

### Adopt cold grinding process to protect volatile constituents of Cumin

Spices are valued for their aroma, visual quality and shelf-life. During grinding volatile oil and aroma losses occur and reduce the value. The technology used at present for grinding has disadvantages of high heat generation, loss of volatile oil and low efficiency. Department of Food Science and Technology, Jabalpur has developed cold grinding process in which the temperature of grinding zone is lowered by circulating chilled water (10-25°C). Aluminium or low density laminated pouches and a storage condition of 37°C and 70% RH have been found ideal for packaging and storage of cold ground cumin (Bera *et al*, *J Food Sci Technol*, 2001, **38**, 257-259).

## Therapeutics

### Potato extract against mammary carcinoma cells

The potato tuber pieces with peel intact were homogenized with a 5mg/ml sodium dithionite solution and the pulp was collected and expressed through a nylon cloth. After further processing an extract was obtained and investigated for its *in vitro* activity against BALB/c mouse mammary tumour cell line F311 (sarcomatoid carcinoma). The extract significantly inhibited adhesion on fibronectin-coated surfaces and blocked migration of tumour cells *in vitro*. A major gelatinolytic activity (gelatinase) of 82 kD was identified in this extract by zymographic analysis. Thus the identification of a novel plant gelatinase extracted from potato tubers needs to be studied further and justified in order to evaluate it as a potential antimetastatic agent (Lorenzo, *Planta Med*, 2001, **67**, 164-166).

### Silymarin is protective in colitis in rat

Silymarin, extracted from *Silybum marianum* (Linn.) Gaertn. possesses anti-inflammatory and gastroprotective activity in addition to its well known antioxidant property. Torcuata Cruz and his team in Spain examined the intestinal anti-inflammatory activity of several doses of silymarin on the acute phase of trinitrobenzene sulfonic acid (TNBS) induced experimental colitis in rats. The results demonstrated that oral administration of silymarin at the dose of 50 mg/kg, significantly reduced the macroscopic mucosal damage in the TNBS/ethanol model of colitis in rats by effectively reducing the damaged colonic surface by 25 per cent (Cruz *et al*, *Planta Med*, 2001, **67**, 94).

### Jungleflame *Ixora* flowers against chemical carcinogenesis

The flowers of ornamental plant Jungleflame *Ixora*, *Ixora coccinea* Linn., grown in gardens are used in Ayurveda to treat oral cancer and also have cytotoxic and antitumour properties. Active fraction of the dried flowers has been tested on chemically induced carcinogenesis and on soft tissue fibrosarcoma in mice. Papilloma formation i.e. skin carcinogenesis was induced in the dorsal skin area of Swiss albino mice with the topical application of 7,12-dimethylbenz(a)anthracene (DMBA) and croton oil and soft tissue fibrosarcoma i.e. tumour was initiated by injecting 3-methylcholanthrene. The topical application of 100mg/kg body weight of active fraction of flowers inhibited the growth and delayed the onset of papilloma formation in mice. Also the active fraction at the same dose when administered orally inhibited the growth of subcutaneously developed soft tissue fibrosarcoma. The active fraction of the flowers has been found to contain the triterpenoid ursolic acid.

*I. javanica* flowers also possess similar antitumour activity but the active principle involved in this species is ferulic acid which is known to have antioxidant properties [Latha & Panikkar, *Pharm Biol*, 2000, **38**(2), 152-156].



### *Salacia* root bark for the treatment of diabetes and renal complications

The root bark of *Salacia oblonga* Wall. ex Wight & Arn. is commonly used in Indian traditional medicine for the treatment of gonorrhoea, rheumatism and skin diseases. The aqueous extract of root bark also possesses hypoglycaemic and anti-inflammatory activity. Hypoglycaemic and anti-lipid peroxidative activity of the petroleum ether extract of the root bark has been studied in streptozotocin hyperglycaemic rats. A significant hypoglycaemic activity and anti-lipid peroxidative activity in the renal tissue of diabetic animals have been observed in the animals treated with the root bark extract of this plant. Thus the plant in future may be useful for the treatment of diabetes and associated nephropathy (Krishna Kumar *et al*, *Pharm Biol*, 2000, **38**(2), 101-105).

