

Notes on naturalised plants

VARIOUS AUTHORS

PETIVERIA ALLIACEA IN KWAZULU-NATAL, SOUTH AFRICA

Petiveria alliacea L. is a New World herbaceous perennial of the family Phytolaccaceae. It has a wide natural distribution from Texas and Florida in the southern United States (Patton & Judd 1986; NatureServe 2011) southward to Ecuador (Jørgensen & León-Yáñez 1999) and Argentina (USDA 2011) as well as on a number of Caribbean islands (Zanoni & Buck 1999; USDA 2011). It is commonly known as Guinea-hen weed, *erva-Guiné* or *anamú* (Spanish) or *mucura caa* (Portuguese) (Defilips & Maina 2002; Glen 2004; Nienaber & Thieret 2008). The generic name honours James Petiver (1658–1718), an English apothecary and botanist (Nienaber & Thieret 2008). The specific epithet *alliacea* refers to the garlic odour emitted from its crushed leaves (Hecklau *et al.* 2005). *Petiveria alliacea* does not tolerate frost (Lonard & Judd 1991) and in its native range occurs in coastal regions, evergreen or deciduous woodland, secondary thickets as well as pastures and shrublands (Vázquez & Kolterman 1998; Jørgensen & León-Yáñez 1999).

Petiveria alliacea is cultivated as an ornamental garden plant in South Africa (Glen 2004), the earliest recorded collection dating back to 1883 (*Wood 415*, NH) from the Durban Botanical Gardens. In 1932 and 1979 further collections were made from cultivated plants in the gardens (*Anon. s.n.*, NH; *Du Toit 2749*, NH; *Pienaar 74*, NH). In 1980, another cultivated specimen was collected from the ‘Durban Botanical Research Unit’ (*Du Toit 2782*, NH), which is an older name for the KwaZulu-Natal Herbarium. *Petiveria alliacea* is not represented at Compton Herbarium and the National Herbarium only has a cultivated specimen that is a duplicate of one of the KwaZulu-Natal specimens.

The first collection from non-cultivated plants in South Africa was made in 1989 (*Ngwenya 571*, NH) on the KwaZulu-Natal herbarium grounds. Currently, the plant is common on the herbarium grounds (*Cheek 928*, NH) despite not being actively cultivated. In a survey in August 2011, plants were found in two main clumps—671 individuals close to the herbarium and 198 in the northern corner of the botanical gardens (Figure 1). Thus far it has not been found in surveys of gardens or natural vegetation.

In January 2012, 500 plants were also found in the gardens of a neighbouring block of flats. All plants have since been cleared (by the botanic gardens authorities and the management of the flat-block respectively). This species could be classified at the D2 stage of invasion according the scheme proposed by Blackburn *et al.* (2011) because it has established self-sustaining, reproducing populations a significant distance from the point of introduction.

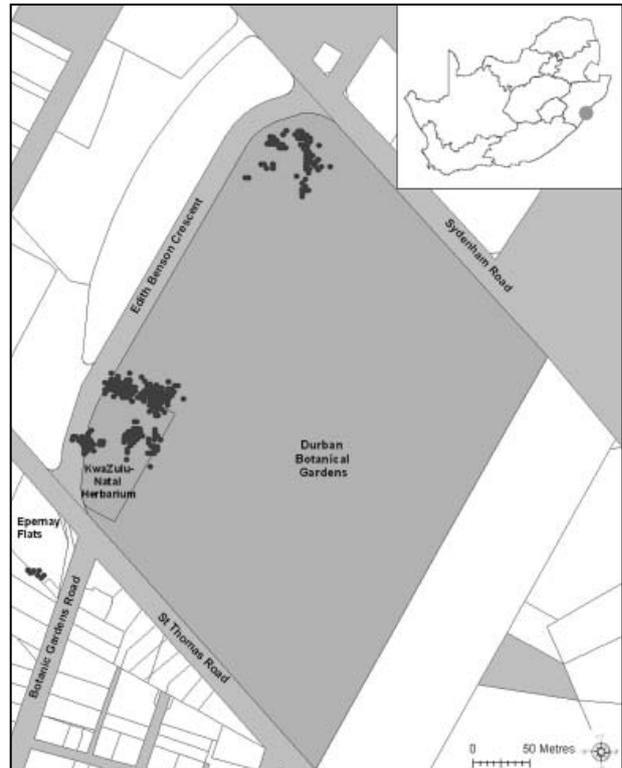


FIGURE 1.—Known distribution of naturalised *Petiveria alliacea* in KwaZulu-Natal, South Africa.

