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## **REVIEW**

**by Prof. D. Sc. Zlatozar Nikolaev Boev from the Vertebrates Department of the National Museum of Natural History - BAS**

**of a PhD thesis for obtaining the educational and scientific degree "Doctor" in Higher Education Area: 4. Natural Sciences, Mathematics and Informatics, Professional Direction: 4. 3. Biological Sciences, Doctoral Program: Ecology and Ecosystem Protection**

**Author: Emil Sashev Yordanov**

**Topic: Nest parameters and phenology of the Egyptian vulture (*Neophron percnopterus* Linnaeus, 1758) in Bulgaria**

**Supervisor: Assoc. D. Sc. Dilyan Georgiev Georgiev - Plovdiv University "Paisiy Hilendarski", Faculty of Biology**

### **1. General description of the presented materials**

Description: I have been provided with all the necessary materials for review: 1. application form to the Rector for opening a procedure; 2. CV in European format; 3. protocol of the preliminary discussion in the department; 4. abstract; 5. declaration of originality and authenticity of the attached documents; 6. certificate of compliance with the minimum national requirements; 7. list of publications; 8. dissertation work; 9. copies of the publications on the subject of the dissertation work; 10. set of documents on electronic media from item 1 to item 10 - 3 pieces; 11. set of documents from items 1, 2, 3, 4, 6, 7, 8.

By order No. PD 21-518 dated 28.02.2024 of the Rector of the Plovdiv University "Paisiy Hilendarski" (PU), I have been appointed as a member of the Scientific Jury to ensure a procedure for the defense of a PhD thesis on the topic "Nesting parameters and phenology of the Egyptian vulture (*Neophron percnopterus* Linnaeus, 1758) in Bulgaria" for the obtaining the educational and scientific degree "Doctor" in the field of higher education: 4. Natural sciences, mathematics and informatics, professional direction: 4. 3. Biological sciences, doctoral program: Ecology and ecosystem protection.

The author of the dissertation is Emil Sashev Yordanov - a full-time PhD student at the Department of Ecology and Environmental Protection, supervised by Assoc. D. Sc. Dilyan Georgiev Georgiev - Plovdiv University "Paisiy Hilendarski", Faculty of Biology.

The set of materials presented by Emil Sashev Yordanov is in accordance with Article 36 (1) of the Rules for the Development of the Academic Staff of the PU, includes the following documents: a request to the Rector of the PU to disclose the procedure for the defense of a dissertation work; CV in European format; protocol from the departmental council related to reporting the readiness to open the procedure and preliminary discussion of the dissertation work; dissertation work; abstract; list of

scientific publications on the topic of the dissertation; copies of scientific publications; list of noticed citations; declaration of originality and authenticity of the attached documents; certificate of compliance with the specific requirements of the relevant faculty (only for doctoral students enrolled until 05/04/2018). The PhD student has attached 2 publications related to his dissertation topic. Notes and comments on the documents: None.

## **2. Brief biographical data for the doctoral student**

The PhD student was born in 1983 and has 9 published scientific articles and reports in the professional direction in which his doctoral studies are conducted. Some of them are in renowned specialized foreign and national publications. He participated in 4 scientific and scientific-applied research projects and 3 scientific conferences. He has good field experience and technical skills and competencies - all very important for successful and safe field work. He has a master's degree (2015) in "Environmental Ecology, Management and Control". In 2020-2024, he is a full-time PhD student in "Ecology and Ecosystem Protection" at Plovdiv University "Paisii Hillendarski".

## **3. Actuality of the topic and appropriateness of the set goals and tasks**

Both nesting parameters and peculiarities in the phenology of the Egyptian vulture are of key importance for the conservation of the species. It is globally endangered and its numbers are rapidly declining throughout most of its range. On the Balkan Peninsula, it survived with 50-60 breeding pairs, most of which are on our territory. The dissertation work was developed within the framework of the environmental protection project of the Bulgarian Society for the Protection of Birds - the national partner of Birdlife International - LIFE project "Protection of the Egyptian vulture on its migration route" (LIFE16 NAT/BG/000874).

