

used. The project further determines the nature of the elicitor-active fractions.

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### A comparative floristic analysis of peri-urban and rural homegardens in North-West, South Africa

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The Tswana *tshimo* (homegarden) is an Indigenous Knowledge System. However, there is a general belief that gardens of indigenous cultures are spontaneous and disorganised. This study considers this by comparing peri-urban and traditional rural homegardens in North-West to (1) assess the useful-plant diversity, (2) determine the origin of the species (alien or indigenous), (3) examine the different use categories, and (4) document the positions of plants within indigenous gardening systems. We conducted a survey of 61 homegardens from rural and 51 from peri-urban areas in North-West. A total of 183 useful plants species belonging to the 66 plant families were recorded, comprising 64 medicinal, 80 food, 23 shade, and 16 hedge plants. Few of these useful plant species (26%) are indigenous (semi-wild domesticates), while the majority (74%) are aliens (naturalised and cultivated exotics). The five most often cultivated plant species (50–70% frequency) were *Prunus persica*, *Schinus molle*, *Ligustrum lucidum*, *Zea mays* and *Vitis vinifera*. A comparison between rural and peri-urban gardens revealed that rural gardens have a higher mean species richness (51 compared to 39), and 54% of the gamma diversity are alien in contrast to the 67% of peri-urban gardens. Nearly 63% of the plants from the peri-urban homesteads were cultivated, whereas 46% of the species from the rural gardens occur naturally. No significant difference was evident with regard to different use categories. Homegarden floras are collectively planted and positioned according to cultural practices passed down generations, resulting in a common layout plan which is repeated in the gardens of rural areas, but is absent from the peri-urban areas.

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### Establishment of *Artemisia* sp. plant cell suspension cultures

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Malaria continues to pose major health threat to Sub-Saharan Africa. The sesquiterpene lactone artemisinin produced in the plant *Artemisia annua* has shown to be effective against quinoline resistant malaria strains. In an effort to improve large scale production of this compound in plant cell systems, we undertook to establish plant cell suspension cultures of *A. annua* for production of artemisinin. We simultaneously developed a protocol for producing *Artemisia afra* cell suspension culture. *A. afra*, an indigenous African plant, lacks the key enzyme to convert artemisnic acid to artemisinin. Future work will involve elicitation of artemisinin and its precursors in cell suspension cultures, and potential manipulation of *A. afra* cell suspension cultures to produce artemisinin.

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### A micropropagation protocol for *Siphonochilus aethiopicus*, an endangered South African medicinal plant

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*Siphonochilus aethiopicus*, also known as wild ginger, is an indigenous plant to South Africa widely known for its medicinal properties. However it has become endangered due to over harvesting. Micropropagation of plants *in vitro* was developed in order to bring back the species from the verge of extinction. To address this, a combination of parameters which included callus induction of rhizomes, corms and leaf bases as explants, in various media compositions, and a plant regeneration frequency formed the basis of evaluation. In this presentation we report that plant regeneration was achieved via somatic embryogenesis and organogenesis depending on the explant used. However, the rate of callus formation varied dramatically amongst the cultured explants.

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### Efficacy of selected plant extracts against fungal pathogens of onion

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Fungal diseases may cause 75–100% onion crop losses per year. Treatment of the fungal infections depends on the prophylactic application of conventional fungicides which is labour intensive and expensive. They also pose detrimental effects to the environment and may cause cancer in humans when exposed to these fungicides. Plant extracts used as a bio-control agent has shown comparable activity to those of fungicides against fungal and bacterial diseases on crops. Leaf extracts of *Azadirachta indica*