Journal of Ethnopharmacology 119 (2008) 630–652

Contents lists available at ScienceDirect

Journal of Ethnopharmacology

journal homepage: www.elsevier.com/locate/jethpharm

South African *Helichrysum* species: A review of the traditional uses, biological activity and phytochemistry

A.C.U. Lourens[a], A.M. Viljoen[b], F.R. van Heerden[a,*]

[a] School of Chemistry, University of KwaZulu-Natal Pietermaritzburg, Private Bag X01, Scottsville 3209, South Africa
[b] Department of Pharmaceutical Sciences, Tshwane University of Technology, Private Bag X680, Pretoria 0001, South Africa

ARTICLE INFO

Article history:
Received 13 May 2008
Received in revised form 3 June 2008
Accepted 10 June 2008
Available online 19 June 2008

Keywords:
Asteraceae
Biological activity
Helichrysum
Phytochemistry
Traditional uses

ABSTRACT

Aims of the study: In South Africa, the genus *Helichrysum* is widely used in traditional medicine. The uses are well documented although renaming of species and the resulting confusing taxonomic nomenclature may cause uncertainty as to which specific species was referred to in some reports. The aim of this paper is to present a collated and coherent overview of the documented traditional uses of *Helichrysum* species and to update the botanical identity of previously studied species.
Materials and methods: Databases (Scifinder, ISI Web of Knowledge) and several books were used to collect in information on South African *Helichrysum* species.
Results: The traditional uses, chemistry and biological activity of *Helichrysum* species have been summarized. It was attempted to give clarity as to exactly which species is refer to in the ethnobotanical literature.
Conclusions: Although a large number of ethnopharmacological uses have been documented and the chemistry of the genus has been studied extensively, only a few South African species have been investigated for their biological activity.

1. Introduction

The genus *Helichrysum* Mill. derives its name from the Greek words *helios* (sun) and *chrysos* (gold) which is appropriate considering the attractive yellow flowers displayed by several species (Pooley, 2003). The genus belongs to the Asteraceae family, tribe Inuleae and subtribe Gnaphaliinae (Hilliard, 1983). This large genus consists of approximately 500–600 species and although *Helichrysum* species are also found in southern Europe, south-west Asia, southern India, Sri Lanka (previously Ceylon) and Australia, most species occur in Africa, including Madagascar (Hilliard, 1983). In South Africa (including Namibia), the ca. 244–250 species are widely distributed and the tremendous morphological diversity displayed by these species resulted in their subdivision into 30 morphological groups, using the shape and size of the flower heads as differentiating characteristics (Hilliard, 1983). The flower heads are either solitary or occur in compact or spreading inflorescences. The aerial parts are usually hairy or woolly and plants occur as herbs or shrublets that are sometimes dwarfed and cushion forming. They are often aromatic (Pooley, 1998, 2003; Van Wyk et al., 2000).

2. Traditional uses

Several *Helichrysums* are widely used in Southern African traditional medicine as summarised in Table 1. The first written record of the medicinal use of *Helichrysum* dates back to 1727 when Boerhaave noted that a *Helichrysum* species was used to treat nervousness and hysteria. The report of a *Helichrysum* species in the early literature could have been based on knowledge acquired from the local Khoi and San people, but is most probably due to the fact that European botanists used their knowledge of medicinal properties of European genera (Scott and Hewett, 2008).

2.1. Ambiguities in nomenclature

As is the case for all ethnobotanical data, the fact that plant names are changed (Germishuizen and Meyer, 2003) and frequently incorrectly cited (Arnold et al., 2002) is quite problematic. To complicate matters further, variation in spelling of names also occurs. Special care needs to be taken when consulting the original texts to unambiguously confirm that a plant selected for a particular study is in fact the same species cited by, for example, Watt and Breyer-Brandwijk (1962). In Table 1, current names are given and previously accepted names are shown in parenthesis. For the sake of clarity, the name as it appears in the reference is sometimes indicated in brackets after the reference.

* Corresponding author. Tel.: +27 33 2605886; fax: +27 33 2605009.
E-mail address: vanheerdenf@ukzn.ac.za (F.R. van Heerden).