## **4. Knowing the problem**

The PhD student knows the research problem, to some extent and in detail. He made a substantial contribution to its research, thereby contributing to its resolution. In the last 3-4 years, he has published (co-authored) 6 scientific publications with important results of his research. With his research, he has covered all three regions (the three distinct parts of the range) of the species in the country - Rusenski Lom, Eastern Stara Planina and Eastern Rhodopes. Regarding the knowledge of the literature on the problem/theme of the research, there is something to be desired. With a few exceptions, he used it correctly and fully. The source: Cramp S. 1985. The Birds of the Western Palearctic. Oxford University Press, London. is incompletely bibliographed. It does not refer to hawks and is incorrectly cited on p. 19 in the text. Obviously, there is partial ignorance/non-use of part of the literature available in our country on the subject of the study:

Dobrev, V., Kret, E., Skartsi, T., Saravia, V., Bounas, A., Opper, S. & Nikolov, S. C. 2016. Individual supplementary feeding of the Egyptian vulture (*Neophron percnopterus*) in Bulgaria and Greece (2012-2015). Technical report under action C4 of the LIFE+ project "The Return of the Neophron" (LIFE10 NAT/BG/000152). BSPB, Sofia. 12 p.m.

Kostadinova, I., D. Gradinarov, V. Dobrev 2019. Gap analysis of the publicly available information on the use of VMPs/NSAIDs that could be potentially dangerous for vultures and other birds of prey in Bulgaria. Technical report under action A2 of the Egyptian Vulture New LIFE project (LIFE 16 NAT/BG/000874). BSPB, Sofia. 27 pp.

Miltschew, B. 1996. Wiederherstellung eines Horstes des Schmutzgeiers. – Ornithologische Mitteilungen, 48(5): 124-126.

Nikolov, S., Nikolov, Ch., Angelov, I. 2013. First Record on Ground Nesting of Egyptian Vulture *Neophron percnopterus* (Aves: Accipitriformes) in Continental Europe. - Acta zool. bulg., 65 (2), 2013: 417-419.

Stoynov, E., A. Grozdanov, H. Peshev and D. Peshev, 2013. Present distribution and conservation specifics of the Egyptian vulture (*Neophron percnopterus* Linnaeus, 1758) in Southwest Bulgaria. Bulgaria J. Agric. Sci., Supplement 2, 19: 259–261

Arkumarev, V. 2014. Nest parameters in the Egyptian vulture (*Neophron percnopterus* Linnaeus, 1758) (Aves: Accipiteriformes) in Bulgaria. - Plovdiv University "Paisii Hylandarski". Faculty of Biology, Dipl. work.1-70.

Yankov, P. 1981. Use of blades by Egyptian vultures (*Neophron percnopterus* Linnaeus, 1758) in Bulgaria. - Ornithological Information Bulletin, 10: 50-55.

## 5. Research methodology

Chapter "5. Material and Methods" is developed in great detail. However, there are 4 unnecessary repetitions in it: point 5.3. with 5.72., point 5.4 – with 5.7.3., point 5.5. – with 5.7.4. and point 5.6. – with 5.7.5. Each occupied nesting territory during the 5 years was visited 5 times to record the nesting parameters, according to the phenology of the species. 14 nesting territories were flown with a drone in full compliance with all regulated restrictions. During 11 years (2011-2021), 6 breeding pairs were observed with photo traps in the Eastern Rhodopes. Data from a total of 208,613 photographs were summarized and analyzed. Four phenological parameters were studied: (1) the arrival of adult birds in the nesting areas; (2) laying the eggs; (3) hatching of young; (4) fledging of the young from the nest. The periods of the day are entered unnecessarily twice in item 5.4.2.1. etc. 5.4.2.2. without specifying the following source. Another repetition: in item 5.4. etc. 5.5. The 6 photo traps are reported twice. Third repetition: 14 territories flown by drone (item 5.3. and item 6.3.). The statistical processing of the data was competently performed. The text from pp. 71-72 should be moved to the "Materials and methods" chapter.

