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PARASITOFAUNA, THE IMPACT OF PARASITOSIS ON SPECIES OF THE HUNTING IMPORTANCE, PROPHYLAXIS AND TREATMENT

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CONCEPTUAL OUTLINES OF THE RESEARCH

Actuality and importance of the topic addressed

The fauna of the hunting interest is the integral part of the national hunting fund of the Republic of Moldova, and both the number and the totality of the spectrum of the main and complementary species determine the value of this fund. The decisive factor in the successful development of the hunting fauna are the measures aimed at ensuring the well-being of wild animals, and more concretely, taking measures to protect them through combating diseases [5, 12, 16, 21].

The dislocation and grazing of various species of domestic and wild animals on common and limited territories allow the accumulation of different parasitic agents, which favor the formation of foci of ecto- and endoparasites common to them. Resulting from the fact that the parasitic diseases not only restrain the growth and development of animal species of the hunting interest, but can also cause their mortality by significantly reducing the body's defense capacity, and as a result being easily captured by predators. The multiple measures aimed at increasing the numbers of animal species of hunting importance cannot be sufficient, without taking into account the parasitic load and impact with the development of prophylaxis and treatment measures, which allows to increase their survival and reproductive potential in natural conditions [4, 11, 23].

Description of the situation in the research field and identification of the research problems

The changes that have taken place in the livestock sector in the last three decades, in connection with the lands appropriation, the reorganization of livestock units, formation of multiple small farms, the redeployment of a large number of animals from complexes to private households, have led to the radical change of the parasitic fauna. The cattle that were in the stables, while moving to grazing in different anthropogenic stations, also enter the natural reservations, where they can transmit pathogens to wild animals of the hunting importance [5, 12, 25].

In recent decades, with the intensification of the impact of anthropogenic and technogenic factors on natural ecosystems, the study and protection of biodiversity in natural ecosystems have become a major current issue, which is of increased interest to specialists and public organizations [4, 11, 25].

Studying the process of the infestation of wild animals of hunting interest with various parasitic agents, establishing their impact on the host organism and developing innovative measures to reduce and combat them is an important, fundamental and, above all, an applied problem, because some species of animals serve not only as intermediate or definitive hosts in the development cycle, but also as their vectors, which are dangerous both for domestic animals and for humans [7, 8, 10, 12, 17].

The aim of the work is the elaboration and scientific-practical substantiation of conceptually-strategic innovative methodologies for diagnosis, prophylaxis and treatment of parasitosis in animal species of the hunting importance.

Research objectives:

- carrying out fundamental research regarding the establishment of the composition of the parasitofauna in the species of hunting importance from various natural and man-made biotopes of the Republic of Moldova;

- evaluation of the degree of infestation and highlighting of the morpho-functional and curative status in cervids with various types of reactivity to stress;
- establishing and determining the impact of mono- and poly-invasions on some indices of the morpho-functional and biochemical status of species of the hunting importance;
- estimating and evaluating the impact of mono- and poly-invasions on some productive indices in the main species of the hunting importance;
- development and implementation of innovative methodologies and procedures for diagnosis, prophylaxis and control of parasitosis in the main species of the hunting importance.

The methodology of scientific research is constituted by the theoretical-scientific strategies presented in the works carried out by [5, 10 - 12, 14, 15, 17, 18, 24], with the basic aim of studying the diversity of parasitosis, establishing the impact of mono- and polyinvasions on some indices of the morphofunctional, biochemical, productive status, as well as the development of innovative procedures for the prophylaxis and treatment of parasitosis in wild animals from hunting fauna.

Novelty and scientific originality. For the first time, in the Republic of Moldova, a problem of major importance was solved, expressed by:

- the elaboration and scientific - practical substantiation of innovative conceptual - strategic methodologies for diagnosis, prophylaxis and treatment of parasitosis in animal species of hunting importance.
- the diversity of the nosologically and epidemiologically specific parasitofauna in animal species of hunting importance from various natural and humanized biotopes of the Republic of Moldova was established and their role in the formation, maintenance and spread of the most dangerous zooinvasions in wild, domestic and human animals was evaluated.
- the impact of mono- and polyinvasions on some indices of the morphofunctional, biochemical, productive and curative status of wild animal species from the hunting fauna was identified and evaluated. The obtained results are the basis for the diagnosis of parasitosis in animal species of hunting importance and the correction of prophylaxis and treatment methods.
- for the first time, innovative conceptual-strategic methodologies and procedures were developed, patented and implemented in production for the diagnosis, prophylaxis and treatment of parasitosis in game animals and for assessing the sensitivity of cervids to stress factors.

These scientific evidences have argued the need for the correction and improvement of the existing methods of diagnosis, prophylaxis and treatment of parasites in animal species from the hunting fauna, which allow their diagnosis, selection and deworming in natural conditions and compensating the deficit, in the cold period of the year, with vitamins, trace elements, assimilable concentrated minerals, which ensure the preservation of healthy animal populations and their high reproductive potential in nature. The scientific results contributed to the argumentation of measures to minimize the risks of infestation and to solve the problem of anti-parasitic protection of humans and animals, based on the concept of integrated diagnosis, prophylaxis and treatment.

The solved scientific problem consists in the elucidation of the role of wild animals of hunting importance in the formation, maintenance and spread of foci of

parasitic agents common to domestic animals, pets and humans, establishing the impact of mono-polyinvasions on the organism - host and developing innovative conceptual - strategic diagnostic methodologies, prophylaxis and treatment of parasitosis in animal species of the hunting importance.

The theoretical significance. In the theoretical aspect, the results of the work made an important contribution to the solution of major interdisciplinary problems of the veterinary medical field in the Republic of Moldova, which highlighted the result of the action on the host organism of mono- and polyinvasions and antiparasitic therapy, identified their impact on food safety with the identification of new methods and techniques for the selection of cervids for diagnosis, prophylaxis and treatment of parasitosis in game animals. From the point of view of theoretical importance, the work allows the realization of new possibilities to study the course of transmission and infestation processes from animal species of hunting importance to other animal species and humans and vice versa.

The applicative value of the work. In the applied aspect, the value of the work consists in the development, patenting and implementation of innovative procedures for the prevention and control of parasitosis in cervids, wild boars, hares, pheasants, the creation and implementation of new advanced methods of selection of cervids according to the type of stress reactivity and diagnostics in parasitology, which essentially contribute to the reduction and recovery of economic damages in the hunting and zoo-veterinary sector in the Republic of Moldova.

Implementation of scientific results. The scientific results obtained are stipulated in 31 implementation documents made within the hunting funds of the "Moldsilva" Agency, the "Zooological Garden" I.M. from the municipality of Chisinau, the Society of Hunters and Fishermen from the Republic of Moldova, the National Agency for Food Safety from the Republic Moldova, "Straseni" Silvo - Hunting Enterprise, "SIL REZENI" Silvo - Hunting Enterprise, "CODRII" Natural Reservation. The research results are used and implemented in the teaching process at the Veterinary Medicine Faculties of the Technical University of Moldova and the University of Life Sciences in Iasi, Romania.

Approval of scientific results. The thesis materials were discussed, approved and exhibited at various national and international scientific forums.

Publications on the topic of the thesis. The scientific results obtained in the work are published in 137 scientific works (14 single-authored works), including 4 monographs (one single-authored), a methodological guide, 9 journal articles from the Web of Science and SCOPUS databases, 18 journal articles from the National Register of professional magazines, category B, C; 11 articles in Journals accepted in the ANACEC database; 31 articles published in the international collections, 44 articles in the works of scientific events included in the Register of materials published on the basis of scientific events organized in the Republic of Moldova; 19 theses in the works of scientific events included in the Register of materials published on the basis of scientific events organized in the Republic of Moldova; 13 invention patents.

The volume and structure of the thesis. The thesis materials are presented in total on 239 basic text pages including: introduction, literature review, investigation results presented in 6 chapters, general conclusions and recommendations, annotations in

Romanian, Russian and English. The bibliography contains 374 sources and 43 Annexes. The content of the thesis is accompanied by 47 figures and 57 tables.

Key words: mono-, polyinvasions, hunting fauna, zooanthroponosis, parasitic impact, productive indices, innovative procedures, prophylaxis, treatment.

1. THE DIVERSITY OF PARASITOSIS, THE IMPACT ON THE HOST ORGANISM, THE TREATMENT AND PROPHYLAXIS OF PARASITIC DISEASES IN THE WILD ANIMALS FROM THE HUNTING FAUNA (Literature review)

The chapter constitutes a synthesis of recent publications regarding the diversity of parasitofauna, the impact of parasitic agents on the host organism, as well as the measures for prophylaxis and treatment of parasitosis identified in species of the hunting importance.

2. MATERIALS AND RESEARCH METHODS

2.1. The methodology of studying the parasitofauna in animal species from the hunting fauna

The work was carried out between 2002-2023 in the Laboratory of Parasitology and Helminthology of the Institute of Zoology. Collecting biological samples in order to establish the parasitofauna and to develop innovative procedures for the prophylaxis and treatment of parasitosis in species from the hunting fauna (noble deer (*Cervus elaphus* Linnaeus, 1758), spotted deer (*Cervus nippon* Temminck, 1838), roe deer (*Capreolus capreolus* Linnaeus, 1758), wild boar (*Sus scrofa*), hare (*Lepus europaeus* Pallas, 1778), pheasant (*Phasianus colchicus* L.), quail (*Coturnix coturnix*), guinea fowl (*Numida meleagris*), partridge (*Perdix perdix*) was realized in various natural and man-made biotopes of the Republic of Moldova (the "Codrii" Natural Reservation, the "Plaiul fagului" Natural Reservation, the "Padurea Domneasca" Natural Reservation, the Republican Center for Reproduction, the "Mandresti" Forest Husbandry, Telenesti district, Chisinau City Zoo, Bardar Village Zoo, Ialoveni District, "Orheiul Vechi" Cultural-Natural Reservation from Tribujeni Village, Orhei District, Zloti Monastery, Cimislia District, Zloti Village, Sfintele Monastery Mironosi women Marta and Maria near Hagimus village, Orhei Forestry Enterprise, "Sil Rezeni" Silvio-Cinegetic Enterprise, Ialoveni district, "Straseni" Silvio-Cinegetic Enterprise, "Moldsilva" Agency, Society of Hunters and Fishermen from the Republic of Moldova).

In total, 4470 animals from the hunting fauna were examined parasitologically, including: Deer - noble (*Cervus elaphus* Linnaeus, 1758) - 166 specimens, red deer (*Cervus nippon* Temminck, 1838) - 220, roe deer (*Capreolus capreolus* Linnaeus, 1758) – 334, wild boar (*Sus scrofa*) - 520 specimens, field rabbit (*Lepus europaeus* Pallas, 1778) – 350 specimens, pheasant (*Phasianus colchicus L.*) - 2320 specimens, quail (*Coturnix coturnix*) – 420, guinea fowl (*Numida meleagris*) - 64 and partridges - 76 specimens from various natural and man-made biotopes of the Republic of Moldova. In order to identify species common to animals from hunting and domestic animals, parasitological investigations were also carried out on other animal species: 460 - cattle

(*Bos taurus*), 1120 - sheep (*Ovis orientalis*), 1200 - birds (*Gallus gallus domesticus*) and 230 - garden dogs and 57 - decorative birds.

The researches were carried out randomly based on the grouping of the obtained results, resulting from the interest of the drawn objective. The biological samples collected during the course of the experiments were investigated by means of coproovoscopic (Fulleborn, Darling) [6] and coprolarvoscopic (Popov, Baermann) [6] methods, partial parasitological investigations (according to K.I. Skriabin) [5] and successive washings. The intensity of the invasion with nematodes, fasciole eggs, dicrocelia, and eimeria oocysts was determined in 5g face in 10 visual microscopic fields (10x40). The systematic determination of parasite species was carried out according to the Europaea fauna. The parasitological evaluation is based on the determination of the extensiveness of the invasion (EI, %) and the intensity of the invasion (II, specimens/animal) in the investigated animals.

2.2. Methodology for determining stress reactivity time in the deer (*Capreolus capreolus* Linnaeus, 1758)

The determination of the type of stress-reactivity in cervids (roe deer (*Capreolus capreolus Linnaeus*, 1758)) was carried out using the adrenalin method formulated by Ahmadiev G. [22] and modified by the authors Rusu S., Erhan D., Savin A., Toderas I. et al. [14].

2.3. Methodology of collecting ectoparasites from the live gallinaceae

The collection of ectoparasites from the live birds was carried out according to the method developed by the authors Luncasu M., Zamornea M. [9] and using the procedure for collecting ectoparasites from live chickens, according to the method developed and patented by the authors: Rusu S. Erhan D., Zamornea M. [15].

2.4. Methodology for establishing the impact of mono- and polyinvasions on the host organism in species of the hunting importance

Hematological indices [hemoglobin, erythrocytes, leukocytes, leukocyte formula, hematocrit, prothrombin, clotting time, erythrocyte sedimentation rate (ESR)], serological [bilirubin, alanine aminotransferase (ALT) and aspartate aminotransferase (AST) activity, K, Na, Ca, total proteins, albumins, globulins α1, α2, β, γ, creatine phosphokinase, glucose, cholesterol], determined the number of eosinophils, according to the classic methods described in specialized publications [24].

3. PARASITOFAUNA IN SPECIES OF THE HUNTING IMPORTANCE FROM VARIOUS NATURAL AND ANTHROPOIZED BIOTOPES OF THE REPUBLIC OF MOLDOVA

3.1. Parasitofauna of cervids from various natural and anthropogenic biotopes of the Republic of Moldova

In order to achieve the purpose of the research on the study of their polyparasitosis in hunting animals, the epidemiology, the impact on the host organism, prophylaxis and treatment measures, first of all, it was necessary to study the parasitological situation of hunting animals from various natural and anthropized biotopes of the Republic of Moldova.

One of the purposes of the research was to establish the level of infestation of cervids with various parasitic agents in the "Plaiul fagului" Natural Reservation.

The result of the analyzes of the biological samples carried out on cervids from the "Plaiul fagului" Natural Reservation, highlighted a level of infestation of the red deer (*Cervus elaphus* Linnaeus, 1758), with parasite species from the Class Trematoda 3 species: *Dicrocoelium lanceolatum* with EI- 12.5%, II-1.6 ex., *Fasciola hepatica* with EI-25.0%, II-1.2 ex., and *Paramphistomum cervi* with EI-7.4% and II-1.3 ex.; Class Secernentae 5 species *Strongyloides papillosus* with EI-100.0% and II-7.8 ex., *Cooperia punctata* with EI-6.3% and II-1.2 ex., *Ostertagia ostertagi* with EI-6.3% and II-1.4 ex., *Toxocara vitulorum* with EI-18.2% and II-1.9 ex., *Trichostrongylus axisi* with EI-12.5% and II-1.2 ex.; Class Cestoda one species: *Moniezia benedeni* – with EI-12.5% and II-1.1 ex.; and Class *Conoidosida* with 2 species: *Eimeria asymmetrica* with EI-6.3% and II-0.5 ex., and *E. austriaca* with EI-6.3% and II-0.8 specimens.

In the spotted deer (*Cervus nippon* Temminck, 1838), from the "Plaiul fagului" Natural Reservation, parasite species from the Class Trematoda 3 species were also highlighted: *Dicrocoelium lanceolatum* with EI-30.7%, II- 3.1 ex., *Fasciola hepatica* with EI-10.2%, II-2.3 specimens and *Paramphistomum cervi* with EI-8.2% and II-1.1 specimens; Class Secernentae 4 species *Strongyloides papillosus* with EI-100.0% and II-8.4 ex., *Cooperia punctata* with EI-10.2% and II-1.4 ex., *Ostertagia ostertagi* with EI-8.2% and II-1.8 ex., *Toxocara vitulorum* with EI- 10.2% and II-1.0 exemplar; Class Cestoda one species: *Moniezia benedeni* – with EI-13.2% and II-0.8 ex.; and Class Conoidosida with 2 species: *Eimeria asymmetrica* with EI-7.9% and II-0.9 ex., and *E. austriaca* with EI-6.8% and II-0.7 specimens.

