Fig. 287. Leaves of *Bryophyllum daigremontianum* (Raym.-Hamet & H.Perrier) A.Berger. (Picture by Neil R. Crouch)

5. *Bryophyllum fedtschenkoi* (Raym.-Hamet & H.Perrier) Lauz.-March.

In: *Comptes Rendus Hebdomadaires des Séances de l'Académie des Sciences* 278: 2508 (1974).

=*Kalanchoe fedtschenkoi* Raym.-Hamet & H.Perrier

Common names: kalanchoe stonecrop, lavender-scallops (English).

Perennial, tuft-forming herbs, up to 50 cm tall, gray-green to green to purple, glabrous, sometimes glaucous; stems thin, branched, erect to prostrate, often creeping and rooting, terete, up to 80 × 1 cm, frequently purple. **Leaves** opposite, evenly spaced, densely arranged, succulent, simple; petiole short, 1–6 mm long; blade obovate-subcircular, obovate or obovate-oblong, 1–5 × 0.5–2.5 cm, base cuneate, apex rounded to obtuse, margins crenate throughout or only in upper half, often red-purple, with a purplish waxy bloom, with bulbils sometimes produced in the notches of leaf margins, mostly of fallen or damaged leaves. **Inflorescence** a lax paniculate corymb, up to 20 cm in diameter, with branches up to 5 cm long; pedicels 7–10 mm long. **Flowers** pendulous, 4-merous. **Calyx** yellow-green with red to blue or violet flecks; tube 12–14 mm long; lobes deltoid, 4–7 × 6–6.5 mm,

apex acute. **Corolla** subtubular to subcampanulate, basally contracted, orange-red with red streaks; tube 17–19 mm long; lobes obovate, obtuse to rounded, 5–8 × 4.2–4.6 mm. **Stamens** inserted below the middle of corolla-tube, upper parts exserted; anthers subreniform, c. 1 mm long. **Carpels** 9–10 mm long; styles 13–15 mm. Nectary scales semi-orbicular, c. 0.8 × 1 mm. **Seed** obovate, c. 0.6 mm long.

References: Descoings (2003), Moran (2009).

Lavender scallops (Fig. 288, 289) is endemic to Central and southeastern Madagascar where it grows on siliceous rocks. It is widely encountered in cultivation and a variegated form with whitish-yellowish leaves is particularly popular (Descoings, 2003). It is naturalised in several countries (e.g. USA, India, Australia, Galapagos) where it most commonly spreads from waste places and gardens (Moran, 2009; PIER, 2010). In South Africa it is persistent and vegetatively spreading on the periphery of old homesteads (Fig. 290).

Fig. 288. *Bryophyllum fedtschenkoi* (Raym.-Hamet & H.Perrier) Lauz.-March. (Picture by Neil R. Crouch)

Fig. 289. Flowers of *Bryophyllum fedtschenkoi* (Raym.-Hamet & H.Perrier) Lauz.-March. (Picture by Neil R. Crouch)

Fig. 290. *Bryophyllum fedtschenkoi* (Raym.-Hamet & H.Perrier) Lauz.-March. on the periphery of an old homestead. (Picture by Neil R. Crouch)

6. *Bryophyllum gastonis-bonnieri* (Raym.-Hamet & H.Perrier) Lauz.-March.

In: *Comptes Rendus Hebdomadaires des Séances de l'Académie des Sciences* 278: 2508 (1974).

=*Kalanchoe adolphi-engleri* Raym.-Hamet
=*Kalanchoe gastonis-bonnieri* Raym.-Hamet & H.Perrier
=*Kalanchoe gastonis-bonnieri* Raym.-Hamet & H.Perrier var. *ankaizinensis* Boiteau ex Allorge-Boiteau

Common names: donkey ears, life plant, palm beachbells (English).