0378-8741/$ – see front matter © 2008 Elsevier Ireland Ltd. All rights reserved.
doi:10.1016/j.jep.2008.06.011

Table 1
Traditional uses and biological activities reported for *Helichrysum* species

Species[a]	Plant part used	Dosage form	Traditional use	Classification of use[b]	Biological activity[b]	References
Helichrysum acutatum DC. **21**[c]			Widely used as traditional medicine, sold commercially in large quantities	NS		Arnold et al. (2002), Cunningham (1988), Hutchings et al. (1996)
Helichrysum adenocarpum DC. **28**	Root	Decoction	Used to treat diarrhoea and vomiting in children.	GIT		Arnold et al. (2002), Jacot Guillarmod (1971), Neuwinger (1996), Phillips (1917), Pooley (2003), Walker (1996), Watt and Breyer-Brandwijk (1962)
Helichrysum appendiculatum (L.f.) Less. **24**	Leaf	Eaten raw	Chest problems or infection of the respiratory tract	Resp, Infec, Anth, W, P	B[d], F[d]	Arnold et al. (2002), Githens (1949), Mathekga (2001)[e], Smith (1895), Smith (1966), Swanepoel (1997), Walker (1996), Watt and Breyer-Brandwijk (1962)
	Plant		Smallpox			
	Plant		Anthelmintic			
	Root		Coughs and colds and applied externally on wounds			
	Leaf	Wound dressing	Applied externally to wounds. Ground leaves are rubbed into areas which cramps or on wounds			
	Roots		Ground and burnt and smeared on body to relax body and to reduce swelling			
	Leaf		Used medicinally as tea			
Helichrysum argyrophyllum DC. **29**	Root	Infusion	Intestinal troubles	GIT		Arnold et al. (2002), Batten and Bokelmann (1966), Smith (1966), Walker (1996), Watt and Breyer-Brandwijk (1962)
			Not grazed by stock, preventing soil erosion in overgrazed areas			
Helichrysum argyrosphaerum DC. **15**			Browsed by animals but poisonous if large quantities is ingested	Poi	B[d], F[d]	Hutchings et al. (1996), Mathekga (2001)[e], Pooley (1998), Van Wyk et al. (2002)
Helichrysum asperum (Thunb.) Hilliard and Burtt. (=*Helichrysum ericifolium* Less.) (Hilliard, 1983) **12**[f]			The plants are casually browsed by sheep and said to be a cause of "Geilsiekte"	Poi		Smith (1966) (*Helichrysum ericaefolium* DC.)[g]
Helichrysum athrixiifolium (Kuntze) Moeser **9**[f]	Leaf	Smoked	Chest complaints.	Resp		Arnold et al. (2002), Jacot Guillarmod (1971) (*Helichrysum athrixifolium* O. Hoffm.)[g], Phillips (1917) (*Helichrysum athrixiifolium* O. Hoffm.)[g], Watt and Breyer-Brandwijk (1962) (*Helichrysum athrixifolium* O. Hoffm.)[g]
Helichrysum aureonitens Sch. Bip. **8**	Leaves and stems	Burnt as incense	Used to invoke the goodwill of the ancestors and to induce trances	Psy, Psyc, Infect, Insect	B[d], F[d], V	Afolayan and Meyer (1997)[e], Cunningham (1988), Hutchings et al. (1996), Jacot Guillarmod (1971), Mathekga (2001)[e], Meyer and Afolayan (1995)[e], Meyer et al. (1996)[e], Meyer et al. (1997)[e], Phillips (1917), Pooley (1998), Pooley (2003), Swanepoel (1997), Walker (1996), Watt and Breyer-Brandwijk (1962)
	Leaves and stems		Commercially sold			
		Decoction	A remedy for inuresis in children			
		Extracts	Used topically for skin infections especially against *Herpes zoster* and infections associated with *Herpes simplex*			
			Used to keep red mites away			
			Used as tinder to start fire, used to make hats.			
Helichrysum aureum Houtt. Merr. var. *aureum*/*monocephalum* (=*Helichrysum fulgidum* (L.f.) Willd.) **30**[h]		Decoction	Used for washing sore eyes	Eye		Arnold et al. (2002) (*Helichrysum fulgidum* L.f.) Willd.)[g], Batten and Bokelmann (1966) (*Helichrysum fulgidum* Willd.)[g], Jacot Guillarmod (1971) (*Helichrysum fulgidum* (L.) Willd.)[g], Phillips (1917) (*Helichrysum fulgidum* Willd.)[g]