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Peer-review of monograph "African swine fever in strict nature reserves (case study of Voronezh nature reserve)". B. V. Romashov, N. B. Romashova, E. A. Starodubtseva, A. S. Mishin.

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V. V. Makarov
Doctor of Science (Biology), Professor, RUDN University, Moscow, Russia

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Рецензия на монографию «Африканская чума свиней в условиях особо охраняемых природных территорий (опыт Воронежского заповедника)». Б. В. Ромашов, Н. Б. Ромашова, Е. А. Стародубцева, А. С. Мишин.

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В. В. Макаров
Доктор биологических наук, профессор, ФГАОУ ВО «Российский университет дружбы народов», г. Москва, Россия

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African swine fever (ASF) epidemic situation in the Russian Federation as well as its tendencies for the whole infection period are persistently specified by "positive" dynamics both in the domestic pigs and in wild boars being at a relatively close ratio of 1.5:1. This clearly suggests the need of urgent change of the attitude to the issue as well as its comprehensive solutions. Clearly prescribed measures compliant with the previous instruction of 1980 and rules approved in 2016 are used for ASF control in the domestic pigs. As for the wildlife, there is a kind of collision and up to confrontation between the biologists, game managers, ecologists, animal advocates and national services involved in the implementation of the anti-epidemic measures. Herewith, the first ones demonstrate total ignorance of epizootology and parasitology canons; they absolutely disregard everything coming from the veterinary science, accuse the veterinary services of all troubles and resort to empty rhetoric lacking any line of reasoning; and all that is echoed by ratings-hungry mass media and even some research journals.

Unfortunately, among the domestic publications only three or four authoritative research papers consider epizootological investigation of "boar – ASF" issue that is significantly lower in number as compared to the ambitious printed materials of the opposition. In this regard, publication of the monograph by B. V. Romashov et al. is just a gift, and extremely well-timed one. Without going into details of the monograph, general and specific ideas should be mentioned that are deemed the most notable from the reviewer's point of view.

As usual in such cases, general statistic data and specific features of the tested object (i.e. large isolated group of boars generally having the properties of the ideal (panmictic) population) were used as the primary, benchmark data for the epizootological analysis. The authors demonstrate actual scientific and practical experience of ASF experts' field operations, which significance (not scale) can, say the least of it, be compared with the disease eradication activities in three regions of the USSR in 1977.

This is due to the unique properties of this epizootic event – i.e. the fact of the development of the complete natural cycle of the large-scale epizootic wave without any outside intervention (it is commonly known that there is no vaccination and the final diagnosis is made nearly *post factum*). The point is that for five months in 2016 (March – July) total mortality of the boars occurred on 32 ths ha area of the Voronezh natural reserve due to ASF introduction and spread. The initial boar population amounted to 532 animals and the average population density amounted to 16.6 animals/1000 ha. The boars actively used the feeding stations and accumulated mostly in the bottomland area of the reserve. The situation development was specified by the typical epizootic curve. The results obtained during this unique and objectively documented and published research can serve as an example of the description of the natural ASF epidemic.

Even the first glance through the publication provides much food for thoughts, questions and objections in the best sense of the term. Here are just some of them.

As a discussion, one cannot agree with the authors' conclusion on the impossibility of stable natural ASF circulation in boars due to high virulence of the agent and the boars' minor role in ASF epizootology (pp. 4, 16, 17 et seq.). Indeed, the incidence of the natural infection reported in the Russian Federation is mostly sporadic and lacks evident temporal or spatial continuity; although, the veterinarians are not inclined to consider the data submitted by game management authorities to be reliable. However, the situation is quite opposite in the ASF-infected countries in Central Europe, where the boar population density is relatively high: the endemicity is associated with the boar morbidity with rare, even sporadic, index-cases in domestic pigs occurring on 9:1 ratio as well as with described hallmarks of the evolution to at least the disease chronicity and moderate virulence of genotype II virus (see, for example: https://doi.org/10.1186/s40813-018-0109-2).

According to multiple foreign analytical publications, the evidence of the boar being the only reservoir of the infection is not even discussed. Rare cases of domestic pigs' involvement in the epidemic process are also not considered to be a problem. One can hardly imagine the human factor to play any role with such a pattern of the epidemic process. Moreover, nearly complete boar depopulation (97.5%) in Lithuania allowed prevention of ASF spread in the country in 2014–2017 as compared to Latvia and specifically Estonia, who ignored the boar depopulation at proper time.

This is also true of the early conclusion stating "there are no biological and ecological prerequisites for ASFV hotspots" (p. 99). How can then be explained the fact that clusters of natural infection occurred in the Novgorod, Nizhny Novgorod and Oryol Oblasts of the Russian Federation in 2019, and they were specified by natural nodality, chronological and spatial distinctness, minimum one year endemic stability and sporadic index-outbreaks in the backyards?

It is the first time when the publication on ASF describes possible fate of the diseased boars and specifically emphasizes the loss of migration instinct. While observing such mortality and in order to control the natural infection, it would be important to have reliable information about dominating natural environment chosen by the infection victims for their departure (there are already some data on this issue in the foreign publications).

The vector "domestic outbreak → wild fauna" is not covered even hypothetically, except for singular reference to the fact that boars are infected from the dumped pig carcasses. In the conclusion the authors use the concept "anthropopressure" for that, i.e. abstract parasitological term, which appears to be of virtual character. Until this vector is considered, all arguments about epizootological safety of boars are just scholastic.

Widespread and quite obvious euphemism stating that "boar is one of the key components of fauna and biodiversity" remains unclear. By the way, before the mid-XXth century there were no boars at all in the USSR with minor exceptions of the southern part of the country. What is specific advantage of the further spread of the boars all over the country? And how one should understand this if in the Russian Federation boar is considered to be an invasive, i.e. environmentally harmful species, but in such authoritative document as Agroecological atlas of Russia and bordering countries it is mentioned as game and pest animal (for illustration see: https://www.youtube.com/watch?v=1iCePTe178w).

There are several editorial shortcomings. For example, in the description of ASF virus: DNA is located not inside the supercapsid envelope, but inside the capsid. The term "virus volatility" is not correct, as ASF cannot be transmitted by air. The list of references is extremely limited and mostly includes domestic authors, while in the Baltic States and Poland there are many published reports about ASF epizootology researches with authoritative conclusions.

All the above mentioned should be considered as the reviewer's opinion, who meanwhile highly appreciates multiple and often critical references to his own publications in the monograph.

As a treatise, the book by B. V. Romashov et al. as a whole complies with the current standards, efficiently compiled and written in good language. Detailed illustrations are also an upside of the monograph.

The monograph is actually unique and rich in facts novel for science and practice both in general and specific epizootological context. The unique experience deserves attention of everybody engaged in veterinary epidemiology, natural nodality, infection emergence and veterinary education.