

STATEMENT

by **Assoc. Prof. Stanislava Dimitrova Ivanova, PhD**

Department of Pharmacognosy and pharmaceutical chemistry
Faculty of Pharmacy,
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regarding a dissertation work for awarding the educational and scientific degree '**Doctor of Philosophy**', in the professional area 7.3. Pharmacy,
Doctoral program: „Pharmacognosy and Phytochemistry“

Author: Vanya Ivanova Nalbantova

Form of the doctoral program: full-time form

Department: „Pharmacognosy and pharmaceutical chemistry“

Тема: „Phytochemical study and potential applications of *Trigonella foenum-graecum* L. seeds“

Scientific supervisor:

Assoc. Prof. Niko Joseph Benbasat, PhD, the department of Pharmacognosy and Pharmaceutical Chemistry, Medical University of Plovdiv and

Professor Cedric Delattre PhD, Clermont Auvergne INP, CNRS, Institut Pascal, Université Clermont Auvergne, F-63000 Clermont-Ferrand, France

1. General presentation of the procedure and the doctoral students.

The submitted set, of paper and electronic materials, **is in** accordance with Art. 70 (1) of Section I. Acquisition of educational and scientific degree "DOCTOR" and scientific degree "DOCTOR OF SCIENCES" at Medical University of Plovdiv; Regulations of MU-Plovdiv from 28.01.2021 and includes the following documents:

- Application to the Rector of MU-Plovdiv for the disclosure of the procedure for the defense of a dissertation;
- CV in European format with the doctoral student's signature;
- a notarized copy of a higher education diploma;
- orders for enrolment in a doctoral programme, for dismissal with the right to defend
- an order for an examination from the individual plan and a corresponding protocol for passing the examination or the doctoral minimum in the specialty;
- the minutes of the departmental council for the preliminary discussion of the doctoral thesis and the decisions taken on the opening of the procedure and on the composition of the scientific jury;
- dissertation work;
- abstract of the dissertation;
- a list of scientific publications on the subject of the dissertation;
- copies of scientific publications;
- list of participations in scientific forums;

- certificate for received credits from completed training in the Doctoral School of MU-Plovdiv;
- declaration of originality and authenticity of the attached documents.

The doctoral student has enclosed 4 (four) publications in connection with her dissertation, and she is the first author of each of them. She has actively participated in scientific forums, including 3 international and 2 national conferences.

Vanya Ivanova Nalbantova obtained her master's degree in 2016. During the period 2017 - 2019 she worked in the specialty in an open-type pharmacy. In 2019 she was assigned as an assistant professor at the Department of Pharmacognosy and Pharmaceutical Chemistry of MU-Plovdiv. She attended various courses on gas chromatography and mass spectrometry, high-performance liquid chromatography to enhance her qualification skills. She started to specialize in Medicinal Plants and Phytopharmaceuticals in 2021.

He is the Principal Investigator of 1 intra-university project (DPDP-05/2021) on "Phytochemical study of seeds of *Trigonella foenum-graecum* L. - fenugreek cultivated in Bulgaria". The doctoral student had an international mobility in France at Clermont Auvergne INP, CNRS, Institut Pascal, Université Clermont Auvergne, F-63000 Clermont-Ferrand for two months.

2. Relevance of the topic

Recently, interest in phytoproducts has increased significantly. This, consequently, is a prerequisite for a deeper investigation of both the biologically active substances contained in medicinal plants and the associated pharmacological effects, as well as therapeutic applications. This dissertation aims to characterize the essential oil and polysaccharide composition of *Trigonella foenum-graecum* L. (fenugreek), a common plant in our country, and despite many previous studies and its widespread use worldwide, there is still a lack of specificity on this issue. Therefore, I believe that the topic of this dissertation is topical and significant.

3. Knowledge of the problem

The literature review is a comprehensive analysis of both the biologically active components contained in *Trigonella foenum-graecum* L seeds and the many activities and uses attributed to them. In the course of its framing, 190 literature sources have been cited, most of them from recent years, which once again testifies to its relevance.

Based on the detailed literature analysis and its generalisation, the aim of the study has been formulated, demonstrating the doctoral student's ability to creatively analyse the literature.

