**Sceletium tortuosum (L.) N.E.Br.**

**Family name:** Mesembryanthemaceae (alternatively Aizoaceae: Mesembryanthemoideae).

**Common names:** Kanna, Kougoed (Afrikaans), 'tortuose fig marigold'

*Sceletium tortuosum* is one of the oldest Mesembrine known to the western world. It became known to the early colonizers of the Cape in the 17th century and has been cultivated in England since 1732. It was first described and given a Latin binomial by Carl von Linnaeus, in 1753. The Khoisan people of South Africa, who use the plant in folk medicine, introduced this mood elevating plant to the western world. In recent years, preparations from *Sceletium tortuosum* are commercialized as anti-depressants and to reduce anxiety. Although the plants are grown commercially on a large scale there is tremendous conservation pressure on wild harvesting of *Sceletium* species.

**Description**

Plants are climbing or creeping. The slender branches become thick and only slightly woody with age. Water cells are conspicuous on the leaves that have recurved tips and 3 to 5 major veins. The flowers are very shortly pedicellate (almost sessile) and of medium size (20 to 30 mm diameter). Petals are white to pale yellow, pale salmon or
pale pink. The calyx has four or five sepals. Fruit are 10 to 15 mm in diameter and open when wet (hygrochastic). The species is readily distinguishable by the imbricate leaves with incurved tips.

![Image of plant](image)

**Distribution, Habitat & Ecology**

The species is considered as 'not threatened'. It ranges from Namaqualand to Montagu through to Aberdeen and commonly occurs in quartz patches and is usually found growing under shrubs in partial shade. The plants are insect pollinated. Seed dispersal occurs during rain events by means of hygrochastic fruit capsules that open when wet allowing seed to escape.

**Derivation of name and historical aspects**

The generic name *Sceletium* is derived from the Latin *sceletus*, referring to the prominent leaf veins that persist as the skeleton-like structure of the dry leaves. The genus contains 8 species and is classified in the mostly weedy subfamily Mesembryanthemoideae. The genus is easily recognized by the persistent dry leaves that become skeletonized. In dry periods, these dry leaves enclose the young leaves protecting them from harsh environmental conditions. The Afrikaans common name *kougoed* means something to chew.
Uses and cultural aspects

*Sceletium tortuosum* contains mesembrine and the related alkaloids mesembranol and mesembranone. Mesembrine is known for its effects on the central nervous system. The compounds also act as serotonin-uptake inhibitors, and in specified doses act as anti-depressants, minor tranquilizers and anxiolytics used in the treatment of mild to moderate depression, psychological and psychiatric disorders where anxiety is present, major depressive episodes, alcohol and drug dependence, bulimia nervosa, and obsessive-compulsive disorders (U.S.Patent 6 288 104). Smith *et al.* (1996) review the data about *Sceletium* accumulated over 300 years; they record the original folk methods for preparing 'Kougoed' and document its psychoactive properties by reporting on the experiences of several test subjects.

Growing *Sceletium tortuosum*

*Sceletium tortuosum* is an opportunistic species with a lifespan of approximately 3 to 5 years. Out of their natural habitat in the Succulent Karoo, plants of *Sceletium tortuosum* are easy to cultivate. Under controlled conditions plants are best kept potted on a sunny windowsill in porous somewhat loamy soil. Their active growth takes place in autumn, winter and spring, with a rest period during summer when plants should not be watered. Propagation is by cuttings or seed. Cuttings take readily in sand whereas seeds do not always germinate easily. In nature, *Sceletium tortuosum* is generally found under bushes, where they get good sunlight for at least part of the day, on the windowsill, plants will flower readily, provided they get sufficient sunlight (Van Jaarsveld, pers comm.).

References

**Sceletium - Kougoed - A natural mood elevator**

*Sceletium tortuosum* is a small groundcover plant native to Southern Africa. For hundreds of years the Hottentots of Southern Africa used Sceletium tortuosum as a mood enhancer, relaxant and empathogen. It is also known as Kanna or Kauwgoed, Kougoed and Canna.

