



PLATE 2295 *Commicarpus pentandrus*

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## Nyctaginaceae

*Tropical and southern Africa*

*Commicarpus pentandrus* (Burch.) Heimerl in Die Natürlichen Pflanzenfamilien: 16C: 117 (1934); *Boerhavia pentandra* Burch.: 432 (1822); *B. grandiflora* sensu Oliv.: 142 (1875), non A. Rich.; *B. plumbaginea* var. *pentandra* (Burch.) Heimerl: (1897); *B. transvaalensis* Gand.: 221 (1919); *B. burchellii* Choisy: 455 (1949), *nom. superfl.* based on *B. pentandra* Burch.

This is the first species of the Nyctaginaceae to be illustrated in *Flowering Plants of Africa*. It is commonly known as the four o'clock family, as most members have flowers that open in the late afternoon to early evening (Levin *et al.* 2001). The family is renowned for its genera *Mirabilis* (commonly known as four o'clocks) and *Bougainvillea* (commonly known as Bougainvillea) for their brightly coloured and profuse flowering. These and most other genera are mainly distributed in the Neotropics and western North America, and globally the family consists of 30 genera with 300–400 species (Douglas & Spellenberg 2010). In southern Africa, the family is represented by five genera with 20 species. *Commicarpus* Standl. is the genus in southern Africa with the largest and most spectacular flowers.

*Commicarpus* was originally regarded as a section of *Boerhavia* L. (*Boerhavia* sect. *Adenophorae* Heimerl) (Heimerl 1889), but was segregated based on morphological differences (Standley 1909). *Boerhavia* species have an upright or diffuse habit, the inflorescence is a compound cyme and the flowers are campanulate. The anthocarps (defined as a fruit enclosed by a persistent perianth [Hickey & King 2000]) are clavate, fusiform or oblong with five ribs or 3–5 wings, and the surface is smooth or covered with multicellular hairs. In contrast, *Commicarpus* species are subshrub-like, spreading or scrambling herbs, the inflorescence is an umbel and the flowers are infundibuliform. The anthocarps are cylindrical, fusiform, clavate or elliptic-clavate with ten ribs and sessile or stalked mucilaginous glands (Stannard 1988). Molecular studies support this segregation and indicate that *Boerhavia* and *Commicarpus* form monophyletic groups (Douglas & Manos 2007).

The genus *Commicarpus* consists of about 30–35 species distributed worldwide in the tropical and subtropical regions, mainly in Africa and western Asia (Bittrich & Kühn 1993; Douglas & Spellenberg 2010). Northeastern tropical Africa and southern Arabia are considered to be the centres of diversity for this genus (Thulin 1990). In Africa, the genus is distributed throughout the continent, except for the extreme north and south and the wet forested areas of the west (Meikle 1978). The species have a preference for arid environments with 12 species occurring in Somalia, Ethiopia and adjacent regions of tropical Arabia, seven species in Namibia, and five in South Africa (Meikle 1978).

Germishuizen & Meyer (2003) list eight species of *Commicarpus* for southern Africa; of these *C. pentandrus* is the most common and widespread species, occurring

in Namibia, Botswana and South Africa (Figure 1). *Commicarpus pentandrus* also occurs throughout tropical Africa (Klopper *et al.* 2006).

*Commicarpus pentandrus* was first collected by William J. Burchell [1781–1863] along the Vaal River in Griqualand West, South Africa. He described it as *Boerhavia pentandra* Burch. in his book, *Travels in the interior of southern Africa* (1822), but the taxon was later transferred to *Commicarpus* by Heimerl (1934). It is a forb with trailing stems of up to 1 m with striking bright pink or purple flowers carried in umbels on tall, upright peduncles. It is commonly known as cerise stars, referring to the flower colour, or *veldpatat* (Afrikaans), in reference to the rootstock, which can be up to 30 mm thick and 300 mm long, resembling a sweet potato (Figure 2). *Commicarpus pentandrus* flowers and produces fruits from October to May, but flowers and fruits can appear as early as August (late winter) and as late as July (mid winter).

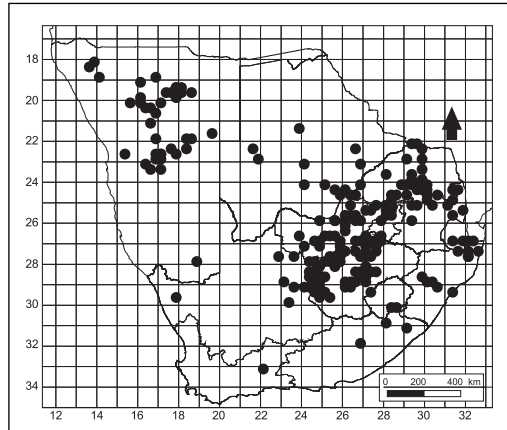


FIGURE 1.—Known distribution of *Commicarpus pentandrus* in the FSA region based on specimens in the National Herbarium, Pretoria.

*Commicarpus pentandrus* is common in bare patches in grassland, savanna and bushveld. It occurs on floodplains, plains, depressions, valleys, hill slopes or outcrops in well-drained to moist, stony or gritty soil.

