the year used as a starvation food.

Ketoun (1849), in his diary entry dated 26th April 1844 refers to Aboriginal women bringing ‘some gum and “twotta” root’, among other things, to share with him. Two days later his diary entry reads:

‘Miserable night I passed; cold, hungry, and affected by the bad water. In the morning, before starting, the natives tightened their “nulbarns,” or belt; the natives procured some bark of the Twotta root, I masticated some and found it relieved my hunger. All this day we were kangaroo hunting but without success, and in the evening a little gum was all the food we had....’

To confirm whether the root bark from the York Gum could be used as a starvation food, we procured a sample in May 2008 from a friend’s property in Toodyay. Digging the

root was difficult after such a long dry summer/autumn period. The first winter rains had not yet arrived. When the root bark was prepared in a (reconstructed) traditional manner of heating and grinding, it tasted sweetish and had a sticky texture. It was not unpleasant to chew, and a rough iodine test showed that it still contained a moderately high level of carbohydrate. Based on the early ethno-historical records such as those of Ketoun (1849) and our own experimentation with *twotta* root bark at different seasons, we would suggest that this substance was used not only as a confectionary but also as a starvation sustenance food.

The root bark would have been consumed primarily for its sugar content and, like the *menna* gum with which it was blended, it would have constituted a highly prized confectionery. Drummond (1843) draws attention to this when he describes the indigenous extraction of the saccharide content of the *doatta* root bark.¹⁴



Sample of root bark from the York Gum (*Eucalyptus loxophleba*) showing its high starch content (using a simple iodine test). Photo by K. Macintyre.

When Ken Macintyre tested the starch content of the root bark of *Eucalyptus wandoo* in October 2008 using an iodine test, he also found it to be high in carbohydrate. Its appearance and moist fibrous sticky texture (after cooking and pounding) closely resembled that of the root bark of *Eucalyptus loxophleba* (York gum).¹⁵

Bates (1938) also comments on the sweet-tasting root bark of an unnamed species of mallee (*Eucalyptus*) that was given to her during her expedition to Eucla.¹⁶ She records this edible root bark, known as *nala*, as one of the last true totems of the people of the Eucla region.¹⁷ She states:

‘Dhalja brought me a wooden scoop filled with this edible bark... The bark was sweet and not unpalatable, and I returned the compliment in sugar, which he found sweeter still.’ (1938:127)

There is no doubt that Bates, like Drummond, was aware that this sweet food delicacy was a highly valued indigenous confectionery.

EXPLANATORY ENDNOTES

1. The term Nyongar can be rendered in a number of different ways. It can be spelt Noongar, Nyoongar, Nyoongah, Nyungar or Nyungah, depending on one's personal or group preference. The literal translation of the term is 'man' or 'people'. Today the term is used to denote indigenous people who originate from the southwest region of Western Australia. (It should be noted that "u" and 'oo' are interchangeable in Nyungar linguistics, both representing more-or-less the same sound).

2. Drummond's letter to W.J. Hooker, Director of Kew Gardens, London, is dated July 25th, 1839 and is written from Hawthornden Farm, Toodyay Valley.

3. Drummond refers to the York Gum (*Eucalyptus loxophleba*) as *doalta* (1839) or *doatta* (1843) or *goatta* (1843). The latter appears to be a typographical error in the transcription of Drummond's original work. (It occurs on the same page as *doatta* referring to the York gum).

4. *Manna* - References to manna gum or manna wattle in the ethnobotanical literature tend to refer to *Acacia microbotrya* (e.g. Meagher 197). The Nyungar terms for this sweet edible gum include *menna* or *meen* or *men* or the colonial name *manna*. The term *manna* is believed to derive from Arabic origins where *mann* denotes the exudation of the tamarisk. Other sources say that it has Latin or Greek derivations where it refers to the sweet secretion from the manna ash or similar plant. This would explain why early Western recorders referred to the sticky exudate eaten by the Nyungars as *manna* gum (1975: 21). Contemporary Elders often call it *menna* or sometimes 'manna.'

5. This reference by Drummond (1843) to root bark spit refuse to be seen around their bivouacs (camps) would suggest that the seasonal collection and preparation of this food was an organized form of food gathering rather than a sporadic opportunistic *in-situ* event. Like other seasonal foods *duotta* would have had a limited season.

6. We would suggest that Stormon's interpretation of Salvado's *duotta* as tuart (*Eucalyptus gomphocephala*) is incorrect as *tuart* only grows in the coastal limestone belt and is not found inland at New Norcia where Salvado was stationed when writing about Aboriginal foods. The *wandoo* is known for its susceptibility to termite infestations and as a source of fresh water in the dry season. Salvado was probably describing *wandoo*.