Histologically *Sceletium tortuosum* was chewed, smoked or used as snuff producing euphoria and alertness which gently fade into relaxation. If chewed in sufficient quantity Sceletium has a mild anesthetic effect in the mouth, much like kava, and is used by the San tribes if you are about to have a tooth extracted, or in minute doses, for children with colic. A tea made from Sceletium is sometimes used to wean alcoholics off alcohol.

**History**

Sceletium tortuosum has a long history of use in South Africa. In fact it is in it's 4th century of recorded use there. With written records dating back to 1662, Sceletium was a bartering currency. Traditionally, the prepared dried plant material was chewed and the saliva swallowed, but it has also been made into teas and tinctures. Less commonly, it has been reported that it used to be inhaled as a snuff, or smoked, usually with the addition of other herbs.

The plant was used in rural areas in very small doses as a *treatment for colic* in infants, added to a teaspoon of breast milk, and this use still survives in some local communities.

**Chemistry and Pharmacology**

The mood-elevating action of sceletium is caused by a number of alkaloids including mesembrine, mesembrenol and tortuosamine which interact with the brain's dopamine and serotonin receptors. Mesembrine is a major alkaloid present in Sceletium. Mesembrine has been demonstrated to be a potent serotonin-uptake inhibitor.

This receptor-specific activity, and receptor activities also found on nicotinic, dopamine and nor-adrenaline sites certainly validate the traditional mood-elevating uses, and suggest additional
therapeutic and wellness potential.

By isolating this and other bio-chemically active compounds, researchers are now confirming what many people have known for many hundreds of years, that Sceletium has a remarkable ability to effectively treat symptoms of anxiety.

Mesembrine is an alkaloid which is derived from the Sceletium Tortuosum plant and is now being acknowledged as a key active component in the ability of the plant to produce beneficial effects which are closely related to it are the alkaloids mesembrenone, mesembrenol and tortuosamine, which are also present and produce very similar effects to mesembrine.

It is a confirmed serotonin (re)-uptake inhibitor, as understood by the US Patent office, which means that it regulates the effects of one of the brain's most important neurotransmitters.

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**Benefits and Uses**

Tablets and capsules of Sceletium are being used successfully by a number of psychiatrists, psychologists and doctors with excellent results for anxiety states and mild to moderate depression; and they can also be used by the lay public as supplements to elevate mood and for stress and tension.

In addition to Sceletium's common use for the stress and mental fatigue of modern industrial living, Sceletium has been used as a natural supplement in:

- uplifts the mood
- decrease anxiety, stress and tension
- gives you energy

Sceletium *elevates mood and decreases anxiety, stress and tension*. It has also been used as an appetite suppressant by shepherds walking long distances in arid areas. In intoxicating doses it can cause euphoria, initially with stimulation and later with sedation. Long-term use in
the local context followed by abstinence has not been reported to result in a withdrawal state. The plant is not hallucinogenic, and no severe adverse effects have been documented.

Sceletium is also being used as a natural anti-depressant that is said to be safer than many pharmaceutical alternatives.

Individuals suffering from depression and anxiety can benefit from Sceletium.

**Mesembrine works thus:**

The brain is made up of countless neurons, which transmit signals to each other only by jumping the gap (synapse) to neighboring neurons. The signal cannot however jump the synapse without assistance.

The message can only travel when the neuron releases a neurotransmitter to fill this gap and allow the signal to transient via it.

The receiving neuron has many points on its surface that which act as potential locks, each of which is known as a receptor and is effected by a particular type of neurotransmitter. When sufficient amounts of the neurotransmitter are received by the relevant receptor, a nerve impulse is started and the message continues to its ultimate destination. To permit recovery of the neuron to receive new messages, the brain takes away the neurotransmitter from the neuron receptors and permitting it to be sent back to the originating nerves, a process known as re-uptake.