Perennial or sometimes biennial herbs, monocarpic, glaucous or not; stems mostly simple and usually short, terete, glabrous. **Leaves** subrosulate, crowded near base, simple, thick and fleshy, whitish-pruinose above, green or grey-green with brownish-green markings; petiole broad, amplexicaul, 3.5–6.5 cm long; blade ovate-lanceolate, 13–50 × 4.5–10 cm, folded lengthwise, apex acute with bulbils producing roots while still attached, margins sinuate to coarsely crenate, glaucous or not. **Inflorescence** a lax cyme, corymbiform, 20–30 cm in diameter; peduncle up to 50 cm long; pedicels 5–15 mm long. **Flowers** pendulous or somewhat spreading. **Calyx** inflated, 1.8–2.5 cm long, pale green, with red or violet lines, glabrous; tube cylindrical, 1.3–1.6 cm long; lobes deltoid, acute, contracted basally, 5–6 × 4.2–5.3 mm. **Corolla** 4–5 cm long, yellow-green marked with violet or red lines, sparsely glandular-pubescent; tube cylindrical c. 3 cm long, contracted basally; lobes triangular-ovate, apex acuminate, 9–11 × 5.5–7.5 mm. **Stamens** inserted below the middle of corolla-tube, upper parts slightly exserted; anthers reniform, c. 3 mm long. **Carpels** 9–11 mm long; style 1.6–2.4 cm. Nectary scales square, emarginate, 1.2–2 mm long. **Seed** obovate, c. 0.8 mm long.

References: Descoings (2003), Moran (2009).

Bryophyllum gastonis-bonnieri (Fig. 291, 292, 293) is grown as an ornamental in southern Africa and it is apparently naturalised in Florida, USA (PIER, 2010).

Fig. 291. *Bryophyllum gastonis-bonnieri* (Raym.-Hamet & H.Perrier) Lauz.-March.
(Picture by Neil R. Crouch)

Fig. 292. Base of a plant of *Bryophyllum gastonis-bonnieri* (Raym.-Hamet & H.Perrier) Lauz.-March. (Picture by Neil R. Crouch)

Fig. 293. Flowers of *Bryophyllum gastonis-bonnieri* (Raym.-Hamet & H.Perrier) Lauz.-March. (Picture by Neil R. Crouch)

Kalanchoe Adans.

Biennial or perennial or sometimes annual succulent herbs, sometimes undershrubs, shrubs or small trees, with branches spreading, fleshy but somewhat tough and woody towards base. **Leaves** usually opposite and decussate, connate at the base, sessile or petiolate; blade undivided or rarely pinnatifid, entire, crenate or serrate, usually flat, sometimes semi-terete, fleshy-succulent, persistent or deciduous. **Inflorescence** a terminal thyrse, panicle or corymb, consisting of several dichasia usually ending in monochasia with few to many flowers; peduncle present or absent with gradual transition from leaves to shorter bracts below flowers. **Flowers** spreading or stiffly erect, 4-merous, ± pedicellate, medium-sized or ± large. **Calyx** shorter than or sometimes equalling the corolla tube, completely green or with purple or red lines; sepals almost free or connate, rarely up to or beyond the middle. **Corolla** gamopetalous, along at least the lower ⅔; tube ± distinctly 4-angled, rounded and swollen near the base, usually constricted upwards; lobes four, shorter than the fused part, spreading or reflexed or erect and sometimes connivent, ± stiff, sometimes minutely papillate above, usually apiculate. **Stamens** 8, in two whorls; filaments glabrous and fused to corolla tube at about the middle; anthers included, ovate or oblong, with ± spherical terminal appendage. **Carpels** 4, free, with ovary gradually constricted into styles; stigma terminal. Nectary glands 4, free, semi-orbicular to linear, entire, crenulate or ± emarginate at the top. **Fruit** consisting of erect follicles. **Seeds** numerous, ellipsoid, covered with longitudinal ridges and dense horizontal striations in grooves between them.

References: Fernandes (1983); Tölken (1985); Dreyer & Makwarela (2000).

Members of the genus are found in tropical Africa, Madagascar, southern and southeastern Asia, and number c. 200 (Dreyer & Makwarela, 2000). In southern Africa there are 14 indigenous species, mainly restricted to the summer-rainfall areas excluding most parts of southern Namibia and the Great Karoo (Tölken, 1985).

