

Ficus sur (Moraceae) and *Gymnanthemum coloratum* (Asteraceae: Vernonieae) – first distribution records for Namibia

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Background: The distribution of *Ficus sur* includes most of tropical Africa, but whilst this species was suspected to occur in Namibia, this has not been verified. *Gymnanthemum coloratum* is a tropical African savannah shrub or tree that has been recorded for Botswana, Swaziland and South Africa, but which has not previously been recorded for Namibia.

Objectives: To formally document the first records of two plant species from Namibia and provide habitat details of the localities from which these species were recorded.

Method: The data presented have resulted from botanical expeditions to the poorly known Baynes Mountains in the Koakoveld region of Namibia. Specimens of the two species in the National Herbarium, Pretoria were examined to verify the identity in the case of *G. coloratum*, and to document additional records in Namibia for *F. sur*.

Results: *Ficus sur* was recorded from two localities, and a third locality based on a specimen in the National Herbarium, Pretoria, was verified. *Gymnanthemum coloratum*, a member of the Asteraceae, was recorded from a single locality.

Conclusion: The fact that *F. sur* was collected at more than one location in the Kaokoveld suggests that it is probably more widespread in suitable microhabitats. *Ficus sur* also occurs further north in Angola, suggesting that the Kaokoveld plants represent a cross-border outlier of the much more widespread Angolan population. *Gymnanthemum coloratum* was only recorded from the one locality in the Kaokoveld. The species also occurs in Angola, which suggests that the Kaokoveld plant represents a cross-border outlier of the population in that country.

Introduction

Ficus (Family Moraceae) is a large pantropical genus with almost 800 species, of which roughly 100 are native to Africa (Burrows & Condy 2011). Most species are from subtropical and tropical regions and the plants vary from shrubs, lianas and epiphytes to large trees. *Ficus* is well represented in those parts of southern Africa where frost is not severe. In the Flora of southern Africa (FSA) region 28 species have been recorded (Jordaan 2003). Of these, 11 species have been reported for Namibia, 8 of which are shared with South Africa.

Ficus sur Forssk. is a round-crowned tree up to 25 m tall, occurring in a wide range of habitats including grassland, woodland, riverine forest, semi-deciduous forest and occasionally rocky outcrops. Its distribution extends from the Cape Verde Islands and Senegal in the west, Ethiopia and Yemen in the north and east, through most of tropical Africa to Zimbabwe, Mozambique and throughout eastern South Africa to the forests of the southern coastal belt and it is, together with *F. burtt-davyi* Hutch., the southernmost representative of *Ficus* in Africa (Burrows & Burrows 2003). It is also widespread in Angola (Figueiredo & Smith 2008). In the FSA region, *F. sur* has hitherto been recorded for Botswana, Limpopo, Mpumalanga, Swaziland, KwaZulu-Natal, Eastern Cape and Western Cape (Jordaan 2003). It is not listed in the *Prodromus einer Flora von Südwestafrika* (Friedrich-Holzhammer 1967). Craven (ed. 1999) listed it as a taxon for which the presence in Namibia needs verification and she mentioned a specimen from the Kaokoveld [Davies, Thompson & Miller 63 (PRE)]. As references, Craven cited Van Greuning (1990) and Berg and Wiebes (1992). However, no mention regarding the presence of *F. sur* in Namibia could be found in the former and in the latter the taxon is merely mentioned as occurring in Namibia. *Ficus sur* was recently thoroughly treated by Burrows and Condy (2011). They included a map showing its distribution in Africa, but there were no records for Namibia indicated.

Gymnanthemum coloratum (Willd.) H. Rob. & B. Khan [= *Vernonia colorata* (Willd.) Drake subsp. *colorata*] is a tropical African savannah shrub or tree, with a distribution that extends from West

Africa, through East Africa to southern Africa (Pope 1992). In the FSA region, *G. coloratum* has hitherto only been recorded and mapped for Botswana, Swaziland and South Africa, for the latter in the provinces Limpopo, Mpumalanga and KwaZulu-Natal (Herman *et al.* 2003; Van Wyk *et al.* 2011).

