

# DOCTORAL DISSERTATION

**Name of Ph.D candidate:** Hoang Minh Chau

**Dissertation title:** Study on the major compounds and chemovariation of bioactive substances in *Gymnema sylvestre* (Retz.) R. Br. ex. Schult "

**Speciality:** Medicinal Material - Traditional Pharmacy

**Code number:** 9720206

**Scientific supervisors:**

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**Academic institution:** Vietnam National Institute of Medicinal Materials

**Summary of new findings:**

## ***1. Phytochemicals***

- 6 previously undescribed compounds were isolated and elucidated from Vietnamese *Gymnema sylvestre*, including: Compound **1**: 3 $\beta$ ,16 $\beta$ ,28-trihydroxyolean-12-en-29-oic acid 3-O- $\beta$ -D-glucopyranosyl(1 $\rightarrow$ 3)- $\beta$ -D-glucuronopyranoside; Compound **2**: Sitakiosogenin 3-O- $\beta$ -D-glucopyranosyl (1 $\rightarrow$ 3)- $\beta$ -D-glucuronopyranoside; Compound **3**: Sitakiosogenin 3-O- $\beta$ -D-glucuronopyranoside; Compound **4**: 29-O-( $\beta$ -D-glucopyranosyl) gymnemagenol 3-O- $\beta$ -D-glucuronopyranoside; Compound **5**: Gymnemagenol 3-O- $\beta$ -D-glucuronopyranoside; Compound **8**: 3-O-[ $\beta$ -D-xylopyranosyl(1 $\rightarrow$ 6)- $\beta$ -D-glucopyranosyl(1 $\rightarrow$ 6)- $\beta$ -D-glucopyranosyl] oleanolic acid 28-[ $\beta$ -D-glucopyranosyl(1 $\rightarrow$ 6)- $\beta$ -D-glucopyranosyl] ester

**2. Biological activities** First testing in vitro PTP1B inhibitory effect of all isolated compounds. Compound 4 and 5 showed the most potent PTP1B inhibitory activity and also significantly enhanced glucose uptake in 3T3-L1 adipocytes: 29-O-( $\beta$ -D-glucopyranosyl) gymnemagenol 3-O- $\beta$ -D-glucuronopyranoside and Gymnemagenol 3-O- $\beta$ -D-glucuronopyranoside compounds.

## ***3. Bioactive compound accumulation***

- Identify and isolate the chemical marker of Vietnamese *G. sylvestre*:

gymnemagenol, the aglycon of compound 4 and 5, to evaluate the seasonal chemical variation for this plant. An analytical method for the validation of gymnemagenol in Vietnamese *G. sylvestre* was established.

- The accumulations of gymnemagenol were identified to be highest in May and October. On the other hand, February showed the lowest amount of gymnemagenol in Vietnamese *G. Sylvestre*.

*Hanoi, November 8<sup>th</sup>, 2018*

**ON BEHALF OF THE SCIENTIFIC SUPERVISORS  
MAIN SUPERVISOR**

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**Assoc. Prof., Dr. Tran Van On**

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