C H A P T E R - I

I N T R O D U C T I O N

Since, disease, decay and death have co-existed with life, the study of diseases and their treatment have been contemporaneous with the dawn of human intellect. As early as A.D. 77, Dioscorides, a Greek botanist, wrote 'De Materia Medica' on drugs of vegetable, animal and mineral origin. It embraced more than 500 drugs and gave notes on collection, preservation and adulteration. Though the treatise was profusely illustrated, descriptions were meagre and classification crude as to be of little use in identification of the drugs. People in India were also acquainted with a large number of medicinal plants from time immemorial. The Rig Veda, one of the oldest books in the library of man, informs that the Indo-Aryans used the 'Soma' as a medicinal agent. 'Soma' is probably Ephedra pachyclada or E.distachia (Baramullar, 1894; Aitchinson, 1933). Recently, E. pachyclada Boiss. or E. intermedia Schrrank and Mey., are suggested to be the 'Soma' plant by Qazilbash (1960). Works of Charaka and Sushruta show that they were acquainted with a large number of medicinal plants. In Sushruta, the properties of some 700 plants are recorded.

Introduction

Though about 1000 species of different plants are currently employed in drugs (Jones, 1941), numerous species still remain uninvestigated medicinally or pharmaceutically. A large number of vegetable drugs mentioned in the British Pharmacopoeia is available in India which has the advantage of having all types of climates.

More than 90% of cinchona used in America and West European countries came from East Indies before world war II. During war, this part being cut off, search for other sources continued in Europe and America. Cinchona pitayensis, C. officinalis, Remijia purdicana and R. pedunculata were tried for quinine in America. The last two species were found to contain substantial amount of quinine in their bark (Pratt and Youngken 1956). More recently, Rauwolfia serpentina is shown to yield the hypotensive and tranquilising alkaloid reserpine. A number of antibiotics like penicillium, streptomycin and chloromycetin has been discovered as the fermentation products of micro-organisms.

Since, 1945, a host of sapogenins has also been isolated from higher plants. These compounds possess important physiological property of causing haemolysis. Orally, they are not harmful either because they are not absorbed from the intestinal tract or they

form harmless additive compound (Moritz, 1936). Some saponin containing materials like spinach and turnip are thus articles of food. The fruits of Samuela carnerosana are relished in Central America. In Turkey, a popular drink called 'Turkey honey' contains extracts of roots of Gypsophila (Moritz, 1936). Tubers of a number of Dioscorea species, especially D.sativus are eaten as vegetables. Both Gypsophila and Dioscorea are known for their saponin contents.

Saponins are present in plant parts such as leaf, bark, fruit, seed, root etc. Saponins are widely distributed in the plant kingdom. Their presence has been demonstrated in more than fifty different families, but they are more abundant in families like Polygalaceae, Sapindaceae, Caryophyllaceae, Mimosae, Primulaceae and Liliaceae.

Saponins have local irritant action on the skin and mucous membrane. They are used as expectorant for irritating the bronchial muscle. Because of their frothing property, they are used as foam producers in beverages and as fire extinguishers. They act as emulsifying agents as they can bring about reduction surface tension. Saponins also increase absorption of diuretically active substances and stimulate kidneys actively. In many pharmaceutical specialities, saponin

4 is judiciously combined with digitalis, curane, acetyl salicylic acid and salts of calcium and magnesium (Jaretzky, 1949).

Saponins have been used as anthelmintics because of their toxic action on the lower organisms. Thus, the barks of Albizzia anthelmintica (Tschesche and Fortsmann, 1957) and A. labbek (Shah and Bhattacharya, 1960[59]) are recommended as anthelmintics.

Saponins as in sarsaparilla are blood purifiers. They probably increase absorption of other constituents and accelerate the metabolism (Moritz,1936). Aqueous solutions of saponins absorb carbon dioxide.

In addition to the above, triterpenoid saponins are also used in the manufacture of acoustic tiles, photographic plates, films and paper ceramics, toothpastes, shampoos, liquid soaps and cosmetic preparations. They are also used in the determination of oxygen in blood (Kirk and Othmer, 1954).

Nowadays, the chief stimulating expectorant employed in medicine is the root of Polygala senega (Polygalaceae). It is also used in diseases of heart, amenorrhoea, dysmenorrhoea, rheumatism and coughs. The expectorant action is due to local irritating properties of saponins that senega contains (Bal and Datta, 1941).

Introduction

It stimulates the mucosa directly. It is used in the form of Ext.Senega Liq., Infusion Senega Conc., Infusum Senega Rec., Syr. Cosillian Co., Tincture Senega and in the powder form.

The present work is undertaken in an effort to find out a suitable substitute which may contain not only a substancial amount of saponin but may also be abundant in India.

A number of other plants belonging to different families are also studied, as they are found to be of recent interest. Fruit of Capparis moonii Wight are reported to be effective in pulmonary tuberculosis; stem-bark of Zanthoxylum rhetsa DC. is reported to possess cholinergic and spasmolitic activities. Another drug, known as 'Asvaghandha' derived from Withania somnifera Dunal is included in I.P. The existing I.P. monograph on this plant is not satisfactory. Entire plants of Merremia emarginata Hallier, are used as a substitute of 'Brahmi', a nerve tonic, in Gujarat and Saurashtra. Likewise, root and stem of Naregamia alata Wight. are used as a substitute of ipecacuanha roots in India.