

Liquid cultures using conventional flasks on shakers usually involve small volumes (Tarmizi *et al.*, 2003). For scaling-up purposes, a commercial bioreactor can be used. However, using a bioreactor is more expensive and involves tedious inoculation procedures (Tarmizi *et al.*, 2004). Previously, MPOB developed and introduced the Modified Vessel (MoVess) to improve the agitation of cultures in liquid medium (Tarmizi *et al.*, 2007). However, this vessel which uses a magnetic stirrer for agitation is limited to working on volumes of 1 to 2 litres of liquid medium. To overcome this limitation, another technology known as the MPOB Motorized Vessel (MPOB-MotoVess) was developed which is able to handle a larger production volume of 3 to 9 litres of liquid medium.

NOVELTY OF THE TECHNOLOGY

Using the MPOB-MotoVess is an economical and practical method for culturing cell aggregates in larger working volumes of liquid media for increased production.

DESCRIPTION

The MPOB-MotoVess is a larger vessel ideal for scaling-up liquid cultures to 3- to 9-litre volumes. This system consists of a motor with a stand and a shaft with an impeller for agitation which is made of perforated stainless steel to provide aeration to the medium. Two long tubes, attached to the side arms of the vessel are attached to a simple pump that generates air for aeration (*Figure 1*).



Figure 1. MPOB Motorized Vessel (MPOB-MotoVess) for liquid culture.

*Patent application, PI 200 70979.

OBSERVATIONS

Fresh weight increments by two- to six-fold were obtained for cultures from three selected oil palm clones after 40 days in MPOB-MotoVess. Clone PL 151 increased by six-fold after 40 days in culture (Figures 2a to 2d).

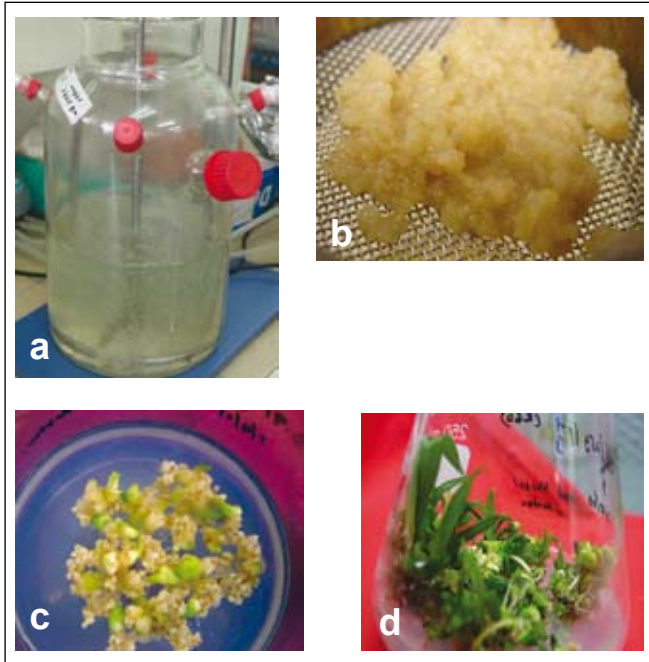


Figure 2. Multiplication and regeneration of culture aggregates. a) Cultures generated in MotoVess. b) Some of the culture aggregates collected after 40 days of maintenance in MotoVess. c) Regeneration of cell aggregates of clone PL151 cultured in MotoVess. d) Polyembryogenic cultures with shoots.

BENEFITS

1. It is an economical system for the scaling-up of liquid tissue cultures to 3- to 9-litre volumes.
2. A simpler inoculation procedure is involved compared to that used in the conventional bioreactor system.
3. The system can be modified to minimize movement of cultures to and from the laminar flow cabinet for maintenance. Replenishment of medium can be done on site to reduce the risk of contamination.
4. The application of this system can be extended to liquid culture systems of other crops.
5. The system also allows for further automation.

REFERENCES

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