Fig. 161. Fruit of *Myrtillocactus geometrizans* (Pfeiff.) Console.
(Picture by Gideon F. Smith)

Fig. 162. Flower of *Myrtillocactus geometrizans* (Pfeiff.) Console.
(Picture by Gideon F. Smith)

Opuntia Mill.

Shrubs or trees with segmented branches; branch segments usually flattened above (cladodes), sometimes cylindric, rarely somewhat tuberculate, often glaucous, sometimes tomentose. **Leaves** usually very small, subulate, caducous; glochidia present. Spines acicular, subulate or bristly, not sheathed. **Flowers** usually on the edges of the branch segments, diurnal. **Pericarpel** with leaves, areoles, glochidia and often spines, often produced into a short hypanthium beyond the ovary. **Perianth** rotate or spreading, rarely erect, yellow, pink, red or off-white. **Stamens** touch-sensitive. **Style** often more or less expanded near base. **Fruit** fleshy or dry. **Seed** compressed, orbicular to broadly ovate in outline, 3–9 mm long; funicular envelope ('aril') brown to off-white, surface bony.

References: Anderson (2001), Parfitt & Gibson (2003), Hunt *et al*. (2006), N.P. Taylor (*pers. comm*.).

Most *Opuntia* species are readily recognised by their compressed branches, i.e. they are modified to cladodes (at least the terminal ones). In *O. salmiana*, some or all branch segments are cylindric, but then narrower than those of *Austrocylindropuntia* or *Cylindropuntia*, only up to 1 cm in diameter, and with softer spines or bristles. Flowers of species in southern Africa are yellow to orange (off-white or cream in *O. salmiana*).

There are 75 species of *Opuntia* currently recognised in North and South America and the West Indies (Hunt, 2006). Twelve species are naturalised in southern Africa (four from South America, eight from Mexico, USA or the West Indies). Several of these are often widespread in southern Africa and cause serious infestations and transformation of vegetation.

Key to the species of *Opuntia* naturalised in southern Africa [based partly on Obermeyer (1976)]:

1. At least some stem segments slender, cylindric or semi-cylindric, up to 2.5 cm wide **2**

1'. All stem segments flattened (cladodes), more than 3 cm wide **3**

2. Terminal stem segments (cladodes) slightly flattened; spines sturdy, rigid; flowers deep yellow; fruit purplish, red or green, 3–4 cm wide . . . . . .**1. *Opuntia aurantiaca***

2'. Terminal stem segments mostly cylindric (not flattened); spines bristle-like; flowers pale yellow to almost white; fruit bright red, c. 1 cm wide . . . . . **10. *Opuntia salmiana***

3. Cladode surface minutely velvety, hairs clearly visible with a 10x lens . **4**

3'. Cladode surface smooth (or minutely papillose in *O. spinulifera*, papillae not visible with a 10x lens) **5**

4. Areoles not prominent, in addition to glochidia, bearing many pale yellow spines and flexible white bristles becoming longer (up to 75 mm) and appearing more dense on older segments, sebaceous or filiform, white, almost covering the stem, particularly in young plants . . . . . .**6. *Opuntia leucotricha***

4'. Areoles prominent, bearing numerous glochidia but without spines (rarely one), long white bristles absent . . . . . **7. *Opuntia microdasys***

5. Cladodes orbicular (not more than 1.5x as long as broad) **6**

5'. Cladodes obovate or elliptic, attenuate towards the base (usually more than 1.5x longer than broad) **8**

6. Cladodes up to 2 cm thick; spines less than 1 mm thick, c. 1.5 cm long, in sunken areoles less than 2 cm apart; fruit yellowish with pale pulp . . . . . .**11. *Opuntia spinulifera***

6'. Cladodes 1.5–4 cm thick; spines absent or more than 1 mm thick, more than 2 cm long, in sunken or slightly raised areoles more than 2 cm apart; fruit red to purple with similarly coloured pulp **7**

7. Arborescent, (1.5–)3(–5) m tall; cladodes up to 40 cm in diameter; areoles somewhat sunken; glochidia few or inconspicuous; fruit broadly obovoid to globoid, 7–8 cm long and as wide, long-tuberculate (at least while green) . . . . . **9. *Opuntia robusta***