Expeditions to the botanically poorly explored Baynes Mountains on the southern side of the Kunene River in the Kaokoveld of north-western Namibia were undertaken by the authors in 2005 (Van Jaarsveld 2005) and 2009. The biologically rich Kaokoveld forms part of the Kaokoveld Centre of Endemism, a biogeographical region rich in restricted-range animals and plants and extending from north-western Namibia into south-western Angola (Van Wyk & Smith 2001). The expedition and subsequent visits resulted in the identification of *F. sur* and *G. coloratum* from the region, and this paper formalises the first records of these two species for Namibia.

Research methods

Specimens were collected for later verification and lodging in the herbarium of the National Botanical Research Institute, Windhoek, Namibia (WIND). Existing material in the National Herbarium, Pretoria (PRE) was examined for comparative purposes and to verify the identity of the two species documented here. Details of the specimens collected and examined are provided below.

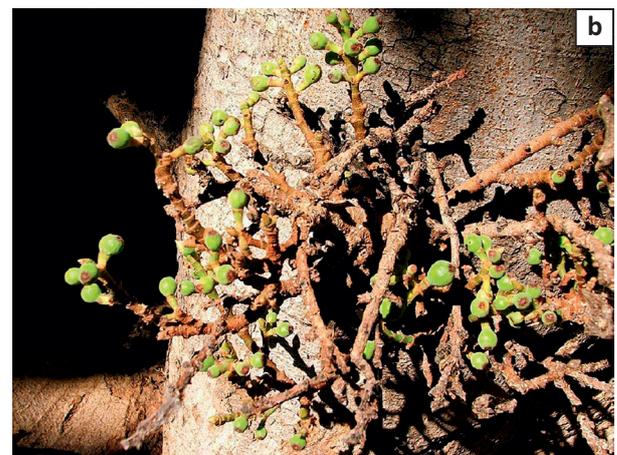
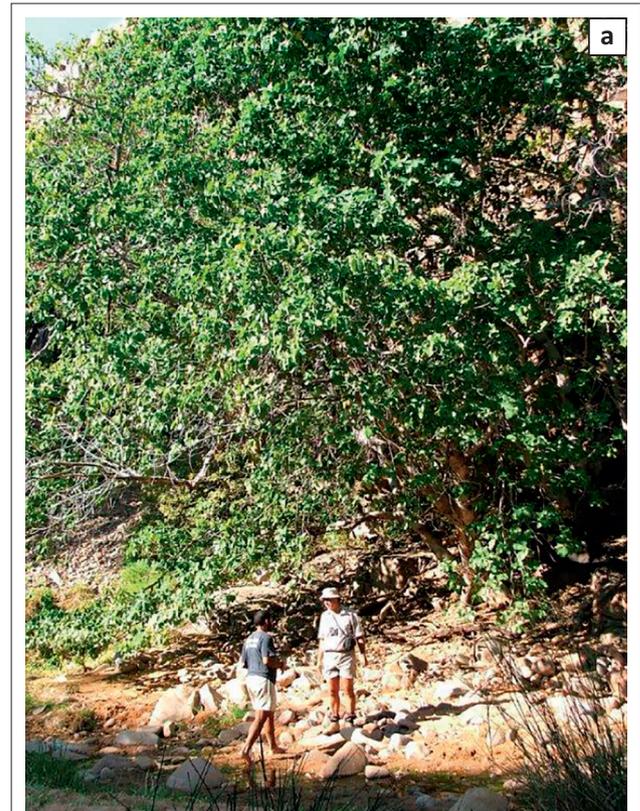
Ethical considerations

Collecting/research permits for the study were issued by the Ministry of Environment and Tourism, Republic of Namibia.