Salvado was not alone in referring to the white gum as *duotta*. Lyon (1833) and Madden (1848) also refer to "white gum" as *dooto* and *doota*, respectively. Others record white gum as *wandoo*, *wornt* or *wando* (*Eucalyptus wandoo*). In traditional Nyungar nomenclature it is not uncommon for a plant (or tree) to have more than one indigenous descriptor or referent term. References to 'white gum' in the early colonial accounts were often vague and general and had a wider application than today. The term broadly covered a number of Eucalypt species including *tuart* (*Eucalyptus gomphocephala*) and *wandoo*. This has created enormous confusion for contemporary researchers in their attempts to identify to species.

The etymology of the term *dwotta* is uncertain. Salvado may provide a clue when he records *totoran-an* as meaning ‘to palpitate’ or ‘to beat.’ Could this be a reference to the rhythmic pounding motion in the preparation of root bark? Could *totoran-an* denote the importance of the beating or pounding of root bark prior to its consumption? In Nyungar plant nomenclature descriptors were often used to denote how a particular plant or plant product was identified, collected, prepared, consumed or otherwise utilised.

7. Bird and Beeck (1988: 118-119) note that the root of the *dward* (York gum) was ‘chewed, mainly for medicinal purposes.’ This information appears to derive from their indigenous informants. Bird and Beeck (1988: 119) do not indicate the time of year when they collected and sampled the wandoo roots, and whether it was within the limited seasonal time frame of when this food was available.

8. Salvado points out that *duotta* is collected from ‘the roots of certain types of trees.’ This suggests that more than one species of tree was used. It is our opinion that the term *twotta* (or its variants *dwotta*, *duatta*, *duotta*, etc) collectively refers to the edible root bark of several species of *Eucalyptus*. The term *tda* (*ta* or *da*) means ‘mouth’ or ‘to eat.’

9. *Menna* does not apply only to the gum of *Acacia microbotrya* (‘manna wattle’). It also describes the edible gum of *A. acuminata* (‘jam wattle’) and *A. saligna* (‘black wattle’). *Menna* is recorded by Moore (1842:100) as the gum of the jam *Acacia* while *meen* is recorded by Hassell (1975: 19, 232) as the edible gum of the black wattle (presumably *A. saligna*). Thus *Menna* is a collective term that denotes the sweet edible gum of several species of *Acacia*. For further information on *menna* gum, also known by Nyongars as *galyang*, see Macintyre and Dobson 2014 ‘Notes on Indigenous Confectionery,’ forthcoming).

10. The *wanna* was commonly used by women for digging. A woman’s *wanna* often accompanied her to the grave. As stated by Nind (1831:47): ‘When a female is interred, her implements are, in like manner, deposited in her grave.’

11. It is highly probable that the root bark was cooked in wood-ash as this would have neutralised or reduced the bitterness associated with any tannins or saponins contained within the bark.

12. Macintyre suggests that *Acacia* gum was added as an ingredient to the root bark mixture to counter any residual tannins and to add mucilage to make it easier to chew. It possibly also enhanced the sweetness quality.

13. This is highlighted by Edward Wilson Landor who based in York, Western Australia in the 1850’s refers, in his journal detailing his experiences in the new colony, to Drummond’s descriptions of indigenous foods (formerly published in the *Inquirer*). Landor states that *doatta* is ‘a species of this class, [‘Eucalyptus tribe’] and the bark of its root is much relished by the natives, having a sweet and pleasing taste....’ Chapter 28. *The Bushman: Life in a New Country*. By E.W. Landor. The Project Gutenberg E-Book.

14. Macintyre suggests that root bark may have been preferred to trunk bark for practical reasons in that it is easier to procure and remove than the trunk bark. Also it is potentially less damaging to the tree to remove the root bark. The partially exposed lateral ground roots of York gum and Wandoo are easily accessed and the younger roots may have been preferred due to their tenderness and lower tannin content.

15. The particular species of mallee is not named or identified by Bates but like all totems it would have been common to the area. There are many Mallee species found in the Eucla region. These include *Eucalyptus calcareana* (Nundroo mallee) and *Eucalyptus oleosa* (Red mallee).

16. In 1913 during an expedition to Eucla (the easternmost point in Western Australia close to the border with South Australia) Bates observes the last initiation ceremony held in the region. She meets a group of local men whose totem was the edible root bark (*nala*). She states:

‘There were a few whose connections had been the Eucla people, the last holder of the two true totems, the wild currant (*ngoora*), and *nala* (the edible bark of the root of a species of mallee)’. (Bates 1938: 120)

17. Although Bates is not referring to Nyungar culture, it is interesting that she records *nala* as one of the last ‘true’ totems of the people of the Eucla region. She comments that it has a ‘sweet’ taste but implies that it is somewhat mild when compared to the intense sweetness of the processed sugar that she offers them in return. Her quote lends support to the view that taste buds are culturally determined or acquired and that sweetness is culturally relative depending on the array of foods to which a particular group is accustomed.

Bates seems aware that the root bark offered to her by Dhalja was considered by them to be a highly valued sweet delicacy. Her return gift of refined sugar would have had a profound effect and possibly would have contributed to the decline of the potency of *nala*, the root bark totem.

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