### Ayurvedic drug *Jibanti* can ameliorate the peroxidative damage

*Desmotrichum fimbriatum* Blume found in western ghats, Tamil Nadu, Sikkim and Khasi hills is known as *Jibanti* in West Bengal. It is a well known Ayurvedic drug for Rasayana therapy. Its effect on the modulation of the two antioxidant enzymes peroxidase and catalase has been studied in mice liver during cold water swim stress on adult male Swiss albino mice of average body weight. The aqueous ethanolic extract of the whole plant increased peroxidase titre in the hepatic cells of normal mice but in the stressed group, the drug displayed no effect on the peroxidase content, while it elicited an elevation of the catalase content. In this experiment  $\alpha$ -tocopherol has been used as the standard drug and was at doses of 60mg/kg body weight. This work suggests that the herb can ameliorate the peroxidative damage caused stress (Chakrabarty *et al*, *Indian J Exp Biol*, 2001, **39**, 485).

### Benzyl isothiocyanate - Chief anthelmintic in papaya seeds

Throughout the world in traditional medicine papaya seeds are used as anthelmintic. Scientific studies have also confirmed that various preparations of papaya seeds can kill helminths effectively *in vitro* and in infected animals but the active principle responsible for this activity was not confirmed. Studies conducted at McMaster University, Hamilton, Ontario, Canada have confirmed that benzyl isothiocyanate is the chief or sole anthelmintic in papaya seed extract. The activity was tested on free living nematode, *Caenorhabditis elegans*. The extract of fresh seeds was prepared after crushing them. Thus the present study supports existing practice of traditional use of papaya seeds as an anthelmintic (Kermanshai *et al*, *Phytochemistry*, 2001, **57**, 427).

### Pomegranate peel is liver protective



The acetone and methanolic extract of dried peel powder of *Punica granatum* Linn. was subjected to a study to ascertain its hepatoprotective activity in rats intoxicated with  $\text{CCl}_4$  (single dose, 0.25 ml/kg i.p.). The plant extract suspensions were administered orally three times at 12 hrs interval. The hepatoprotective activity of the acetone and methanol extract is detected by the decreased level of SGPT (Serum Glutamic Pyruvic Transaminase) and SGOT (Serum Glutamic Oxaloacetic Transaminase) enzyme activity which has been shown to reduce microsomal enzymes and thereby accelerating the excretion of  $\text{CCl}_4$ . The aqueous and powder extract did not show any activity. A further study to identify the active principle is required on such a potential hepatoprotective material (Asockson *et al*, *Indian Drugs*, 2001, **38**, 183).







### Anti-tumour-promoter lignans

The methanolic and acetone extracts of the seeds of *Hernandia ovigera* Linn. yielded several lignans like podophyllotoxin. Some of these lignans are cytotoxic and the podophyllotoxin derivatives are an important class of anticancer agents. Lignans are the secondary metabolites formed by enzymatic dimerization of phenyl propanoid precursors and some of them might be active as anti-tumour-promoters. Seven lignans, including aryltetralin lactones, aryl-naphthalene derivatives, dibenzylbutyrolactones and a furofuran were tested in a short term *in vitro* assay of TPA-induced EBV-EA activation in Raji cells. All the lignans showed inhibitory activity with  $IC_{50}$  470-590 mol ratio/32 pmol TPA. Thus these lignans may be promoted as valuable anti-tumour-promoters (Ito *et al*, *Planta Med*, 2001, **67**, 166-168).