Kalanchoe beharensis Drake

In: *Bulletin du Muséum d'Histoire Naturelle* 9: 41 (1903).

=*Kalanchoe van-tieghemii* Raym.-Hamet

Common names: elephant's ear kalanchoe, felt bush/feltbush, felt plant; velvet bush, velvet elephant ear, velvet leaf, velvet leaf kalanchoe (English); donkie-oor (Afrikaans).

Shrubs or small trees up to 3 m tall; stems simple below and branched above, erect, 2–12 cm diameter, pubescent, with conspicuous leaf scars with sharp projections on either side, toughly woody when old. **Leaves** crowded towards branch tips, petiolate; petiole terete and fleshy, up to 10 cm long; blade deltoid to peltate, sometimes lobate, 7–40 × 8–30 cm, base emarginate, apex acute, glabrous and pruinose to ± densely white to brownish pubescent. **Inflorescence** axillary, many-flowered panicles, 20–30 cm tall; peduncle 40–50 cm long; pedicel 4–13 mm long.

Flowers placed in all directions, pubescent. **Calyx** yellow-green with reddish lines; tube 1–3 mm long; lobes deltoid, 5–13 mm long, apex acute. **Corolla** urceolate, tube 6–10 mm; lobes ovate, 5–13 × 3–6 mm acute, pink-greenish to green-yellow. **Stamens** inserted near the top of the corolla tube, exserted. **Carpels** 5–12 mm long; style 5–10 mm long. Nectary glands rectangular, basally connate, c. 1 × 1.5–3 mm. **Seed** obovate, c. 0.7 mm long.

Reference: Descoings (2003).

Kalanchoe beharensis (Fig. 294, 295) is native to Madagascar where it occurs in the south and southwestern parts of the country in xerophytic forests (Descoings, 2003).

It is a popular garden plant and mature leaves are often silvery in colour (Fig. 296) or a brownish colour above and silvery below. The fine hairs covering the leaves of plants can, however, vary in colour and density even within populations, and some forms with leaf surface outgrowths are being marketed as cultivars in the horticultural trade (Descoings, 2003).

Kalanchoe beharensis grows in four camps within the Kruger National Park in South Africa, where it has shown signs of naturalisation (Foxcroft *et al*., 2008). It has potential as a garden escape, especially in subtropical parts of South Africa, due to its hardiness and prolific production of seedlings. Plants are frost-sensitive and will not easily survive the winter climates of South Africa above the Great Escarpment.

Fig. 294. *Kalanchoe beharensis* Drake. (Picture by Geoff R. Nichols)

Fig. 295. Flowers of *Kalanchoe beharensis* Drake. (Picture by Geoff R. Nichols)

Fig. 296. Leaves of *Kalanchoe beharensis* Drake. (Picture by Geoff R. Nichols)

DRACAENACEAE Salisb.

(Dragon-tree family; *Skoonma-se-tong-familie*)

by

M. Walters

Shrubs to large trees or rhizomatous xerophytic perennials; stems fibrous and partly or wholly subterranean and rhizomatous, or more rarely pachycaul and enormous or occasionally absent. **Leaves** often in rosettes crowded at branch tips or tips of subterranean rhizomes, spirally arranged or occasionally distichous, entire, stiff, simple, narrowly linear to ovate and sessile, sometimes conspicuously succulent and terete, usually fibrous, venation parallel. **Inflorescence** a raceme or panicle, axillary and pedunculate, emerging either from rosette near the ground or on branch ends. **Flowers** small but numerous, bisexual, hypogynous, 3-merous, pedicellate, generally very fragrant; pedicels with an often discoid articulation. **Tepals** 6, in two whorls, petaloid, elongate, all equal, usually basally connate into a short to very long tube with free tips, brownish, purple-violet or white. **Stamens** 6, in two whorls, arising at the base of the lobes, exserted; filaments filiform to inflated; anthers versatile, introrse. **Ovary** superior, 3-carpellate, 3-locular; ovule 1 per locule, anatropous; style often long and simple; stigma 3-lobed or capitate. **Fruit** a globose berry, red or orange. **Seeds** 1–3, globose or elongate, dirty white.

