Textile

Dyeing of woolen fabric with a natural dye

The traditional practice of dyeing textile with natural dyes has again received preference over synthetic dyes from the point of view of natural finish, health safety and eco-friendliness. Researches on new techniques of dyeing are in progress so that the constraints like availability, shade range, reproducibility and fastness of natural dye can be overcome. Agarwal and Patel at Department of Textile Chemistry, M. S. University of Baroda, Vadodara studied the padding techniques to apply a natural dye from ***Acacia nilotica* (Linn.) Delile** subsp. ***indica* (Benth.) Brenan** syn. *A. arabica* Willd. (Hindi – *Babool*) to wool substrate and to evaluate the fastness properties of the dye substrate. The dye was extracted from bark of *Babool* by dipping it into cold water and filtration. The residue was re-dissolved in hot water and charcoal was added. The solution was boiled and filtered hot. The filtrate was cooled to obtain fine crystals of the dye. Three individual mordants, namely stannous chloride, ferrous sulphate and copper sulphate as well as mixed mordant system of ferrous sulphate and copper sulphate (in 1:1 proportion) were selected for the investigation. Pad dry-steam and cold pad-batch dyeing techniques were utilized for the application of the dye liquor.

The results revealed that woolen fabric can be dyed with *babool* dye using metallic salts as mordants. Energy consumption being high in case of pad-dry steam technique cold pad-patch process can be considered as best technique for small scale industries. Fastness properties of samples dyed by padding techniques are adequate for both techniques of dyeing irrespective of whether the metallic salt (mordant) is present in the dyebath or not (Agarwal & Patel, *Man-Made Textiles India*, 2002, **45**, 237-241).

Therapeutics

Prevention of vascular diseases by Perilla

Perilla [***Perilla frutescens* (Linn.) Britton** var. ***crispa***] leaves are frequently used as garnish for fresh seafood. The leaves are also used as medicine in East Asian countries and several studies have revealed their pharmacological activities, such as sedation, for digestion and for protection against food microbial poisoning. The authoritative Chinese drug encyclopaedia *Ben Cao Kong Mu* mentions that perilla harmonized "blood", which includes both blood circulation and blood vessels in oriental Kampo medicine. Makino and others from Kyoto University, Japan investigated the inducible effect of perilla on nitric oxide (NO) production and the inhibitory effect on the proliferation of cultured Vascular Smooth Muscle Cells (VSMC), which are closely related to antiatherogenic action.

The effects of perilla leaves on murine cultured vascular smooth muscle cells were investigated. The water extract of perilla leaves induced NO production of VSMC and this effect was synergistically augmented when combined with interferon (IFN)-γ or tumour necrosis factor (TNF)-α, while the perilla extract significantly inhibited NO production induced by IFN-γ combined with lipopolysaccharide (LPS). The findings suggest that perilla would be useful for the prevention of vascular diseases such as arteriosclerosis [Makino *et al*, *Phytother Res*, 2002, **16**(suppl), S19-S23].

Hypocholesterolaemic effect of Capsicum oleoresin

It is generally accepted that lowering high serum cholesterol levels plays a significant role in the prevention of atherosclerosis.

The oleoresin, or pungent principle of red-hot chilli is a potent analgesic, anti-inflammatory, antiobesity agent and causes a desensitisation against different chemical irritants on long term treatment. Chilli has been used as a medicine in Ayurveda for the treatment of inflammation, boils, toothache, etc. Research has shown that it exhibits a variety of biochemical and pharmacological properties. Gupta and others from University of Rajasthan, Jaipur studied the effect of capsicum oleoresin on dietary hypercholesterolaemia in male gerbils at a dose of 75 mg/kg body wt/day. The oleoresin reduced cholesterol and triglycerides by 70% and 66%, whereas liver cholesterol and triglycerides were lowered by 70.9% and 68.7%, respectively in comparison with atherogenic fed controls. Capsicum oleoresin feeding prevented the accumulation of cholesterol and triglycerides in the liver and aorta. The faecal excretion of cholesterol and triglycerides was significantly increased in oleoresin fed gerbils [Gupta *et al*, *Phytother Res*, 2002, **16**(3), 273-75].

A common weed with hypoglycaemic activity

***Abutilon indicum* (Linn.) Sweet**, Hindi – *Kanghi* found commonly throughout tropical parts of India is used for its many medicinal properties. Scientists at Gulbarga University, Gulbarga and V. L. College of Pharmacy, Raichur studied the hypoglycaemic activity of its leaf extract in rats.