Introduced plants can be considered naturalised when self-sustaining populations persist for at least 10 years without direct human intervention, by recruitment from seed or ramets (Pysek *et al.* 2004). The current paper is the first record of naturalisation for *Petiveria alliacea* in South Africa. However, it has been recorded as naturalised in forest edges and disturbed sites in Benin and Nigeria and also in India (Schmelzer & Gurib-Fakim 2008). Although the Flora of West Tropical Africa (Hutchinson & Dalziel 1928) makes no mention of the plant, Olaiya *et al.* (1987) recorded it as indigenous to Nigeria, suggesting naturalisation occurred in the middle of the twentieth century. It is listed in the Global Compendium of Weeds (Randall 2007). In a survey of parks, gardens and abandoned areas of Curitiba (Brazil), Biondi & Pedrosa-Macedo (2008) recorded it as alien to the region but not displaying serious invasive characteristics.

In Durban, flowering starts in spring and ends in autumn when the racemes of white flowers are replaced by small compact achenes. Forty of the plants counted in August 2011 had fruit and none were flowering. The infructescence resembles that of *Achyranthes* L. spp.

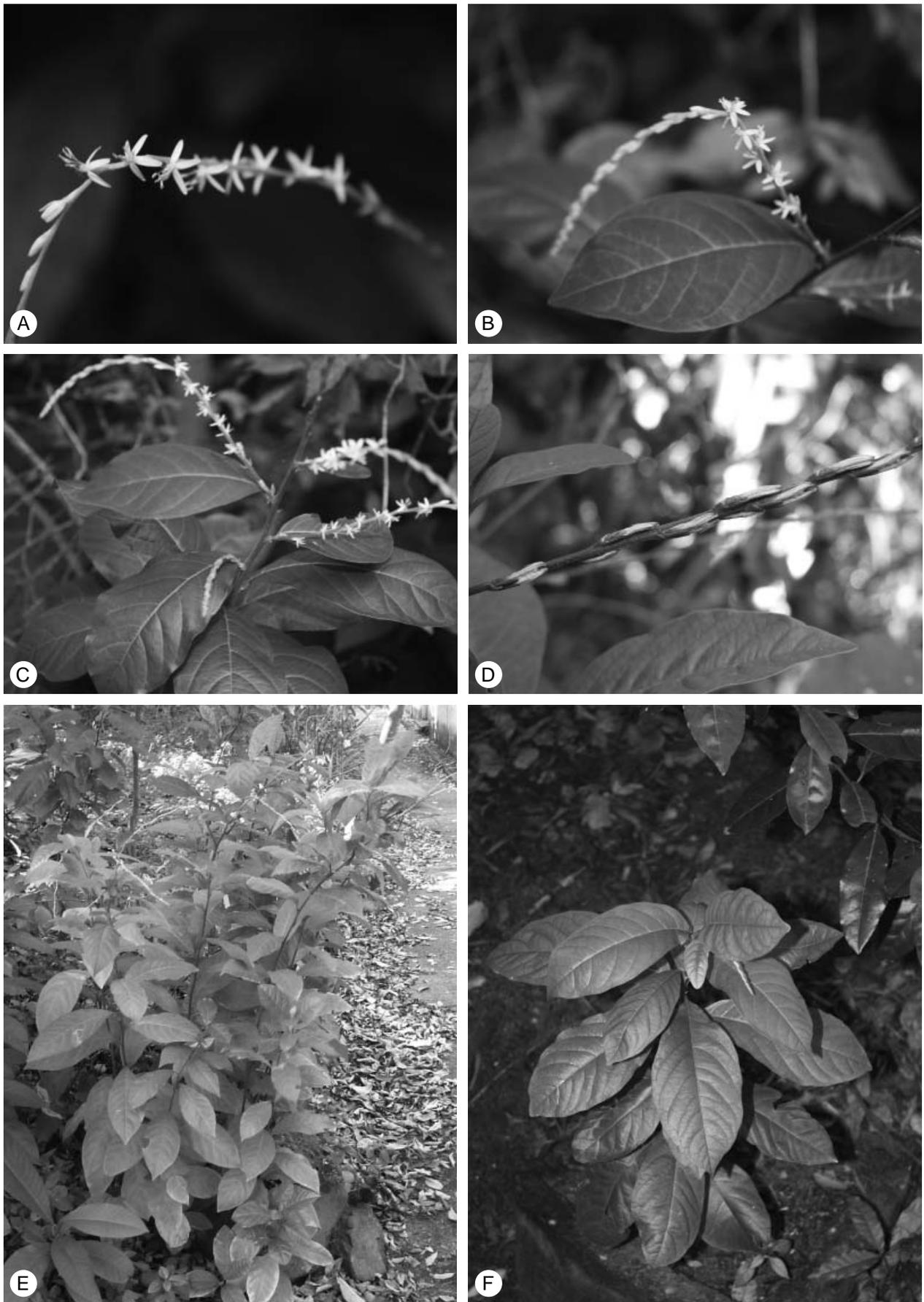


FIGURE 2.—*Petiveria alliacea* L. A,B, flowers; C, inflorescence; D, fruits; E, habit; F, young plant. Photographs: M. Cheek.

(Amaranthaceae) and the dispersal method is the same, namely sticking to clothes or fur (epizoochory; Mori & Brown 1998). Each fruit is armed with four 'hooks' at the apex, which are effective in adhering to clothing. In an investigation into the dispersal ability using clothes Bullock & Primack (1977) found mean dispersal distances of 107 m in forest understory vegetation for *P. alliacea* and a mean distance of 33 m along roadside vegetation. In addition, the fruit can be wind dispersed (Schmelzer & Gurib-Fakim 2008). This plant could also become problematic for agriculture as it taints cattle milk with a garlic smell and has been reported to cause nitrate poisoning in cattle if browsed regularly (Schmelzer & Gurib-Fakim 2008; Nienaber & Thieret 2008).

The family Phytolaccaceae contains a number of well-known South African weeds: *Phytolacca octandra* L., *P. dioica* L., *P. americana* L. and *Rivina humilis* L. The bellhambra tree, *Phytolacca dioica*, is a category 3 plant under the Conservation of Agricultural Resources Act and *Rivina humilis*, the blood berry, is a proposed category 1a plant under the National Environmental Management: Biodiversity Act (Act No. 10 of 2004).