## 6. Characterization and evaluation of the PhD thesis

Although the doctoral program is full-time (i.e. 3-year), the PhD student conducted his research over 5 years (2017-2022), as stated on p. 30 "to establish the distribution and the size of the population of the species in Bulgaria and to calculate the main reproductive parameters and trend of the population of the species.". Distribution and numbers, however, do not fall within the scope of the topic as set - "nest parameters and phenology".

In some cases there is an incorrect analysis of the data: In the discussion of the hatching data (p. 62) it is claimed that 7.14 and 5.87 are "almost equal", when the difference is 17.8%, which is over 1/6. On p. 64 – the same: 54.88 and 45.11 with a difference between them also of 17.8%.

The "young rearing period" is not defined. The same is true for the other periods of the phenology of the species. It would be good if they were presented according to Cramp & Simmons (1980) and then compared and discussed.

It is stated that "historic sites" were also explored. For some of them, there is also unused data published in the last 15 years - a period that coincides with the conduction of his research. These are: (1) in Western Stara Planina - Stoyanov, G., Z. Boev 2009. Die Nahrung des Schmutzgeiers *Neophron percnopterus* in Norwest-Bulgarien. – Ornithologische Mitteilungen, 61 (10): 333-335.

and (2) in Strandzha - Boev, Z., B. Georgiev, R. Raichev, U. Georgieva 2008. The wetland of the Malkotarnovska river near the town of Malko Tarnovo (Burgas region) - an example of rich biodiversity (vertebrate fauna) in intense anthropogenic pressure. - Seventh International Symposium "Ecology - Sustainable Development", Scientific Papers, Vratsa, 23.10-25.10.2008. Union of Scientists - Vratsa, 66-72. (in Bulgarian). It is noteworthy that the comparisons with data from some provinces in Spain are quite detailed, but not so with the data from Bulgaria.

The entire chapter "6. 6.7. Description, application and guidance of alternative methods for monitoring Egyptian vultures using phototraps and drone" should not be included in "Results and Discussion". It contains methodological information and should be part of "Materials and methods". There is not a single result or discussion of it.

In the chapter "9. References" are included unused sources:

Bergenas, J., Stohl, R., & Georgieff, A. 2013. The other side of drones: saving wildlife in Africa and managing global crime. *Conflict trends* 2013 (3): 3-9.

Junda H., Greene E., Zazelenchuk D. & Bird M. 2016. Nest defense behavior of four raptor species (osprey, bald eagle, ferruginous hawk, and red-tailed hawk) to a novel aerial intruder—a small rotary-winged drone. *Journal of Unmanned Vehicle Systems* 4 (4): 217-227.

## **7. Contributions and significance of the development for science and practice**

The Egyptian vulture has been the most thoroughly studied species of our vultures since 50-60 years ago. Although during this long period the natural conditions for the species in the country have greatly changed, most of the data from his previous studies are still valid today. Therefore, the opportunities for obtaining new (i.e. original) contributions seem to be somewhat narrowed before the present study. The author has correctly divided his contributions into "original" and "confirmatory". He singles out a third of his contributions as those of a "scientific-applied nature".

Although valuable, contribution 8.1.1. is off topic. "Contributions" 8.1.2., 8.1.3.1 8.1.5. and 8.1.6. they are not like that. The rest of the original contributions are important (on the participation of both sexes in the nesting the day and at night, on the manifestations of cannibalism, etc.).

Of the 6 affirmative contributions, I do not accept only No 8.2.2. It may be a methodological contribution, but it is not to the essence of the research.

Although they are placed in third place, I think that the 4 "8.3. Contributions of a scientific and applied nature" are very valuable and will have a great practical application in the field work on the observation, support and monitoring of the remaining breeding pairs of the Egyptian vulture still in our country.

Most of those defined in item "7. Conclusions" are actually just results.

## **8. Evaluation of publications on the dissertation work**

The 2 publications presented are published in reputable specialized periodicals with an impact factor. One was released in Great Britain (IF = 3.4), and the other in Bulgaria (IF = 0.5). Both are written in English. Both are co-authored. In the first, he is the 29th co-author (out of a total of 30), and in the second, he is the leading (first) co-author (out of three). Both publications are on the topic of the dissertation and contain research results.

