Differentiation and Diversity
The kingdom of Nepal boasts of about 6000 to 7000 different species of plants that are distributed throughout the country and this vast diversity has been aptly attributed to the huge variation in altitude and the different habitats the plants tend to thrive in (Williams, 2005). Manandhar (1998) report indicated that there are about 800 species of medicinal plants in Nepal, 30% of which are recognized as ethnomedical contributions from the western regions of the country. Kunwar **et al.** (2006) stated that Nepal recognizes about 1624 plant species with medicinal as well as aromatic properties, Sri Lanka about 1400, India about 2500 and China about 5000. The alpine flora from Nepal’s Himalayan region consists of 1227 species in 317 genera of which 114 from the sub-alpine zone and 45 from the alpine zone has been cataloged as plants with medicinal properties (Kunwar **et al.,** 2006).
Bridging the Disparity of Knowledge

The core theme of the Nepali Nighantu is based on the practice and principles of traditional medicine and compiles a commentary on about 750 Nepali medicinal plants with annotations on their therapeutic merits (Kunwar et al., 2006). Although the use of medicinal plants is widespread in Nepal, however, Griggs et al. (2001) is of the opinion that very few species have been subjected to scientific investigations for their bioactive compounds and such, and apparently the paucity of documented studies on the healing properties of most plants of medicinal value is still a major failing. Most of the medicinal and aromatic plants that grow in alpine meadows and mountain pastures at high altitudes are initially collected by the herders (Oli et al., 2003) and are eventually traded in the local bazaars and bustling markets of Kathmandu.

The distribution and uses of some of the most important plants that are commonly used in the traditional medicinal practice of Nepal are presented in this article.

Medicinal Plants and the Healing Properties

*Cassia fistula* Linn (Rajbrik) of the family Leguminosae is a semi-wild Indian laburnum commonly known as “Golden Shower Tree” or “Indian Laburnum” and is distributed throughout Asia, South Africa, Mexico, China, West Indies, East Africa and Brazil (Duraipandiyan and Ignacimuthu 2007). The occurrence of *C. fistula* in the Dadeldhura district of Nepal and its potential as a herbal drug among the Raute tribe has been documented by Manandhar (1998). *C. fistula* is also mentioned in the Ayurvedic system of medicine as a treatment for hematemesis (bloody vomitus), pruritus (itching), leucoderma (loss of pigment in areas of the skin) and diabetes (Bhakta et al., 2001). The antibacterial properties of *C. fistula* as revealed from the study by Duraipandiyan and Ignacimuthu (2007) rationalizes its use in traditional medicine as a cure for skin infection, fever and diarrhea. In addition, Duraipandiyan and Ignacimuthu (2007) concluded that the compound 4-hydroxy benzoic acid hydrate that was isolated from *C. fistula* possessed antidermatophytic activity and hence the plant had the potential to serve as a source of drugs against fungal infections.

*Dioscorea bulbifera* Linn (Ban tarul), known as “Air potato” or “Air Yam” in English, belongs to the family Dioscoreaceae and is an important aspect of the diets of the people inhabiting the mid-hills and the Terai region of Nepal (Singh et al., 1979). Consumption of wild yam is generally popular among various tribes like the Chepangs, the Tharus, the Bantars, the Danuwars and the Tamangs, that inhabit the rural regions of Nepal (Bhandari et al., 2003). In Nepal, the roots of *D. bulbifera* are first cleaned, chewed raw and then swallowed as a treatment for pneumonia and throat problem (Shrestha and Dhillion, 2003). The root tubers of *D. bulbifera* are also used in Chinese medicine as a remedy for sore throat and struma (swelling of the thyroid gland) (Komori, 1997).

*Mentha arvensis* Linn (Babari), known as “wild mint” in English, is an aromatic herb belonging to the family Labiatae. The genus *Mentha* consists of more than 25 species of which *M. arvensis*, *M. piperita*, *M. spicata* and *M.
Pulegium contain the essential oils consisting of monoterpenes like menthol, menthone, carvone and pulegone as the major constituents (Phatak and Heble, 2002). These oils are widely used in the food and pharmaceutical industries and also for flavor and/or fragrance formulations (Lawrence, 1992).

*Picrohiza scrophulariiflora* (syn. *Neopicrorhiza scrophulariiflora*) Pennell (Kutki) belongs to the family Scrophulariaceae which is known as Kutki in the Nepalese language while the Sherpas call it Ho-dling (Bhattarai, 1989). From Smit *et al.* (2000) study, it was apparent that diethyl Soxhlet extract prepared from the dried rhihme of *P. scrophulariiflora* had the highest anti-inflammatory effect compared to all the other extracts. Prolonged administration of the extract orally inhibited carrageenan-induced paw edema in mice and also delayed prevalence of collagen-induced arthritis.

*Stellera chamaejasme* Linn (Dyaurali phool), known as Chinese Stellera in English, belongs to the genus Daphne of the family Thymelaeaceae. *S. chamaejasme* is a popular medicinal plant not only in Nepal but also in China where it is widely distributed in the northern and western provinces as well as in the regions along the Yellow River (Peng *et al.*, 2006). About 15g of the root is boiled in about 500 ml of water, strained and boiled again until it is reduced to about ¼ of the amount and then applied to treat aching joints in Nepal (Manandhar, 1995). The daphnane-type diterpene gnidimacrin, isolated from the roots of *S. chamaejasme* has been found to strongly inhibit cell growth of human leukemias, stomach cancers and non-small cell lung cancers *in vitro* (Yoshida *et al.*, 1996).

*Urtica dioica* Linn (Sishnoo) is a plant belonging to the family Urticaceae that boasts of a long history as a herbal remedy and nutritious addition to the diet. Application of *U. dioica* as a medicinal plant has also been reported from Turkey (Kültür, 2007). The root juice is consumed as a treatment for fever or an infusion is prepared from the root and drunk as remedy for asthma in Nepal (Shrestha and Dhillion, 2003). *U. dioica* is used to relieve rheumatic pain. Rheumatoid arthritis is an autoimmune disease that is characterized by chronic inflammation, hyperproliferation of the synovial lining and cartilage destruction (Reihemann *et al.*, 1999). The levels of cytokines such as tumor necrosis factor (TNF) are highly elevated in the synovial fluid (Reihemann *et al.*, 1999) and TNF is a pivotal pathogenic factor in rheumatoid diseases (Elliott *et al.*, 1994). *U. dioica* is used to treat excessive menstrual flow for which decoction prepared from the leaves, is drunk about four teaspoonfuls three times a day in Nepal (Joshi and Joshi, 2000).

**Going Natural – The Future Trend**

In conclusion, scaffolds as basic library design – an integrated approach with structure-based approaches and classical medicinal chemistry will provide ingredients for the success of natural products and medicinal plants in Nepal and Asian biotechnology. Another approach will be the integration of natural products in the drug discovery process – pathway analysis, proteomics and chemical genomics. Natural products are regarded as privileged structures in the modern global pharmaceutical industry. We hope Nepal medicinal plants will contribute to the growing global pharmaceutical discovery and drug development.
References


