



## Review

## The history and ethnobotany of Cape herbal teas

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## ABSTRACT

A review is presented of Cape plants that have been (or still are) used as hot beverages (i.e., tisanes or “teas”, consumed primarily as food items but partly also as traditional medicines). Data are presented on the historical and contemporary ethnobotanical uses of 52 species from 15 Cape genera (*Agathosma*, *Aspalathus*, *Catha*, *Cyclopia*, *Geranium*, *Helichrysum*, *Lessertia*, *Leysera*, *Mentha*, *Mesembryanthemum*, *Plecostachys*, *Rafnia*, *Stachys*, *Thesium* and *Viscum*). The tradition of drinking tea (and coffee), introduced by early European settlers in the 17th century, appears to have stimulated the use of numerous indigenous plants as tea and coffee substitutes. The fact that Khoi and San vernacular names for tea plants have never been documented might indicate that the drinking of herbal tea or bush tea was not part of the indigenous Khoi and San culinary traditions in the pre-colonial era (before the introduction of tea and coffee to the Cape). Several Cape “teas” have remained poorly known or apparently lost their popularity (e.g. *Leysera gnaphalodes*, once considered to be the most widely used Cape tea) while others appear to be relatively recent inventions (e.g. rooibos tea, *Aspalathus linearis*, conspicuous by its absence in the early literature and first mentioned in the historical record in the late 19th century). In contrast, honeybush tea or Cape tea (*Cyclopia* species, first recorded in 1830) has remained popular since the 18th century but only recently became an important item of commerce. There is evidence that some species were mainly used as adulterants or to improve the flavour of the tea (e.g. by enhancing the fermentation process). Some Cape herbal teas with commercial potential as new functional foods currently lack scientific data on the main chemical constituents and their modes of action.

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## 1. Introduction

The well-known Cape flora comprises close to 9000 species of seed plants (Manning and Goldblatt, 2012), of which more than 60% are endemic. Many species are used in traditional medicine and a few have already been developed as commercial herbal teas and functional foods. Examples include rooibos tea (*Aspalathus linearis*), honeybush tea (*Cyclopia genistoides*), buchu (*Agathosma betulina* and *A. crenata*), hoodia or *ghaap* (*Hoodia gordonii*), sutherlandia or cancer bush (*Lessertia frutescens*) and scelletium or *kougoed* (*Mesembryanthemum tortuosum*) (Van Wyk and Wink, 2015; Van Wyk et al., 2015).

The ethnobotany of Cape plants has remained poorly recorded despite the global scientific interest in both the unique flora and the indigenous Khoisan people. It is a great pity that there has not been any attempt at a systematic study of the medicinal and other useful plants during the 17th and 18th centuries. Some excellent ethnographic studies were done (summarised in Schapera, 1930) but these include only general accounts of useful plants without details about the species and the exact ways in which they were used. Particularly, the available information on hot beverages used by the Khoisan in ethnographical and anthropological records is scarce and often inconsistent, making it virtually impossible, in most instances, to determine if those beverages were consumed in the pre-colonial era.

Scott and Hewett (2008) provided a valuable summary of early ethnobotanical data recorded during the time of the Dutch East India Company, including (often incomplete) records from Boerhaave, Burman, Commelin, Herman, Houttuyn and Wehdeemann but also of Van der Stel and Thunberg. The earliest ethnobotanical exploration was by the Cape Governor Simon Van der Stel, who visited Namaqualand in 1685 (De Wet and Pheiffer, 1979). A few medicinal plants were described and illustrated, including only one detailed account – on the use and value of *kanna* or *channa* (*Mesembryanthemum tortuosum*), a traditional masticatory that may also be taken as an infusion in milk or water. The second significant contribution was by Thunberg, who recorded the names and uses of about 33 medicinal plants during his long journeys into the Cape interior in the period from 1772 to 1775.

Pappe (1847, 1850, 1854, 1857, 1868) was the first to attempt a systematic and comprehensive account of Cape medicinal plants. The various editions of his *Florae Capensis Medicae Prodromus* (or: An Enumeration of South African Plants used by the Colonists of the Cape of Good Hope) are an important historical account of the best-known medicinal plants in use in the middle of the 19th century. The most complete third edition of 1868 comprises 101 items, including 97 vascular plants, two algae, one fungus and one animal product (hyraceum). A similar valuable contribution was made by Smith (1888, 1895) who listed “native” remedies according to ailments in his “A contribution to the South African Materia Medica”. Although some plants are reported to be used as tonics, no mention is made of plants used as hot beverages or tea substitutes. Other early contributions include the list of home remedies of Dykman (1891, 1908), the six volumes of the Flora of South Africa by Marloth (1915–1932) and the medicinal booklet by Kling (1923).

A summary of all or most of the traditional Cape herbal medicines that have been used as infusions or decoctions can be found in Table 1. The majority of the species are used primarily as medicine and not as food items. However, some serve both purposes and a few are used mainly as tea substitutes. The last-mentioned two categories are shown in bold in Table 1 and are reviewed below, with emphasis on ethnobotany and historical records.

## 2. Materials and methods

The choice of species included in Table 1 and in the reviews below is based on the early literature on Cape plants and on experience and insights gained during ethnobotanical surveys. All early references to Cape herbal teas that we were able to locate are recorded below. Direct citations, lengthy as they may be, are considered critical in this review because they often contain subtle nuances and uncertainties that would have been lost if the data were summarised. It is important to note that the term “tea” is loosely used in Cape ethnobotany and may refer to both infusions and decoctions. Rooibos tea, for example, is traditionally prepared as a decoction and not as an infusion. To this day, in the rooibos-growing areas, a special kettle is used for this purpose, which is placed on the simmer plate of the stove to ensure a permanent supply of the brew. General information on Cape herbal teas can also be found in Van Wyk and Gericke (2000), Arnold et al. (2002), Van Wyk (2008a, 2008b) and Van Wyk et al. (1997, 2009). No attempt is made here to comprehensively review the chemistry and pharmacology of traditional teas.

The recorded vernacular names and traditional uses of most of the well-known Cape medicinal teas are given in Table 1, with a selection of 15 genera and more than 52 species used as herbal teas in bold type, together with the source(s) of the information. Authorities for the names in Table 1 follow The Plant List (2013) and are given only in Table 1 and not elsewhere in the text. Examples of the traditional sources of Cape teas are illustrated in Figs. 1 and 2.

## 3. Results

### 3.1. Tea-drinking at the Cape

Several early visitors to the Cape recorded the popularity of coffee and tea among both the indigenous people and the European colonists. The use of local indigenous plants as substitutes for Chinese tea, which was expensive and not always available, is frequently mentioned.

La Trobe (1818, pp.165, 177 and 252) noted on three separate occasions that he was served with “tea-water” when he visited the southern Cape region in 1816. Tea water was the Dutch way of making Chinese tea, which was mentioned by several eighteenth century travellers. Perhaps the earliest explicit observation on the popularity of tea at the Cape was made by Mentzel (1944), who travelled into the interior, to Stellenbosch and Swellendam, in the mid eighteenth century: “As is well-known the African womenfolk drink a great deal of tea and since the kettle is at hand practically the whole day, they always keep near it a small tin or porcelain teapot, the size of a teacup: into this they strain a little saffron in boiled water and pour a few drops of it in a dish of tea .... One thing I have also noticed, that instead of tea they sometimes drink *cardo benedictum* [now *Centauria benedicta*] which they call *Kormandyk* [*karmedik*], presumably when they are experiencing some indisposition. As is known, tea grows only in China and Japan, for the kind discovered in America a few years ago compares very unfavourably with that. However, at the Cape of Good Hope none is grown, but that does not prevent an incredibly large quantity from being consumed yearly in that country. The Europeans as well as the Africans drink it at all hours of the day and sometimes even fairly late at night .... In the districts where vines are not grown, it serves as a refreshment for the farmers, and a tonic for the slaves. For this reason, many colonists give their slaves a little tea of the ordinary kind, if not daily then quite often; and hardly a housewife will not send her slave with the laundry to the washing place without giving him or her some tea and candy.

This is very sensible of them, for if the slaves stood in the hot sun all day and became heated from the washing and were then to drink water, they would soon become ill, for they were accustomed to drink tea in their homeland. At harvest time, too, every prudent farmer gives his slaves a little tea after their midday meal; without it they would suffer from thirst in the afternoon heat on the field."

General comments on the popularity of tea among inhabitants of various races were made by Burchell (1822) when he visited Klaarwater (now Griekwastad). Referring to the local people of Khoi descent, he pointed out: "All are exceedingly fond of tea, and when the Chinese kind is not to be procured, they make use of the leaves of various wild plants: next to tobacco and brandy, they esteem tea the greatest luxury, as a beverage." Burchell (1824) made further comments on the popularity of tea when he visited Litakun, or Dithakong: "Instead of wine or brandy, I presented my guests with tea; which they called *metsi-morruka*, and with which they were as much pleased, as with the rice. We had no sugar, but as they had not seen me use any, they thought the tea equally pleasant without it; but without waiting to be guided by my example, they added to it a small quantity of milk as readily as if they had been accustomed to this beverage every day; and had probably seen it thus used at Klaarwater, or had been informed that such was the practice of white-people." (p. 393–4). Later on (page 466) he wrote: "They expressed their warmest gratitude when I presented to them some brandy, tobacco, and a small quantity of tea leaves, the three greatest luxuries, besides meat, which can be given to a Hottentot."

Thompson (1827) made observations on tea and coffee when visiting the Sneeuwberg region: "A traveller, on arriving, if it does not happen to be mealtime, is always presented with a cup of tea, without sugar, milk, or bread .... When their tea and coffee is exhausted, a succedaneum is found in roasted grain, prepared in the same way as Hunt's *radical coffee*, which, if not very palatable, is nevertheless a refreshment to a thirsty and weary traveller."

These accounts show that tea-drinking was well established at the Cape, at least before the middle of the eighteenth century. As far as Cape herbal teas are concerned, historical anecdotes relating to specific genera and species are presented below.

### 3.2. *Agathosma*

Buchu is one of the earliest and best-known medicinal plants and export products from South Africa. According to Flückiger and Hanbury (1879), the colonists of the Cape learnt about the uses of buchu leaves from the local Khoi people. This view is strongly supported by the fact that the cosmetic use of buchu powders was an integral part of both San and Khoi material cultures, including the traditional buchu pouch made from a small tortoise shell (Schapera, 1930). The use of buchu was recorded by visitors to the Cape such as Kolb (from 1704 to 1712), Thunberg (from 1772 to 1775 and Burchell (from 1810 to 1815). Furthermore, several Khoi (*Khoekhoegowab*) vernacular names have been recorded (Laidler, 1928; Haacke and Eiseb, 2002), in addition to the well-known collective term (variously transcribed as *bucku* or *bukku* in English) that was used for aromatic members of the Rutaceae. Thunberg referred to the use of buchu and the associated tortoise shell containers no less than six times (Forbes, 1986). Only *Agathosma pulchella* (L.) Link was identified by Thunberg as a source of buchu powder but other anecdotes probably refer to *Diosma hirsuta* L. (also Rutaceae).

From a commercial perspective, the three most important species are *A. betulina* (endemic to the Cederberg, from Nieuwoudtville to Grootwinterhoek), *A. crenulata* (from Tulbagh to Piquetberg and Worcester, and southwards to the Hottentot's Holland Mountains) and *A. serratifolia* (Swellendam area) (Table 1, Fig. 1A–C). Others such as *boegoe* [*A. capensis* (L.) Dümmer] and *basterboegoe* [*A. ovata* (Thunb.) Pillans] are still widely used by local communities (Van Wyk et al., 2008). Historically, *A. crenulata* (Fig. 1B) was considered to be "true buchu" and was much praised for its usefulness in promoting

perspiration when taken as a tea (Pappe, 1847, 1850, 1857, 1868). It was thought to be beneficial in treating chronic rheumatism and gout and was particularly appreciated for its value in promoting kidney and bladder health (Pappe, 1868). As diuretic and diaphoretic it was given to treat "all those cachectic and hydropical complaints, arising from suppression of the perspiration or urine." Buchu tea was also prescribed as general tonic and stomachic to increase appetite (Pappe, 1868). *Agathosma serratifolia* (Fig. 1C) and *Empleurum serrulatum* Sol. ex Aiton [now correctly known as *E. uncapulare* (L.f.) Skeels] was considered to be adulterants of true buchu with inferior therapeutic value (Pappe, 1847, 1850, 1857, 1868). However, Flückiger and Hanbury (1879) listed all three of the closely related species (*A. crenulata*, *A. serratifolia* and *A. betulina*) as source of *Folia Buchu* (*Feuilles de Buchu*, *Bukublätter*). Buchu leaves are described in detail, including the diagnostically different length to width ratio, the penetrating peculiar odour, the strongly aromatic taste and some aspects of the chemistry as far as it was known at the time. Curiously, *A. betulina* was considered the "least esteemed" of the three and fetched the lowest price, despite it being rich in essential oil (Flückiger and Hanbury, 1879). This pharmacognostic treatment included *Empleurum uncapulare* (*E. serrulatum*) as an adulterant, with diagnostic details such as the lack of lateral veins in the leaves, the apetalous flowers and the uncarpellate capsules. Flückiger and Hanbury (1879) also recorded the first buchu exports to Europe: "consigned to the house of Reece & Co, of London, who introduced it to the medical profession in 1821". *Agathosma betulina* (Fig. 1A1, A2) is nowadays considered to be superior to *A. crenulata* because of the presence of diosphenol as main compound and the near absence of pulegone (a potentially harmful compound) but both are still widely used. As a traditional buchu used to anoint the skin, *A. betulina* was considered to be the most valuable of all. Among several buchu's used in Namaqualand, Laidler (1928) described the use of this species: "*P/nkaou* is rare and valuable, and a thimbleful is worth from a sheep to an ox. It is obtained in mountainous districts and when used is pounded and tied in a cloth over which hot water is poured. Is this a method due to exercise of economy?". Watt and Breyer-Brandwijk (1962), Spreeth (1976) and Van Wyk et al. (1997, 2009) provide further details of *Agathosma* species and their traditional uses.

The chemistry and pharmacological activities of *Agathosma* species are relatively well known and have been reviewed by Viljoen et al. (2006) and Moola and Viljoen (2008). Clinical trials are needed to confirm the reported diuretic effects and to find evidence in support of the presumed efficacy in treating kidney, bladder and urinary tract infections. Buchu leaf is nowadays used as herbal tea but more commonly as an ingredient of mixtures and as a source of essential oil used as flavourant and fragrance.

### 3.3. *Aspalathus*

The strong focus on rooibos tea (*A. linearis*) and its commercial success as a health product (Van der Walt and Machado, 1992; Joubert et al., 2008; Joubert and De Beer, 2011; Muller et al., 2016) contrasts strongly with the relative obscurity of its congeners and several other members of the family, which were mentioned in the early literature as sources of herbal tea (Table 1, Fig. 2). Three species of the *Borbonia* group of *Aspalathus*, namely *A. angustifolia*, *A. cordata* and *A. crenata* (Fig. 2B) were once used as tea, as was the closely similar *A. alpestris* (Fig. 2A) of the *Pedunculares* group (Dahlgren, 1988). These plants all have simple, rigid, spine-tipped leaves, hence the common name *stekeltee*. The earliest record of the use of *Aspalathus* as a source of tea was that of Thunberg (Forbes, 1986), who wrote about the use of *A. cordata* as tea: "Of the leaves of *Borbonia cordata* the country people make tea (Thunberg, July 1772, at Paarl); no common name was given. This anecdote is sometimes uncritically cited and erroneously associated with rooibos tea (*Aspalathus linearis*) (e.g. Morton, 1983; Department of Environmental Affairs, 2014). The same species is listed as *Borbonia cordata* L. by Pappe (1847), as *B. ruscifolia* Sims by Pappe

**Table 1**

Scientific names and vernacular names of Cape plants used as herbal teas (as food items and for medicinal purposes), together with their traditional uses and the sources of information (see footnotes for abbreviations). In some cases, the vernacular name merely implies that the plant is or has been used as tea. Note that no distinction is generally made between infusions and decoctions. Species names in bold indicate plants that may also be used as a refreshing beverage and not only for medicinal purposes.

