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Evaluation of the PhD Thesis of Ms. Ni Ni Than, entitled  
**Investigation of Bioactive Phytoconstituents and the Biological Activities of some  
Myanmar Traditional Medicinal Plants**

Most of the great success of the so-called modern or Western medicine for the treatment of internal diseases is based on traditional medicine and plant constituents. The realisation of these facts in combination with the rapid development of analytical techniques have led to a renewed interest in natural products and an intensified investigation of folk's medicine for active constituents. This part of pharmacological and chemical research gains special interest also for economic reasons and is due to the urgent demand for new drugs with higher selectivity, less side reactions etc. Ms. Than delivered a very valuable contribution with her PhD thesis in this fascinating field of bioactive natural products.

Four different plants with special importance in Myanmar traditional medicine were investigated in detail, using various chromatographic and modern spectroscopic techniques. The plants were: *Phyllanthus niruri*, *Elephantopus scaber*, *Eclipta alba*, and *Butea monosperma*, amongst which *Phyllanthus niruri* was especially fruitful: 15 compounds were isolated and elucidated by a detailed discussion of their data or by comparison with reference values, respectively. It should be mentioned that plant chemistry is nowadays a very difficult task, as more than 100.000 metabolites are already known. It is therefore not only a sign of good luck, but also of hard work and precise techniques that among these metabolites, one was new. This compound, niruri-flavone, was a new type of sulphonic acids and has recently been accepted for publication with NNT as the first author.

From *Elephantopus scaber*, ten compounds were isolated and identified, among which two were new sesquiterpene lactones named 17,19-dihydrodeoxyelephantopin and iso-17,19-dihydrodeoxyelephantopin. Their structures were determined by spectroscopic methods and additionally confirmed by X-ray crystallography. Also these compounds were published in the meantime. The two other plants delivered also many compounds, which were, however, all already known.

As the starting point of this investigation was the (supposed) pharmacological activity of these plants, a number of biological tests was performed. It is of interest to see that some of the pure components were showing a reasonable cytotoxicity and an interesting selectivity. A set of 14 compounds was further tested for antioxidant properties using a sophisticated biological test with *Lingulodinium polyedrum*. The positive results are not unexpected and can be explained on the basis of chemical structures.

The test for anti-HBsAg like activity is certainly of special interest, and extracts of *P. niruri*, *E. alba*, *B. monosperma* proved to be active as well as some of their constituents. Extracts from *E. scaber* were inactive.

It should be stated that Ms. Than was involved in parallel to her PhD work also in some other projects, which are not discussed in her thesis, but delivered also two publications with a third under preparation.

Altogether, in this thesis valuable experimental material is provided and discussed on a clear and scientific basis. It comes out that Ms. Than was masterly handling difficult separation problems and is able also to discuss and interpret complex spectra. It is clear for me that she demonstrated her ability to perform research on her own.

Her work delivers an interesting and well-established contribution to our knowledge of natural products from plants and fulfils my own standards for a PhD thesis, concerning most of the content: It is, however, a decision of her local supervisor, if the characterisation of known compounds should be discussed more in detail, or can remain as it is in this short and empirical form.

It should be stated, however, that the technical performance (typing errors, formatting, grammar) needs some polishing before final publication. In spite of these editorial needs, I suggest without hesitation to accept this work as a PhD thesis.

6. December 2005

A handwritten signature in black ink, appearing to read 'H. Laatsch', written in a cursive style.

(Prof. Dr. H. Laatsch)