In addition to these two publications, the doctoral student presented the titles of 4 of his "Participations in scientific conferences and materials on the subject of the dissertation", which, however, are bibliographed incompletely incorrectly. Their texts are not presented in the review materials for the procedure.

## 9. Personal participation of the doctoral student

Despite the mentioned notes and the large number of persons to whom thanks are expressed, it is indisputable that the work is original (of the PhD student) and is his personal work. In the field work, it is often impossible (and dangerous) for one person to perform the designated activities alone. Most of the obtained data are original (new) and important for the identification and conservation of the species. All contributions formulated and results obtained are his personal credit.

## 10. Abstract

The abstract (with some exceptions) is prepared according to the requirements of the relevant regulations and reflects the main results of the dissertation research. In it, the date 23.04.2024 is marked for defense, which is different from the date in the order of the Rector of Plovdiv University "Paisiy Hilendarski". The structure of the abstract does not follow that of the dissertation, i.e. its parts do not correspond to the parts of the dissertation.

## 11. Critical remarks and recommendations

(Not in order of importance.)

1. Incorrect bibliography: (1) use of quotation marks: Ninov N. 1997. "Geography of Bulgaria". Sofia: BAS; (2) spelling of "p.": Paspalev M. 1961. Contribution to the avifauna of Lyulin Mountain. Ex. Zool. inst. with museums. 16: 35-59 p., (3) not specifying the pages: "Velev S. 1997. The drought in Bulgaria in the period 1980 - 1994. Problems of geography, book 1. Sofia.", (4) not specifying the journals: Michev, T. 1968. Distribution and nesting biology of the Egyptian vulture (*Neophron percnopterus* L.) in Bulgaria. BA. 27: 65-79.; (5) replacement of the composition of the authors: Dobrev V., Boev Z., Hoi V., Dobrev D., Kret E., Saravia V., Bounas A., Vavylis D., Nikolov S.C. & Oppel S. 2016a. Diet is not related to productivity but to territory occupancy in a declining population of Egyptian Vultures *Neophron percnopterus*. Bird Conservation International 26: 2 73-285.; (6) failure to identify publications by the same author and the same year (eg Fernandez J. 1994).
2. Spelling errors: "decrease" - "decrease", "Iskar gorge", "Monitoringa" - The "monitoring", the "conventional" - the "conventional", "not allowing" - "disallowing", "Near" - The "Near", "Indian" - "Indian", "European countries" - "European countries", "European population" - "the European population", "the Spanish population" - "the Spanish population", "the population of the species" - "the population of the species", "Roussen Lom", "Albania", "the Middle East", "great importance", "interesting observations", "Vrachan Balkan", "someone important", "someone predatory", "the chance met", "happen", "up to now", "in consideration", "Pre-breeding period", "Non-breeding", "the above mentioned" and many dozens of similar ones.
3. Technical errors: "Some", "these estimates", "Bulgarians", "Reproductive success", "the small", "the population", "in the period 2011 and 2021".
4. It is logical that the "Acknowledgments" should be at the end of the text, after the reader has familiarized himself with what was done, and not at the beginning.
5. Chapter "5. Material and methods" seems too fragmented. Only the writing of its parts in the "Contents" occupies 1 page of the entire text (125 pages).
6. Arabadjiev's book (1962) does not contain data on the distribution of the species in Strandja and Sakar (p. 14).
7. Other incorrect terms and expressions: "wild animals and birds", "landfills are ... a food resource", "diet composition", "food items" and "food products" cf. food components, "human waste (dumps)", "restocking program", "population trajectory", "Ciconia Ciconia", "the theory that wool is used...", "effort to consume .... energy", 'method to glance', 'effort in churning', 'density of birds of prey',

'animals more likely to be poisoned'; Misuse of the term "diet". It is a diet, not a food composition, as it is supposed to mean.