In the roe deer (*Capreolus capreolus* Linnaeus, 1758), from the "Plaiul fagului" Natural Reservation, three species of parasites from the Class *Trematoda* were identified: *Dicrocoelium lanceolatum* with EI-26.6%, II-2.4 ex., *Fasciola hepatica* with EI-18.6%, II-1.3 ex., and *Paramphistomum cervi* with EI-12.6% and II-1.5 specimens; Class Secernentae with 4 species *Strongyloides papillosus* with EI-100.0% and II-12.4 ex., *Cooperia punctata* with EI-23.2% and II-2.1 ex., *Ostertagia ostertagi* with EI-15.2% and II-1.9 ex., *Toxocara vitulorum* with EI-15.2% and II-1.3 specimens; Class Cestoda one species: *Moniezia benedeni* - with EI-15.2% and II-1.3 specimens and Class Conoidasida with 3 species: *Eimeria ponderosa* with EI-61.6% and II-4.7 ex., *E. capreoli* with EI-61.6 % and II-3.8 ex. and *E. bovis* with EI-12.6 and II-1.4 specimens.

From the adjacent areas of the "Plaiul fagului" Natural Reservation, biological samples were collected from cattle (*Bos taurus*), which grazed in these territories. For this purpose, 32 samples were collected. As a result of coprological research, the following parasite species were identified: Class Trematoda 3 species – *Dicrocoelium lanceolatum* with EI-35.8%, II-2.8 ex., *Fasciola hepatica* with EI-23.3%, II-2, 2 ex. and *Paramphistomum cervi* with EI-8.9% and II-1.3 specimens; Class *Secernentae* with 5 species *Strongyloides papillosus* with EI-44.2% and II-4.7 ex., *Cooperia punctata* with EI-14.8% and II-1.6 ex., *Ostertagia ostertagi* with EI-19.2% and II-2.4 ex., *Toxocara vitulorum* with EI-17.5% and II-1.9 ex., and *Trichostrongylus axisi* with EI-3.4% and II-0.6 ex.; Class Cestoda one species: *Moniezia benedeni* – with EI-3.2% and II-0.4 ex.; Class *Conoidosida* with 3 species: *Eimeria asymmetrica* with EI-37.5% and II-3.4 ex., and *E. bovis* with EI-23.6 and II-2.7 specimens.

The analysis of the parasitofauna in cervids from the Natural Reservation "Plaiul fagului" and in the cattle grazing near the reservation, allows us to mention that there are 3 species of the obligate parasites in cervids (*Eimeria austriaca, E. ponderosa, E. capreoli*) and 11 common species for domestic ruminants (*Dicrocoelium lanceolatum, Fasciola hepatica, Paramfistomum cervi, Strongyloides papillosus, Cooperia punctata, Ostertagia ostertagi, Toxocara vitulorum, Trichostrongylus axei, Moniezia benedeni, Eimeria asymmetrica, E. bovis*).

An important factor, which determines the formation of parasitofauna in wild mammals (cervids), is the zootechnical sector. The grazing of domestic animals of different ages and, often, in a much greater number than that of cervids in nature, leads to the sudden increase in these biotopes of the density of parasitic agents, as well as of animals receptive to these species of parasites.

It is established that wild animals serve as an important source of parasitic agents for domestic ones, where the contact between wild and domestic animals is limited or even excluded, it is observed that only some obligate parasite species are present in the parasitofauna of domestic animals.

The parasitological research carried out shows us that cervids and cattle cross-contaminate each other with various parasitic agents by grazing on common territories, despite the existence of rules prohibiting grazing and maintaining domestic animals in natural reservations, in order to limit the circulation of common parasitic agents to domestic animals and wild ones. Measures to combat and prevent parasitic diseases in animals are highly needed, if not until they are completely eliminated, then until they are reduced to a level below the damage threshold. Therefore, these measures can only be developed knowing the biological peculiarities of both the parasites, their hosts, and the environment, in order to intervene to interrupt the trophic chain of the parasitic agents.

Therefore, the obtained results demonstrate that the parasitofauna established in cervids, in general terms, corresponds to that of cattle, which grazed in the adjacent areas. Therefore, it is of a high need that the parasitic invasions in wild animals be monitored annually, establishing in this way their evolution, the appearance of the new parasitic agents harmful to cervid herds.

In the "Codrii" Natural Reservation, the biological samples from cervids and cattle grazing in the areas adjacent to the reservation were investigated. In the red deer and the spotted deer, 8 species of parasites were identified: Class Trematoda – 4 species (*Dicrocoelium lanceolatum, Fasciola hepatica, Paramphistomum cervi, P. explanatum*); Class *Secernentea* 2 species (*Strongyloides papillosus, S. stercoralis*) and Class Isospora 2 species (*Eimeria asymmetrica, E. austriaca*).

In deer, 10 species of *Trematoda* Class parasites were identified - 4 species (*Dicrocoelium lanceolatum, Fasciola hepatica, Paramphistomum cervi, P. explanatum*); Class Secernentea 2 species (*Strongyloides papillosus, S. stercoralis*) and Class Conoidosida 4 species (*Eimeria asymmetrica, E. capreoli, E. panderosa, E. bovis*).

In cattle grazing in the areas adjacent to the reservation, 8 species of parasites were identified: Class Trematoda - 4 species (*Dicrocoelium lanceolatum, Fasciola hepatica, Paramphistomum cervi, P. explanatum*); Class *Secernentea* 2 species (*Strongyloides papillosus, S. stercoralis*) and Class Conoidosida 2 species (*Eimeria asymmetrica, E. bovis*).

As a result of coproscopic research in the red deer (*Cervus elaphus*) from the "Codrii" Natural Reservation, it was found out that it was infested with *Dicrocoelium lanceolatum* - 12.8%, II-3.4 specimens, *Fasciola hepatica* with EI-9.5% and II-1.6 ex., *Paramphistomum cervi* with EI-12.4%, and II- 1.2 ex. *P. explanatum* with EI-3.2%, and II-0.6 ex. larvae of *Strongyloides papillosus* with EI-88.0% and II-8.2 ex., *S. stercoralis* with EI-32.2% and II-4.6 ex., and *Eimeria asymmetrica* oocysts with EI-28 .2% and II-4.8 ex. *E. austriaca* EI-6.6%, II-2.7 ex.; spotted deer (*Cervus nippon*) – with *D. lanceolatum* with EI-14.9% and II-3.6 ex., *F. hepatica* EI-10.2% and II-2.3 ex., *Paramphistomum cervi* with EI-16.8%, and II-1.6 ex. *P. explanatum* with EI-6.8%, and II-1.5 ex., larvae of *Strongyloides papillosus* with EI-79.8% and II-7.4 ex., *S. stercoralis* with EI-43.5% , and II-5.1 ex., oocysts of *Eimeria asymmetrica* EI-22.4% and II – 3.3 ex., *E. austriaca* EI-5.2%, II-1.4 ex.; roe deer (*Capreolus capreolus*) – with *D. lanceolatum* EI-20.1%, II-4.8 ex., *F. hepatica* EI-3.2% II-1.2 ex., *Paramphistomum cervi* with EI-23.2 %, and II-2,3 ex. *P. explanatum* with EI-10.3%, and II-1.5 ex., larvae of *Strongyloides papillosus* EI-89.4%, II-9.4 ex., *S. stercoralis* with EI-57.8%, and II-6.2 ex., oocysts of *Eimeria asymmetrica* EI-38.1%, II-3.0 ex., *E. capreoli* EI-68.4%, II-4.8 ex., *E. ponderosa* EI -65.2%, II-3.3 ex. and *E. bovis* - EI- 12.6%, II-1.4 ex.

From the adjacent areas of the reservation, biological samples were collected from the cattle grazing in these biotopes. As a result of the coprological research on them, there were identified the eggs of *Fasciola hepatica* with EI-33.3% and II-4.2 ex., *Dicrocoelium lanceolatum* with EI-45.8% and II-4.8 ex., *Paramphistomum cervi* with EI - 14.6%, and II-1.8 ex. *P. explanatum* with EI-5.7%, and II-1.0 ex., larvae of *Strongyloides papillosus* with EI-54.2% and II-6.3 ex., *S. stercoralis* with EI- 43.2% , and II-3.4 ex., oocysts of *Eimeria austriaca* EI-37.5%, II-4.6 ex., *E. bovis* - EI-35.4%, II-2.8 ex. It was found that the infested animals were polyparasitized in 95-100%.

The study of parasitofauna in wild ruminants (red deer (*Cervus elaphus Linaeus*, 1758), spotted deer (*Cervus nippon* Temminsk, 1838), roe deer (*Capreolus capreolus* Linaeus, 1758) from the Republican Reproduction Center, "Mândrești" Forestry and Telenești district highlighted the following level of parasitic infestation:

In the red deer (*Cervus elaphus* Linaeus, 1758), 3 species of parasites from the Class Trematoda were highlighted: *Dicrocoelium lanceolatum* with EI-20.7%, II-2.3 ex.; *Fasciola hepatica* with EI-17.2%, II-1.2 ex., and *Paramphistomum cervi* with EI-4.2% and II-1.1 ex.; class Secernentae 6 species *Strongyloides papillosus* with EI-93.1% and II-12.8 ex.; *Cooperia punctata* with EI-10.3% and II-1.6 ex., *Capillaria bovis* with EI-13.1% and II-1.7 ex.; *Ostertagia ostertagi* with EI-3.1% and II-0.6 ex.; *Toxocara vitulorum* with EI-12.6% and II-1.8 ex.; *Trichostrongylus axis* with EI-10.5% and II-1.1 ex.; Class Cestoda one species: *Moniezia benedeni* – with EI-6.9% and II-0.5 ex.; and the Conoidosida class with 2 species: *Eimeria asymmetrica* with EI-10.3% and II-1.1 ex.; and *E. austriaca* with EI-12.1% and II-1.8 specimens.

The study of the extent of the mixed invasions of cervids, depending on the biotope, highlighted a higher level of their infestation in the "Plaiul fagului" Natural Reservation, compared to those in the "Codrii" Natural Reservation and the Republican Reproduction Center, Forest Husbandry "Mandresti", Telenesti district. Thus, the extensiveness of the mixed invasion in the red deer from the "Plaiul fagului" Natural Reservation being 35.8% higher, compared to that of the red deer from the "Codrii" Natural Reservation, and 15.5%

higher, compared with the one from the noble stag in the Republican Reproduction Center, Forest Husbandry "Mandresti", Telenesti district.

The extensiveness of the mixed invasions, identified in the spotted deer, being 30.2% higher than that of the spotted deer in the "Codrii" Natural Reservation, and only 0.6% higher, compared to that of at the spotted deer from the Republican Reproduction Center, Forest Husbandry "Mandresti", Telenesti district.

In roe deer (*Capreolus capreolus* Linnaeus, 1758), from the "Plaiul fagului" Natural Reservation, the highest extensiveness of mixed invasions was highlighted, being 12.8% higher, compared to that from the specimens from the "Codrii" Natural Reservation and from The Republican Reproduction Center, "Mandresti" Forest Husbandry, Telenesti district.

Research on the spread of echinococcosis/hydatidosis in animals in the Republic of Moldova was carried out by several parasitologists [1-3, 5, 12, 19].

Also, complex parasitological research was carried out on injured and unrecoverable cervids, which were subjected to the necessary slaughter. Biological samples were collected from them for possible laboratory investigations. In cervids slaughtered by necessity, after a preventive assessment of the stress-reactivity type by applying the adrenalin test formulated by Ahmadiev G. [22], modified [14], 2 groups were formed: group I – stress-reactivity and group II - stress-resistant, which were then subjected to parasitological investigations in order to identify their infestation.

The study of the parasitofauna in cervids slaughtered by necessity made it possible to highlight the stress-reactive group I parasite species: *Fasciola hepatica* with EI-33.3%, II-4.4 ex.; *Dicrocoelium lanceolatum* with EI-50.0% and II-4.6 specimens; *Strongyloides papillosus* with EI-100.0%, II-12.2 ex.; *Cooperia* scored with EI-66.6%, II-10.2 ex.; *Ostertagia ostertagi* with EI-33.3 %, II-8.0 ex.; *Echinococcus granulosus* with EI-83.3%, II-4.4 ex.; *Toxocara vitulorum* with EI-16.6 %, II-3.0 ex.; *Eimeria ponderosa* with EI-66.6%, II-6.3 ex.; *E. capreoli* with EI-83.3 %, II-6.2 ex. and *E. bovis* with EI-33.3%, II-5.3 copies. In group II, a level of infestation with *Fasciola hepatica* was highlighted - EI-25.0%, II-2.0 ex.; *Dicrocoelium lanceolatum* – EI-37.5% and II-2.6 specimens; *Strongyloides papillosus* with EI-37.5%, II-2.6 ex.; *Cooperia* scored with EI-25.0%, II-3.0 ex.; *Ostertagia ostertagi* with EI-12.5 %, II-3.0 ex.; *Echinococcus granulosus* with EI-12.5 %, II-2.0 ex.; *Eimeria ponderosa* with EI-12.5 %, II-2.0 ex.; *E. capreoli* with EI-25.0 %, II- 2.6 ex. and *E. bovis* with EI-12.0%, II-2.0 specimens.

The result of the parasitological investigations in both groups of cervids made it possible to highlight the fact that both the extensiveness of the invasion and the intensity of the invasion are higher in cervids from group I – stress-reactive ones.

The necessary sacrifices of cervids with various types of stress-reactivity made it possible to highlight, in the internal organs of both groups, their infestation with the *Echinococcus granulosus* cestode. The presence of the cestode *Echinococcus granulosus* was highlighted in stress-reactive group I in 5 cases (83.3%), of which 3 cases (60.0%), being the hepatic form, one case (20.0%) – the pulmonary form and one case (20.0%) being the mixed hepatic and pulmonary form. In group II of stress-resistant cervids, only one case of infestation with *Echinococcus granulosus* was identified - 12.5% located in its liver. Both the extensiveness of the invasion and the intensity of the invasion being increased by 70.8% and, accordingly, by 54.5% in group I – stress-reactive, compared to group II – stress-resistant.

The detection of the *Toxocara vitulorum* cestode in cervids slaughtered for necessity was possible only in group I with stress-reactive cervids, while in group II - stress-resistant this parasitic species was not detected.

Also, in both groups of cervids slaughtered for needing, parasitic agents from the *Conoidosida* Class (*Eimeria ponderosa, E. capreoli, E. bovis*) were highlighted, whose extensiveness of invasion was 54.1%, 58.3 % and, correspondingly, by 21.3% higher, and the intensity of invasion by 68.3%, 58.1% and, correspondingly, by 62.3% also increased in group I – stress-reactive, compared to the group II – stress-resistant.

The research carried out regarding the spread of echinococcosis/hydatidosis in humans and animals highlighted the fact that this is a hyperendemic disease in the Republic of Moldova, and recent molecular investigations carried out in humans and animals revealed the presence not only of the *E. granulosus* species, but also of the *Echinococcus canadensis* species G6/G7, which are registered both in our country and in neighboring countries, which confirms the important role of rodents, carnivores and parasitoids in the spread of this parasitosis not only in animals but also in humans [2, 3, 19].

In the process of arachnoentomological research on wild and domestic mammals, in the climatic conditions of the Republic of Moldova, together with representatives of different groups of temporary and permanent ectoparasites (ixiodid ticks, anoplura, malophagus), the hematophagous insects of the fam. *Hippoboscidae* (*Lipoptena fortisetosa* (Maa, 1965), *L.cervi* (Nitzsch, 1818)) [8, 13].

The research, carried out between 2015-2020 on cattle that grazed near the forest biotopes in the Central Zone of the Republic of Moldova, made it possible to identify both species of invasive hematophagous insects from the *Hippoboscidae* family: *L. cervi* with EI – 25.0% and II – 15-45 specimens and *L. fortisetosa* (Maa, 1965) with EI – 85.0 % and II -25 – 65 specimens.

Until now, in the Republic of Moldova, invasive hematophagous insects of the genus *Lipoptena* have not been reported in horses. The arachnoentomological investigations carried out, on animals from various natural and anthropogenic biotopes of the Republic of Moldova, during the years 2018-2020, made it possible to highlight the presence of the species of invasive hypoboscid insects - *Lipoptena fortisetosa* (Maa, 1965) in the horses from the Central Zone of the Republic of Moldova with an EI of 20.0 % and an II of 25-80 specimens.

Therefore, the study of the species diversity of invasive hematophagous insects of the fam. *Hippoboscidae* allowed us to establish that both cattle and horses, which grazed in the natural reservations of the Republic of Moldova, as well as in the areas adjacent to them, had a major degree of infestation with invasive hematophagous insect species - (*Lipoptena cervi*, *Lipoptena fortisetosa*), thus contributing to the expansion of their range, where cervids serve as a specific host for their feeding, development and reproduction.