References: Archer (2000), Walker (2001), Heywood *et al*. (2007).

The Dracenaceae is sometimes included in a broadly circumscribed Asparagaceae but is here treated as a separate family. It consists of two genera i.e. *Dracaena* L. and *Sansevieria* Thunb. (Archer, 2000) (though the inclusion of *Sansevieria* in *Dracaena* which has been discussed by various authors, would make the family monogeneric), with c. 100 species (Heywood *et al*., 2007).

The family is mostly tropical, occurring worldwide in rainforests or arid areas (Heywood *et al*., 2007). It is distributed throughout subtropical and tropical Africa, Asia and Australasia, with one species of *Dracaena* from Mesoamerica (Walker, 2001; Heywood *et al*., 2007). Species in this family have a centre of distribution in Africa (Walker, 2001).

Certain species of Dracaenaceae are cultivated as garden or house plants e.g. *Dracaena draco* (L.) L. (the dragon tree) (Heywood *et al*., 2007) and *Sansevieria trifasciata* Prain (mother-in-law's tongue), of which variegated cultivars are usually grown (Walker, 2001).

Only one succulent species from one genus is naturalised in southern Africa.

Sansevieria Thunb.

Caulescent or acaulescent, very drought-hardy perennials, sometimes branching near base with subterranean rhizomes or runners above ground, forming colonies; rhizome thick, fibrous, bearing early deciduous cataphylls. **Leaves** solitary, few

or many, distichous or rosulate, succulent or leathery, lanceolate, linear or lorate and flat, or cylindrical or semi-cylindrical and usually with a groove on adaxial side, sessile, sometimes narrowed at the base resembling petiole, plain green or often with irregular lighter and darker green transverse bands. **Inflorescence** a terminal, paniculate or simple spike-like raceme, sometimes capitate, dense or lax, with extrafloral nectary glands associated with the bracts. **Flowers** numerous, subsessile, solitary or in irregular clusters along scape, bracteate, pedicellate, actinomorphic, often nocturnal and opening for one night only, sweetly scented; pedicel articulated. **Tepals** united at the base to form a tube with 6 free lobes curling back at anthesis, mostly whitish. **Stamens** 6, erect, much exserted, exposed at anthesis by curling back of tepals, fused to tube below; filaments filiform. **Ovary** 3-locular, ovoid; style simple, filiform and as long as stamens or slightly longer, exserted early from closed perianth at anthesis. **Fruit** a berry, smooth or tuberculate. **Seeds** 1–3, with thick softly verrucose epidermis, dirty white.

References: Obermeyer (1992), Archer (2000), Newton (2001).

The genus consists of c. 60 species from Africa, southern Asia (India, Sri-Lanka, Myanmar), Madagascar, Comoro Islands and the Arabian Peninsula (Yemen) (Newton, 2001; Mabberley, 2008). Only seven species in the genus are native to southern Africa (Klopper *et al*., 2006). A number of *Sansevieria* species are naturalised in other regions of the world (PIER, 2010).

Members of the genus *Sansevieria* are used as medicine or protective charms and the fibres are used for making nets, string, sails and paper in various African countries (Watt & Breyer-Brandwijk, 1962; Mabberley, 2008).

Sansevieria trifasciata Prain

In: *Bengal Plants* 2: 1054 (1903).

Common names: bowstring hemp, mother-in-law's tongue, snake plant (English); skoonma-se-tong (Afrikaans); isikuha, isikusha, sikuha, sikusha (Ndebele).

Acaulescent, rhizomatous herb; rhizome 1.3–2.5 cm in diameter. **Leaves** 1–2 (–6) per branch, erect, linear-lanceolate, 30–122 × 2.5–7 cm, narrowed gradually from the middle or somewhat above to a channeled petiole, with 3–4 mm green subulate tip, with alternating transverse bands of light green or whitish green and deep green to almost blackish green with slight glaucous bloom, margin green, surface smooth. **Inflorescence** a simple, spike-like raceme, 30–76 cm long, lax, with 3–8 flowers per cluster; peduncle green with pale-green dots; bracts ovate, acute or acuminate, 1–4 mm long; pedicel 2–4 mm long. **Flowers** whitish or greenish-white sometimes slightly red-tinged outside. **Tepals** united at the base; tube c. 1 cm long; lobes 1.2–1.5 cm long. **Stamens** exserted. **Ovary** 3-locular, ovoid. **Fruit** a berry. **Seeds** 1–3. **Distribution**: SA. (Fig. 297).