8. When citing sources presenting the use of tools of the species, Iankov, P., 1983. Un Percnoptere d'Egypte (*Neophron percnopterus*) en Bulgarie se sert d'instruments should be cited. - Alauda, 51 (3): 228, who was the first to prove this for the Bulgarian Egyptian vultures. This source has been cited, but unsubstantiated, as containing data on the presence of "domestic animals and land turtles" in the species' diet. This raises doubts about the use of this publication.

9. The work Yankov P. 1981. Tool using by *Neophron percnopterus* L. in Bulgaria is incorrectly cited. Ornitologicheski Informatsionen Byuletin 50-55, which is published in Bulgarian and has no English abstract/title.

10. Chapter "1. Literature review" is quite detailed. It occupies 12% of the manuscript and could be presented in a more synthesized form.

11. Dissertation topic and research objective(s) are different concepts. In order to develop the topic, appropriate goals are set, which are achieved by the implementation of clearly formulated tasks. In this case, the subject and purpose are unambiguous.

12. Repetitions (3 times!) of entire passages: p. 21, 45 and p. 67: "... with carcasses and excrement of vertebrates, human waste, eggs, invertebrates and small vertebrates that he himself catches alive ..." , at pp. 63 and 76: "The Egyptian vulture is a species that usually lays two eggs."

13. The "western European hedgehog (*Erinaceus europaeus*)" is not found in Bulgaria, but the northern white-breasted hedgehog (*Erinaceus roumanicus* Barrett-Hamilton, 1900).

14. The topic of the dissertation is: "Nesting parameters and phenology of the Egyptian vulture (*Neophron percnopterus* Linnaeus, 1758) in Bulgaria". The topic of Volen Arkumarev's diploma thesis is: "Nesting parameters of the Egyptian vulture (*Neophron percnopterus* Linnaeus, 1758) (Aves: Accipiteriformes) in Bulgaria". Despite the amazing coincidence, Arkumarev's work is not cited in the PhD thesis. The dissertation is 146 pages, and the diploma thesis is 70! It begs the question, is it a coincidence?

## **12. Personal impressions**

I don't know the PhD student personally. From the materials presented during the procedure, it is clear that he entered the problem and made serious contributions to the study of the species. However, he lacks the necessary knowledge about scientific bibliography, scientific style, Bulgarian orthography.

## **13. Recommendations for future use of dissertation contributions and results**

The future use of part of the scientific and scientific-applied contributions of the dissertation research is possible and expected given the huge amount of conservation activities that are to be carried out in order to ensure a steadily progressing population of the Egyptian vulture.

## **CONCLUSION**

As the main drawback of the reviewed manuscript, I would point out the poor style of expression - not only in relation to the spelling in Bulgarian, but also in relation to the terminology used. Both are inadmissible in similar texts claiming the PhD "Doctor" degree. There are also some unsubstantiated claims about the data obtained. The paper is poorly structured and entire paragraphs should be moved to other chapters. Regardless, the dissertation also contains scientific and scientific-applied results, which represent an original contribution to science and meet the requirements of the Act on the Development of the Academic Staff in the Republic of Bulgaria, the Regulations for the Implementation of the Act and the relevant regulations of the PU "Paisiy Hilendarski".

The dissertation shows that the PhD student Emil Sashev Yordanov (despite the indicated gaps) possesses theoretical knowledge and professional skills in the scientific specialty "Ecology and Ecosystem Protection" and demonstrates qualities and skills for independently conducting scientific research.

Due to the above, I give my positive assessment of the conducted research, presented by the above-reviewed dissertation work, abstract, achieved results and contributions, and I propose to the honorable Scientific Jury to award the Educational and Scientific Degree "Doctor" to Emil Sashev Yordanov in the field of higher education: 4. Natural Sciences, Mathematics and Informatics, professional direction: 4. 3. Biological Sciences, Doctoral program: Ecology and Protection of Ecosystems. If he intends to engage in scientific activity in the future, he should pay serious attention to the notes and recommendations made and be precise in the use of other people's information.

12.03.2024

Reviewer: ..... ..  
(signature)  
Prof. D.Sc. Zlatozar Boev