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Mkuyamba Vincent (1997). Virus identification and elimination by meristem-tip culture in Zambian cassava (*Manihot esculenta* Crantz) landraces. (Supervisor: Dr. K. Nichterlein).

The production of cassava in Zambia is concentrated in the Western, North Western, Northern and Luapula provinces. Pests and diseases have been listed among the major constraints to increased production of the crop. The present study was done to identify the viruses attacking cassava in Zambia and to evaluate the efficacy of heat treatment of meristem donor plants in regenerating virus-free cassava plants through meristem-tip culture. Cassava leaf samples bearing virus disease symptoms were collected from different locations and tested by triple antibody sandwich enzyme linked immunosorbent assay (TAS-ELISA) and immunosorbent electron microscopy (ISEM). Meristem-tips obtained from heat treated mother plants (37°C for 4 weeks) were cultured on a modified Murashige and Skoog (MS) medium. Indirect (TAS)-ELISA confirmed the presence of the geminivirus, African cassava mosaic virus (ACMV) in all varieties tested. Additionally, in the variety "Kapumba" a second and only recently discovered virus called cassava Q virus (CQV), was detected by ISEM. Based on the number of shooting meristems, results revealed 40% higher shoot induction on meristem-tips derived from heat treated mother plants compared to meristem-tips obtained from untreated donor plants. On the other hand basal callus formation was lower for meristem-tips arising from heat treated donor plants in comparison to the meristems arising from untreated mother plants. The study shows that heat treatment of meristem donor plants does enhance shoot regeneration of cassava plantlets as well as improve virus elimination. Lower basal callus formation allowed for better shoot growth and plantlet regeneration.