



Deutscher Tropentag, October 9-11, 2002, Witzenhausen
“Challenges to Organic Farming and Sustainable Land Use
in the Tropics and Subtropics”

**Tropical and Subtropical Plants With Sweetening Properties: the
Potential Source of Low-Calorie Sweeteners**

ZBYNEK POLESNY

Czech University of Agriculture Prague, Institute of Tropical and Subtropical Agriculture, Czech Republic

Abstract

Plant species with unusual taste properties such as bitterness, sourness or sweetness, and others with a taste-modifying components, have long been known to man, although their exploitation has been limited (SUMMERFIELD et al., 1977). In recent years there has been an increasing demand for ‘Low-calorie’ sweeteners. Together with this trend, there is also an increase in the demand for healthy and natural food products. Therefore, and in order to address this need, there is an intense and ongoing search for alternative sweeteners (FAUS, 2000). The restriction on the use of artificial sweeteners such as cyclamate in the USA and other countries highlights the commercial potential for indigenous plant species with taste-modifying properties or sweetening principles (SUMMERFIELD et al., 1977). Recently, a number of plant constituents are employed as dietary sucrose substitutes in one or more countries, including the diterpenoid, stevioside (*Stevia rebaudiana* BERTONI), the triterpenoid, glycyrrhizin (*Glycyrrhiza glabra* L.), and the protein, thaumatin (*Thaumatococcus daniellii* BENTH.). Accordingly, there has been much interest in discovering further examples of potently sweet compounds of natural origin, for potential use in foods, beverages, and medicines. Approximately 75 plant-derived compounds are presently known, mainly representative of the flavonoid, proanthocyanidin, protein, steroidal saponin, and terpenoid chemotypes. In current research directed towards the elucidation of further highly sweet molecules from plants, candidate sweet-tasting plants for laboratory investigation are obtained from ethnobotanical observations in the field or in the existing literature. Examples of novel sweet-tasting compounds obtained so far are the sesquiterpenoids, hernandulcin and 4 beta-hydroxyhemandulcin; the triterpenoids, a-brusosides A-D; a semi-synthetic dihydroflavonol based on the naturally occurring substance, dihydroquercetin 3-acetate; and the proanthocyanidin, selliguaein A. Potential commercial value of naturally sweet substances stimulate a search for new plant sources of sweeteners (KINGHORN and KENNELLY, 1995).

Keywords: Ethnobotany, low-calorie sweeteners, sweet compounds, tropical and subtropical plants