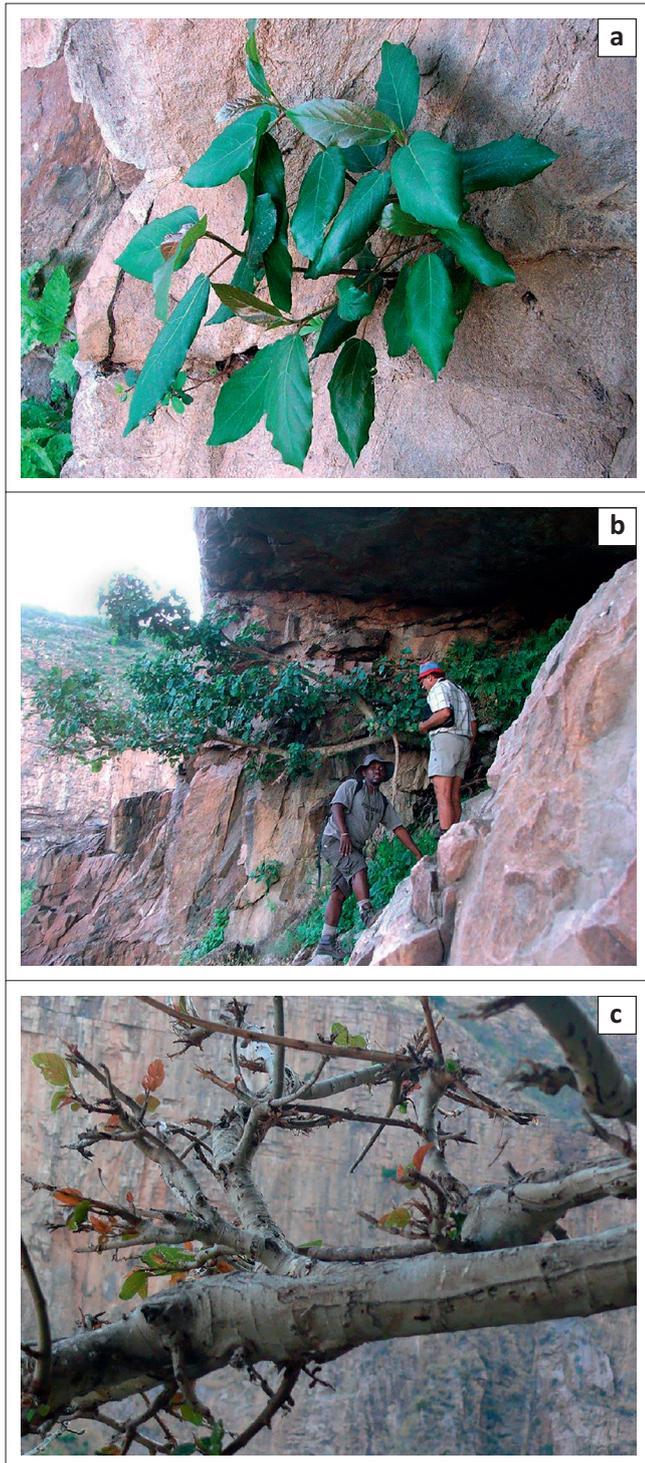
Results

Whilst exploring the deeply dissected Slangkloof gorge through the north-central portion of the Baynes Mountains in the Kaokoveld in 2005, an unfamiliar *Ficus* tree (± 9 m tall) and a single unfamiliar member of the family Asteraceae (tree, ± 4 m tall) were spotted growing amongst *Diospyros mespiliformis* Hochst. ex A.DC. along the banks of a small perennial stream. Closer examination revealed three specimens of *F. sur* on the fringe of the perennial stream. All were in healthy condition, and in fruit (Figure 1). Other fig trees growing in the immediate vicinity were *F. bubu* Warb., *F. cordata* Thunb., *F. glumosa* Delile, *F. sycomorus* L. subsp. *gnaphalocarpa* (Miq.) C.C.Berg.

