



ASR Nurseries

Stevia

Is this the most promising herb of this decade?

HISTORY

Stevia rebaudiana, commonly known as the honey leaf in English and recently coined as MADHU PATRA in Sanskrit by ASR GROUP for the Indian market, is no more a name not heard or read about. Simple internet search engine like Google alone throws up 3,06,000 websites as of mid March 2004, clearly indicating the abundance of information available on Stevia and the commercial value and public interest in this plant and plant-based products. Stevia rebaudiana is a small plant native to Paraguay, discovered in 1887 by Antonio Bertoni, a South American botanist.

Bertoni learned of the herb from the Guarani Paraguayan Indians, who locally knew it as Caa'-ehe or Kaa'-he-e, which means "sweet herb" or "honeyleaf". Bridel and Lavielle, two French chemists, began to unravel the secret of Stevia in 1931 with exploratory extraction on Stevia rebaudiana leaves. Their research yielded a pure, white crystalline compound they named "stevioside" which was found to be 300 times sweeter than table sugar without toxic effects in laboratory animals.

CULTIVATION & BOTANY

Stevia was tested for cultivation in India since the early 90's, but the commercial breeding, multiplication and cultivation of Stevia started in 1997 mainly in Bangalore, followed by companies in Tamil Nadu and is now fast spreading among farmers in Kerala, Andhra, Maharashtra, Gujarat, Assam and Himachal. Breeding programs in Stevia are to optimize: the glycoside content and sensory characteristics, disease resistance, leaf yields and leaf-to-stem ratio. Like any other plant, the soil, water and climatic conditions influence the crop greatly, which can be influenced mar-

ginally with management practices. It is a short day plant, growing up to 0.6 meters in the wild and flowers under short day conditions. Grows well on fertile, sandy acid soils with shallow water tables. The natural climate is semi-humid subtropical with temperature extremes from 21 to 43 C, averaging 24 C.

PROPERTIES OF STEVIA

The di-terpene glycosides (7 of them in total) of which stevioside and rebaudioside are the most dominant ones, are stable in a wide range of Ph. Steviosides are stable up to a 180°C, while rebaudiosides are stable up to a 100°C. Rebaudiosides are preferred for carbonated beverage and chilled foods, while steviosides are preferable for baked and cooked products. Hypoglycaemic action: Paraguayans believe that Stevia is hypoglycemic and aids the diabetic by influencing the pancreas to restore normal pancreatic function. Oviedo, et al, reported a 35.2% fall in normal blood sugar levels 6-8 hours following the ingestion of a Stevia leaf extract. Other workers have reported similar trends in humans and experimental animals. Based on scientific validation, physicians in Paraguay prescribe Stevia in the treatment of diabetes and similarly, in Brazil. However, it is important to note that Stevia does not lower blood glucose levels in normal subjects. An excellent calorie-free herbal sweetener.

Cardiovascular Action: A good deal of experimental work done on the effects of Stevia and stevioside on cardiovascular functioning in man and animals like possible toxicity and possible therapeutic action. No significant properties were found in both types of study. The most curious finding is a dose-dependent action on heartbeat, with a slight increase appearing at lower doses, changing to a mild decrease at higher doses. In both instances, the result is remarkable, and it is extremely doubtful that humans would experience any effect at normal doses. The long-term use of Stevia would probably have a cardiotonic action, that is, would produce a mild strengthening of the heart and vascular system.

Antimicrobial Action: Stevia can inhibit the growth and reproduction of bacteria and other infectious organisms. Research clearly shows that Streptococcus mutans, Pseudomonas aeruginosa, Proteus vulgaris and other microbes cannot survive in the presence of Stevia constituents. This fact, in association with the sweet taste, makes Stevia an excellent ingredient for mouthwashes and toothpastes. Try the patent literature search to know more on such applications of Stevia-based products. Stevia has even been shown to lower the incidence of dental caries.

