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Determination of growth stages and seedling structures associated with slow growth of the shea butter tree (*Vitellaria paradoxa* C. F. Gaertn.)

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ABSTRACT

Introduction and objectives of the study: The shea tree, *Vitellaria paradoxa*, is of much dietary and socio-economic importance, which has made it the priority species for domestication in the semi-arid tropics. However, among some of the disturbing characteristics of the species under cultivation is its slow emergence and low growth rate. Admittedly, under favorable conditions, the seed of *Vitellaria* sprouts easily. However, its cryptogeal germination pattern makes the false radicle to grow downwards, form the shoot somewhere along its length which subsequently appears above ground. The time lag between the sprouting of the false radicle and emergence of the plumule above ground is long. Unfortunately, information on the relative period of growth of seedling structures which could indicate the relative contributions of each structure to the long time it takes the plumule to emerge above ground is not available. It was therefore considered imperative in this study to monitor the germination and emergence processes of shea seedlings and identify which stages or seedling structures are responsible for emergence delays in this very important species. The knowledge obtained would contribute to efforts

towards overcoming the characteristic slow emergence of *Vitellaria* seedlings.

Methodology and results: Duration and growth of seedling structures of *V. paradoxa* of three accessions– Makurdi, Jalingo and Kano – were investigated at Makurdi, Nigeria, in 2007. Ten (10) seeds per accession were planted in 7-litre plastic containers filled with weathered saw dust at the rate of one seed/container, with each seed representing a replicate. The experiment was a completely randomized design (CRD). Weekly observations for germination and growth of seedling structures were done on the seeds or seedlings. Results of analysis of variance indicated that accessions differed with respect to days to appearance of swelling, length of radicle at which swelling appeared and shoot length above ground at the time of emergence. Similarly, the percentage of seedlings that sprouted during the first week of observation differed in favour of seeds from Makurdi (80%) and Kano (60%), while seeds from Jalingo began sprouting after two weeks of planting. Seedling emergence spanned from 51-79 days. It was evident that the accessions followed the pattern of germination and growth associated with *Vitellaria*. However, time to sprouting, formation of swelling, splitting of swelling for shoot formation and formation of shoot to its growth and emergence could account for the long time it takes for the seedling to emerge above ground.

Actual or potential application of findings: Results of this study will help in focusing future efforts at overcoming seedling emergence delays in this species to the identified specific seedling structures and stages.

Key words: Accessions, duration, growth, seedling structures, *Vitellaria paradoxa*