Species (those used as hot beverages – and not only as medicine – in bold); *exotic species	Common names Khoi>Nama names underlined)	Plant part used and main use(s)	References
<i>Acacia karoo</i> Hayne (Fabaceae)	<i>Doringboom</i>	Bark decoction or infusion: diarrhoea and dysentery	P1–4,6; D1; K11; L1
<i>Adiantum aethiopicum</i> L. (Adiantaceae)	<i>Vrouwehaar</i> (T1)	Herb (syrupy decoction): cough, respiratory disorders (T1)	T1
<b><i>Agathosma betulina</i></b> (P.J. Bergius) Pillans [syn. <i>Diosma betulina</i> L.; <i>Barosma betulina</i> Bartl. & Wendl.] (Rutaceae)	<i>Buchu barosma, letulina, p/nkaou</i> (11); <i>bookoo boegoe</i> ,	Leaf infusion or tincture: kidney and bladder ailments; diuretic, tonic; leaves in vinegar for wounds, sprains and contusions.	B3, P1–43,6; D1; K1; F1; L
<b><i>Agathosma crenulata</i></b> (L.) Pillans [syn. <i>Diosma crenulata</i> L.; <i>Diosma crenata</i> L.; <i>Barosma crenata</i> Sweet; <i>Barosma crenulata</i> Hook. (Rutaceae)]	<i>Buccho</i> (p1); <i>bucchu</i> (p2–4, 6); <i>boegoe</i> , <i>buchu</i>	Leaf infusion or tincture: kidney and bladder ailments; diuretic, diaphoretic, stimulant, stomachic (F1), tonic.	B3, P1–4,6; D1; K1; F1; L1; M5
<b><i>Agathosma serratifolia</i></b> (Curt.) Spreeth [ <i>Diosma serratifolia</i> Curt.; <i>Barosma serratifolium</i> Engl.]	<i>Langblaarboegoe</i> , <i>kloofboegoe</i> (s3)	Leaf infusion or decoction: kidney and bladder ailments; diuretic, tonic	F1; S3
<i>Arctopus echinatus</i> L., <i>A. monacanthus</i> Carmichael ex Sond.	<i>Platdoorn</i> (p1–4,6); <i>zieketroost</i> (p2–4, 6); <i>bitterwortel</i> , <i>pokkieswortel</i> , <i>sieketroos</i> , <i>plattoring</i> (s2)	Root decoction: taken for gonorrhoea (T1); demulcent, diuretic; syphilis (mixed with rabas); general medicine; blood purifier	T1; B4, P1–3; D1, K1; M1
* <i>Artemisia absinthium</i> L.	<i>Groenamara</i>	Leaf infusion; stomach ailments	D1
<i>Artemisia afra</i> Jacq. ex Willd.	<i>Wildeals</i> , <i>wilde-als</i> , <i>als</i> , <i>alsem</i> ; <i>wilde-als(ies)</i> , <i>wilde-alsem</i> (s2)	Leaf infusion (in hot or cold water); tonic, antispasmodic, anthelmintic; various uses; colds, influenza, cough, fever; eye drops	P1–3; S1; D1; K1
<i>Asclepias crispa</i> P.J.Bergius [syn. <i>Gomphocarpus crispus</i> R.Br.]	<i>Bitter-wortel</i> (t, p2–4,6); <i>bitterwortel</i> , <i>bitterhout(jie)</i>	Root decoction: diuretic (T1); stomach pain	T1; P1–4,6; S1; K1; L1
<b><i>Aspalathus alpestris</i></b> (Benth.) R.Dahlg. [syn. <i>Borbonia trinervia</i> auct. Non L.]	<i>Bossiestee</i> (s2)	No data on actual use as tea	S2
<b><i>Aspalathus angustifolia</i></b> (Lam.) R.Dahlg. [syn. <i>Borbonia lanceolata</i> L.]	<i>Bossiestee</i> , <i>stekeltee(bossie)</i> (s2)	No data on actual use as tea	S2
<b><i>Aspalathus cordata</i></b> (L.) R.Dahlg.	No common name given (t1); <i>stekeltee(bossie)</i> , <i>cape gorse</i> (s2)	Leaf infusion or decoction: used as beverage.	T1, P1; K1
<b><i>Aspalathus crenata</i></b> (L.) Dahlg. [syn. <i>Borbonia parviflora</i> Lam.]	<i>Stekelthee</i> (p1–4,6); <i>bergtee(bossie)</i> , <i>skagaltee(bossie)</i> , <i>stekeltee(bossie)</i> (s2)	Leaf (fresh or dried and fermented) infusion: used as tea.	P1–4,6; S2
<b><i>Aspalathus linearis</i></b> (Burm.f.) R.Dahlgren [syn. <i>Aspalathus contaminata</i> Druce; <i>A. tenuifolia</i> DC.]	<i>Rooibostee</i> , <i>bossietee</i> ; <i>rooibos(sie)tee</i> , <i>rooibossie</i> , <i>koopmanstee</i> , <i>naaldete</i> , <i>speldete</i> , <i>sprinkaantee</i> , red (bush) tea; <i>swarttee(bossie)</i> , black tea (s2); bush tea, <i>rooibostee</i> (m2)	Twigs and leaves (“fermented”) used as tea (infusion or traditionally as decoction); also as general health tea (said to improve appetite).	M3; S2
<b><i>Aspalathus pendula</i></b> R.Dahlg.	<i>Sweeptee</i> ; <i>golden tea</i>	Twigs and leaves (“fermented”) used as tea; (may be mixed with commercial rooibos tea to improve the “sweating” process and quality of the tea).	Van Wyk (2011b)
<i>Asparagus laricinus</i> Burch., <i>A. stipulaceus</i> Lam., <i>A. retrofractus</i> L.	<i>Katdoring(wortels)</i> , <i>t'nuance</i>	Roots used as medicinal tea: as diuretic and to treat tuberculosis	P2–3; D1; K1; L1
<i>Athanasia cuneifolia</i> Lam. (perhaps incorrectly identified – see <i>Pegolettia baccaridifolia</i> )	<i>Ghwarrieson</i> , <i>kwarison</i>	Herb; tinctures or infusions for a weak heart	D1
<i>Ballota africana</i> L.	<i>Kattekruid</i>	Leaf infusions used for colds, fever, measles, influenza	P2–3; D1; K1; L1
* <i>Cannabis sativa</i> L.	<i>Makdagga</i> , <i>rookdagga</i> , <i>dagga</i>	Leaves: used as medicinal tea; smoked after a stroke	D1
<b><i>Catha edulis</i></b> (Vahl.) Endl.	<i>Bosjesmanstee</i> (p1–6); <i>boesmanstee(boom)</i> , <i>boesmansteebos</i> , <i>spelonke(n)tee</i> , bushman's tea (m2, s2)	Leaves: chewed or taken as tea; cough, asthma (P1–6).	P1–3
<b><i>Centaurea benedicta</i></b> (L.) L. (syn. <i>Cnicus benedictus</i> L.)	<i>Karmedik</i>	Herb: infusions or tinctures used as bitter tonic, stomachic, for cough and hoarseness; treatment of internal cancers	D1
<b><i>Centella glabrata</i></b> L. [syn. <i>Hydrocotyle bupleurifolia</i> A. Rich.; syn. <i>Hydrocotyle centella</i> Cham. & Schldt.]	<i>Persgras</i> (p1–4,6); <i>persiegras</i>	Roots and stalks; treatment of chronic diarrhoea and dysentery; diaphoretic	P1–4,6; K1
<i>Chironia baccifera</i> L.	<i>Bitterbos</i> , (–blare), <i>aambeibos</i>	Leaves, stems and fruits; used post-partum to expel a retained placenta; traditional Khoi medicine	K1; L1; M5
<i>Cissampelos capensis</i> L.f.	<i>Dawidjies</i> (see <i>dawidjiewortel</i> )	Root, rhizome; emetic, purgative; tincture for dysentery, syphilis; snake bite (leaf paste, root decoction)	P1–3; D1; M1; S1
<i>Cliffortia ferruginea</i> L.f.	<i>Glaste</i> , <i>pypsteelbos</i> , <i>teringtee</i> (m2, s2)	Leaves are used as a medicinal tea to treat consumption and other chest ailments (S2)	M2, S2
<i>Cliffortia ilicifolia</i> L.	<i>Doornthee</i> (p1–4,6); <i>doringtee</i> , <i>jankoensedoring</i> , <i>rysbos</i> , <i>vleirybsos</i> (s2); <i>doringtee</i> , <i>jankoensedoring</i> (m2)	Leaves: tea [used as an expectorant in coughs (it is said to have an emollient action)] (P1–4,6; S2).	P1–4,6; M2; S2
<i>Cliffortia odorata</i> L.f. [syn. <i>Cliffortia discolour</i> Weim.]	<i>Wildewingerd</i> (m2, s2)	Tips (“toppe”): strong infusion for haemorrhoids, amenorrhoea	D1; K1
<i>Conyza scabrida</i> DC. [syn. <i>C. ivaefolia</i> (L.) Less.]	<i>Oondbos</i> , <i>oondbesembos</i>	Herb; infusions for stomach, chest, heart. Influenza (1918); topical (steaming) for women's ailments	S1
<i>Cotula villosa</i> DC.	<i>Kams</i> , <i>t'kams</i>	Herb; rheumatism, scalds, cutaneous eruptions	P1–4,6; K1
<i>Crassula ericoides</i> Harv.	<i>Karkai</i>	Herb: fever, diarrhoea and dysentery	P3–4,6; K1
<i>Crassula muscosa</i> L.	<i>Klein koorsbos</i>	Herb; decoction for fever (diaphoretic)	L1
<i>Crassula ovata</i> (Mill.) Druce [syn. <i>Crassula portulaca</i> Lam.]	<i>Karkay</i> , <i>t'karkai</i> , <i>karkey</i>	Fresh leaves boiled in milk to treat diarrhoea	P1–4,6; K1

(continued on next page)

Table 1 (continued)

Species (those used as hot beverages – and not only as medicine – in bold); *exotic species	Common names Khoi/Nama names underlined>	Plant part used and main use(s)	References
<i>Crassula</i> species	Not recorded	Leaf; dysentery	B1
<i>Crassula tetragona</i> L.	As above	Fresh leaves boiled in milk to treat diarrhoea	P1–3; K1
<b><i>Cyclopia bowieana</i></b> Harv. (syn. <i>C. ashtonii</i> Hofmeyer & E. Phillips)	<u>Vleitee</u> (h4, k2); <u>boertee</u> ; <u>vleitee</u> , <u>boer tea</u> ; <u>bush tea</u> (s2);	Flowering tops used as bush tea	H4; K2; S2; S4
<b><i>Cyclopia burtonii</i></b> Hofmeyer & E. Phillips	Sugar tea, honey tea (h4); <u>heuningtee</u> , <u>suikertee</u> , <u>swartbergtee</u> (k2); <u>suikertee</u> (bos), <u>heuningtee</u> , <u>honingtee</u> , <u>boertee</u> , <u>boertea</u> , <u>bush tea</u> (s2)	Flowering tops used as bush tea	H4; K2; S2; S4
<b><i>Cyclopia buxifolia</i></b> (Burm.f.) Kies	<u>Boer tea</u> , <u>bossiestee</u> , <u>bostee</u> , <u>bush tea</u>	Source of the finest bush tea (erroneously reported as <i>C. latifolia</i> )	M3; S4
<b><i>Cyclopia falcata</i></b> (Harv.) Kies (syn. <i>C. brachypoda</i> sensu Hofmeyer and Phillips)	<u>Boertee</u> , <u>bos(sies)tee</u> , <u>heidelbergtee</u> , <u>boertea</u> , <u>bush tea</u> (s2)	Flowering tops used as bush tea	S2; S4
<b><i>Cyclopia genistoides</i></b> (L.) R.Br.	<u>Honigthee</u> (p1–6); <u>heuningbostee</u> , <u>honeybush tea</u> , <u>boer tea</u> (m2); <u>honey tea</u> (h4); <u>heuningbos(tee)</u> , <u>heuningtee</u> (k2, s2); <u>honingtee</u> , <u>bergtee</u> , <u>bos(sies)tee</u> , <u>potbergtee</u> , <u>boertee</u> , <u>boertea</u> , <u>bush tea</u> , <u>honey tea</u> (s2)	Flowering tops: tea, used as expectorant, restorative and for the treatment of tuberculosis.	P1–6; M3; H4; K1; K2; S2; S4
<b><i>Cyclopia intermedia</i></b> E.Mey	Kouga bush tea (k2); <u>bergtee</u> , <u>boertee</u> , <u>bossiestee</u> , <u>boertea</u> , <u>bush tea</u> (s2)	Flowering tops used as tea.	H4; K2; S2; S4
<b><i>Cyclopia longifolia</i></b> Vogel	<u>Bergtee</u> , <u>boertee</u> , <u>boertea</u> , <u>bush tea</u> (s)		
<b><i>Cyclopia maculata</i></b> (Andrews) Kies (syn. <i>C. tenuifolia</i> Lehm.)	<u>Vleitee</u> (m2, h4, k2); <u>vleitee</u> , <u>boertee</u> , <u>rooitee</u> , <u>rooibostee</u> , <u>boer tea</u> , <u>bush tea</u> (s2); <u>genadentaltee</u>	Flowering tops used as tea.	H4; K2; S2; S4
<b><i>Cyclopia meyeriana</i></b> Walp.	<u>Woltee</u> (m)	Flowering tops used as tea (Willem Hanekom, pers. comm).	S4
<b><i>Cyclopia sessiliflora</i></b> Eckl. & Zeyh.	<u>Heidelberg tea</u> (h4, k2); <u>gewone bossiestee</u> , <u>hottentotstee</u> (k2)	Flowering tops used as tea.	H4; K2; S4
<i>Cyclopia</i> spp.	<u>Boertee</u> ; <u>boertea</u> ; <u>bush tea</u> ; <u>blommetjies</u> ; <u>rooibos</u> (s2)	Flowering tops used as tea.	S2
<b><i>Cyclopia subternata</i></b> Hofmeyer & E. Phillips (syn. <i>C. vogelii</i> Harv.)	Honey tea, boer tea (m2); common bush tea, hottentot's tea (h4); <u>gewone bossiestee</u> (k2); <u>bergtee</u> , <u>boertee</u> , ( <u>gewone</u> ) <u>bossiestee</u> , <u>boer tea</u> , <u>bush tea</u> (s2)	Flowering tops used as tea.	M2; M3; H4; K2; S2; S4
<i>Cynodon dactylon</i> (L.) Pers.	<u>Kweekgras</u> , <u>garre</u> , <u>gari(e)s</u>	Rhizomes; decoctions for coughs; mixed with fat and rubbed in for gout	D1; L1
<i>Dicoma capensis</i> Less.	<u>Karmedik</u> , <u>wilde karmedik</u>	Herb; bitter tonic and diuretic; kidneys, bladder, back pain, nausea, influenza, colds, cancer; anti-diarrhoeal	K1
<i>Diospyros pallens</i> (Thunb.) F.White	<u>Bloubos</u> , <u>swartwortel</u>	Decoction of powdered roots used for stomach pain; with stems included, to treat diarrhoea	L1
<i>Dodonaea viscosa</i> L.	<u>Ysterhout(toppe)</u> , <u>sandolien</u> , <u>t'koubi</u>	Twigs ("toppe", tips) as medicinal tea: colds and fever; general tonic, inflammation; lung ailments, tuberculosis	P1–3; D1; K1; L; N1
<i>Ecklonia maxima</i> (Osbeck) Papenfuss and other genera and species of seaweed	<u>Seebamboes</u> , <u>seederm</u>	Dried material infused as medicinal tea (source of iodine); hot poultices; glandular swellings; an infusion of the ash taken for syphilis	P1–3; K1
<i>Elytropappus rhinocerotis</i> (L.f.) Less.	<u>Rhinosterbosjes</u> (p1–4,6); <u>renosterbos(toppe)</u> , <u>anosterbos</u>	Twigs ("toppe", tips) as medicinal tea: bitter tonic for dyspepsia, indigestion, diarrhoea; tincture for gravel; vermifuge; fumigant; powdered herb used to treat diarrhoea in children	P1–4, 6; D1; K1
<i>Empleurum unicapsulare</i> (L.f.) Skeels	<u>Hottentot's buchu</u>	Leaf; bruises (oral and topical)	W1; F1
<i>Eriocephalus africanus</i> L. [syn. <i>E. umbellulatus</i> Cass.] and/or <i>E. racemosus</i> L.	<u>Gnaphalii herba</u> (t1); <u>wilde rosmaryn</u> (p1); wild rosemary (p2–4,6); <u>kapokbos(sie)</u> , <u>wilderoosmaryn</u>	Herb: diuretic for dropsy (T1); colds and chest ailments; stomach pain; weak stomach	T1; P1–3; K1; L1
<i>Eriospermum capense</i> (L.) Thunb. subsp. <i>capense</i>	<u>Baviaans-oren</u> (p1–4,6); <u>bobbejaanore</u>	Tuber decoction: for amenorrhoea; topical for ulcers, sores	P1–4,6; K1; L1
* <i>Eucalyptus globulus</i> Labill.	<u>Blougom</u> [bloekom]	Leaves; fever, diphtheria, cough (in mixtures); wounds	D1
<i>Euclea crispa</i> (Thunb.) Gürke	<u>Guarritee</u> , <u>bosghwarrie</u> , <u>ghwarriebos</u> (s2); <u>bloughwarrie</u> (m2)	Leaves used to brew an astringent medicinal tea (S2)	M2; S2
<i>Euclea</i> species [2]	<u>Ghwarriebos</u> , <u>Ghuarriebos</u>	Leaves; infusions for heart problems	K1
<i>Euryops multifidus</i> (Thunb.) DC. and other <i>Euryops</i> species	<u>Harpuisbos</u> , <u>t'goonu(?)</u> , <u>nu-nu</u>	Resin; a few drops of the infusion or tincture in water, for headaches, influenza; resin mixed with fat for sores	P1–3; K1; L1
<i>Exomis microphylla</i> (Thunb.) Aellen var. <i>axyrioides</i> (Fenzl.) Aellen	<u>Hondebos</u>	Leaf decoctions in milk; old Khoi remedy for epilepsy; winds, cramps and convulsions in infants	S1
* <i>Foeniculum vulgare</i> Mill.	<u>Vinkel</u>	Leaves and/or fruits; carminative, eye drops	D1; K1
<i>Garuleum bipinnatum</i> (Thunb.) Less.	<u>Slangenwortel</u> (p1); <u>snake-root</u> (p2–4, 6); <u>slanghoutjie</u> , <u>gijhoutjie</u> , <u>kowerbos(sie)</u>	Root; chest ailments, expectorant, diaphoretic, diuretic in gout and dropsy, antidote for snake-bite; weak stomach	P2–3; D1; K1
<b><i>Geranium incanum</i></b> Burm.f.	<u>Bergtee</u> (m2, s2); <u>vrouebossie</u> , <u>meidjiejanwillemse</u> (s2)	The whole herb is used as hot beverage and as medicinal tea.	M1, M2, S2
<i>Gerbera crocea</i> (L.) Kuntze	<u>Dialsatee</u> , <u>dialsabossie</u> , <u>tongblaarbossie</u> (s2)	"The leaves are used medicinally as a tea" - Knysna region (S2)	S2
<i>Glia prolifera</i> (Burm.f.) B.L. Burt	<u>Chamare</u> (v1); <u>gli</u> (t1)	Root: carminative, diuretic (V1, Berg River – more likely to be <i>G. Decidua</i> B.-E. Van Wyk)	V1, T1

Table 1 (continued)

