Somatic embryogenesis is key tool for plant breeding. Case *Agave tequilana* Weber var. azul

Carlos Ramirez-Serrano[1], Alejandro Angeles-Espino[1], Lilia Paredes Gutierrez[2], Alberto Valencia-Botin[3] y Gil Virgen-Calleros[1]. [1]CUCBA, Universidad de Guadalajara, Camino Ing. Ramon Padilla Sánchez, 2100, 45110 Zapopan Jal. México. [2]Instituto Nacional de Investigaciones Nucleares, La Marquesa Ocoyoacac, Estado de México. [3]CUCIENEGA, Universidad de Guadalajara, Ocotlan Jal. Corresponding autor cramirez@cucba.udg.mx

Key words: Agave, somatic embryogenesis, genotype

Introduction. The most applied process in plant improvement is genetic transformation, although the antagonist or inadequate social opinion. *Agave tequilana* Weber var. azul is the unique source of carbohydrates to industrialize tequila 100% according with the Appellation of Origin and the Mexican Polices and Regulations (1), normally the plantlets are produced by asexual reproduction, and consequently there are several disease and pathogens that could be considered as endemics; and reduced genetic variation. Under this sight, our research focused in alternative approach such mutagenesis in order to select desirable genotypes, considering that each plant arises from a single mutated cell. In the other hand, Is remarkable that plant regeneration have been shown two types of genotypes, normal and recalcitrant producers of somatic embryos (2), likewise in *Agave* spp., which are not capable to germinate and became into plants. The aim of this research was to achieve plants via somatic embryogenesis generated from different genotypes and tissues of *Agave tequilana,* before apply mutagenesis.

Methods. An evaluation was done utilizing explants from different genotypes and plant growth regulators as described before (3), and MS culture medium modification (4). First was treated the tissue for induction of somatic embryogenesis during two or three weeks depending on the genotype. Later were exposed to media lacking of plant growth regulators in order to maturate the somatic embryos until germination. The competence to regenerate after mutagenesis treatment and the variation acquired are under evaluation.

Results. This approach shows wide competence since arisen somatic embryos from roots and/or leaves (Figure 1), depending on the genotype; that competence was induced inter and intra families of pine trees (5); is remarkable that the embryos developed normally in the modified medium (Table 1), on which we can affirm the embryo aberrations that are considered as genetic concerns, are only physiological hitches since the medium normally applied is inadequate to provide the key requirements to achieve normal somatic embryos.

Fig.1. Somatic embryogenesis in Agave tequilana. A) Induction (esc = 5 mm); b) Maturation (esc = 1 cm).

Table 1. Achievement of somatic embryogenesis in *Agave tequilana* Weber var. azul testing explants and culture medium.

Culture Medium	Competence on	Aberrations
Modified	Root or /and leave	No
Normal	Root or leave	Yes

Conclusions. Somatic embryogenesis is process capable to be a tool for genetic breeding in *Agave tequilana* considering that any genotype can be regenerated.

Acknowledgements. To CONACyT Mexico for the PhD grants.

References.

1. DOF. (2006). Norma Oficial Mexicana NOM-006-SCFI-2005, *Diario Oficial de la Federación,* Mexico. 06/01/2006. 1-21.
2. Suhasini K, Sagare P, Krishnamurthy K. (1996). *In Vitro Cell.Dev.Biol*. 32: 6-10.
3. Soltero R, Nieto MF, Ramirez C. (1999). Embriogénesis somática en *Agave tequilana* Weber. *VIII Congreso Nacional de Biotecnología y Bioingeniería.* SMBB. Huatulco Mexico. September, 1999. 548.
4. Ramirez C, González V, Pelayo O. 2007. Method of producing and establishing embryogenic tissue from multiple pine genotypes (Genus *Pinus*). Granted Patent NZ35553. IPONZ. New Zealand. 1-36.
5. Ramirez C,. 2007. Method for producing somatic embryos of pine trees (Genus *Pinus*). Granted Patent NZ521144. IPONZ. New Zealand. 1-30.