7'. Shrub with branches close to the ground, 0.4–1.5 m tall; cladodes less than 25 cm in diameter; areoles somewhat raised; glochidia unusually large,prominent in areoles of upper half of cladode, particularly along the distal margin; fruit obovoid or ellipsoid, c. 7 cm long and c. half as wide, smooth . .**3. *Opuntia engelmannii***

8. Cladodes glaucous, dull; pericarpel scales and outer tepals green or yellowish, at most with a reddish tinge **9**

8'. Cladodes not glaucous, green, often shiny or tinged purple; pericarpel scales and outer tepals uniformly red **12**

9. Procumbent shrublets up to 0.3 m high; fruit narrowly obovoid, less than 3 cm wide . . . . . **5. *Opuntia humifusa***

9'. Shrubs or trees; fruit wider than 30 cm **10**

10. Tall shrubs or trees 1.8–3(–5) m tall; cladodes 20–60 cm long; pericarpel with many areoles; fruit ellipsoid or obovoid, greenish to orange or red, with pale pulp . . . . . .**4. *Opuntia ficus-indica***

10'. Low spreading bushes 1–1.6(–2) m tall; cladodes 10–20 cm long; pericarpel with few or no areoles; fruit obovoid or pyriform, narrowed at the base, smooth, red-purple with deep red-purple pulp **11**

11'. Areoles less than 8 mm across, with few (0–3), thinner, yellow to greyish spines, mostly along the cladode margin; glochidia inconspicuous; pericarpel and fruit usually straight . . . . . **13. *Opuntia stricta* var. *stricta***

11. Areoles more than 8 mm across, with 4–7(–11) coarse, hard, yellow to brown spines, not concentrated along cladode margin; glochidia conspicuous; pericarpel and fruit often curved . . . . . .**12. *Opuntia stricta* var. *dillenii***

12. Cladodes less than 4x as wide as thick; tubercles not apparent; cladode margin straight or convex between areoles; inner tepals bright orange . . . . . .**2. *Opuntia elata* var. *elata***

12'. Cladodes more than 8x as wide as thick; tubercles prominent, cladode margin concave between some tubercles/areoles; inner tepals yellow . . . . . **8. *Opuntia monacantha***

1. *Opuntia aurantiaca* Lindl.

In: *Botanical Register* 19: t. 1606 (1833).

Common names: jointed cactus, tiger pear (English); katjie, litjieskaktus, suurtjie (Afrikaans).

Low spreading spiny shrub up to 0.3(–1) m high; subterranean parts developed into tubers; lower (older) branch segments almost cylindric, upper segments (cladodes) somewhat compressed, 6–15(–20) × 1.5(–2.5) × 1 cm, not tuberculate, easily detached, bright green, sometimes tinged reddish-purple. Spines usually 2–3 per areole, sturdy, rigid, 1–3 cm long, pale brown, barbed. **Flowers** from Nov. to Jan., 2.5–4 cm across, deep yellow. **Fruit** up to 3 cm long, purple-red or green and seedless, with few spines (upper pericarpel areoles may generate further fruit, thus forming short chains); detached fruit may regenerate vegetatively through the formation of roots and shoots. **Distribution**: S, SA. (Fig. 163)

References: Moran *et al*. (1976), Obermeyer (1976), Zimmerman (1983), Anderson (2001), Henderson (2001), Hunt *et al*. (2006).

The epithet '*aurantiaca*' is a misnomer, as this species never has orange flowers (Moran *et al*., 1977). It is usually identified by its narrow, slightly flattened, rigidly spiny stems, of which the terminal segments are somewhat flattened and easily detached (Fig. 164). The name 'tiger pear' (used in Australia) presumably alludes to the common stem colouring, green with darker purplish areas on the edges, and around, but particularly extending in a stripe below, each areole.

Jointed cactus is originally from central and eastern Argentina and Uruguay in South America (Zimmermann, 1983). Hunt *et al*. (2006) tentatively grouped it with *Opuntia salmiana* from southeastern South America, in their informal '*Aurantiacae*' group, but noted that it resembles taxa in his more widespread '*Curassavicae* & *Pumilae'* group.