4. Research methodology

The tasks formulated in the dissertation allow achieving the set aim. A variety of classical and advanced methods in the field of pharmacognosy and phytochemistry are selected. The materials, reagents and standards used are also presented in detail. In the research, the doctoral student used methods such as high performance thin layer chromatography, high performance liquid chromatography, Fourier transform infrared spectrometry, chromatography with light scattering detector and refractometric detector, gas chromatography with fluorescence detection, NMR structural analysis. Moreover, a method for the identification and quantification of galactomannan by HPTLC was developed and validated. The experimental setups are illustrated by figures. The application of a variety of methods to achieve the stated aim, gives reason to believe that during her studies the doctoral student has also acquired skills for independent future research.

5. Characteristics and assessment of the thesis and contributions

The current thesis consists of 134 pages and is illustrated with 22 tables and 34 figures. The literature review is well structured, shows a thorough knowledge of the problem and provides a theoretical basis for the choice of methods used. The aim is clearly formulated and the objectives (6 in number) are logically related to the stated aim. The Materials and Methods section describes in detail the methods used, which have been selected in accordance with the stated tasks.

The results are presented in an understandable and scientific language and illustrated with figures and tables.

A method was developed for the isolation of essential oil in minimal quantities by secondary distillation and the composition of essential oil from seeds of common fenugreek in our country was characterized. A comparative analysis of the terpene composition of seed oil cultivated in Bulgaria and India was carried out. A polysaccharide fraction of the studied species was isolated and in addition a method for identification and quantification of hydrolyzed galactomannan was developed and validated. The epithelialization effect of isolated galactomannan from fenugreek and *Cotinus coggygria* Scop. extract on rat buccal mucosa was analyzed, which could serve as a basis for future studies on their potential as a carrier of plant medicinal substances.

As a result of the studies conducted, 7 conclusions were formed, which correspond to the set tasks. The contributions of the present thesis are well formulated and represent its essence.

6. Assessment of publications and personal contribution of the doctoral student

In connection with the dissertation, the doctoral student has submitted a list of 4 publications, and she is the first author of each of them. Three of the publications are in journals with impact factor - two published in the journal *Pharmacia* and one is published in the journal *Polysaccharides*, which fall into the first quartile (Q1) of the publications in the field. The doctoral student's total score for this indicator is 44.39, which covers the minimum national requirements for indicator group G of the Regulations for the Implementation of the Law on the development of the academic staff in the Republic of Bulgaria. The results of the trials have also been reported at scientific forums, including 3 international and 2 national. Two of the presentations were awarded the prize for the best poster presentation.

The doctoral student has also realized an international mobility in France, at Clermont Auvergne INP, CNRS, Institut Pascal, Université Clermont Auvergne, F-63000 Clermont-Ferrand, for a period of two months.

Based on the submitted declaration of originality and reliability, as well as on my personal impressions of the doctoral student, I consider that she has actively participated in the experiments carried out in connection with the thesis, the preparation of the materials and the processing of the results. I have no critical remarks about the doctoral student.

7. Abstract

The presented abstract is 49 pages in length and includes the aim, objectives, materials and methods used and presents the main results, conclusions and contributions of the thesis. The data are illustrated with 12 tables and 17 figures. The abstract fully corresponds to the requirements set in the Regulations for the conditions and procedure for the acquisition of scientific degrees and academic positions at MU-Plovdiv.

CONCLUSION

The dissertation entitled „Phytochemical study and potential applications of *Trigonella foenum-graecum* L. seeds“ **contains scientific, scientific-applied and applied results, which represent an original contribution to science and meet all the** requirements of the Law for the Development of Academic Staff in the Republic of Bulgaria (LDASRB), the Regulations for the Implementation of the LDASRB and the Regulations of MU-Plovdiv. The presented materials and dissertation results **fully** correspond to with the specific requirements adopted in connection with the Regulations of MU - Plovdiv for the application of the LDASRB.

The dissertation work shows that the doctoral student Vanya Ivanova Nabantova **possesses** in-depth theoretical knowledge and professional skills in the scientific specialty "Pharmacognosy and Phytochemistry", **demonstrating** qualities and skills for independent conduction of scientific research.

Due to the above, I confidently give my **positive assessment** for the conducted research, presented by the above-reviewed dissertation, abstract, results and contributions, and **I propose the honorable scientific jury to award the educational and scientific degree of 'Doctor'** to Vanya Ivanova Nabantova in the doctoral program "Pharmacognosy and Phytochemistry", in the field of higher education 7. Health and Sport, professional field 7.3. Pharmacy.

21.10.2024 г.

Заличено на основание
Чл.5 §1, 6."В" Регламент (ЕС)2016/679

Reviewer:

(Assoc. Prof. Stanislava Ivanova, PhD)

