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Farmers’ and academia’s views”

***In vitro* propagation of *Capsicum annuum* L. (Chili pepper): effect of seed sterilizing chemicals, plant parts, and growth hormones on the rooting and shooting performance**

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Abstract

Capsicum annuum L. (Chili pepper) is an annual plant cultivated for its medicinal and food flavoring use. In Ethiopia, it is mainly cultivated in the southwestern part of the country where it represents the most important source of income for smallholder farmers. However, the crop in this area is now facing drastic problems in its seedling formation and maturation due to viral, fungal, and bacterial diseases, leading to an alarming yield decline. A way to solve this problem is by producing pathogen-free explants using *in vitro* plant propagation. This study aims at developing an efficient and reliable protocol for surface sterilisation, *in vitro* establishment, and mass propagation of aseptic cultures of chili pepper. The experiment was conducted at the Wondogenet College of Forestry and Natural resources, Ethiopia. To carry out the experiment seeds of chili pepper were obtained from the Halaba special district, southern Ethiopia. Various surface sterilisation agents at different concentrations and treatment time duration (Sodium Hypochlorite and/or Calcium Hypochlorite:2.5–10 % and control), time:5–15 min) were tested for *in vitro* establishment. For *in vitro* mass propagation the effects of two plant growth regulators (PGR) on rooting and shooting performance at different concentrations (IBA and BAP at 0.5–3.0 mg/l, and control in MS (Murashige and Skoog, 1962) as basal culture media) were assessed using various *in vitro* plant parts (apical shoots and nodal segments). Throughout the experiment parameters such as level of surface sterilisation, germination rate, shoot length, leaf number, roots, and morphological abnormalities were collected and analysed to determine what sterilisation agent and PGR are effective in the mass production of *in vitro* chili pepper. Preliminary results show that chili pepper seeds are able to germinate under *in vitro* conditions after surface sterilisation producing both roots and shoots. Further evaluation will determine the effects of the PGR on the growth and development of chili pepper for their mass propagation. The development of an efficient mass propagation protocol of aseptic chili pepper plantlets will ensure the availability of pathogen-free germplasm for Ethiopian farmers who are dependent on this crop for their subsistence.

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