

REPORT

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of the materials in the competition for filling the academic position of an Associate Professor in the Professional Field 4.2. Chemical Sciences according to the Classifier of the Areas of Higher Education and the Professional Fields Bioorganic chemistry, chemistry of natural and physiologically active compounds

In the competition for an associate professor, announced in the State Gazette, issue 43 of the 31.05.2019 and on the website of IOCCP - BAS, as a candidate participates Dr. Kalina Moneva Danova from the Institute of Organic Chemistry with the Centre of Phytochemistry, Bulgarian Academy of Sciences.

1. General presentation of the procedure and the applicant

This Report is prepared in response to Order № ПД-09-185 of 26.07.2019 issued by the Director of the Institute of Organic Chemistry with Centre of Phytochemistry, Bulgarian Academy of Sciences (IOCCP-BAS), following the decision made by the Academic Jury that met on 7.08.2019.

The presented by Dr. Kalina Danova set of materials is in compliance with the Development of Academic Staff in the Republic of Bulgaria Act (DASRB), the Rules for the Application of the Development of Academic Staff in the Republic of Bulgaria Act, the Rules of BAS and with the Rules set at the Institute of Polymers, Bulgarian Academy of Sciences, for applying the aforementioned Act.

In 2000, Kalina Danova graduated from the Faculty of Pharmacy, Medical University, Sofia with specialty master pharmacist. She started working at IOCCP-BAS in 2010. In 2011 Kalina Danova successfully defended a dissertation in the Biological faculty, Sofia University St. Kliment Ohridski on the topic “*In vitro* cultivation and secondary metabolites in species of the genus *Hypericum* and *Pulsatilla*, cryopreservation of *Hypericum rumeliacum* Boiss”, for which she was awarded the educational and scientific degree "Doctor".

2. General characteristics of the applicant's activities

For the entire creative period, Dr. Kalina Danova presents 46 publications, and in the competition she participated with 18 publications in journals and 3 chapters of books which were referenced and indexed in WoS and Scopus, which did not include publications used to acquire the educational and scientific degree doctor. The results of the research activity of the candidate are published in authoritative international journals, including in the Q1 region (WoS or Scopus): Natural Product Communications, Journal of Plant Growth Regulation, etc. According to the database Scopus her h index is 5, which meets the requirement for this indicator in the rules of IOCCP-BAS (h = 5 for the position of Associate Professor). The publications, with which the candidate participates in the competition, are divided into two groups, covering indicators B and Г, according to the the Rules for Granting Academic Degrees

and Filling Academic Positions set at IOCCP – BAS. In the first group, indicator B - "habilitation work-scientific publications in journals, which are referenced and indexed in world-famous databases with scientific information (WoS or Scopus)" are presented 7 publications (2 in the Q1 area, 1 in the Q2 area and 4 in the Q3 area (WoS or Scopus)), which are valued at 130 points, required are 100 points. A very good impression is made by the fact that in all of them Dr. Danova is the first author and/or corresponding author. In the second group 11 publications and 3 chapters of books covering the indicator Г are presented, with a total of 251 points, the required being 220 points.

In the attached report 56 citations were presented, with which, according to indicator Д, Dr Danova, receives 112 points, the required being 70 points for the position of Associate Professor in accordance with the Rules for Granting Academic Degrees and Filling Academic Positions set at IOCCP – BAS.

The evaluation of the indicators in the DASRB and the respective regulations for its implementation in the submitted materials, with which Dr. Kalina Danova participates in the competition, convincingly show that she meets the requirements for the position of Associate Professor.

98 participations in international and national scientific forums are presented with poster and oral presentations, of which 3 plenary lectures and 2 invited lectures.