### A cytotoxic benzoquinazoline alkaloid from Custard Apple seeds

The seeds of Custard Apple, *Annona squamosa* Linn. are well-known for their antifeedant, antimalarial, cytotoxic and immunosuppressive activities. During phytochemical analysis a benzoxyquinazoline alkaloid, samoquasine A ( $C_{15}H_8N_2O$ ) has been obtained from methanolic extract of seeds. This is said to be the first isolation of a benzo[h]quinazoline alkaloid from a plant in the family Annonaceae. It exhibited significant cytotoxicity against murine lymphoma L 1210 cells with an  $IC_{50}$  value of 0.38  $\mu$ g/ml (Morita *et al*, *J Nat Prod*, 2000, **63**, 1707).

### Cancer chemopreventive agents

Cancer chemoprevention with the help of herbal products is currently regarded as a promising avenue for cancer control. The cytotoxic activity of naturally occurring butadienolides has been studied by determining their anti-tumour activity towards several cell lines, including KB cells, human lung carcinoma A-549, colon HCT-8 tumour cells, human carcinoma of nasopharynx and Walker intramuscular 256 carcino sarcoma. Supratman and his team from Japan isolated five butadienolides from the leaves of *Kalanchoe pinnata* (Lamk) Pers. syn *Bryophyllum calycinum* Salisb., and *K. daigremontiana x tubiflora*. All compounds showed inhibitory activity on Epstein-Barr Virus early antigen (EBV-EA) activation induced by 12-O-tetradecanoylphorbol-13-acetate (TPA) in Raji cells. These results strongly suggest that these plants are potential natural cancer chemopreventive agents (Supratman *et al*, *Biosci Biotechnol Biochem*, 2001, **65**, 947).

### Contraceptive herb

The WHO projects on potential antifertility medicinal plants and their products have been planned and experimental studies are being conducted for finding safer contraceptives for both male and female.

An experiment conducted on the contraceptive effect of *Phyllanthus amarus* Schum. & Th. extract on female mice, revealed that alcoholic extract of the whole plant possesses a reversible antifertility effect. During the experiment a dose of 100 mg/kg body weight for 30 days was given orally in cyclic adult female mice (Rao & Alice, *Phytother Res*, 2001, **15**, 265-267).



### CNS depressent activity of Creat

*Andrographis paniculata* Nees, Creat is well known drug for its febrifuge, stomachic, anthelmintic and hepatoprotective activities. However, the psychopharmacological activity of the extract of this plant has been reported only recently. Intraperitoneal injections of the extract were given to Swiss albino mice and Charles-Foster rats. The results revealed that the extract has a potent central nervous system (CNS) depressant action as indicated by its hypnotic potentiation effect; it produced hypothermia and exhibited an analgesic action against acetic acid-induced writhing in a dose dependent manner (Mandal *et al*, *Phytother Res*, 2001, **15**, 253-256).



### Evaluation of Ophthacare® Eye drops

The use of medicinal plants is based on the experience of many generations of physicians and traditional systems of medicine from different ethnic societies. The use of medicinal plants in modern medicine suffers from the fact that although hundreds of plants are used in the world to prevent or to cure diseases, scientific evidence in terms of modern medicine is lacking in most cases. Ophthalmic problems afflict a substantial portion of the population. Some of these can be managed with antibiotics and steroids. However, the prolonged use of these drugs has its own drawbacks. Ophthacare® is a combination of eight herbs. It is a colourless, odourless transparent aqueous extract of these eight plants: (*Carum copticum* (seeds): 0.060% w/v; *Terminalia belerica* (fruits): 0.65% w/v; *Emblica officinalis* (fruits): 1.30% w/v, *Curcuma longa* (rhizome): 1.30% w/v; *Ocimum sanctum* (leaves): 1.30% w/v; *Rosa damascena* (petals) 1.10% w/v; *Cinnamomum camphora* (crystals): 0.5% w/v and *Melospiranthus* (Honey): 3.70% w/v.

