Soil respiration is an important process that contributes significant amounts of carbon to global atmospheric carbon stocks and carbon cycling; however, little is known about the factors that control soil respiration in semiarid savanna such as found in many parts of Sub-Saharan Africa. We investigated the rate of soil respiration and the abiotic and biotic factors controlling this process in a granitic savanna in Kruger National Park, South Africa. We found catenal processes, more precisely soil moisture, to be more closely related to the rate of soil respiration than changes in plant cover due to herbivore activities. Riparian zones, consistently wetter than elsewhere in the catena, showed higher soil respiration rates than upland areas, both in the wet and dry season. During the wet season we also found significantly higher soil respiration rates in the uplands in areas beneath the canopy of trees compared to open areas, again due to elevated soil moisture levels. We conclude that soil moisture, rather than soil temperature is the stronger control on soil respiration in this semiarid savanna, and that soil moisture, to be more closely related to the rate of soil respiration than changes in plant cover due to herbivore activities.

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Leaf micromorphology and anatomy of Cryptolepis (Apocynaceae, Periplocoideae) in southern Africa

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The genus Cryptolepis R.Br. consists of 31 species and is widespread throughout Africa, the island Socotra, India, southern China, Malaysia and Ceylon. In southern Africa six Cryptolepis species occur as slender, woody climbers or low growing shrubs. Five of the six species inhabit sub-tropical forests or savannah, and only one species is found in the semi-desert regions towards the west of southern Africa. Floral characteristics are generally of little taxonomical value in the genus since variation among the different species is small. Consequently vegetative characteristics are most often used for species identification. The aim of the present investigation was to identify diagnostic characteristics of the leaf anatomy and epidermal surface of the six southern African Cryptolepis species. The results show that a combination of these characteristics is effective for distinguishing all the Cryptolepis species in southern Africa. Diagnostic characteristics of leaf anatomy and micromorphology include the isobilateral or dorsiventral arrangement of the parenchyma, amphistomatic or hypostomatic arrangement of the stomata and the occurrence of wax platelets, striations and papillae on the epidermal surface.

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Antifungal activity of Psychotria capensis leaf extracts

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Cowpea (Vigna unguiculata) is an indigenous African legume crop of nutritional importance for many small-scale farmers and rural communities in sub-Saharan Africa. However, these seeds, as with other grain and legume crops, are susceptible to fungal infection under sub-optimum storage conditions. Some fungi, including Aspergillus and Fusarium spp., produce mycotoxins which can adversely affect the health of animals and humans if ingested. The control of these fungi with biological extracts is currently attracting a great deal of attention. Psychotria capensis (Rubiaceae) is an evergreen shrub, which has been used for gastric complaints. Other Psychotria species are known for their antimalaria, anti-emetic and antimicrobial activity. The aim of this study was to investigate the antifungal activity of P. capensis leaf extracts against fumonisin producing Fusarium species and to isolate potential active compounds. The antifungal activity of 16 major fractions was conducted by a direct bioassay on TLC plates. The plates were developed with dichloromethane and methanol (20:2) and thereafter sprayed with spore suspensions of F. proliferatum and F. verticillioides. From the 16 major fractions tested, two fractions showed activity and three pure compounds were isolated. Two of the compounds have been identified as β-sitosterol and a carotenoid derivative. These compounds will be tested their for antifungal activity.

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Vegetation classification of the proposed Heritage Park, North-West Province, South Africa

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The proposed Heritage Park will link the Pilansberg National Park and the Madikwe Game Reserve with a corridor of approximately 170 000 ha. Currently this area is bordered by 38 rural villages and is used by these communities for livestock grazing and crop production. High poverty levels exist and any form of socio-economic development will increase the livelihoods of the rural communities. Due to the tourism demand, the challenge is to create a conservation area for eco-tourism, which could lead to better job opportunities. The area is also known for its archaeological importance. For effective development and management, scientific studies need to be conducted. This project, which focuses on vegetation classification, forms the