

Domestication of the wild African vine *Cryptolepis sanguinolenta* as a cash crop for smallholder farmers in Africa: GhanaMedPlants

Cryptolepis sanguinolenta (CS) is a climbing vine found throughout eastern and central sub-saharan Africa (Fig 1). The roots of CS are collected from the wild for the anti-malaria compound cryptolepine (Dzotsia, 2007; Paulo and Houghton 1995). In Ghana these roots are delivered to the official, government-regulated Herbal Medicine industry for extraction and inclusion of cryptolepine in herbal concoctions. Surveys and continued interactions, undertaken by our collaborator Dr J. Naalamle Amissah, Uni. of Ghana, with key players along the value chain (including medicinal plant collectors, middlemen, manufacturing companies and government regulators) have confirmed that CS is sourced solely from the wild (Amissah et al. 2016). Consequently CS populations have declined dramatically, with CS plants becoming increasingly more difficult to find, putting the supply of this raw material at considerable risk. Working with Dr Amissah we are exploring the potential to domesticate CS as a crop for smallholder farmer cultivation.



Fig. 1: *Cryptolepis sanguinolenta*



Fig. 2: Callus produced from leaf tissue on the different callus induction

From the 13 March to the 22 July 2016 Dr Amissah undertook a Cambridge Africa CAPREx Fellowship at NIAB, Cambridge. During this fellowship Dr Amissah tested the ability of different genotypes of CS to produce callus and regenerate plants on a range of plant tissue culture media. One media in particular resulted in the production of callus with significantly higher levels of cryptolepine (Fig 2). Plants regenerated from this callus (Fig 3) are being tested for their cryptolepine content.

A collection of CS plants gathered from the wild is being assessed for morphological traits relevant for domestication of CS as a smallholder farmer crop. These plants were selected by Dr Amissah from eight sub-populations, each represented by 17 to 29 individuals, located within the Ashanti (Asuafo-Sekyere West), Eastern (Hwehwee-Ata n' Ata, Hwehwee-Yaw Gyeni, Kwahu Abene, Kwahu Pepease, OgenyaKrobo/Krobo Gyekiti) and Brong Ahafo (Dromankese Nkoranza North) regions of Ghana.

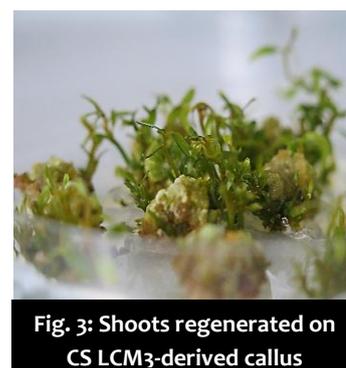


Fig. 3: Shoots regenerated on CS LCM₃-derived callus

References: Amissah, J.N., Spiller, M., Oppong, A., Osei-Safo, D., Owusu-Darko, R., Debener, T., Danquah, E.Y., and Addae-Mensah, I. (2016). Genetic diversity and cryptolepine concentration of *Cryptolepis sanguinolenta* (Lindl.) Schltr from selected regions of Ghana. *Journal of Applied Research on Medicinal and Aromatic Plants* 3, 34-41. <http://dx.doi.org/10.1016/j.jarmap.2015.12.005>; Dzotsi, E. Y. (2007) *Extraction of alkaloids from the stem of the plant Cryptolepis sanguinolenta (LINDL.) schltr* (Doctoral dissertation, University of Cape Coast); Paulo, A., Gomes, E. T., & Houghton, P. J. (1995). New alkaloids from *Cryptolepis sanguinolenta*. *Journal of Natural Products*, 58(10), 1485-1491.