Opinion

by Assoc. Prof. Milena Petkova Popova, PhD,
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regarding the materials submitted for application in the procedures for an academic position "Associate professor" at the IOCCP-BAS in the higher education area 4. Natural science, mathematics and informatics, professional filed 4.2. Chemical science, scientific specialty "Bioorganic chemistry, chemistry of natural and physiologically active compounds" for the need of lab. "Chemistry of natural compounds".

In the procedure for Associate Professor, announced in State Gasette, no. 43/31.05.2019 and on the website of IOCCP-BAS, the only candidate is
Assist. Prof. Kalina Moneva Danova, PhD
from IOCCP-BAS, lab. "Chemistry of natural compounds".

1. General presentation of the competition materials

The set of materials presented by Assist. Prof. Dr. Kalina Danova is in accordance with the Regulations of the Development of the Academic staff of the Institute of Organic Chemistry with Centre of Phytochemistry, Bulgarian Academy of Sciences (IOCCP-BAS), and meets the criteria of the Institute for occupying the academic position "Associate professor".

Assist. Prof. Kalina Danova graduated from Faculty of Pharmacy at the Medical University, Sofia in 2000 as a Master of Pharmacy. Her scientific career began in 2006 as a PhD student at the Faculty of Biology, Sofia University. She joined the IOCCP-BAS in 2010 as a chemist, and a year later she was elected as an assistant professor.

The candidate has provided a total of 21 scientific papers (7 of indicator B and 14 of indicator G), 18 of which have been published in refereed scientific journal, and 3 book chapters. The grouping of the papers by the respective quartiles of the journal is as follows: 5 – Q1, 5 – Q2, 5 – Q3 and 3 – Q4. The total impact factor of the articles is 20. A list of 25 articles entitled "Other publications of the candidate" has also been presented. 17 of them are not included in the PhD thesis, and published mainly as a full text in proceedings of international and national conferences and seminars. The citations of Dr. Danova's articles after occupying the academic position "Assistant professor" are 56 (a total of 81), *h*-index 5 (Scopus). Materials for participation in research projects and scientific events have been provided.

2. General characteristics of the candidate's activities

The research activity of Dr. Danova is mainly focused on *in vitro* cultivation of aromatic and medicinal plants, a topic that she has been working on since developing her PhD thesis. The topic is relevant and perspective in view of the biotechnological production of plant biomass and metabolites with valuable pharmacological properties, as well as for the conservation of natural habitats of rare and endangered plant species.

The major contributions of Assist. Prof. Danova's research may refer to:

- *Establishment of condition for in vitro cultivation of medicinal and aromatic plants* – successful protocols for *in vitro* cultivation of *Hippophae rhamnoides*, *Clinopodium vulgare*, *Artemisia alba* Turra and *Hypericum* species (*H. tetrapterum*, *H. rumeliacum*, *H. richeri* и *H. calycinum*) have been developed.
- *Assessment of the biosynthetic potential of in vitro cultures* – the essential oil composition and the composition of polar extracts of plant biomass have been

characterised; important relationships between both cultures development and metabolic profile have been emphasized.

- *Assessment of the antioxidant protection of in vitro cultures and their antiradical activity* - the influence of plant growth regulators on the enzymatic activity, the levels of non-enzymatic antioxidant and the content of phenols and flavonoids was reported; the *in vitro* cultures have a potential as antiradical agents;
- *Conservational evaluation of medicinal plants* – critically endangered status of *H. rhamnoides* L. in Bulgaria has been established. The status from "Endangered" to "Critically endangered" was changed in 2009.
- *Summary and analysis of data for medicinal and aromatic plants* – scientific data for chemical composition and pharmacological activity of medicinal and aromatic plants have been summarized and discussed in view to the potential and perspective of plant biotechnology for a large-scale production of valuable secondary metabolites. Summary of literature data for ethnopharmacology and biological activity of *Sideritis* species has also been presented.

Although some of the publications presented in indicator G are not included in the habilitation report, the following contributions should also be mentioned:

- *Influence of cultivation conditions on the biosynthetic potential* - studies on *Anthricus cerefolium* and *Linum tauricum ssp. tauricum*, and *Hypericum* species;
- *Phytochemical characterization of wild and cultivated plants* – the chemical profile of extracts of *Artemisia alba*, *Inula Britannica*, *Anthemis rumelica* and *Anthricus cerefolium* has been characterized and a number of chemical constituents, incl. new natural compounds have been identified, among which sesquiterpene lactones and coumarins. The *in vitro* systems for the main active metabolites production are under development and optimization.

The candidate's scientific contributions are undoubtedly of scientific and scientifically-applied interest, included in 17 research papers and 4 reviews. Dr. Danova is the first author and/or corresponding author for 13 of them, as in 3 books chapters being the only author, which is indicative of the candidate's personal contribution. So far, the papers have received 32 citations in refereed scientific journals.

The candidate's research activity is related to implementation of 12 international projects, incl. 7 bilateral contracts (EBR), and 2 national contracts. Dr. Danova has been a leader of 5 of the international projects, as well as an advisor of a young scientist through the project funded from abroad.

The number of her participations in scientific events is also remarkable. In the period 2011 – 2019, the research results were reported at more than 40 international and national conferences and seminars by oral and poster presentations.

3. Critical notes

In my opinion, the candidate should also briefly discuss on the contributions of the papers applied in indicator G. This would lead to a more complete presentation of the scientific production provided for participation in the current competition.

4. Personal impression

I know Dr. Danova personally since she joined IOCCP. From my personal impression, confirmed by the results obtained and the future plan, I can confidently say that Assist. Prof. Danova is a persistent and perspective scientist with interdisciplinary skills. She also works actively and responsibly to promote the IOCCP activities as a PR Officer.

CONCLUSION

The documents and materials presented by Assist. Prof. Kalina Danova meet all the requirements of the Act for the Development of the Academic Staff in the Republic of Bulgaria (ADASRB), the Regulations for the application of the ADASRB, the Regulations for the application of the ADASRB of BAS and the Regulations of IOCCP-BAS.

The candidate has provided a sufficient number of scientific papers with indisputable scientific and scientifically-applied contributions.

After reviewing of the materials and scientific papers presented in the competition, analysis of their importance and contributions, together with the candidate's ability to lead and promote research projects, I give my **positive assessment** and recommend to the Scientific Jury to prepare a report-proposal to the Scientific Board of IOCCP-BAS for election of Assist. Prof. Kalina Danova, PhD, on the academic position "Associate Professor" at IOCCP-BAS in the professional field 4.2 Chemical Sciences, scientific specialty "Bioorganic Chemistry, Chemistry of Natural and Physiologically Active Compounds".

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Assoc. Prof. PhD Milena Popova