REVIEW

ФВМ 7402 от 12
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on materials regarding competition for the academic rank "Associate Professor", in higher education field 6.0 „Agrarian Sciences and Veterinary Medicine", professional field 6.4 „Veterinary Medicine", scientific specialty "Epizootiology, infectious diseases and prevention of infection diseases of animals", scientific discipline "Infectious diseases (general part, diseases on farm animals, diseases on equids, diseases on companion animals) announced by the University of Forestry, promulgated in State Gazette issue 101 of 27 December 2019, procedure code **VM-AsP-1119-30.**

Candidate: Chief Assistant Professor Roman Pepovich Petkov, DVM, PhD.
Reviewer: Professor Ivan Stoyanov Zarkov, DVM, DSc, Department of Veterinary Microbiology, Infectious and Parasitic Diseases, of Veterinary Medicine Faculty, Trakia University – Stara Zagora. Professional field 6.4 „Veterinary Medicine ".
Appointed as a member of the academic jury by Order № ZPS-27 from 27.01.2020 of the Rector of the University of Forestry and decision of the Faculty Council of the Faculty of Veterinary Medicine (Protocol 46/14.01.2020). Designated as a reviewer at the first meeting of the academic jury (11 March 2020).
I declare no conflict of interest with the applicant in the competition.

1. Short biography of the candidate.

Chief Assistant Professor Roman Pepovich Petkov is born on 11 August 1978. From 1998 to 2005 he was enrolled at the Faculty of Veterinary Medicine at the Trakia University – Stara Zagora and later, in the Faculty of Veterinary Medicine (FVM) at the University of Forestry (UF). He graduated as Master in Veterinary Medicine. From 2005 to 2007 he was appointed as junior expert in the Regional Veterinary Service in Lovech. Since 2007 he was appointed as Assistant Professor at the FVM, UF; later promoted to Senior Assistant Professor (2010) and Chief Assistant Professor (2016) in the Department of infectious pathology, hygiene, technology and control of foods of animal origin. In 2015 was conferred the PhD educational and academic degree after defending a thesis entitled "Incidence, diagnostics and measures for control of enzootic pneumonia in industrial production systems". Fluent in Russian and English, both written and spoken. He has professional skills for work with special research and diagnostic equipment (ELISA, PCR). The applicant has participated in international forums in Romania, has given lectures in Italy (Erasmus+ project). Has participated in the commission regarding the programme accreditation of programmes for training PhD students and in procedures for evaluation of projects. Participates in 7 commissions to the FVM, UF. Member of the Faculty Council and General Assembly of the university from December 2018 to December 2019.

2. Compliance of applicant's materials and documents to the requirements listed in the Statute for Development of the Academic Staff of the University of Forestry.

All copies of documents and materials related to the application of Dr. Pepovich were presented in a good form. One part of them are associated to the procedure itself, and another part – to the research activities of the applicant. All of them are compliant to the the Statute for Development of the Academic Staff of the University of Forestry.

The applicant has developed ¼ of the collective monograph (110 from 460 pages without the references) "Prevention and control of infectious animal disease" (2020), ISBN:978-619-7554-06-9. He has written chapters as a sole author and a sufficient number of pages to comply with the definition for **monograph**.

3. Evaluation of teaching & learning activities.

Dr. Pepovich was engaged in teaching & learning activities since his appointment at the VMF, UF. His training experience is 13 years. He gives lectures and conducts practical training with students in Bulgarian and English programmes. With Bulgarian-speaking students, he gives lectures in 3 courses (Infectious diseases; Epidemiology and Preventive Medicine; Virology) and conducts practical training in 4 courses (Infectious diseases; Epidemiology and Preventive Medicine; Virology; Mobile clinic). The total course load of Dr. Pepovich is 150 hours lectures and 180 hours practical training. With English-speaking students, he gives lectures in 2 courses (Virology; Epidemiology and Preventive Medicine) and practical training in 3 courses (Virology; Epidemiology and Preventive Medicine; Mobile clinic) with course load of 60 hours theoretical and 90 hours practical training. For improvement of training, he has participated in development of curricula of 2 courses, creation of a teaching lab and development of 5 educational projects. The training of students is supported with publication of three teaching manuals: electronic and in a virtual library. The out-class activities of Chief Assistant Professor Roman Pepovich include participation of examination of students at the end of semesters, participation in commissions for examination of postgraduate students, defense of clinical practical training and reports of undergraduate students. Also, he participates in five international educational projects and in a procedure of accreditation. As expert, he performed consultation activities, has been a member of specialised committees, has reviewed research publications. All these activities have contributed to improvement of qualification of Dr. Pepovich and proved that he is a well-trained instructor with considerable experience.