3.2. Parasitofauna of wild boars (*Sus scrofa*) in various natural and anthropogenic biotopes of the Republic of Moldova

Research on the wild boar (*Sus scrofa*) parasite fauna in the forest ecosystem of the "Plaiul fagului" Natural Reservation in the Republic of Moldova, where they live, shows that they were parasitized with parasite species with diverse locations,

systematically classified into 4 classes (Trematoda, Secernentea, Acantocephala, Conoidosida), 12 families (Fasciolidae, Dicrocoeliidae, Trichuridae, Strongyloidae, Metostrongylidae, Spirocercidae, Ascarididae, Trichostrongylidae, Gongylonematidae, Ancylostomatidae Oligacanthorhynchidae and Eimeriidae) and 13 genera (*Fasciola, Dicrocoelium, Gongylonema, Oesophagostomum, Ascaris, Strongyloides, Metastrongylus, Hyostrongylus, Globocephalus, Physocephalus, Trichocephalus, Macracanthorhynchus* and *Eimeria*).

The study of the examined biological samples highlighted a high level of their infestation with various parasitic agents: Class Trematoda 2 species (*Fasciola hepatica* with EI of 6.3% of cases and II of 2.6 ex., *Dicrocoelium lanceolatum* – 12, 6% of cases, II-2,2 ex.); Class Secernentea 9 species (*Trichocephalus suis* – 18.2% of cases, II – 2.4 ex., *Strongyloides ransomi* – 70.4% of cases, II-8.5 ex., *Metastrongylus elongatus* – 64.6% of cases , II-4.5 ex., *Oesophagostomum dentatum* – 19.4% of cases, II - 4.4 ex., *Physocephalus sexalatus* – 4.1% of cases, II-3.2 ex., *Ascaris suum* – 26, 5% of cases, II-6.4 ex., *Hyostrongylus rubidus* – 15.8% of cases, II-4.5 ex., *Gongylonema pulchrum* – 2.1% cases, II-3.2 ex., *Globocephalus urosubulatus* – 36.8% of cases, II-7.4 ex.), Class Acantocephala one species (*Macracanthorhynchus hirudinaceus* – 2.4% of cases, II - one specimen) and Class Conoidosida – one species *Eimeria debliecki* – 42, 4% of cases, II-8.4 ex.

The parasitological examination performed on wild boars from the forest ecosystem of the "Plaiul fagului" Natural Reservation showed that in 85.6% of cases parasitic agents are present. Parasitic invasions formed by a single species of parasite are present in 29.6% of cases, and polyinvasions in 70.4% of all samples examined (fig. 3.1.).

From the total number of detected infested samples, the following polyparasitic associations were established more frequently: with 2 species of parasites -32.0%; *Strongyloides ransomi + Eimeria debliecki* –45.0%; *Strongyloides ransomi + Metastrongylus elongatus* –30.0%; *Strongyloides ransomi + Ascaris suum* – 25.0%.

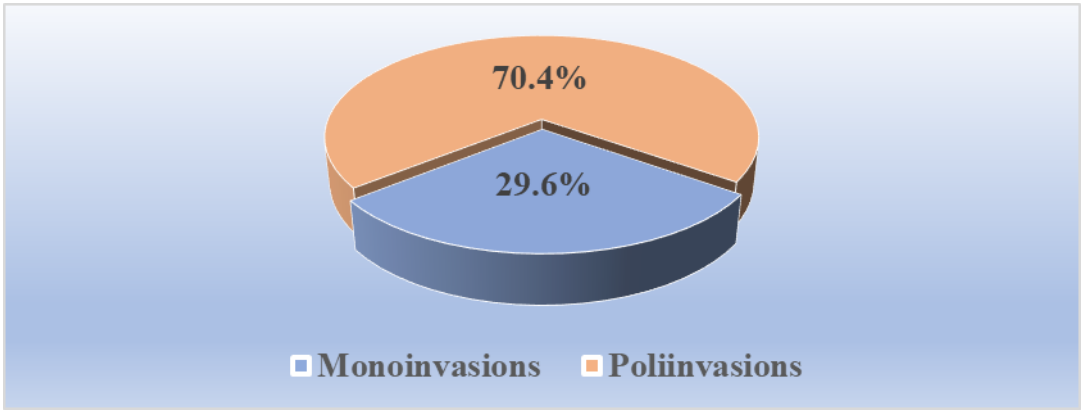


Figure 3.1. Mono- and polyparasitic invasions in wild boar (*Sus scrofa*) from the Natural Reservation "Plaiul Fagului"

In 19.2% of cases examined, polyparasitic associations were established, consisting of 3 species of parasites: *Strongyloides ransomi + Metastrongylus elongatus + Eimeria debliecki* –45.8%; *Strongyloides ransomi + Ascaris suum + Eimeria debliecki* –

33.3%; *Strongyloides ransomi + Globocephalus urosubulatus + Eimeria debliecki* – 20.8%.

If we make a division of the parasite species, identified in wild boars according to the way the development cycles are carried out, we can divide them into: bioparasites (46.2%) – parasite species whose development cycle requires an intermediate host; geoparasites (53.8%) – parasite species that do not require an intermediate host in their development cycle.

The results of the parasitological examination allowed us to report the fact that the wild boars in the forest ecosystem of the Natural Reservation "Plaiul fagului" in the of Moldova have a diverse and high parasite load, and the presence of polyparasitic associations in them is frequent. From the total number of parasitic species identified in wild boars (13 species): two species (15.5%) are specific only for wild boars (*Gongylonema pulchrum; Eimeria debliecki*), 8 species (61.5%) (*Trichocephalus suis, Strongyloides ransomi, Metastrongylus elongatus, Oesophagostomum dentatum, Physocephalus sexalatus, Ascaris suum, Hyostrongylus rubidus, Macracanthorhynchus hirudinaceus*) are common to other wild and domestic animal species, and 3 species (23.0%) (*Fasciola hepatica, Dicrocoelium lanceolatum and Globocephalus urosubulatus*) are common to both animals as well as humans.

The study of the parasitofauna in wild boars from the forest ecosystem of the "Padurea Domneasca" Natural Reservation of the Republic of Moldova, made it possible to highlight parasite species with diverse localization, systematically classified into 4 classes (Trematoda, Secernentea, Acantocephala, Conoidosida), 13 families (Fasciolidae, Dicrocoeliidae, Trichuridae, Strongyloidae, Metostrongylidae, Strongyloidae, Spirocercidae, Ascarididae, Trichostrongylidae, Gongylonematidae, Ancylostomatidae Oligacanthorhynchidae and *Eimeriidae*) and 13 genera (*Fasciola, Dicrocoelium, Gongylonema, Oesophagostomum, Ascaris, Strongyloides, Metastrongylus, Hyostrongylus, Globocephalus, Physocephalus, Trichocephalus, Macracanthorhynchus* and *Eimeria*).

The analysis of the examined biological samples highlighted a high level of infestation of wild boars from the "Padurea Domneasca" Natural Reservation with various parasitic agents: Class Trematoda - 2 species (*Fasciola hepatica* with EI of 18.4% cases and II of 3.2 ex ., *Dicrocoelium lanceolatum* – 7.7% cases, II-3.1 ex.); Class Secernentea – 9 species (*Trichocephalus suis* – 24.4% cases, II – 3.4 ex., *Strongyloides ransomi* – 82.2% cases, II-10.4 ex., *Metastrongylus elongatus* – 52.4% cases, II-6.6 ex., *Oesophagostomum dentatum* – 16.8% cases, II-3.2 ex., *Physocephalus sexalatus* – 5.8% cases, II-1.2 ex., *Ascaris suum* – 44.6% cases , II-4.2 ex., *Hyostrongylus rubidus* – 22.6% cases, II-3.0 ex., *Gongylonema pulchrum* – 3.2% cases, II-1.6 ex., *Globocephalus urosubulatus* – 42.2% cases, II-4.6 ex.), Class Acantocephala – one species (*Macracanthorhynchus hirudinaceus* – 2.8% cases, II-1.6 ex.) and Class Conoidosida – with 2 species (*Eimeria debliecki* – 64.5% cases , II- 9.2 ex., and *Eimeria scabra* – 32.6% cases, II-4.6 ex.

The parasitological examination performed on wild boars from the forest ecosystem of the "Padurea Domneasca" Natural Reservation showed that in 92.7% of cases parasitic agents are present. Parasitic invasions, formed by a single species of parasite, are present in 19.1% of cases, and polyinvasions in 80.9% of cases (fig. 3.2).

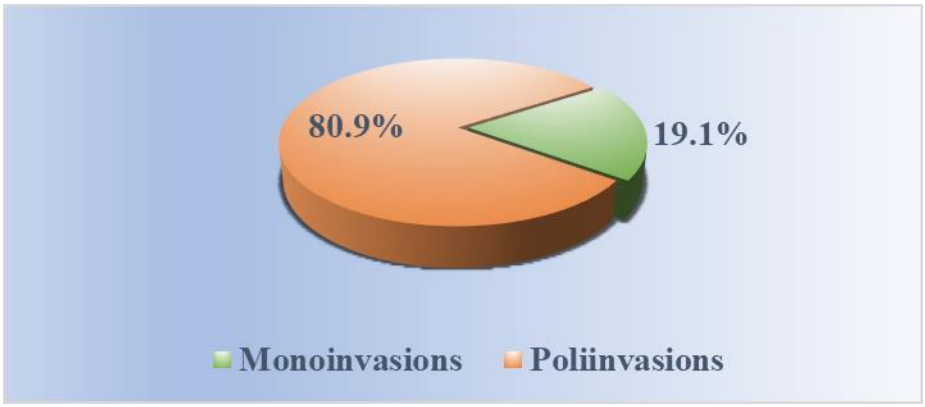


Figure 3.2. Mono- and polyparasitic invasions in the wild boar (*Sus scrofa*) from the "Padurea Domneasca" Natural Reservation

From the total number of parasitic species identified in wild boars from the "Padurea Domneasca" Natural Reservation (14 species): 3 species (21.4%) are specific only for wild boars (*Gongylonema pulchrum; Eimeria debliecki, Eimeria scabra*), 8 species (57 .2%) (*Trichocephalus suis, Strongyloides ransomi, Metastrongylus elongatus, Oesophagostomum dentatum, Physocephalus sexalatus, Ascaris suum, Hyostrongylus rubidus, Macracanthorhynchus hirudinaceus*) are common to other wild and domestic animal species, and 3 species (21.4%) (*Fasciola hepatica, Dicrocoelium lanceolatum and Globocephalus urosubulatus*) are common to both animals and humans.

Research on the parasite fauna of wild boars in the forest ecosystem of the "Codrii" Natural Reservation in the Republic of Moldova where they habitate, shows that they were parasitized with parasite species with diverse locations, systematically classified into 4 classes (Trematoda, Secernentea, Acantocephala, Conoidosida), 11 families (Fasciolidae, Dicrocoeliidae, Trichuridae, Strongyloididae, Metostrongylidae, Strongyloidae, Ascarididae, Trichostrongylidae, Ancylostomatidae Oligacanthorhynchidae and Eimeriidae) and 12 genera (*Fasciola, Dicrocoelium, Oesophagostomum, Ascaris, Strongyloides, Metastrongylus, Hyostrongylus, Globocephalus, Physocephalus, Trichocephalus, Macracanthorhynchus* and *Eimeria*). The study of the examined biological samples highlighted a high level of their infestation with various parasitic agents: Class Trematoda – 2 species (*Fasciola hepatica* with EI of 4.2% cases and II of 1.1 ex., *Dicrocoelium lanceolatum* – 8, 4% cases, II-1.8 ex.); Class Secernentea – 7 species (*Trichocephalus suis* – 11.2% cases, II-2.6 ex., *Strongyloides ransomi* – 56.2% cases, II-6.2 ex., *Metastrongylus elongatus* – 43.3% cases, II -3.2 ex., *Oesophagostomum dentatum* – 12.2% cases, II-3.0 ex., *Ascaris suum* – 18.4% cases, II-4.2 ex., *Hyostrongylus rubidus* – 12.8% cases, II-2.8 ex., *Globocephalus urosubulatus* – 24.3% cases, II-3.3 ex.), Class Acantocephala – one species (*Macracanthorhynchus hirudinaceus* – 1.4% cases, II-1.1) and Class Conoidosida – one species *Eimeria debliecki* – 34.3% cases, II-4.2 ex.

The results of the parasitological examination allowed us to report the fact that the wild boars in the forest ecosystem of the "Codrii" Natural Reservation in the Republic of Moldova have a diverse and high parasite load, and the presence of polyparasitic associations in them is frequent. From the total number of parasitic species identified in wild boars (11 species): one species (9.1%) is specific only to wild boars (*Eimeria*

debliecki), 7 species (63.6%) (*Trichocephalus suis, Strongyloides ransomi, Metastrongylus elongatus, Oesophagostomum dentatum, Ascaris suum, Hyostrongylus rubidus, Macracanthorhynchus hirudinaceus*) are common to other wild and domestic animal species, and 3 species (27.3%) (*Fasciola hepatica, Dicrocoelium lanceolatum* and *Globocephalus urosubulatus*) are common to both animals and humans. These results can be explained by the fact that the wild boar is an omnivorous wild mammal that prefers forest biotopes with rich vegetation (light forests, glades, edges, sectors with undergrowth, wet biotopes), which represent suitable places for mutual contamination between different types of parasitic hosts (definitive, intermediate, complementary), terrestrial and aquatic.

3.3. Parasitofauna of the hare (*Lepus europaeus* Pallas, 1778), from various biotopes natural and man-made of the Republic of Moldova

The parasitological research carried out, regarding the study of the parasitofauna in the hare (*Lepus europaeus* Pallas, 1778) from the forest ecosystem of the "Codrii" Natural Reservation, Republic of Moldova, shows that they are parasitized with various species of dangerous parasites with diverse localization, systematically in 3 classes (Trematoda, Secernentea, Conoidasida), 9 families (Fasciolidae, Dicrocoeliidae, Trichuridae, Strongyloididae, Trichostrongylidae, Oxyuridae, Trichuridae, Molineidae, Eimeriidae) and 9 genera (*Fasciola, Dicrocoelium, Trichuris, Strongyloides, Trichostrongylus Passalurus, Nematodirus, Graphidium* and *Eimeria*).

As a result of the parasitological research carried out, an increased level of infestation in hares with various parasitic agents was established: class Trematoda - 2 species (*Fasciola hepatica* with EI of 7.5% of cases and II of 4.6 ex. , *Dicrocoelium lanceolatum* with EI – 11.3% of cases, II-2.4 ex.); Class Secernentea – 8 species (*Trichocephalus leporis* with EI – 16.1% of cases, II- 7.1 e.g., *Strongyloides papillosusi* with EI – 69.2% of cases, II-14.7 e.g., *Trichostrongylus retortaeformis* with EI – 5.3% of cases, II-2.4 ex., *Passalurus ambiguus* with EI – 34.6% of cases, II-5.2 ex., *Trcihostrongylus probolurus* with EI – 17.1% of cases, II -4.3 ex., *Trichuris leporis* with EI – 7.1% of cases, II-3.5 ex., *Graphidium strigosum* with EI – 2.3% of cases, II-1.4 ex., *Nematodirus abnormalis* with EI – 3.7% of cases, II-5.5 ex.) and the Conoidasida class with 6 species: *Eimeria leporis* with EI – 51.4% of cases and II-18.5 oochis, *Eimeria magna* with EI – 31, 3% of cases, II-12.4 oocysts, *Eimeria stiedae* with EI – 57.1% of cases, II-18.7 oocysts, *Eimeria perforans* with EI – 12.9% of cases, II-17.6 oocysts, *Eimeria exigua* with EI – 48.1% of cases, II-15.3 oochists; *Eimeria intestinalis* with EI – 14.3% of cases, II-17.2 oocysts.

The parasitological examination, carried out on hares from the forest ecosystem of the "Codrii" Natural Reservation, showed that in 94.8% of cases, parasitic agents are present. It was established that monoinvasions were present in 28.1% of cases, and parasitic associations, formed by several species of parasites (polyinvasions), being recorded in the rest of the investigated samples - 71.9% of cases (Fig. 3.3.).

