

R E V I E W

by *Professor Mariyana Vladimirova Filipova-Marinova,*

Doctor of Biological Sciences

Museum of Natural History – Varna

Member of the Scientific Selection Committee by Order No. 252 from 1st of October 2019 of the Director of the Institute of Oceanology, Bulgarian Academy of Sciences – Varna on a competition for filling the academic position “**Associate Professor**” in the research speciality “**Botany**”, research area “**Algology (Diatomology)**”, Professional area: 4.3. Biological Sciences, Higher educational area: 4. Natural Sciences, Mathematics and Informatics, published in the *State Gazette*, **issue 61 dated 02nd of August 2019**.

In the announced competition for the academic position "Associate Professor" in the research speciality "Botany", the only candidate is **Dr. Ralitsa Petrova Zidarova** from the section "Biology and Ecology of the Sea" at IO-BAS.

1. General data on the career and thematic development of the applicant

Ralitsa Petrova Zidarova is graduated with honors in the Master's Degree Program in Biology with a speciality in Botany at the Faculty of Biology of Sofia University "St. Kliment Ohridski" in 2001 and obtained the professional qualification "Biologist".

During the last 18 (eighteen) years, the career development of Dr. Ralitsa Zidarova has been entirely in the scientific field of Botany and in the relevant research area of Algology (Diatomology), starting in November 2001 at the Bulgarian Academy of Sciences, where he consistently occupies the following positions: biologist at the Institute of Botany (2001-2002), biologist at the Central Laboratory of General Ecology (2007-2009), Research Assistant I degree at the Central Laboratory of General Ecology (2009-2011), and biologist at the Institute of Oceanology since 2018. She was also a part-time assistant professor (2001-2004) and chief assistant professor (2011-2016) at the Department of Botany of the Faculty of Biology at Sofia University "St. Kliment Ohridski". In 2008, she defended her dissertation work before the Specialized Scientific Committee on Botany and Mycology at the Higher Attestation Committee for the acquisition of PhD Degree in Botany on the *taxonomic composition, ecology and distribution of algae from Livingston Island, South Shetland Islands, Antarctica.*

The applicant's **scientific topics** are **entirely in the field of algology: taxonomy, biodiversity and biogeography of diatoms**. Dr. Zidarova has an extensive experience in algae sampling and cultivation, as well as in the physiological and biochemical laboratory studies of algae. As an **expert-diatomist**, Dr. Zidarova participates in the preparation of environmental expertises of surface waters on the phytobenthos parameter. She also has valuable **nine years of teaching experience** in the compulsory disciplines of the Faculty of Biology: "Structure and Biodiversity of Plants and Fungi", Systematics of Algae and Fungi" and "Botany".

2. Major topic of the applicant's research and major scientific contributions to each

The self-assessment of scientific contributions presented is **accepted** as **sufficiently detailed, excellently-structured and proper**. Dr. Ralitsa Zidarova's research activities are characterized by a strong interest in the **interdisciplinary approaches** and **diverse research methods** (including **molecular biology**), and the ability to work on **actual topics of practical importance to the World's Biological Science**. In general, the candidate's contributions can be defined mainly as a **novelty to science**, and to a lesser extent, as an **enrichment of existing knowledge with new data** in her research area: **taxonomy, biodiversity and biogeography of diatoms**.

The main and most significant **research contributions** of the applicant are:

Original research contributions:

✓ **A total of 90 new taxa have been described:** 89 species and 1 variety of diatoms, duly presented at the bibliographic reference list;

✓ **Two new taxonomic combinations** are made: the little-known Antarctic species *Navicula glaberrima* W. & G.S.West from the continent of Antarctica and *Navicula megacuspadata* Carlson from Southern Georgia have been transferred to the genus *Craticula*, based on their morphological features under scanning electron microscopy;

✓ **The taxonomically correct name** that should be used for the common in the Southern Hemisphere species *Pinnularia austroshetlandica* (Carlson) Cleve-Euler **is clarified;**

✓ **The type** of the brackish-marine species *Caloneis bacillum* (Grunow) P.T.Cleve **is illustrated;**

✓ **The identity of a large number** of incorrectly identified Antarctic diatom species reported under the names of European or North American taxa **has been clarified**;

✓ Series of species previously identified and reported under the name of a single taxon in the literature on Antarctic **are distinguished as separate species**;

✓ **The actual diversity of diatoms**, as well as the real species richness within the different diatom genera from the Antarctic marine area **are clarified**;

✓ **The diatomaceous flora of the Antarctic marine area has been proved as highly specific to the area**, with a high percentage presence of endemic species, many of which are of limited distribution: only in the Antarctic marine area;

✓ **Narrow bioregionalism is identified**: some species are spread only in certain areas of the Antarctic marine area; a diversity decrease in southbound and a replacement of species from the north of the marine area with species typical for the Antarctic continent;

✓ **For the first time in the world's science, the colonization processes of Antarctic marine benthic diatoms have been traced out**. The colonization, growth, and development of diatom communities on new substrates from two contrast stations were compared.

Confirmative research contributions:

✓ **The presence** of several European and widespread species from other regions of the World **is confirmed** for the **Antarctic marine area**;

✓ During the clarifying of real distribution of diatom species from the Antarctic marine area, **the biogeographic division of Antarctica was confirmed**: the Antarctic continent and the Antarctic marine area;

✓ **A new Bulgarian locality** of the rare freshwater red algal species *Hildenbrandia rivularis* (Liebmann) J.Agardh **is established**.