During a subsequent expedition to the Kaokoveld in April 2008 the authors recorded yet another location of *F. sur* in the Baynes Mountains. At Omavanda (south-eastern part of the Baynes Mountains), which is about 20 km to the south-east of Slangkloof, two trees as well as some seedlings were found in rock crevices just above an accessible broad rock ledge on a damp south-facing cliff (Figure 2a, 2b). Moisture draining from various spots along the cliff creates a microclimate (oasis), enabling various mesophytic plant species such as the ferns *Adiantum capillus-veneris* L., *Christella dentata* (Forssk.) Brownsey & Jermy (another first record for



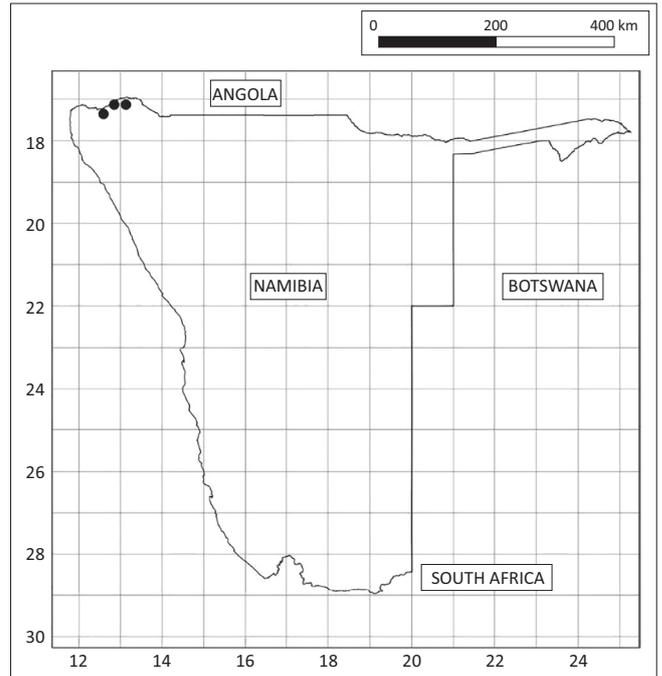
Source: (a and b) Photos taken by Ernst van Jaarsveld, (c) photo taken by Wessel Swanepoel
FIGURE 1: *Ficus sur* growing in Slangkloof, Kaokoveld, Namibia: (a) tree approximately 6 m tall, (b) twig with fruit (July 2005) and (c) close-up of a fruiting branch (July 2005).



Source: Photos taken by Ernst van Jaarsveld

FIGURE 2: *Ficus sur* at Omavanda, Kaokoveld, Namibia: (a) young plant growing in a rock crevice with characteristic dentate leaves (April 2008), (b) a larger specimen on the cliff ledge with one of the authors, Wessel Swanepoel and uPhakamani Xaba (South African National Botanical Institute) standing next to the tree (April 2008) and (c) the same specimen as in (b), heavily utilised by Rosy-faced lovebirds damaging the growth tips (June 2012).

Namibia) and others to survive. The particular ledge is formed by an impermeable quartzitic sandstone bedrock layer which causes groundwater to surface from crevices at various points. On a subsequent visit in 2012, we observed that the figs were being systematically damaged by Rosy-faced lovebirds feeding on the young growth tips (Figure 2c). Other trees



Source: Distribution map prepared by Hester Steyn

FIGURE 3: Known distribution of *Ficus sur* in Namibia.

and herbs growing in the vicinity were *Ficus bubu*, *F. burkei* (Miq.) Miq., *F. ilicina* (Sond.) Miq., *F. glumosa*, *Aeollanthus rydingianus* van Jaarsv. & A.E.van Wyk, *Cotyledon orbiculata* L., *Nuxia* sp., *Manuleopsis dinteri* Thell., *Cussonia angolensis* Hiern., *Solanum nigrum* L., *Pegolettia* sp., *Leonotis ocyimifolia* (Burm.f.) Iwarsson, *Obetia carruthersiana* (Hiern.) Rendle, *Kalanchoe lanceolata* Pers., *Plectranthus hereroensis* Engl. and *Tetradenia riparia* (Hochst.) Codd.

