

The productivity of conventional cultures in liquid media is limited due to the size of flasks or shakers used. The MPOB Fast Transfer Technique (MoFaTT) (Tarmizi and Zaiton, 2005) allows cultures in less than 300 ml working volume of medium while the Two-in-One MPOB Simple Impeller (2-in-1 MoSLIM) and Simple Impeller with Fast Transfer Technique (SLIM-FaTT) (Tarmizi and Zaiton, 2006a,b) were designed for medium volumes of 300 ml to 1 litre. For scaling up, a commercial bioreactor can be used. A bioreactor is expensive and the preparation for culture inoculation tedious. To obviate the problems, the MPOB Modified Vessel (MoVess) was developed. This larger Vessel is more economical for larger scale production liquid culture systems (of 1 to 2 litres working volume).

## NOVELTY OF THE TECHNOLOGY

Economical and practical method for culturing cell aggregates in liquid media for larger scale production.

## DESCRIPTION

The MPOB Modified Vessel (MPOB-MoVess) is a larger vessel for scaling up liquid culture. This vessel consists of an agitation shaft, a magnetic stirring bar, plastic impeller for agitation and perforated tubings for aeration process in the medium. Two long tubings are attached to the side arms on the external surface of the vessel which is attached to a simple pump to provide for aeration. The whole vessel is then placed on a magnetic stirrer for agitation (Figure 1).

## OBSERVATION

Fresh weight increments of 5- to 35-fold were obtained for cultures of three selected oil palm

\* Patent drafting in progress, ref Patent Agent: Shearn Delamore & Co.: SD/2957017/ZRS.



Figure 1. MPOB Modified Vessel (MoVess) for liquid tissue culture system.

clones after 30-60 days in MoVess. Clone E 110 increase 35-fold after 40 days (Figures 2a and b).

## BENEFITS

### Advantages

- Simple and economical system for scaling up liquid tissue culture;
- Simpler inoculation than in a normal bioreactor;
- The system can be modified so that there is no need to move the cultures to and from the laminar flow cabinet for maintenance. Replenishment of medium done on site. This will also reduce risk of contamination;
- The system can be applied to any liquid culture system for other crops or animals; and
- Potential for automation.



Figure 2. (a) Cultures in MoVess (b) cultures from clone E 110.

## REFERENCES

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TARMIZI, A H; NORJIHAN, M A; SAMSUL KAMAL, R; ZAITON, R and CHEAH, S C (2003). Mass propagation of oil palm planting materials using liquid culture and bioreactor technology. *Proc. of the 2003 PIPOC International Palm Oil Congress - Agriculture Conference*. MPOB, Bangi. p.130-144.

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