The three most abundant tree *Euphorbia* species of the Transvaal (South Africa)

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Formerly known as the Transvaal the four northern provinces of South Africa (Limpopo Province, Mpumalanga, Gauteng and parts of the North-West Province) are home to about 41 species of woody to succulent *Euphorbia* species. Although it is not known as the Transvaal province any more, I use the term "Transvaal" as an indication to the floristic region of the four northern provinces of South Africa.

Many of the Transvaal species are rare and others are very common and widespread with a high degree of variability throughout their distribution ranges. The rarer species of this region include *E. barnardii* White, Dyer and Sloane, *E. clivicola* R.A. Dyer, *E. knobelii* Letty, *E. waterbergensis* R.A. Dyer and *E. zoutpansbergensis* R. A. Dyer which have restricted distribution ranges and at the same time are very rare in their natural habitats. In contrast the three species covered in this article (*E. cooperi* N.E. Brown ex Berger var. *cooperi*, *E. ingens* E. Meyer ex Boissier, *E. tirucalli* L.) are variable and commonly found in the warmer and drier areas of nearly all four northern provinces of South Africa. These three species are often found in association with each other or at least with one of the species in close proximity to the other two species. This can be seen

Fig. 1: A very large specimen of Euphorbia cooperi *var.* cooperi *growing near Penge where a mining operation has begun*

Fig. 2: A slender form of Euphorbia cooperi *var.* cooperi *growing near Rust de Winter*

Fig. 3: A young plant of Euphorbia cooperi *var.* cooperi *in habitat near Penge*

especially in the Limpopo province. *E. cooperi* var. *cooperi* favours rocky areas whereas *E. ingens* and *E. tirucalli* are found in a wide range of habitats from open plains to rocky outcrops and steep rock faces. In the Penge region of the Limpopo province one occasionally finds rocky ridges festooned with large specimens of all three species.

Fig. 4: Distinct branch scars on the trunk of Euphorbia cooperi *var.* cooperi

E. cooperi N.E. Br. ex A. Berger var. *cooperi*

E. cooperi N.E. Br. ex A. Berger var. *cooperi* bears the name of Thomas Cooper, an English plant collector and grower who introduced this species to English Horticulture. In 1900 N.E. Brown, the son in law of Thomas Cooper, illustrated and named this species without a proper description in a Hand list of tender Dicotyledons cultivated in the Royal Botanic Gardens. Later in 1907 A. Berger published a proper description of this species in a handbook on Succulent Euphorbias of which he was the author. The illustration that accompanied his script was incorrect and showed *E. ingens* and not *E. cooperi. E. ingens* has also been confused with *E. cooperi* by Thomas Cooper who has recorded *E. cooperi* from certain localities where plants are not to be found.

E. cooperi is a tall single crowned tree species that can reach heights of up to about 10 metres with the branches restricted to the upper section of the tree with branch scars clearly visible along the length of the stems. The branches have 4 to 6 wing-like angles with segmentation along the branches, the segments usually take on the shape of an inverted heart with their widest section near the base of the segment that tapers to its apical part. This can also be seen in other of the Transvaal species like *E. barnardii* White, Dyer & Sloane and *E. grandialata* R.A. Dyer. The size of the segments may vary in populations and also depend on the habitat of the plants. The segments of young plants usually are much larger than those of older plants that have smaller and somewhat rounded segments. The branches are deciduous and shed continuously as new ones are formed resulting in a bare trunk that is dark blackish-grey in colour with irregularly spaced branch scars. The lower branches curve upward giving the tree the shape of a candelabrum, hence the common name Bushveld Candelabra Euphorbia.

The spine shields are grey in colour and form a continuous margin along the angles of the branches with paired spines varying from about 4 mm to more than a centimetre in length. The spines are grey turning to a black colour towards their tip. There may also be a pair of minute prickles present above the main spines. Along the spine ridge the scars of the small rudimentary leaves may also be seen.

The inflorescences appear above the spines on the apical section of the branches. The inflorescences consist of three cymes that are vertically arranged each with 3 cyathia and yellowish in colour. The central cyathium

is male, followed by two lateral bisexual cyathia.

