Chapter-I

Introduction

Curcuma species are well-known indigenous medicine, used for the treatments of various ailments and metabolic disorders. They are mostly aromatic and medicinal in nature. They are used as spices, dyes, food, perfumes, cosmetics, tonics, starch and as tropical green-house ornaments. Curcuma longa Lin. is the most common and important among the species of curcuma reported and studied till date. Turmeric (Curcuma longa) and has been extensively used in Ayurveda, Unani and Suddha medicine as remedy for various disease (Ammon and Wahl, 1991; Eigner and Scholz, 1999). It is also credited with religious magical rites in India and certain South East Asian countries. The roots are known to be antiseptic and aromatic. Its paste is used in cleansing, disinfecting the skin and skin ulcers without drying out its natural oils (Chopra et al., 1958). The yellow coloring is imparted by curcumin (diferuloylmethane) a phenolic pigment (Copper et al., 1994). Curcumin has a long history of medicinal used in India and South Asia and is known to exhibits a variety of pharmacological effects including anti-inflammatory (Huang et al., 1992), antitumour, anti-HIV and anti-infectious (Allen et al., 1998 and Chan et al., 1998), exhibits anti-oxidant properties in the treatments of cardiovascular diseases (Tilak et al., 2004), inflammation (Kohli et al., 2005).
In addition to turmeric (*Curcuma longa*), the other species of *Curcuma* are also known to have medicinal properties. The rhizome paste as well as powder of *Curcuma aromatica* are externally used in leucoderma, scabies, small-pox and considered useful in blood diseases and intestinal worms. Juice given orally is a strong remedy against rheumatism and juices mixed with gingers are administered for smooth delivery in North-Eastern India (Prakash and Mehrotra, 1996). The rhizomes of *Curcuma amada* are used as stimulant, expectorant, diuretic, carminative and stomachic (Sinha, 2001). Rhizome paste mixed with hot water is applied in inflammation, itching and given as decoction in bronchitis, asthma constipation, gastric troubles (Prakash and Mehrotra, 1996). The rhizomes of *Curcuma angustifolia* is applied in leprosy, leucoderma, burning sensation, decoction is given in asthma, jaundice, dyspepsia, kidney-stone and anaemia (Prakash and Mehrotra, 1996). The rhizomes of *Curcuma leucorrhiza* is used in Singbhum, Bihar for treating enlarged liver, spleen and ulcer in stomach (Pal and Srivastava, 1976). A paste made with honey and rhizome pieces of *Curcuma caesia* is used as tonsil remedy by the Meiteis in Manipur. A decoction of the rhizomes of *Curcuma caesia* is given in asthma, epilepsy and tuberculous gland of neck (Prakash and Mehrotra, 1996).

The use of medicinal plants or their active components is becoming an increasingly attractive approach for the treatments of various disorders. Another alternative approach is the used of food derivatives, which have the advantages of being relatively non-toxic. Limited scientific evidence regarding
the effectiveness of these natural derivatives, in conjunction with lack of mechanistic understanding of their actions has prevented incorporation into the mainstream of medical care. Therefore scientific research regarding the bioactive components is needed to overcome these confusions.

Analysis of bioactive compounds can help ensure quality and batch-to-batch reproducibly of botanically derived products. The active chemical constituents in plants serve as characteristic fingerprint for that plant to develop analytical techniques to ascertain the quality of the active constituents in botanically derived products. The main active compound of *Curcuma* species are curcuminoids and essential oils. The main colored substances in the rhizomes of *Curcuma* species are curcumin and the two related demethoxy compound, demethoxy curcumin and bis-demethoxy curcumin. The essential oils are composed of several monoterpenes and sesquiterpenes compound such as zingiberene, *α*, *β* turmerone (Golding *et al.*, 1982) sebinene, Cineol, borneol, *α*-Phellandrene, pinene, camphor, terpinolene, camphene (Kapoor, 1990). The main biological activities of the essential oils are carmi active, anti-flatulence, antifungal and as an antiplatelet agent (Lee, 2000). Many research studies have been conducted on *Curcuma longa* L. (Turmeric) in particular to its secondary metabolites as a source of antioxidants (Ho and Zheng, 2002). Systematic research has revealed a wide range of pharmacological applications for *C. longa* in treating cancer, alzheimer’s disease (Varghese, 2000). Its uses as antioxidant, anti-inflammatory activities, anti-allergic activity (Ramsewak *et al.*, 2000).
Though much research work has been done on the therapeutic value and the pharmacology of *Curcuma* species particularly that of *Curcuma longa* L. However, research work relating to the isolation and characterization of bioactive compounds from *Curcuma* species which directly or indirectly related to the medicinal uses of these plants is limited. Moreover there is no recorded data pertaining to bioactive components of *Curcuma* species found in Manipur. Hence, the present investigation is being taken up with an objective to:

1. Investigate the different *Curcuma* species found in Manipur and
2. Screen out qualitatively and quantitatively some of the naturally occurring bioactive compounds present in the available *Curcuma* species
3. Study of the nutritive values of these *Curcuma* species
4. Isolation and characterization of the bioactive components present in these *Curcuma* species.
5. Assessing the bioactive components in increasing the medicinal properties of these plants which will be of vital importance for biotechnology based pharmaceutical industries.