

2002 discovery of an isolated *Brachystegia* woodland (~15 ha) in the Soutpansberg (South Africa) suggests a refugium separated by 240 km from the continuous *miombo* woodlands elsewhere in Africa. A second vicariant woodland (~32 000 ha) exists in southern Mozambique, isolated by 540 km from the continuous *miombo* woodlands. The future warming and increased precipitation projected for the region favours the expansion of the Soutpansberg *miombo* relict into the surrounding woodland, especially threatening biological communities at the savanna-grassland interface. In contrast, a resurgence of coastal forest at the expense of the Mozambican *Brachystegia* woodland is expected. Understanding the historical spatial dynamics of vegetation plays a crucial role in the ability to predict community responses and biodiversity consequences to future global change. The presence of these insular relicts raises research questions relating to i) the mechanism of their isolation, ii) their floral representivity and diversity, iii) their persistence, iv) their behaviour under the projected conditions of global climate change and v) their possible role in climate change detection and response monitoring studies.

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Evaluation of bacterial and plant-based expression systems for recombinant foot-and-mouth disease VP1 protein production

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Bacterial expression systems are one of the most effective expression systems for producing commercially important proteins due to low cost, high expression levels and well defined purification procedures. However, due to certain limitations, such as the inability to perform post-translational modifications and the exposure of heterologous protein(s) to cellular proteases, alternative expression hosts need to be sought to mitigate these challenges. Plants are fast becoming feasible and attractive expression systems for foreign proteins. Thus the need arises to adopt an empirical approach on a "protein-by-protein basis" when evaluating both bacteria and plants as expression systems as very often these systems are used in conjunction with each other. The main purpose of this study was to use the major immunogenic capsid protein VP1 from the foot-and-mouth disease virus (FMDV) as a model protein to evaluate its expression level in both a bacterial and a plant-based expression system. The full-length VP1 coding sequence was first expressed in *Escherichia coli* producing an antigenic fusion protein which could be effectively purified and separated from the bacterial background protein complement. Subsequently, VP1 was transiently expressed in the endoplasmic reticulum (ER) of *Nicotiana benthamiana*. A protein resembling VP1 could be detected using immuno-blotting using an antiserum raised against FMDV. Findings of this study showed that a larger VP1 content amassed in *E. coli* most likely due to more effective downstream protein enrichment and purification whereas production of VP1 in tobacco plants was rather low when compared to the *E. coli* system. Overall, this study has shown that transient VP1 expression in tobacco is possible, but still requires substantial optimization, such as investigating the role of proteases in VP1 production, to compete with the bacterial expression system.

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A phytochemical profile of *Aloe marlothii* in the Nobody area of the Capricorn District, Limpopo Province

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It is well documented that plant utilisation by Bapedi traditional healers is very specific in the parts utilised, as it is believed that some parts are more potent than others. Thus in support of this belief there is a distinct preference for subterranean parts as opposed to aerial parts. To test this hypothesis or belief a study was conducted on *Aloe marlothii* in the Nobody area of the Capricorn District, Limpopo Province. Species selection was based on the Bapedi custom to utilise both roots and leaves to treat various ailments. Plants were selected within a 1 km² area, on the same soil strata. Leaves and roots were sampled from 20 large plants (stem length > 2 m), and 20 smaller plants (stem length < 1 m). Green leaves, from the crown, and dried leaf remnants, enveloping the stem, and pointing in the four magnetic directions were sampled, as there is a belief among Bapedi traditional healers that material from the east and west is the most potent. Green and dry leaves were compared to ascertain the degree of congruence with regard to their phytochemical profile. Root sections (20 cm segments) radiating from the plant as a point of origin were collected, as a conservation strategy, to validate if roots further from the plant exhibit equal potency compared to those in closer proximity to the plant. Crude extracts were made and phytochemical profiles determined. The results of this investigation are of considerable importance as root structure and development forms the basis of successful plant establishment and ultimately ecosystem conservation.

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Ethnobotanical inventory of medicinal plants used by Vhembe traditional healers in the management of weight loss amongst HIV/AIDS patients

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Acquiring immune deficiency syndrome which is caused by the human immunodeficiency virus (HIV) is a devastating epidemic in Africa and South Africa has been reported to have the fastest growing rate of HIV/AIDS epidemic in the world. Weight loss is one of the symptoms amongst HIV/AIDS patients. HIV/AIDS is well known for causing severe weight loss condition known as wasting. Loss of body cell mass carries a particularly poor prognosis, and aggressive measures should be taken to stop such depletion. About 80% of rural communities across developing world depend on medicinal plants for their healthcare needs. The study therefore aimed to investigate the medicinal plants used by Vhembe traditional healers in the treatment and management of weight loss amongst HIV/AIDS patients. It was found that 65% of medicinal plants used in the treatment of weight loss amongst HIV/AIDS patients were trees whereas 26% were shrub and 9% were herbs. Roots (46%) contributed the highest percentage in terms of plants parts used followed by bark (23%). Leaves, fruits, seeds, whole plants and stem portion contributed the remaining 31 percent. The results showed that traditional healers are playing a role in management of HIV/Aids symptoms and their medicinal plants can form a basis for new drug development.

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