Biswas and others from Delhi conducted an open prospective multicentre clinical trial in patients suffering from various ophthalmic disorders namely, conjunctivitis, conjunctival xerosis (dry eye), acute dacryocystitis, degenerative conditions (Pterygium or pinguecula) and postoperative cataract patients with Ophthacare®. Side effects, if any, were noted during the study. An improvement was observed with the treatment of the herbal eye drop treatment in most cases. There were no side effects observed during the course of the study and the eye drop was well tolerated by the patients. Ophthacare® has a useful role in a variety of infective, inflammatory and degenerative ophthalmic disorders [Biswas *et al*, *Phytother Res*, 2001, **15**(7), 618-620].



### Herbal drugs against leprosy

The herbal drugs Chirata [*Swertia chirayita* (Roxb. ex Flem.) Karst.], Gulancha Tinospora [*Tinospora cordifolia* (Willd.) Miers ex Hook. f. & Thoms.], Prickly-Chaff Flower (*Achyranthes aspera* Linn.), Cutch Tree (*Acacia catechu* Willd.), Henna (*Lawsonia inermis* Linn.) and Indian Oleander (*Nerium indicum* Mill.) are known to possess antileprotic properties. Dapsone is an antibiotic effective against the bacteria that cause leprosy. Asthana and others at Department of Pharmaceutical Sciences, Dr. H.S. Gour Vishwavidyalaya, Sagar tested the extracts of these drugs against the pathogens (M.T.B.G<sub>37</sub> RV, *Mycobacterium fortuitum*, *M. kansasii*, *M. phlei* and *M. smagmetis*) having characteristics common to *Mycobacterium leprae*. They observed that only three drugs *S. chirayita*, *T. cordifolia* and *A. aspera* showed broth activities.

Chirata was found to be superior in activity than other two drugs. The inter-combinations have given better results than any one of the drugs alone. Dapsone in combination with these drugs has shown improved antileprotic activity [Asthana *et al*, *Indian Drugs*, 2001, 38(2), 82].



### Antioxidant activity of *Cuscuta*

The plant, Giant Dodder *Cuscuta reflexa* Roxb. is useful in diseases of eye, heart, biliousness and *kapha*. Yadav and others at Banaras Hindu University, Varanasi, studied the ethanolic extract of the stem of this plant and observed that the extract has antioxidant activity. The antioxidant activity of the flavonoid glycosides was measured by estimating degree of



non-enzymatic haemoglobin glycosylation at 440 nm.

The flavonoid glycoside, myricetin 3-*O*- $\alpha$ -rhamnoside was the most active as antioxidant amongst the isolated compounds [Yadav *et al*, *Indian Drugs*, 2001, 38(2), 95].

### Antifertility activity of *turmeric*

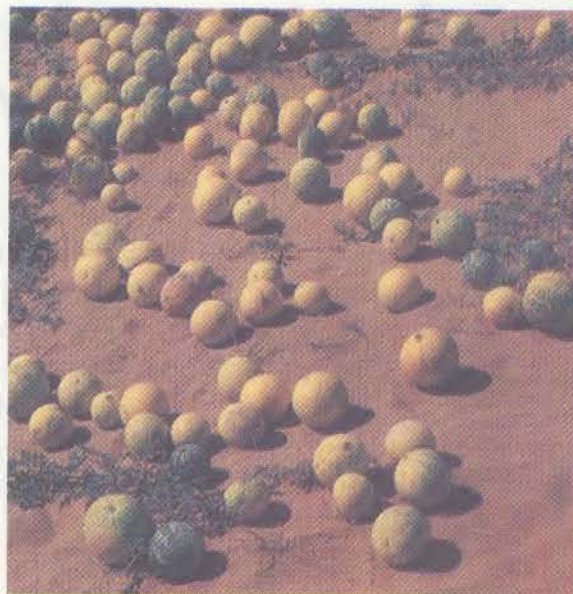
Bhagat and Purohit from JNV University, Jodhpur studied the effects of alcoholic and aqueous extracts of turmeric (*Curcuma longa* Linn.) on male albino rats. The rats were fed with 500mg/kg body wt/rat/day with extract of turmeric for 60 days. Antispermato-genic activity is confirmed by the significant reduction in the number of spermatogenic elements like spermatogonia, spermatocytes and spermatids. Compared to alcoholic extract, aqueous extract showed strong antifertility effect [Bhagat & Purohit, *Indian Drugs*, 2001, 38(2), 79].