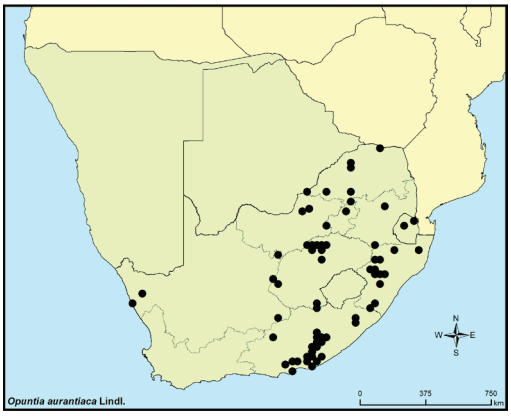

Fig. 163. Distribution map of *Opuntia aurantiaca* Lindl.

In South Africa the species (Fig. 165) is found in dry parts of the savanna biome (Henderson, 2007) from Limpopo Province to the far eastern part of the Northern Cape, as far east as Swaziland, and south to the Eastern Cape. Some outlying infestations have been recorded from Namaqualand (SAPIA data). It is classified as a category 1 invader (Henderson, 2001) and has been proposed for listing as a category 1b species under NEMBA and CARA (Anonymous, 2009). It is also naturalised in Australia (Telford, 1984).*Opuntia aurantiaca* spreads vegetatively by means of easily detached small branch segments or fruit that attach to animals, vehicles and farm equipment by needle-sharp, barbed spines (Fig. 166). Both branch segments and fruit have the capacity to root and give rise to plantlets from their areoles (Zimmermann, 1983). This was the most expensive and damaging cactus invader in South Africa for many years. It was introduced from Argentina via England by 1856. It is a declared weed, as it transformed pastoral land with karroid, savanna, and thicket vegetation, rendering it virtually useless especially for small stock farming (Zimmermann, 1983). Millions of rands were spent on its chemical and mechanical control between 1957 and 1999.

Fig. 164. *Opuntia aurantiaca* Lindl. has flattened terminal stem segments.
(Picture by Neil R. Crouch)

Fig. 165. *Opuntia aurantiaca* Lindl. Note sterile fallen fruit propagules.
(Picture by Neil R. Crouch)

The introduction of the cochineal insect, *Dactylopius austrinus*, in 1932 contributed substantially to its biological control, but its efficacy was not acknowledged and chemical control persisted until a few years ago. Research on the host plant-insect interaction contributed to a better understanding of biological control so that chemical control is now largely replaced by biological control (Fig. 167). The cochineal performs best in warm, dry regions.

Herbicidal control is still practiced in sensitive areas and where the cochineal performs poorly. For registered herbicides consult the Department of Agriculture's guide to the use of herbicides (Anonymous, 2004; Grobler, 2005).

Fig. 166. Easily detached stem segments of *Opuntia aurantiaca* Lindl. attach to humans and animals. (Picture by Helmuth G. Zimmermann)

Fig. 167. Biological control of *Opuntia aurantiaca* Lindl. by means of its own cochineal (*Dactylopius austrinus*) and a caterpillar. (Picture by Helmuth G. Zimmermann)

2. *Opuntia elata* Salm-Dyck

In: *Hortus Dyckensis* ou *Catalogue des Plantes*: 361 (1834) **var. elata**

Shrub 1–1.5 m tall; cladodes oblong-elliptic or narrowly obovate, up to 25 cm long and usually more than 2 cm thick, green, often with purple blotches, along the cladode margin and around areoles, particularly below them; areoles sparse, wool white; glochidia virtually absent, not prominent. Spines 0–3, unequal, 2–3.5(–6) cm. **Leaves,** scales and sepaloid tepals crimson-red, caducous. **Flowers** c. 5 cm across, orange. **Stamens** whitish. **Stigma** whitish. **Fruit** obovate to oblong, 6 cm long, spineless; pulp pale. **Seed** 6 mm long, fertile. **Distribution**: N, SA. (Fig. 168)

References: Telford (1984), Anderson (2001), Leuenberger (2002), Hunt *et al*. (2006).

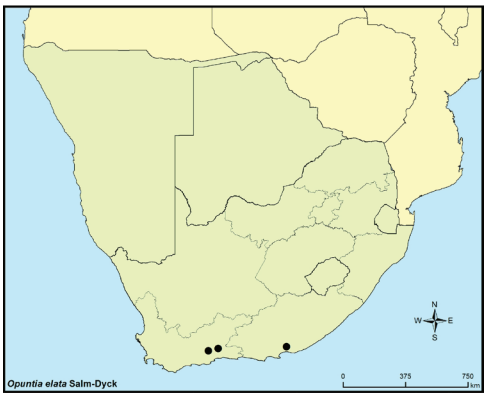

Fig. 168. Distribution map of *Opuntia elata* Salm-Dyck var. *elata*.