Species (those used as hot beverages – and not only as medicine – in bold); *exotic species	Common names Khoi>Nama names underlined)	Plant part used and main use(s)	References
<i>Gunnera perpensa</i> L.	<i>Wilde ramanas</i> (p1–4,6); <i>wilderamanas</i> , <i>rivierpampoep</i>	Leaves as medicinal tea: demulcent in pulmonary ailments; root decoction: dyspepsia, indigestion; root tincture: gravel; fresh leaf applied to ulcers and wounds	P1–4,6
<b><i>Helichrysum imbricatum</i></b> Bolus [syn. <i>Helichrysum auriculatum</i> Less.]	<i>Hottentot's tee</i> (m2); <i>duinen-thee</i> (p3,4,6); <i>duinetee</i> (bossie) (s2)	Leaves infused as tea; also for chest ailments, as demulcent and emollient).	P3,4,6
<b><i>Helichrysum nudifolium</i></b> (L.) Less.	<i>Hottentotstee</i> (bossie), <i>hottentot's tea</i> (s2); <i>vaaltee</i>	Leaves as tea or medicinal tea): chest ailments, colds	P1–3; S1
<b><i>Helichrysum odoratissimum</i></b> (L.) Sweet	<i>Hottentotskooigoed</i> , <i>hottentotskruie</i> (s2)	Leaves (as medicinal tea): cough, heart ailments, influenza, nervous disorders (usually in mixtures)	D1; K1
<b><i>Helichrysum pandurifolium</i></b> Schrank [syn. <i>Helichrysum auriculatum</i> Less.]	<i>Hottentotskruie</i> , <i>hottentotskooigoed</i>	Leaves infused as tea (also as demulcent in coughs, chest ailments)	P1–4,6
<i>Helichrysum</i> sp.	<i>Griekwatee</i> (s2)	No data on actual use as tea	S2
<i>Helichrysum</i> spp.	Not recorded	Herb?; nervous conditions, hysteria	B1
<i>Hertia pallens</i> O.Kuntze	<i>Springbokbos</i> (sie); <i>teebos</i> ; <i>vleibos</i> ; <i>harpuisbos</i> ; <i>malkopharpuis</i> (s2)	No data on actual use as tea	S2
<i>Hilliardiella pinifolia</i> (Less.) H.Rob. [syn. <i>Vernonia capensis</i> (Houtt.) Druce; <i>V. pinifolia</i> Less.]	<i>Blounaaldetee</i> (bossie) (s2)	Leaves (as medicinal tea) for chest complaints (S2)	S2
hyraceum (concretions of rock rabbit urine)	<i>Dassiepis</i> , <i>swart bo meester</i> , //am uru; <i>t'gaous</i> ; <i>klipsweet</i>	Anti-spasmodic; back and stomach pain; poisoning; hysteria, epilepsy, all nervous conditions; as tea to treat women's ailments; abortifacient (large doses)	P1–3; D1; K1; L1
<i>Jamesbrittenia atropurpurea</i> (Benth.) Hilliard [syn. <i>Lyperia crocea</i> Eckl. Ex Benth]	<i>Geelblommetjie</i> , <i>saffraanbossie</i>	Herb; antispasmodic, stimulant; convulsions; cough, bronchitis	P1–3; K1
<i>Kedrostis africana</i> (L.) Cogn.; <i>K. nana</i> (Lam.) Cogn., [syn. <i>Bryonia africana</i> L.; syn. <i>Pilogyne eklonii</i> Scrad.] [Zehneria scabra (L.f.) Sond.?] ]	<i>Dawid's wortel</i> (t1); <i>dauidjeswortel</i> (p1–4,6); <i>dawidjiewortel</i> , <i>gameroo</i> (?), <i>rabuiswortel</i>	Tuber decoction: sexually transmitted diseases, skin ailments; emetic, purgative, diuretic (T1); dropsy, syphilis	T1; P1–4,6; M1; K1; L1
<i>Leonotis intermedia</i> Lindl., <i>L. oymifolia</i> (Burm.f.) Iwarsson?	<i>Klipdagga</i>	As for <i>Leonotis leonurus</i>	S1; K1; L
<i>Leonotis leonurus</i> (L.) R.Br.	<i>Wilde dagga</i> (p1); <i>wilde dagga</i> (p2–4,6); <i>wildedagga</i> , <i>rooi dagga</i> , <i>dagga</i>	Leaves as decoction: purgative, emmenagogue; headache, bronchitis; eye ointment; seeds for bronchitis, headaches; snakebite antidote; first aid in poisoning	P1–3; S1; M1; D1; K1; L1
<b><i>Lessertia canescens</i></b> Goldblatt & J.C.Manning [syn. <i>Sutherlandia tomentosa</i> Eckl. & Zeyh.]	<i>Eendjies</i> , <i>gansieskeur</i> , <i>jantjiebarend</i> , <i>kalkoenblom</i> , <i>kalkoenbos</i> , <i>kankerbos</i> (sie), <i>kiepiebos</i> , <i>kipkippers</i> , <i>kipkippies</i> , <i>kippiebos</i> , <i>klappers</i> , <i>rooikeurtjie</i> (s2); <i>eendjies</i> (m)	Leaves used for a wide range of ailments.	V2
<b><i>Lessertia frutescens</i></b> (L.) Goldblatt & J.C.Manning var. <b><i>frutescens</i></b> [syn. <i>Sutherlandia frutescens</i> (L.) R.Br.; <i>S. humilis</i> Phillips & R.A.Dyer]	<i>Belletjie</i> , <i>eendjies</i> (blom), <i>gansies</i> (blom), <i>gansiesbos</i> , <i>gansieskeur</i> , <i>hoenderbelletjie</i> , <i>jantjiebarend</i> , <i>kalkoenbelletjie</i> , <i>kalkoenbelletjieblom</i> , <i>kalkoenbelletjiebos</i> , <i>kankerbos</i> , <i>kiepiebos</i> , <i>kipkippers</i> , <i>kipkippies</i> , <i>klappers</i> , <i>camphor bush</i> , <i>cancer bush</i> , <i>turkey flower</i> , <i>blaasbossie</i> , <i>kleingansiesbos</i> (sie), <i>kleinkankerbos</i> (sie), <i>rooi-ertjie</i> (bos) (s2); <i>kankerbos</i> , <i>belletjie</i> , <i>gansies</i> , <i>eendjies</i> (m)	Roots, leaves: wounds, eye diseases; bitter tonic, cancer, numerous ailments; fever, consumption, chicken pox; Coastal forms with hairy leaves have been used as general tonic and to treat cancer.	P1–4,6; S1; D1; L1; V2
<b><i>Lessertia frutescens</i></b> (L.) Goldblatt & J.C.Manning var. <b><i>microphylla</i></b> [syn. <i>Sutherlandia microphylla</i> Burch. ex DC.]	<i>Bitterblaar</i> , <i>gansiesbossie</i> , <i>grootgansiesbossie</i> , <i>grootkankerbossie</i> , <i>kalkoenbos</i> , <i>kankerbos</i> , <i>klapper</i> , <i>bergkankerbos</i> (sie) (s2); <i>belbos</i> ; <i>jantjie-bêrend</i>	Leaves used as bitter tonic and for a wide range of ailments, including as a prophylaxis for cancer (S1).	V2
<b><i>Lessertia frutescens</i></b> (L.) Goldblatt & J.C.Manning var. <b><i>speciosa</i></b> [syn. <i>Sutherlandia speciosa</i> Schltr.]	<i>Jantjie-bêrend</i>	Commonly used in Namaqualand as one of the most important traditional medicines.	V2, N1
<i>Leucospermum conocarpodendron</i> R.Br.	<i>Kreupelboom</i> (p4); <i>kreupelhout</i>	Bark: astringent for diarrhoea (P4)	P4
<b><i>Leysera gnaphalodes</i></b> (L.) L.	<i>Geele bloemetjies-thee</i> (p1–4,6); <i>duinetee</i> (bossie), <i>geelblommetjies</i> (bossie), <i>hongertee</i> (bossie), <i>skilpadtee</i> (bossie), <i>teringtee</i> (bossie) (s2); <i>skilpadteebossie</i> , <i>teringteebossie</i> (m2); <i>Vaaltee</i> (bossie) (m2, s2)	Twigs and leaves used as tea. Also as emollient to treat lung ailments – catarrh, cough and “consumption” (p1–4,6; s2)	P1–4,6; K1; M2
<b><i>Leysera tenella</i></b> DC.	<i>Kalmoes</i> , <i>kalmiswortel</i>	No data on actual use as tea	M2; S2
<i>Lichtensteinia lacera</i> Cham. & Schldl.	<i>Wildelobelia</i> , <i>wild lobelia</i> (s)	Root (rhizome) as decoction: dyspepsia	K1
<i>Lobelia pinifolia</i> L.		Root: “blood purifier” (T1); ) decoctions used for skin infections; diaphoretic, rheumatism, gout (S2)	T1; P1–3
* <i>Malva parviflora</i> L. (Malvaceae)	<i>Kiesieblaar</i> , <i>kasies</i>	Poultices (sores); decoctions (neuralgia, sore throat)	P2–3; D1, K1
<b><i>Mentha aquatica</i></b> L.	<i>Kruis</i> (t)ement, <i>kruis</i> (t)emunt (s2); <i>water mint</i> (m5)	Leaves used as tea	
<b><i>Mentha longifolia</i></b> (L.) Huds. [syn. <i>Mentha capensis</i> Thunb.]	<i>Ballerja</i> , <i>balderjan</i> , <i>baldrjan</i> , <i>t'kamma</i> , <i>wild mint</i> , ( <i>wilde</i> ) <i>kruis</i> (t)ement, ( <i>wilde</i> ) <i>kruis</i> (t)emunt (s2); <i>wildekruisement</i> (m5)	Leaves used as tea; also medicinally as antispasmodic, diaphoretic and carminative, to treat flatulent colic, amenorrhoea and hysteria.	P1–4,6; L1; M5
* <i>Mentha spicata</i> L.	<i>Kruisement</i> , <i>kruisement</i>	General medicine, stomach ailments; used as tea or tea flavourant	D1
<b><i>Mesembryanthemum tortuosum</i></b> L., <b><i>M. emarcidum</i></b> and other species [syn. <i>Sceletium</i> spp.]	<i>Kanna</i> (v1); <i>kanna</i> (wortel), (“ <i>channa</i> , <i>canna</i> ”) <i>kougoed</i> ; <i>sceletium</i>	Fermented and dried leaves or whole plant: mood-enhancer, intoxicant (V1); suppression of thirst; chewed as hypnotic and sedative, for toothache, stomach ache; treatment of colic in infants; “will make a child sleep”; infusions (sometimes in milk) also used, especially for infants.	V1; P1–3; H3, Z, L1
<i>Monsonia emarginata</i> (L.f.) L'Hér. [syn. <i>Monsonia</i>	<i>Keita</i> (bossie); <i>geita</i> (bossie); <i>nceta</i> ; <i>naaldebossie</i> ;	Herb and root used for diarrhoea and dysentery; Khoi	P1–3; K1;

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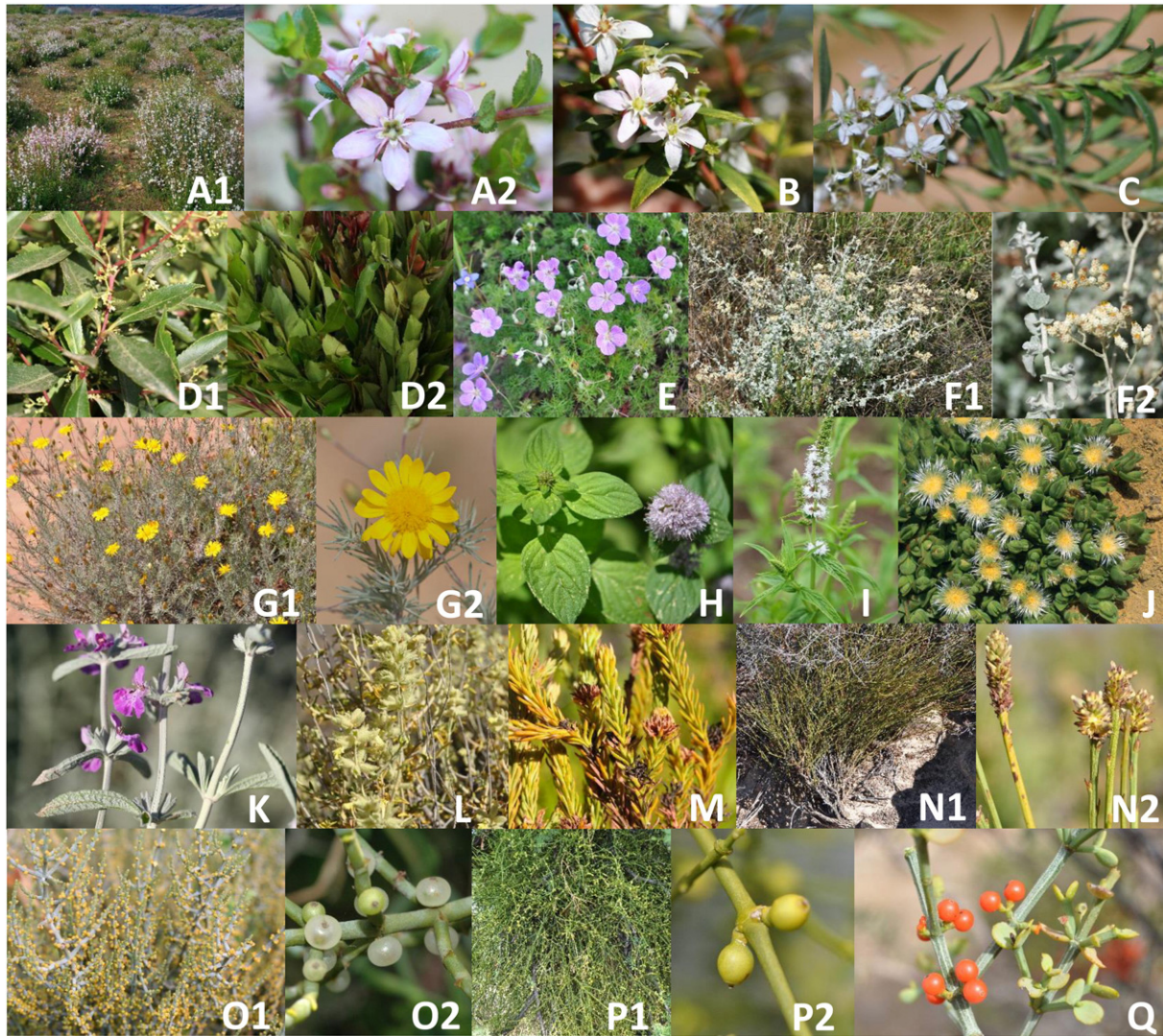
Table 1 (continued)

Species (those used as hot beverages – and not only as medicine – in bold); *exotic species	Common names Khoi/Nama names underlined>	Plant part used and main use(s)	References
<i>ovata</i> Cav.]; <i>M. burkeana</i> Planch. ex Harv.	dysentery herb (s2)	remedy for colds and inflammation of the chest	S1; M1
<i>Morella quercifolia</i> (L.) Killick [syn. <i>Myrica quercifolia</i> L.]	<u>Maagpynbossie</u> (m2, s2)	Leaves used to treat flatulence and stomach pain (S2)	M2; S2
<i>Notobubon galbanum</i> (L.) A.R.Magee [syn. <i>Peucedanum galbanum</i> L.; syn. <i>Bubon galbanum</i> L.]	<u>Wilde seldery</u> (p1); wild celery (p2–4,6); <i>duynhout</i> , <i>zwarthout</i> (t1); <i>bergseldery</i> , <i>duinehout</i> , <i>wildeseldery</i> , blister(ing) bush (s2)	Leaf decoctions; diuretic; treatment of gravel, obesity	P1–4,6; D1; K1; W2; M5
<i>Nylantia spinosa</i> (L.) Dumort.	<u>Skilpadbessie</u>	Tips (“toppe”); decoction for atrophy, phthisis	P1–3
<i>Nymanina capensis</i> (Thunb.) Lindb.	<u>Stinkbos</u>	Leaves used to treat convulsions	L1
<i>Olea europaea</i> L. subsp. <i>africana</i> (Mill.) P.S.Green	<u>Olienhout</u>	Tips (“toppe”) pounded and applied as cold poultice to eye injuries	D1
<i>Oncosiphon africanum</i> (P.J.Bergius) Källersjö; [syn. <i>Matricaria africana</i> P.J.Bergius, <i>Matricaria capensis</i> L., <i>Matricaria glabrata</i> (Thunb.) DC., <i>Matricaria hirta</i> (Thunb.) DC., <i>Oncosiphon glabratum</i> (Thunb.) Källersjö	<u>Wilde kamille</u> (p1); wild chamomile (p2–4,6); <i>wildekamomille</i> , <i>kamelle</i>	Herb; antispasmodic, colic, stomachic in dyspepsia; convulsions	P1–4,6; D1; K1
<i>Oncosiphon suffruticosum</i> (L.) Källersjö [syn. <i>Tanacetum multiflorum</i> Thunb.; <i>Pentzia suffruticosa</i> (L.) Hutch. & Merxm.]	<u>Wormkruid</u> (p1); <i>worm-kruid</i> (p2–4,6); <i>stinkkruid</i> , <i>wurmkruid</i> , <i>wurbos(sie)</i> , <i>miskruid</i>	Herb; tonic, digestive, anthelmintic, diuretic; infantile convulsions; stomach pain; poultice for scorpion stings; typhoid fever, rheumatic fever, influenza	P1–3; S1; D1; K1; L1
<i>Oncosiphon piluliferum</i> (L.f.) Källersjö	<u>Karoostinkkruid</u>	Used in the same way as <i>O. Suffruticosum</i>	
<i>Osmitopsis afra</i> (L.) K.Bremer [syn. <i>O. hirsuta</i> Less.]	<u>Van der merwe’s kruiden</u> (p2–4,6); <i>belskruie</i> , <i>vandermerweskruie</i> (s2)	Herb used as medicinal tea: chest ailments	P2–4,6
<i>Osmitopsis asteriscoides</i> (P.J.Bergius) Less.	<u>Bellis</u> (p1–4,6) <i>bels</i> , <i>belskruie</i>	Herb used as medicinal tea: cough, hoarseness, chest ailments, flatulent colic, antispasmodic, tonic; tinctures are used externally to treat inflammation, paralysis and haemorrhoids.	T1; P1–4,6; D1; K1; Viljoen et al. (2003)
<i>Osmitopsis dentata</i> (Thunb.) K.Bremer [syn. <i>Osmites camphorina</i> Less.]	<u>Bellis</u> (p1–4,6), <i>basterbelskruie</i> (s2); <i>kaapsebelskruie</i> (m)	Herb used as medicinal tea (see <i>O. Asteriscoides</i> ); Considered to be superior to <i>O. Asteriscoides</i> (T1)	T1
<i>Parmelia</i> spp.; <i>Xanthomaculina hottentotta</i> (Ach.) Hale-Müll. [syn. <i>P. hottentotta</i> (Ach.) Ach.]	<u>Klipblom</u> , <u>klipmos</u> , <u>klipbuchu</u>	Infusions for back pain; mouth wash for oral thrush; aromatic lichen (klipbuchu) used for anointing the body (and as mouth wash for teething children)	K1; L1
<i>Pegoletia baccaridifolia</i> Less.	<u>Ghwarrieson</u> , <u>heuningdou</u>	Twigs and leaves as medicinal tea: used to treat oedema (dropsy), bladder and kidney ailments, skin cancer and as tonic for weak old people	M5
<i>Pelargonium antidysentericum</i> (Eckl. & Zeyh.) Kostel.	<u>T’namie</u> , <u>t’kamie</u> , <u>naniewortel</u>	Herb; decoction, fomentation or enema, for colic, nephritis and as emollient	P1–3; K1; L1
<i>Pelargonium cucullatum</i> (L.) L’Hér.	<u>Wilde malva</u> (h1)	Herb: decoction, fomentation or enema, for colic, nephritis and as emollient	H1; P1–3
<i>Pelargonium grossularioides</i> (L.) L’Hér. [syn. <i>P. anceps</i> DC.]	<u>Rabassam</u> , <u>rooiwortel</u>	Red stems; amenorrhoea	P1–3; K1; L1
<i>Pelargonium myrrhifolium</i> (L.) L’Hér.	Not recorded	Root: menstrual disorders, tonic, tuberculosis, earache, colic	B2
<i>Pelargonium odoratissimum</i> (L.) L’Hér.	Not recorded	Leaf: cardiac stimulant	B2
<i>Pelargonium ramosissimum</i> (Cav.) Willd.	<u>Dassieboegoe</u>	Herb; infusion or tincture, for colds, tuberculosis; as nerve tonic	S1
<i>Pelargonium reniforme</i> Curtis, <i>P. sidioides</i> DC.	<u>Rabas</u> , <u>rooirabas</u>	Tuberous roots; diarrhoea and dysentery; anaemas and weakness, fever	S1; M1
<i>Pelargonium triste</i> (L.) L’Hér.	<u>Rabas</u> , <u>rooirabas</u>	Tuberous roots; diarrhoea and dysentery	T1; P1–3
<i>Persicaria decipiens</i> (R.Br.) K.L.Wilson	Not recorded	Herb?: oedema of the lower limbs (t1)	T1
<i>*Petroselinum crispum</i> (Mill.) A.W.Hill	<u>Pietersielie</u>	Leaf infusion as diuretic	D1; K1
<i>Pharnaceum lineare</i> L.f.	<u>Droëdaskruie</u>	Herb; infusion used to treat tuberculosis	P2–3; K1
<i>*Plantago major</i> L., <i>*P. lanceolata</i> L.	<u>Weeblaar</u>	Seed infusions used to treat diarrhoea (especially children); leaf as poultice for wounds and sores	S1; D1
<b><i>Plecostachys serpyllifolia</i></b> (P.J.Bergius) Hilliard & B.L.Burt [syn. <i>Helichrysum serpyllifolium</i> (P.J.Bergius) Pers.; syn. <i>H. orbiculare</i> (Thunb.) Druce]	<u>Hottentots tee</u> , <u>vaal tee</u> (m2); <u>hottentotstee(bossie)</u> , <u>hotnotstee</u> , <u>vaaltee(bossie)</u> (s2)	Leaves used as tea, and also for chest ailments, colds (demulcent, emollient).	P1–4,6; K1; M2; S2
<i>Pollichia campestris</i> Aiton	<u>Suikerteebos(sie)</u> , <u>teesuikerkaroo</u> (s2)	The vernacular name is partly derived from the use of the plant as medicinal tea (S2)	S2
<i>Protea nitida</i> Mill.	Not recorded (t1); <u>wagenboom</u> , <u>waggon-tree</u> (p4); [ <u>waboom(bas)</u> ]	Bark: astringent for diarrhoea (T, P4)	T1
<i>Psoralea bracteata</i> L.	<u>Skaapbosstee</u> (s2)	No data on actual use as tea	S2
<i>Psoralea glaucina</i> Harv.	<u>Bloutee(bossie)</u> (s2)	No data on actual use as tea	S2
<i>Punica granatum</i> L.	<u>Granaat(skilie)</u> , <u>granaatbas</u>	Fruit rind, roots; vermifuge; treatment of diarrhoea and dysentery	P3; S1; D1; K1
<b><i>Rafnia acuminata</i></b> (E.Mey.) G.J.Campbell & B.-E. Van Wyk [4] [syn. <i>Vascoa perfoliata</i> (Thunb.) DC.; syn. <i>Rafnia perfoliata</i> auct. non (Thunb.) Willd.]	<u>Veldtee</u> (m2); <u>vascobossie</u> (k1); <u>veldtee</u> , <u>soethoutbossie</u> (s2)	Leaf decoction as tea: diuretic to treat oedema (T1)	P1–4,6; K1
<b><i>Rafnia amplexicaulis</i></b> (L.) Thunb. [as <i>Crotalaria perfoliata</i> ]; [syn. <i>Crotalaria amplexicaulis</i> L.; <i>Vascoa amplexicaulis</i> (L.) DC.]	<u>Zoethout-boschje</u> (p1–4,6); <u>veldtee</u> (m2); <u>soethoutbossie</u> , <u>veldtee</u> (s2); <u>soethoutbossie</u> (m5); <u>waboomtee</u> , <u>jakkalstee</u> , <u>borskwaal</u> , <u>brilbos</u>	Leaf decoctions or infusions: taken as tea, also for asthma, influenza, bad back, infertility; root: demulcent, similar to liquorice root	M2; P1–4, 6; Kinfe et al. (2015)
<i>Rorippa nasturtium-aquaticum</i> (L.) Hayek	<u>Bronkorsslaai</u>	Tea for bronchitis, lung ailments	D1; S1

