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OPINION

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on the competition for the academic position "Associate Professor" in the professional field 4.3. "Biological Sciences", scientific specialty "Entomology", for the needs of the "Fauna, Taxonomy and Ecology of Invertebrates" Research Group to the "Biodiversity and Ecology of Invertebrates" Division, Department of Animal Diversity and Resources of the Institute of Biodiversity and Ecosystem Research (IBER) of the Bulgarian Academy of Sciences (BAS), announced in the State Gazette No. 71/18.08.2023.

The opinion is written in fulfillment of Order No.78/17.10.2023 by the Director of the IBER-BAS, Assoc. Prof. Dr. Vladimir Vladimirov.

The single candidate has applied the necessary documents for participation at the competition for the academic position "Associate Professor" - Chief Assistant Dr. Boyan Petrov Zlatkov from IBER-BAS.

Dr. Boyan Zlatkov graduated from the Faculty of Biology, Sofia University "St. Kliment Ohridski" in 2005 with a master's degree in Entomology. In 2011, Boyan Zlatkov successfully defended his dissertation with a title "Moths of family Tortricidae from Sandanski-Petrich valley" and obtained a doctoral degree in Entomology. From 2008 to 2017 he worked at the Faculty of Biology, Sofia University "St. Kliment Ohridski" as a biologist and a curator, then from 2017 and until now he is a Chief Assistant at IBEI, BAS.

The documents submitted have been prepared accurately and contain the necessary administrative documents and publications relating to the competition. They are in accordance with the Act for the Development of the Academic Staff in the Republic of Bulgaria and the Regulations of BAS and IBER for the implementation of this Act.

For the competition, Dr. Boyan Zlatkov has presented 28 publications (apart from those for obtaining a PhD degree – four publications in the group of indicators A): 8 and 20 publications in the group of indicators V and G, respectively. They are in journals indexed in Web of Science and Scopus; with 2 publications in journals from the first quartile (Q l), 8 in Q2, 5 in Q3 and 3 in Q4. Ten publications are in journals indexed only with Scopus. Dr.

Zlatkov is the sole author of 6 publications (4 in Nota lepidopterologica, 1 in Zoomorphology and 1 publication in Zootaxa). He is the first author of 10 co-authored publications, indicating his leading role in these studies.

In addition to the publications submitted for the competition, Dr. Zlatkov is the author of another 15 publications that have been refereed in other databases. Two of these articles were published in the journal Historia naturalis bulgarica in 2020, and this journal has received a quartile Q4 in the 2021 year in the Scopus database. According to the clarifications in the regulations of BAS and IBER, namely "If a quartile is not available for the journal in the year of publication, the available quartile for the closest year is used" and "The quartiles Q1, Q2, Q3 and Q4 according to the SJR metric can also be used", these articles can be equated to articles in group of indicators G with SJR without impact factor. Thus, I consider that the total number of publications of Dr. Boyan Zlatkov for participation in the competition is 30 instead of 28.

The candidate has submitted a list of 40 citations in Web of Science and Scopus refereed journals, 37 of which are in journals with impact factor. In the Scopus database, his scientometric indicator, *h*-index, is 6.

The review of the scientometric indicators submitted by Dr. Zlatkov shows that all the minimum requirements for the academic position "Associate Professor" are fulfilled, and exceeded – a total of 145 points for the publications in indicator group V (a minimum requirement of 100 points), 296 points for the publications in indicator group G (minimum requirement of 220 points) and the number of citations is 40, resulting in 80 points in Group D (a minimum requirement of 60). In addition to this, the candidate demonstrates active participations in scientific projects; he presents a list of 22 projects. Dr. Zlatkov is a leader of a project for fundamental research financed by the National Science Fund of Bulgaria, with a title: “Sexual selection in moths: copulatory mechanisms and functional morphology of the copulatory organs (Insecta: Lepidoptera)”, contract No. KP-06-N31/4 10.12.2019.

The scientific contributions of the candidate for the academic position "Associate Professor" can be grouped as follows:

Contributions on various aspects of insect taxonomy, anatomy and functional morphology

Dr. Boyan Zlatkov described the species *Dichrorampha sakartvelana* Zlatkov, 2016 (Tortricidae) from the Great Caucasus Mountains. In co-authorship with leading specialists he described 12 taxa new to science with species or subspecies status within a total of 7 genera of the order Lepidoptera: *Epinotia* Hübner, 1825 ('1816) (1 species), *Cydia* Hübner,