The results of the parasitological research, carried out on the hares from the "Codrii" Natural Reservation, Republic of Moldova, indicate an increased level of infestation with various parasitic agents dangerous for both domestic animals and humans. From the total number of parasitic species identified (16 species): 10 species (62.5%) are specific only for field rabbits (*Trichuris leporis, Trichocephalus leporis, Passalurus ambiguous,*

Graphidium strigosum, *Eimeria leporis*, *Eimeria magna*, *Eimeria stiedae*, *Eimeria perforans*, *Eimeria exigua*, *Eimeria intestinalis*); 4 species (25.0%) are common to other wild and domestic animal species (*Strongyloides papillosus*, *Trcihostrongylus probolurus*, *Trichostrongylus retortaeformis*, *Nematodirus abnormalis*), and 2 species (12.5%), (*Fasciola hepatica*, *Dicrocoelium lanceolatum*) are common both for animals as well as for humans.

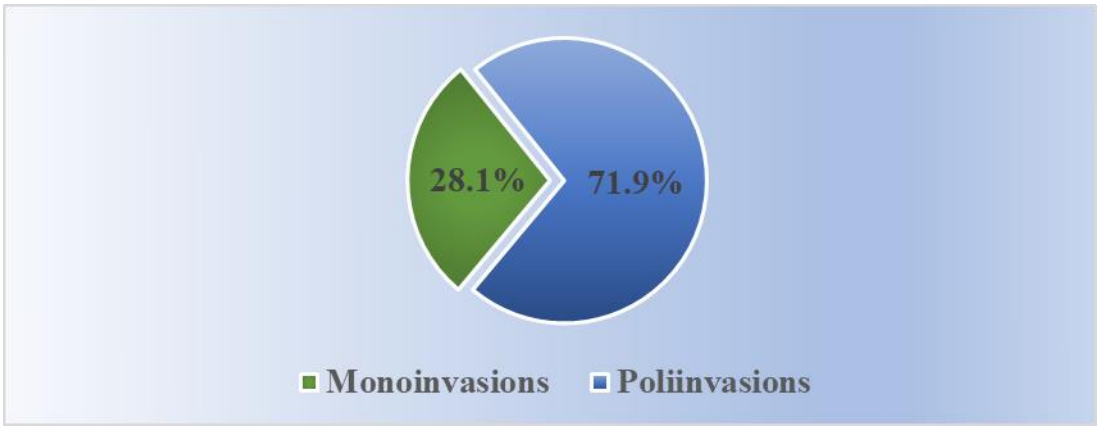


Figure 3.3. Mono- and polyparasitic invasions in European hares (*Lepus europaeus* Pallas, 1778) from the "Codrii" Natural Reservation

As a result of the evaluation of the diversity of the most dangerous parasitic zooinvasions in the hare (*Lepus europaeus* Pallas, 1778) from the Northern Zone of the Republic of Moldova, their infestation with various parasitic agents was established, from the class *Cestoda* - 1 species, class *Trematoda* - 2 species , *Secernentea* class - 8 species and *Gonoidasida* class - 4 species.

The parasitological examination performed on the field rabbit (*Lepus europaeus* Pallas, 1778) from the Northern Zone of the Republic of Moldova showed that parasitic agents are present in 100% of cases.

Infestations formed by a single parasite species are present in 30.9%, and in the form of polyinvasions it was established in 69.1% of cases.

The results of the parasitological research conducted on field rabbits from various natural and man-made biotopes of the Republic of Moldova indicate an increased level of infestation with various parasitic agents dangerous for both domestic animals and humans.

3.4. Parasitofauna diversity in birds of the hunting interest from various biotopes natural and man-made of the Republic of Moldova

As a result of the endoparasitological examination performed on pheasants (*Phasianus colchicus L.*), a high level of their infestation with various parasitic agents was highlighted: class Trematoda - one species (*Prosthogonimus ovatus* with EI 12.4% and II-2.8 ex .); Secernentea class - 6 species (*Capillaria annulata* with EI-5.1%, II-6.6 ex., *Syngamus trachea* with EI-9.5.1%, II-3.7 ex., *Heterakis isolonche* with EI-10 .3%, II-8.4 ex., *Ascaridia galli* with EI-82.3%, II- 14.4 ex., *Heterakis gallinarum* with EI-21.8 %, II-11.9 ex. and *Trichostrongylus tenuis* with EI-11.1%, II-3.6 ex.) and the Conoidasida class –

3 species (*Eimeria colchici* with EI-11.9%, II-19.4 ex., *E. duodenalis* - with EI-27, 0%, II-14.7 ex. and *E. phasiani* with EI-9.3%, II-15.2 ex.).

From the total of parasitological samples examined from pheasants, it was highlighted that 30.7% were infested in the form of monoinvasions, and 69.3% were in the form of mixed invasions.

Parasitological research, carried out on quail (*Cotrunix cotrunix*), highlighted their infestation with various parasitic agents: Trematoda class – 2 species (*Echinostoma revolutum* with EI -14.5% and II-3.4 ex., *Prosthogonimus ovatus* with EI -10.4% and II-5.6 ex.); Secernentea class – 4 species (*Capillaria caudinflata* with EI-8.3%, II-4.3 ex., *Syngamus trachea* with EI-2.0%, II-2.3 ex., *Ascaridia galli* with EI-64.6 %, II-18.3 ex. and *Heterakis gallinarum* with EI-60.4%, II-14.3 ex.); class *Cestoda* – with one species (*Raillietina tetragona* with EI- 22.9%, II-5.8 ex.) and class Conoidasida – 3 species (*Eimeria usura* with EI-14.5%, II-15.6 ex., *E. bateri* with EI-20.8%, II-12.4 ex. and *E. coturnicis* with EI-35.4%, II-17.6 ex.).

From the total samples, examined from quails, it was highlighted that 35.4% were infested in the form of monoinvasions, and 64.6% - with mixed invasions.

The parasitological research, carried out on guinea pigs (*Numida meleagris L.*), highlighted their infestation with various parasitic agents: Class Trematoda - one species (*Prosthogonimus ovatus* with EI-2.77% and II-7.3 ex.); Class Secernentea – 4 species (*Capillaria annulata* with EI-47.2%, II-9.8 ex., *Syngamus trachea* with EI-2.77%, II-3.7 ex., *Ascaridia galli* with EI-41.6 %, II-11.2 ex. and *Heterakis gallinarum* with EI-16.6%, II-12.4 ex.) and from the class Conoidasida – 2 species (*Eimeria numidae* with EI-51.5%, II-15, 6 ex. and *E. adenoeides* with EI-32.1%, II-16.8 ex.).

From the total samples examined from guinea pigs, it was highlighted that 30.5% were infested in the form of monoinvasions, and 69.5% - with mixed invasions.

Research on the ectoparasitic fauna of wild birds of hunting interest in the Central-North Zone of the Republic of Moldova has highlighted a rich range of ectoparasites from the following families in pheasants: Family Philopteridae - 7 species (*Cuclotogaster cinereus* with EI-15.3% and II- 18 ,0 ex., *Cuclotogaster heterographus* with EI-71.9% and II-133.0 ex., *Goniocotes chrysocephalus* with EI-56.9% and II-78.5 ex., *Goniocotes microthorax* with EI-32.3% and II-65.4 ex., *Goniodes colchici* with EI-41.7% and II-96.0 ex., *Goniodes dissimilsis* with EI-11.8% and II-9.0 ex. and *Lipeurus caponis* with EI- 31.2% and II-43.0 ex.); Menoponidae family – 3 species (*Amyrsidea perdicis* with EI-32.7% and II-93.0 ex., *Menacanthus stramineus* with EI-74.1% and II-109.0 ex. and *Menopon gallinae* with EI-32.5 % and II-64.0 ex.); Family Ceratophyllidae – 2 species (*Ceratophylus gallinae* with EI-14.3% and II-27.0 ex. and *Ceratophylus hirundinis* with EI-23.8% and II-42.1 ex.) and Family Dermanyssidae with 2 species (*Dermanyssus gallinae* with EI-56.9% and II-76.2 ex. and *Dermanyssus hirundinis* with EI-17.2% and II- 32.6 ex.).

The study of the quail (*Coturnix coturnix*) ectoparasite fauna from various natural and anthropogenic biotopes of the Republic of Moldova allowed us to detect 14 species of ectoparasites: Philopteridae family – 7 species (*Cuclotogaster cinereus* with EI - 90.0% and II-240 ,0 ex., *Goniocotes chrysocephalus* with EI-24.1% and II-32.3 ex., *Goniodes astrocephalus* with EI - 41.5 % and II-20.0 ex., *Goniodes disappear* with EI-21.7% and II-17.9 ex., *Goniodes dissimilsis* with EI - 9.1 % and II-6.0 ex., *Goniocotes gallinae* with EI-22.7% and II-54.1 ex. and *Lipeurus caponis* with EI - 48.0% and II -

34.0 ex.); Menoponidae family – 3 species (*Menacanthus abdominalis* with EI-41.6% and II - 8.0 ex., *Menacanthus stramineus* with EI- 44.3% and II-56.0 ex. and *Menopon gallinae* with EI - 63.0 % and II - 186.0 ex.); Family Ceratophyllidae – 2 species (*Ceratophylus gallinae* with EI - 45.7% and II - 56.0 ex. and *Ceratophylus hirundinis* with EI-39.1% and II-48.0 ex.) and Family Dermanyssidae with 2 species (*Dermanyssus gallinae* with EI-57.3% and II-68.7 ex. and *Dermanyssus hirundinis* with EI - 45.1% and II-54.3 ex.).

The study of the diversity of ectoparasitofauna in partridges (*Perdix perdix*) made it possible to highlight 11 species of ectoparasites: Family Philopteridae – 6 species (*Cuclotogaster heterographus* with EI-3.7% and II-6.0 ex., *Cuclotogaster heterogrammicus* with EI-8, 9% and II-7.0 ex., *Goniocotes chrysocephalus* with EI-19.7% and II-21.3 ex., *Goniocotes microthorax* with EI-15.9% and II-17.4 ex., *Goniodes disappear* with EI-81.3% and II-211.0 ex., *Goniodes dissimilsis* with EI-1.9% and II-3.0 ex.); Menoponidae family – 3 species (*Amyrsidea perdicis* with EI-31.9% and II-41.0 ex., *Menacanthus stramineus* with EI- 81.3% and II-231.0 ex. and *Menopon gallinae* with EI-33.7 % and II-18,6 ex.); the Ceratophyllidae family with a single species (*Ceratophylus hirundinis* with EI-39.1% and II-48.0 ex.) and the *Dermanyssidae* family with a single species (*Dermanyssus hirundinis* with EI-43.9% and II-77.1 ex.).

The study of the diversity of ectoparasitofauna in guinea fowl (*Numida meleagris*) made it possible to highlight 12 species of ectoparasites: Family Philopteridae – 5 species (*Cuclotogaster heterographus* with EI-32.1% and II-21.2 ex., *Goniocotes maculatus* with EI-1, 0 % and II-3.0 ex., *Goniodes dissimilsis* with EI-7.2 % and II-12.7 ex., *Goniocotes gallinae* with EI - 35.9 % and II-48.0 ex., *Lipeurus caponis* with EI-1.0 % and II-6.0 ex.); Menoponidae family – 3 species (*Amyrsidea perdicis* with EI-25.0% and II-27.0 ex., *Menacanthus stramineus* with EI - 32.4 % and II - 23.9 ex. and *Menopon gallinae* with EI - 45.8 % and II-57.9 ex.); The Ceratophyllidae family with 2 species (*Ceratophylus gallinae* with EI- 37.9 % and II-56.2 ex. *Ceratophylus hirundinis* with EI - 27.3 % and II-41.0 ex.) and the Dermanyssidae family with a single species (*Dermanyssus gallinae* with EI-32.5% and II-44.1 ex. *Dermanyssus hirundinis* with EI-33.9% and II-17.8 ex.).

The complex parasitological results, carried out on wild birds of the hunting interest, from various natural and man-made biotopes of the Republic of Moldova, show that the biological phenomenon of polyparasitosism has a permanent character, although the structure of polyparasitism is in continuous dynamics both quantitatively and qualitatively.

4.0. THE IMPACT OF MONO- AND POLY-INVASIONS ON SOME INDICES OF THE MORPHO-FUNCTIONAL AND BIOCHEMICAL STATUS IN WILD ANIMAL SPECIES FROM THE HUNTING FAUNA OF THE REPUBLIC OF MOLDOVA

4.1. The impact of mono-, polyinvasions and antiparasitic therapy on some morphofunctional indices in the roe deer (*Capreolus capreolus Linnaeus*, 1758), with various types of stress reactivity

Determination of the dynamics of hematological indices (hemoglobin, erythrocytes, leukocytes, hematocrit, prothrombin, clotting time, erythrocyte sedimentation rate (ESR)) in groups of cervids (roe deer (*Capreolus capreolus* Linnaeus,

1758)) stress-resistant and stress-reactive, until and after the application of the antiparasitic treatment with *Brovalzen*, allowed to highlight at the initial stage, until the treatment, a variation of these indices in the group of stress-resistant cervids, namely an increase in the hemoglobin content by 10.6 g/l, (td =2.6; $P \leq 0.05$) of the number of erythrocytes by 1.1 mln./mm^3, of the hematocrit level, determined by 3.2%, of the prothrombin content by 7.2% and of the clotting time by 2.8 sec., compared to the group of stress-reactive cervids.

The determination of the number of leukocytes and the erythrocyte sedimentation rate (ESR) in the groups of stress-resistant and stress-reactive cervids, even after the antiparasitic treatment with Brovalzen, made it possible to highlight at the initial stage a variation of these indices, namely a increase in the leukocyte content by 2.4 thousand/mm^3 more and the erythrocyte sedimentation rate (ESR) by 0.4 ml/sec. higher until treatment in the group of stress-reactive cervids, compared to the content of these indices in the group of stress-resistant cervids.

When determining, in dynamics, the hematological indices, in the groups of stress-reactive and stress-resistant cervids, on the 7th, 14th and 21st days after the application of the antiparasitic treatment with the *Brovalzen* preparation, an increase in hematological indices in both groups of cervids have been observed.

Therefore, on the 7th day after treatment, an increase in the level of hemoglobin in the stress-resistant cervid group by 3.0 g/l, compared to the initial state and by 8.0 g/l, (td =2 .4; $P \leq 0.05$), compared to the stress-reactive cervid group at this stage.

On the 14th and 21st days after the application of the antiparasitic treatment, an increase in this index is still evident in both groups, with a dominant one in the stress-resistant deer group, which on the 14th day being by 3.7 g/l, and at 21 days by 15.1 g/l higher, compared to the stress-reactive group, and by 7.4 g/l at the 14th day and by 20.5 g/l on the 21st day higher in the stress-resistant group compared to it at the initial stage.

During the dynamic monitoring of the number of erythrocytes in both groups of stress-reactive and stress-resistant cervids, on the 7th, 14th and 21st days after the application of antiparasitic treatment with the *Brovalzen* preparation, it was also revealed an increase of this index in both groups of cervids, but with a dominant one in the stress-resistant group, which on the 7th day reached values of 0.9 mln/mm^3, on the 14th day with 1.0 mil./mm3 and on the 21st day with 0.8 mln/mm^3 (td =4; $P \leq 0.01$), greater in the stress-resistant group, compared to the indices from the same evidence stages in the group reactive stress.

The hematocrit indices also vary in groups of cervids with different types of stress-reactivity after the application of the antiparasitic treatment, being greater in the group of stress-resistant cervids, which on the 7th day after treatment is higher by 5.2% , compared to its initial state and 5.4% higher, compared to its indices in the stress-reactive group. The values of the hematocrit index, in the stress-reactive group on the 21st day after treatment, reached the limit of the physiological norm and were 9.3% higher, compared to its initial stage.

The prothrombin indices, determined dynamically, after the application of the antiparasitic treatment, in cervids with various types of stress-reactivity, vary from one group of animals to another, being more increased in the stress-resistant group by 4.5% in the 7th day, 4.3% on the 14th day and by 6.2% on the 21st day after treatment, compared to its values in the stress-reactive group.

The identification, in the dynamics, of the number of leukocytes in groups of cervids with various types of stress-reactivity on the 7th, 14th and 21st days after the antiparasitic treatment with *Brovalzen*, made it possible to highlight a decrease of the number of leukocytes in both groups, which on the 7th day was by 2.0 thousand/mm^3, on the 14th day by 0.87 thousand/mm^3 and on the 21st day by 0.4 thousand/mm^3 more decreased in the stress-resistant group, compared to the stress-reactive group. On the 21st day after treatment, a decrease of this index is established by 2.6 thousand/mm^3 in the stress-reactive group and by 4.6 thousand/mm^3 in the stress-resistant group, compared to their initial stage of until treatment.