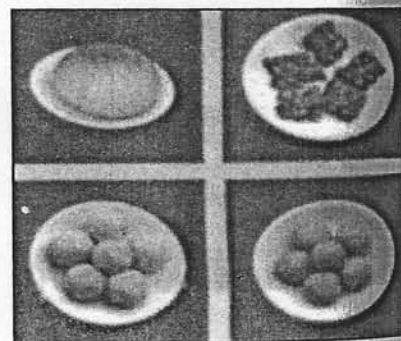
Digestive Tonic Action: Brazilian literature ranks Stevia high among the list of plants used for centuries by the "gauchos" of the south-

ern plains to sweeten the bitter medicinal preparations. Through much experimentation, these people identified that Stevia improved digestion, and that it actually influenced overall gastrointestinal function. Similarly, the Chinese use Stevia in teas hot or cold, as an appetite stimulant, digestive aid, aid to weight management, and even for staying young.

Effects on the Skin: A property of Stevia yet to be clinically validated is its ability to aid solving of skin problems. The Guarani and other people familiar with Stevia report its effect on acne, seborrhea, dermatitis, eczema, etc. Stevia placed directly in cuts and wounds resulted in more rapid healing, without scarring, is observed. (This treatment will sting for a few seconds followed by lowered pain). Stevia face packs have also been found to be very effective in tightening of the skin, as a result a few leading brands of Stevia-anti-wrinkle face packs are available internationally.

Safety Information Regarding Stevia

The best piece of information on Stevia is the fact that for over 1500 years of continuous use by Paraguayans, there is no ill effect reported to date. Similarly, for over a decade Japanese have been ingesting stevioside-based products and not a single report of side effects of any kind has been reported. Compare that record to the track record of aspartame, which is the number one source of consumer



food complaints, made to the FDA. Pomaret and co-workers in South America performed the first official investigation of possible toxicity from Stevia in 1931. Their tests were negative. They observed that stevioside passes through the human alimentary canal without being altered by digestive processes. That is, it goes out in exactly the same form that it goes in. In the decades since that observation, there has raged a minor debate over this issue, but so far nobody has been able to prove Pomaret wrong. An example of a good toxicology trial was one performed in 1985 by Yamada and co-workers. They administered stevioside and rebaudioside A to rats for two years at the rate of 0.3-1% of their diet. The animals were then sacrificed, and the researchers conducted bio-chemical, anatomic,

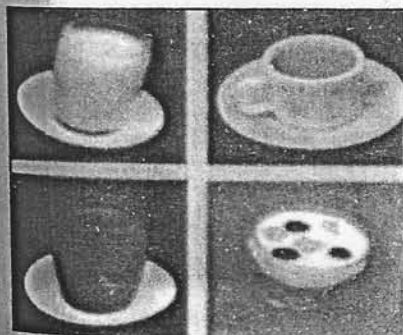
pathological and carcinogenic tests on 41 organs following autopsy. In addition they performed ongoing hematologic and urine tests on the same animals. Each of the animals was matched to a control animal that experienced exactly the same treatment except for the Stevia and no ill effects were observed between them. Similar batteries of tests carried out by the National Ministry of Health and Welfare in Japan also failed to find any form of toxicity whatsoever.

AVAILABILITY OF STEVIA

Stevia rebaudiana is currently available in India in the form of dried green leaf, leaf powder, liquid extract and spray dried whole leaf extract. In addition to these basic forms, Stevia is also available as value added products like Stevia tea, Stevia face pack, Stevia health drink, Stevia Sweet supari, Stevia biscuits, Stevia toothpaste, Stevia chocolates etc. The first commercial brand of Stevia and currently the only one with PFA license is called as STEVIER from ASR Herbals. Stevia is sold in the US with FDA approval as a dietary supplement.

A. Stevia Close up, B. Stevia field beds in different stages, C. Stevia Nursery D. Products

Close up, filed plots, nursery beds and products of ASR group are shown in photographs A to D. The author is the partner of ASR Nurseries & Herbals, India's first company dedicated to the promotion of Stevia in India



since 1997. ASR Group provides consultancy, planting material, basic products from Stevia and value added products from Stevia. He can be contacted by e-mail: stevier@asrherbals.com, Fax: 080-26651157 or Call 9845006451.