1825 (2 species and one subspecies), *Dichrorampha* Guenée, 1845 (1 species), *Phtheochroa* Stephens, 1829 (4 species) (Tortricidae), *Eutelia* Hübner, 1823 (1 subspecies) (Euteliidae), *Lacanobia* Billberg, 1820 (1 subspecies) and *Hadena* Schrank, 1802 (1 subspecies) (Noctuidae). Complex taxonomic problems related to synonymy of taxa, clarification of taxonomic status, or new combinations were resolved in 12 species of Tortricidae family from the genera *Dichrorampha*, *Phtheochroa*, *Cydia, Clepsis* Guenée, 1845 and *Cnephasia* Curtis, 1826. The use of diverse approaches to solve taxonomic problems is very impressive - the candidate combines studies on the external morphology and genitalia of the studied insects with the application of modern molecular methods.

Based on in-depth studies on several moth species from different families (Tortricidae, Crambidae, Geometridae, Erebidae и Noctuidae) a new technique was developed to study the functional anatomy of the skeletomuscular apparatus of the genitalia in male Lepidoptera. The method allows optimal tissue fixation and sample processing for various further studies - histology, scanning electron microscopy and confocal laser scanning microscopy.

Based on the study on *Eugnosta magnificana* (Rebel, 1914) (Tortricidae) the detailed function of the internal musculature of the phallus in Lepidoptera has been elucidated.

The first study of the process of copulation in order Lepidoptera by three-dimensional reconstructions of real copulating pairs was published in the prestigious scientific journal Frontiers in Zoology with the first and corresponding author Dr. Boyan Zlatkov, where the species *Tortrix viridana* Linnaeus, 1758 (Tortricidae) was studied using a combination of techniques and approaches - confocal laser scanning microscopy, scanning electron microscopy, histological sections.

The structure of the vesica in Eucosmini and Grapholitini, closely related tribes of the subfamily Olethreutinae (Totricidae) has been studied under light microscope. In contrast with previous studies Dr. Zlatkov has observed clear distinction in the position and function of the cornuti (sclerotized features attached to the vesica).

A microscopic study of the anatomy of the proboscis of *Macroglossum stellatarum* (Linnaeus, 1758) (Sphingidae) has revealed the mechanism of attachment of the proboscis to the flowers of the ornamental plant *Oenothera speciosa* Nutt (Onagraceae), which sometimes results in the death of moths - this is an unusual interaction of the proboscis with thick-walled trichomes on the hypanthium and flower stalk.

Faunistic and ecological contributions in insects

Four lepidopteran species, *Klimeschia transversella* (Zeller, 1839) (Douglasiidae), *Chrysoesthia sexguttella* (Thunberg, 1794 (Gelechiidae), *Falseuncaria degreyana*

(McLachlan, 1869) и *Epibactra immundana* (Eversmann, 1844) (Tortricidae) and three tenebrionid species *Asida (Asida) cocquempoti* F. Soldati & L. Soldati, 2001, *Pedinus (Pedinus) olympicus* Kiesenwetter, 1880 and *Platydema europaea* Laporte & Brullé, 1831 have been reported new for Bulgaria.

Pollen analysis showed that the species from genus *Oedemera* Olivier, 1789 (Coleoptera: Oedemeridae) prefer as pollen sources different species of Asteraceae family.

During a study on the parasitoids and inquilines occurring in galls of *Andricus quercustozae* (Bosc, 1792) (Hymenoptera) from the Lozenska Mts., Bulgaria, the inquiline *Pammene amygdalana* (Duponchel in Godart, 1842) (Torticidae) is recorded from *A. quercustozae* galls from Bulgaria for the first time.

Traps baited with a mixture of (*E*)-9-dodecenyl acetate and (*Z*)-9-dodecenyl acetate attracted three tortricid species in Bulgaria - *Enarmonia formosana* (Scopoli, 1763), *Retinia resinella* (L., 1758) and *Cnephasia pasiuana* (Hübner, [1796-99]), and can to be a useful tool for detection and monitoring of the seasonal flight of these species.

In conclusion: The analysis of the scientometric indicators and publications of Dr. Boyan Zlatkov show that he is an established specialist in the field of entomology. His scientific contributions correspond entirely to the requirements of Act for the Development of the Academic Staff in the Republic of Bulgaria and the Regulations of BAS and IBER for the implementation of this Act for the academic position "Associate Professor". On the basis of the above, as well as on my personal impressions, I strongly recommend the members of the Scientific Jury to support the election of Chief Assistant Dr. Boyan Petrov Zlatkov for the academic position of "Associate Professor" in the professional field 4.3. "Biological Sciences", scientific specialty "Entomology".

18. 12. 2023

Sofia / Assoc. Prof. Dr. Teodora Toshova/