The obtained results allowed us to find that most of the hematological indices (hemoglobin, erythrocytes, hematocrit, prothrombin, clotting time), initially identified before the antiparasitic treatment with *Brovalzen*, are more diminished in the group with stress-reactive cervids, compared to those from the group of stress-resistant cervids, and which shows a gradual increase in both groups on the 7th, 14th day, reaching the maximum limit on the 21st day after the application of the antiparasitic treatment, with their maintenance at a higher level increased in the stress-resistant group, compared to the stress-reactive group.

The result of monitoring the dynamics of some biochemical indices in cervids with various types of stress-reactivity, even after the antiparasitic treatment with *Brovalzen*, allowed us to highlight deviations in the bilirubin content, which initially reached the limit of 13.4±1.8 mkmol/l in the stress-reactive group and 12.2±0.8 mkmol/l in the stress-resistant group, noting a difference of only 1.2 mkmol/l greater in the stress-reactive group. On the 7th and 14th days after treatment, the indices of bilirubin content, being decreasing with the maintenance of the same trend until the 21st day after treatment in both groups, being 3.8 mmol/l in the stress-reactive group and by 2.8 mmol/l in the stress-resistant group more diminished, compared to its values at the initial stage.

Variations depending on the type of stress-reactivity in deer were recorded in the content of AST (aspartate aminotransferase), which at the initial determination was 0.15 mmol/h/l higher in the group of stress-reactive deer, compared to its values in the stress-resistant cervid group. After the application of the antiparasitic treatment, the AST content decreased in both groups, reaching on the 7th day 0.08 mmol/h/l lower values in the stress-resistant group, compared to the stress-reactive one. The most decreased values of AST content are recorded in both groups on the 21st day after treatment and reach values of 0.24 mmol/h/l or 47.9% in the stress-reactive group and by 0.13 mmol/h/l or by 39.4% in the stress-resistant group more diminished, compared to them at the initial stage of determination until treatment.

Also, in the blood serum from both groups of cervids with various types of stress-reactivity, variations in the content of creatine kinase, glucose and cholesterol were identified and it was established that all these indices are increased in the group of stress-reactive cervids, compared to the group of stress-resistant cervids. The content of creatine phosphokinase is identified within the limits of 225±6.5 IU in the stress-reactive group and 182±4.2 IU in the stress-resistant group, highlighting a difference of 19.12% (t_d =5.56; P ≤ 0.001), higher in the stress-reactive cervid group. The indices of glucose content in blood serum also vary from one batch to another, being by 1.3 mmol/l or

21.2% (t_d =2.6; P ≤ 0.05), more increased in the stress-reactive group, compared to the stress-resistant one.

The biochemical analyzes of the blood serum, of both groups of cervids, made it possible to highlight deviations in the cholesterol content in the examined groups, being by 1.10 mmol/l or by 17.75% (t_d = 4.6; P ≤ 0 .01) increased in the stress-reactive group, compared to the stress-resistant one (Fig. 4.1.).

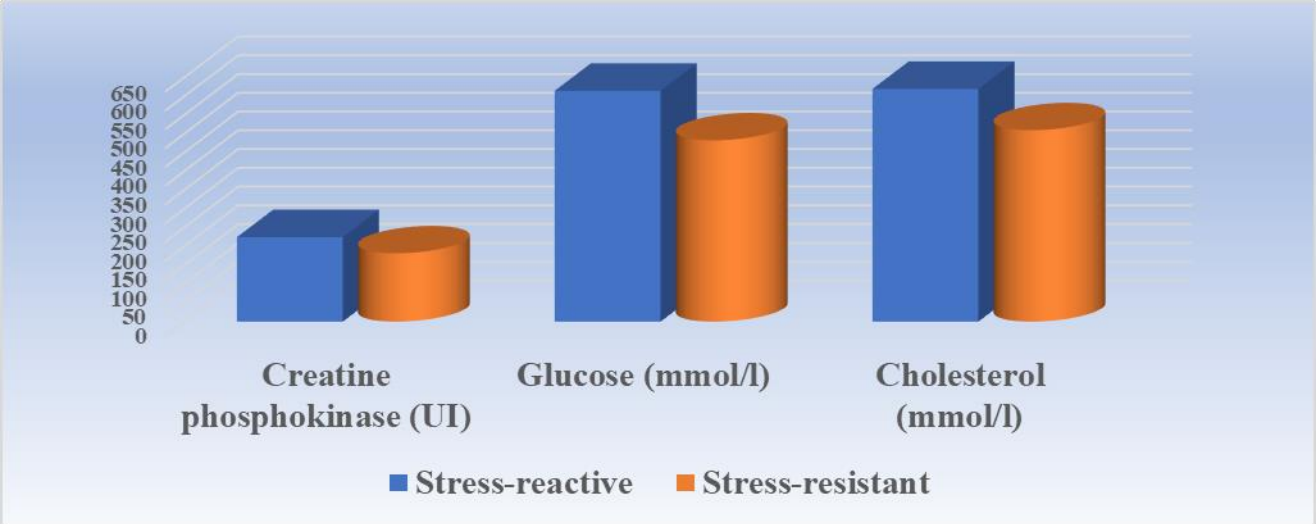


Figure 4.1. Evaluation of some biochemical indices in the blood serum of the roe deer (*Capreolus capreolus* Linnaeus, 1758), with various types of stress-reactivity

Therefore, the indices of the content of creatine phosphokinase, glucose and cholesterol, identified in the blood serum of cervids with various types of stress-reactivity, allowed to find that their values are increased in the group with stress-reactive cervids, compared to the stress-resistant ones.

Evidence of the number of total eosinophils, in cervids with various types of stress-reactivity, made it possible to establish their level at the initial stage with 22.8% (t_d =3.2; P ≤ 0.05), higher at the stress-reactive cervid group, compared to the stress-resistant group. After the antiparasitic treatment, in both groups of cervids a decrease in the number of total eosinophils is observed, which, on the 7th day after treatment, their number being by 25.0% (t_d =4.2; P ≤ 0.01), more increased in stress-reactive ones, compared to stress-resistant ones and by 15.8% in stress-resistant ones and by 18.2% in less stress-reactive ones, compared to their initial evidence. A maximum decrease in the number of total eosinophils, in cervids with various types of stress-reactivity, was recorded on the 21st day after treatment, their level being highlighted by 42.2% (t_d =4.2; P ≤ 0.001) in stress-reactive and by 36.4% (t_d =2.2; P ≤ 0.05) in stress-resistant more diminished, compared to their indices at the initial stage.

Therefore, the obtained data show that, after the application of the antiparasitic treatment, a decrease in the number of total eosinophils is evident in both groups of cervids, compared to their initial number, but their maximum limit is maintained in the group of stress-reactive cervids, compared to the stress-resistant one (Fig. 4.2).

At the initial determination of the number of young neutrophils in cervids with various types of stress-reactivity, a neutrophilia of 22.0% (td =4.6; P ≤0.001) was highlighted, more increased for the stress-resistant group, compared to the stress-reactive one. After the application of the antiparasitic treatment, an increase in young neutrophils

is observed in both groups of cervids, which on the 14th day is 38.9% (t_d =4.6; P ≤ 0.001), higher in the stress-resistant group compared to the stress-reactive group. A maximum level of increase is reached on the 21st day after treatment, which is 37.0% (t_d =8.6; P ≤ 0.001), also higher in the stress-resistant group compared to the stress-reactive and with values of 31.5% for stress-reactive and 44.8% for stress-resistant higher, compared to their initial level.

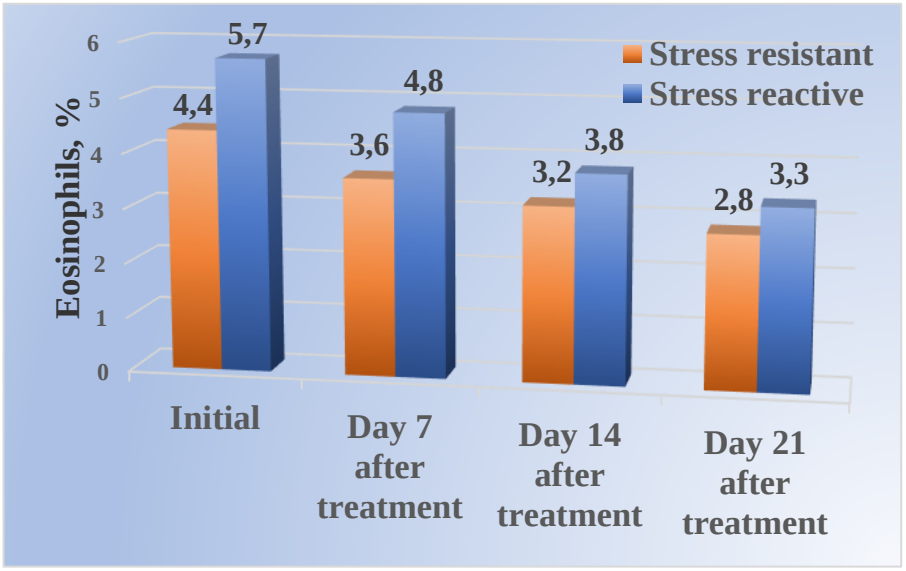


Figure 4.2. Dynamics of total eosinophils (thousands/mkl) in the roe deer (*Capreolus capreolus* Linnaeus, 1758), with various types of stress-reactivity, even after the application of antiparasitic treatment with *Valbazen*

Therefore, performing a general analysis of the indices both initially and of the majority of them after the antiparasitic treatment in the cervid groups, one can find that the content of hemoglobin, erythrocytes, hematocrit, total proteins, albumins, glucose, cholesterol varies from group to group and being more decreased, and the activity of aspartate aminotransferase, the level of bilirubin, the number of eosinophils is higher in the stress-reactive cervids compared to those in the group of stress-resistant cervids.

4.2. The impact of mono- and polyinvasions on some morphofunctional indices in the wild boar (*Sus scrofa*)

A separate compartment of the investigations carried out was to establish the impact of parasitic agents on the host organism in wild boars through the analysis of some hematological and biochemical indices. The collection of blood samples, with the aim of establishing some hematological and biochemical results, took place from wild boars with different levels of infestation from various natural and anthropogenic biotopes of the Republic of Moldova.

The main objective of the investigations carried out was to evaluate the consequences of mono- and polyparasitosis on the physiological status of wild boars. In order to achieve this objective, initially the parasite fauna was studied in wild boars, after which 4 groups were formed: group I – non-infested, group II – spontaneously infested with *Strongyloides ransomi*, group III – spontaneously infested with *Dicrocoelium lanceolatum* and group IV – spontaneously polyinfested with

Dicrocoelium lanceolatum, Strongyloides ransomi, Metastrongylus elongatus and *Eimeria debliecki*. Determination of hematological indices (hemoglobin, erythrocytes, leukocytes, hematocrit, prothrombin, clotting time, erythrocyte sedimentation rate (ESR)) was carried out in non-infested mono- and polyparasitized wild boars.

As a result of the investigation of hematological indices in non-infested, mono- and polyparasitized wild boars, it was established that both the indices of hemoglobin content, hematocrit, number of erythrocytes, as well as clotting time and ESR (red blood cell sedimentation rate) vary and are more increased in the group I with non-infested boars, compared to the mono- and poly-parasitized ones. The content of leukocytes, being more diminished in group I - non-infested, compared to its values in the other groups of infested boars.

Therefore, the index of hemoglobin content is increased in group I with uninfested boars by 38.5% (t_d =3.3; P≤0.05), compared to group II – spontaneously infested with Strongyloides ransomi, - by 30, 8%, compared to group III – spontaneously infested with *Dicrocoelium lanceolatum* and by 43.0% (td =3.5; P ≤ 0.01), compared to group IV – wild boars spontaneously polyinfested with *Dicrocoelium lanceolatum, Strongyloides ransomi, Metastrongylus elongatus* and *Eimeria debliecki*.

The number of erythrocytes also varies from batch to batch, being in group I by 23.6% (t_d =2.4; P ≤ 0.05), more increased, compared to group II, by 9.7% - face by group III and by 41.7% (t_d=5; P ≤ 0.001), compared to group IV. The values of hematocrit and VSH indices are also increased in group I by 22.4% - compared to group II, by 14.5% - compared to group III and by 31.0% (t_d =3.3; P ≤ 0.05) - compared to group IV for hematocrit content and, respectively, higher in group I by 37.5% - compared to groups II and IV and by 25.0% compared to group III for VSH.

The thrombus time indices, being highlighted more increased for group I of non-infested boars by 13.3% compared to group II and by 18.3% (t_d =2.9; P ≤ 0.05), compared to group III with monoparasitized boars (*Strongyloides ransomi, Dicrocoelium lanceolatum*) and by 23.3% (t_d=3.9; P≤0.01), compared to group IV with polyparasitized wild boars (*Dicrocoelium lanceolatum, Strongyloides ransomi, Metastrongylus elongatus* and *Eimeriadebliecki*). The content of leukocytes, highlighted in the wild boar groups, was more decreased in group I by 18.8%, compared to group II, by 17.1% compared to group III and by 22.3% compared to group IV.

The impact of monoinvasions (*Strongyloides ransomi, Dicrocoelium lanceolatum*) and polyinvasions (*Dicrocoelium lanceolatum, Strongyloides ransomi, Metastrongylus elongatus* and *Eimeria debliecki*) on lymphocyte indices in the wild boars was also studied.

As a result of the analysis of the leukocyte formula in wild boars, a decrease in the number of eosinophils was found in group I - not infested by 29.0% (t_d = 5.0; P ≤ 0.001), compared to group II - spontaneously infested with *Strongyloides ransomi*, with 18.0% (t_d =2.3; P ≤ 0.05), compared to group III – spontaneously infested with *Dicrocoelium lanceolatum* and, respectively, 40.8% (t*d* =7.8; P ≤ 0.001), more diminished, compared to group IV – wild boars spontaneously polyparasitized *(Dicrocoelium lanceolatum, Strongyloides ransomi, Metastrongylus elongatus* and *Eimeria debliecki*). Depending on the parasitic species and the level of infestation of the boars, variations are observed in the leukocyte formula of the content of young neutrophils, which are also more diminished in group I - uninfested boars by 27.3%, compared to those in group II, with

42.9%, compared to those in group III and 56.8% (t_d =2.4; P ≤0.05), compared to group IV.

When analyzing the lymphocyte indices, variations in the content of lymphocytes are observed, which are in greater numbers in group I with uninfected boars by 13.0%, compared to those in group II, by 19.5%, compared to those in the group III and by 25.9%, compared to polyparasitized boars from group IV. The amount of monocytes in boars from group I, being more decreased by 35.0% (t_d =2.8; P≤0.05), compared to those from group II, by 31.5%, compared to those from group III and by 38.4% (t_d =2.8; P ≤ 0.05), compared to polyparasitized wild boars from the group IV.

As a result of the study of the impact of mono- and polyinvasions on the proteinogram indices in wild boars, the content of total proteins, albumins and globulins was determined.

In the wild boars of group II, spontaneously infested with *Strongyloides ransomi*, a total protein content of 33.8% was highlighted, in those of group III - by 19.5%, and in those of group IV - by 37.7% more decreased, compared to group I. The albumin content decreases by 14.7% in group II, by 7.4% in group III and by 22.0% (t_d =4.3; P ≤ 0.01), in group IV, in comparison with uninfested group I. α1 globulins in group II decreased by 20.0% (t_d =2.9; P ≤ 0.05), in group III – by 13.8%, and in group IV – by 32.5% (t_d =5.6; P ≤ 0.001), compared to group I. The level of α2 globulins in group II was 8.7%, in group III by 18.1% (t_d =3.3; P ≤ 0.05) , and in group IV – by 23.4% (t_d =4.6; P ≤ 0.01), more increased compared to group I. β-globulins, in group II being by 11.9%, in group III by 18.5% (t_d =3.8; P ≤ 0.01), and in group IV – by 24.7% (t_d=7.0; P ≤ 0.001), also increased, compared to group I , and of γ globulins, in group II being by 16.5% (t_d =3.3; P ≤ 0.05), in group III by 13.7% (t_d =2.4; P ≤ 0.05) , and in group IV – by 23.6% (t_d =3.8; P ≤ 0.01), more increased in the infested groups, compared to the non-infested group I.

Infestation with *Dicrocoelium lanceolatum* leads to the modification of the proteinogram indices and causes the respective changes that express the type VIII electrophoregram specific to the hepatobiliary symptom complex, due to the toxic, mechanical and spoliating action of the dicrocelia located in the bile ducts of the liver.