Opuntia elata belongs with *O. monacantha* in series *Armatae*. It is readily distinguished from that species by its shorter, thicker (more than 2 cm) cladodes (Fig. 169) and orange, not yellow, inner tepals (Fig. 170) (Leuenberger, 2002). The South American species tend to have stem colouring in various shades of green, though not glaucous or greyish as in most species from further north.

The natural distribution range of *Opuntia elata* is centred on the Entre Rios region of southeastern South America, along the mid to lower reaches of the Paraná and Uruguay rivers, and includes parts of Paraguay, Argentina (Corrientes, Entre Ríos, Santa Fé), Brazil (Rio Grande do Sul) and Uruguay. In South Africa, it has been present as an ornamental for at least fifty years, but has only recently (in 2008) been recorded as an emerging invasive plant in the Western Cape Province (Leeugamka and Beaufort West) (Fig. 171, 172). It is also known to be naturalised in the Coega area near Port Elizabeth (Eastern Cape), and in Namibia. The dry conditions in which most invading populations are found in southern Africa are surprising considering its origin from an area with over 1 000 mm annual precipitation, though this is explained by their native occurrence on rock outcrops (N.P. Taylor, *pers. comm*.). The species is also naturalised in Australia (Telford, 1984).

This species is not yet a declared invader in South Africa. The eastern seaboard may be most vulnerable to invasion, given the similarity to its native conditions, and the naturalised range of its closest relative in South Africa, *O. monacantha*, should be used as a guideline. It is not known whether it is susceptible to *Dactylopius ceylonicus*, like some of its close relatives from South America.

Fig. 169. *Opuntia elata* Salm-Dyck var. *elata* has short thick cladodes.
(Picture by Helmuth G. Zimmermann)

Fig. 170. Flower of *Opuntia elata* Salm-Dyck var. *elata*. (Picture by Pieter J.D. Winter)

Fig. 171. *Opuntia elata* Salm-Dyck var. *elata*. (Picture by Pieter J.D. Winter)

Fig. 172. *Opuntia elata* Salm-Dyck var. *elata* is a common ornamental plant.
(Picture by Pieter J.D. Winter)

3. *Opuntia engelmannii* Salm-Dyck

In: *Cacteae* in *Horto Dyckensi Cultae*. Anno 1849: 235–236 (1850).

=*Opuntia engelmannii* Salm-Dyck var. *lindheimeri* (Engelm.) B.D.Parfitt & Pinkava
=*Opuntia lindheimeri* Engelm.
=*Opuntia tardospina* Griffiths (sometimes spelled '*tardispina*')

Common names: small round-leaved prickly pear (English); kleinrondeblaarturksvy (Afrikaans).

Shrub, ± erect to decumbent, 0.8–1.5 × 1–5 m; trunk usually absent; cladodes orbicular or broadly obovate, 15–20 × 12–20 cm, more or less tuberculate, glabrous, often glaucous; areoles elliptic, 4.5 × 3 mm, 5–8 in a row diagonally across the centre of the cladode, 2.5–4 cm apart, wool tawny, ageing blackish; glochidia yellow, becoming brown. Spines 1–3(–6), sometimes absent from lower areoles, subulate, slightly flattened, most curved and thus lying near the stem surface, up to 4(–5) cm long, yellow or paler, becoming brown or grey with age. **Leaves** 3–9 mm long. **Flowers** from Oct. to Dec., 5–8 × 5–7.5(–10.5) cm, yellow, rarely red. **Fruit** obovoid to very broadly obovoid, almost spineless, 3–7 cm, purple or red; pulp reddish purple (not green in southern Africa). **Seeds** subcircular to deltoid, flat, 2.5–6 × 2–5 mm wide, tan to grayish; girdle protruding 0.3–0.5 mm. **Distribution**: N, SA. (Fig. 173)

References: Obermeyer (1976), Anderson (2001), Henderson (2001), Parfitt & Gibson (2003), Hunt *et al*. (2006).

