



Strategies towards sustainable bark sourcing as raw material for plant-based drug development: a case study on *Garcinia lucida* tree species

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Original submitted in on 31st May 2017. Published online at www.m.elewa.org on 31st July 2017
<https://dx.doi.org/10.4314/jab/v115i1.10>

ABSTRACT

Objectives: To appraise the amount of sustainable bark stripped and time to complete bark recovery as basis for sourcing of raw materials for plant-based drugs

Methodology and Results: A two-year experiment was conducted and several local harvest practices were tested on *Garcinia lucida* (named Essok in Boulou language). For each harvest method, 20 healthy trees were selected and harvested. Tree health was monitored every month and the total bark regrowth was calculated using planimetric techniques. The mean bark mass was 2.54 kg/tree (range, 0.5-15 kg/tree; SD, 2.40; n=80) and increased with bark thickness, ranging from 1.28 kg tree⁻¹ (0.4-0.8 cm thin) to 4.38 kg tree⁻¹ (1.2 – 1.8 cm thick). The mean rate of bark regeneration was 787±601 cm²/tree/year (range, 452±166-1870±1042 cm²/tree/yr; n=53) and positively correlated to harvest method (p < 0.01) and surface debarked (p < 0.05). Standard Deviation values were higher, suggesting that each tree had its proper bark growth rate patterns, and that bark regrowth process may be tree-specific and strongly correlated to intrinsic factors.

Conclusions and application of findings: Peeling off pieces of bark using a machete and debarking over 1/3 of the stem circumference at breast height, once every 3 years for small trees or every 5 years for large trees, has been found to be the best harvest method for *G. lucida* species. This is to tackle the challenge of availability of raw material and harvest sustainability. As the increased trade and processing of bark has shifted from subsistence use to large-scale commercial use, posing a threat to supply of raw material and species conservation, sustainable harvesting methods should constitute important tools of the guidelines on good collection practices for medicinal plants that would help to ensure safety and quality at the first and most important stage of the harvest of medicinal plants. This study has provided information on the species-specific bark harvest prescriptions to assist in developing such guidelines, thereby promoting the processing and trade of the most valued medicinal species for plant-based drug development in Africa.

Keywords: *Garcinia lucida*, medicinal plant, bark, raw material, sustainable bark stripping.