Reference: Walker (2001).

Two varieties of *Sansevieria trifasciata* are recognised and the plant occurring in

southern Africa can be ascribed to the typical variety (Fig. 298). The var. *laurentii* differs from var. *trifasciata* in having yellow leaf margins up to 1 cm wide (Walker, 2001).

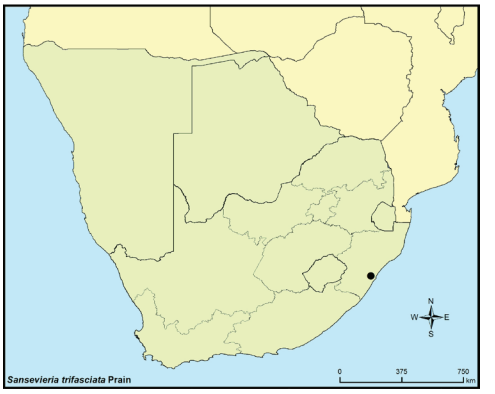

Fig. 297. Distribution map of *Sansevieria trifasciata* Prain.

Fig. 298. *Sansevieria trifasciata* Prain in a healer garden. (Picture by Neil R. Crouch)

This species hails from Nigeria and the Democratic Republic of the Congo (Walker, 2001). In southern Africa it has been found growing in natural vegetation in the Westville area of the KwaZulu-Natal Province of South Africa (Fig. 299). This species should be monitored for further spread and escape from gardens elsewhere. It has also become naturalised or invasive in other countries, for example, Australia, Ecuador, Samoa and the USA (PIER, 2010).

Sansevieria trifasciata is widely cultivated as both an indoor and outdoor plant, with numerous cultivars in existence. These may differ in their leaf sizes, degrees of variegation and shades of green (Walker, 2001). The leaves are known to contain haemolytic compounds and organic acids (Watt & Breyer-Brandwijk, 1962).

Fig. 299. *Sansevieria trifasciata* Prain invasion. (Picture by Neil R. Crouch)

EUPHORBIACEAE Juss.

(Spurge or Milkweed Family; *Noors-* or *Melkbosfamilie*)

by

E. Figueiredo

Dioecious or monoecious herbs, shrubs or trees, with or without a milky latex or coloured sap. **Leaves** usually alternate, sometimes opposite or whorled, mostly petiolate, simple or compound, entire lobed or toothed, sometimes with a gland at the base of the petiole; stipules present or absent. **Inflorescence** terminal, axillary, lateral or leaf-opposed, cymose, paniculate, racemose, spicate or cyathial, or with the flowers fasciculate or solitary. **Flowers** unisexual, usually actinomorphic and small. **Calyx** usually with 3–6 lobes or sepals. **Corolla** with 3–6 free (rarely united) petals or absent. Disc of free or united glands, or lobed, annular, cupular or absent. **Stamens** 1–many. Pistillode sometimes present. **Ovary** superior, usually sessile, usually 3-locular; styles usually 3; staminodes sometimes present. **Fruit** usually schizocarpic, often dehiscing into 3 bivalved cocci leaving a persistent columella, or fruit drupaceous indehiscent. **Seeds** 1–2 per locule, or by abortion 1 per fruit, carunculate or not.

Reference: Carter (2002).

The Euphorbiaceae is a large family with c. 300 genera and 5 000 species (Carter, 2002). It is subcosmopolitan but mostly occurs in the humid tropics and subtropics of both hemispheres (Carter, 2002). It includes groups of genera that are sometimes segregated into other families by some authors (Androstachydaceae, Antidesmataceae, Bischofiaceae, Hymenocardiaceae, Phyllanthaceae, Pedilanthaceae, Picrodendraceae, Porantheraceae, Putranjivaceae, Ricinocarpaceae, Scepaceae, Stilaginaceae, Trewiaceae and Uapacaceae). However, some parts of the Euphorbiaceae that were separated from it (such as the Phyllanthaceae and Picrodendraceae) may be combined again (Stevens, 2008). For that reason the family is accepted here in a broadly defined sense (Carter, 2002).

