



CHAPTER 5

5.1

CONCLUSION

The aqueous extracts of the traditional hypoglycemic medicinal plants and recipes of Thai and Nigerian origin namely; *Anogeissus acuminata* (Roxb. ex DC) Guill. & Perr. (Ta Khian nu), *Catunaregam tomentosa* (DC.) Tirveng (Nam Taeng), *Dioecrescis erythroclada* (Kurz) Tirveng (Ma Khang Daeng), *Dendrophthoe pentandra* (L.) Miq (Ka Fak Ma Muang), *Mimosa pudica* Linn. var. *hispida* Bren (Mai Ya Rab), *Moringa oleifera* Linn. (Ma room), *Pterocarpus macrocarpus* kurz (Pra Doo), *Rauwolfia serpentina* (L.) Bth. ex. Kurz (Rayom) from the Northern part of Thailand; and *Anisopus mannii* N.E.Br (Kashe zaki), *Anogeissus leiocarpus* (D.C) Guill & Perr. (Mareke), *Daniella Oliveri* (Rolfe) Hutch & Dalz. (Maje), *Detarium macrocarpum* Harms (Taura), *Leptedenia hastata* (Pers) Dec'ne (Ya diya), *Mimosa invisa* var. *inermis* Adelb (Idon zakara), *Moringa oleifera* (Zogale), *Pterocarpus erinaceus* (Madobiya), *Rauwolfia serpentina* (Ganyen Ghana) and Maganin Ciwon Suga (recipe comprising of *Ficus thonningii*. Blume (chediya), *Raphia vinifera* P. Beauv, (kimba) and *Leptedenia hastata* (Pers) Dec'ne (Yaa diya)) from the North Eastern part of Nigeria, were screened for their hypoglycemic effects in normoglycemic and alloxan induced diabetic ICR mice for the first time. This study has shown the hypoglycemic effects of several medicinal plants meticulously selected from the traditional medicines of two distinct communities in Northern Thailand and the North Eastern part of Nigeria. The results obtained from the screening of the aqueous extract of the 20 medicinal plants showed that, the free radical scavenging activity in association to their phytochemical constituents enhanced the significant hypoglycemic activity observed in diabetes mellitus. One from each group with the

highest hypoglycemic effect was selected *Anogeissus acuminata* (Roxb. ex DC) Guill. & Perr. (Ta Khian nu) – Thailand and *Anisopus mannii* N.E.Br (Kashe zaki)- Nigeria for fractionation, screening of the sub-fractions and purification, isolation and characterization of the its pure compound and testing of the pure compound on diabetic mice. One compound from each plant emerged after all various tests and experiments namely: Castalagin from the Thai hypoglycemic plant and probably a new compound 3, 23, 28-Trihydroxy-12-oleanen-3-*O*-(β -D-glucopyranosyl-(1,6)- β -D-glucopyranosyl-(1,6)- β -D-xylopyranosyl)-28-*O*- β -D-glucopyranosyl-(1,6)- β -D-glucopyranoside”named (manosrin) from the Nigerian medicinal plant.

The two active principles isolated from the Thai and Nigerian hypoglycemic medicinal plants have proven for the first time to be potent sources of pharmaceutical agents for the treatment of diabetes mellitus. The pure compound, castalagin which was isolated from the Thai medicinal plant, *A. acuminata*, proved to be biologically more active at suppressing FBG than its Nigerian counterpart, manosrin. By a simple comparison of the concentrations of the compound which exerted significant hypoglycemic effect with the concentration of the standard drugs, insulin and glibenclamide, it was observed that the concentration of castalagin needed to elicit significant hypoglycemic effect was about 6 times less than what was needed for the standard drug, therefore it could be considered that castalagin has a very hypotency which is comparable to insulin. This is not surprising to some extent because the aqueous extract had earlier proven to be slightly more hypoglycemic than insulin in the preliminary experiment. It also showed that it is more potent than glibenclamide in the suppression of FBG levels. This finding is one of very few of its kind and a very important one for the herbal or medicinal plant scientists and diabetes patients.

The hypoglycemic activity of manosrin compared to the castalagin, considering the concentration used to obtain a significant FBG reduction of 45.15%. Results from the model suggested that the peak values for the manosrin could probably be between the 3.2 and 32 ug/kg bw. Though significant reduction of the FBG was obtained at a high concentration, this efficiency compares only with glibenclamide on a 1:1 basis but not with insulin. These findings are very interesting and they confirmed the use of these medicinal plants by the traditional health care givers and assure the patients in Thailand and Nigeria, on the ancient wisdom on the use of these hypoglycemic plants in the management of what has been considered a global silent killer.

This study like many others before it has shown that medicinal plants could be relied upon if it is used with care like its allopathic counterpart. The use of medicinal plants around the world, especially in developing countries like Thailand and Nigeria is inevitable considering the socioeconomic status of the majority of people in these countries and many like them. The fact that, the health alarm from world bodies about the continual increase in the number of diabetic patients as a result of change in lifestyle and cuisine especially in the developing countries makes this study worthwhile. It can be noted that, earlier on, diabetes was regarded in most communities in the developing countries, as a disease of the aged, affluent and the rich. This is no longer the case, though such ignorance contributed to the increasing numbers of diabetic patients in developing countries, especially Thailand and Nigeria. The number of diabetes patients in these countries will be reduced significantly if access to drugs could be granted and funded by the governments of these countries. But considering the state of world economy, cheaper drugs can be made available to

the teaming populace with the increase in the funding into research on medicinal plants and the subsequent reprocessing of the medicinal plants to mimic orthodox or allopathic medicines. The natural appearance and constituents of the processed medicinal plants are very important if they maintain potency because, it assures the presence of the natural adjuvant and the principles which exert synergistic effect and within the framework of the medicine. The fact that, the main focus of the use of medicine of any kind is to heal, cure or reversal of disease conditions, research into the medicinal plants could stress more emphasis on the dosage and safety in such a way that the primary benefits of the medicinal plants would be received by those who need it, because orthodox medicines also have their side effects cum contra indications and are still allowed on the shelf and prescribed/administered to patients in hospitals or health centers. If the increasing number of people suffering from diabetes mellitus in developing countries would be assisted in managing their condition, considering the prevailing problems encountered by them, such as cost of the drugs, compliance to dosage regimen and numerous side effects, the time lapse between that drug development and marketing it or making it available to the consumer, the scarce funds needed for such research, energy required and other factors that slows the process would not make the drugs any cheaper nor readily available to those who need it. Therefore as the world goes “green”, the realization that medicines both for prophylactic and therapeutic abound in nature would encourage the planting of more trees, reforestation programs and the reclaiming or a forestation of the desert parts of Africa and a significant reduction on the reliance of fossil sources of energy and an eventual cut in the budget for medicinal plant research for a better and healthier world.

Further studies are recommended on the chronic toxicity of castalagin and manosrin and on the hypoglycemic effects of other compounds still yet to be isolated from the *Anogeissus acuminata* and *Anisopus mannii*.