As such, given the observed tendency to spread, its invasiveness in other countries, and related species being invasive, we would recommend that the species is placed on the species-under-surveillance list, and that further studies are conducted to assess whether it should be included in invasive species regulation. Publicity material requesting sightings of *Petiveria alliacea* will be distributed with a request for sightings to be sent to alienplants@sanbi.org.za.

2371.000 *Petiveria alliacea* L., Species plantarum 1: 342 (1753). Type: *Clifford 141* (BM, lecto. —JSTOR Plant Science image!, website accessed 04-10-2012). [For complete synonymy see Marchioretto (1989).]

Perennial, multi-stemmed, herb or woody shrub, up to 2 m tall. *Stems* round to terete, glabrous or faintly hairy, red when young, turning green, up to 12 mm diam. *Bark* lenticillate, green turning grey-white with age. *Stipules* paired, linear, persistent on lower stems after leaves have dropped, 1.5–2.0 mm long. *Leaves* simple, alternate, glabrous above and below, sometimes sparingly puberulent on abaxial veins, soft, green, margin entire, petiolate, ovate to oblanceolate, up to 200 × 72 mm, base attenuate, apex acute, acuminate or obtuse; petioles up to 10 mm long. *Inflorescence*: branched, dense racemes, up to 450 mm long, terminal or axillary; bracts lanceolate to deltate, 1–3 mm long, bracteole 1 mm long. *Receptacle* with sepals green with white margins, 5 × 2 mm. *Flowers* with tepals white or pink, up to 6 × 1 mm, reflexed, linear to oblong, prominently 3- to 5-veined, anthers exerted. *Achenes* up to 12 × 3 mm, green turning white with age, appressed to the infructescence axis and with 4 retrorse awns at the apex, peduncles to 2 mm. Flowering time in South Africa: spring to autumn. Figure 2.

Specimens examined

KWAZULU-NATAL.—2931 (Stanger): Durban Botanic Gardens, (–CC), Mar. 1932, *Anon. s.n.* (NH); 20 Apr. 1979, *P.C.V. du Toit* 2749

(NH); 12 Mar. 1979, *B. J. Pienaar* 74 (NH); Jan. 1883, *J.M. Wood* 415 (NH); Durban, KwaZulu-Natal herbarium grounds, 22 July 2011, *M. Cheek* 928 (NH); 29 Jan. 1980, *P.C.V. du Toit* 2782 (NH); 17 Feb. 1989, *A.M. Ngwenya* 571 (NH).

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