Many species of Euphorbiaceae have economic importance. The family is well-known as the main source of rubber (*Hevea* Aubl.) but also as the source of widely consumed edible products such as cassava and tapioca (*Manihot* Mill.) (Heywood *et al*., 2007). Other products include oils such as tung oil (*Aleurites* J.R.Forst. & G.Forst.) and castor oil (*Ricinus* L.), medicines and insecticides (Burkill, 1994; Carter, 2002; Smith & Crouch, 2002). Several species are ornamental, particularly in the genera *Euphorbia* L. (e.g. poinsettia) and *Codiaeum* Rumph. ex A.Juss. (garden croton) (Heywood *et al*., 2007)

Only four succulent species from two genera of the Euphorbiaceae are naturalised in southern Africa.

These two genera can be distinguished on the inflorescence being composed of cyathia in *Pedilanthus*, while *Jatropha* has inflorescences with lateral male flowers and terminal female flowers (Carter, 2002).

Jatropha L.

Monoecious or rarely dioecious trees, shrubs or herbs, with clear, whitish or reddish latex. Indumentum simple, sometimes glandular or absent. **Leaves** alternate, sometimes crowded, petiolate or sessile; blade usually lobed, usually with glands at petiole apex; stipules multifid and glandular or spiny, usually palmatilobed. **Inflorescence** terminal or subterminal, cymose, usually with a solitary female flower terminating each primary axis and lateral cymules of male flowers. **Male flowers:** sepals 4–6, imbricate and slightly connate at the base; petals 5, imbricate, disc entire or of 5 free glands; stamens 6–10, often in 2 whorls, outer whorl opposite petals; pistillode filamentous or absent. **Female flowers:** sepals and petals as in male flower but larger; sepals usually persistent in fruit; staminodes sometimes present; disc entire, 5-lobed or of 5 free glands; ovary 1–5-locular; style entire or bifid. **Fruit** schizocarpic, dehiscing septicidally or loculicidally, rarely subdrupaceous and ± indehiscent. **Seed** with caruncle.

References: Radcliffe-Smith (1986, 1987, 1996), Gilbert *et al*. (1993), Carter (2002), Li & Gilbert (2008a), Mabberley (2008).

Jatropha is a pantropical genus extending to North America and South Africa. It includes c. 175 species of which 70 are native to Africa (Gilbert *et al*., 1993). Several *Jatropha* species are known for their ornamental value in domestic horticulture, the most commonly cultivated species being *Jatropha podagrica* Hook. (Mabberley, 2008). This bottle-trunked species carries small, but magnificent, crimson red inflorescences in summer. It grows well in mild areas in open ground or in containers as a stoep plant. Extracts of two species (*Jatropha curcas* and *J. multifida* L.) are used locally as a purgative (Van Wyk & Gericke, 2000; Van Wyk *et al*., 2002). *Jatropha* is also used to produce fuel from seed oil.

Key to the three succulent species of *Jatropha* naturalised in southern Africa [adapted from Li & Gilbert (2008a); note that succulence is little developed in *J. gossypiifolia* and *J. curcas*]:

1. Petioles with gland-tipped hairs along their length, 8–12 cm long, sticky; leaf blade reddish-brown to bronze coloured at least in young leaves . . . . . **2. *Jatropha gossypiifolia***

1'. Petioles without gland-tipped hairs, 10–20 cm long, not sticky; leaf blade green to grey-green **2**

2. Stipules scalelike, minute, caducous; petals fused in lower half, greenish-yellow; leaves unlobed or shortly 3–5-lobed . . . . . **1. *Jatropha curcas***

2'. Stipules divided, spinose or setose, persistent; petals free or almost so, red; leaves shortly lobed . . . . . **3. *Jatropha podagrica***

1. *Jatropha curcas* L.

