



CHAPTER I

INTRODUCTION

The Loganiaceous genus *Strychnos* has long been regarded as an attractive source for phytochemical research. The use of certain species in medicine and pharmacy as well as in poisoning has directed scientists to the study of their active principles. Phytochemical information in literatures indicates that the genus contains a wealth of indole alkaloids. Most of the alkaloids isolated from *Strychnos* species belong to the group of terpenoid indole alkaloids, the compounds which are regarded to be fascinating for scientists from different disciplines. The complexities of their structures have provided challenges to the organic chemists in their elucidation and syntheses. The presence of various pharmacological activities of certain alkaloids, some of which are used as therapeutic agents, remind pharmacologists not to look upon them. And owing to their natural occurrence which is rather specific in some plant families, the compounds are expected to be beneficial for chemotaxonomists. Up to now more than 350 alkaloids have been isolated from *Strychnos* species and new structure types of the terpenoid indole alkaloids are continually encountered .

Besides the alkaloids other interesting groups of compounds are also found in *Strychnos* species such as the groups of iridoids and lignans. Certain members of the former are biogenetically related to the terpenoid indole alkaloids. The isolation of the compounds in this group from plants containing such bases might thus provide the information which either confirm or extend the knowledge of the alkaloid biosynthesis. The latter is well recognized of a great variety of its bioactivities. The attention upon the compounds of this group is also substantiated by the knowledge of their structure variation, as well as their range of occurrence in the plant kingdom, which is continually expanding. There is no doubt that these compounds are one of the most covetious objects for natural product chemists.

The genus *Strychnos* is the largest among 29 genera of the family Loganiaceae. It is organized into 12 botanical sections of about 200 species found distributing in three continental parts of the world: Central and South America, Africa

and Asia including Australia. According to Bisset *et al*¹ and Smitinand², there are 14 species of *Strychnos* in Thailand as the following.

- * 1. *Strychnos axillaris* Colebr.
- 2. *Strychnos curtisii* King et Gamble
- * 3. *Strychnos ignatii* Berg
- * 4. *Strychnos lucida* R.Br.
- * 5. *Strychnos minor* Dennst.
- 6. *Strychnos myrioneura* Gilg
- 7. *Strychnos nitida* G.Don
- * 8. *Strychnos nux-blanda* A.W. Hill
- * 9. *Strychnos nux-vomica* Linn.
- 10. *Strychnos polyantha* Pierre ex Dop
- * 11. *Strychnos rupicola* Pierre ex Dop
- * 12. *Strychnos thorelii* Pierre ex Dop
- * 13. *Strychnos vanprukii* Craib
- 14. *Strychnos wallichiana* Steud. Ex DC.

* *Strychnos* species with reported chemical constituents

Of these fourteen *Strychnos*, ten species have been reported of their chemical constituents³⁻⁸. One of the chemically untouched species is *S. nitida* G.Don. which has been the subject of the present study. This plant is known in Thai name as "Saan dee lok: ตานคิลอก" (Chiang Mai) or "Kluai Khieo: กล้วยเขี้ยว" (Nakorn Ratchasima)². The species is also found growing in India, Bangladesh, Burma, Laos and south Vietnam¹. It is a large woody liane with bifid tendrils 2-6 cm. long. The leaf is lanceolate-ovate or elliptic-lanceolate in shape, 8-15 cm. long, 4-6 cm. wide, acute apex, glabrous and possesses the tertiary venation in the form of dense network of fine, subparallel nerves.^{1,9} The dense inflorescence is in the form of compact corymbs.⁹ The corolla is 10-14 mm. long. The anther is basifix. The style is 7-9 mm. long ; the lower half is very hairy. The fruit is globose, 3-8 cm. in diameter¹⁰. According to its ethnobotanical information, *S. nitida* G.Don has been reported to be used as a medicinal plant in Thailand, however no further details are given⁹.

According to Bisset and Phillipson on their investigation of alkaloids from Asian *Strychnos* species, *S. nitida* was regarded to contain at most only traces of alkaloids as evident from the negative alkaloidal test of the leaf sample¹¹. In the present work, the stem of *S. nitida* was submitted to preliminary screening, revealing the positive result for alkaloids from the acid-base extract, however, only small amount of the compounds was obtained from the plant material. In addition, the presence of lignans was also suggested. Owing to the status of *S. nitida* as one of Thai *Strychnos* species which has not been previously studied on the of chemical constituents and also the results obtained from the preliminary screening, the more detailed investigation on the stem of the plant was undertaken. The work involved isolation, identification and bioactivity determination of the isolated compounds. The resulted structure obtained were expected to provide an information on alkaloidal constituents and/or other principles in the species as well as on their biological activities. For chemical point of view, the structures of the constituents present in *S. nitida*, especially the alkaloids were compared with those of other species variously classified in different groups. These species of different taxonomic groups or geographical groups or even the alkaloid-rich species, were expected to be ideal plant materials for the study in order to provide some useful information in fields of chemotaxonomy and phytochemistry. On the other hand, for pharmacological point of view, the results obtained from the bioactivity determination may suggest some interesting activity of certain isolated compounds. The obtained information might clarify the unambiguous use in the Thai traditional medicine of *S. nitida*.

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