Name	Counterpart	Title
Zulkarnain (UNJA), Elis Kartika, Lizawati Lizawati (PTPN VI)	**Z01**	Investigation on the micropropagation of oil palm (*Elaeis guineensis Jacq.*) by somatic embryogenesis

The general term "tissue culture" refers to the *in vitro* culture of various types of plant parts including stems, leaves, roots, flowers, callus, cells, protoplasts and embryos. These parts, known as explants, are then isolated from the *in vivo* condition and cultured on an artificial sterile medium where they regenerate and differentiate into new intact plants. A more specific term "micropropagation" indicates the application of tissue culture techniques to the plant propagation system starting with very small plant parts (explants) grown aseptically in a test tube or other similar containers. However, in practice, these two terms are often used interchangeably to describe any plant propagation technique involving aseptic culture

Micropropagation is widely used by many private and publicly funded companies around the world for mass production of plants. Many plantation crops, such as *Theobroma cacao*, *Camelia sinensis*, *Cocos nucifera*, *Coffea arabica* and *Phoenix dactylifera*, have been successfully propagated using tissue culture. This technique has also been used for the clonal propagation of oil palm (*Eleis guineensis*) although with varied degrees of success.

The objective of this study was to develop an efficient *in vitro* protocol for clonal propagation of oil palm through somatic embryogenesis.

The investigation was started by preparing explant materials, culture medium and culture environment. The plant materials used were plumulae and radicles from sprouts of the DxP Sriwijaya variety obtained from Seed Processing Unit PT Binasawit Makmur, Palembang. The medium used was the MS composition supplemented with vitamins, myo-inositol and sucrose and with the pH set at 5.8±0.02. The medium was then solidified with agar and autoclaved at 17.5 psi and 121oC for 30 mins. Cultures were maintained under 1500 lux, L:D 16:8 and 25±1°C.

There were 2 trials in this investigation: 1) the eradication of explant contamination by different sterilization techniques (5 sterilization protocols were tested) to obtain clean cultures and, 2) the effect of different levels of 6 benzylaminopurine (0, 2.5, 5.0, 7.5 and 10 mg L^{-1}) on explant growth and on the development of embryogenic callus.

The results showed that, even when the explants were from sprouts germinated under controlled conditions, contamination was still a major problem affecting the success of the culture. However, this problem was avoided when we treated the explants with 0.1% $HgCl_2$ for 30 minutes following fungicide application. In addition, the use of plant growth regulator, particularly 6 benzylaminopurine, up to 10 mg L^{-1} was not effective in boosting boost explant growth or embryogenic callus formation.

In the light of our findings, we suggest: 1) applying fungicide plus 0.1% $HgCl_2$ for 30 minutes as the sterilization protocol and, 2) carrying out further investigations by increasing the 6 benzylaminopurine concentration along with the use of auxin to induce embryogenic callus formation leading to somatic embryogenesis.

Figure 1. Ineffective sterilization protocol resulting in serious explant contamination, mostly by fungi.

Figure 2. A = explant at culture initiation, B = 10 weeks after culture initiation, C = 14 weeks after culture initiation.