The flowers of *Commicarpus* species are divided into an upper petaloid part and a lower coriaceous part. The shape and sculpturing of the lower, coriaceous part of the flowers, as well as the shape and sculpturing of the anthocarps, differ among the *Commicarpus* species of southern Africa (Struwig 2012). *Commicarpus pentandrus* differs from the rest of the species in that the apex of the lower part of the flower has one or two rows of five prominent sessile glands with smaller, less prominent glands scattered over the surface below the apex. The anthocarps have five thickly stalked glands alternating with five smaller, less prominent glands around the apex and sessile glands are scattered over the surface below the apex.

*Commicarpus chinensis* subsp. *natalensis* and *C. pilosus* are often confused with *C. pentandrus*. The former easily, as both species are forbs with trailing stems and pink or purple flowers in umbels on long, upright peduncles. *Commicarpus pilosus* is often mistaken as *C. pentandrus*, as their distribution ranges overlap and both species have purple flowers. However, these three species differ significantly in the shape and sculpturing of the lower part of the flower and the anthocarp (Table 1).

*Commicarpus chinensis* subsp. *natalensis* and *C. pentandrus* are allopatric, as the former is habitat specific, occurring on coastal dunes and forest edges along the north

TABLE 1.—Shape and sculpturing of the lower part of the flower and the anthocarp of *Commicarpus chinensis* subsp. *natalensis*, *C. pentandrus* and *C. pilosus*

Species	Lower floral part		Anthocarp	
	Shape	Indumentum	Shape	Indumentum
<i>C. chinensis</i> subsp. <i>natalensis</i>	Cylindrical	Sessile glands scattered over the surface	Cylindrical	Sessile glands around the apex and wart-like glands scattered over the surface below the apex
<i>C. pentandrus</i>	Clavate	One or two rows of five prominent sessile glands around the apex with smaller, less prominent glands scattered over the surface below the apex	Clavate	Five thickly stalked glands alternating with five smaller, less prominent glands around the apex; sessile glands scattered over the surface below the apex
<i>C. pilosus</i>	Elliptic	Five prominent sessile glands around apex with smaller, less prominent glands scattered over the surface below the apex	Elliptic-clavate, tapering to both ends	Five shortly stalked glands around the apex and sessile glands are scattered over surface below the apex

coast of KwaZulu-Natal. *Commicarpus pilosus* differs in habit from *C. pentandrus* in that it is not trailing, but subshrub-like and up to 1 m tall.

Plants of *C. pentandrus* from Sekhukhuleni, differ morphologically to plants occurring elsewhere in that the branches are shorter, the leaves are smaller and arranged less densely. Molecular studies are currently in progress to ascertain different phenotypes.

A root decoction of *C. pentandrus* is used in Namibia and elsewhere in Africa to treat gonorrhoea (Neuwinger 2000; Von Koenen 2001) and the whole plant is used as fodder in South Africa (Cooke 1912; Burt Davy 1926; Stannard 1988). The plant is also used in Tswana traditional culture for magical purposes (Hedberg & Staugard 1989).

The generic name, *Commicarpus* (Greek for *Commi*, meaning gum, and *carpus*, meaning fruit), refers to the sticky anthocarp (Meikle 1978). The specific epithet, *pentandrus*, means with five stamens (Glen 2007).



FIGURE 2.—Rootstock of *Commicarpus pentandrus* which can be up to 30 mm thick and 300 mm long. Photograph: S.J. Siebert.

*Commicarpus pentandrus* germinates easily from seed and in cold climates is cultivated in a greenhouse at 25°C in a mixture of river sand, soil and compost. The addition of Multifeed® K will ensure optimum growth.

**Description.**—Perennial herbs, prostrate or procumbent up to 1 m long, from a woody rootstock up to 30 mm thick and 300 mm long. *Stems* sometimes tinged purple; pubescent. *Leaves* petiolate, petiole (4–)8(–12) mm long; ovate, elliptic, orbicular, deltoid, (13–)27(–39) × (13–)20(–29) mm, apex apiculate, rounded to acute, base cordate, truncate, cuneate, rounded, obtuse, subcordate or shortly attenuate, upper sides darker than undersides; margin entire; sparsely pubescent; slightly fleshy. *Inflorescence* pedunculate, peduncles (30–)79(–150) mm long; umbellate, sometimes up to three whorls of umbels and up to six flowers per umbel; pubescent; bracteate. *Flowers* pedicellate, pedicels (2–)7(–18) mm, flowers (12–)15(–23) mm long, bisexual. *Perianth* divided into a lower and upper part; lower part (2–)4(–6) mm long, clavate, greenish, coriaceous, constricted above ovary, with ten narrow, longitudinal grooves, one or two rows of five prominent sessile glands around the apex with smaller, less prominent glands scattered over the surface below, persistent; upper part (9–)11(–17) mm long, infundibuliform, petaloid, purple or pink, lobed, with a distinct greenish, basal tube, caducous after anthesis. *Stamens* 4–6, long exserted, filaments 11–17 mm long, anthers 0.7–0.8 × 1.2–1.5 mm long, transversely elliptic. *Ovary* 0.75–1.00 mm long, ellipsoid, stipitate; style 14–20 mm long, long exserted. *Anthocarp* (7.0–)8.4(–9.0) × (2.0–)2.1(–3.0) mm, 10-ribbed; clavate, five thickly stalked glands alternating with five smaller, less prominent glands around the apex, sessile glands scattered over surface below the apex; glabrous. Plate 2295.

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