

EFFECTS OF PLANT FACTORS ON *IN VITRO* SEED GERMINATION OF TEA (*Camellia sinensis* (L) O. Kuntze)

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Effects of seed weight, seed maturity and their interactions on *in vitro* seed germination were studied for the cultivars TRI 2024 and Assam 4/10. Decoated seeds of each category were cultured in MS medium supplemented with 3 mg/l Benzyl amino purine (BAP) and 0.5 mg/l Indol-3-butric acid (IBA) with 3% w/v sucrose. Response of three types of explants, i.e. embryos with full cotyledons, embryos with half cotyledons and isolated embryos was studied, for seeds of the same maturity level in two seed weight classes in cultivar TRI 2024. Data were analyzed by categorical data analysis (CATMOD) procedure using SAS computer program.

Effects of seed weight, seed maturity and type of explant on *in vitro* seed germination varied between the two cultivars tested. In TRI 2024, seed maturity had a significant ($p < 0.05$) effect on *in vitro* seed germination whereas in Assam 4/10, seed weight showed a significant effect. In TRI 2024, plantlet formations under *in vitro* conditions increased with increasing seed maturity, being 63% at fully mature stage and only 8% at immature stage. In Assam 4/10 plantlet formations under *in vitro* conditions increased with increasing seed weight, being 48% for seeds above 2.5 g and 36% for seeds below 2.0 g.

There was a significant ($p < 0.05$) effect of the type of explant on plantlet formation, both in moderately mature seeds above 2.25 g and seeds between 1.5 g – 2.25 g in TRI 2024. In moderately mature seeds above 2.25 g, 60% plantlet formation was achieved when embryos with half cotyledons were used and it was 60% with seeds between 1.5 g – 2.25 g. Seedlings generated from embryos with full cotyledons and embryos with half cotyledons were of similar vigor. Even though isolated embryos responded quickly compared to the other two types of explants, there was no subsequent growth in those explants, whereas other seedlings continued to have a growth. Therefore, it was concluded that the best type of explant for *in vitro* seed germination in TRI 2024 is embryo with half cotyledons.

There was a high degree of morphological variation among the *in vitro* raised seedlings, irrespective of the clone, maturity level, seed weight and the type of explants. But, there was no relationship between morphology of the plantlets and their vigor. As morphogenesis under *in vitro* conditions is regulated by phytohormones, through a quantification of endogenous hormonal content in cotyledons and embryos, a correlation between the concentration of specific phytohormones and the morphogenic responses of *in vitro* grown tea seedlings could be established.