### Antispermatogetic activity of *Bitter Apple* root

Mali and others at University of Rajasthan, Jaipur studied the ethanolic extract of the roots of Bitter Apple (*Citrullus colocynthis* Schrad) on male rats for antifertility effects.

A crude 50% ethanol extract of roots was administered orally to male albino rats at dose levels of 50, 100 and 200 mg/kg body wt/day for a period of 60 days for evaluation of antifertility effects. Significant decreases in cauda epididymal sperm mortality, density, number of pups and fertility were observed in all treatment groups. The experiment showed the antifertility effects of ethanolic extract of roots [Mali *et al*, *Pharm Biol*, 2001, 39(2), 113-19].



### Anti-parasitic activity of Cannon-ball tree

Golatkar and others at Haffkine Institute, Mumbai studied various extracts of flowers, leaves, bark and fruits of the Cannon-ball tree (*Couroupita guianensis* Aubl). Their findings revealed that the petroleum ether extract of flowers and methanol extract of fruits showed good anti-parasitic activity against *Hymenolepis nana* in albino rats [Golatkar *et al*, *Indian Drugs*, 2001, 38(2), 102].

### Antifertility activity of *Colebrookia*

The plant *Colebrookia oppositifolia* Smith is used in folk medicine. The roots are used for epilepsy and the leaves for wound healing. Gupta and others at University of Rajasthan, Jaipur studied the antifertility activity of the plant.

Oral administration of leaf extracts for 60 days to male rats brought about a significant loss in testis weight, which is related to the number of spermatids and spermatozoa present in the tissue [Gupta *et al*, *Fitoterapia*, 2001, 72(3), 236-245].

### Antifungal agent from *Arjuna*

Arjuna [*Terminalia arjuna* (Roxb.) Wight & Arn.] is a medicinal plant used in the indigenous system of medicine. A new glycoside, 2 $\alpha$ ,19 $\alpha$ -dihydroxy-3-oxo-olean-12-en-28-oic acid 28-O- $\beta$ -D-glucopyranoside isolated from the roots of this plant, showed antifungal activity against the fungi, *Aspergillus niger*, *Candida albicans* and *Bacillus oryzae* at 25 and 50 ppm concentrations [Chouksey & Srivastava, *Indian J Chem*, 2001, 40B(4), 354-56].





### Pharmacological activities of genistein from Soybean

Suthar and others at Ajanta Pharma Research Centre, Mumbai reviewed the pharmacological activities of genistein, an isoflavone from soybean (*Glycine max* Merrill). The isoflavones genistein and daidzein are present in high concentrations (up to 3 mg/g) in soybeans. Soybean also contains genistin and daidzin, which are sugar containing isoflavone molecules. During digestion, intestinal bacteria cleave the sugar molecules, creating still more genistein and daidzein. The soy isoflavones act in four different ways as estrogens and antiestrogens, as cancer-enzyme inhibitors, as antioxidants and as immune enhancers.

Genistein is potentially beneficial in treating diseases related to menopause and osteoporosis as well as in the prevention of cardiovascular disease. In view of the multifaceted benefits of this soy isoflavone, it may seem prudent to shift towards soybean-rich diets. However, soybean food contains the  $\beta$ -glucoside, genistin and conversion to the active aglycone form is dependent upon the activity for the gut microflora which in turn results in wide variations in the bioavailability of genistein from soy products. Consequently, the administration of genistein in the form of a standardized dietary supplement is a convenient means of ensuring improved absorption with the resulting potential health benefits [Suthar *et al*, *Indian J Exp Biol*, 2001, 39(6), 520-25].

