3.4.1 Mwenebanda, Branco M. L. (2003). Potential use of dormant buds as ex-plants and callus culture for micropropagation of ginger (*Zingiber officinale* Roscoe). (Supervisor: Dr. D. M. Lungu).

The study was carried out in the Tissue Culture laboratory of the Crop Science Department at the School of Agricultural Sciences of the University of Zambia from September, 2001 to May, 2002. In vitro regeneration and growth capability of two ginger varieties (China and MES 4) from Malawi was investigated on three different MS media:(1) 1.5 ppm BAP + 1.0 ppm NAA, (2) 3.0 ppm BAP + 1.5 ppm NAA and (3) 3.0 ppm BAP + 1.5 ppm NAA + 0.2 ppm GA3 using three different types of explants; (1) sprouted buds, (2) dormant modified buds which were dipped in 10.0ppm GA3 for a day and (3) dormant unmodified buds. Two experiments were conducted; (1) direct explant culture in which the cultures were incubated for sixteen hours of light and eight hours of darkness and (2) callus culture in which the cultures were incubated in complete darkness for twenty-four hours. Varieties had no significant influence on most of the parameters evaluated. The type of media significantly influenced days to shooting and rooting and shoot height in light incubated experiment. The addition of GA3 to media delayed shooting and rooting in light incubated experiment but produced taller plantlets compared to the other media in both experiments. In the light incubated experiment, sprouted buds started shooting and rooting earlier than the others. These sprouted buds had lower contamination rate; had taller shoots and higher regeneration rate than the other explants. In the dark incubated experiment, explants did not have influence on contamination rate, roots per shoot and external environment survival rate but they significantly increased regeneration rate, shoots per explants and shoot height and reduced days to shooting and rooting. In both the experiments and for all the measured parameters there were no differences between dormant modified and dormant unmodified buds. The dark incubated explants did not yield callus as was expected but produced shoots just as those incubated in light. There were statistically significant differences between the dark and light incubated experiment for days to shooting and rooting and regeneration rate. Explants incubated in light started shooting and rooting earlier and had higher regeneration rate than those in dark. Dormant ginger buds have shown capacity to regenerate in vitro just like sprouted buds.