

# Seaweed Extract for Micropropagation and Production of Secondary Metabolites in an Endangered herb *Swertia chirayita*

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## ABSTRACT

*Swertia chirayita* of gentianaceae family is critically endangered herb of Himalayas known for its medicinal significance in Ayurveda, Unani and Siddha. It is used in various herbal formulations like Diabecon (Himalaya<sup>R</sup>), Ayush 64, Mensturyl syrup, for curing diabetes, malaria and having antifungal, antibacterial properties. As the availability of authentic material is very critical, the market is flooded with its adulterants. So, *in vitro* technique has been developed for its propagation and eliciting the medicinal compounds like swertiamarin, mangiferin and amarogentin by using growth hormone and seaweed extract (red seaweed *Kappaphycus alvarezii* gifted by Sea6 Energy Pvt. Ltd. based in Bangalore) in different concentrations and combinations. This is reported for the first time that the effect of seaweed extract (SWE) has been tested for enhancing the micropropagation potential and for improving the *in vitro* production of medicinally important metabolites. We have tested eight different combinations of SWE, with and without Murashige and Skoog salts (1962), agar, growth hormones and sucrose. The best proliferation of shoots was observed on optimized medium having MS+IBA+KN+GA<sub>3</sub>. These shoots were further cultured on test media and the combination of 3g/l of seaweed, agar without MS salts, sucrose and growth hormones gave best results, for maximum shoot length (6.5 cm) and number of shoots (12) and metabolites in concentration of 11.2 µg/mg swertiamarin, 3.05 µg/mg mangiferin and 1.16 µg/mg amarogentin. So, the usage of seaweed extract holds potential for propagation and metabolite production in *Swertia chirayita* in a cost effective and eco-friendly way.