Not only is *Opuntia engelmannii* very variable (Fig. 174, 175), it also hybridises with *O. stricta*, *O. phaeacantha* Engelm. and *O. littoralis* (Engelm.) Cockerell in the USA (Pinkava, 2003a), thus creating blurred species boundaries. In cultivation it may hybridise more widely, particularly within series *Phaeacanthae*, and such hybrids may become invasive. Some variants that have previously been formally recognised as *O. tardospina* and *O. lindheimeri* occur in South Africa, mainly in the Eastern Cape Province.

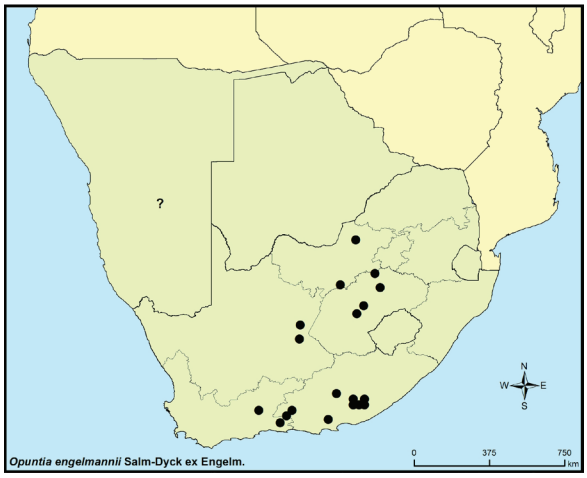

Fig. 173. Distribution map of *Opuntia engelmannii* Salm-Dyck. More invasions in the Gariep - and Vaal River basins are suspected.

Fig. 174. Flower of *Opuntia engelmannii* Salm-Dyck. (Picture by Pieter J.D. Winter)

Fig. 175. Fruit of *Opuntia engelmannii* Salm-Dyck. (Picture by Pieter J.D. Winter)

Future identifications in South Africa should also consider the probability of other members of series *Phaeacanthae* having become naturalised. Other names from this Mexico-USA centred group previously used in southern Africa include *O.* ×*occidentalis* Engelm. & J.M.Bigelow (a complex involving *O. engelmannii, O. littoralis* and *O. phaeacantha*)*, O. macrocentra* Engelm. (including the synonym *O. violacea* Engelm. ex B.D.Jacks.) and *O. phaeacantha* var. *major* Engelm.

Opuntia engelmannii occurs in Mexico from Chihuahua east to Tamaulipas and as far south as Hidalgo. In the USA it has a range from California to Texas, and as far north as the southern parts of Nevada and Utah. It has a wide altitudinal range from 100 m to 2 700 m above sea level (Pinkava, 2003a). It is naturalised in Australia (Telford, 1984).

Although this species is widely used in Texas as a source of fodder for stock and wildlife (spines and glochids are singed with flame throwers to make them edible), this is not the case in southern Africa, and is not considered to be a sustainable practice. It was presumably introduced into southern Africa as an ornamental.

Infestations are known from along the lower reaches of the Vaal River in North-West Province (Bloemhof area), Free State (Vredefort Dome, Brandfort and Kroonstad areas to Bloemfontein) (Fig. 176, 177), and in the Northern Cape (Douglas and further southwest as far as Strydenburg). In the Western Cape it has been recorded from the Prince Albert and Uniondale districts of the Great Karoo, and in the Eastern Cape from the Willowmore district and between Cradock and Alice in the Fish River basin (SAPIA data). An unidentified population in the Limpopo Province north of Lebowakgomo, where plants have many, long, reddish brown spines and reddish brown glochidia up to 1 cm long, could be a lesser known form, perhaps from Mexico. The species is also naturalised in Namibia.

Hybrids with *Opuntia stricta* (known as *O.* ×*alta* Griffiths) are suspected in cases (Free State, KwaZulu-Natal) where plants have few or no spines other than on the cladode margin, and fruit with less than 15 areoles (Pinkava, 2003a).

Though a declared weed in South Africa, it was until recently, and at a local scale in the Eastern Cape, considered a minor weed due to biocontrol (Henderson, 2001; L. Henderson, *pers. comm.*), before the plant causing invasions of vast extent in the northern Free State and adjacent areas was identified as the same species. Although the prickly pear cochineal (*Dactylopius opuntiae*) and the cactus moth (*Cactoblastis cactorum*) can damage these plants, the effect is not adequate to keep this species under control, and chemical control is recommended. A more aggressive and host-adapted cochineal biotype may be introduced from the USA in future to improve on biological control.

