SUMMARY

In vitro cultivation and conservation of papaya germplasm (*Carica papaya* L.)

Papaya (*Carica papaya* L.) is the third most consumed tropical fruit worldwide, which is considered one of the most economically important. However, this crop is affected by numerous diseases which can reduce production and cause the death of plants; in addition, it presents problems in its reproduction. Therefore, *in vitro* culture and cryopreservation represent tools for massive multiplication of elite plants and for the long-term storage of germplasm.

The objective of this work was to develop a protocol for the *in vitro* culture and micropropagation of papaya variety Maradol germplasm to establish the conditions that allow the cryopreservation of apical shoot tips and calluses.

After *in vitro* establishment, the plants were multiplied using different concentrations of 6-benzylaminopurine (0.2 and 0.5 mgL^{-1}) and naphthaleneacetic acid (0.2 and 0.5 mgL^{-1}) and their combination, to determine the most effective media composition for this stage. Likewise, different culture media (MS+ 0.2 mgL^{-1} BAP and basal MS) were used for regeneration of the minimum viable size of apical meristems isolated from plants *in vitro.* For cryopreservation of apical meristems, the effect of different exposure times to the cryoprotective solutions PVS2 and PVS3 was studied. In the case of calluses, the response of the tissues to cryoprotective solutions was evaluated using 5% DMSO and 5% DMSO + 0.75 M sucrose.

According to the statistical analysis, the culture medium recommended for the micropropagation of papaya seedlings was the MS medium supplemented with 0.2 mgL^{-1} of BAP; while the basal MS medium was the one that favored the culture of meristems isolated from *in vitro* plants with a minimum viable size of 2 mm. The results indicate that the treatment with the PVS2 cryoprotective solution for 45 min was more effective for the regeneration of papaya apical shoot tips after the cryopreservation. Likewise, the 5% DMSO + 0.75 M sucrose cryoprotective solution favored callus recovery and decreased the oxidation before and after cryopreservation.

Key words: Papaya, 6-benzylaminopurine, cryopreservation, droplet-vitrification, PVS2, DMSO.