

Fuel briquettes from agricultural waste

In Indian villages agricultural wastes are mixed with cow-dung and fuel is prepared for cooking and heating purposes. To combat fuelwood scarcity and deforestation problem various programmes are being developed throughout the world. Fuel briquette technology is in use in many countries and is found to be viable and cost-effective method of making fuel from agricultural waste.

Owen McDougal, an Assistant Professor of Chemistry at Southern Oregon University, Richard Stanley, Codirector of Legacy Foundation and Seth C. Holstein, Research Assistant at Harvard University have published an article entitled 'A unique approach to conservation' and covered the successful story of fuel briquette making process in Malawi.

As mentioned in the article, the process involves collecting dried, nutrient-leached field residues (corn stalks, straws, grasses, leaves, water hyacinth, etc.), then pounding and chopping them into cornflake-sized pieces. The sizing can be done by a mortar, pestle, hand-driven thresher, hammer mill or by a lawn chipper. The cut pieces are then moistened and left for partial decomposition to release fibres. Charcoal fines and sawdust can also be used in this technology. The softened mass can then be blended with other agricultural and environmental residues to improve smoke smell. Eucalyptus leaves, cedar and pine needles blends add pleasing aroma. After compacting in a hand-operated, compound lever-press, donut-sized briquettes are obtained and are air-dried before use.

The authors have reported that a team of 6-8 people can most efficiently use this process and provide meaningful employment to rural communities. The authors concluded and anticipated that with the development of a practical technology for production, environmentally intelligent and energy-efficient recycling of wastes can become a reality for the average household and local recycling center (McDougal, *Chemical Innovation*, February 2001, 23-28).

Salai guggal for chronic colitis

In middle aged persons and sometimes in young also, chronic colitis results into lower abdominal pain, bleeding from rectum with diarrhoea and some related problems. Scientists of Medical College, Jammu and University of Tübingen, Germany have reported that the inflammatory process in colitis is associated with increased formation of leukotrienes causing chemotaxis, chemokinesis, synthesis of superoxide radicals and release of lysosomal enzymes by phagocytes. The key enzyme for leukotriene biosynthesis is 5-lipoxygenase. Boswellic acids were found to be non-redox, non-competitive specific inhibitors of the enzyme 5-lipoxygenase.

The scientists studied the effect of gum resin of *Salai guggal*, ***Boswellia serrata* Roxb.** for the treatment of chronic colitis.

During the experiment twenty patients were given a preparation of the gum resin of *Salai guggal* (900 mg daily divided in 3 doses for 6 weeks) and ten patients (control) were given sulfasalazine (3 gm daily divided in three doses for 6 weeks). Out of 20 patients treated with this gum resin 18 patients showed an improvement in stool properties, histopathology, haemoglobin, serum iron, calcium, phosphorus, proteins, total leukocytes and eosinophils. In control group 6 out of 10 showed



▲ *Boswellia serrata* Roxb.



Salai guggal

similar effect. Thus the ***Boswellia*** gum resin preparation could be effective in the treatment of chronic colitis with minimal side effects (Gupta *et al*, *Planta Med*, 2001, 67, 391-395).

New source of **natural gum**

***Cordia rothii* Roem. & Schult.** (Hindi-Gonda, Gondi) a tree up to 10 m in height is found commonly in Punjab, Rajasthan, Gujarat and South India. The bark of the tree has medicinal properties. Scientists at the Central Arid Zone Research Institute, Jodhpur for the first time collected gum exudation and reported that it is odourless, mucilaginous and colourless with a brittle, fractured surface. In powder form it is white in colour, insoluble in alcohol and almost entirely soluble in twice its weight of water, yielding a highly viscous, slightly acidic solution. When diluted with more water and allowed to stand, the sample produced a negligible amount of gummy residue, produced a greenish instead of blue colour on treatment with hydrogen peroxide and benzidine. It gives white precipitation with lead acetate. This *Gonda* gum possess slight variation in properties compared to Indian gum but high solubility in water recommends its application for various purposes (Khan *et al*, *J Bombay Nat Hist Soc*, 2001, **98**, 152).

Insecticide/Pesticide

Samadera indica Gaertn. quassinoids exhibit insect antifeedant activity

The seeds and bark of *Samadera indica* Gaertn. are used in medicine for fever and skin diseases but the insect antifeedant growth regulating activities against agricultural pests are not yet reported. Govindachari and the team worked at Centre for Natural Products, SPIC Science Foundation, Chennai and isolated four quassinoids, viz. indaquassin C, samaderins C, B and A from seeds and bark of this plant. Antifeedant and growth regulatory activities against the tobacco cutworm, *Spodoptera litura* were tested and compared with azadirachtin A, a potent insect antifeedant.

Indaquassin C was found to be most effective as an antifeedant even at concentration of 0.5 $\mu\text{g}/\text{cm}^2$, being half as active as azadirachtin A. Samaderin C and B significantly increased larval and pupal durations and induced mortality and were comparable to azadirachtin A (Govindachari *et al*, *Fitoterapia*, 2001, **72**, 568-571).



Samadera indica Gaertn.

Livestock

Application of **Succinylated Glycerol Monostearate** for tenderization of **meat** and heated sliced **beef**

To maintain softness of meat, proteolytic enzymes like papain, ficin and some fungal enzymes have been used but the quality of the meat needed a watch. Succinylated glycerol monostearate (SGMS) is an approved food additive and is also used as a dough conditioner in bread making. Mori *et al* reported that SGMS (an anionic surfactant) is most effective for tenderizing roast beef slices. Recently Mori and others studied the effect of SGMS on tenderization of sheep casings (5 cm length) and beef cut into slices of 70 mm in diameter and 5 mm in thickness. SGMS was applied (2% solution on sheep casings and 2% granular on beef) and heated at 80°C and 200°C for 30 minutes and 1 minute, respectively. The results revealed that SGMS is most effective in reducing shear-force value when used as a surfactant to tenderize meat. Roasted beef showed a marked decrease in toughness due to the penetration of SGMS along the perimysium during heating. Since the reaction mechanism of SGMS is completely different from that of conventional meat tenderizers, such as papain, it is recommended as a novel meat tenderizer (Mori *et al*, *J Food Sci*, 2001, **66**, 524-528).