### Antioxidant and hepatoprotective effect of Sea Holly

The leaves of Sea Holly (*Acanthus ilicifolius* Linn.) are used in ethnomedical practices to treat rheumatism, snakebite, paralysis and asthma. Analgesic, anti-inflammatory and leishmanicidal activities are also reported.

Babu and others at Amala Cancer Research Centre, Thrissur studied the antioxidant and hepatoprotective effects of the plant.

The alcoholic extract of leaves inhibited the formation of oxygen-derived free radicals *in vitro*. The oral administration of the extract significantly reduced CCl<sub>4</sub> induced hepatotoxicity in rats [Babu *et al*, *Fitoterapia*, 2001, 72(3), 272-77].

### Antinociceptive activity of Malvastrum

*Malvastrum coromandelinum* (Linn.) Garcke is used in traditional medicine as anti-inflammatory, analgesic, antidysenteric and in the treatment of jaundice and ulcers. Reddy and others at College of Pharmacy, Ootacamund, Tamil Nadu studied the antinociceptive activity of the plant.

The acetone and chloroform extracts of aerial parts of the plant showed antinociceptive activity in the acetic acid-induced writhing test in mice; the activity is comparable to that of aspirin [Reddy *et al*, *Fitoterapia*, 2001, 72(3), 278-80].

### Antimicrobial activity of Cashewnut

Cashew nut (*Anacardium occidentale* Linn.) has many uses. An infusion of the bark and leaves is used to relieve toothache and sore gums while the young leaves are used for the treatment of dysentery, diarrhoea and piles. Stem bark is used for the treatment of pellagra. Dr. Akinpelu at Obafemi Awolowo University, Nigeria studied the antimicrobial activity of the bark of this plant.

The methanolic extract of the bark exhibited antimicrobial activity against 13 out of 15 bacterial isolates at a concentration of 20 mg/ml. It is also effective against *Klebsiella pneumoniae* strain resistant to streptomycin [Akinpelu, *Fitoterapia*, 2001, 72(3), 286-87].





## **Antibacterial activity of Indian Long Pepper & Common Yew**

Scientists at Indian Institute of Chemical Technology, Hyderabad studied the isolates from Indian Long Pepper (*Piper longum* Linn.) and Common Yew (*Taxus baccata* Linn.) for their anti-bacterial activity. The isolates from dried fruits of black pepper namely piperlonguminine showed activity against *Bacillus subtilis*, piperine against *Staphylococcus aureus* and pellitorine against *Bacillus sphaericus*.

The isolate (-)-rhododendrol of yew tree (dried needles) inhibited *Salmonella typhimurium* and *Pseudomonas syringae* while 4-(4'-hydroxyphenyl)-butan-2-one and 4-(4'-hydroxyphenyl)-*trans*-but-3-en-2-one inhibited *Pseudomonas syringae* and *Bacillus sphaericus*.

Piperlonguminine showed the highest antibacterial activity against *B. subtilis* at 9µg/ml. Among the compounds from yew tree, (-)-rhododendrol showed highest inhibition when tested against *P. syringae* at 90µg/ml [Reddy *et al*, *Pharm Biol*, 2001, **39**(3), 236-38].

## **Clitoria improves memory**

*Clitoria ternatea* Linn., is widely used in the traditional system of medicine as a brain tonic and is believed to promote memory and intelligence. Scientists at KLES College of Pharmacy, Belgaum, Karnataka examined the effectiveness of alcoholic extract of aerial parts and root parts of this plant at 300 and 500 mg/kg doses orally in rats attenuating electroshock-induced amnesia. Extracts at 300 mg/kg dose pro-



duced significant memory retention and the root parts were found to be more effective.