Table 1 (continued)

Species (those used as hot beverages – and not only as medicine – in bold); *exotic species	Common names Khoi>Nama names underlined)	Plant part used and main use(s)	References
<i>Rubia petiolaris</i> DC.	<i>Rooihoutjie</i>	Root; diarrhoea and dysentery;	S1
<i>Rubus pinnatus</i> Willd.	<i>Braambosch</i> (p4); <i>braam</i> (wortels), <i>braamboswortel</i>	Root decoction: chronic diarrhoea (P4); haemorrhoids, epilepsy	P2–3; D1; K1
* <i>Ruta graveolens</i> L.; <i>Ruta chalepensis</i> L.	<i>Wynruit</i> , <i>wynruik</i>	Weak infusions for inflammation, rheumatism, fever, chest ailments, diabetes, high blood pressure,	D1; K1
<i>Salix mucronata</i> Thunb., * <i>S. babylonica</i> L.	<i>Wilger</i> (toppe), <i>rivierwilger</i>	Tips (“toppe”) or bark; fever, inflammation, headache; old Khoi remedy for rheumatic fever	D1; S1
<i>Salvia africana-coerulea</i> L.	<i>Bloublom</i> (metjie)salie, <i>perdesalie</i> , <i>wildesalie</i> , <i>afrikaanse salie</i> (s2); <i>bloublomsalie</i> (m2)	Leaf decoctions used for coughs, colds, women’s ailments; diarrhoea	P2–3; D1; K1; L1
<i>Salvia africana-lutea</i> L.	<i>Bruinsalie</i> , <i>geelblomsalie</i> , <i>sandsalie</i> , <i>strandsalie</i> (s2); <i>bruinsalie</i> , <i>strandsalie</i> (m2)	Leaf decoctions used for coughs, colds, women’s ailments	L1
<i>Salvia chamelaeagnea</i> P.J.Bergius	<i>Bloublom</i> (metjie)salie, <i>afrikaanse salie</i> (s2); <i>bloublomsalie</i> (m5)	Flowering tops as infusions to treat chest complaints, influenza, fever, headache, stomach ache (M5)	M5; <i>Kamatou</i> et al. (2008)
<i>Salvia dentata</i> Aiton	<i>Bloublomsalie</i> , <i>bergsalie</i> (n1, d2)	Used in the same way as <i>S. Africana-coerulea</i>	N1
<i>Salvia disermas</i> L. [syn. <i>Salvia rugosa</i> Ait.]	<i>Teesalie</i> , <i>grootblousalie</i> , <i>witsalie</i> , <i>aasvoëltee?</i> (s2); <i>terpentybos</i> , <i>muishondbos</i> (m5); <i>aasvoëlbos</i>	Used as tea to treat heart problems, rheumatism and high blood pressure (M5)	M5
<i>Salvia officinalis</i> L.	<i>Salie</i> , <i>maksalie</i>	Gargle for sore throat	D1
<i>Samolus valerandi</i> L.	<i>Bronkors</i>	Tea for lung ailments; skin rash	S1; D1
<i>Sansevieria aethiopica</i> Thunb.	<i>Aambeiwortel</i> , <i>ghaiwortel</i> , <i>t'kay</i>	Rhizomes; infusions to treat haemorrhoids; decoction for intestinal worms	P2–3; S1; K1
<i>Solanum linnaeanum</i> Hepper & Jaeger	Not recorded	Root decoction: dropsy (oedema)	H2
<b><i>Stachys aethiopica</i></b> L.	<i>Kat</i> (pis)bossie, <i>kruie</i> (s2); <i>katbossie</i> (m2); <i>kleinkattekruie</i> (m5)	Herbs is taken as medicinal tea to treat influenza, internal haemorrhoids, liver complaints and women’s ailments (M5)	M5
<b><i>Stachys aurea</i></b> Benth. [syn. <i>Stachys integrifolia</i> Vahl.]	<i>Geeltee</i> (bossie) (s2)	No data on actual use as tea	S2
<b><i>Stachys burchelliana</i></b> Launert [syn. <i>Stachys burchellii</i> Benth.]	<i>Boesmanstee</i> , <i>jakkalstee</i> , <i>vaalbossie</i> , <i>saliebossie</i> , <i>teebossie</i> , <i>wildesalie</i> (s2)	No data on actual use as tea	S2
<b><i>Stachys flavescens</i></b> Benth.	<i>Geeltee</i> (bossie) (m2)	No data on actual use as tea	S2
<b><i>Stachys lamarckii</i></b> Benth.	<i>Hottentotskruie</i> (s2)	No data on actual use as tea	S2
<b><i>Stachys linearis</i></b> Burch. ex Benth. [syn. <i>Stachys rugosa</i> Aiton var. <i>linearis</i> Skan]	<i>Boesmantee</i> (m2); <i>boesmanskruie</i> , <i>boesmanstee</i> , <i>bosvaalbossie</i> , <i>dassiebossie</i> , <i>wildeboesmantee</i> (s2)	No data on actual use as tea	S2
<b><i>Stachys rugosa</i></b> Aiton	<i>Vaaltee</i> (m2); <i>teebossie</i> , <i>vaaltee</i> (bossie), <i>karotee</i> (bossie), <i>kliptee</i> (bossie), <i>boesmanstee</i> , <i>dassiebos</i> , <i>jakop-jong</i> , <i>kruie</i> , <i>muishondkruie</i> (s2)	Used as an aromatic tea by Dutch settlers (S2)	S2
<b><i>Stachys spathulata</i></b> Burch. ex Benth.	<i>Teebossie</i> (s2)	No data on actual use as tea	S2
<b><i>Stachys thunbergii</i></b> Benth.	<i>Kattekruie</i> (s2) (but see <i>ballota africana</i> )	No data on actual use as tea	S2
<i>Sutherlandia</i> – see <i>Lessertia</i>			
<i>Tarchonanthus littoralis</i> P.P.J.Herman [syn. <i>T. camphoratus</i> L., pro parte]	<i>Kuskanferbos</i> ; coastal camphorbush; <i>siriehout</i> ; <i>wilde salie</i> ; wild sage	Leaf: infusion or tea; diaphoretic as antispasmodic, tonic, and resolvent; treatment of bronchitis, asthma	P3, 4; K1; L1
<i>Teucrium africanum</i> Thunb.	<i>Paddaklou</i> (w), <i>bitterbossie</i> , <i>aambeiebossie</i> (s2); <i>paddaklou</i> (m2)	Herb; tonic, sore throat; hot infusion for snake bite; leaf paste for toothache	S1; <i>Ruiters</i> et al. (2016)
<i>Teucrium trifidum</i> Retz. [syn. <i>Teucrium capense</i> Thunb.]	<i>Akkedispoort</i> , <i>kaatjiedrieblaar</i> , <i>koorsbossie</i> , <i>maagbossie</i> , <i>aambeiebossie</i> , Dutchman’s fever plant (s2); <i>akkedispoort</i> , <i>kaatjiedrieblaar</i> (m2)	Used in the same way as <i>T. Africanum</i>	<i>Ruiters</i> et al. (2016)
<b><i>Thesium carinatum</i></b> A.DC.	<i>Jakkalstee</i>	Leafy stems used as tea (Ben Zimri, Brugkraal, pers. Com.)	
<b><i>Thesium macrostachyum</i></b> A.DC.	<i>Lidjeste</i>	Stems used as tea (well known in the Wupperthal area)	
<b><i>Thesium spicatum</i></b> L.	<i>Lidjes tee</i> (m2); <i>lidjeste</i> (s2)	Stems are used as a medicinal tea (S2)	M2; S2
<b><i>Thesium strictum</i></b> P.J.Bergius	<i>Teringbos</i> (m2, s2)	Stems are used as tea (Petrus Hanekom, Algeria, pers. Com.)	M2; S2
<i>Tulbaghia alliacea</i> L.f.	<i>Wilde knoflook</i> (p1–4,6); <i>wildeknoffel</i> , wild garlic	Bulb decoction (in water or milk): used to treat intestinal worms, fever, influenza, high blood pressure, tuberculosis	T1; P1–4,6; K1
<i>Tulbaghia violacea</i> Harv. [syn. <i>T. cepacea</i> L.f. var. <i>maritima</i> Vosa]	<i>Wildeknoffel</i> , <i>wilde knoflook</i>	As above	T1; P1–4,6; K1
* <i>Urtica urens</i> L.	<i>Brandnetels</i> , <i>brandneuker</i>	Chest ailments, whooping cough; wounds and sores; powdered leaf or leaf tincture as styptics	S1; D1; K1
<i>Valeriana capensis</i> Thunb.	<i>Wildebalderjan</i> (see <i>balderja</i> ), <i>baldrian</i>	Root infusions; typhoid fever, epilepsy, hysteria, intestinal worms; sudoriferous	P1–4,6; K1
<b><i>Viscum capense</i></b> L.f.	<i>Vogeleend</i> (p1–4,6); <i>voëlent</i> , <i>litjeste</i> , <i>voegelstront</i> (s2)	Whole herb used as tea; infusions also used medicinally to treat diarrhoea, epilepsy in children, wasting disease (children); antispasmodic.	T1; P1–4,6; D1; K1
<b><i>Viscum continuum</i></b> E.Mey ex Sprague	<i>Voëlent</i> (s2)	Whole herb used in the same way as <i>V. Capense</i> (often confused with it)	
<b><i>Viscum rotundifolium</i></b> L.f.	<i>Voëlent</i> , <i>voegelstront</i> (s2)	Whole herb used as tea (M5)	M5
<i>Withania somniferum</i> (L.) Dunal	<i>Geneesblare</i>	Leaf for ulcers and wounds; root bark as tonic	S1
<i>Xysmalobium undulatum</i> (L.) Ait.f.	<i>Bitterwortel</i> (p1); <i>bitterkalmoes</i>	Root as infusion or decoction: used as diuretic to treat oedema (dropsy)	T1; P1; S1; K1; W2
<i>Zanthoxylum capense</i> (Thunb.) Harv.	<i>Wilde kardamom</i> (t1); <i>wildekarmonk</i>	Fruit (decoction?): colic, flatulence, paralysis (t1);	T1; P1–3; K1





**Fig. 1.** Examples of Cape herbal teas. A1, *Agathosma betulina*, plantation; A2, *Agathosma betulina*; B, *Agathosma crenulata*; C, *Agathosma serratifolia*; D1, D2, *Catha edulis*; E, *Geranium incanum*; F1, F2, *Helichrysum odoratissimum*; G1, G2, *Laysera gnaphalodes*; H, *Mentha aquatica*; I, *Mentha longifolia*; J, *Mesembryanthemum tortuosum*; K, *Stachys rugosa*; L, *Stachys aurea*; M, *Thesium carinatum*; N1, N2, *Thesium macrostachyum*; O1, O2, *Viscum capense*; P1, P2, *Viscum continuum*; Q, *Viscum rotundifolium*. Photos: B.-E. Van Wyk.

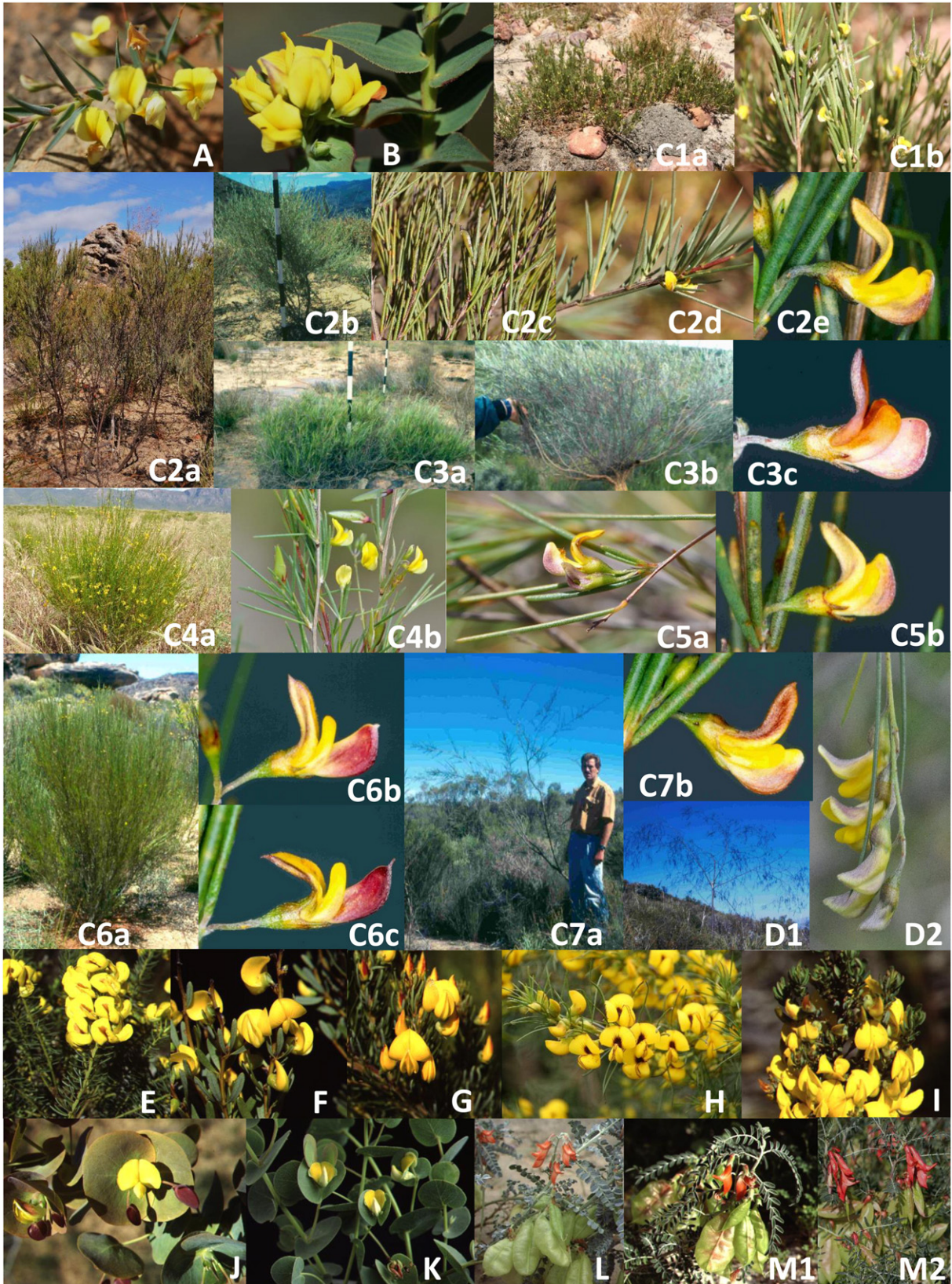
(1850), and as *B. parviflora* Lamarck by Pappé (1857, 1868). He reported that the plant, called “*Stekelthee*”, is common on Lion’s Head and Table Mountain and that a decoction is given as diuretic. John R. Jackson, who was Curator of the Kew Museums, made historically interesting observations on several Cape herbal teas (Jackson, 1873): “Another South African leguminous genus, the leaflets of which are used for making a medicinal infusion, known to the colonists as “*Stekelthee*,” is *Borbonia*; the genus consists of thirteen species all natives of South Africa .... *B. parviflora*. Lam., is the species mostly used, the leaves of which are given as a diuretic in the form of decoction.”