In: *Species Plantarum* 2: 1006 (1753b).

Common names: Barbados nut, fig nut, pig nut, purging nut (tree), physic nut (English); purgeerboontjie (Afrikaans); mathlapametse (Tswana); inhlakuva (Zulu).

Shrubs or small trees up to 7 m tall with olive grey-green, peeling bark; branchlets semisucculent. Latex watery. **Leaves** alternate; petiole 3–20 cm long, glabrous; blade broadly ovate in outline, pentagonal or shallowly 5-lobed, 5–15 × 5–15 cm, cordate, margins usually entire, glabrous, 7–9-nerved from the base; stipules subulate, 0.5 mm long, caducous. **Inflorescence** subterminal or supra-axillary, subcorymbiform, up to 12 cm long; peduncle up to 6 cm long; bracts up to 8 mm long, acute. **Male flowers:** pedicels up to 4 mm long; sepals c. 2 mm long united at base; petals c. 7 × 3 mm, united to middle, oblong, greenish-yellow, pilose within; disk glands 5; stamens 8, in two whorls, 5 outer and 3 inner, 5–6 mm long; filaments glabrous; anthers c. 2 mm long. **Female flowers:** pedicels up to 3 mm long, extending in fruit; calyx lobes obtuse, entire, 5–7 mm long, puberulous; petals elliptic-oblong, c. 6.5 × 3 mm, greenish-yellow, pilose within; disk glands 5, free; staminodes 10, up to 1 mm long; ovary ovoid-ellipsoid, somewhat 3-lobed, c. 2.5 × 2 mm; style c. 2.5 mm long; stigma bifid. **Fruit** a ellipsoid, slightly 3-lobed capsule, 2.5–3 × 2–2.5 cm, loculicidally dehiscent, green. **Seed** ellipsoid to subcylindric, up to 2 × 1 cm, blackish; caruncle depressed-conic. **Distribution**: S, SA. (Fig. 300).

References: Radcliffe-Smith (1986, 1996), Gilbert *et al*. (1993), Carter (2002), Henning (2007), Li & Gilbert (2008a).

Jatropha curcas (Fig. 301, 302, 303, 304) is a small to medium-sized leafy tree with pale yellowish pealing bark. As indicated by its common names, the seeds (Fig. 305) of *Jatropha curcas* contain a strong purgative oil (curcas oil), which is used medicinally. In West Africa, for instance, it is part of a local remedy for paralysis, leprosy and skin diseases (Burkill, 1994; Oliver-Bever, 1986). It is also used to anoint the body, as a lubricant and in the manufacturing of soap, paint, candles, and for lighting (Burkill, 1994; Henning, 2007; Li & Gilbert, 2008a). Seeds have also been shown to have anti-tumour activity (Mabberley, 2008). Leaves, bark, roots and latex are also used medicinally in various ways (Burkill, 1994). Although roasted seeds are used as a purgative (Hutchings *et al*., 1996) seeds are poisonous when chewed and a common cause of human poisoning in South Africa (Van Wyk *et al*., 2002). Given the plant's toxic properties it has also been used as a vermifuge, insecticide, fish, bird or mammal poison, and arrow-poison (Burkill, 1994). The sap is used as a black dye.

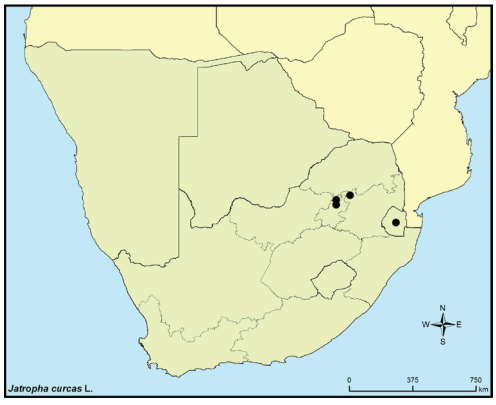

Fig. 300. Distribution map of *Jatropha curcas* L.