Root parts are found to be more effective in attenuating memory deficits as compared to aerial parts. The mechanism by which this plant produced memory retention appears to be similar to the standard drug pyritinol, since aerial parts, root parts and pyritinol have similar influence on cholinergic activity of the brain [Taranalli & Cheeramkuzhy, *Pharm Biol*, 2000, **38**(1), 51-56].



## Anthelmintic activities of *Buchholzia* and *Gynandropsis*

In African traditional ethnomedicine *Buchholzia coriacea* stem bark has been used for the treatment of earache; bark decoction is drunk for chest and kidney pains and for washing small pox wounds. The fruit is anthelmintic. The seeds of *Gynandropsis gynandra* (Linn.) Briq. are reputed for anthelmintic properties. The oil of the fruit is used as a fish poison as well. Ajaiyeoba and others at University of Ibadan, Nigeria studied the anthelmintic activities of these plants.

Methanolic extract from the leaves and stems of these plants were investigated for their activity against *Fasciola gigantica*, *Taenia solium* and *Pheritima posthuma*. Extracts were studied in the bioassay, which involved determination of time of paralysis and time of death of the worms.

The extract caused paralysis of worms and also caused death of worms, especially at 100mg/ml. This study confirms the folkloric uses of these plants in traditional settings in Africa [Ajaiyeoba *et al*, *Pharm Biol*, 2001, **39**(2), 217-20].

## Analgesic and antipyretic activities of *Hunteria*

Scientists at Prince of Songkla University, Hat-Yai, Songkhla, Thailand studied the major constituents, analgesic and antipyretic activities of stem bark extracts.

The pharmacological activities of the butanol alkaloids extracted from the stem bark of *Hunteria zeylanica* (Retz.) Gardn. ex Thw. and its major constituents, strictosidinic acid, on nociceptive response using writhing and hot plate tests, the antipyretic activity in yeast-induced fever, pentobarbital induced sleep, and locomotor activity were examined in mice

The butanol extract of stem bark possesses peripheral antinociceptive and mild antipyretic effects. Its constituent, strictosidinic acid, produced a similar antinociceptive profile but had marked differences in antipyretic effects [Reanmongkol *et al*, *Pharm Biol*, 2000, **38**(1), 68-73].

## Chinese herbal mixture, 'Slimax' to treat human obesity

'Slimax', a Chinese herbal mixture, is an aqueous extract of the medicinal plants Barley (*Hordeum vulgare* Linn.), Solomon's Seal (*Polygonatum multiflorum* All.), *Dimocarpus longan* Lour., *Ligusticum sinense* Oliv., *Lilium brownii* and Ginger (*Zingiber officinale* Rosc.).

Scientists from Australia administered 'Slimax' orally to human volunteers for a six-week period, using a double blind experimental method. Treatment with 'Slimax' resulted in a significant decrease in parameters such as body weight, waist and hip circumference and body mass index in all subjects tested. The basis of action is through modification of lipid metabolism, with significant effects on both the accumulation and the release of lipid from adipose tissue. The experimental results indicate a great potential for the use of this herbal preparation in treatment of human obesity [Ignjatovic *et al*, *Pharm Biol*, 2000, **38**(1), 30-35].

## Pharmacological studies on *Sterculia*

The tree, *Sterculia foetida* Linn. is useful in many ways. Its seeds are eaten like chestnuts. Gum is used in medicine. Leaves of this plant are used as herbal medicine as aperient, diuretic and as insect repellent. The researchers at Agharkar Research Institute, Pune studied the pharmacological properties of the

alcoholic extract of the leaves of this plant.