Research contributions with applied character:

✓ **A new method** for the assessment of rare and endangered species of microalgae **is proposed**;

✓ **A mechanism** for university student's practice in assessing the ecological status of water bodies **has been developed**;

✓ **A new typology, classification system and establishment of reference conditions for different types of water bodies have been developed**.

3. Significance of the results obtained

The analysis of scientometric data from the research production submitted for review is in **full compliance** with the *Rules on the Conditions and Procedures for Acquisition of Educational and Scientific Degrees and Occupation of Academic Positions at IO-BAS*.

I fully accept the evidence presented by Dr. Ralitsa Zidarova to meet the national minimum requirements for the PhD Degree and the Associate Professor Academic Position. With the presented scientific production, the candidate gains a total of **539 points**, with the required **430 points** for occupation of the Academic Position “Associate Professor” in Botany at the IO-BAS, which **significantly exceeds the requirements** of the above mentioned *Rules*.

Dr. Ralitsa Zidarova presents lists of **41** scientific papers in the competition. From a total of **40 full-text publications** submitted for the competition for the academic position “Associate Professor” in the research speciality “Botany”, **I accept for review 40 (forty) (100%). I accept 22 (twenty-two) articles as Impact Factor publications.** In 19 (nineteen) of the 40 (forty) reviewed publications, the candidate is the lead author (47.5%). The applicant's scientific work **is reflected more than excellently** in world literature. The author's reference of the quotations found in Scopus contains **60** citations of **22** papers with the participation of the candidate. She is a participant in **31 scientific forums**, mainly abroad.

A significant part of the candidate's collective papers is the result of active collaboration on scientific projects, and is **co-authored with well-established scientists**. Dr. Zidarova is **an equal co-author** in all the collective articles, which is evident from the parts she has developed. The applicant's scientific publications are mainly printed in English, most of them in reputable journals with international editorial boards, such as *Phytotaxa*, *Fottea*, *Diatom Research*, etc.

4. Demonstrated research skills and most significant scientific achievements

Apart from candidate's publications and their reflection in the literature, her participation in the development and implementation of **13 research projects**, as well as the emphasizing clear **practical orientation** of the performed interdisciplinary research with **high scientific value** is a proof of the professional competence and authority. The candidate is the leader of 2 research projects. During the course of this competition, **the National Science Fund approved for funding a new project proposal by Dr. Zidarova on "Marine benthic diatoms as a tool for anthropogenic pressure assessment of the Black Sea coast"**.

Her original contribution to the description of a total of 90 new taxa is of exceptional scientific value.

5. Profile of the research work

The work of Dr. Ralitsa Petrova Zidarova reflects **contemporary scientific and applied projects** with original and confirmational contributions, **skillful use** of interdisciplinary research methods and comparative approaches, and presents her convincingly as: an established **specialist with a clearly defined profile** in the field of one of the Natural Sciences with the most accumulated knowledge: Botany; **key expert: diatomist-phycologist** and **professional creator with** nationally and internationally **recognized authority**.

6. Applicant's educational and pedagogical activity and role in the training of young scientific staff

Dr. Ralitsa Zidarova **has a valuable nine years of experience** as part-time and chief assistant professor in the compulsory disciplines "Structure and Biodiversity of Plants and Fungi", Systematics of Algae and Fungi" and "Botany" at the Faculty of Biology of Sofia University „St. Kliment Ohridski". **She developed** an university student internship **mechanism** to assess the environmental status of water bodies. **The above mentioned is a reliable basis for the leading role of the future habilitated specialist in the training of new staff for the validation and development of diatomology as a new scientific area for IO-BAS.**

7. Critical notes and recommendations

As a matter of fact, **I have no** critical notes on the applicant's scientific output. I find the layout of the documents submitted for competition as **a model**, combining **exceptional precision and high scientific style**. I recommend to Dr. Zidarova to include in her future scientific work a study of the fossil diatomaceous flora of the Black Sea basin, because it is of high value for paleoecological science.

8. Conclusion

Dr. Ralitsa Zidarova participates in the competition for the academic position "Associate Professor" with **sufficient as volume and quality scientific production**, which determines the appearance of her research field: Algology. The materials submitted for review

contain **diverse and detailed information**, both on research interests, results and achievements, as well as on academic, expert and teaching activities, and the applicant's professional biography, in **full compliance (even exceeding)** with the conditions and national minimum eligibility criteria of the academic position "Associate Professor", formulated in the Law on the Development of the Academic Staff in the Republic of Bulgaria, the Ordinance for the implementation of the Law, and the internal academic rules and criteria, adopted by the Scientific Council of IO-BAS-Varna.

The above mentioned gives me a reason to recommend convinced the honorable members of the Scientific Selection Committee of this competition and the respected members of the Scientific Council of the Institute of Oceanology of the BAS - Varna to vote "YES" for the election of Dr. Ralitsa Petrova Zidarova in the competition for the academic position "Associate Professor" in research speciality "Botany".

29.11.2019

Reviewer:

Varna

(Prof. Mariyana Filipova-Marinova, Dr. Sci. Biol.)