[BIO29]
***In vitro* regeneration system of teak (*Tectona grandis* Linn.)**

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Teak (*Tectona grandis* L.) is one of the world's finest appearance grade timbers and it enjoys a global reputation and demand. The species is amenable to plantation cultivation and strived well as an exotic in many countries of the tropics. There is currently significant demand for good quality planting stock in Malaysia as well as the South and Southeast Asian countries. However, conventional method of propagation *via* germination of teak fruits and cuttings is unable to meet this need and for future expansion of teak establishment. Therefore, this paper investigates the feasibility of *in vitro* technique for mass production of teak planting material. Four types of explants namely shoot tip, nodal explant, cotyledon and zygotic embryo and 21 combinations of plant growth regulator consisting of 6-benzylaminopurine (BAP) and α-naphtaleneacetic acid (NAA) with different concentrations were used for proliferation of axillary and/or adventitious shoots. After four weeks of culture on Murashige and Skoog (MS) medium with 16 hours photoperiod and at temperature of 25±2°C, the zygotic embryo produced the highest response for the number of shoots. The adventitious shoots proliferating from the expanding zygotic embryo were subcultured and transferred to rooting media to produce normal plantlets with good rooting system. In contrast to the organogenesis pathway abide by the above-mentioned shoot multiplication system, another pathway that is somatic embryogenesis is also studied in this paper for its potential uses in genetic engineering, bioreactor propagation and artificial seed production. Seed derived explants namely the cotyledon and zygotic embryo were used to induce the formation of callus. Irrespective of the initial explant used, combinations and concentrations of four types of plant growth regulator, strength of MS media and incubation condition applied, the induced callus elicited similar response in terms of morphology. As such, they are categorized accordingly for future selection. Embryogenic callus was only obtained from zygotic embryo cultured in full or half strength MS media supplemented with 2,4-dicholorophenoxyacetic acid (2,4-D) and BAP and incubated under dark condition. In liquid medium, the embryogenic cells undergo several stages of division and differentiation before transformation into globular or early heart stage somatic embryo. With the development of suitable *in vitro* regeneration system for teak, mass propagation of superior clones will not only be achievable in time but will also facilitate tree improvement programs.