E. cooperi var. *cooperi* is a widespread species in South Africa and the variability mainly depends on habitat, geology and climate. The plants inhabit many types of soils and vegetation, usually they can be found on rocky outcrops and ridges. Distribution ranges from KwaZulu-Natal, Swaziland, North-West Province, Mpumalanga and Limpopo to Mozambique, Zimbabwe and Botswana. There are 3 varieties of *E. cooperi* namely *E. cooperi* var. *cooperi*, *E. cooperi* var. *calidicola* L.C. Leach that is distributed in Zimbabwe, Zambia, Malawi and Mozambique, and *E. cooperi* var. *ussanguensis* (N.E. Brown) L.C. Leach which occurs in Tanzania and Zambia.

E. cooperi var. *cooperi* is closely related and may be confused with *E. grandialata* R.A. Dyer, a rare species endemic to the Penge district of the Limpopo Province. It is similar in appearance, the inflorescences are borne in the same way although the cymes are sessile in *E. cooperi* var. *cooperi* and are peduncled in *E. grandialata*, the spines in *E. grandialata* are much longer and the plants have a reduced main stems with branches that are usually 4 angled and rarely higher than 2 metres whereas *E. cooperi* var. *cooperi* forms a definite tree. The branches of *E. grandialata* also show attractive yellowish markings on the stems.

The latex of *E. cooperi* var. *cooperi* is very poisonous and any contact with the skin, eyes and mouth causes severe pain and may have very bad affects causing blisters or blindness. The latex of this species is used by the locals as a bird lime. Drained from the branches, heated and boiled the latex will become resinous and is painted on twigs and branches where birds often sit near water sources or food. This is a substitute for the sticky fruits of *Tapinanthus* sp. (Loranthaceae). Sections of the branches or tufts of grass soaked in the latex are also used in catching fish where the material will be thrown in a suitable water source.

E. ingens E. Mey. ex Boissier

Occasionally found with *E. cooperi* var. *cooperi* is the widespread and variable *E. ingens* E. Mey. ex Boissier. The specific epithet for *E. ingens* means huge, massive or colossal and refers to the robustness and the mass of branches produced by a single tree. This species is commonly known in South Africa as "Naboom" in Afrikaans. There is a town in the Limpopo province where *E. ingens* grows in abundance and that was named after the "Naboom" as Naboomspruit ("spruit" meaning a small annual water course).

Fig. 5: A colony of Euphorbia ingens *growing near Sekhukhune*

This species was discovered in 1831 by J.F. Drège and was originally described by E. Meyer in 1843. *E. ingens* include synonyms like *E. similis* A. Berger and *E. natalensis* Hort.

E. ingens is a tree forming species with a multi-branching habit reaching heights of about 10 metres and forms very sturdy main trunks with time. Its large and somewhat rounded crowns consist of a mass of irregularly branched 4-angled branches that are seg-

Fig. 6: A stunted plant of Euphorbia ingens *growing near Sekhukhune*

mented and dark green in colour. The segments are variable in size with angles that are wing-like or occasionally crenate and bear poorly developed separated spine shields. Spines may be absent or short and stubby. The leaves are rudimentary and variable in size. Inflorescences usually consist of 3 peduncled cymes that are vertically disposed each with 3 cyathia, the central one being male between two bisexual cyathia that mature after the male cyathium. The ovaries become exerted soon after pollination and ripen to a globose fruit of about 1cm in diameter that is covered in a fleshy outer layer. It is reported that the fruits of *E. ingens* are eaten and dispersed by guinea fowl in South Africa.

E. ingens occupies a wide range of habitats and soils along its wide distribution range. Plants may be found growing on steep rock faces, rocky outcrops and ridges to the open veldt or to the bushveld. This species is distributed from KwaZulu-Natal, Swaziland, Mpumalanga, Gauteng, North West Province, Limpopo province, Mozambique, Zimbabwe and northwards. There are no species closely related to *E. ingens* in South Africa although there are several relatives further north in Africa including *E. candelabrum* Trémaux ex Kotschy and *E. kamerunica* Pax.

