Therapeutics

Terminalia pallida fruit possess antidiabetic activity

Maceration of fruit powder of ***Terminalia pallida* Brandis** is given orally as a drink twice a day for 25 days for the treatment of diabetes by tribal people in Andhra Pradesh where locally it is known as *Tellakaraka*.

As the fruits of the other species of the same genus viz., ***T. arjuna* Wight & Arn.**, ***T. belerica* Roxb.** and ***T. chebula* Retz** are found to have antidiabetic activity an attempt was made to investigate the antidiabetic activity of this plant by researchers at S.V. University, Tirupathi.

During experiments ethanolic extract of fruits at a dose of 0.5 g/kg b.w. could produce a significant fall in blood glucose levels by about 24% in diabetic rats, after 5 hour of treatment. But none of these extracts could produce any hypoglycaemic effect in normal rats. Hence the ethanolic extracts may be considered to have good antihyperglycaemic active principles without causing any hypoglycaemic effect unlike insulin and other synthetic drugs (Rao *et al, J Ethnopharmacology,* 2003, **85**, 169-172).

Lethal neurotoxic protein from Indian king cobra venom

A lethal neurotoxin protein (Toxin CM36) was isolated and purified from the Indian King Cobra (*Ophiophagus hannah*) venom by CM-Sephadex ion exchange chromatography and HPLC. The purified toxin had a SDS- molecular weight of 15 ± 0.5 kD. The UV absorption spectra of Toxin CM36 showed a peak at 280 nm and an E_{max} at 343.8 nm, when excited at 280nm fluorescence. Toxin CM36 had an LD_{50} of 3.5 µg/20 g (iv) in male albino mice. It exhibited neurotoxicity and produced irreversible blockade of isolated chick biventer cervicis and rat phrenic nerve diaphragm. The neurotoxicity was found to be Ca^{2+} dependent. Toxin CM36 had no significant effect on isolated guineapig heart and auricle. It also had no effect on blood pressure of cat and rat but produced respiratory apnoea in rat and guineapig. Toxin CM36 lacked phospholipase activity (Pallabi *et al, Indian J Exp Biol*, 2002, **40**, 1365-1372).

Tissue culture

Regeneration of *Quercus floribunda* Lindl.

Oak trees are important plants of Himalayas but due to many reasons their regeneration is deteriorating. Tissue culture technique is the only method to conserve and regenerate them. Scientists at G. B. Pant Institute of Himalayan Environment and Development, Almora developed a regeneration protocol for ***Quercus floribunda* Lindl.** using cotyledonary nodes (with attached cotyledons but without radicle and primary shoot) as explants. Multiple shoots were induced on woody plant or MS medium supplemented with 6-benzyladenine (BA), either alone or in combination with gibberellic acid (GA_3). BA (22.19 µM) was much more effective in WP medium for induction of multiple shoots; addition of GA_3 (2.89 µM) resulted in thinner but slightly longer shoots. Rooting (83.3%) of regenerated shoots involved a two-step procedure where the microshoots were treated with indole-3-butyric acid (100 µM) for 24 hours followed by transfer to plant growth regulator-free half-strength WP medium. Ninety per cent plantlets were successfully established in earthen pots containing soil and farmyard manure (3:1) (Purohit *et al, Curr Sci*, 2002, **83**, 312-315).

Tissue culture

In vitro plantlet regeneration from seedling nodal explants of *Acacia catechu*

The rapid propagation of commercial source of *Katha*, ***Acacia catechu* (Linn.f.)Willd**. is warranted seeing the indiscriminate felling of these trees in forests. A protocol for rapid *in vitro* multiplication of this species has been developed by research team at Department of Botany, University of Delhi. During the experiment multiple shoots were initiated after 20 days in stem nodes excised from *in vitro* grown seedlings of ***Acacia catechu***, on Murashige and Skoog's medium adjuvanted with 1 to 100 µM of N^6-benzyladenine (BA). Explants were subcultured on the same medium augmented with 1.5 g l^{-1} of polyvinylpyrrolidone (PVP) after 30 days. In the second subculture, after 30 days, the explants were transferred to a medium lacking PVP, but containing 10 µM of BA, where nine or ten shoots differentiated per explant within next 30 days. If individual shoots along with some callus were subcultured on BA (10 µM), nearly 15 shoots per explant regenerated in 90 days. Thus, the average number of shoots obtained from each node was 142 after 180 days. Since a seedling develops four nodes after 20 days, theoretically an average of 568 shoots can be obtained from a single seed. If shoots were individually subcultured on ½-strength MS medium with 14.7 µM of indole-3-butyric acid (IBA), roots developed in 20 days. Addition of 40 mg l^{-1} of glutamic acid to the rooting medium prevented leaf senescence. These plantlets thrived well in garden soil, sand and silica (1:1:1) (Sahni & Gupta, *Indian J Exp Biol*, 2002, **40**, 1056-1059).

Vegetable

Edible coating on baby carrots

Discolouration of the surface of peeled baby carrots occurs due to reversible surface dehydration and irreversible formation of lignin which affect their storage quality and shelf-life. Edible coatings have been applied to the surface of fresh carrots to control white surface discolouration by acting as moisture barrier or surface moisturizer. An edible coating can also be used as an effective carrier of many functional ingredients, including antimicrobial agents, antioxidants, flavourings and colourants.

Peeled baby carrots are high in nutrients such as vitamin A and carotene, vitamin C and dietary fiber but a poor source of calcium and vitamin E. The use of edible coatings as carriers of calcium and vitamin E on fresh baby carrots is a natural extension of their barrier property and it can expand the functionality of edible coatings by providing additional health benefits to consumers.

Mei and colleagues developed the formulation of edible coatings for incorporating calcium and vitamin E, and to demonstrate the feasibility of applying these coatings on peeled baby carrots. Xanthan gum coating was used to carry 5% Gluconal cal, a mixture of calcium lactate and gluconate, and 0.2% α-tocopheral acetate (vitamin E) by weight, respectively. During experiment peeled baby carrots were dipped in the coating solutions, dried and then stored at 2°C and 85% relative humidity for up to 3 weeks. Calcium and vitamin E contents of the coated samples, per serving (85 g), increased from 2.6% to 6.6% of the Dietary Reference Intakes (DRI) values, respectively. Edible coatings ($p<0.05$) improved the desirable surface colour of carrots without effects ($p<0.05$) on the taste, texture and fresh aroma and flavour except for a slightly slippery surface. The β-carotene level in the baby carrots ($p<0.05$) was not affected by edible coating (Mei *et al, J Food Sci*, 2002, **67**, 1964-1967).