

DOCTORAL DISSERTATION

Topic of the dissertation:

“Study on Botanical Characteristics, Chemical Composition and Biological Effects of *Bombax malabaricum* DC., (family Bombacaceae)”.

Specialized in: Traditional Pharmacy

Code number: 62.72.04.06

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Name of advisors:

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Institution: Ha Noi University of Pharmacy

Summary of new findings of the thesis

Botanical identification:

The morphological characteristic of studied sample collected from Huong Son, My Duc (Ha Noi) had been investigated, described and its scientific name was identified as *Bombax malabaricum* DC. The microscopy characteristics of leaves, flower, and stem bark had been also investigated and described.

Chemical compositions:

- Groups of substances have been identified in stem bark of *B. malabaricum* DC. including: cardiac glycosides, alkaloids, saponins, flavonoids, coumarins, tannins, organic acids, reducing sugars and sterols;
- Groups of substances have been identified in flowers and leaves of *B. malabaricum* DC. Including: cardiac glycosides, alkaloids, saponins, flavonoids, coumarins, tannins, organic acids, reducing sugars, sterols, amino acids and carotenes.
- Eight compounds were isolated from stem bark of *B. malabaricum* DC. including: friedelin, catechin, epicatechin, momor cerebroside I, daucosterol, stigmasterol and diethylhexyl adipate.
- Seven compounds were isolated from leaves of *B. malabaricum* DC including daucosterol, stigmasterol, mangiferin, lupeol, taraxeryl acetate, taraxerol and 7α -hydroxysitosterol.
- This was the first time when momor cerebroside I, 7α -hydroxysitosterol were isolated from family Bombacaceae and friedelin, epicatechin, catechin were isolated from genus *Bombax* L. Lupeol, daucosterol and stigmasterol were isolated from both stem bark and leaves.
- Reverse-phase HPLC method for simultaneous quantitative determination of crystallized compounds isolated from *B. malabaricum* DC. leaves, flowers and stem bark was developed with following conditions: reverse-phase Zorbax C18 column, 280-nm detector, acetonitrile and methanol gradient solvents. This method was fully validated and could be applicable for quantitative determination of compounds isolated from *B. malabaricum* DC. leaves and

stem bark. This result is a contribution to the modernization of the plant material standardization.

- The results of the quantitative determination showed as follows: 100g of dried stem bark contains: epicatechin – 12.3mg, catechin – 6.7mg, daucosterol – 1.8mg, lupeol – 9.5mg, stigmasterol – 1.9mg, friedelin – 7.6mg; 100g of dried leaves contains: mangiferin – 8.1mg, daucosterol – 1.1mg, 7 α -hydroxysitosterol – 0.9mg, lupeol – 5.7mg, taraxeryl acetate – 4.1mg, stigmasterol – 0.9mg, taraxerol – 5.1mg.

2.3.3. Biological effects of *B. malabaricum* DC.

The results of the acute toxicology studies on white mice showed that:

- No dead was found in all tested batches when mice was orally administered of water extract of stem bark and leaves at the dose of 100 – 300g/kg body weight.
- No dead was found when mice was orally administered of water extract of flowers at the dose below 220g/kg body weight, however, at the dose above 220g/kg body weight, some mice were found dead. LD₅₀ of *B. malabaricum* flowers was 500.71g/kg.

Biological effects of B. malabaricum DC.

- The water extract and ethyl acetate fraction of *B. malabaricum* DC. stem bark at the dose of 6g and 12 g/kg body weight showed peripheral analgesic but not central analgesic effect in mice.
- The ethyl acetate fraction of *B. malabaricum* DC. stem bark at the dose of 8 g/kg body weight showed anti- acute inflammatory effect in white rats.
- The water extract and ethyl acetate fraction of *B. malabaricum* DC. stem bark at the dose of 12g/kg body weight showed anti- chronic inflammatory effect in white rats.
- The water extract of *B. malabaricum* DC. stem bark at the dose of 12 g/kg body weight reduced bleeding time in white mice.
- The water extract of *B. malabaricum* DC. leaves at the dose of 6 and 12g/kg body weight showed hepatic protective effect in white mice: significantly decreased the acute increasing of ALAT and ASAT enzyme levels in serum, limited the hepatic damages caused by paracetamol (at the dose of 400mg/kg body weight).
- The water extract of *B. malabaricum* DC. leaves at the dose of 6 and 12g/kg body weight showed reduction effect on liver weight and antioxidant effect by reducing MDA concentration in homogenized liver ($p < 0.05$) in mice.

The scientific advisors

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