A sterile specimen of *F. sur* from the Otjihipa Mountains, 50 km to the south-west of the Baynes Mountains [Davies, Thompson & Miller 63 (PRE)], corresponds to the Baynes Mountain plants with regard to shape and leaf indumentum. This specimen in PRE was probably overlooked in the past and represents the first record of *F. sur* for Namibia.

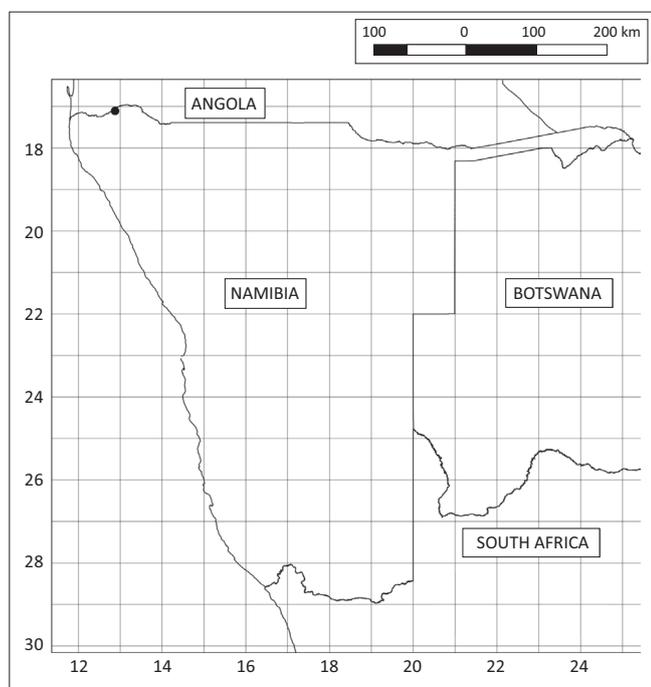
The plants of *F. sur* in the Namibian part of the Kaokoveld Centre of Endemism (Figure 3) represent a range extension of ± 1650 km to the north-west of the nearest hither to known localities for the FSA region in south-eastern Botswana (Van Wyk *et al.* 2011).

Flowering material of the unfamiliar specimen of Asteraceae was collected in May 2009 at the Slangkloof gorge site [Swanepoel 301 (WIND)], and it was subsequently identified as *G. coloratum* (Figure 4). Diagnostic morphological characters of this species are, amongst other, the tomentose branches, elliptic to broadly oblong-elliptic or ovate leaves which are scabridulous adaxially, thinly pubescent abaxially, the indumentum comprising 1-armed T-shaped hairs, the undulate leaf margins, subglobose-cyathiform involucre, ecaudate phyllaries, white florets, 10-ribbed, tapering and sub-cylindric achenes which are glandular but otherwise



Source: Photo taken by Wessel Swanepoel

FIGURE 4: *Gymnanthemum coloratum* in the Kaokoveld, showing leaves and flowers.



Source: Distribution map prepared by Hester Steyn

FIGURE 5: Known distribution of *Gymnanthemum coloratum* in Namibia.

glabrous, tipped with a pappus of copious ridged slender barbellate setae, widening towards the apex. Elsewhere in Africa *G. coloratum* is reported as being a tree up to 10 m tall or a shrub occurring in woodland, savannah and grassland, occupying a similar habitat as in the Baynes Mountains and in addition on termite mounds (Coates Palgrave 2002; Pope 1992). The Kaokoveld plant was flowering in May, which corresponds to the time (April–September) given for *G. coloratum* in the eastern half of southern Africa (Boon 2010; Coates Palgrave 2002).

The specimen recorded here represents the first record of *G. coloratum* for Namibia (Figure 5), and a range extension of ± 1250 km to the west of the nearest hitherto known localities for the FSA region in northern Botswana.