MacOwan (1894) reported the infrequent use of this species (as “*Stekel Thee*”). Smith (1966) also recorded it as a medicinal tea to treat asthma and as diuretic. Another early anecdote is that of Drège, who reported the use of *A. crenata* as tea at Paarl, in October 1828 (Meyer, 1836): “*Bergthee colonis*” (E.Mey., Comm. 1: 16). Smith (1966)

commented on the preparation and use of the tea. “Used as a tea either fresh or dry, the dry condition being preferred owing to the better flavour obtained as the result of fermentation which takes place during the drying and sweating operations”. The related *A. alpestris* and *A. angustifolia* are also cited as sources of tea, but no details are provided (Smith, 1966). A report published at the turn of the 19th century confirmed the use of *Aspalathus* (*Borbonia*) species (Anonymous, 1899): “Another genus of plants, though belonging to the same order is the *Borbonia* .... The plant possesses other than a derivative interest for the Boer. The *Borbonia parviflora*, an evergreen native of the Cape of Good Hope, gives him, after judicious decoction and infusion of its pungent aromatic leaves, a liquid which ‘cheers’ probably as much, and ‘inebriates’ no more, than the ‘cups which wait on each’ in Cowper’s ‘Winter Evening’.”

#### Notes to Table 1

References [pre-1800 references are cited from: <sup>a</sup>De Wet and Pfeiffer (1979) and <sup>b</sup>Scott and Hewett (2008)]: B1 = Boerhaave (1727)<sup>b</sup>; B2 = Burman (1759)<sup>b</sup>; B3 = Burchell (1822–1824); B4 = Barry (1827), cited by Theodore (1978) and Magee et al. (2007); C = Commelin (1697–1701)<sup>a</sup>; D1 = Dykman (1908); D2 = De Beer and Van Wyk (2011); F1 = Flueckiger and Hanbury (1879); H1 = Herman (1687)<sup>b</sup>; H2 = Houttuyn (1776)<sup>b</sup>; H3 = Hartwich (1911); H4 = Hofmeyer and Phillips (1922); K1 = Kling (1923); K2 = Kies (1951); L1 = Laidler (1928); M1 = MacOwan (1897); M2 = Marloth (1917); M3 = Marloth (1925); M4 = Marloth (1932); M5 = Anonymous (Montagu Museum) (1998); N1 = Nortje and Van Wyk (2015); P1 = Pappé (1847); P2 = Pappé (1850); P3 = Pappé (1857); P4 = Pappé (1862); P5 = Pappé (1868); S1 = Smith (1895); S2 = Smith (1966); S3 = Spreeth (1976); S4 = Schutte (1997); T1 = Thunberg (1785)<sup>b</sup>; V1 = Van der Stel (1685)<sup>ab</sup>; V2 = Van Wyk and Albrecht (2008); W1 = Wehde mann (1836)<sup>b</sup>; W2 = Watt and Breyer-Brandwijk (1928); W3 = Watt and Breyer-Brandwijk (1962); Z = Zwicky (1914).



**Fig. 2.** Rooibos tea (*Aspalathus linearis*), honeybush tea (*Cyclopia* spp.) and other herbal teas from the legume family (Fabaceae). A, *Aspalathus alpestris*; B, *Aspalathus crenata*; C, *Aspalathus linearis*: C1a, southern sprouter, habit; C1b, leaves and flowers; C2a,b, grey sprouter, habit; C2c,d, grey sprouter, leaves; C2e, grey sprouter, flower; C3a,b, Nieuwoudtville sprouter, habit; C3c, Nieuwoudtville sprouter, flower; C4a, commercial red type, habit; C4b, commercial red type, leaves and flowers; C5a, black tea, leaves and flowers; C5b, black tea, flower; C6a, Wupperthal tea, habit; C6b,c, Wupperthal tea, flowers; C7a, tree type, habit; C7b, tree type, flower; D1, *Aspalathus pendula*, habit; D2, *Aspalathus pendula*, leaves and flowers; E, *Cyclopia genistoides*; F, *Cyclopia intermedia*; G, *Cyclopia maculata*; H, *Cyclopia sessiliflora*; I, *Cyclopia subternata*; J, *Rafnia amplexicaulis*; K, *Rafnia acuminata*; L, *Lessertia* (*Sutherlandia*) *canescens*; M1, *Lessertia frutescens*, hairy coastal form; M2, *Lessertia frutescens*, microphylla form. Photos: B.-E. Van Wyk.

It is curious that neither MacOwan (1894) nor Marloth (1909) mention rooibos tea (*A. linearis*) in their reviews of Cape medicinal products. Marloth must have been familiar with the Clanwilliam area because he married Marian Van Wyk of Clanwilliam in 1891 and undertook a botanical expedition to the Gifberg and Cederberg in 1901 (Glen and Germishuizen, 2010). MacOwan went on a botanical trip to the Clanwilliam and Wupperthal areas in 1897, in order to, among other things, “renew the old and decayed types of Ecklon and Zeyher” (Anonymous, 1898). However, we have not found any mention of rooibos tea in his later writings. Bush tea (*Cyclopia* species) and *Leysera gnaphalodes* are briefly discussed by Marloth (1909), the last-mentioned designated as the “Tea of the Cederbergen”. Marloth (1912) described the Wupperthal form of rooibos as a new species, namely *Borbonia pinifolia* Marloth (Fig. 2C6a-c). He stated that ‘The *Borbonia* is of economic importance, being the source of a colonial tea, viz., rooibosch tea...’ and also ‘This plant is of special interest as it supplies the “rooibosch-tea”, which is now so largely used in South Africa either under this name or as “naald-thee” or Koopmans-thee’. The shrublet occurs apparently only on the Cedar Mountains near Clanwilliam and Wupperthal.’ In his list of plant names accompanying the Flora of South Africa, Marloth (1917) listed several sources of wild teas. His entry for rooibos tea reads: ‘*Rooibos tee, Rooi tee, Naald tee* or *Koopmans tee*, is *Borbonia pinifolia*; a small shrublet of the Olifant’s river and Cedar mts. The twigs and leaves are cut up and fermented like the *Cyclopia*. A pleasant beverage, especially in hot weather, free from tannin and stimulating ingredients.’ He also gives the name *Spelde tee* as synonym of *Rooi tee*. Black tea (from Clanwilliam and Piquetberg) is listed as *Aspalathus tenuifolia* (the leaves are said to be very similar in appearance to rooibos tea, but black in appearance (when prepared for use) (see notes on black tea below). The Leguminosae (Fabaceae) is treated by Marloth (1925) in Volume 2, Part 1 of his Flora of South Africa. Under *Aspalathus corymbosa* E.Mey. (with *Borbonia pinifolia* given as synonym) he states: ‘This shrublet yields the *rooibostee* (*naald tee*) now largely used in South Africa as a harmless beverage (free from stimulating alkaloids). It is named *Borbonia* on the plate, as the first flowering specimens obtained from collectors of the tea possessed only leaves...’ It may be concluded that rooibos tea became generally known in the Cape only in the period between 1902 and 1912. In 1907, rooibos was displayed at the South African Exhibition in London. Rooibos was sold outside of its habitat – as far as Worcester and maybe even further – at least since 1902–4. It is evident from the testimonies of traders submitted as part of the ‘Rooibosch’ trade mark case of 1909, heard in the Supreme Court of the Cape Colony (Motion. Charles Beeton Heatlie and Sydney Glaeser Heatlie trading as Heatlie Brothers, and Krone and Co. Ltd. versus James Hodgson Hartley, 1909 (source CSC, vol 2/6/1/366, ref. 783) [Cape Town Archives Repository (KAB)], National Archives of South Africa). The name “reed tea” appears under the heading “Bush Tea – Clanwilliam” in a letter sent by the Civil Commissioner at the Cape to England on 5 June 1907 (Cape bush tea – encouragement of industry, 1907–10 [source AGR; vol 611; ref. T83] Cape Town Archives Repository (KAB), National Archives of South Africa). This tea, which is said to grow in abundance on the mountain slopes and commonly used by the “hottentots and poor whites”, may refer to rooibos tea. A potential link between this “reed tea” and rooibos tea is provided by Coetzee (1969), who recorded the name *riettee* in the vicinity of Aurora near Piquetberg. *Riettee* is said to be also known as *naalde en spelde* (i.e., “needles and pins”). Although the name *riettee* does not appear in Marloth (1917), both *naalde tee* and *spelde tee* are given as common names for *Borbonia pinifolia* (= *Aspalathus linearis*). According to Smith (1966), *riet* or *rietjies* is a general term applied to members of the Restionaceae that is usually found in compound vernacular names. The name *riettee* therefore suggests that the tea grows in fynbos (i.e., among Restionaceae), which is true for both *lidjies* (*Thesium* spp.) and rooibos tea (*Aspalathus linearis*). It seems that the names *riettee* and “reed tea” most likely refer to rooibos tea. In government correspondence, inquiries about

*rooibosch* tea appeared at least from 1906. For instance, P J du Toit, Director of Agriculture, Cape Town, in a letter to the Civil Commissioner, Clanwilliam, 5 October 1906, wrote: ‘I am directed to inform you that experiments are being made with Cape bush teas with a view to ascertaining whether they can be made into merchantable article. This Department has been advised that a certain kind of bush growing in your Division is used for preparing what is locally known as “Rooi Thee”; and I am to request that you will be good enough to cause about 10 lbs weight of the plant including leaves and stalk to be forwarded to this office at an earliest date.’ (Cape bush tea – encouragement of industry, 1907–10 [source AGR; vol 611; ref. T83] Cape Town Archives Repository (KAB), National Archives of South Africa).

Unfortunately, there are no earlier ethnobotanical records and no Khoi or San vernacular names have ever been recorded. However, several authors have assumed that the tea originated from the local inhabitants of the Cederberg. Statements that rooibos tea is a traditional drink of Khoi-descended people of the Cedarberg (and “poor whites”) are correct but we have not been able to trace this tradition further back than the last quarter of the 19th century. Could it be that some of the indigenous teas were “discovered” as part of a general commercially motivated survey (perhaps inspired by traders, missionaries and colonial commissioners) to find alternatives for the expensive imported black tea?

Rooibos tea was traditionally processed by beating the material on a flat rock (in an area where there is a slight depression) using a heavy wooden pole or club (such as a stump of sand olive, *Dodonaea viscosa*) or a large wooden hammer, usually made from wild olive (*Olea europaea* subsp. *africana*). The hammer was called a “moker” and this word (of Dutch origin) can also be used as a verb when referring to tea-making (e.g., *ons het tee gaan moker* – we went to make/“beat” tea). An example of a *moker* can be seen in the Clanwilliam Museum (Fig. 3).

The remarkable diversity of wild types of rooibos tea (Fig. 2), all considered to be part of the *Aspalathus linearis* species complex, has not yet been fully explored. The species is exceptionally polymorphic, with considerable morphological, ecological, genetic and chemical variation. The first known reference to the various forms of rooibos tea was by the Conservator of Forests (1949). His assessment is accurate, except that the differences are genetically determined and not the result of environmental effects: “I have never been very clear in regard to the exact botanical nomenclature of the bush teas in the Cedarberg, but as far as I

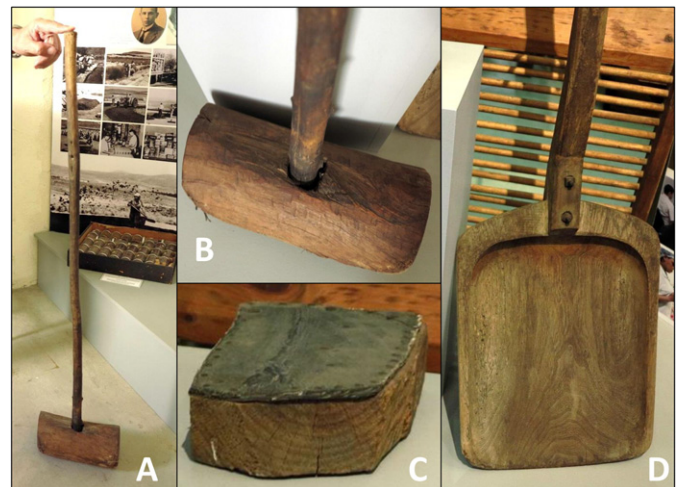


Fig. 3. Tools used in the rooibos tea industry in the early part of the 20th century. A, *moker* (wooden hammer), used to bruise rooibos leaves to enhance the fermentation process; B, head of the *moker*; C, scouring block (piece of wood with rubber from a tyre) used to scour the seed coats of rooibos seeds to enhance germination; D, wooden shovel, used to spread out the rooibos tea after fermentation so that it can dry in the sun. Photos: B. Gorelik (with kind permission from the Clanwilliam Museum).

can make out the position there is that only one species of *Aspalathus* is concerned, known at various times as *A. tenuifolia*, *A. cedarbergensis* and *A. corymbosa* with a number of different forms due to environmental influences, chiefly altitude, or minor varieties.

Thus we have (all *Aspalathus contaminatus* (Thunb.) Druce):

1. True or typical Rooibos Tea - The best quality
2. Rooibos Langbeen Tea; Rooibos Kortbeen Tea - slightly inferior
3. Vaal Tea; Bruin Tea - inferior to No. 2
4. Swart Tea - worst quality.

These four, and especially Rooibos and Swart tea, seem to be clearly differentiated in Clanwilliam and the differentiation is very marked in the prices the various kinds fetch. ... I do not think it will be possible to get more than the 8000 lbs. of Swart Tea referred to previously collected. In any case, I am not anxious to encourage further collection of that quality as there is the danger that it will be used to adulterate the Rooibos tea."

In his revision of the genus *Aspalathus*, Dahlgren (1968) also described the main types of rooibos tea: "The professional producers of "tea" from *A. linearis* distinguish between the main types mentioned below. Although all types of Rooibos Tea were still commercially available only a few years ago, only Rooi Tea is available today. The other types originated from wild forms that are only fragmentarily known even among the tea producers and buyers at Clanwilliam, and this knowledge will probably fade rapidly as the types are disappearing altogether.

Rooi (red): Nortier type. This is obtained from cultivated, successively selected biotypes, which originally derive from wild forms, mainly found in the northern part of the Cederberg Mountain range (at least partly in the Pakhuis Pass area). The cultivated forms selected have fresh-green (not pale or bluish green), relatively slender leaves, erect growth, and a leafy habit. The flowers are relatively bright yellow. The tea, obtained according to the procedure described below, is reddish and has a mild aroma.

Cederberg type. This is obtained from the wild forms out of which the cultivated Nortier Type has been selected. These forms occur mainly in the Pakhuis Mountains (northern part of the Cederberg range) and also to some extent in the mountains in the Citrusdal area (and possibly in the Olifants River Mountains).

Rooi-bruin (red-brown): This was obtained from wild plants reported to grow mainly on the sand flats in the northern regions of the distribution area, especially in the lowlands from Pakhuis (Clanwilliam Division) northeastwards into the Calvinia Division and northwards into the Vanrhynsdorp Division. The tea produced is reddish-brown and not or only slightly coarser than the Rooi Tea; the flavour is not very different.

Vaal (grey): This was obtained from wild forms in the mountains chiefly of the Cederberg (but probably also the Olifants River) Mountain range in the Clanwilliam Division. The leaves of the forms yielding this tea type are rather pale and greyish green, and the tea obtained is also more greyish in colour. The tea is considered to have a somewhat undesirable honey aroma.

Swart (black): Similarly, this type is said to have been obtained from forms chiefly growing in the Cederberg Mountains, but different from those yielding the Vaal and Rooi Tea. According to information from the professional Rooibos Tea producers at Clanwilliam, the forms yielding the Swart Tea occur in rocky regions of the Cederberg Mountains. The tea is distinctly darker in colour than the Vaal Tea and has an aroma markedly different from all the other tea types. This type of tea was the first to be discontinued on a commercial basis."

More recently, Malgas and Oettlé (2007), Malgas et al. (2010) and Hawkins et al. (2011) described wild tea ecotypes from the northern Cederberg and Bokkeveld.

Field observations by BEVV over many years have shown that *Aspalathus linearis* represents a remarkably diverse species complex that includes distinct regional variants, some of which are killed by

fire and others not. An attempt is made below to clarify the rather confusing nomenclature that has been used for the various wild tea plants as well as the teas made from them.