Reading
 * Brandle, JE and Rosa, N (1992) Heritability for yield, leaf-stem ratio and stevioside content estimated from a landrace cultivar of Stevia rebaudiana. Canadian Journal of Plant Science 72: 1263-1266.

* Crammer, B, and Ikan, R (1986) Sweet glycosides from the Stevia plant. Chemistry in Britain 22: 915-916.

* Kinghorn, AD, and Soejarto, DD (1985) Current status of stevioside as a sweetening agent for human use. In 'Economic and medi-

cal plant research'. Academic Press. London.

* Metivier, J, and Viana, AM (1979) The effect of long and short day length upon the growth of whole plants and the level of soluble proteins, sugars and stevioside in leaves of Stevia rebaudiana Bert. Journal of Experimental Botany 30: 1211-1222.

* Soejarto, DD, Compadre, CM, Medon, PJ, Kamath, SK and Kinghorn, AD (1983) Potential sweetening agents of plant origin. II. Field search for sweet-tasting Stevia species. Economic Botany 37: 71-79.

For more details, please contact :
 Dr. Seetharam Annadana, Partner, ASR Nurseries, Krishi, 29, C.R.Layout, Sarakki Main Road, J.P.Nagar P.O, Bangalore - 560 078 Tel : 080-26340962 Fax : 080-26651157. Email : asrherbals@hotmail.com



VRMAP

Creating value added products

Vizag-based medicinal plants processor.

VR Medicinal & Aromatic Plantations Pvt Ltd. [VRMAP] a leading company in the cultivation and production of medicinal & aromatic plantations in Andhra Pradesh was established in May 2000, Visakhapatnam [A.P] . The promoters of this organization are Mr. V Madhusudhan Rao B.E., M.B.A, F.I.V, managing director and his son Mr. V. Ramanarayana M.B.A, executive director who carry rich experience not only in the field of medicinal & aromatics but also in other core fields like constructions, chits and finance, information technology, education, agro farms and constructions.

VRMAP is proud to become a member of EOAI [Essential Oil Association of India], New Delhi a reputed organization in the segment of medicinal & aromatic plantations in India and is also on the verge of becoming a member of FAFAI, Bombay. VRMAP so far motivated large number of farmers in and around Visakhapatnam in the cultivation of medicinal and aromatic plantations and made them to realize that this venture is fruitful and profitable.

So far VRMAP has successfully catered to the needs of several agarbathi manufacturers, perfumery industries, unani and phytopharmaceuticals companies and earned a reputation of reliable, authentic and genuine supplier of essential oils at an economical price.

VRMAP cultivates, manufactures and markets more than 100 products of herbs, herbal extracts, alkaloids, drug intermediates and essential Oils.

The company also owns good number of distillation units in and around Visakhapatnam Dt to extract essential oils and to meet the present demand of the market all the time.

VRMAP is also on the verge of launching Herbal Tea's and other products. Type of Herbal Tea's that are being introduced in the market are anti-cough and cold, energy enhancer, memory enhancer, anti diabetic, immune enhancer, rejuvenator and aphrodisiac.

VRMAP has also got web presence by name " www.vrmap.org " to enable it's customers to know more about the company's services and it's products online. VRMAP also listed it's products in some of the reputed web sites namely " www.indiamart.com " and " www.trade-india.com " popular web sites in the area of B2B activities to promote business globally.

VRMAP successfully claims " Certificate of Registration " issued by F.D.A Registrar Corp, Virginia, USA [U.S. FDA Registration No:13401181730 ,Effective Date of Registration: December 8,2003]. VRMAP has registered with the U.S. Food and Drug Administration pursuant to section 305 of the United States Public Health Security and Bioterrorism Preparedness and Response Act of 2002, P.L. 107-188.

For more details, please contact :
 Mr.V.Rama Narayana, Executive Director, VR Medicinal & Aromatic Plantations Pvt. Ltd. VR Mansions, 36-46-37, Kancharapalem, Visakhapatnam - 530 008, AP, India, Tel:(O) 0891-559190/797420 (R) 0891-729173.