As a result of the study of the impact of mono- and polyinvasions on the indices of plasma hemostasis in wild boars, it was established that the level of the prothrombin index (PI), in animals from group II, was lower by 16.4% (td =3.5; P ≤ 0 .01), in those from group III by 14.2% (t_d =3.2; P ≤ 0.05), and in those from group IV by 18.2% (t_d =4.5; P ≤ 0, 01), compared to those in group I. The activated recalcification time (TRA), in boars from group II, increased, compared to group I, by 16.8% (t_d =3.7; P ≤ 0.01), from group III with 9.5% and from group IV with 18.5% (t_d =4.2; P≤0.01) (fig. 4.4.).

The activated partial thromboplastin time (TTPa) also increased in boars from group II by 18.7% (t_d =5.6; P ≤ 0.001), in group III by 11.4% (t_d=2.4; P ≤ 0.05), and from group IV by 19.1% (t_d =3.8; P ≤ 0.01), compared to those from group I. Thrombin time (TT) is decreasing in groups infested with 21.3% (t_d=4.5; P ≤ 0.01), in group II, with 14.9% (t_d =3.1; P≤0.05), in group III and with 24.6% (t_d =8.0; P ≤ 0.001), in group IV, compared to group I – uninfected boars.

The fibrinogen content in group I with non-infested boars is higher by 21.2 % (t_d=2.8; P≤0.05) in group II, by 9.7 % in group III of mono-infested boars and by 36.6 % (t_d =7.0; P≤0.001), in group IV with polyinfested boars. The Ca^{2+} content also, being

more decreased in group II by 35.5% (t_d =6.0; P≤0.001), in group III by 23.5% (t_d =2.7; P≤0.05) and in group IV by 44.2% (t_d =7.1; P≤0.001), compared to group I.

The obtained results show that both in wild boars spontaneously infested with *S. papillosus* from group II, and in those infested with *D. lanceolatum* from group III, a decrease in hemostatic indices was established, and their maximum decrease is highlighted in group IV with wild boars polyinfested with *Dicrocoelium lanceolatum*, *Strongyloides ransomi*, *Metastrongylus elongatus* and *Eimeria debliecki*.

This decrease occurs due to the exotoxins eliminated by the parasites, which contain anticoagulant and hemolyzing substances and which neutralize the properties of fibrinogen, thrombin, Ca^{2+} ions and vitamin K.

4.3. The impact of mono- and polyinvasions on some morphofunctional indices in the pheasants *(Phasianus colchicus L.)*

In order to establish the impact of mono- and polyinvasions on some morphofunctional indices in the common pheasant (*Phasianus colchicus L.*), two groups were formed: group I – non-infested pheasants and group II – polyparasitized pheasants with malophages, fleas and gamy mites, in which determined: the number of erythrocytes, the value of hemoglobin, the average erythrocyte hemoglobin, the average concentration of erythrocyte hemoglobin, the average erythrocyte volume, the number of platelets, the average platelet volume in pheasants infested with malophages, fleas and gammazis mites. Some indices determined in groups of pheasants were compared with those previously determined in groups of chickens: group I – uninfested chickens and group II – chickens polyparasitized with malophages, fleas and gamy mites [20].

As a result of the parasitological investigations carried out in pheasants, it was established that the extent of invasion (EI) in pheasants with malophages was 90.0% cases, fleas – 26.0% and with gamaziz mites – 59.0% cases.

As a result of the study of the number of erythrocytes in pheasants from the infested group II, it was found that their number was 20.0% (t_d =2.3; P≤0.05), lower than in group I, with non-infested pheasants. Determining the number of erythrocytes in polyparasitized animals can be used to determine the level of exacerbation of anemia in order to initiate an antiparasitic, antianemic and antihemorrhagic treatment (Fig. 4.3).

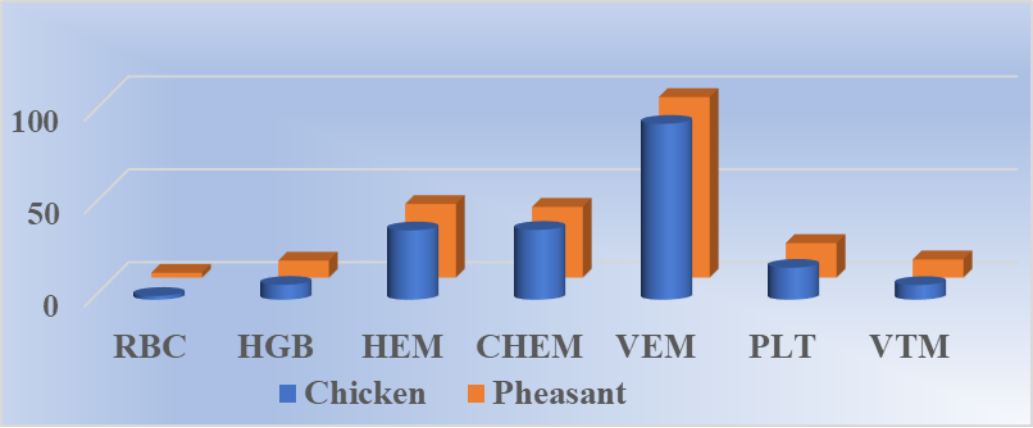


Figure 4.3. The variation of hematological indices in pheasants and chickens infested with ectoparasites (*malophages, fleas, mites – gamiasis*)

The level of hemoglobin, in group II of infested pheasants, was lower by 10.8% compared to uninfested group I, but increased by 11.7% (td =3.7; P≤0.01), compared to the group of chickens polyparasitized with ectoparasites.

In the research carried out, in group II with infested pheasants, a decrease in the average erythrocyte hemoglobin (HEM) value was established, by 7.1% compared to uninfested group I. During the investigations carried out, the derived constant of the average concentration of erythrocyte hemoglobin (CHEM) was determined. The obtained results show a decrease of this index in the infested group II compared to the control group I by 13.1%, and in comparison with the group II of polyparasitized chickens, there was an insignificant increase in its level by only 1.4%.

In pheasants from group II - polyparasitized with ectoparasites, there was a decrease in the average erythrocyte volume (VEM) by 5.3%, compared to group I - uninfested.

The number of platelets in group II of polyparasitized chickens was lower by 23.7% (t_d=3.2; P≤0.01), compared to group I with uninfested chickens and by 7.6% (t_d =2.5; P≤0.05), compared to it in group II with the infested pheasants. There was also an increase in the mean platelet volume (VTM) in group II with infested pheasants by 23% (t_d =2.5; P≤0.05), compared to group II with polyparasitized chickens and a decrease by 19, 4% (t_d =2.4; P≤0.05), compared to the group I with non-infested pheasants.

Therefore, the variation of the highlighted hematological indices reveals an anemia, a state of spoliation of the body in the group with infested pheasants, caused by mixed invasions with various species of ectoparasites.

The results of the obtained research show that the number of leukocytes in pheasants from group II polyparasitized with ectoparasites includes higher values by 28.9% (t_d =4.2; P≤0.01), compared to uninfested group I. Likewise, there was an increase in the number of monocytes by 9.7% (t_d =2.7; P≤0.05), granulocytes by 9.5% (t_d =2.4; P≤0.05) and eosinophils by 9.1% (t_d =3.0; P≤0.05) in the group II with polyparasitized pheasants, compared to group I with non-infested pheasants (Fig. 4.4).

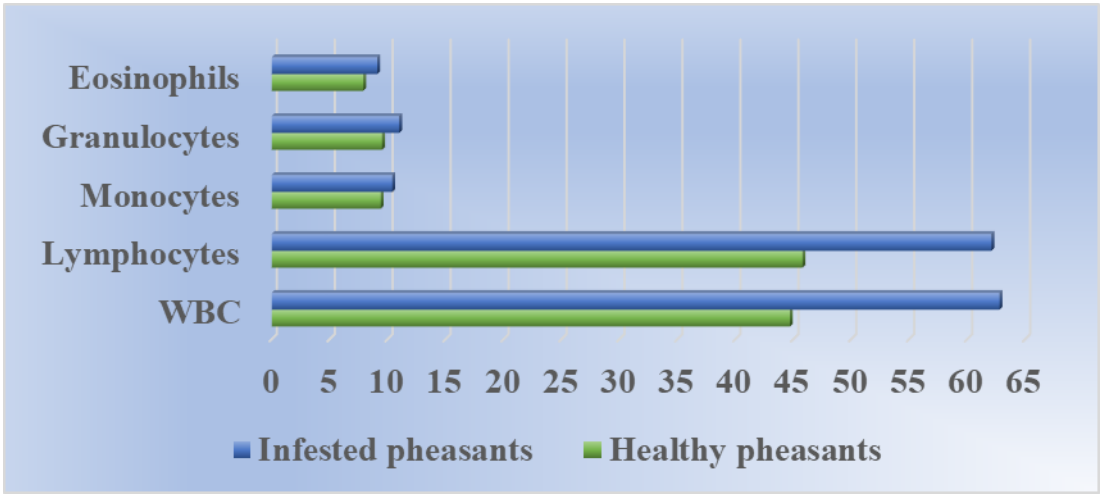


Figure 4.4. The variation of leukocyte indices in healthy pheasants and those infested with ectoparasites (*malophages, fleas, gammazis mites*)

Therefore, the leukogram changes prove that the detection of eosinophilia as a marker contributes to a large extent to the diagnosis of ectoparasitosis in parasitized birds.

Monitoring the correlation between the changes in the protein indices and the level of infestation with ectoparasites (*malophages, fleas, gammazis mites*), allows to appreciate the evolution of the parasitic factor and the severity of the disease. The results of the conducted research highlight a level of total protein content in blood serum in group I of non-infested pheasants of 40.9 g/l, which is by 18.2% (t_d =2.4; P≤0.05), more diminished, comparing to group II with polyparasitized pheasants. This is explained by the fact that in the ectoparasitized animal body, in the initial - pathological phase, protein consumption increases, therefore protein metabolism intensifies - a condition also valid in mixed invasions with ectoparasites.

Another important parameter of protein metabolism, in mixed infestations with ectoparasites, is serum albumin. It reflects not only the state of metabolism, but also the functional state of the liver, because this organ is responsible for synthesizing it. The established dysproteinemia is characterized by a decrease in total albumins by 18.7% (t_d =2.4; P≤0.05), in infested pheasants (group II), compared to non-infested ones (group I).

In the same way, deviations of the protein fractions were also highlighted. The level of α-globules in birds free of ectoparasites (group – I) constituted 17.4%, and in the infested group – 13.7%, a difference of 21.3% was noted (t_d =4.1; P≤ 0.05), higher in the group of non-infested pheasants. Also, the content of β-globulins, being reduced by 12.0% in the group with infested pheasants, compared to the parasite-free group. There was an increase in γ-globulins in the infested group by 21.1% (t_d =3.1; P≤0.05), compared to the non-infested group. This increase is caused by the increase in non-specific humoral activity, accompanied by the body's immune response, which reveals the dependence of the body's immunological activity on the level of invasion.

Protein metabolism deviations were estimated, expressed by increasing the amount of total protein by 18.2% (t_d =2.4; P≤0.05), of γ-globulins by 21.1% (t_d =3.1 ; P≤0.05), followed by the decrease in the amount of albumins, globulin fractions (α, β), as well as Ca^{2+} ions from the group of pheasants infested, compared to those from the group free of ectoparasites.

Based on the research carried out, we can mention the fact that the elucidation of the mechanisms of action of the associations of ectoparasites with malophages, fleas and gamaziz mites, the determination of hematological and biochemical indices offered the opportunity to establish and interpret their manifestation characteristics depending on the ectoparasitic load.

5. THE IMPACT OF MONO- AND POLY-INVASIONS ON SOME PRODUCTIVE INDICES IN ANIMAL SPECIES OF HUNTING IMPORTANCE FROM MOLDOVA

5.1. Evaluation of some productive indices in roe deer (*Capreolus capreolus* Linnaeus, 1758), with varied level of infestation and type of stress reactivity

In cervids slaughtered by necessity, after a preventive assessment of the type of stress-reactivity by applying the adrenaline test, formulated by Ahmadiev G. [22], modified [14] and dividing them into 2 groups: group I – stress-reactive cervids, the

group II – stress-resistant cervids, parasitological investigations of the internal organs were carried out and their quality determined depending on the level of infestation.

Then, both in cervids from group I – stress-reactive, and in those from group II – stress-resistant, investigations were carried out with the aim of identifying the content of micro- and macroelements in the liver and muscle tissue, the dorsal longitudinal muscle (*Longissimus dorsi*).

The obtained results allowed us to establish that, in stress-reactive cervids, the content of Na in the muscle tissue was increased by 22.2% and Ca by 34.0%, and the content of Mg by 26.5 %, of Fe by 37.0% (td =2.9; P≤0.05), of K by 27.4% and of the P content by 26.0% more decreased, compared to these indices in cervids stress-resistant.

As a result of the investigations of the content of micro- and macroelements in the liver of stress-reactive cervids, it was established that the content of Na is 24.7%, and that of Ca is 47.8% (t_d =3.0; P≤0.05) , more increased in the stress-reactive group compared to the stress-resistant group. The Mg content, being by 26.2% (t_d =2.4; P≤0.05), of the Fe content by 21.7% (t_d =3.7; P≤0.01), of the Fe content K by 18.0% and that of P by 23.4% more diminished in echinococci infestation in the stress-reactive cervid group, compared to those in the stress-resistant group.

Therefore, in the result of the analysis of the obtained data, variations in the content of mineral substances in the muscle tissue and in the liver of cervids with various types of stress-reactivity were highlighted.

Also, in cervids with various types of stress reactivity, the content of some biochemical indices in meat and liver was established.

The research carried out, with the aim of establishing the pH level in the muscle tissue of cervids with various types of stress-reactivity, made it possible to highlight that, in those from the stress-reactive group, its level is 2.0%, and in the liver by 3.3% more, compared to it in stress-resistant cervids.

The moisture content is increased in muscle tissue by 2.4% (t_d =9.0; P≤0.001), and in the liver by 3.7% (t_d=14.5; P≤0.001), in stress-reactive cervids, compared to the stress-resistant ones.

In the group of stress-reactive cervids, the dry matter content in the muscle tissue decreased by 12.4% (t_d =24.2; P≤0.001), and in the liver by 18.0% (t_d =30.5; P ≤0.001), compared to the values of this index in the group of stress-resistant cervids.

The protein content in the muscle tissue is by 14.0% (t_d =17.0; P≤0.001), and in the liver by 15.8% (t_d =17.5; P≤0.001), more decreased in cervids from the group stress-reactive, compared to their content from cervids from the stress-resistant group.

In stress-reactive cervids, the lipid content in the muscle tissue is 24.8% (t_d =2.5; P≤0.05), and in the liver by 33.6% (t_d =4.0; P≤0, 01), less, compared to their content in stress-resistant cervids.

Also, the amount of mineral substances in the muscle tissue of stress-reactive cervids is by 12.5% (t_d =2.3; P≤0.05), and in the liver by 25.4% (t_d =2.3; P≤0.05), more diminished compared to their content in stress-resistant cervids.

Therefore, it was established that the high level of infestation of the stress-reactive cervid group leads to changes in the biochemical content of both the muscle tissue and the liver, considerably reducing their nutritional and edible value. Parasitic invasions cause changes in the chemical content of muscle tissue and liver in cervids, but these are

more significant in the stress-reactive group of cervids, compared to the stress-resistant group.

5.2. The impact of mono- and poly invasions on some productive indices in the wild boar (*Sus scrofa*)

In order to establish the influence of mono- and polyinvasions on some productive indices in the slaughtered boars, parasitological investigations of the internal organs were carried out, after which they were divided into four groups: group I – uninfested boars, group II – boars monoparasitized with strongyloides, group III – boars monoparasitized with fasciolae, group IV – boars polyparasitized with fasciolae and dicrocelia and group V – boars monoparasitized with echinococci. In all groups of slaughtered mono- and polyparasitized boars, investigations were carried out with the aim of identifying the content of minerals in the liver and muscle tissue, the dorsal longitudinal muscle (*Longissimus dorsi*).

The results of the study of the content of micro- and macroelements of the muscle tissue in wild boars allowed to establish that, in those from group II - wild boars monoparasitized with strongyloides, the content of Na in the muscle tissue is 22.1% and that of Ca is 34.0% increased, and the content of Mg, being by 26.5%, of Fe – 37.0%, of K – 27.4% and of the content of P by 26.0% less, compared to these indices in boars from group I - uninfected. The study of the mineral content of the liver in boars from group II (boars monoparasitized with strongyloides), allowed to establish a content of Na by 1.9% and Ca by 1.5%, more increased and a content of Mg by 0 .5%, Fe by 0.4%, K by 4.5% (t_d =2.57; P≤0.05) and P by 1.0%, more reduced compared to group I - non-infested boars.