Fire-survival strategy in fynbos legumes were first documented by Schutte et al. (1995), who described and analysed reseeding (seeding) and resprouting (sprouting) in several genera. Van der Bank et al. (1995, 1999) studied genetic differences between seeding and sprouting populations, while Van Heerden et al. (2003) listed the wild tea types and reported on the main phenolic compounds of several provenances. Tea made from *A. pendula* (Fig. 2D1,2), a close relative of *A. linearis* that was historically added to rooibos to improve the fermentation, was also analysed. Aspalathin, a dihydrochalcone, is the major phenolic compound in the commercial red tea type (Rocklands type) but also present are another dihydrochalcone (nothofagin), together with flavones (orientin, isoorientin, vitexin, isovitexin, luteolin, chrysoeriol), flavanones (dihydro-orientin, dihydro-isoorientin, hemiphlorin) and flavonols (quercetin, hyperoside, isoquercitrin, rutin) (Joubert and De Beer, 2011). Some wild populations contain rutin and other flavonoids (Van Heerden et al., 2003) and rutin was also reported to be the main flavonoid in *A. pendula* (Fig. 2D1,2). Beelders et al. (2012), however, showed that rutin co-elutes with quercetin-3-robinobioside unless a special HPLC method is used. Although considerable variation may exist within some of the tea types, the following eight main categories can be distinguished (Fig. 2C):

- (1) Southern sprouter (Cape Peninsula, Franschhoek Pass to Ceres and Tullbagh): A small plant with a prostrate growth form, somewhat hairy leaves and yellow flowers (Fig. 2C1a,b). This type was known to Dahlgren (1968) but has apparently never been used to make tea (at least not on a commercial scale).
- (2) Grey sprouter (Citrusdal area): Erect, robust, multi-stemmed, with thick glaucous leaves; flowers partly reddish-purple (Fig. 2C2a-e). This is the source of the vaal tea described above. Although Dahlgren (1968) mentions an undesirable honey aroma, a farmer in the Citrusdal district who regularly won awards for his tea, ascribed his success to the use of this vaal tea to improve both the fermentation and the aroma of his commercial red tea (personal communication to BEVV).
- (3) Northern sprouter (Citrusdal to Cederberg and Bokkeveld): Prostrate plants, often with the flowers partly or completely violet. This has been called *kortbeen tee* (Conservator of Forests, 1949) and *rooi-bruin* (red-brown) tea (Dahlgren, 1968), who stated that the tea quality is comparable to that of the red tea type. The *rankiestee* of Malgas and Oettlé (2007) agrees with this type.
- (4) Nieuwoudtville sprouter (Fig. 2C3a-c), also known as *heiveldtee* or *jakkalstee*. It differs from the northern sprouters in the generally larger and more erect growth form. The flowers are partly violet to orange-purple (Fig. 2C3c). This tea agrees closely with the red-brown type of Dahlgren (1968) who apparently did not distinguish between the various northern sprouting forms.
- (5) Red type (seeder) (Clanwilliam region to Nardouwsberg). This type is represented by the commercial form, also known as the Rocklands type or Nortier type. The habit is erect and robust, the leaves bright pale green and the flowers invariably yellow. Some populations appear to be chemically variable and may not have the typical high level of aspalathin as main phenolic compound (Fig. 2C4a,b). Dahlgren (1968) referred to wild forms of the red type as the Cederberg type (not to be confused with Type 7, which is endemic to higher altitudes in the Wupperthal area of the Cederberg).
- (6) Black type (seeder) (Piketberg, Paleisheuvel and Citrusdal areas). This is possibly the "Black Tea" referred to by Marloth (1917) who stated that the processed tea is black in colour. The plants are typically tall, erect, sparse and slender, with the flowers partly violet in colour (Fig. 2C5a,b). It also agrees with

the *swart tee* or black type described by the Conservator of Forests (1949) and Dahlgren (1968).

- (7) Wupperthal type (seeder) (Cederberg region): An erect, densely branched shrublet of up to 0.8 m tall with relatively small, bright green leaves. The flowers are typically bicoloured, with the standard petal and wing petals predominantly yellow but with a reddish violet (maroon) keel. Particularly noteworthy is the distinctively awned keel tip, which appears to be a unique character (Fig. 2C6a–c). This is the new species, *Borbonia pinifolia*, of Marloth (1912). Dahlgren (1968) treated it as a separate subspecies (*A. linearis* subsp. *pinifolia*) but did not uphold this concept in his later revision of the genus (Dahlgren, 1988). Some local inhabitants of the Cederberg have called this “*bloublommetjiestee*” (Smit, 2004; Smit, pers. comm.).
- (8) Tree type (seeder) (Citrusdal area): A sparse, tall plant of up to 3–4 m high with drooping branches, relatively large, often glaucous leaves and partially violet flowers (Fig. 2C7a,b). This is probably the *langbeen tea* of the Conservator of Forests (1949) but is not recognised by Dahlgren (1968) as a distinct type. Malgas et al. (2010) referred to it as the *saligna* type.

Variation studies are needed to determine the precise diagnostic value of morphological, anatomical and chemical characters as previously reported by Dahlgren (1968, 1988), Van Heerden et al. (2003) and Kotina et al. (2012). Joubert et al. (2016) showed that terroir and climate (i.e. the different environmental conditions in the various production areas of rooibos tea) played a relatively small role in determining the phenolic profile of the commercial red tea type. Large differences in the phenolic compounds of wild tea types (Van Heerden et al., 2003) are therefore likely to be genetically fixed and may be useful in developing regional products such as Wupperthal tea and Heiveld tea. The composition of flavonoids may provide an additional diagnostic character for registering and protecting these teas as geographical indications, in the same way as other origin-based products such as champagne, port and sherry. Another potential step towards this aim is the aroma profiles and aroma wheel that have been developed (Jolley et al., 2016). The concerted efforts in recent years (Koch et al., 2012, 2013; see also De Beer et al., 2016 and other papers by Joubert and co-workers in the reference list) to improve the quality of the product and to develop quality control tools for use in the rooibos tea industry were crucial elements in elevating the product to an international standard.

### 3.4. *Catha*

This tree (Fig. 1D) is traditionally known as bushman's tea or *spelonken tee* (Marloth, 1917) in the Eastern Cape Province of South Africa and demonstrates two important points. Firstly, that the original dosage form was probably a masticatory (Pappe, 1847, and all later editions) and that tea-making was a more recent invention: “a favorite beverage with the Bushmen and others, who also chew it, and calls it *Boschesmansthee*”. Jackson (1873) probably based his account on the work of Pappe when he wrote on *Catha edulis* in his review: “*Methyscophyllum glaucum*, E. and Z., ... furnishes what is known as Boschjesmans-thee; from the leaves is made an infusion which has a very pleasant flavour, and besides being used for coughs, asthmatic, and similar diseases, is a favourite drink with the bushmen and others.” “*Catha edulis*, Forsk., .... The use of this tea is said to produce effects somewhat similar to those produced by the Peruvian coca (*Erythroxylon Coca*), namely, extreme wakefulness and capability of bearing extra strain with a minimum of fatigue. Taken in decoction, in moderate quantity, its effect is exhilarating, nearly analogous to that of Chinese green tea.” Secondly, the tea is a rare example of a local stimulant – based on the presence of cathinone, a natural product closely similar to amphetamine and ephedrine. The first record of this tea appears to be from 12 May 1812 (Scholtz, 1970): Boesmanstee: “*als mijn*

*vrouw en iulij na graf renet kom sal ik mijn heer wat spek in bossemans tee sture*”. See also Smith (1966), pp. 149–150.

Watt and Breyer-Brandwijk (1928) gave a brief review of early studies on the chemistry. In contrast to the rich literature on khat in North-east Africa and Arabia, relatively few details are available about the ethnobotany of the plant in South Africa (Hirst, 1997; Van Wyk and Gericke, 2000). Pappe (1847) noted the sweet and pleasant taste of the tea, which was also used to treat cough, asthma and other chest ailments.

### 3.5. *Cyclopia*

In contrast to *Aspalathus linearis*, numerous records exist of the use of *C. genistoides* (Fig. 2E) and other species to make herbal tea at the Cape during the 19th and early 20th centuries. This popular herbal tea, known as *Honigthee* or honeybush tea, was accurately recorded for the first time by Bowie (1830, p. 29): “*Cyclopia*. Astringent; a decoction of this shrub is much used by the Colonists as a restorative.”, Ecklon and Zeyher (1836, p. 153): “*Cyclopia genistoides* ... Incolis Africanis: “Honingthee” pthisi ab iis adhibita [used by the inhabitants of Africa to treat tuberculosis], Meyer (1836, p. 4): “Honingthee colonis” and Pappe (1847, 1850, 1857 and 1868): “This plant [*Cyclopia genistoides* Vent.] is common in moist places on the Cape Flats, near Wynberg, Hout Bay, and elsewhere. In the form of a decoction or infusion, it is often made use of for the purpose of promoting expectoration in chronic catarrh, and even in consumption. It has a sweet, astringent taste, and is generally considered as a restorative.” Jackson (1873), in his review of Cape herbal teas, also made mention of bush tea: “*Cyclopia genistoides*, Vent., is known at the Cape as bush tea, the leaflets being used for that purpose. It has a strong aroma resembling Chinese tea, and a sweetish astringent taste. It is used in medicine for assisting expectoration in chronic catarrh, and also in consumption. Though the present species is that generally spoken of as yielding bush tea, the leaflets of other species no doubt are used for a similar purpose, *C. vogelii*, Harv., undoubtedly being one of them.”

Bryer and Hunt (1984) when writing about the 1820 Settlers, recorded the use of coffee and tea substitutes in the Albany district in the 1820s: “For the most part the settlers learned to rely on their own resources .... Roasted barley ground to a powder was a substitute for coffee, and ‘bush tea’ tasted almost as good as the real thing, especially when sweetened with wild honey.” This is possibly also a reference to honeybush tea. The medical records of a ship, the US *Constellation*, which visited the Cape in the early 1840s, contain some notes on medicinal plants and bush tea (almost certainly referring to *Cyclopia genistoides*): “There are several other medicinal plants greatly prized in domestic use by the Hottentots and Dutch Boers. There is one, which passes under the popular name of “bush tea”, the infusion of which is an excellent tonic, having a taste resembling the *salvia officinalis*” (Anonymous, 1842).

The catalogue of an exhibit of Cape products in London (Anonymous, 1886) referred to a Cape Tea [probably honeybush?]: “Sample used here either as a substitute for or with China Tea.” Notes on the use of bush tea also appeared in a report of 1899 (Anonymous, 1899): “[In the Transvaal] The Boer's tea is found in the leaves of the *Cyclopia vogelii* .... He makes from it a savoury drink, which his palate prefers to any imported article. Another shrub of the same order is used by him for the same purpose, viz., the *Cyclopia genistoides* .... The infusion of the leaves of the *C. genistoides* tree is known to him as Honig-thee, or honey-tea, from its sweet flavour. The *C. latifolia*, strangely varying in the form of its leaves from the *C. genistoides*, produces under skilful manipulation a beverage known as bush tea.”

It is interesting to note that bush tea (almost certainly *Cyclopia* spp.) was commercially available at the end of the 19th century, through village general stores in the Cape (Cadbury, 1902): “In most of these Colonial stores “bush” tea can be bought. It costs sixpence a pound,

looks like the clippings of a privet hedge, including the twigs, and is said to be a tonic.”

In an article that appeared in the Rand Daily Mail newspaper (Anonymous, 1909) the widespread use of bush tea is confirmed: “There is stated to be no less than 82 varieties of bush tea (says the “Grahamstown Journal”) growing in this colony, but the varieties now gathered and sold number only three, known as rooibosch, cyclopia, and honeybush. Some of the others are disqualified by being too bitter, and others by being flavourless. A fair quantity of bush tea is being gathered in Clanwilliam district, and is sold retail at prices varying from 6d. to 1s. per lb. It is said to be a cure for indigestion and nervousness, and is recommended by medical men for some complaints. The New Somerset Hospital it is stated uses about 200lbs. monthly because of these medical qualities. It is free from tannin, which is largely present in China and Ceylon tea ....”

Tea made from *C. genistoides* is to this day known locally as honey tea or honeybush tea (*heuningtee*, *heuningbostee*) but internationally it was historically referred to as Cape tea or Boer tea. The first study of the chemical composition of honeybush tea was by Church (1870), who not only first reported the presence of cyclopic acid, but also the total absence of caffeine (Church, 1881). Wüthner (1872) analysed several different teas from across the globe for their “theine” (caffeine) content and reported that *Capthee* (almost certainly *C. genistoides*) had the lowest caffeine content of them all, namely 0.13% (today we know that *Cyclopia* spp. are alkaloid-free). Greenish (1881) performed a detailed pharmacognostic study of *C. genistoides* (called *honig-thee* or Cape tea). In a laboratory report (Anonymous, 1895) the absence of caffeine in bush tea was reported: “Cape Tea. — Two samples of Cape Tea — namely Honey Tea and Bush Tea have been examined at the request of the Colonial Botanist in order to discover whether they contained Theine or any other alkaloid; careful investigations were performed by Dr. Van der Riet, who as a result, was perfectly satisfied that no such alkaloid was present. [Senior Analyst, Chas. P. Juritz]”. Ambiguity about the name “speldetee” was introduced in another laboratory report the next year (Anonymous, 1896): “Cape Tea. — In my last Annual Report an observation was made on the honey and bush “Teas” which were found to contain no alkaloid. A sample of “Spelten Tea” was submitted to me for analysis some months ago and found to contain some ethereal oil and a quantity of resinous matter but no thein. The analysis of this sample, identified by the Government Botanist as *Cyclopia tenuifolia*, Lehm. [now *C. maculata*], confirms the previous investigations of Dr. Van der Riet. [Senior Analyst, Chas. P. Juritz]”.

Marloth (1909) pointed out that, in addition to the well-known *C. genistoides*, other species are also sources of bush tea: “The name bush-tea is applied to several species of *Cyclopia* (Leguminosae), the most commonly used species being *C. vogelii* Harv. [*C. subternata*, Fig. 2I], but in some districts, e.g. on the Outeniqua mountains, *Cyclopia longifolia*, Vog., prevails. The fresh leaves are submitted to a process of fermentation by putting them into heaps and then drying them in the sun”. Marloth (1917) states that the name bush tea and other names are applied to several species of *Cyclopia*, including honey tea or boer tea for *C. vogelii* (now *C. subternata*) and *C. genistoides*, and *vlei tee* for *C. tenuifolia* (now *C. maculata*).

Hofmeyer and Phillips (1922) anticipated the commercial development of *Cyclopia* species and listed six species that are locally wild-harvested and used as tea: *C. genistoides* (honey tea), *C. maculata* (*vlei tea*, Fig. 2G), *C. sessiliflora* (Heidelberg tea, Fig. 2H), *C. subternata* (common bush tea, hottentot’s tea, Fig. 2I), *C. bowieana* (*vlei tea*) and *C. burtonii* (*heuning tea*, *sugar tea*). In her revision of the genus *Cyclopia*, Kies (1951) noted the sources of bush tea but these are mostly taken from Hofmeyer and Phillips (1922): *C. bowieana* (*vleitee*), *C. burtonii* (*heuningtee*, *suikertee*, *swartbergtee*), *C. genistoides* (*heuningtee*), *C. intermedia* (*Kouga bush tea*, Fig. 2F), *C. maculata* (*vleitee*), *C. sessiliflora* (*Heidelbergtee*, *gewone bossiestee*, *hottentottee*) and *C. subternata* (*gewone bossiestee*).

In a comprehensive study of the taxonomy of *Cyclopia* which included extensive field studies, Schutte (1997) provided clarity on the circumscriptions, diagnostic characters and geographical distributions of all 23 *Cyclopia* species and species complexes and thus provided a solid scientific foundation for the research and development of honeybush that followed. Stepanova et al. (2012) showed that leaf anatomical details may be helpful in pharmacognosy.

The recent history of crop and product development is detailed in the excellent reviews by Joubert et al. (2008), Joubert and De Beer (2011). Much credit must go to Hannes de Lange (at the time based at Kirstenbosch Botanical Garden) for his pioneering work to turn wild honeybush plants into a cultivated crop. Commercial honeybush is today focused on a handful of species but it is likely that all *Cyclopia* species can be used to make tea. Mangiferin, a medicinally relevant compound, was found to be the main phenolic compound in *Cyclopia* (De Nysschen et al., 1996). Further detailed work on the chemistry of the various species (reviewed by Joubert et al., 2008 and Louw et al., 2013) revealed that the original Cape Peninsula species, *C. genistoides*, has substantially higher levels of mangiferin than other species, accompanied by smaller amounts of isomangiferin (De Beer and Joubert, 2010). The presence of relatively large quantities of these xanthenes, as well as flavanones, dihydrochalcones and benzophenones have been demonstrated in hot water infusions of a number of *Cyclopia* species (Schulze et al., 2015). In addition to investigations on the phytoestrogen (Louw et al., 2013) and anti-cancer properties of honeybush extracts and phenolic compounds (Joubert et al., 2008), skin photo-protection and skin cell viability (Petrova et al., 2011; Im et al., 2014, 2016; Magcwebeba et al., 2016), as well as anti-obesity (Dudhia et al., 2013; Pfeiffer et al., 2013; Jack et al., 2016) and anti-diabetic properties of *Cyclopia* extracts (Muller et al., 2011; Chellan et al., 2014; Schulze et al., 2016) received attention in recent years. Honeybush is likely to become an important herbal tea and export product despite the slow pace of commercialization over the last 100 years. Recent work by Joubert and co-workers (and a Polish research group) has made major contributions to our understanding of the chemical variation of *Cyclopia* species (De Beer et al., 2012; Kokotkiewicz et al., 2012, 2013; Beelders et al., 2014a, 2014b; Schulze et al., 2014). Sophisticated quality control criteria and procedures have been developed to provide scientific support for its commercialization process (Theron et al., 2014; Erasmus et al., 2016). As a result of these recent research activities and those mentioned in the previous section for rooibos, both herbal teas are very far ahead of all other South African herbal teas along the path towards success as international products.

### 3.6. Geranium

*Geranium incanum* (Fig. 1E) is generally considered to be both a tea substitute and a medicinal tea and was illustrated by the younger Burmann in 1759 (Scott and Hewett, 2008). Harvey and Sonder (1860) mentioned in the first volume of the Flora Capensis that “this is the berg-thee of the colonists”. MacOwan (1894) stated that the plant is “...sometimes collected and dried under the name berg thee”. According to Smith (1966) it is used medicinally and was known as a medicinal plant at the Cape early in the 18th century, even though it was not listed by Pappé (1847–1868). Several species of *Geranium* (e.g. *G. robertianum* L.) are used in European and Asian traditional medicine (Van Wyk et al., 2015), with tannins as the presumed main active ingredients. It seems likely that the use of *G. incanum* at the Cape originated from European colonists. It is one of eight Cape teas listed by Ellis (undated) as having a non-medicinal (food) use, in addition to medicinal uses. *Geranium caffrum* Eckl. & Zeyh. (called *hoendervoetrabas*) has been recorded in the Montagu area as a medicinal tea to treat jaundice and women’s ailments (Anonymous, 1998).