E. ingens is a very widespread species and with a high degree of variability throughout its distribution range that requires an in depth taxonomic study which will probably result in new species or varieties or *E. ingens* may remain a very complicated and extremely variable species.

The colouration in seedlings of *E. ingens* is not anything like that of the larger and mature specimens. The seedlings are dark green in colour with a greyish marbling on the 4-angled stems. They first grow to considerable length before the irregular branching occurs. The seedlings of *E. cooperi* var. *cooperi* may also be dark green in colour and occasionally have markings on the stems, but these seedlings start to branch at an early stage of their live cycle. The seedlings of *E. cooperi* var. *cooperi* also have much longer spines and are more colourful than those of *E. ingens*.

As for all *Euphorbia* species of the Transvaal the latex of *E. ingens* is very poisonous. It can cause temporary to permanent blindness when it comes in contact with the eyes. It is also highly irritating to the skin, burning the skin and even forming large blisters. Used as a purgative the latex is consumed with added sugar - fatalities have occurred in people who consumed too much of

Fig. 7: A seedling of Euphorbia ingens *with the distinct four angles and colouration*

Fig. 8: A seedling of Euphorbia cooperi *var.* cooperi *with five angles and segmentation already visible*

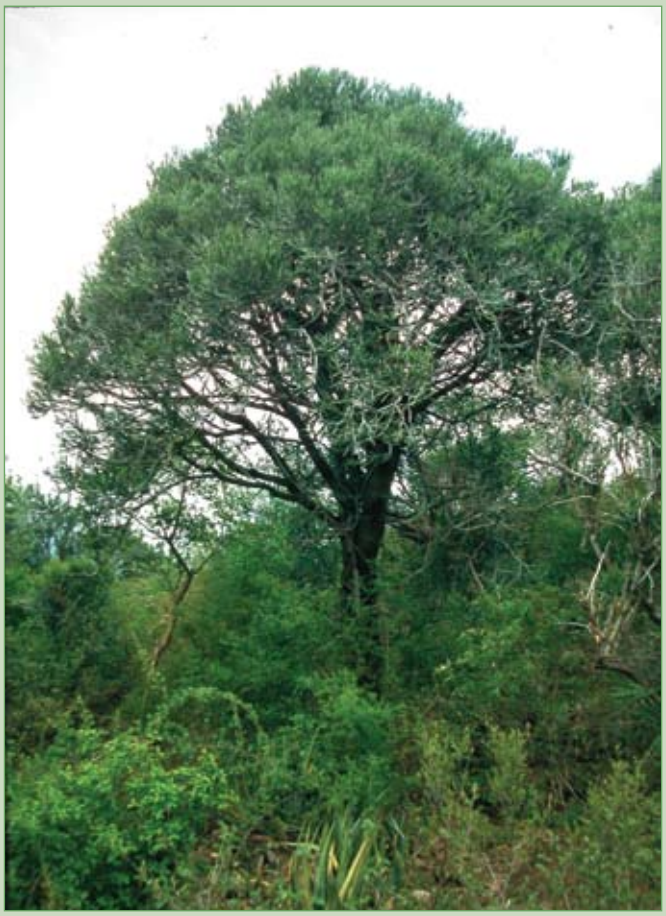

Fig. 9: Euphorbia tirucalli *growing in the Steelpoort river valley (photo = Kotie Retief)*

Fig. 13: Euphorbia tirucalli *"Sticks of Fire" also known as "Fire Sticks" with fiery orange-red stems in cultivation in Pretoria*

Fig. 10: The branches of Euphorbia tirucalli *near Burgersfort*

Fig. 11: The pubescent globose fruit of Euphorbia tirucalli *from near Burgersfort*

Fig. 12: A hedge of Euphorbia tirucalli *planted by the locals of the Limpopo province*

this deadly treatment. It is believed that the latex is a cure for ulcers and cancer.

The wood is light and also used by the locals. *E. ingens* is a fast growing, easy obtainable and drought resistant hedge plant that is often used by the locals of the Limpopo province. Truncheons root easily and are made nearby from trees in the wild, the hedges are stronger than those of *E. tirucalli* and form solid walls with time.