4. Evaluation of research, research & development and teaching activities of the candidate.

The overall research activities of Dr. Pepovich was made popular with defense of a PhD thesis, publication of his research works in a monograph, book, textbooks, manuals, research journal, proceedings, participation in research forums and research projects.

Subject to evaluation are **47 publications and other materials** which were not included in materials for conferral of **PhD** educational and academic degree (6). These are **42 publications** in journals and proceedings, and **5 other works** (monograph, book, two teaching aids for veterinarians and one for students). From 2007 to 2019, he participated in research forums in Bulgaria (20 participations) and abroad (2 participations). Additionally, he was included in the organisation committee of 4 research forums (2012-2014 and 2016).

4.1. Participation in research, research & development and educational projects.

Dr Pepovich presents 11 projects. He participated in 4 university research projects in 2009, and 2014-2017. Some of them were funded by the RDS to UF (3) and one – by the RDS to the Trakia University. Two were devoted to investigation of infectious agents in pigs, one in rabbits and one – in carnivores. An important part of the research and teaching work in the VMF is the investment projects funded by National Science Fund, Ministry of Education and Science, in which the applicant takes part. The projects are aimed at creation and equipment of university labs for biotechnological, molecular and genetic studies. Most of educational projects are funded by the Human Resources Development operational programme. Some of them were associated to improvement of applicant's pedagogical skills, team work, mastering of research and development activities, foreign language fluency and student supervision functions. He has participated in ERASMUS+ programme with lectures in University of Sassari, Italy.

4.2. Analysis of published research works.

From all 47 works subject to evaluation, 42 (89.4%) are relevant to the academic rank for which Dr. Pepovich is applying for. These include research studies and reviews of

infectious diseases in animals and men, and in the field of general epidemiology. Materials with general information in the field of veterinary medicine with short data about infectious diseases are included. Another 5 publications are not directly associated with the position for which Dr. Pepovich applies for. These are research studies on non-infectious pathological states and conducted experiments, related to the professional field but not to the scientific specialty and disciplines, subject of the competition.

The number of publications of the candidate is 42. Twenty-nine (69%) are in journals and 13 (31%) are in proceeding from scientific conferences. Dr. Pepovich has not publications as a single author. Fifteen (51.7%), of research works in **journals** are published in worldwide refereed and indexed journals, while 14 (48.3%) are in non-refereed journals that are not indexed. From refereed and indexed publications, 6 are with IF (40%), 8 with SJR (53.3%) and one – without IF&SJR (6.7 %). Eight publications are published abroad (6 with IF and 2 with SJR), and 7 – in Bulgaria (6 with SJR and 1 without IF&SJR). The candidate is leading author in one publication (17%) with IF and in 4 with SJR (50%). The total IF of the candidate is 9.677, and total SJR - 5.97. From publications in non-refereed journals that are not indexed, 11 (78.6%) are in English and 3 – in Bulgarian (21.4%). He is leading author in 7 publications (24.1%) and co-author in 22 (73.9%). With respect to the place of publication, 8 (27.6%) are published abroad and 21 (72.4%) in Bulgaria. With respect to language of publication, 26 (89.7%) are published in English and 3 (10.3%) in Bulgarian. From works published in **proceedings,** all are from participation in scientific conferences held in Bulgaria, and published in Bulgarian. Out of them, 7 are from international forums (53.8%). The candidate is leading author in 2 (15.4%) and co-author in the other 11 (84.6%). In presented materials **other than research works,** the candidate is the sole author of the book "Enzootic pneumonia in pigs – prevalence, diagnostics and measures for control "and of e-learning course for undergraduate students „Epidemiology and preventive medicine (epizootiology) ". He is co-author in 3 materials – a monograph; Manual for the veterinary practitioner starting an own private business; and Handbook of the veterinarian. The summarised fact sheet shows that from all 47 materials presented for evaluation, the candidate is the sole author of 2 materials (4.3%), leading author of 9 (19.1%) and co-author in the other 36 (76.6%).