### 3.7. *Helichrysum*

Several aromatic species of *Helichrysum* have been recorded as medicinal teas Pappé (1847–1868), including *H. imbricatum*, *H. nudiflorum*, *H. odoratissimum* (Fig. 1F) and *H. panduriforme* (Table 1). Jackson (1873) probably cited Pappé (1868) when he discussed the use of *Helichrysum* species as tea: The leaves of two or three species of *Helichrysum* — a well-known genus of *Compositae* — are used at the Cape under the several names of Caffre tea, Hottentot's tea, and Duinen-thee. The first-named is procured from *Helichrysum nudiflorum*, Less., a common herbaceous plant of the colony .... The plant is demulcent, and an infusion made from it is recommended in phthisis, catarrh, and pulmonary complaints generally. *H. serpyllifolium*, Less. [syn. *Plecostachys serpyllifolium*, see below], furnishes Hottentot's tea. It has an agreeable smell, and is a favourite among the natives. It is said to possess demulcent and emollient properties, and is used for similar purposes as the last-named species. The leaves of *H. imbricatum*, Less, constitute the Duinen-thee — literally tea from the Downs, in reference to the plant being common on the Cape Downs. This is likewise used in coughs and chest diseases, as are also the leaves of *H. auriculatum*, Less.”

These teas have generally been used as demulcent in case of coughs and chest ailments. Traditional uses are poorly recorded and the ethnobotanical record is undoubtedly incomplete, as is shown by several new species records in recent ethnobotanical surveys (Van Wyk et al., 2008; Nortje and Van Wyk (2015). For a review of the traditional uses, chemical constituents and biological activities of *Helichrysum* species, see Lourens et al. (2008).

### 3.8. *Lessertia*

The genus *Sutherlandia* is nowadays included in *Lessertia*. The two species [*L. canescens* (Fig. 2L) and *L. frutescens* (Fig. 2M)] and various regional forms have a great reputation as medicine, since it was first documented by Pappé (1847–1868) and Smith (1888). Although extremely bitter, it has been widely used as a medicinal tea, said to have a liquorice aftertaste. Pappé states that the use of the plant was first recorded by Thunberg, but this appears to be an error (Thunberg referred to *Lessertia tomentosa* DC., a prostrate plant with very small bladderly pods). Van Wyk and Albrecht (2008) gave a detailed review of the ethnobotany and chemistry of *sutherlandia*, widely known as cancer bush. It is noteworthy that the traditional use against cancer (and as cancer prophylactic, see Smith, 1895) is not without scientific support. The plant is unusual in having high levels of the non-protein amino acid *L*-canavanine in leaves (canavanine, which has documented anti-cancer activity, is typically a seed metabolite in other legumes). Furthermore, the triterpenoids are structurally similar to those of the closely related *Astragalus* (a traditional Asian anti-cancer medicine), which have demonstrated *in vivo* anti-cancer activity. Further research and development of *sutherlandia* as a commercial medicinal and herbal tea can be expected.

### 3.9. *Leysera*

The popularity of *Leysera gnaphalodes* (Fig. 1G) as a Cape herbal tea was first recorded by Pappé (1847, 1850, 1857, 1868): “Very few of our indigenous plants are so much in domestic use as this one, known as Geele bloemetjies-thee. When pounded, or rubbed between the fingers, it gives an agreeable scent, and the infusion has a pleasant, sweetish taste. It is emollient, and for that reason is highly commended in catarrh, cough, and even consumption. Some of our apothecaries have added this plant to the species pectoralis”. It is curious that Marloth (1909) described this plant as the most popular tea of the Cederberg and not rooibos tea: “In the Cedarbergen the people do not use the *Cyclopia*, but quite a different plant, viz., *Leyssera gnaphalioides* L., a composite with needle-shaped leaves. No chemical investigation of this plant has been made as yet, to my knowledge, but the beverage

prepared from it has a pleasant aromatic flavour without any stimulating action.” Marloth (1917) recorded the vernacular names *geel blommetjies tee*, *honger tee* (“said to stimulate appetite”) and *skilpad tee* for *Leysera gnaphalodes*, and *vaal tee* for *L. tenella* from the Roggeveld. Leipoldt (2007), who grew up in Clanwilliam in the last quarter of the 19th century, also referred to this “composite” tea (i.e., derived from *Compositae*/*Asteraceae*, and not *Leguminosae*/*Fabaceae*) in his novel *Gallows Gecko*, set in the Olifants River valley several decades earlier. He pointed out that the majority of the inhabitants of the area could not afford to use Asian tea regularly. “As a result”, he wrote, “most of the valley folk contented themselves with tea made from a local composite plant which was pleasant to the taste, contained much less tannin than the imported article, was healthier to drink and had the added advantage of being procurable by all those who took the trouble to gather it from the hillside.” Coetzee (1969) mentioned three types of tea that were used in the Aurora area (near Piketberg): *riettee* (*naalde en spelde*), *heuningtee* and *hongerdoodee*. *Hongerdoodee* seems to refer to *Leysera gnaphalodes*, while *riettee* (perhaps the same plant listed as “reed tea” in colonial correspondence – see reference above) apparently referred to rooibos tea. Marloth (1917) gave *naaldtee* as common name for *Aspalathus linearis* (“*Borbonia pinifolia*”) together with other names (*rooibostee*, *rooitee*, and *Koopmanstee*). The *heuningtee* referred to by Coetzee (1969) is certainly *Cyclopia*, and most likely *C. genistoides*, which does occur naturally on the west coast.

An interesting question arises from the persistent reference to the spiky and needle-shaped leaves of Cape herbal teas in vernacular names such as *stekelthee*, *naaldete* and *spelde-tee*, which cuts across the generic boundaries of *Leysera* and *Aspalathus*: Could it be that *Leysera gnaphalodes* was once the original and most popular Cape tea [as explicitly stated by Pappé (1847) and suggested in Marloth (1909)] and that similar-looking spiny-leaved plants with an agreeable taste and aroma were systematically tasted and selected as additional alternatives to Chinese tea?

According to Manning and Goldblatt (2012) the correct spelling is *Leysera gnaphalodes* (and not *Leyssera gnaphaloides* as spelled in the older literature). They recorded the vernacular name *teebos* for the genus *Leysera*, *skilpadteebossie* and *teringteebossie* for *L. gnaphalodes* and *vaalteebossie* for *L. tenella*. According to Van Wyk and Gericke (2000) and Van Wyk (2011b), *Leysera gnaphalodes* may have potential to be developed as a commercial herbal tea. Tschritzis and Jakupovic (1991) listed several terpenes present in aerial parts, including ursolic acid, oleanolic acid, 2 $\alpha$ -hydroxyoleanolic acid, kauren-18-oic acid, dehydroabiatic acid, four labdane diterpenoids, two 13-epi-manoyloxide derivatives and a kaur-15-ene derivative. The relatively importance of these compounds and their pharmacological activities remain to be studied in detail.

### 3.10. *Mentha*

The use of the indigenous *Mentha longifolia* (Fig. 1I) was first recorded by Backhouse (1844): “...we passed a large family of Bushmen, some of whom were drying a species of mint for tea”. This mint is widely known by the Afrikaans (Dutch) name *ballerja* but the Khoi name *t'kamma* (meaning “at or near the water”) has also been documented (Laidler, 1928). It is used as a hot beverage and medicinal tea, often in combination with other herbs. The statement of Backhouse may be an example of confirmation bias; the dry herb was more likely intended for use as a buchu powder than as tea. However, perhaps these local people were already influenced by European settlers to prepare tea in this way? The indigenous *M. aquatica* (Fig. 1H) is also used as medicinal tea in the Cederberg and Still Bay areas. Two exotic species are commonly grown for culinary and medicinal purposes: *M. spicata* (*kruisement*) and *M. xipiperita* (*peperment*). Both are popular in Cape traditional medicine and as refreshing teas or tea flavourants.

### 3.11. *Mesembryanthemum*

*Scelletium* species are today included in the genus *Mesembryanthemum* on the basis of morphological and molecular evidence (Klak et al., 2007). *Mesembryanthemum tortuosum* (Fig. 1J) is one of the most important medicinal plants of the Nama people and its ethnobotany was recorded in detail by Van der Stel in 1685 (De Wet and Pfeiffer, 1979), who wrote: “Dit kruid word bij de Namaquaas en op eenige harer bergen alleenlijk gevonden, in Octobr. ingesamelt, en Canna genaamt, 't is bij haar en d' omleggende volckeren in alsulcken groot agting, als de betel of areeck bij de Indianen soude connen sijn sij kauwen desselfs stam soo wel als de wortel meest den gehelen dagh over, waar door oock droncken worden, soo dat uijt dit effect, en wegens desselfs angename reuck en cordiale smack van sijns werkingen men jets voordeeligs oordelen en verwagten kan. Den 20e 8ber gevonden.” [“This plant is found with the Namaquaas and then only on some of their mountains. It is gathered in October and is called *Canna*. It is held in as great esteem as the betel or areca with the Indians. They chew its stem as well as the roots, mostly all day, and become intoxicated by it, so that on account of this effect and its fragrance and hearty taste one can judge and expect some profit from its cultivation. Found on the 20th October.”]

Details of the ethnobotany of *Mesembryanthemum emarcidum* were recorded in the Little Karoo by Thunberg on the 29th of December 1773 (Forbes, 1986, p. 248): “*Kon*, was the name given by the Hottentots to a shrub that grew here (*Mesembryanthemum emarcidum*) and was famous all over the country. The Hottentots came from far and near to fetch this shrub with the root, stalk and leaves which they stamp together, and afterwards twist them up like pig-tail tobacco; after which they let the mass ferment, and keep it by them for chewing, especially when they are thirsty. If it be chewed immediately after fermentation, it intoxicates. The word *kon*, is said to signify a quid; the colonists call it *canna* root. It is found in the driest fields only, and is gathered chiefly by the Hottentots, who live near this spot. These afterwards hawk it about, frequently to a great distance, and exchange it for cattle and other commodities”. The traditional uses of *M. tortuosum* were also recorded by Pappé (1850–1868): “This species, a native of the Karroo, appears to possess narcotic properties. The Hottentots, who know it by the name of *Kauw-goed*, are in the habit of chewing it, and become intoxicated, while the farmers use it in the form of decoction or tincture, as good sedative.” Hartwich (1911) and Zwicky (1914) also recorded the uses of this species.

Recent research and development (since 1996) established that *Scelletium tortuosum* (now *Mesembryanthemum tortuosum*) was traditionally the most important species in Namaqualand (and undoubtedly the same as described by Van der Stel in 1685), and that it was probably chosen because of the very high alkaloid content. The wider importance of the plant in Khoi and San ethnobotany is also reflected in the name *Kannaland*, the original name for the Little Karoo in South Africa, where it is still a popular traditional medicine in some rural communities. The contemporary use of *M. emarcidum* Thunb. has also been recorded, especially in the Great Karoo (e.g. Shearing and Van Heerden, 1994; Van Wyk et al., 2008). These plants are remarkable for several reasons. They contain unique mesembrine-type alkaloids with unusual and potentially novel neuropharmacological activity. Especially interesting is the fact that this traditional masticatory and hypnotic shows no evidence of physical or psychological dependency and therefore has potential for application as replacement therapy, to break addictions to alcohol and drugs (Van Wyk and Gericke, 2000; Gericke and Viljoen, 2008; Van Wyk, 2011a). Recent clinical studies have shown not only that the product is safe but also that it enhances a range of neuroactivities related to anxiety, depression and cognitive functions (Nell et al., 2013). Although *kougoed* or *canna* is traditionally used as a masticatory, Pappé (1850–1868) reported that it is used by the colonists in the form of decoction or tincture to treat nervous conditions. Jacobsen (1960) indicated that the product can be used as tea. However, it is only

since about 2002 that the product has become commercially available as a herbal tea. In rural parts of Namaqualand the plant is often given to restless infants in the form of infusions in milk. A few drops of the juice mixed with mother's milk is said to be a very effective sedative. *Mesembryanthemum tortuosum* has the potential to become an international success story and it is likely that novel neuropharmacological activities will be discovered.

### 3.12. *Plecostachys*

This species is scientifically poorly known yet it appears to have been an important Cape herbal tea. Pappé (1847, 1850, 1868) reported that it “...has a pleasant smell, much liked by the coloured people, who infuse it as tea”. It was originally known as *Helichrysum serpyllifolium* or *H. orbiculare* (see Table 1) and is commonly known as *vaaltee* and *hottentotstee* (Marloth, 1917; Smith, 1966).

### 3.13. *Rafnia*

*Rafnia amplexicaulis* (Fig. 2J) and *R. acuminata* (Fig. 2K) are woody shrubs, closely related to the genus *Aspalathus* (Campbell, 1998; Campbell and Van Wyk, 2001). Both species have been used as sweet-tasting teas and for their medical value in treating asthma, influenza, back problems and infertility (Van Wyk, 2008a). The first historical record is that Thunberg in 1772 (Forbes, 1986): “A decoction of the leaves of the *Crotolaria perfoliata* [now *Rafnia acuminata*] was esteemed a powerful diuretic, and in consequence of this property, to cure dropsies [an old term for oedema].” The roots were used as a liquorice substitute and decoctions were used to treat catarrh and phthisis (Pappé, 1847, 1868; Watt and Breyer-Brandwijk, 1962; Anonymous, 1998). All published and oral-traditional ethnobotanical data was presented by Kinfe et al. (2015). The major compound of the roots and leaves of *R. amplexicaulis*, responsible for the intense bittersweet taste, was isolated and identified as genistein 8-C- $\beta$ -D-glucoside. According to Van Wyk (2011b) and Kinfe et al. (2015), *Rafnia amplexicaulis* and other species may have considerable potential for developing new commercial herbal teas.

### 3.14. *Stachys*

Several species of highly aromatic herbaceous perennials or shrublets belonging to this genus have been recorded as sources of tea (Table 1). These include *S. aethiopica*, *S. aurea* (Fig. 1L), *S. burchelliana*, *S. flavescens*, *S. lamarckii*, *S. linearis*, *S. rugosa* (Fig. 1K), *S. spathulata* and *S. thunbergii*. The extent to which these teas were used as hot beverages (and not medicinal teas) has never been carefully recorded but Smith (1966) mentioned that *S. rugosa* was used as herbal tea. This species was also recorded in the Kamiesberg as *koorsbos*, *bergsalie*, *stinkkoorsbos* and *stinkbos* (Nortje and Van Wyk, 2015). It is used locally as infusion or decoction to treat colds, fevers and influenza. Some uses of *Stachys* species are indicated in Table 1, but a thorough search of the ethnobotanical literature may provide new insights. *Stachys cuneata* Banks ex Benth., for example, was reported to be drunk as a tea in the southeastern Karoo to treat a painful body (Van Wyk et al., 2008). *Stachys aethiopica* (*kleinkattekruid*) is well known as a medicinal tea (Anonymous, 1998). A systematic study of the chemistry and biological activity of *Stachys* species may yield interesting results.

### 3.15. *Thesium*

Two species of *Thesium* are known to be used as tea. Marloth (1917) was the first to report the use of “*lidjes tea*” (*T. spicatum*) in the Cederberg. He reports that the tea is black when ready for use. Under *lidjes tea* he also gives *Viscum capense*, said to be used dry or green. *Thesium strictum* was listed in Smith (1966) as *teringtee* (“*tuberculosis tea*”) with no details of its use except the implication is that this tea



was used to treat tuberculosis. The use of two other species has not yet been reported in the scientific literature. The best known and most popular *Thesium* tea is made from *T. macrostachyum*, known to many inhabitants of the Wupperthal area in the Cederberg as *lidjies tee* (Fig. 1N). A herbarium specimen in the Compton Herbarium at Kirstenbosch (Andrag 8) confirms the identity and use of this species as a traditional tea of the Cederberg. Some inhabitants of the Cederberg consider this *lidjies tee* to be superior to rooibos tea in taste. It should be noted that *Viscum capensis* (q.v.) is rarely also referred to as *lidjies tee* but mostly as *voëlent*. Another species of *Thesium* recently recorded as a source of tea in the Wupperthal area is *T. carinatum* (locally called *jakkalstee*) (Fig. 1M). *Jakkalstee* is a name sometimes also applied to wild rooibos tea that is mixed with the commercial red type of rooibos tea to either increase the bulk or to improve the fermentation and flavour. The name *jakkalstee* (i.e., “jackal tea”) therefore refers to the clandestine use of these species as adulterants, apparently derived from the idiom *skelm soos 'n jakkals* (equivalent to the English expression “sly as a fox”). Very limited information is available on the chemistry and pharmacological activity of the Cape species of *Thesium*. Since the plants are semi-parasitic, the chemical composition may vary depending on the host plant (see *Viscum*).

### 3.16. *Viscum*

Three species of *Viscum* are used in the Cape region as sources of herbal tea and they are nowadays almost invariably called *voëlent* by local people. The best known is *V. capense*, first recorded by Thunberg in 1773 near the Berg River: “*lidjies tee* was used in diarrhoeas, and also for tea”. The locality leaves no doubt that this was *V. capense* and not *V. continuum*, with which it is often confused. The two species are superficially similar and both have been used as tea. Unlike *V. capense* which may grow on several different host plants, *V. continuum* is found only on *Acacia* (*Vachellia*) *karoo* and is more or less restricted to the Little Karoo (Shearing and Van Heerden, 1994). It can easily be distinguished (Fig. 1Q) by the more slender and often drooping stems and especially by the shortly stalked fruits (Fig. 1P2) – those of *V. capense* (Fig. 1Q2) are sessile. The legendary *Lappiesman* (Jan Schoeman) of Prince Albert in the Great Karoo (Oberholzer, 2002; Van Wyk, 2011b) ascribed his exceptional fitness at an advanced age to a daily cup of *lidjies tee* (in this case definitely *T. continuum* and not *T. capense*), taken in the morning. The choice of host plant is considered to be important when *voëlent* is harvested for medicinal use and it is possible or even likely that the chemical composition of the host plant has an effect on the taste and/or efficacy of *Viscum* species. In the Agter-Hantam, only material taken from the *kruboom* [*Searsia lancea* (L.f.) F.A.Barkley] is considered suitable for medicinal use (De Beer and Van Wyk, 2011) while in Namaqualand, it must grow on *taaibos* [*Searsia burchellii* (Sond. ex Engl.) Moffett], hence the vernacular name *taaibosvoëlent* (Nortje and Van Wyk, 2015). In the Little and Great Karoo regions, many local people are aware that *V. rotundifolia* (Fig. 1Q) may serve as herbal beverage but it seems to be rarely used nowadays.