E. ingens have also been observed as a host plant of a hemiparasite plant in the Loranthaceae family (Mitich, 1984).

E. ingens is easily distinguished from *E. cooperi* var. *cooperi* that it is occasionally associated with and from all other South African tree *Euphorbia* species. It has a sturdy trunk with a massive crown of 4 angled and somewhat erect branches that arise from low down on the trunk, the spines are inconspicuous and occasionally absent. The fruits are unique being fleshy and globose.

Euphorbia tirucalli L.

One of the best known and probably the most widespread of all *Euphorbia* tree species is *Euphorbia tirucalli* Linnaeus. Its origin is uncertain but due to its many uses and its ease of growth the plant has nearly naturalised on all continents with a subtropical climate or drier but warm climate including Africa, Asia and South America. In South Africa the plants are distributed from the Eastern Cape Province northwards through the Mpumalanga, North-West and the Limpopo Province.

E. tirucalli forms part of a small group of coralliform plants of which most of the species are native to Madagascar. As such it is unique among the South African tree *Euphorbias.* The plants have cylindrical spineless stems and the female and male cyathia are borne on separate plants.

E. tirucalli was described by Linnaeus in 1753. The type description was made from cultivated plants from Malabar in India. The plants that were in cultivation at that time were probably introduced by early Portuguese travellers who travelled to the east and made a stop in Mozambique (formerly Lourenco Marques). It was probably in use there long before and might also have been introduced. The specific epithet originates from the word Tiru-calli, a name given to this plant by the inhabitants of Malabar in India. *E. tirucalli* is also known as Aveloz (a name applied to this plant and some relatives in Brazil), Rubber-hedge Euphorbia and Kraalnaboom in South Africa. Material that was received from Africa was described as *E. media* by N.E. Brown, later it was realised to be the same as the Indian (originally from Africa) *E. tirucalli.* This species also includes synonyms like *E. rhipsaloides* Welwitsch and *E. laro* Drake

E. tirucalli may be a shrub or a small to medium sized tree that can reach a height of up to ten metres. The main trunk becomes a greyish-brown colour and somewhat rough with age. Branching is variable and may be irregular, alternating, oppositely or in clusters. Leaves are small and rudimentary. The crown is formed by a dense mass of cylindrical smooth green stems and branches. Plants are dioecious, the somewhat sweetly scented cyathia are clustered at the apical ends of the branches. The female cyathium develops pubescent globose fruits measuring about 8 mm in diameter which become a pinkish colour when ripe.

Great care should be taken when plants are handled as the latex can cause temporary to permanent blindness and severe damage to the skin. The plant has many applications and has been used for centuries in Africa and India as a hedge plant around kraals and villages to keep out intruders. The latex is believed to cure sterility and sexual impotency and is taken orally, although this may be fatal. *E. tirucalli* is also used to repel flying insects and ants. The latex is used as an arrow poison and rice boiled in the latex is used to catch birds for food. It is believed to be useful for many ailments (gonorrhoea, syphilis etc.) and as a cure for cancer, tumours, warts etc.

Extracts from the latex of *E. tirucalli* have been studied as a substitute for petroleum with positive results. The latex has also been used as an substitute for rubber but could only produce a low grade rubber because the high resin quantities makes it unsuitable

E. tirucalli makes a good garden plant and is easily propagated from stem cuttings or seed. A cultivar *E. tirucalli* "Sticks of Fire" or "Fire Sticks" with orange to reddish branches is also available and is commonly used for landscaping purposes in South Africa. ♦

References

Lötter, M., McCleland, W. & Schmidt, E. (2002): Trees and shrubs of Mpumalanga and Kruger National Park. Johannesburg (Jacana)

Mitich, L. (1984): The succulent euphorbias: Poisonous and medicinal. Euphorbia Journal, Volume 2. Mill Valley (Strawberry Press)

White, A. Dyer, R. A. & Sloane, B. L. (1941): The Succulent Euphorbieae. Abbey Garden Press, California