The main research interests of Dr. Pepovich are related to infectious pathology of **pigs**. Studies were performed on important porcine infectious diseases as enzootic pneumonia (EP), circovirus infection, hepatitis E, classical swine fever, ileitis. The studies of the candidate on EP until 2015 were used to obtain the PhD educational and academic degree. After that, investigations on infectious diseases in pigs are still within the focus of his research and professional interests. The studies in pigs are more than one-third of the research production of the candidate. Dr. Pepovich presents a book with him as the only author with data from his PhD thesis devoted on the prevalence, diagnostics and control measures of enzootic pneumonia in pigs. The research in **goats** is associated to mastitis. Dr. Pepovich is part of the author team of publications on infectious, including vector borne, and non-infectious diseases in **dog patients.** These are parvovirus (CPV-2) infection, anaplasmosis and a spontaneous hepatocarcinoma case. As co-author, the applicant participates in an experiment with **mice** infected with *Trypanosoma equiperdum.* An overview co-authored by the applicant describes some aspects of the spread of myxomatosis among **rabbits.** He participates in a publication associated to the possibility for detection of avian influenza A virus in wild migratory and zoo **birds** and in other experiments with birds and embryos inoculated with carcinogens. He takes part in publications on vector borne and zoonotic infections in **men** – Lyme borreliosis, infection with *Coxiella burneti* and member of genus *Richettsia.* A series of three reviews with the applicant as co-author emphasises the general features and prevention of hepatitis A and hepatitis B infections and makes a literature overview on hepatitis E infection in humans.

All enumerated numerous studies and acquired knowledge make the application of Dr. Pepovich in the competition justified and well deserved.

4.3. Impact of applicant's research activities (citations).

Cited research works are 11. Ten are published in journals, and one – in a teaching aid. The total number of citations are 15. Out of them, 14 are in journals and one – in a book. Two are cited in journals with IF (total IF 6.822), 5 in journals with SJR (total SJR 3.994) and the rest 7 – in journals without IF & SJR.

4.4. Contributions in research works of the candidate.

Scientific contributions.

✓ As a result, from investigations in 10 pig farms, the prevalence of EP within the porcine respiratory disease complex (PRDC) was established. The research confirms the multietiological character of PRDC (32).

✓ An overview and analysis of methods for EP diagnosis was made. It was concluded that diagnostics required an integral approach in the presence of clinical signs and pulmonary changes and depended on the stage of disease and the type of examined samples. Laboratory methods for detection of microorganisms, antigens or DNA (bacteriological, immunofluorescence, immunohistochemical tests, PCR) and antibody detection are used (14).

✓ In connection with increasing antimicrobial resistance, a detailed overview and analysis of potentially efficient antibiotics against *Mycoplasma hyopneumoniae* was made. The optimum doses, routes of application and recommended protocols for therapy and metaphylaxis of EP were determined (34). The therapeutic potential of enrofloxacin and florfenicol in Bulgarian industrial pig farms affected with EP was evaluated, the results showed a high efficiency in treated with enrofloxacin – 89.6% and florfenicol – 75.6% (20).

✓ Clinical investigations were carried out in industrial pig farms to evaluate the efficiency of combined and monovalent vaccines against EP. A good prophylactic effect of vaccination was noted, leading to improvement of clinical condition, reduction of pulmonary damage and better productive performance manifested with higher daily weight gain, lower morbidity and mortality (1, 12, 33).

✓ An evaluation and analysis of the grade and severity of pathomorphological lung lesions in pigs naturally infected with *Mycoplasma hyopneumoniae* was made. It was reported that in 64% of cases, gross alterations specific for EP were found out post mortem. The changes in 40.4% of cases were specific for monoinfection with *M. hyopneumoniae* and in 59.6% of cases – for co-infection with *Actinobacillus pleuropneumoniae.* Moderate extent of pulmonary affection was predominating (3).

