

OPINION

by Dr. Borislav Vasilev Georgiev - Associate Professor of Entomology at the National Natural History Museum at the Bulgarian Academy of Sciences

of a dissertation for awarding the educational and scientific degree "**Doctor of Philosophy**"

Field of higher education: 4. Natural sciences, mathematics and informatics

Professional direction: 4.3. Biological Sciences

Doctoral program: Zoology

Author: Svetlozara Boyanova Kazandzhieva

Topic: Biodiversity and Distribution of the Families Bolitophilidae, Diadocidiidae, Ditomyiidae, Keroplatidae and Mycetophilidae (Diptera) in the Oriental Region

Scientific supervisor: Prof. D.B.Sc. Dimitar Nikolaev Bechev – University of Plovdiv “Paisii Hilendarski”

1. General presentation of the procedure and the doctoral student

The set of materials presented by Svetlozara Kazandzhieva, related to the procedure for the dissertation defense for the educational and scientific degree “Doctor of Philosophy” was prepared according to the requirements of Art. 36, para. 1 and para. 3 of the Regulations for the Development of the Academic Staff of “Paisii Hilendarski” University of Plovdiv.

2. Actuality of the topic

The relevance of the developed dissertation is determined by: (a) the unknown number of genera and species of fungus gnats in the Oriental zoogeographical region and the lack of modern faunal lists or databases, despite the considerable amount of literature data published from 1848 to the end in the second decade of the XXI century; (b) the absence of any (even previous) zoogeographical analyses of the Oriental fungus gnat fauna. The studied group is promising from an evolutionary and zoogeographic point of view.

3. Knowing of the problem

The presented information about the specifics of the studied group (item 1. Introduction), the description of the methods of processing the material and the methods of data analysis (item 5. Material and methods), as well as the detailed analysis of the stages of the previous studies in researched region (item 2. Previous studies on fungus gnats in the Oriental region), made in view of a huge number of literature sources, show an excellent knowledge of the taxonomic group studied. All this provides a good basis for a proper assessment of the problems related to the achievement of the set goal.

4. Research methodology

The research methods are generally accepted for this kind of research and allow achieving the goal of the research and obtaining adequate answers to the tasks set in the dissertation work. The use of a modified scheme to represent the geographical distribution of species reflects the author's original vision of the structure of the northern areas of the Oriental region, characterized by faunal complexes that appear to be transitional in relation to the Palearctic region.

5. Characterization and evaluation of the dissertation work and contributions

The dissertation contains a title page, 244 pages of main text and 19 pages of appendices, 71 figures and 9 tables in the main text and 4 tables in the appendices. The list of cited literature contains 285 titles, of which 4 are in Cyrillic and 281 are in Latin.

In the chapter "Results and discussion" the results of the taxonomic, faunal and zoogeographic studies are indicated and interpreted. The main contributions in it are almost entirely scientific and come down to the mentioned three groups:

Taxonomic contributions. Four species new to science are described (2 of which have been published and respectively validated), and other 8 species having unclear taxonomic status are commented. Six homonyms are also established, which publication is forthcoming. The diagnoses and descriptions of the new taxa are carefully prepared, the illustrations are very good and clearly exhibit diagnostic traits. The identification keys of the genera *Stenophragma* and *Chetoneura* allow quick and easily identification of the respective species.

Faunistic contributions. The Oriental fauna as a whole and its individual subregions have been enriched with a number of new species and genera. An updated list of 825 species (belonging to 116 genera) of fungus gnats is presented and taxonomic structures at the level of family (and subfamily) and at the level of genus are analyzed. In view of the observed lower rate of investigation of the regional fauna, compared to that of the Palaearctic region, the list and both analyzes are a solid basis for further studies of the Oriental and world fungus gnat faunas.

Zoogeographical contributions. The zoogeographic study is the first of its kind in relation to the Oriental region. The conclusions are objective that the modern regional fungus gnat fauna at the genus level represents a combination of Laurasian and Gondwanaland elements, in approximately equal proportions, with the core of endemic and subendemic genera composed primarily of descendants of the old Gondwanaland fauna.

The conclusions of the research are completely original, well formulated and reflect achievements in relation to the set goal and tasks. The language and style of the dissertation are very good.

Critical remarks. It would be more correct the names of countries, geographical regions and zoogeographical categories, and their abbreviations, used in some of the figures (e.g. Figs. 7-9, 14, 62, 64, 67, 71) and tables (e.g. Tables 3-6, 8-9, tables in the appendices) to be written in Cyrillic rather than Latin. The same in the text are written in Cyrillic, which definitely makes it difficult for the reader to compare and analyze the information.

6. Assessment of the PhD student's publications and personal contributions

In connection with the topic of the dissertation, 2 publications are presented. Both are in journals with IF and co-authorship with the supervisor. The candidate is the leading author in one of the two publications. Given the dissertation work presented, I have no doubts about the personal contribution of the doctoral student.

7. Dissertation abstract

The dissertation abstract has been made according to the requirements of the Regulations of the PU "Paisii Hilendarski" and reflects the main results and contributions of the dissertation work.

8. Recommendations for future use of dissertation contributions and results

I recommend that the faunal list and the faunal and zoogeographical analyses (or part of them) be revised and published. Only in this way the original, as-yet-unpublished data in this work will be widely disseminated, which will be of benefit for fungus gnat specialists or regional environmental engineers conducting environmental research.

CONCLUSION

Mag. Svetlozara Kazandzhieva is well acquainted with the fauna and taxonomy of fungus gnats, applied modern methods for taxonomic, comparative faunal and zoogeographic studies, has established a number of new facts (including 4 species new to science) and has a tendency to in-depth analyses. Her dissertation contains scientific and scientific-applied results, which represent an original contribution to science and meet the requirements of the Law on the Development of the Academic Staff in the Republic of Bulgaria, the Regulations for the Implementation of the RASRB and the relevant Regulations of Plovdiv University "Paisii Hilendarski".

All of the above gives me the reason to announce my positive assessment and to recommend to the respected members of the Scientific Jury to vote for her to be awarded the educational and scientific degree "Doctor of Philosophy" in the field of higher education 4. Natural sciences, mathematics and informatics, professional direction 4.3. Biological Sciences, scientific specialty Zoology.

25th April 2023

Prepared the opinion:

/Assoc. Prof. Dr Borislav Guéorguiev/