The extract was subjected to pharmacological screening using various animal models. The extract caused reduced exploratory activity in mice. It potentiated pentobarbitone sleeping time in normal and pentobarbitone treated mice. It also potentiated barbital sodium

induced hypnosis, indicating central nervous system depressant activity. The extract also exhibited significant anti-inflammatory activity in the acute carageenan-induced rat paw edema and the chronic granuloma pouch models [Majumdar *et al*, *Pharm Biol*, 2000, **38**(1), 13-17].



# Biological activity of withanolides from *Dunalia*

Withanolides are steroidal lactones. The shrub *Dunalia brachyacantha* (Griseb.) Sleumer is known for its medicinal uses for alleviating stomachache among the Raqaypampenos, an ethnic group settled in the Mizque province of Cochabamba in Bolivia. The leaf extract of this shrub had displayed moderate antimalarial activity *in vivo* and good activity *in vitro*. The scientists from Bolivia and France studied the compounds from the plant and their activities.

From the leaves of this plant the acetoxo withanolides, 18-acetoxo withanolide D and 18-acetoxo-5,6-deoxy-5-withanolide and a withanolide glycoside named dunawithanine G were isolated. The acetoxo withanolides are shown to be responsible for the trypanocidal, leishmanicidal and bactericidal activities manifested by the crude ethanolic extract [Bravo *et al*, *J Nat Prod*, 2001, 64(6), 720].

## 'Mirazid', a schistosomicidal drug from Heerabol myrrh

Schistosomiasis is regarded as a silent disease. Most infected people do not experience pain and attend clinics for less specific symptoms such as dysuria, dribbling urine, increased frequency of micturition and abdominal pain. Schistosomiasis is a debilitating and sometimes deadly, parasitic infection that afflicts hundreds of millions of people in developing countries.

Myrrh is an oleogum resin obtained from the stem of *Commiphora molmol* Eng. ex Tschirch. It is useful for treatment of sore throat, bleeding gums, chronic pharyngitis, and amenorrhea. Badria and others prepared a special formulation named mirazid, from the fraction of the myrrh extract.

'Mirazid' was administered orally to mice at the dose level of 250 mg and 500 mg/kg. Acute toxicity study on 'Mirazid' showed neither death nor other behavioural or toxicological changes on the roots up to a dose as high as 2.0 g/kg. LD<sub>50</sub> of 'Mirazid' is >2g/kg. 'Mirazid' was found to possess antischistosomal activity against *Schistosoma mansoni* in mice with high therapeutic index. The activity was comparable to the marketed schistosomicidal drug "Praziquantel". Mirazid has low toxicity relative to the praziquantel extracts [Badria *et al*, *Pharm Biol*, 2001, 39(2), 127-131].

## Antifungal activity of stilbenes from *Lonchocarpus*

The dichloromethane extract of *Lonchocarpus chiricanus* Pittier root bark is known to show marked activity against the phytopathogenic fungus *Cladosporium cucumerinum* and the larvae of the yellow fever-transmitting mosquito *Aedes aegypti*. Scientists from Switzerland and Panama undertook a phytochemical investigation of the active extract with the aim of isolating both major and bioactive compounds.

They isolated the stilbenes, chiricanines A-E, longistylinines-C,D and 3,5-dimethoxy stilbene from root bark. Chiricanine A is responsible for the antifungal properties of the dichloromethane root extract of *L. chiricanus* against *C. cucumerinum*. However, chiricanine A was found to be less active than nystatin (nystatin is an antifungal medication used to prevent or treat fungal infections of the mouth) on this latter mould in both bioantographic and dilution assays; longistylidine C, longistylidine D, chiricanine A, and 3,5-dimethoxystilbene were identified as the *A. aegypti* larvicidal agents of the extract. In dilution tests, 3,5-dimethoxy stilbene was even found to be as potent as rotenone, a well-known insecticidal compound originally extracted from species belonging to *Derris* or *Lonchocarpus* [Ioset *et al*, *J Nat Prod*, 2001, 64(6), 710-15].