✓ The secondary bacterial pathogens in nasal and lung samples from growing and fattening pigs affected with PRDC with serological evidence (ELISA) for presence of antibodies against *Mycoplasma hyopneumoniae* and *Actinobacillus pleuropneumoniae* were identified. In nasal samples from 54.2% of growing pigs, monoinfection with predominance of *alpha hemolytic Streptococcus* (70.8%) was present, whereas in fattening pigs – mixed infection with *alpha hemolytic Streptococcus* and *Streptococcus epidermidis* (62.5%). In lungs of both age groups, *E. coli* monoinfection was identified (70.8% and 75% respectively), as septicaemia, possibly potentiated by *Mycoplasma hyopneumoniae*. The major part of bacterial isolates showed high resistance to tetracyclines (19).

✓ For the first time in Bulgaria, hepatitis E infection was detected among pigs from industrial farms. Three of research works provided proofs for its substantial spread and high seroprevalence (43.3% and 60.3%) in different farms. The results showed that seropositivity was age-dependent. Sows were the most affected (80% - 93.3%), followed by fattening pigs (61.7% - 75.8%) and growing pigs (25%) (6, 10, 13).

✓ A development protocol for control of ileitis in pigs reared in industrial and semi-industrial production systems including immunoprophylaxis, metaphylaxis and general measures was tested. A good health and economic effect was demonstrated (36).

✓ A high prevalence of porcine circovirus infection in Bulgaria caused by PCV-2 was established. It was associated with other viral and bacterial infections. PCV-2 infection is characterised with a broad spectrum of clinical and pathomorphological changes, classified into 3 groups: first group – general and constant changes, second group associated with postweaning multisystemic wasting syndrome (PMWS) and third group: with dermatitis and nephritis (PDNS) - (37).

✓ In two reviews, evaluation of applied classical and modern methods for diagnostics of classical swine fever was made along with analysis of facts and circumstances impeding the eradication of the disease (27, 28).

✓ For the first time in Bulgaria, RT-PCR with *MGB* probes was used for examination of faecal samples from dogs of different breeds with clinical signs of canine parvovirus 2 infection (*CPV-2*). Compared to conventional RT-PCR using *TaqMan* probes, the used method showed higher sensitivity and allowed identifying the different types *CPV* - 2a and *CPV* - 2b (30).

✓ The incidence of anaplasmosis in stray dogs in the Sofia region was investigated. In 18.87% of tested dogs, there were specific antibodies against *Anaplasma spp* and in 40% - haematological and biochemical changes (26).

✓ The prevalence of mastitis among goats in Bulgaria was investigated. Fata demonstrated that 45.8 % of udder halves were affected with mastitis, out of them subclinical forms were 43%, and clinical ones – 2.8%. The lactation period, stage and number of lactations, age of animals had an effect on the incidence of mastitis. The latter increased by the end of lactation, with increasing goats' age and number of lactation (16, 18, 38).

✓ The effect of prophylaxis of subclinical mastitis during the dry period on the expression of udder inflammations during the lactation was elucidated (18). The therapeutical and prophylactic effect of antibiotic therapy (*Cloxacillin*) with treatment of affected half (selective approach) and treatment of both halves (non-selective approach) was evaluated. It was shown that both approaches resulted in reduction of the incidence and expression of mastitis as well as to reduction of milk somatic cell counts after giving birth (15).

✓ The bacterial agents of caprine mastitis were established, and their *in vitro* sensitivity to various antimicrobial drugs was tested. Isolates were obtained from 82.53% of animals with highest prevalence of *Staphylococcus spp.* either alone in 52.75 % or in association with other agents in 23.86%. The highest sensitivity of isolates to antimicrobial drugs was exhibited towards enrofloxacin and ciprofloxacin, while the highest resistance – to oxacillin and penicillin (21).

✓ The changes in some physicochemical parameters of milk (pH, lactose, fat, freezing point, P and Ca concentrations) in subclinical mastitis were evaluated при субклинични мастит (40). Haematological changes in lactating goats with subclinical mastitis included increased total white blood cell counts, whereas changes in other parameters (RBC, Hb, MCV, MCH, MCHC, RDW) were insignificant and without clinical relevance (25).

✓ A detailed literature analysis of two vector-borne infections and one with clinical cases was made. The emphasis was placed on etiological agents from the family *Rickettsiaceae* and used therapeutic means (41, 42). A detailed analysis of etiology, distribution, clinical signs, diagnostic methods, therapy and prevention of Lyme borreliosis was performed (9). In clinical patients (9 men) with fever of unknown origin (FUO), antibodies against *Coxiella burnetii* were serologically conformed (ELISA). The results showed that one of the possible causes for FUO was the infection with *Coxiella burnetii* (11).

