

PHYTOCHEMICAL AND PHARMACOLOGICAL STUDIES ON SOME
MEDICINAL PLANTS OF SRI LANKA

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ABSTRACT

This thesis covers the phytochemical studies and some biological studies of two medicinal plants belonging to the family Apocynaceae namely, *Alstonia macrophylla* and *Alstonia scholaris*. The second part of this thesis describes the estimation of vasicine content in *Adhatoda vasica* and its seasonal variation in the plant.

The second chapter describes the taxonomy and chemical characteristics of the genus *Alstonia*. The biosynthesis of indole alkaloids including the formation of strictosidine and the plausible biogenetic pathways of some *Alstonia* alkaloids are given in detail.

General methods of extraction of alkaloids that have been used so far, their advantages, disadvantages and more advanced and improved techniques are discussed in the fifth chapter.

According to the pharmacological reports on *Alstonia* alkaloids, it is evident that the two plants we have studied have significant medicinal value.

In the first part of the eighth chapter, the method of extraction, fractionation and isolation of alkaloids of *A. macrophylla* and *A. scholaris* described in detail including the precautions undertaken to isolate alkaloids in their genuine form. Structures of twelve alkaloids have been elucidated from these two plants. One of which is a new alkaloid, 19-hydroxyvincamajine. In these studies we have found that local *A. macrophylla* is different from the same species found in other countries due to the presence of talcarpine, vincamajine, 19-hydroxyvincamajine, vincorine and cabucraline. Talcarpine and picraline deacetyl are reported for the first time from the genus *Alstonia*. These studies give us significant evidences for chemotaxonomic relationships among different species of *Alstonia* and some other genera such as *Tabernaemontana*, *Strychnos*, *Pleiocarpa* and *Aspidosperma*.

The effect of alkaloidal extracts of these two plants (leaf and stem bark) on alternative and classical pathways of human complement was tested in vitro. These findings suggest that these two plant alkaloids can be used as immunomodulating agents.

Seasonal variation of vasicine content in five parts of *A. vasica* was studied. According to these studies vasicine content is highest during the month of August. Therefore it is advisable to collect that plant materials between the months of July to September for preparation of Ayurvedic medicine in order to obtain the highest amount of vasicine which is the most active ingredient in the plant *A. vasica*.