Fig. 176. *Opuntia engelmannii* Salm-Dyck encroaching onto koppie.
(Picture by Pieter J.D. Winter)

Fig. 177. *Opuntia engelmannii* Salm-Dyck invades grassy-karroid habitat.
(Picture by Helmuth G. Zimmermann)

4. *Opuntia ficus-indica* (L.) Mill.

In: *Gardener's Dictionary*, Edition 8 [unpag.] (1768).

=*Opuntia megacantha* Salm-Dyck

Common names: Indian fig, mission prickly pear, prickly pear, sweet prickly pear (English); boereturksvy, doringturksvy, grootdoringturksvy, turksvy (Afrikaans).

Large shrub or small tree up to 5(–7) m tall, mostly with a trunk up to 1 m in diameter; cladodes obovate to oblong 20–60 × 10–20(–40) × 2.5–5 cm, dull green or blue-green, base attenuate. Spines variable, absent or 1–2 or more, the longer up to 2.5 cm long, white or off-white. **Leaves** caducous. **Flowers** from Oct. to Dec., 6–7 × 5–7 cm, orange or yellow. **Pericarpel** areoles dense, with a few long glochidia (c. 1 cm) in addition to numerous short glochidia. **Fruit** ellipsoid, 5–10 × 4–9 cm, yellow, orange, red or purple in different cultivars. **Seeds** suborbicular, 4–5 mm across, warped, pale tan; girdle only slightly protruding. **Distribution**: B, L, N, S, SA. (Fig. 178)

References: Britton & Rose (1963), Obermeyer (1976), Zimmerman (1983), Anderson (2001), Henderson (2001), Taylor & Zappi (2004), Hunt *et al*. (2006).

This species can be identified by its often narrowly obovate or oblong cladodes (Fig. 179), typically longer than 30 cm, white spines (Fig. 180), orange flowers (Fig. 181) [there are yellow-flowered forms too (Fig. 182), but these are rare in southern Africa], and areolate, ellipsoid fruit with a pale pulp (Fig. 183, 184).

Opuntia ficus-indica is considered to be of hybrid origin and derived from species endemic to the central Mexican Plateau, where it was domesticated and selected for spinelessness and fruit quality (Griffiths, 1909; Pimienta-Barrios, 1990; Nobel, 1994; Griffith, 2004; Reyes-Agüero *et al*., 2005).

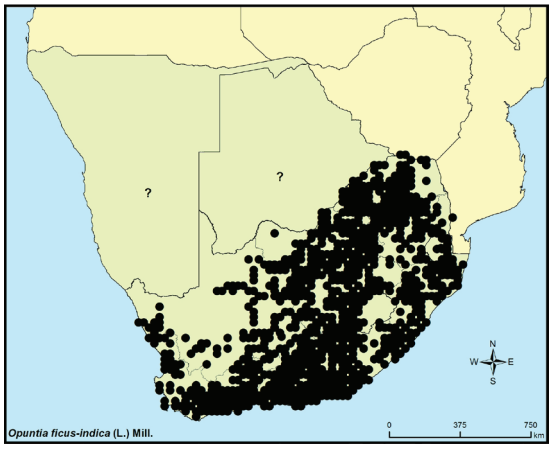

Fig. 178 . Distribution map of *Opuntia ficus-indica* (L.) Mill. These data mostly reflect casual aliens. In South Africa, actual invasions are limited to pockets in the Uitenhage, Ohrigstad and Polokwane areas.

Fig. 179. *Opuntia ficus-indica* (L.) Mill. has oblong cladodes.
(Picture by Helmuth G. Zimmermann)

Fig. 180. White spines of *Opuntia ficus-indica* (L.) Mill. (Picture by Gideon F. Smith)

Fig. 181. Orange flowers of *Opuntia ficus-indica* (L.) Mill. (Picture by Neil R. Crouch)

Fig. 182. Yellow flowers of *Opuntia ficus-indica* (L.) Mill.
(Picture by Neil R. Crouch)

Fig. 183. Unripe fruit of *Opuntia ficus-indica* (L.) Mill.
(Picture by Geoff R. Nichols)