✓ A detailed review on the etiology, epidemiology, clinical signs, diagnostics and prevention of hepatitis A virus infection in men was done (5), as well as on clinico-epidemiological features, diagnostics and prevention of hepatitis B in humans (7). A 24-year analysis of 23 literature sources on hepatitis E infection in men was made. From the studied 2257 samples, 13.1% were reported positive. Men were more commonly affected (80%) and men over 50 years of age (8).

✓ Evaluation of diagnostic potential of different serological tests for detection of antibodies against *Infiuenza A virus* in wild migratory birds, zoo and market birds was done. From tested egg yolks from Dalmatian pelicans, conflicting results were obtained with ELISA, immunodiffusion test, virus neutralisation test and haemagglutination inhibition test. It was concluded that the use of multiple tests could contribution to reduction of omissions during the diagnostics (24).

✓ Investigations were carried out in poultry (turkeys, chickens, guinea fowl) and embryos (chickens, Japanese quails) after embryonic treatment with hepatocarcinogens (N-nitrosodimethylamine and/or N-nitrosodiethylamine). Pre-neoplastic or neoplastic liver lesions were found out. In poultry and guinea fowl, hematological and blood biochemical changes were demonstrated (4, 17, 22, 23).

✓ A mathematical model for development of infectious disease that could predict its evolvement into epizootic was presented. The possibilities for its control through vaccination as a strategy for prevention and control were elucidated (31).

Contributions to learning/teaching activities.

✓ For students, an e-learning course of training in epidemiology and preventive medicine was developed. It contains the most important theoretical and practical knowledge for diseases affecting a large number of animals. The emphasis is placed on the main principles for identification, confining, eradication of epidemics and measures for protection of farms (47).

✓ For practicing veterinarians, the candidate has developed 4 chapters in "Manual for the veterinary practitioner starting an own private business" and "Handbook of the veterinarian" – Diseases in equids, Diseases in swine, Diseases in poultry, Diseases in rabbits (45, 46).

5. Evaluation of the personal contribution of the applicant.

The analysis of works presented for evaluation allowed me concluding that for works in which the candidate is the sole author, the contribution is entirely his own. He has a leading contribution in works in which he is the first leading author. For collective works, I assume that the candidate has also a contribution regardless of the place in authors' list. This conclusion is substantiated by the integral nature of the studies, outlining the scientific profile of the candidate.

6. Critical notes and recommendations.

- Publications in Table 3, group B4 should contains works, refereed and indexed in global research databases (Scopus, Web of Science). The included publication 4.11 in *Trakia Journal of Sciences* is listed in the database of NACID but not all publications are refereed and indexed. No. 4.11 is "in press" and such information is therefore unavailable.

- Page 72, point 5 of the „Statute for Development of the Academic Staff of the University of Forestry " from 2019 states that monographs with more than one author should necessarily have a protocol for contributions of authors, which is not presented in the applicant's documents.

- The monograph „Prevention and control of infectious animal disease" is authored by Y. Ivanov, Ch. Filipov and R. Pepovich. In the fact sheet for research and publication activities, the candidate is incorrectly listed as its only author.

- There is a discrepancy between the number of articles in the PhD thesis abstract (3) and documents for conferring of the PhD educational and academic degree (6).

- Articles citing candidate'a works are not well arranged. Some of them are repeated.

7. Personal impressions.

I do not know Dr. Roman Pepovich in person. From presented materials, I conclude that he is a good scientist and teacher. He can work on his own and within a team. The impressions about his work are very good.

8. Conclusion.

Summarising all presented data and comparing them to the minimum requirements for conferring the academic rank "Associate Professor" listed in the Statute for Development of the Academic Staff of the University of Forestry, it could be seen that the applicant covers the needed minimum. Therefore, I propose to confer the **academic rank "Associate Professor"**, in scientific discipline "Infectious diseases (general part, diseases on farm animals, diseases on equids, diseases on companion animals), scientific specialty "Epizootiology, infectious diseases and prevention of infection diseases of animals", to **Chief Assistant Professor Roman Pepovich Petkov, DVM, PhD.**

Undersigned:

The review report is presented on 8.04.2020