DII 02 Study on seed germination potential on Cardamom (*Elettaria cardamomum L. Maton)* under *in vitro* conditions

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Cardamom (*Elettaria cardamomum*) belongs to the family *Zingiberaceae* has great commercial value as a spice in Sri Lanka. Due to the presence of hard seed coat cardamom has low seed germination potential and it takes more than 3 months in natural conditions. This study was conducted to investigate the potential to improve the seed germination by applying different mechanical, physical and chemical treatments and to develop a cost effective and rapid seed germination method in *in-vitro* conditions. Complete randomized design with ten replicates was used for the study. The seeds of cardamom were treated with 40 different seed treatments and surface sterilized by using 20% Clorox. MS basal medium was used without plant growth regulators and solidified by using 0.6% agar. Anova test showed that there were significant effects at $p<0.05$ level on seed germination of cardamom seeds with different seed treatments. According to the results 50% nitric acid (HNO_3) for 15minutes treatment (T_7) was the best to obtain higher number of germinated seeds (90%) within 6weeks upto 0.6cm height. The second and third best treatments were 75% HNO_3 for 15minutes (T_4) and 75% HNO_3 for 10min (T_3) with 80% and 65% seed germination percentages respectively. Highest germination percentage (60%) was recorded by 50% sulfuric acid (H_2SO_4) for 5 minutes (T_{23}) but it showed low germination percentage (less than 20%) until eighth week and then increased rapidly up to (60%). Treatment 23 is suitable for production of higher number of plants however germination time was too long. This experiment showed that HNO_3 was the best to induce seed germination of *E. cardamomum* in *in-vitro* conditions. Accordingly all acetic treatments, *Hydrochloric acid* (HCl) treatments, alcohol treatments and hot water treatments are not successful. These results will beimportant for plant breeders and farmers who cultivate cardamom commercially.

Keywords: *Elettaria cardamomum, seed germination, in-vitro condition,* MS basal medium