As a result of the investigations of the micro- and macroelement content of the muscle tissue in boars from group III – boars monoparasitized with fasciolae, it was established that the Na content was increased by 1.2% and Ca by 1.9%, and the Mg content by 1.5%, Fe by 0.2%, K by 2.5% and that of P by 0.3% less, compared to those in group I – uninfested. The study of these indices, established as a result of the analysis of the content of micro- and macroelements in the liver of wild boars infested with fasciola, allowed us to highlight that their values are higher in the liver, compared to those in the muscle tissue. In the liver of boars from group III (boars monoparasitized with fascioles), the Na content was increased by 4.8% (t_d =1.8; P≤0.1) and Ca by 4.7%, and Mg by 5.0%, Fe by 2.7% (t_d =8.7; P≤0.001), K by 14.5% (t_d =8.1; P≤0.001) and that of P by 6.5% (t_d =3.3; P≤0.01), more diminished, compared to the values of these indices determined in the liver of boars from group I - with non-infested boars.

When analyzing the micro- and macroelement content of muscle tissue in polyparasitized wild boars from group IV (polyparasitized with fasciolae and dicrocelia), only a 2.2% increase in Ca content was identified compared to uninfested group I. The content of the other micro- and macroelements Na, Mg, and P, being in a downward trend, compared to their values in group I - uninfested. The content of Fe determined in the muscle tissue of polyparasitized boars from group IV being 0.8% (t_d =2.9; P≤0.01), K by 5.3% (t_d =3.3; P≤0, 01), lower compared to group I - non-infested.

When evaluating the content of micro- and macroelements in the liver of wild boars from group IV (polyparasitized with fasciolae and dicrocelia), it was established that the content of Fe is 6.5% (t_d =8.7; P≤0.001), K - with 22.4% (t_d =8.1; P≤0.001) and

P - by 11.9% (t_d =3.3; P≤0.01), more increased compared to the values of these indices, identified in the liver, in non-infested boars - group I. The values of the macroelements identified in the liver of boars in group I, such as the content of Ca, Na and Mg, being in a downward trend compared to their values in group I - non-infested.

When determining the content of micro- and macroelements in the muscle tissue of wild boars from group V (monoparasitized with echinococci), it was identified that the Na content was 7.3% (t_d =2.57; P≤0.05) and K with 4.4% (t_d =2.24; P≤0.05), more increased compared to the values of these indices of muscle tissue in wild boars from group I - non-infested. The content of Ca, Mg, Fe, and P, being in a downward trend, compared to the values of these indices in group I - with uninfested boars.

When evaluating the content of micro- and macroelements of the liver in boars from group V with boars monoparasitized with echinococci, an increase in Na content by 5.8% (td =1.96; P≤0.1) and a decrease of Mg content by 11.1% (td =2.58; P≤0.05), Fe by 13.9%, (td =38.5; P≤0.001), K by 25.5% (td =12.1; P≤0.001) and P by 12.6% (td =13.9; P≤0.001), compared to the values of these indices, identified in the liver, in uninfected boars from group I. The content of Ca, in the liver of wild boars in group V was in a downward trend, compared to the values of this index in uninfested group I.

The analysis, carried out on the content of micro- and macroelements of the muscle tissue and the liver in mono- and polyparasitized wild boars, made it possible to highlight a decrease in most of the indices identified in the infested wild boars.

Also, in wild boars, the impact of mono- and polyparasitosis on the variation in the content of biochemical indices of muscle tissue and liver was established.

The obtained results show that in the muscle tissue both in the boars of group II (boars monoparasitized with strongyloides), group III (boars monoparasitized with fasciolae), group IV (boars polyparasitized with fasciolae and dicrocelia), and in those of group V (boars monoparasitized with echinococci), the values of the *pH* level were in an upward trend, compared to the values of these indices in group I with uninfected boars.

The determination of the *pH* level values of the liver in wild boars revealed a level of it in group III with 2.3% (t_d =2.8; P≤0.05) and in group V with 5.0% (t_d =5.2; P≤0.001) higher compared to group I – uninfested. The *pH* values in the liver of wild boars in groups II and IV were in an upward trend, compared to the values of these indices in group I with non-infested wild boars.

Therefore, it was found that the greatest deviations of the *pH* level were identified in wild boars of group V (monoparasitized with echinococci), both in the muscle tissue and in the liver.

The moisture content, both in the muscle tissue and in the liver of wild boars, varies depending on the specifics of the parasite load. Thus, the moisture level in the muscle tissue in group II is 1.7%, in group III - by 7.9% (t_d =1.9; P≤0.1), in group IV - by 7.8% (t_d =1.9; P≤0.1) and in group V - by 10.6% (t_d =2.7; P≤0.05), more increased compared to group I, not infested.

The value of moisture in the liver in boars from group V - monoparasitized with echinococci, was 14.3% (td =3.2; P≤0.01), more increased compared to that of group I with uninfected boars. The values of moisture in the liver in boars from groups II, III and IV had a tendency to increase, compared to the value of this index in group I with non-infested boars. In the liver, in all five groups of boars, the moisture level is higher compared to that in the muscle tissue.

Therefore, it was found that the most pronounced increase in the level of moisture in the liver was recorded in group V (boars monoparasitized with *echinococci*), which was 13.8% higher compared to group II (boars monoparasitized with *strongyloides*), with 7 .05% in comparison with group III (boars monoparasitized with *fasciolae*) and respectively with 7.09% in group IV (boars polyparasitized with *fasciolae* and *dicrocelia*).

In the content of the biochemical indexes of the muscle tissue and the liver in mono- and polyparasitized wild boars, variations in the content of dry matter were established, which also vary from one batch to another depending on the specifics of the infestation, being identified in the muscle tissue of the group II with 4.3% (t_d =6.1; P≤0.001), in group III with 21.2% (t_d =30.5; P≤0.001), group IV with 22.6% (t_d =38, 5; P≤0.001) and in group V (boars monoparasitized with echinococci) by 29.2% (t_d =42.1; P≤0.001) more diminished, compared to uninfested group I. The content of dry matter, established in the liver of boars from group II (boars monoparasitized with strongyloides), was 1.2%, group III (boars monoparasitized with *fascioles*) – 12.0% (t_d =24.4; P≤0.001), group IV (boars polyparasitized with *fasciolae* and *dicrocelia*) – 22.5% (t_d =25.0; P≤0.001) and group V (boars monoparasitized with *echinococci*) with 43.3%, (t_d =60.2; P≤0.001), also less, compared to uninfested group I.

The identification of the protein content, in the muscle tissue, in the mono- and polyparasitized boars, highlighted a lower level of them in group III by 9.8% (t_d =2.2; P≤0.05) and in the group IV by 9.7% (t_d =5.1; P≤0.001), compared to uninfested group I.

The protein content in the liver of group II (boars monoparasitized with strongyloides) was 0.47%, in group III (boars monoparasitized with fascioles) - by 34.1% (t_d =3.2; P≤0.01), group IV (boars polyparasitized with *fasciolae* and *dicrocelia*) – by 38.2% (td =3.4; P≤0.01) and in group V (boars monoparasitized with *echinococci*) it was by 37.4% (t_d = 3.2; P≤0.01), less, compared to group I (non-infested boars). The lowest level of protein content is found both in the muscle tissue and in the liver of polyparasitized boars infested with echinococci. The study carried out showed us the fact that there is a variable protein content both depending on the infested organ and the specifics of the invasion.

Thus, it was established that the protein content is increased in the liver, compared to their content in the muscle tissue and decreased in groups IV and V with boars polyparasitized and monoparasitized with echinococci, compared to group I - uninfested and group II infested only with strongyloides.

The study of the biochemical indices of muscle tissue and liver in mono- and polyparasitized wild boars allowed to highlight a variation in the lipid content in muscle tissue in group III, being by 18.3% (t_d =6.6; P≤0.001), and in group IV- by 20.0% (t_d =7.7; P≤0.001) and in group V- by 22.1% (t_d =7.2; P≤0.001), more diminished, compared to group I. The lipid content in the liver in group II (monoparasites with *strongyloides*), being by 0.3%, in group III - by 22.9% (t_d =4.8; P≤0.001), in group IV - by 30.4% (t_d =6.2; P≤0.001), and in V - by 36.0% (t_d =2.3; P≤0.05), less compared to group I - non-infested.

Therefore, both in the liver and in the muscle tissue, the lipid content was more reduced in the groups with infested boars, especially in group IV polyparasitized and group V - monoparasitized with *echinococci,* compared to group I - uninfested and groups II, III - monoinfested.

5.3. Evaluation of some productive indices in pheasant (*Phasianus colchicus L.*) depending on the specifics of the infestation

The study of the parasitofauna of pheasant (*Phasianus colchicus L.*) made it possible to highlight a rich range of ecto- and endoparasites, which significantly influence the development and quality of their products. For this purpose, a series of experiments were carried out to identify the impact of parasitic agents on the quality of pheasant meat.

In the slaughtered pheasants, ecto- and endoparasitological investigations were first carried out, and, depending on their infestation, four groups were selected: group I – control with non-infested pheasants; group II – pheasants infested with a single species of endoparasites (*Heterachis gallinarum* (Schrank, 1788)) and polyparasited with three species of ectoparasites (*Cuclotogaster heterographus* (Nitzsch, 1866), *Menacanthus stramineus* (Nitzsch, 1818), *Goniocotes chrysocephalus* (Giebel, 1874)); group III – polyparasitized pheasants with three species of endoparasites (*Heterachis gallinarum* (Schrank, 1788), *Ascaridia galli* (Schrank, 1788) and *Eimeria duodenalis* (Norton, 1967)) and three species of ectoparasites (*Cuclotogaster heterographus* (Nitzsch, 1866), *Goniocotes chrysocephalus* (Giebel, 1874), *Menacanthus stramineus* (Nitzsch, 1818)) and group IV with polyparasitized pheasants with five species of ectoparasites (*Cuclotogaster heterographus* (Nitzsch, 1866), *Goniodes colchici* (Denny, H. 1842), *Lipeurus caponis* (Linné, 1758), *Menacanthus stramineus* (Nitzsch, 1818), *Dermanyssus gallinae* (Degeer, 1778)).

From all four groups formed with slaughtered pheasants, muscle tissue samples were collected from the pectoral muscles in order to identify the impact of polyparasitic agents on their quality.

The content of P in pheasant muscle tissue also varies from one batch to another, with the highest content being identified in the control group. In group II (pheasants infested with a single species of endoparasites and polyparasitized with three species of ectoparasites), the content of P, in the muscle tissue, being 5.6% (t_d =2.1; P≤0.05), at group III - by 11.0% (t_d =4.9; P≤0.001), and in group IV - by 10.0% (t_d =3.7; P≤0.01), more reduced, compared to the group I, uninfested.

When establishing the content of Cu in pheasant muscle tissue, it was found that its level in group II with pheasants infested with a single species of endoparasites and polyparasitized with three species of ectoparasites, was 3.4%, in group III with pheasants polyparasitized with three species of ecto- and three species of endoparasites, was by 11.1% (t_d =4.8; P≤0.001), and in group IV, with pheasants polyparasitized with five species of ectoparasites, it was by 2.5% more diminished, compared to group I, uninfested. The most decreased content of Cu being highlighted in the muscle tissue of pheasants from group III, which was lower by 7.9% compared to group II and by 8.8% compared to group IV.

The study carried out, regarding the presence of mineral content of muscle tissue in pheasants, made it possible to highlight remarkable variations depending on the specifics of the infestation and in the presence of Mg, which was less than the control by 9.2% (t_d =1.8; P≤0.1), in group II (pheasants infested with a single species of endoparasites and polyparasitized with three species of ectoparasites) - by 18.9% (t_d =3.7; P≤0.01), in the group III (polyparasitized pheasants with three species of

endoparasites and three species of ectoparasites) and by 15.9% (t_d =3.1; P≤0.01), in group IV (polyparasitized pheasants with five species of ectoparasites).

The Ca content showed maximum values in the muscle tissue of pheasants from group I, being more increased, compared to group II by 8.8%, group III - by 16.2% (t_d =3.8; P≤0.01) and group IV - by 11.5% (td =4.7; P≤0.001). Therefore, the lowest Ca content was highlighted in group III, with pheasants polyparasitized with three species of endoparasites and three species of ectoparasites, which showed lower values by 8.15% compared to group II, with pheasants infested with only one species of endoparasites and polyparasites with three species of ectoparasites and by 5.3%, lower than group IV, with polyparasited pheasants with five species of ectoparasites.

As a result of establishing the mineral content of the muscle tissue in the infested pheasants, we found that their content varies and depends on the specifics of the infestation and the intensity of the invasion.

Thus, the highest content of minerals is highlighted in the muscle tissue of pheasants from group I, with non-infested pheasants, while a gradual decrease in their content is reported in the groups with mono- and poly-parasitized pheasants.

Also, in pheasants, the impact of polyparasitosis on the variation of the biochemical content of their muscle tissue and liver was established. To achieve this goal, the variation of the following indices was determined in the muscle tissue of the groups of polyparasitized pheasants: pH, humidity, dry matter, protein, lipid and mineral salt content.

The results of the analyzes allowed us to establish that, in group II pheasants, infested with a single species of endoparasites and polyparasited with three species of ectoparasites, the *pH* level in the muscle tissue was 2.0% (t_d =1.9; P≤0.1), in group III, with pheasants polyparasitized with three species of ecto- and three species of endoparasites, being 6.3% (t_d =7.0; P≤0.001), and in the group IV, with pheasants polyparasitized with five species of ectoparasites, was 5.4% (t_d = 4.5; P≤0.001) higher, compared to group I, not infested.

Therefore, the *pH* level in pheasant muscle tissue varies and depends on the intensity of the invasion and the specifics of the infestation. The lowest *pH* level is highlighted in the uninfested group I, and the highest level being reported in group III, with pheasants polyparasitized with three species of ecto- and three species of endoparasites, respectively, being 4.3% and 0.9% higher than group II and, correspondingly, compared to group IV, with polyparasitized pheasants with five species of ectoparasites.

In the biochemical content of the muscle tissue in polyparasitized pheasants, variations in the dry matter content were identified, which also vary from one batch to another depending on the specifics of the infestation, being identified in the muscle tissue of group II (pheasants infested with a single species of endoparasites and polyparasites with three species of ectoparasites), - by 1.8%, in group III (polyparasitized pheasants with three species of ecto- and three species of endoparasites) - by 4.9%, and in group IV (polyparasitized pheasants with five species of ectoparasites) - 7.7% less, compared to group I, uninfested.

The identification of protein content in the muscle tissue of polyparasitized pheasants highlighted a lower level of them in group II (infested with a single species of endoparasites and polyparasitized with three species of ectoparasites) - by 3.2%, at

group III (polyparasitized pheasants with three species of ecto- and three species of endoparasites) - by 13.7% (td =1.9; P≤0.1) and in group IV (polyparasitized pheasants with five species of ectoparasites) - by 6.0%, compared to group I, uninfested.

Therefore, the protein content in pheasant muscle tissue varies depending on the specificity and intensity of the invasion. Thus, it was established that their content was significantly lower in group III (polyparasitized pheasants with three species of ecto- and three species of endoparasites), then in group IV (polyparasitized pheasants with five species of ectoparasites) and in group II (pheasants infested with with a single species of endoparasites and polyparasites with three species of ectoparasites), compared to group I, uninfested.

The biochemical research of the muscle tissue in pheasants highlighted a variation in the lipid content, which in the muscle tissue of group II was by 15.3% (t_d =1.9; P≤0.1), in group III - by 26.5% (t_d =2.9; P≤0.01), and in group IV - by 6.9% (t_d =2.3; P≤0.05), less, compared to group I, with non-infested pheasants.

Therefore, the lipid content in groups with poly-infested pheasants (II, III, IV) was significantly lower, compared to group I, not infested.

A special objective of the conducted research was to establish the impact of the parasitic factor on the variation of body mass in pheasants from group I - polyparasitized with malophages, fleas, mites-gammazis and untreated, compared to those from group II - polyparasitized with malophages, fleas and mites-gammazis, which were then treated with a preparation of vegetable origin *Ectogalimol* in a concentration of 3.0%.

