



Scelletium tortuosum:

A comparison between the anthropological and modern day uses of this indigenous herb

Sanien de Beer¹), James Campbell¹), Kristian Leisegang¹), Xueseng Ma¹)

¹School of Natural Medicine, University of the Western Cape, Bellville, South Africa

INTRODUCTION:

Scelletium tortuosum (Fig. 1) is a scrambling succulent ground cover indigenous to the Western and Eastern Cape. It has probably been used for centuries as a mood-altering drug, especially by the Khoisan hunters and Nama shepherds, where it was often smoked or used as snuff. It also has hallucinogenic properties and high dosages were often used during trance dances. These properties have been associated with alkaloids such as mesembrine. The San people used it prior to hunting to sharpen their senses, and to diminish hunger and thirst. Even in excessive dosages its initial euphoric effect seems to be replaced with feelings of serene sedation. It was more often used for enjoyment and not primarily for medicine. Modern day medical and commercial use of *Scelletium spp* is primary as a mood enhancer, to decrease anxiety, stress, and in addiction therapy. The objectives of this study was to investigate and compare the historical and anthropological use of *Scelletium* with the modern day and current uses thereof.

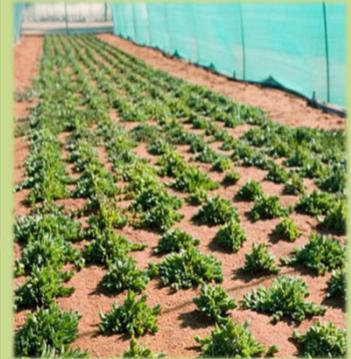


Figure 1: *Scelletium tortuosum* cultivations in Namibia.

METHODS:

Data was gathered from peer reviewed articles published in various scientific journals. A search was conducted in electronic databases including EBSCO HOST, CINAHL Plus with Full Text, MEDLINE, Science Direct, Pubmed and Google Scholar. Keywords used in the search included *African Traditional Medicine, Khoisan, alkaloid, anthropology, ethno botany, mesembrine, mesembryanthemaceae, Scelletium species and Scelletium tortuosum*. Only articles available in English were reviewed for practical purposes. Reference lists of selected articles were analysed for relevant sources, which included various books. Articles and book chapters published from 2005 – 2012 were focused on.

RESULTS:

A total of 38 scientific articles and 12 books were included for review. There are many reports in the literature on the activity and use of *Scelletium tortuosum*, by the indigenous people of South Africa, but it is not clear if this is critical observation or hearsay. Investigations of some of the chemical constituents have validated some of its traditional uses. Through the literature study, similarities in the traditional and modern day uses of *Scelletium tortuosum* are evident. Possible active constituents and their mechanisms of actions responsible for its uses and effects have been identified. A comparison between traditional uses, modern day uses and scientific evidence based on the literature is summarised in table 1.

Table 1: A comparison between the traditional uses and modern day uses of *Scelletium tortuosum*, with any known scientific literature that validated these uses.

Traditional Uses	Modern Day Uses	Scientific Evidence
Smoked (ceremonial)	Smoked (recreational)	Releases mesembrine alkaloids which has a direct effect on the Central Nervous system and can induce a state of euphoria.
Chewed (without swallowing it)	There was no evidence that this is still being done	Mesembrine alkaloids is best absorbed through mucus membranes of the mouth; keeping it in the mouth for extended periods of time ensure maximal absorption of active constituents.
Snuffed (ceremonial)	No documented evidence (may be recreational)	As the narcotic effect can be effectively achieved sublingually, there is little reason to doubt the efficacy of administration by snuff.
Tea (aqueous extractions)	Aqueous extractions used	Tea infusions enhances mood, with added benefits of antioxidants, no caffeine and low tannins.
Alcoholic extractions (tinctures)	Used to form standardized extracts.	Standardised ethanolic extracts of dried plant material contain the alkaloids mesembrine, mesembrenone and mesembrol.
No documented evidence	Capsules and Tablets	Standardized dosages are used with a total alkaloid content of 6 to 100 micrograms per dose
Mood enhancer	Stress; Tension; Anxiety; Depression	The activity of mesembrine as both serotonin uptake inhibitor and a PDE4 inhibitor is one mechanism of action whereby <i>Scelletium</i> may act as an antidepressant
Not documented	Anti Addiction therapy	No rigorous clinical data exists at present to verify this use
To suppress hunger and thirst	Eating disorders	Affects serotonin, noradrenalin and dopamine metabolism which can influence appetite.
To sharpen senses or used as a sedative	Sense of Euphoria followed by deep relaxation (recreational)	These seemingly conflicting actions seem to be dose dependant. An intoxicating dosages <i>Scelletium</i> can cause euphoria, initially with stimulation followed by sedation
Pain relief	Various inflammatory disorders	PDE4 inhibition and stimulation of neural cell proliferation and neuro differentiation (modulation of neuro genesis and pain)
Hallucinogenic properties	Recreational use (and abuse)	Alkaloids considered to be narcotic-anxiolytic.
Harvesting late in spring	Seasonal fluctuations in alkaloid concentrations	Wide seasonal variation of the total alkaloid content and chemistry

CONCLUSIONS:

Similarities in the traditional and modern day uses of *Scelletium tortuosum* are evident, and possible active constituents and their effects have been identified. Some of the indigenous knowledge and uses of this herb can be confirmed by scientific evidence. Although it has been established that *Scelletium* contains numerous active constituents, such as mesembrine alkaloids which has possible serotonin and PGE4 inhibitory actions, no recommendations on effective dosage quantities have been made. There is a need for further pharmacological studies and human clinical trials on *Scelletium* based on the alkaloid chemistry. Modern research findings on the effectiveness and dynamics of traditional healing are becoming more available and will assist in the creation of more evidence and a shared understanding of indigenous and complementary health practices.

REFERENCES:

- Carlini EA. 2003. Plants and the central nervous system. *Pharmacological Biochemical Behaviour*, 75:501–512.
- Gericke N, Van Wyk BE. 1999. Pharmaceutical compositions containing mesembrine and related compounds. **US Patent 6,288,104**.
- Gericke N, Viljoen AM. 2008. *Scelletium* – A review update. *Journal of Ethnopharmacology*, 119:653–663.
- Gericke N, et al. 2012. *Scelletium* Extract and uses thereof. **European Patent Office Bibliographic data: EP2408460 (A1)**.
- Harvey AL, et al. 2011. Pharmacological actions of the South African medicinal and functional food plant *Scelletium tortuosum* and its principal alkaloids. *Journal of Ethnopharmacology*, 137(3):1124-9.
- Rood B. 1994. **Uit die Veld-Apoteek**. Tafelberg, Cape Town.
- Shikanga EA, et al. 2012. In vitro permeation of mesembrine alkaloids from *Scelletium tortuosum* across porcine buccal, sublingual, and intestinal mucosa. *Planta Medica*, 78(3):260-268.
- Shikanga EA, et al. 2012. The chemotypic variation of *Scelletium tortuosum* alkaloids and commercial product formulations. *Biochemical Systematics and Ecology*, 44: 364–373.
- Smith C. 2011. The effects of *Scelletium tortuosum* in an in vivo model of psychological stress. *Journal of Ethnopharmacology*, 133(1):31-6.