Jatropha curcas is also widely cultivated in the tropics as a living fence, for erosion control, demarcation of boundaries and for protection (Henning, 2007; Burkill, 1994), which contributed to it becoming naturalised. It has been increasingly used for bio-fuel (Henning, 2007). It is thought that it will become a major source of renewable energy in the drier rural areas of tropical and subtropical Asia, Africa and America and much research is being done to improve its viability in cultivation (Henning, 2007).

The origin of *Jatropha curcas* is somewhat uncertain but it is thought to be native to Mexico or the neighbouring regions of central America. Portuguese seafarers took it to Cape Verde, where it became an export crop. It was distributed all over the world long ago and is now naturalised throughout the tropics and subtropics (Henning, 2007). It is commonly cultivated in the Old World tropics and Australia which has contributed to its widespread naturalisation in these regions (Radcliffe-Smith, 1996).

In Africa it is widely cultivated for the oil-producing seeds and also as living hedges and stockades, which contributed to it becoming naturalised. In South Africa, it is said to have been introduced by Sekukuni's [Sekhukhune] ancestors when the tribe invaded the north of the country (Smith, 1966).

Jatropha curcas occurs in semi-arid tropical and warm subtropical frost-free climates, on degraded, sandy or gravelly and even saline but not waterlogged soils (Henning, 2007).

Fig. 301. *Jatropha curcas* L.
(Picture by Neil R. Crouch)

Fig. 302. Leaves of *Jatropha curcas* L. (Picture by PPRI)

Fig. 303. Inflorescence of *Jatropha curcas* L. (Picture by Geoff R. Nichols)

Fig. 304. Fruits of *Jatropha curcas* L. (Picture by Geoff R. Nichols)

Fig. 305. Seeds of *Jatropha curcas* L. (Picture by Geoff R. Nichols)

2. *Jatropha gossypiifolia* L. var. *elegans* (Pohl) Müll.Arg.

In: De Candolle, *Prodromus Systematis Naturalis Regni Vegetabilis* 15(2): 1087 (1866).

Common names: bellyache bush, cotton-leaved physic nut, red fig-nut, red fig-nut flower, red physic nut, wild cassada, wild cassava (English).

Erect shrubs up to 2–3 m tall. Young shoots exuding brownish latex. **Leaves** alternate; petiole 3–13 cm long, with stipitate glands adaxially; blade broadly ovate in outline, 6–10 × 8–14 cm, 3(5)-lobed, cordate, reddish-brown to dark bronze-coloured, glabrous, 3–5-nerved from the base; lobes obovate to oblanceolate, middle lobe 4–10 × 2–5 cm, margins glandular and minutely toothed; stipules multifid, 4–8 mm long. **Inflorescence** leaf-opposed, paniculate, up to 8–18 cm long; peduncle 6–8 cm long. **Male flowers:** sepals c. 2.5 mm long; petals obovate, c. 3.5 mm long, dark red; disk glands 5; stamens 8, in two whorls, 2–3 mm long. **Female flowers:** calyx and petals as in the male flowers but twice larger; disk 5-lobed; ovary 3-lobed to subglobose, c. 2 × 2 mm; style c. 1.5 mm long, stigma bifid. Fruit a 3-lobed to subglobose capsule, c. 1 × 1 cm, septicidally and loculicidally dehiscent. **Seed** compressed ellipsoid-ovoid, 7 × 4 mm, light brown; caruncle multifid. **Distribution**: SA. (Fig. 306).

References: Radcliffe-Smith (1986, 1996), Carter (2002).

Jatropha gossypiifolia (Fig. 307) is native to the West Indies, and Central and South America (Radcliffe-Smith, 1986). It was introduced into the Old World tropics where it was planted as a quick-growing hedge and boundary plant. It is also grown ornamentally for its striking dark red young foliage (Fig. 308). It is widely planted as an ornamental and medicinal plant in villages of the tropics (Kawanga, 2007). It escaped and became naturalised throughout tropical Africa, but only sporadically in northern South Africa.

Fig. 306. Distribution map of *Jatropha gossypiifolia* L. var. *elegans* (Pohl) Müll.Arg.