During the experiment wistar rats (200-300 g) of either sex were fasted for 18 hours prior to experiment with water *ad libitum*. The alcoholic and aqueous extracts (400 mg/kg) were given orally. Both the extracts showed reduction in blood glucose level at the 4th hour (26.95%) and 6th hour (27.89%) respectively. However, as compared to tolbutamide, the extracts possess a weak activity (Seetharam *et al*, *Fitoterapia*, 2002, **73**, 156-159).

Calotropis roots possess antiimplantation and uterotropic activity

The roots and latex of commonly found plant ***Calotropis procera* Ait.** are used by tribal women to terminate early stage pregnancy but the antifertility activity of the plant is yet to be ascertained. Kamath and Rana at Krupanidhi College of Pharmacy, Bangalore and Dr H. S. Gour University, Sagar, respectively did the preliminary study on antifertility activity of the roots of this plant in female rats.

Female wistar rats were given ethanolic extract of roots at a dose of 250 mg/kg. A strong antiimplantation (100%) and uterotropic activity was observed,which may be due to its estrogenic activity. However, further studies are required to confirm the potent estrogenic effect and to isolate the active principle (Kamath & Rana, *Fitoterapia*, 2002, **73**, 111-115).

Prevention of neurotoxic effects by *Acorus*

The rhizome of the plant, ***Acorus calamus*** **Linn.** is used extensively in the traditional Indian system of medicine for the treatment of epilepsy, hysteria, insomnia, neurosis, etc. either as a single drug or as a component of a certain drug reported to be pharmacologically active and to increase the latency of seizures and reduced mortality. Shukla and others investigated the neuroprotective potential of the ethanol water extract of rhizomes of this plant on selected biochemical and behavioural parameters against acrylamide toxicity.

Acrylamide, a monomer, is a highly reactive molecule and has extensive applications in the production of polymers and copolymers. The monomer is a potent neurotoxic agent and has been reported to affect both central and peripheral nervous systems. Exposure of rats to acrylamide led to decrease in the reduced glutathione (GSH) content and glutathione-S-transferase (GST) activity in the corpus striatum and an increase in striatal dopamine receptors as evident by an increase in the binding of 3H-spiperone to striatal membranes.

Treatment with the ethanol water (1:1) extract of rhizomes increased the GSH content and GST activity in the corpus striatum. The results suggest that the neuro-behavioural changes produced by acrylamide may be prevented following treatment with the rhizome extract [Shukla *et al*, *Phytother Res*, 2002, **16**(3), 256-60].

Wound healing properties of *Terminalia*

The process of wound healing is promoted by several plant products, which contain active principles such as triterpenes and alkaloids and biomolecules. These agents usually influence one or more phases of the healing process.

Terminalia chebula **Retz** and its parts have been reported to have medicinal values. The unripe fruit is astringent and is useful in dysentery and diarrhoea. The ripe fruit is a purgative, tonic, carminative and enriches the blood. It is effective in ophthalmia, spleen diseases, piles and in treatment of paralysis. The coarsely powdered fruit, when smoked in a pipe, provides relief from asthma. A decoction of the fruit is a good astringent wash. The bark of the tree has diuretic and cardiotonic properties. Suguna and others examined the effect of topical application of an alcohol extract of the leaves on the healing of rat dermal wounds, *in vivo*. The wounds treated with leaves extract healed much faster as indicated by improved rates of contraction, and a decreased period of epithelialization. In addition the extract showed antimicrobial activity and was active largely against *Staphylococcus aureus* and *Klebsiella*.

These results strongly indicate that this plant may be a potential candidate for dermal wound healing because of its positive influence on various phases of the healing process and particularly effective in view of its antioxidant and antimicrobial properties [Suguna *et al*, *Phytother Res*, 2002, **16**(3), 227-231].

Antineoplastic properties of marking nut

Semecarpus anacardium **Linn.**, commonly known as 'marking nut', is known for its multipurpose applicability in the Ayurvedic system of medicine. It has been used therapeutically in neurological disorders, ulcers, corns, leprosy, leucoderma, arthritis and cancer. Sujatha and Sachdanandam from University of Madras, Chennai evaluated the antitumour

activity of a Siddha preparation of marking nut extract against experimental mammary tumour in rats in relation to glucose metabolism. The Siddha preparation of marking nut extract was found to be effective in regulating the key enzymes related to carbohydrate metabolism. No untoward or toxic side effects were observed in the drug control animals. Thus marking nut extract may be a potential antineoplastic agent against mammary carcinoma [Sujatha & Sachdanandam, *Phytother Res*, 2002, **16**(suppl), S14-S18].