In individuals suffering from depression, the neurotransmitter serotonin (also known as 5-hydroxytryptamine) is lacking. Mesembrine slows down the re-uptake process, making it more probable there will be more serotonin in the relevant receptors, greatly increasing the possibility that there will be sufficient levels to set up the signal transfer in all neighboring neurons.

Mesembrine allows the brain to function with reduced levels of serotonin, allowing time for natural levels to build up, whereupon the mesembrine dosage can be reduced or eliminated.
Doses

A typical dose is between 50mg and 100mg once or twice day, usually taken after breakfast and after lunch. Less commonly this can be increased to 100mg twice a day, if necessary. In drug rehabilitation programs, under physicians or psychiatrists supervision, the dose needed may be as high as 200mg twice a day.

Side Effects

Very few people experience side-effects. The reported side-effects include occasional episodes of:

- Mild headache
- Slight nausea, no vomiting
- Soft stool or loose stool with no cramping
- Transient increase in anxiety or irritability an hour after initiating treatment, which resolves after an hour or so
- Insomnia: corrected by lowering the dose or taking the product not later than midday
- A feeling of sedation: corrected by taking the product as a single 50mg dose at night

NO severe adverse effects have been documented.

Contra indications

There have been no confirmed reports of drug interactions; However, because of the nero-receptor activities of Sceletium there may be interactions with other pharmacokinetic drugs. People taking any psychiatric drug (including all anti-anxiety drugs, sedatives, hypnotics, antidepressants and anti-psychotics and so-called designer or recreational drugs) or any cardiac medications, are advised not to take Sceletium-containing products.

As with most supplements and modern drugs, safety in pregnancy has not been established.
Sceletium is used to rebalance the brain and nervous system and thereby relieve symptoms of depression. Combined with other well-known herbs, this formulation has been proven to be extremely effective and safe.

**Sceletium and Mesembrine**

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The Distribution of Mesembrine Alkaloids in Selected Taxa of Kanna and their Modification in the Sceletium Derived `Kougoed

Michael T. Smith, Courtney R. Field, Neil R. Crouch and Manton Hirst

Univ. Natal, Botany Dept., Pietermaritzburg, South Africa Natal Herbarium, Ethnobotany Programme, National Botanical Institute, Kaffrarian Museum, Kingwilliam's Town, South Africa

Twenty species from nine genera of the Mesembryanthemaceae (Aptenia, Bergeranthus, Delosperma, Drosanthemum, Glottiphyllum, Lampranthus, Oscularia, Ruschia, and Sceletium) as well as the reportedly psychoactive preparation `kougoed', prepared from `fermenting' Sceletium tortuosum, were screened for the presence of the mesembrine alkaloids. Using gas chromatography (GC) with a nitrogen-phosphorus detector (NPD) three putative alkaloids were detected in Sceletium tortuosum whose mass spectra corresponded to those of 4'-O-demethylmesembrenol, mesembrine and mesembrenone. All the Mesembryanthemaceae plants investigated were shown to have Dragendorff-positive compounds on thin layer chromatograms (TLC); those containing mesembrine alkaloids, as shown by later GC MS analysis, exhibited similar Rf values to the Sceletium alkaloids. However, using the technique employed in this study which encompassed the use of column and gas chromatography, the only genus containing mesembrine alkaloids to any significant extent was Aptenia. Alkaloid levels were found to be extremely low in all other taxa investigated. When a `modern' technique for the preparation of a fermented Sceletium product, `kougoed', was carried out it was found that levels, as well as the ratios, of the three alkaloids changed markedly. Substantial increases
in total alkaloid levels were observed when the Sceletium material was crushed and bruised prior to drying for alkaloid extraction whereas no such changes occurred when intact plants were oven dried at 80°C prior to alkaloid extraction. It is speculated that of the many potentially usable Mesembryanthemaceae plants available to the indigenous peoples, Sceletium was selected because it is the only genus with alkaloid levels high enough to elicit a psychoactive response. The traditional preparation technique also appears to have evolved as a method of producing a dry, stable, and relatively palatable preparation of increased pharmacological activity.

