A variety of characters contributed by the different disciplines have been employed as an aid to plant systematics. The taxonomic value of anatomical characters is widely recognized. It is generally realized that anatomical markers are as valuable as morphological ones. Some anatomical features have attained diagnostic value and commonly used in taxonomic delineations. Often they are indicative of the affinity of taxa. These microscopic parameters have also been used in the pharmacognostic as well as in the forensic studies.

The order Myrtales as defined by Cronquist (1981) consists of 14 families and more than 9000 species, whereas Takhtajan’s (2003) Myrtales have a large number of 17 families. In addition to most strongly perigynous to epigynous flowers, the order is marked by two uncommon anatomical features, internal phloem and vestured pits in the vessel elements.

The family Lythraceae consists of about 24 genera and nearly 500 species widespread in the tropical countries with relatively few species in the temperate regions (Cronquist, 1981). In India it is represented by 11 genera and about 45 species (Hooker, 1879). The largest genus by far is Cuphea comprising more than 250 species of herbaceous annuals and perennials, native to the tropical and subtropical America and the Hawaiian
islands. Some other genera of considerable size are *Rotala* (35), *Lagerstroemia* (30) and *Lythrum* (30). An interesting range of variation, specially in their habit which varies from herbaceous plants to large forest trees is seen in this family. The plants are herbs (*Rotala, Ammannia*); shrubs (*Lawsonia*) or trees (*Lagerstroemia*). The species of *Ammannia* and *Rotala* grow in damp places.

Several members of the Lythraceae are of economic importance. *Cuphea* is a major potential seed-oil crop that is promising source of medium chain fatty acids for chemical, food and health industries (Princen, 1983; Hinman, 1986; Graham, 1989). The woody ornamental *Lagerstroemia*, has been in cultivation for centuries in its native south East Asia and favoured for its lengthy and colourful flowerings. The genus, and in particular *Lagerstroemia indica* was introduced into Europe in 1759 and reached America a few decades later. The genus has naturalized in many countries and becoming one of its most distinctive and popular flowering woody ornamentals. The popularity is due to its wide assortment of inflorescence colours and a long summer flowering period. Other common garden ornamentals include *Cuphea lanceolata, C. ignea* and several species of *Lythrum*. Species of *Lawsonia, Woodfordia* and *Lafoensia* are useful for the preparation of dyes. Leaves of *L. inermis* are used for staining fingers, nails, hairs and also for wool, silk and leather. Timbers for making boats and other articles are obtained from *Lagerstroemia speciosa, L. lanceolata, L. indica* etc.
Nearly all cultures both ancient and recent have used plants as a source of medicines. The traditional medicines and the use of medicinal plants if carefully selected, appear to be useful health tools due to their simplicity. Many wild and cultivated species of Lythraceae are known to have medicinal importance (Kirtikar and Basu, 1935; Dastur, 1962; Chopra et. al., 1956, Sivarajan and Indira Balchandran, 1994; Joshi, 2000).

The bark of *Woodfordia fruticosa* is pungent, cooling and anthelmintic. While the dried flowers are used in the preparation of asavas and aristas which help in fermentation (Bajpayee et. al., 1985, Sivarajan and Indira Balchandran 1994, Joshi 2000). Two drachms powder are given with curdled milk in dysentery and other bowel complaints as well as for internal haemorrhages (Dastur, 1962). They also improve seminal weakness and are considered as a safe stimulant in pregnancy. The woodfordsins A, B and C dimeric hydrolysable tannins from *W. fruticosa* flowers exhibit remarkable antitumor activity (Yoshida et. al.,1989).

Many of the skin infections are treated and cured successfully with henna, whereas leaves and flowers are used for medicinal and cosmetic preparation as well as in treating psoriasis patients (El-Gammal, 1991). Leaf is antibacterial and antiinflammatory. It is an important component of many formulations of skin care (Ali, 1996).

The root of *Lagerstroemia speciosa* astringent, stimulant and febrifuge, whereas aqueous extract of the leaves acts as hypoglycemic activity. Decoction of bark is used in fever while seeds are known as
narcotic (Joshi, 2000). The leaf extract of *L. speciosa* also acts as an antioxidant or free radical scavenger to protect biological systems against oxidative stress (Unno, et. al., 1997).

The herb of *Ammannia baccifera* is a rich source of vitamin ‘C’ and has antityphoid and antitubercular properties. It is appetiser, aphrodisiac, also used in colic and seminal weakness. The leaves are prescribed in rheumatic pains, ring worms and other skin diseases (Joshi, 2000).

The Lythraceae have been treated variously by different taxonomists. In the Englarian system the family Lythraeae was placed in Myrtaeae; Bentham and Hooker (1862-67) included it in the order Myrtales along with Myrtaceae and Combretaceae. Bessey (1915) also considered it under the order Myrtales. In a revised system of Engler it again forms a component of Myrtiflorae (Melchior, 1964). However Hutchcinson, 1926 kept this family in its own order Lythrales and after the revision shunted in to Onagrales (Hutchinson, 1973). The family is generally considered to be most allied to the Myrtaceae. According to the recent taxonomists it forms a part of the order Myrtales (Cronquist, 1981, 1988, Takhtajan, 1980, 2003, Dahlgren, 1980, Thorne, 1992).

The perusal of the available literature on the family Lythraceae reveals that the taxonomical (Graham, 1985; Panigrahi, 1976, Rajagopal and Ramayya, 1968); Palynological (Graham et. al., 1968, 1985, 1990; Levin, 1970; Erdtman, 1952, Panigrahi, 1979); Embryological (Joshi and Venkateshwarlu, 1935, 1936 a,b,c; Venkateswarlu, 1937; Maheshwari
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1950, 1963, Smith and Herr, 1971); Chemotaxonomical (Graham and Robeelan, 1981); Pharmacognostical (Datta and Mukerjee, 1955; Deshmukh and Pandit, 1967; Mitra and Kapoor, 1971; Wahi et. al., 1982); cytological (Graham, 1989; O’Neil, 1994) and floral anatomical (Cheung and Sattler, 1967), investigations have been fairly extensive. The studies in vegetative anatomy have considerable scope (Solereder, 1908; Metcalfe and Chalk, 1950; Bass and Zweypfenning, 1979; Panigrahi, 1980, 1988; Bhat et. al., 1989, Amarasinghe et. al., 1991). Particularly significant in this regard is a study of as many organs of the plants of a species as is possible. There do exist a number of taxa which need to be covered. It was therefore thought worthwhile to undertake such a study.

In this contribution is presented an account of the vegetative anatomy of 22 species distributed over two of the tribes of the family, Morphological, taxonomical and phylogenetic appraisals of alliance have been attempted in the light of present study on the vegetative anatomy and also in reference to pertinent earlier literature.