*Viscum album* is a well-known medicinal plant in Europe and many medicinal and ritual uses have been recorded (Van Wyk et al., 2015; Van Wyk and Wink, 2015). The main chemical compounds to which medicinal activity have been ascribed include lectins, flavonoids and alkaloids. The South African species have not yet been systematically studied for their active metabolites.

## 4. Discussion

Cape herbal teas can be classified into the following categories of use: (1) those used as beverages for their pleasant aroma or flavour; (2) those used for their bitter tonic (*amara*, *amara-aromatica*) effect; (3) those with essential oils, used for their carminative effects (*aromatica*); (4) those with stimulant or sedative effects; and (5) those used for making medicinal infusions and decoctions to treat

various conditions, from colic to tuberculosis (Table 1). These categories are somewhat overlapping but typical examples of beverages include *Aspalathus linearis* and *Cyclopia* species, bitter tonics include *Lessertia* species, aromatic tonics include *Agathosma* species, and stimulants/sedatives include *Catha edulis* and *Mesembryanthemum tortuosum*. In an early review of Cape herbal teas, MacOwan (1894) proposed that these products do not compete successfully with tea and coffee because of the general lack of stimulants such as caffeine, at the time thought to be of value in reducing food intake. *Catha edulis* contains natural amphetamines (cathinone), while *Mesembryanthemum tortuosum* contains mesembrine-type alkaloids (mainly mesembrine, mesembrenol and mesembrenone). *Artemisia absinthium* and *A. afra* are widely used in Cape traditional medicine for their tonic, spasmolytic and carminative value but apparently not for the stimulant effect of thujone, which is a known neurotoxin. Similarly, none of the indigenous plants used as coffee substitutes are known to contain caffeine. Examples include the nuts of *Brabejum stellatifolium* or wild almond; the source of the *ghoo* coffee described by Pappé (1854, 1862) and Leipoldt (Van Wyk, 2011b), the roots of *Boscia albitrunca* (shepherd's tree or *witgat*) and the commercial *Cichorium intybus* (chicory) (Van Wyk and Gericke, 2000; Van Wyk et al., 2009). The most common traditional stimulant was undoubtedly alcohol, obtained by fermenting honey or sugary fruits to produce traditional mead (*karri*) or fruit wines (Van Wyk and Gericke, 2000).

In modern times, the lack of stimulants in rooibos tea and honeybush tea has become a selling point for these natural health products. An evaluation of the commercial potential of the numerous traditional Cape teas, almost all of which apparently lack stimulants, may yield interesting results. *Aspalathus pendula*, *Leysera gnaphalodes* and *Rafnia amplexicaulis* have been singled out as potential candidates for new product development (Van Wyk, 2011b).

The historical record seems to reflect the dynamic and adaptive nature of traditional plant use and the fact that new products are readily incorporated alongside well-known ones. This process of experimentation at the Cape was mentioned by Thunberg in 1772 (Forbes, 1986): “In a country like this, where it is for the most part impossible to have recourse to an apothecary, and the medicines sent from Europe are extremely dear, the inhabitants had prudently thought of trying the indigenous plants of Africa; and among these they had discovered various useful remedies in different diseases. As botanist and physician, I was eager to be acquainted with them, and never lost an opportunity of adding to the slender stock of my knowledge, which often proved serviceable both to myself, and the benevolent and obliging colonists. For when any of these could impart to me, in their plain and artless way, a slight notion only of some useful plant, I was able afterwards to give them a more accurate idea of its true use in curing diseases.” Similarly, the “traditional use” of alien weeds and exotic garden plants have been regularly reported (e.g. Pappé, 1868; Dold and Cocks, 2000; Van Wyk et al., 2008). Rural people who live close to nature often reported to BEVW that they taste wild plants while walking in the veld. In this way, new plants may be selected for use, based on their flavour and aroma. Some experienced Cape healers (*bossiedokters*) use taste as a first assessment of the physiological effects and possible therapeutic value of medicinal plants. It also appears that some plants may lose their popularity and fall into disuse. An excellent analysis of these changes over time was done on Ghanaese medicinal plants by Soelberg et al. (2015). A comparison of detailed historical medicinal plant data recorded in Ghana in 1697, 1803 and 1807 with current uses showed that less than one third of the historical medicinal plants are still used in some way or another (i.e., not necessarily for the same purposes as was originally recorded). The lack of early ethnobotanical information for the majority of Cape herbal teas seems to suggest that they were selected for use after tea and coffee were introduced by European settlers in the 17th and 18th centuries. This coincides with the time when the words ‘tea’ and ‘coffee’ were introduced. Then again, there is a strong possibility, in case of such remote and underpopulated regions as the

Cederberg, that the tea-drinking culture was introduced by both European settlers and by acculturated Khoisan migrants into the area, or acculturated descendants of Khoisan. And, of course, Chinese tea being a luxury, they found a local substitute, an ersatz tea. Leopoldt described this process in *Gallows Gecko* (Leopoldt, 2007). The lack of

indigenous (Khoi and San) names for the species used as tea is noteworthy. Recent ethnobotanical field studies by BEVW (especially in the dry interior of the Cape) showed that several medicinal plants are simply eaten (when out in the veld) and not taken as infusions, decoctions or tinctures. Available evidence therefore suggests that all or most of the

**Table 2**

Common edible plants of the Cape flora with their uses and vernacular names (? = apparently not recorded).

Species; family	Food use(s)	English and Afrikaans names	Khoen and/or San name(s)
<i>Acacia karroo</i> Hayne; Fabaceae	Edible gum	Sweet thorn; <i>soetdoring</i>	Hyra (gum)
<i>Allium dregeanum</i> Kunth; Alliaceae	Bulb and leaves used as vegetable	Wild onion; <i>wildeprei</i>	?
<i>Annesorhiza nuda</i> (Aiton) B.L.Burt (and other spp.); Apiaceae	Root eaten as vegetable	(mountain) anise root; <i>anyswortel</i>	?
<i>Aponogeton distachyos</i> L.f.; Aponogetonaceae	Inflorescences (cooked as stew); tubers edible	Pondweed; <i>waterblommetjie</i> , <i>wateruintjie</i>	?
<i>Asparagus laricinus</i> Burch. (and other spp.); Asparagaceae	Young stems eaten as vegetable	Wild asparagus, <i>katdoring</i>	?
<i>Brabeium stellatifolium</i> L. Proteaceae	Seeds eaten as nuts (after leaching)	Wild almond; <i>wilde-amandel</i>	<i>Ghu, ghoe</i>
<i>Carissa bispinosa</i> (L.) Desf. ex Brenan [= <i>C. haematocarpa</i> (Eckl.) A.D.C.]; Apocynaceae	Fruits (berries) eaten	Num-num; <i>noem-noem</i>	<i>Noem-noem</i>
<i>Carpanthea pomeridiana</i> (L.) N.E.Br.; Aizoaceae	Young plants (cooked as stew)	<i>Vetkousie</i>	?
<i>Carpobrotus edulis</i> (L.) L.Bolus (and other spp.); Aizoaceae	Fruit (fresh or dried)	Sour fig; <i>suurvy, hotnotsvy</i>	<i>Ghaukum, ghoea</i>
<i>Chamarea capensis</i> (Thunb.) Eckl. & Zeyh. (and other spp.); Apiaceae	Roots eaten fresh	<i>Vinkelwortel</i>	<i>Chamare</i>
<i>Citrullus lanatus</i> (Thunb.) Matsum. & Nakai; Cucurbitaceae	Fruit eaten fresh; seeds eaten (roasted)	<i>Tsamma melon</i> ; <i>tsamma, wilde waatlemoen</i>	<i>Tsamma</i>
<i>Conicosia pugioniformis</i> (L.) N.E.Br.; Aizoaceae	Root and young fruits eaten as vegetables	<i>Duikerwortel</i>	?
<i>Cyanella hyacinthoides</i> L.; Tecophilaeaceae	Corms eaten (fresh or roasted; boiled in milk)	<i>Raapuintjie, raaptol</i>	?
<i>Cyphia sylvatica</i> Eckl. (and other species); Apocynaceae	Tubers eaten fresh	<i>Baroe</i>	<i>Baroe, bouroe</i>
<i>Diospyros ramulosa</i> (E.Mey. ex A.D.C.) De Winter; Ebenaceae	Fruit eaten fresh	Wild apricot; <i>wilde-appelkoos</i>	<i>Koenoekam</i>
<i>Euclea undulata</i> Thunb.; Ebenaceae	Fruit eaten fresh	<i>Guarri; ghwarrie</i>	<i>Ghwarri</i>
<i>Fockea comaru</i> (E.Mey.) N.E.Br., <i>F. edulis</i> (Thunb.) K.Schum. (and other spp.); Apocynaceae	Tuber eaten fresh	<i>Comaru; camao, kamaroo, kambro, kamu</i>	<i>Camao, camerebi, gameru</i>
<i>Gethyllis afra</i> L. (and other species); Amaryllidaceae	Fruits eaten fresh	<i>Kukumakranka; koekoemakranka, kroekies</i>	<i>Koekoemakranka, bramakranka</i>
<i>Glia prolifera</i> (Burm.f.) B.L.Burt; Apiaceae	Roots used as ferment for <i>karri</i> (honey beer)	<i>Moerwortel</i>	<i>Gli</i>
<i>Glia decidua</i> B.-E. Van Wyk; Apiaceae	Tuberous root edible (although not very tasty!)	None recorded	<i>Gategaai</i>
<i>Hoodia gordonii</i> (Masson) Sweet ex Decne. (and other spp.); Apocynaceae	Stems eaten fresh (as masticatory)	<i>Hoodia; ghaap</i>	<i>Ghōba, ghaap</i>
<i>Hydnora africana</i> Thunb.; Hydnoraceae	Ripe fruit eaten (fresh or baked)	<i>Jakkalskos</i>	<i>Kannip, kanni</i>
<i>Microloma sagittatum</i> (L.) R.Br., <i>M. tenuifolium</i> (L.) K.Schum. Apocynaceae	Young fruits (and flowers) eaten fresh	<i>Bokhoringkies, kannetjies</i>	?
<i>Moraea fugax</i> (D.Delaroche) Jacq.; Iridaceae	Corms eaten (often boiled in milk)	<i>Wituintjie, melkuintjie</i>	?
<i>Muraltia spinosa</i> (L.) F.Forest. & J.C. Manning [= <i>Nylandtia spinosa</i> (L.) Dumort.]; Polygalaceae	Fruits (berries) eaten fresh	<i>Tortoiseberry; skilpadbessie</i>	<i>Cargoe</i>
<i>Olea europaea</i> L. subsp. <i>africana</i> (Mill.) P.S.Green; Oleaceae	Ripe fruits eaten fresh	Wild olive; <i>olienhout, wilde-olein</i>	?
<i>Osteospermum moniliferum</i> L. [= <i>Chrysanthemoides monilifera</i> (L.) Norl.]; Asteraceae	Ripe fruits eaten fresh	<i>Bietou</i>	<i>Bietou</i>
<i>Oxalis pes-caprae</i> L.; Oxalidaceae	Leaves and flowers stalks eaten fresh (or in stew or <i>suringpap</i> ); fleshy root eaten fresh	<i>Sorrel; suring</i>	?
<i>Pappea capensis</i> Eckl. & Zeyh.; Sapindaceae	Seed aril eaten fresh	<i>Jacket-plum; wildepruim</i>	<i>T'kaam; ! Kaam</i>
<i>Pelargonium carnosum</i> (L.) L'Hér.; Geraniaceae	Stems eaten fresh or baked; leaves eaten fresh	<i>Oupa aree</i>	<i>Aree</i>
<i>Pelargonium incrassatum</i> (Andrews) Sims; Geraniaceae	Tubers eaten raw or baked	None recorded?	<i>Neitjie</i>
<i>Quaqua incarnata</i> (L.f.) Bruyns and Q. mammillaris (L.) Bruyns; Apocynaceae	Stems eaten fresh	None recorded?	<i>Aroena (karoena, ouroena)</i>
<i>Rhoicissus tomentosa</i> (Lam.) Wild. & R.B.Drumm. (and other spp.); Vitaceae	Ripe fruits eaten fresh	Wild grape; <i>wildewingerd</i>	?
<i>Romulea rosea</i> (L.) Eckl.; Iridaceae	Green fruits (with seeds) eaten fresh	<i>Froetangs, knikkers, knikkels</i>	<i>Froetangs? (Malay word?)</i>
<i>Rubus rigidus</i> Sm. (and other spp.); Rosaceae	Fruits eaten fresh	Wild bramble; <i>wilde-braam</i>	?
<i>Rumex lanceolatus</i> Thunb. (and other spp.); Polygonaceae	Leaves eaten fresh or used as cooked vegetable	Wild sorrel	?
<i>Salicornia</i> species; Chenopodiaceae	Stems eaten fresh	Sea coral; <i>seekoraal</i>	?
<i>Schotia afra</i> (L.) Thunb. (and other spp.); Fabaceae	Ripe seeds (and arils) eaten	Karoo boerbean; <i>karoo-boerboon</i>	?
<i>Searsia lancea</i> (L.f.) F.A.Barkley; Anacardiaceae	Fruits eaten; used as ferment in <i>karri</i>	<i>Karee; karee</i>	<i>Karri(e), (karee)</i>
<i>Searsia undulata</i> (Jacq.) T.S.Yi et al.; (and other species); Anacardiaceae	Ripe fruits eaten	<i>Njara(bessie)</i>	<i>Ghara, njara</i>
<i>Tetragonia decumbens</i> Mill.; Aizoaceae	Fresh leaves used as vegetable (spinach)	Dune spinach; <i>duine-spinasie</i>	?
<i>Trachyandra divaricata</i> (Jacq.) Kunth; Asphodelaceae	Young inflorescences used as vegetable (in stew)	Dune cabbage; <i>duinekool</i>	?
<i>Trachyandra falcata</i> (L.f.) Kunth (and other spp.); Asphodelaceae	Young inflorescences used as vegetable (in stew)	Wild cabbage; <i>wilde-kool, veldkool, hottentotskool</i>	?
<i>Tulbaghia capensis</i> L.; <i>T. alliacea</i> L.f.; <i>T. violacea</i> Harv.; Alliaceae	Bulbs and leaves used as vegetable	Wild garlic, cape wild garlic; <i>wildeknoffel</i>	?

Cape herbal teas that became popular in the seventeenth and eighteenth centuries emerged as substitutes for Chinese tea. It is highly likely that the chosen species were traditionally used by indigenous people as masticatories even though there is little or no evidence to support this idea. Van der Stel did not record any traditional herbal teas and his detailed account of *channa* refers only to its use as masticatory. It is possible that some plants traditionally used as masticatories or as edible herbs were chosen to be used as tea or tea substitutes, not only to enjoy as hot beverage but also to benefit from their traditional value as general medicines (e.g. *honigthee*, *Cyclopia*), bitter tonics (e.g. *buchu*, *Agathosma*) and (rarely) stimulants (*kanna*, *Mesembryanthemum tortuosum* and bushman's tea, *Catha edulis*). *Mentha longifolia* is the only species with an explicit early anecdote for its use as tea (but this is uncertain, as explained earlier).

The lack of recorded vernacular names for Cape herbal teas (if *buchu* and *channa* are excluded on the basis of being originally recorded as topical cosmetic and masticatory respectively, and not as tea) calls for a closer look at vernacular names in general. One would expect the common names of articles that are in everyday use to have a higher probability of being recorded and preserved. The Khoi and San names for food and drink items are therefore anticipated to have a higher frequency of preservation than medicinal products because the latter are likely to be only sporadically used when needed. Tea is typically consumed on a daily basis as a food item, so if this practice was part of the traditional plant use pattern of Khoi and San people, then one would expect the names of tea plants to have the same level of nomenclatural preservation as common food plants. A summary of well-known Cape food plants is presented in Table 2, together with their vernacular names. A comparison of the percentage of Khoi and San names for herbal tea plants vs common food plants in Table 2 is shown as Fig. 4. Only one out of 15 genera (7%) [or one out of 52 species (2%)] of plants known to have been used as tea have a recorded Khoi or San vernacular name, namely *t'kamma* (*Mentha longifolia*). This simple analysis additionally reveals that it is not only tea that has a paucity of vernacular names but also green vegetables (stems, leaves and inflorescences) that are typically used as cooked ingredients of stews. The only known vernacular names in this category are for veld foods such as *ghaap*, *aroena* and *aree*, all three of which are eaten fresh. Stews are typical of

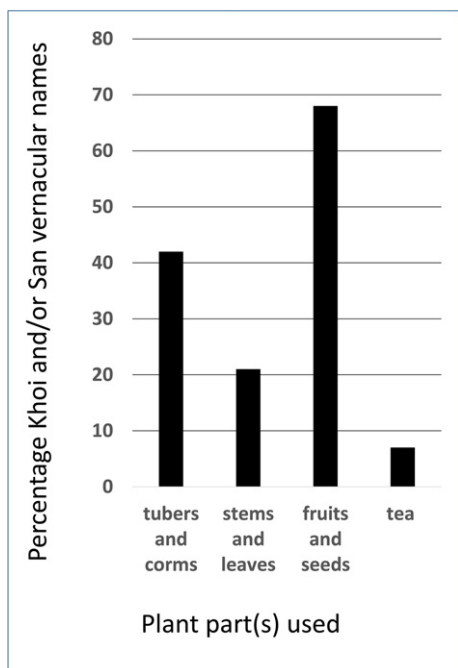


Fig. 4. Various categories of Cape food plants (as listed in Table 2), showing the percentage of species with recorded Khoi and/or San vernacular names.

Cape cooking but their origin is linked to the Dutch and Malay culinary traditions (Claassens, 2006). This result is surprising and interesting, and supports own observations (BEVW) in the Kalahari, where green vegetables (several types of leaves) are always eaten in situ during foraging, while only tubers and bulbs are collected and carried home in the traditional leather bag (*uintjiesak*) for later use (e.g. to be roasted in the fire). The almost complete absence of Khoi and San vernacular names for tea plants (and for green vegetables that are used today as ingredients of stews) apparently shows that teas (and cooked vegetables) were not part of the traditional Khoi-San cuisine in the pre-colonial era (before the 17th century).

It is important to have an accurate historical record of plants that are suitable for use as tea, not only for the relevance of this data for intellectual property rights and geographical indicators, but also to get at least a first indication that the plants are safe to consume and that they have a pleasant taste or aroma. This historical review revealed several poorly known indigenous Cape teas and draws attention to the paucity of recorded ethnobotanical information, not only about these species but also about Cape herbal teas in general. It also highlights the rich diversity of useful plants and celebrates the productive interinfluence of cultures throughout the South African history.

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