Keywords: 4'-O-demethylmesembrenol, ethnopharmacology, `kougoed', mesembrenone, mesembrine, Mesembryanthemaceae, pharmacological activity, psychoactive, Sceletium

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Univ. Natal, Botany Dept., Pietermaritzburg, South Africa
Natal Herbarium, Ethnobotany Programme, National Botanical Institute
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ABSTRACT
Twenty species from nine genera of the Mesembryanthemaceae (Aptenia, Bergeranthus, Delosperma, Drosanthemum, Glottiphyllum, Lampranthus, Oscularia, Ruschia, and Sceletium) as well as the reportedly psychoactive preparation `kougoed', prepared from `fermenting' Sceletium tortuosum, were screened for the presence of the mesembrine alkaloids. Using gas chromatography (GC) with a nitrogen-phosphorous detector (NPD) three putative alkaloids were detected in Sceletium tortuosum whose mass spectra corresponded to those of 4'-O-demethylmesembrenol, mesembrine and mesembrenone. All the Mesembryanthemaceae
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Keywords: 4’-O-demethylmesembrenol, ethnopharmacology, ‘kougoed’, mesembrenone, mesembrine, Mesembryanthemaceae, pharmacological activity, psychoactive, Sceletium
**About Sceletium**

Sceletium Tortuosum is a low to the ground flowering creeper that grows almost exclusively in South Africa. For hundreds of years, native tribes prized its calming effects, which appear to be very similar to those of St. John's Wort, except the potency is significantly greater. The plant is nowhere near as common in the wild as it once was, with most of it being grown in controlled environments.

**The Name**

Sceletium Tortuosum (often shortened to simply Sceletium) is the Latin name for a plant the grows in South Africa.

It is known by a few other names. Among them are:

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<thead>
<tr>
<th>Name</th>
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<tr>
<td>Kougoed / Kaugoed</td>
<td>(Afrikaans)</td>
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<tr>
<td>Kanna / Canna</td>
<td>(Hottentot)</td>
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<tr>
<td>Mesembryanthemum</td>
<td>(Afrikaans)</td>
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**Locations**

The plant grows almost exclusively in South Africa, though it has been introduced in limited quantities to other countries (without much success unless hydroponics are involved). It is now considered quite rare due to over harvesting of it over many years and more recently, due to its native habitat being changed by development. Very recently, a disease has hit hard the few remaining examples in the wild.
These days, it is grown mostly in nurseries under very controlled conditions. Though the plant has an excellent ability to manage water resources, it is very sensitive to soil type and temperature.

**Characteristics**

The plant is a low to the ground creeper that produces white flowers of considerable aesthetic appeal. It is known as a succulent, which means that it has special characteristics which enable it to thrive in a hostile (in this case, low water) environment. Sceletium Tortuosum has an exceptional ability to store water, limiting evaporation to the bare minimum and thus is able to thrive even in very low rainfall areas.

The plant grows well in winter and in summer the leaves skeletonize.

**History**

The plant has been used by hunter gatherers who inhabited what is now South Africa for well over 1,000 years. Its primary use was by warriors returning from battle, who took it to help dispel the fear and depression that was common after violent conflict.

The first documented use of it under Western auspices occurs in 1662, when an explorer / trader named van Riebeeck started to barter with local tribes for it, after finding out about its effects on stressed individuals. In 1685, the Governor of the Dutch Cape Colony, van der Stel noted how the native tribes prized it and would travel far to collect the best examples.

Over the ensuing years, the effects of this plant were known to only a small number of Westerners. But now, with the problems of depression and anxiety in Western society reaching unprecedented levels, the demand for safe
This plant has been used by hunter-gatherers and shepherds as a mood enhancing substance for millennia, and is far more effective and rapid-acting than the well-known European plant Hypericum (St Johns Wort).