Specimens examined

Ficus sur

NAMIBIA: **1712** (Posto Velho): Slangkloof, large trees, along the main stream 16 May 2009, *Swanepoel 300* (WIND); 05 July 2005, *Van Jaarsveld & Swanepoel 19608* (WIND) (–BB); About 9 miles up the Kapupa River south of Otjhipaberg summit, near spring in kloof, 1959, *Davies, Thompson & Miller 63* (PRE) (–BC). **1713** (Swartbooisdrif): Omavanda, on ledge east of cave, 22 Apr. 2008, *Swanepoel & Van Jaarsveld 298, Van Jaarsveld & Swanepoel 22074* (WIND) (–AA).

Gymnanthemum coloratum

NAMIBIA: **1712** (Posto Velho): Baynes Mountains, 15 km north-northwest of Otjipemba, on bank of stream, 16 May 2009, *Swanepoel 301* (WIND) (–BB).

A selection of additional specimens examined for *Gymnanthemum coloratum*

ANGOLA: *Cooper 177* (PRE); *Teixeira 1253* (PRE); *Teixeira & Andrade 5.009* (PRE). BOTSWANA: *Miller B/1321* (PRE). MALAWI: *Hall-Martin 418* (PRE). MOZAMBIQUE: *Petrogão 275* (PRE); *Rodin 4180* (PRE). SOUTH AFRICA: *Gerstner 5427* (PRE); *Hemm 689* (PRE); *Koekemoer 2288* (PRE); *Meyer 4845* (PRE); *Netshungani 1308* (PRE); *Van der Schijff 3831* (PRE); *Van Jaarsveld 1277* (PRE). ZAMBIA: *Robinson 5617* (PRE). ZIMBABWE: *Gilges 633* (PRE); *Hornby 2255* (PRE); *Mowbray 108* (PRE); *Plowes 47644* (PRE).

Discussion

Ficus sur is closely related to *F. sycomorus* and *F. vallis-choudae* Delile. Both *F. sycomorus* and *F. sur* have fruit which are borne on short, much branched leafless branches (trusses), hence the English common name 'broom cluster fig' recorded for both species (Van Wyk *et al.* 2011). However, *F. sur* has glabrous leaves, occasionally with fine hairs, and the margins are irregularly dentate. The fruit (syconia) is glabrous or slightly hairy. The leaves in both subspecies of *F. sycomorus* are rounder with uniform margins, the apex is also rounder and the leaf surface very often scabrid. In *F. sycomorus* the fruit is densely and finely hairy, sometimes glabrous, and in subsp. *gnaphalocarpa* (the subspecies which occurs in the Kaokoveld) the figs are borne singly in the leaf axils. *Ficus vallis-choudae* also has fruits which are borne singly in the leaf axil. However the resemblance ends there. The larger leaves have blunt or rounded tips (Burrows & Burrows 2003). The latter species has not been recorded for Namibia or South Africa.

The fact that *F. sur* was collected at more than one location in the Kaokoveld suggests that it is probably more widespread in suitable microhabitats. *Ficus sur* also occurs further north in Angola, suggesting that the Kaokoveld plants represent a cross-border outlier of the much more widespread Angolan population.

Gymnanthemum coloratum was only recorded from the one locality, and was not seen at any other sites in the Kaokoveld by the authors during expeditions to the area. The species also occurs in Angola (Figueiredo & Smith 2008), which

suggests that the Kaokoveld plant represents a cross-border outlier of the population in that country.

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Competing interests

The authors declare that they have no financial or personal relationships which may have inappropriately influenced them in writing this article.

Authors' contributions

W.S. (University of Pretoria) prepared the manuscript, and was responsible for fieldwork and research in the Windhoek (WIND) and SANBI Pretoria (PRE) herbaria. E.J.v.J. (Kirstenbosch National Botanical Garden) was responsible for manuscript editing, provision of important additional information, fieldwork and research in the Compton (COMPT) herbarium.

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