

The changes in cytotoxicity levels in the corms of *Hypoxis hemmerlicoides* due to varying rainfall patterns: A study in Vernon Crookes Nature Reserve – Samkelisiwe Precious Ndlovu

Changing climatic conditions are expected to affect the levels of cell toxicity (cytotoxicity) in plants. To determine the impact rainfall has on plants (an objective of the study), especially medicinal plants, 12 samples of *Hypoxis hemmerlicoides* corms in the reserve were studied under controlled conditions using different parameters (the flooding effect, the drought effect and the annual rainfall pattern). It can be concluded that plants tend to protect themselves in ever-changing climatic conditions; the cytotoxicity levels rise when conditions are adverse, resulting in creation of a barrier by these plants to save themselves against destruction. For future studies, anti-microbial, chemical profiling and phyto-chemistry studies need to be undertaken to determine the effects of varying climatic conditions on the chemical constituents of medicinal plants.



Assessing effect of African elephant (*Loxodonta africana*) on the African baobab trees (*Adansonia digitata*) of the Mapungubwe National Park, Limpopo Province, South Africa – Dellan Steven Khosa

Mapungubwe National Park was created to preserve biodiversity and cultural heritage in South Africa and is an open system park with a high population of African Elephant (*Loxodonta africana*) as well as the iconic baobab tree (*Adansonia digitata*). The potential for elephant damage is therefore of concern to South African National Parks (SANParks). The study was carried out in 2019 to assess the impact of elephant on baobab in Mapungubwe National Park and address four questions: 1) to determine the baobab density and spatial distribution and compare the structure of the baobab population across the two sections of the Mapungubwe National Park; 2) to determine whether elephant damage caused death of the baobab trees and the proportion of baobab mortality between 2005-2009; 3) to determine the extent of elephant damage (debarking and dieback) within the eastern and western section, and which size class of the tree is most affected across the two sections of the park; and finally 4) to determine whether trees could survive to 2019 if they were 100% debarked in 2005. Results showed that 8% of baobab trees were found dead in 2019. Moreover, of 18 trees that had 100% debarking in 2005, only one (equal to 6%) was found dead in 2019. The results furthermore showed that debarking has increased considerably since 2009. The majority of trees (43%) in 2009 were in Class 2 (1-26% debarked), while in 2019 the majority of trees displayed 76-100% debarking (45% in Class 5). There is insufficient evidence to prove that all baobab mortality between 2009 and 2019 was due to elephant impact. The results suggest that the overall dieback damage remained minimal while debarking damage has increased between 2009 and 2019.