Dr. Kalina Danova has participated in the implementation of 14 completed and ongoing national and international projects, of which she has been the leader of 5 projects. It should be noted that Dr. Danova has important participation in a number of international projects with scientists from the Czech Republic, Egypt, Serbia, Turkey, Ukraine and Switzerland, from which I would like to note a project financed by the Swiss National Scientific Foundation, Switzerland and the Ministry of Education and Science, Bulgaria on "Bioassay-guided approach for the standardized biotechnological yield of phytopharmaceuticals of the Balkan valuable medicinal plants" (PhytoBalk) implemented in the period 2013-2016 under the coordination of Dr. Danova from the Bulgarian side. The participation of Dr. Danova in a number of national and international projects is proof of her authority and her ability to attract funding for her research ideas.

The research activities of Dr. Kalina Danova are in a very topical direction of modern phytochemistry, related to the development of new *in vitro* cultures of medicinal and aromatic plants, which are used as novel sources of secondary metabolites, with proven phytotherapeutic properties.

Significant scientific and applied scientific results are obtained in a conservation, fundamental and applied aspect, which can be summarized as follows:

1. A comparison of the flavonoid compounds of the wild plant of *Hippophae rhamnoides* with its introduced population is made. Over the course of the study it was found that the only surviving population of this plant is located in the region of Pasha Dere near Varna. The conditions for initiation of *in vitro* culture of the species have been established.
2. *In vitro* plant cultures from above-ground parts of *Clinopodium vulgare*, *Hypericum* (*H. tetrapterum*, *H. rumeliacum*, *H. richeri*) have been obtained, with plant material from their respective natural habitats in Bulgaria being used, and for *Hypericum calycinum* aboveground parts of the plant cultivated in gardens are used due to its protected status. Their anti-radical activity was evaluated, and in the hypericin non-producing *Hypericum calycinum* the relationship between enzyme activity and polyphenol content was assessed.

3. *In vitro* cultures of *Artemisia alba* Turra have been obtained and two main types of essential oils are isolated. In plants with a developed root system the oils are characterised by an increased ratio of mono/sesquiterpenoids, while the suppressed root formation decreases this ratio more than twice. It was found that suppression of the root formation *in vitro* increases the total content of sesquiterpenoids in essential oils and stimulates the formation of polyphenol compounds.
4. Characterization of the endogenous content of cytokinins and chloroplast architecture is made in the two *Artemisia alba* morphotypes and an assumption for the correlation between biogenesis of different classes of terpenoids as well as bioactive cytokinin derivatives and chloroplast architecture in the plant cell is made.

The scientific contributions of Dr. Danova's publications are a novelty in science, they have significant application potential and there is no evidence of plagiarism. There are also concrete topics presented, developing the already started studies, in which Dr. Danova will focus her research efforts in the next three years.

3. Personal impressions

I know the candidate and I have wonderful impressions of her scientific work, ability to organize and manage international projects, as well as to present convincingly and accessibly her results to the community. For me, Dr. Danova's contribution in the submitted research is indisputable.

CONCLUDING REMARKS

The documents and materials presented by Dr. Kalina Danova meet all the requirements of the Development of Academic Staff in the Republic of Bulgaria Act (DASRB), the Rules for the Application of the Development of Academic Staff in the Republic of Bulgaria Act, the Rules of BAS and with the Rules set at the Institute of Polymers, Bulgarian Academy of Sciences, for applying the aforementioned Act.

The candidate in the competition has presented a sufficient number of scientific papers published after the materials used in the defense of the educational and scientific degree **doctor**, with original scientific and applied contributions in the field of development of new *in vitro* cultures that have received international recognition.

On the basis of the above, I find it reasonable to give my positive assessment and recommend to the scientific jury to prepare a report-proposal to the Scientific Council of IOCCP-BAS on the choice of Dr. Kalina Moneva Danova for the academic position of Associate professor in IOCCP-BAS in professional direction 4.2. Chemical Sciences (Bio-organic chemistry, chemistry of the natural and physiologically active substances).

Date: 9.09.2019

Report prepared by:

Prof. Margarita Popova

Member of the Academic Jury