

STATEMENT

by Assoc. Prof. Iliya Zhelev Slavov, PhD

Faculty of Pharmacy,
Medical University of Varna Prof. Dr. Paraskev Stoyanov

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

The doctoral student has enclosed 4 (four) publications related to the dissertation, three of them in IF journals. One of the presented publications falls in the first quartile (Q1) of publications in the field. The total number of points of the doctoral student on this indicator is 44.39, which is in accordance with the requirements under the Regulations for Academic Development of MU-Plovdiv for the acquisition of the scientific degree.

Vanya Ivanova Nalbantova graduated from the Medical University - Plovdiv with a Master's degree in Pharmacy in 2016. She has been working in the specialty in an open-type pharmacy for the period 2017 – 2019. From 2019 to the present moment she is working as an Assistant in the same department. In 2021, she started her specialization in Medicinal Plants and Phytopharmaceutical Products.

The PhD student takes part in a number of advanced qualification courses. In connection with the development of the dissertation she has carried out an international mobility, in the framework of the Erasmus program, for a period of two months in Clermont Auvergne INP, CNRS, Institut Pascal, Université Clermont Auvergne, F-63000 Clermont-Ferrand, France. She is the principal investigator of 1 intra-university project (DPDP-05/2021) and has participated in 3 international and 2 national conferences.

2. Relevance of the topic

The presented dissertation focuses on the well-known in folk medicine *Trigonella foenum-graecum* L. (fenugreek). The variety of primary and secondary metabolites contained in the seeds determines their enormous therapeutic potential and the benefits they exhibit in different application fields.

Despite the abundant data on the biologically active substances contained and their beneficial effects, the characterization of the essential oil and polysaccharide composition as well as the study of the possibilities of their application would provide a good basis for the future development of medicinal forms.

The dissertation synthesizes research in the field of pharmacognosy and phytochemistry, pharmaceutical analysis and pharmacology, which makes the presented results theoretically and practically significant for pharmacy and medicine in general, therefore I consider the topic to be significant and dissertationable.

3. Knowledge of the problem

The dissertation presented shows the competence of the doctoral student about the state of the problem. In the literature review, description and interpretation of the results 190 literature sources were used.

A phytochemical characterisation of the groups of biologically active substances known to date to be present in the well-known species *Trigonella foenum-graecum* L. as well as an in detail analysis of the numerous biological activities and applications attributed to them have been made. As a result of the literature review, the PhD student has formulated the aim of the study, which demonstrates the ability to analyse scientific material.

4. Research methodology

The doctoral student used a variety of methods in the field of pharmacognosy and phytochemical research. The use of classical and modern methods, such as Fourier transform infrared spectrometry, gas chromatography, chromatography with light scattering detector and refractometric detector, high-performance liquid chromatography, anion-exchange chromatography, NMR structural analysis, is impressive. In addition, a method for the identification and validation of galactomannan by

HPTLC was developed and validated. This allows to achieve the set aim and perform the assigned tasks, which is a precondition for acquiring the necessary theoretical knowledge and practical skills in conducting scientific experiments. The use of different methods shows that the doctoral student, in the course of her studies, has acquired the ability to conduct independent future research.

5. Characteristics and assessment of the thesis and contributions

The presented dissertation is structured in 134 pages within the generally accepted standards. The data are presented in 22 tables and illustrated with 34 figures.

The bibliography includes 190 references, of which 1 in Cyrillic only. A significant part of them are from recent years, which once again demonstrates the topicality of the subject. The literature review shows a detailed analysis of the literature and a good theoretical basis on the issues of the problem. The aim is clearly formulated, and 6 specifically defined tasks are provided for its realization. The materials and methods used are described in detail, ensuring that accurate and reproducible results are obtained. The results are thoroughly discussed with argued conclusions.

The values and results were obtained, some of which were established for the first time:

- A new method was developed for the isolation of essential oil, by secondary distillation of distilled aromatic water, from seeds of *Trigonella-foenum graecum* L.;
- A comparative analysis of the terpene composition of essential oil, from seeds cultivated in Bulgaria and India, was carried out.
- The extraction conditions of the polysaccharide fraction contained in the seeds of the studied species were optimized.
- The monosaccharide composition of isolated galactomannan from fenugreek cultivated in Bulgaria was characterized by different chromatographic methods.
- A chromatographic (HPTLC) method was developed and validated for the identification and quantification of hydrolysed galactomannan from seeds of a common in Bulgaria fenugreek.
- A film-coating assay of isolated galactomannan from *Trigonella foenum-graecum* L. and extract of *Cotinus coggygria* Scop. on rat buccal mucosa was carried out for epithelizing effect.

The contributions of the thesis, six in number, represent its essence by not overestimating the results obtained.

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

The presented list of publications related to the dissertation contains 4 scientific publications, the doctoral student being the first author of each of them. Three of the publications were published in journals with impact factor. Results of the current dissertation have also been promoted through participation in congresses and scientific forums, 3 of which are international and 2 national. The doctoral student is also the principal researcher in one intra-university research project.

In connection with the development of this thesis, Vanya Nalbantova has also carried out an international mobility at Clermont Auvergne INP, CNRS, Institut Pascal, Université Clermont Auvergne, F-63000 Clermont-Ferrand, France, for the period 08.05.2023 - 07.07.2023.

Based on the results obtained, the PhD student has drawn seven conclusions, logically-following the aim and the formulated objectives.

Vanya Nalbantova is the first author of all publications related to the dissertation, as well as of the abstracts of participation in national and international scientific forums. This shows the great personal involvement of the doctoral student both in the dissertation research and in the formulation of the contributions and results obtained.

I have no critical remarks to the doctoral student.

7. Abstract

The submitted abstract contains 49 pages and fully reflects the conducted research and obtained results as well as contributions mentioned in the thesis. The data are illustrated with 12 tables and 17 figures. The abstract fully corresponds to the requirements of 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 Nalbantova 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.

Reviewer: 

(Asscc. Prof. Iliya Zhelev Slavov, PhD)

Заличено на основание
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