Fig. 184. Reddish fruit on spineless form of *Opuntia ficus-indica* (L.) Mill.
(Picture by Helmuth G. Zimmermann)

Spiny forms have been known under a range of names (Annecke & Moran, 1978) in southern Africa (e.g. *Opuntia elatior* Mill., *O. maxima* Mill., *O. megacantha* Salm-Dyck, *O. schumannii* Weber, *O. tuna* Haw.). While these are mostly misapplied, some, such as *O. elatior*, *O. schumannii* and *O. spinulifera,* represent additional species that were perhaps at one stage naturalised in South Africa, or that still are. The invasive form with orange to red flowers was at one stage referred to as *O. megacantha*.

In the Americas the fruits of these plants are eaten and the juvenile cladodes are consumed as a vegetable. This multi-purpose plant has also been introduced in

various arid and semi-arid countries for use as an emergency source of feed for animals (Felker & Inglese, 2003). In South Africa it is cultivated for edible fruits, animal fodder and is often used as a form of security hedging.

Many spineless cultivars are cultivated in South Africa, but only the spiny form is reported to be invasive. The spineless forms (Fig. 185) are eaten by stock and wildlife. There are a few cases where it appears as if a spineless form is 'invasive' but this is because it grows inside spiny cactus thickets where animals cannot reach it. The plant also undergoes significant genotype-environment interaction which affects identification based on phenotypic traits.

Fig. 185. Spineless form of *Opuntia ficus-indica* (L.) Mill. (Picture by Gideon F. Smith)

The spineless forms were introduced into the rest of the world by Spaniards from Nueva Espana (Mexico) as far back as about 1500. These were soon cultivated all around the European Mediterranean basin. Annecke & Moran (1978) mention that it was introduced into the Cape shortly after Jan van Riebeeck landed. These introductions were still spineless. Once widely established in the Eastern Cape, spiny forms emerged through cross pollination and genetic recombination, reverting back to the spiny forms (seeds taken from a spineless fruit and germinated result in a high proportion of spiny seedlings). The spineless forms were often protected by the spiny forms and could proliferate.

Opuntia ficus-indica invades many habitats, but is mainly a potential transformer in dry and rocky places in savanna, thicket and karoo (Fig. 186), widespread through most of South Africa. During the late 19th century the spiny form invaded huge areas in the Eastern Cape (South Africa) (Fig. 187), Tigray in Ethiopia and in Saudi Arabia. It has never reached full invasive potential in Australia, thanks to early introduction of appropriate biocontrol agents.

Spiny types are declared category 1 (transformers) weeds in South Africa, and have been proposed for category 1b of NEMBA and CARA (Anonymous, 2009). The infestations in South Africa have been successfully controlled to manageable levels using three natural insect predators, namely the cactus moth, *Cactoblastis cactorum*, the cochineal, *Dactylopius opuntiae* (Fig. 188) and the weevil, *Metamasius spinolae* (Annecke & Moran, 1978). Although the use of these biological control agents is the most economical form of control, there are currently also two herbicides registered for use in South Africa (Anonymous, 2004; Grobler, 2005)

Ethiopia has opted to control rampant populations by promoting their utilization as a source of human food (fruit and vegetable), fodder and for the production of the red colourant (carmine) from the cochineal insect *Dactylopius coccus*.

Infestations have now stabilised in South Africa after seventy years of biological control. The biocontrol agents manage to prevent resurgences of prickly pear in previously invaded areas. But some small infestations persist in a few isolated areas e.g. around Uitenhage, Patensie, Grahamstown, Ohrigstad and Polokwane. These are now widely utilised for their fruit and form the basis for an important informal fruit industry. Byproducts made from fruit, including confectionaries, syrups, jams, iqhilika (local brew) and 'nopalitos' are supporting and benefiting many small enterprises, and these are gaining in importance (Beinart, 2007). Control of prickly pear is still practiced in conservation areas and in these cases the preferred and most economical form of control remains biological, though sometimes in combination with chemical control.

In general, *Opuntia ficus-indica* populations have stabilised at acceptable levels and pose no further threat to agriculture and the environment despite the few pockets of infestations in some nature reserves. Its invasive species ranking remains high mainly because of its past history and its wide distribution. The aggression and past impact on agriculture in South Africa still looms high in the memories of farmers and conservationists.