CHAPTER I

INTRODUCTION

The genus *Mitragyna* belongs to the family Rubiaceae as a member of the subtribe Mitragyninae in the tribe Cinchoneae. This genus consists of ten species, all of them are trees growing in tropical and subtropical regions of Asia and Africa. There are six Asian species, growing in Thailand, India, Sri Lanka and Southeast Asian countries, one East African and three West African species. According to Ridsdale's recent revision, they are now recognised as follows (Ridsdale, 1978) :

Asian species :

Mitragyna diversifolia (Wall. ex G. Don) Havil.

(formerly *M. javanica* Koord et Val. var. *microphylla* Koord et Val.)

M. hirsuta Havil.

M. parvifolia (Roxb.) Korth.

var. *parvifolia* (Roxb.) Korth.

var. *microphylla* (Kurz.) Ridsd., comb. nov.

M. rotundifolia (Roxb.) O. Kuntze

M. speciosa (Korth.) Havil.

M. tubulosa (Arn.) Havil.

East African species :

M. rubrostipulata (K. Schum.) Havil.

West African species :

Mitragyna inermis (Willd.) O. Kuntze

M. ledermannii (K. Krause) Ridsd., comb. nov.

(formerly *M. ciliata* Aubr. et Pellegr.)

M. stipulosa (DC.) O. Kuntze

M. brunonis (Wall. ex G. Don) Craib was regarded as a synonym of *M. rotundifolia* (Roxb.) O. Kuntze (Ridsdale, 1978).

Several species of *Mitragyna* have been used in local folkloric medicine for a wide variety of ailments. In West Africa, the leaves of *M. inermis* (Willd.) O. Kuntze (then recorded as *M. africana* Korth.) are used as a remedy for fever, gonorrhoea, leprosy wounds and blood poisoning; the root in fever and colic; the bark in fever and as an emetic, diuretic and febrifuge (Watt and Breyer-Brandwijk, 1962). The bark is also used as a yellow dye (Burkill, 1935; Watt and Breyer-Brandwijk, 1962). In India, the bark and root of *M. parvifolia* (Roxb.) Korth. are used for fever and colic (Sastri, 1962). The leaves are used, in common with leaves of *M. speciosa* Korth., as a cure for opium addiction (Saxton, 1965). The bark of *M. rubrostipulata* (K. Schum.) Havil. is used in some parts of Africa as a remedy for dysentery, fever and round worm (Watt and Breyer-Brandwijk, 1962). The leaves of *M. speciosa* (Korth.) Havil. are chewed, or a preparation is made from them in different ways, or they are smoked as one smokes opium. The effects of drug, whether taken internally or smoked, are said to resemble those of opium, and in large doses it is poisonous, producing stupor. In Perak of Malaysia, pounded leaves are applied to wounds,

and whole, heated leaves over enlarged spleens (Burkill, 1935). In Africa, the leaves and bark of *Mitragyna stipulosa* (DC.) O. Kuntze (then recorded as *M. macrophylla* Hiern.) are used for cough, for malaria and as a diuretic (Watt and Breyer-Brandwijk, 1962).

At the early stage rhynchophylline, rotundifoline and mitragynol (probably isorotundifoline) were reported to be present in the leaves of *M. rotundifolia* (Roxb.) O. Kuntze from Philippines (Barger, Dyer and Sargent, 1939; Badger, Cook and Ongley, 1950). In 1964, Shellard and Phillipson reported that neither rotundifoline nor isorotundifoline could be isolated from this plant, and they believed that Barger *et al.* and Badger *et al.* examined *M. parvifolia* (Roxb.) Korth. in mistaken identity for *M. rotundifolia* (Roxb.) O. Kuntze (Shellard and Phillipson, 1964a, b). In contrast, they obtained three alkaloids from the leaves of *M. rotundifolia* (Roxb.) O. Kuntze from Burma (Shellard and Phillipson, 1964a). The isolated alkaloids were isorhynchophylline, rhynchophylline and 'base-line' alkaloid which was subsequently identified as an isorhynchophylline N-oxide (Shellard, Phillipson and Sarpong, 1971) and further study shown it to be *anti* isorhynchophylline N-oxide (Phillipson, Rungsiyakul and Shellard, 1973). In 1974, Houghton and Shellard isolated 3-isoajmalicine and isocorynoxeine from the leaves of *M. rotundifolia* (Roxb.) O. Kuntze from Burma. Isomitraphylline, mitraphylline, isorhynchophylline and its N-oxide, rhynchophylline and its N-oxide and corynoxeine were also reported to be present. In addition to the mentioned six oxindole alkaloids of the leaves, without their N-oxides, they also reported the presence of rhynchociline in

the stem bark and rhynchociline and ciliaphylline in the root (Houghton and Shellard, 1974).

The variations in the pattern of alkaloids present in the leaves of *Mitragyna parvifolia* (Roxb.) Korth. obtained from different geographical sources have been reported by research workers at Pharmacognosy Research Laboratories, Chelsea College (Shellard and Phillipson, 1964b; Shellard, Phillipson and Gupta, 1968a, b, 1969a).

Belonging to the same genus, *M. rotundifolia* (Roxb.) O. Kuntze might bear similar situation as those of *M. parvifolia* (Roxb.) Korth. The alkaloidal content of the leaves of *M. rotundifolia* (Roxb.) O. Kuntze growing in Thailand has not yet been reported nor that of *M. brunonis* (Wall. ex G. Don) Craib which is included in the former species. Hence this present investigation is undertaken in the hope that it might reveal an interesting variation in the pattern of alkaloids from those previously reported.