**Uses:**
- Low mood, winter-blues, mood swings
- Anxiety, stress, nervous tension
- Hot flushes and irritability in menopause
- Alcoholic rehabilitation support
- Irritability in smoking-cessation
- Supports libido

**Chemistry and Pharmacology:**
The active constituents of the plant are mesembrine-alkaloids along with the closely related compounds of mesembrenone, mesembrenol and tortuosamine, which have been demonstrated by the National Institute of Mental Health (USA) to act positively on serotonin, nor-adrenaline, nicotine and dopamine receptor-sites in the brain.

**Suggested Dosage:**
1 capsule twice daily or as directed by a health practitioner.

**Contra-Indications & Cautions:**
Although there have been no confirmed reports of drug interactions, because of the neuro-receptor activities of Sceletium tortuosum there are theoretical interactions with other psychiatric medications and cardiac drugs. People taking any psychiatric drug (including all anti-anxiety drugs, sedatives, hypnotics, anti-depressants and anti-psychotics and so-called designer or recreational drugs) or any cardiac medications, are advised not to take Sceletium-containing products. Do not use during pregnancy or while breastfeeding. Keep out of reach of children.

**Side Effects:**
Very few people experience side-effects with Sceletium tortuosum. The reported side-
effects include occasional episodes of mild headache, slight nausea, no vomiting, soft stool or loose stool with no cramping, transient increase in anxiety or irritability an hour after initiating treatment, which resolves after an hour or so, insomnia: corrected by lowering the dose or taking the product not later than midday, a feeling of sedation: corrected by taking the product as a single 50mg dose at night. In large doses Sceletium can cause euphoria, but without any associated come-down. Long-term use followed by abstinence has not been reported to result in any withdrawal state. The plant is not hallucinogenic, and no severe adverse effects have been documented.

Store below 25OC in a dry place.
Protect from light.
Keep out of reach of children

It is said that taking sceletium on a regular basis, may have the following effects:

- Elevation of mood
- Decrease in anxiety
- Possible appetite suppression
- Increase in energy

Sceletium is not hallucinogenic but in intoxicating doses it has been known to cause euphoria.

**Doses:**

Generally doses of between 50mg and 100mg once or twice a day are recommended and thus far no serious side effects have been documented, although headaches may occur if sceletium is taken in conjunction with alcohol.

**How does sceletium work?**

Sceletium contains various alkaloids, including mesembrine, mesembrenol and tortuosamine. These interact with the serotonin and dopamine receptors in the brain,
thus causing the mood elevating effects of sceletium. Of these alkaloids, mesembrine has been found to be a strong serotonin –(re)uptake inhibitor, which means that it helps to regulate the effects of one of the most important neurotransmitters of the brain.

**Interactions:**

Little is known about sceletium's interactions but it should not be taken with any psychiatric drugs or cardiac medications. *It is always best to consult with your medical professional before making any changes to what you are currently doing for your health.*

For further information regarding sceletium, please visit the following sites (both of which were used in the writing of this piece):

Sceletium tortuosum

**Product size**
60 vegecap capsules
200mg per capsule
Suitable for vegetarians

**Recommended Dosages for Adults and Children**
Take 1 to 4 capsules with a glass of liquid 1 to 3 times a day with after meals.

The recommended dosages given are for Adults Only. The dosage for Children should be calculated in accordance with the child weight with the weight of the average weight of an adult (see example below)

20 kg / 80 kg = ¼ of the adult dose
40 kg / 80 kg = ½ of the adult dose

*For extreme cases the highest dosage should be followed.

**General Warning when using Sceletium Tortuosum**
- **KEEP OUT OF REACH OF CHILDREN**
- Safety in pregnancy and lactation has not been established and this product is therefore not recommended for pregnant or nursing mothers
- If you have a medical condition or taking any medication, consult a healthcare professional prior to use
- Do not drive vehicle or operate machinery after taking this product
- This product does not purport to be a medicine and makes no claims. Always consult a medical practitioner before taking any dietary supplement, and or if any side effects occur.