

## *In vitro* shoot induction and callus induction of a medicinal tree *Oroxylum indicum* (Tattu) through tissue culture

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### SUMMARY

*In vitro* shoot induction and callus induction of *Oroxylum indicum* (Tattu) was carried out by using apical and axillary bud and leaf midrib explants. A simple and reliable protocol was developed through apical and axillary bud and leaf midrib explants of *Oroxylum indicum* for multiple shoot induction and callus induction. Among the different types of growth regulators used for culture establishment BAP and 2, 4-D exhibited the best response for inducing multiple shoots and callus, respectively. Axillary bud showed significantly high shoot multiplication on MS medium with 2Mg/l BAP whereas leaf midrib explant was found to be more effective on MS medium with 4Mg/l 2, 4-D for callus induction.

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**Key words :** *Oroxylum indicum*, *In vitro*, Tissue culture

The plant *Oroxylum indicum* belonging to the family Bignoniaceae commonly known as Shivnak, Shyonak, Sonpatha or midnight horror, is a small deciduous, soft wooded tree with light grayish brown, soft and spongy bark that grows upright up to 20 meters high. It is also known as Indian Trumpet Flower and it's fear-provoking. The tree is often grown as an ornamental for its strange appearance. A deciduous medium sized tree, the pods, seeds, stem and root bark contain many flavones, weak acids and traces of alkaloids (Uddin *et al.*, 2003; Dalal and Rai, 2004). The plant contains flavonoids like chrysin, oroxylin and baicalein as active principles (Chen *et al.*, 2003). Leaves are emollient and contain anthraquinone and aloe-emodin (Parrotta, 2001; Nakahara *et al.*, 2002). The leaf contains chrysin and baicalein. Other flavonoids, known for their anti-inflammatory and anti-allergy effects, are also present, though it may need to be used in high doses to get a response. Oroxindin has also been isolated from *Oroxylum indicum* (Nair, 1979).

*Oroxylum indicum* is widely used by the Indians for

the treatment of various ailments. It has been categorized as vulnerable medicinal plant by the government of India (Ravi Kumar and Ved, 2000). In general, roots are used as astringent and for the treatment of tuberculosis (Bhattacharje, 2000). In India, roots are used in Ayurvedic preparation called "Dasamoola" *i.e.*, used as an astringent, anti-inflammatory, anti-helminthic, antibronchitic, antileucodermatic, anti-rheumatic, anti-anorexic and for treatment of leprosy and tuberculosis. *Oroxylum* root bark is the part used in Ayurvedic medicine, administered as an astringent, bitter tonic, stomachic, and anodyne. It is included in famous tonic formulations, such as Chyawanprash. The plant is also used in Asian folk medicine for the treatment of abdominal tumors (Soe and Myongure, 2004). It was also reported to possess anticancer properties (Lambertini *et al.*, 2004; Costa-Lotufo *et al.*, 2005). The seed extract exhibits antimicrobial, analgesic, anti-tussive and anti-inflammatory properties (Rasadah *et al.*, 1998). The fruits are used in treating bronchitis, leucoderma, helminthosis etc., (Parrotta, 2001; Dalal and Rai, 2004).

The uncontrolled collection and sale of large quantities of plant material from the forest leads to destruction of many forest plants. Cultivation of medicinal plants especially high value medicinal plants is creating new dimension in the field of agriculture. *Oroxylum indicum* is feared to become endangered soon. Hence there is a need for a scientific approach for propagation of medicinal plants.

Plant tissue culture offers unconventional technique for plant improvement. It has become an important tool

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