At the initial stage of the investigations, 2-month-old pheasants were weighed, and the average weight obtained in group II with pheasants polyparasitized with ectoparasites and treated had close values to that of pheasants in group I - polyparasitized with ectoparasites and untreated. The birds were fed according to the physiological requirements of their age. Thus, at the initial stage, in group I with pheasants polyparasitized with ectoparasites and untreated, an average weight of 705.0 g was revealed, and in group II, with pheasants polyparasitized with ectoparasites and treated with the herbal preparation *Ectogalimol* 3.0% , of 709.0 g.

A difference between the daily increase in average weight is observed starting from the 60th day after treatment, when on average the body mass of pheasants, treated from group II, was increased by 10.11% (t_d =2.2; P≤ 0.05), compared to that of group I pheasants - infested and untreated pheasants. Significant differences in body weight are recorded on the 95th day after treatment in group II with pheasants polyparasitized with ectoparasites and treated, which was 16.45% (t_d=3.2; P≤0.01), more increased, compared to that of group I with pheasants polyparasitized with ectoparasites and untreated (Fig. 5.1.).

Therefore, invasions with ectoparasites (malophages, fleas, gamaziz mites) cause a significant reduction in the body weight of infested pheasants, and their processing with the preparation of natural origin Ectogalimol 3% can avoid the estimated losses from their infestations with ectoparasites.

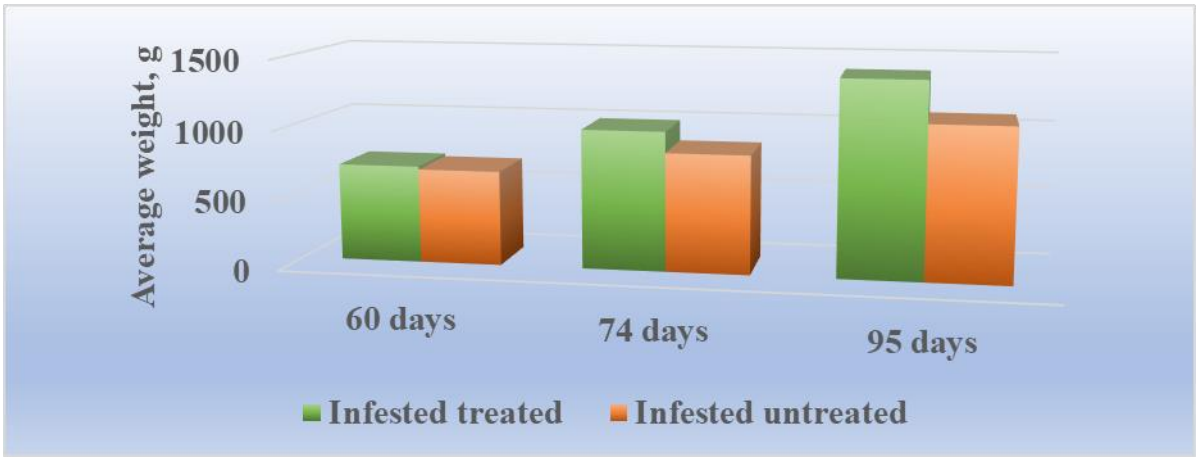


Figure 5.1. Dynamics of daily weight gain in non-infested pheasants and those polyparasitized with *malophages, fleas* and *gammazi mites*

6. INNOVATIVE PROCEDURE FOR THE PREVENTION AND TREATMENT OF PARASITOSIS IN WILD ANIMALS FROM THE HUNTING FAUNA OF THE REPUBLIC OF MOLDOVA

6.1. Innovative procedures for prophylaxis and treatment of parasitosis in cervids

One of the intended goals in this compartment was to develop effective, harmless, inexpensive, simple methods of deworming and additional feeding of cervids.

In order to increase the effectiveness of the antiparasitic treatment in cervids, complementary food was developed and administered, in briquetted form, containing antiparasitic preparations with an immunostimulating, coccidiostatic effect, premix for horned cattle and containing the necessary vital substances. All parasitic forms, eliminated by the animal during the frosty period of the year, are destroyed under the influence of unfavorable climatic factors - low temperature. The anti-parasitic preparation with an immunostimulating effect, included in this lighter, contributes to increasing the resistance of the animal body against other parasitic agents, infections, diseases and various stressful factors.

For this, 45 briquettes of 800.0 g each (dose for one animal) were prepared, respectively, for 45 cervids (average weight 50.0-70.0 kg).

Each lighter had the following composition: Corn grits – 6.0 kg (30%); Oatmeal – 6.0 kg (30%); Wheat flour – 5.0 kg (25%); Sunflower bunch – 2.0 kg (10%); Soybean meal – 1.0 kg (5 %). To all this dry mixture of 20.0 kg of concentrated feed was added: Hunted clay (Bentonite) – 8.0 kg; Iodized table salt - 0.4 kg; Premix for parachows – 900.0 g (20 g premix/animal x 45 animals).

To the total dry mixture obtained (29.3 kg), add 5.3 kg of aqueous solution (2740 ml water + 1260 ml coccidiostatic preparation *Diclazuril* 1 % + 1000.0 ml molasses = 5000.0 ml solution = 5300.0 g = 5.3 kg), in which there were diluted preventively: 315.0 g – antiparasitic preparations with immunomodulatory action – *Levamisole* 8% (1g preparation x 10 kg body mass x 45 cervids with an average body mass of 70.0 kg); 1260.0 ml – coccidiostatic preparation *Diclazuril* 1%, (1 ml/2.5 kg body mass x 70 kg x 45 heads); 1.0 liter of molasses; 1.0 kg – *Dextrin* (food glue).

In total, a complex mass of 36.0 kg or 36000.0 g was obtained, which we homogenized well, until we obtained a bolus, which was then fixed in forms for lighters, made of wooden boxes, with the dimensions of 18 x 7 x 5 cm that have holes on the lower surface. One box makes a lighter of 800.0 g (daily dose for an animal). Respectively, the total quantity of 36000.0 g : 800.0 g (daily dose for one animal) = 45 briquettes, for respectively 45 cervid heads.

The briquettes are dried in ovens (or other installations) at a temperature of 40-45^{0}C. The briquettes are administered to the hooves within 2-3 days after preparation.

For the experimental control of the proposed composition, 3 variants/experimental briquettes with different amounts of mixtures were prepared. The composition of lighter 1 was 400 g, of lighter 2 – 800 g, and of lighter 3 – 1600.0 g. For deworming, it is recommended to use lighter 2 whose composition has demonstrated optimal results.

The species, spatial distribution, herd and density of cervids on a certain territory were determined and a thorough coprological analysis of the biological samples was carried out for the presence of helminth larvae and eggs. The deer deworming procedure was carried out during the frosty months of the year (December - February) in the "Padurea Domneasca" Reservation, according to the recommendations of the leaflet of the antiparasitic preparation, included in the lighter. Deworming of cervids is carried out only once a year. After deworming, in 2-3 weeks the biological samples from the dewormed cervids are analyzed to establish the effectiveness of the antiparasitic preparation.

The results of the research showed us that the proposed procedure allowed providing cervids with vitamins, trace elements, assimilable concentrated minerals deficient in food from nature during the cold period of the year and to carry out, for prophylactic and curative purposes, deworming and immunostimulation of the body with minimum expenses.

Thus, the simultaneous performance of deworming, immunostimulation and compensation of the body's physiological needs in vitamins, trace elements, concentrated minerals, assimilable through the use of briquettes, give a new qualitative effect, which allows to increase the survival and reproduction potential of cervids in natural conditions. The proposed procedure can be used in zoos and in all forest areas in the Republic of Moldova, populated by cervids.

Cervids from both groups with various types of stress-reactivity were subjected to parasitological investigations. In cervids from group I (stress-reactive), the following indices of invasion extensiveness (EI) and invasion intensity (II) were established: *Fasciola hepatica* – EI - 40% of cases, II -1.7 ex., *Dicrocoelium lanceolatum* with EI – 50.0%, II – 2.8 ex., *Strongyloides papillosus* with EI – 100.0% and II – 22.0 ex., *Cooperia punctata* with EI- 60.0% and II-12.0 ex., *Ostertagia ostertagi* with EI – 40.0% and II – 6.2 ex., *Toxocara vitulorum* with EI – 20.0% and II-3.5 ex., *Eimeria ponderosa* with EI- 60.0% and II – 5, 0 ex., *E. capreoli* with EI – 80.0 % and II – 6.9 ex. and *E. bovis* with EI – 30.0 and II – 4.3 specimens.

Until the antiparasitic treatment was applied, the following level of infestation was established in group II (stress-resistant) cervids: *Fasciola hepatica* with EI – 20.0%, II-1.0 ex., *Dicrocoelium lanceolatum* with EI – 30.0% , II – 2.0 ex., *Strongyloides papillosus* with EI –70.0 % and II – 8.4 ex., *Cooperia punctata* with EI – 40.0 % and II – 5.2 ex., *Ostertagia ostertagi* with EI – 30.0% and II – 5.3 ex., *Eimeria ponderosa* with

EI- 40.3% and II – 2.2 ex., *E. capreoli* with EI – 60.0% and II – 2.3 ex. and *E. bovis* with EI -20.0 and II – 3.5 specimens.

As a result of the parasitological investigations obtained from both groups of cervids, until the application of the antiparasitic treatment, it can be noted that the level of infestation with all parasite species identified in cervids is obviously higher in the stress-reactive group, compared to those in the stress-resistant.

The parasitological investigations performed on cervids from group I (stress-reactive), on the 14th day after the antiparasitic treatment, revealed the following results: *Dicrocoelium lanceolatum* with EI – 20.0%, II – 1.0 ex., *Strongyloides papillosus* with EI – 30.0% and II – 3.0 ex., *Cooperia punctata* with EI - 20.0% and II-4.5 ex., *Ostertagia ostertagi* with EI - 10.0% and II – 1.0 e.g., *Eimeria ponderosa* with EI - 20.0 % and II – 1.0 ex. and *E. capreoli* with EI – 30.0 % and II – 1.6 ex. In cervids from group II (stress-resistant), after the application of the antiparasitic treatment, no parasitic agents were identified in any animal.

After performing the parasitological diagnosis 14 days after the first treatment, repeated antiparasitic treatment was applied to the cervids in the stress-reactive group, after which it was established that the cervids in the stress-reactive group were also completely dewormed.

The result of the parasitological investigations obtained after the application of the antiparasitic treatment to both groups of cervids allows us to note that the effectiveness of the antiparasitic treatment carried out is higher in the stress-resistant group of cervids, compared to those in the stress-reactive group.

The result of the innovation consists in the fact that the proposed procedure allows to select cervids resistant to infestation with various parasitic agents and to obtain a higher efficacy of antiparasitic treatment in stress-resistant cervids, compared to stress-reactive ones.

6.2. Innovative procedures for prophylaxis and treatment of parasitosis in the wild boars (*Sus scrofa*)

The procedure of complementary feeding and deworming of wild boars, according to the invention, provides for the administration during the frosty winter period, which also corresponds to the reproductive period of wild boars (December - February), when they endure a food shortage and need additional concentrated food, of a mixture of cereals, premix, antiparasitic preparation, dosed per head of animal in the form of briquettes with the following composition: (corn - 452.0 g; soybean meal - 250.0 g; sunflower seed - 250.0 g; roasted caraway seeds (*Amaranthus retroflexus*) – 48.0 g; barley – 160.0 g; concentrated protein-vitamin-mineral premix for pigs 2.5 % – 40.0 g), which forms the daily norm of a wild boar with body weight of approx. 100.0 kg and ingredients 400.0 g (*Dextrin* – 195.0 g; bentonite (hunted clay) – 200.0 g; antiparasitic preparation *Granulated Alben (White)* – 5.0 g). To the total mass obtained of 1600.0 g, add 0.5 liters of drinking water while mixing.

The entire mass of 1600.0 g was divided into 4 equal masses of 400.0 g each, which are manually briquetted in the form of corn cobs and form the complex daily feed required for a boar with a body mass of 100.0 kg.

The obtained briquettes (4 pieces) were dried in ovens at a temperature of up to 45^0C, which were administered in two rounds, at an interval of 14 days, in special feeders arranged previously.

Finally, we obtain a total content of briquetted components, in %, per animal head: corn (436.0 g) – 27.3%; soybean meal (250.0 g) – 15.6%; sunflower seed (250.0 g) – 15.6%; barley – (160 g) – 10.0%; concentrated protein-vitamin-mineral premix for pigs (40.0 g) – 2.5%; roasted caraway seeds (*Amaranthus retroflexus*) (64.0 g) – 4%; antiparasitic preparation *Granulated Alben (White)* (5.0 g) – 0.30; *Dextrin* (195.0g) – 12.2%; bentonite (hunted clay) (200.0 g) – 12.5 %. This composition allows to effectively and economically use both the food, the premix, and the antiparasitic preparations.

The administration of the *Granulated Alben (White)* preparation to boars was carried out in identical doses (5.0g preparation included in the briquetted feed of 1600.0g for a boar).

The obtained results revealed that the preparation *Granulated Alben (White)* has a high efficiency on the endoparasites from the wild boars (Tab. 6.3.).

Table 6.3. The efficiency of *Alben granulat* preparation in controlling the endoparasites in wild boars (*Sus scrofa*)

Invasion	EI before the treatment, %	EI after the treatment, %
Strongyloides ransomi (Wedl, 1856)	25.6	2.2
Dicrocoelium lanceolatum (Rudolphi, 1819)	16.5	1.4
Metastrongylus elongatus (Dujardin, 1845)	16.8	0
Ascaris suum (Goeze 1782)	22.6	2.0
Hyostrongylus rubidus (Hassalland and Stiles, 1892)	26.4	4.6
Globocephalus urosubulatus (Alessandrini, 1909)	56.4	6.4
Gongylonema pulchrum (Joseph Leidy, 1850)	5.8	0
Physocephalus sexalatus (Raffaele Molin, 1860)	8.7	0
Oesophagostomum dentatum (Raillet, 1905)	23.2	0
Trichocephalus suis (Schrank, 1788)	15.5	0
Macracanthorhynchus hirudinaceus (Travassos,1916)	12.4	0

Thus, in order to deworm and compensate the physiological needs of the boars' body during the cold period of the year with vitamins, trace elements, assimilable concentrated minerals, 1600 g each (4 briquettes of 400 g each) was administered in two seasonal installments, December and February, a briquetted supplement for each boar, which ensures survival, increases their reproductive potential in natural conditions, as well as decreases the risk of their capture by predators.

6.3. Innovative procedures for the prophylaxis and treatment of parasitosis in the hares (*Lepus europaeus* Pallas, 1778)

The problem solved by the present study consists in the development of a composition for feeding and deworming the field rabbit and an effective, harmless, relatively cheap and simple complex deworming procedure, which simultaneously ensures their complementary feeding and deworming during the cold period of the year.

The composition, according to the invention, contains, in %: oats – 30-50; wheat – 4.0-7.0; barley – 2.0-4.0; corn – 2.0-4.0; sunflower meal – 2.0-4.0; soybean meal – 2.0-4.0; hunted clay (*Bentonite*) – 20.0-30.0; molasses – 1.0-2.0; dextrin – 2.0-3.0; complex vitamin-mineral premix for rabbits containing coccidiostatic preparation - *Diclazuril* – 1.0-2.0; antiparasitic preparation *Granulated Alben (White)* – 1.0-2.0.

The procedure for complementary feeding and deworming of the European hare (*Lepus europaeus* Pallas, 1778), according to the invention, provides for the administration during the frosty winter period (December - February) of the mentioned composition dosed per head of animal in the form of briquettes of 75, 0 g/rabbit, in two installments at an interval of 12-14 days, suspended with a string passed through the holes at a height of 25-40 cm from the ground.

The recommended dose for fur animals is 50-100 g of *Granulated Alben (White)* preparation (granules), mixed with food, placed in feeders for a group of 10-100 animals.

The complex vitamin-mineral premix for rabbits is a product based on vitamins, trace elements, concentrated assimilable and coccidiostatic minerals.

Based on the daily norm of a rabbit in the winter period (December – February) of 50 g of grain concentrates, ingredients were taken for 200 rabbits: oats – 7000.0 g; wheat - 1000.0 g; barley - 500.0g; corn – 500.0 g; sunflower seed - 500.0 g; soybean meal - 500.0 g; betonite – 4000.0 g; molasses - 200.0 g; Dextrin - 400.0 g; complex premix for rabbits - 200.0 g, *Granulated Alben (White)* - 200.0 g. Mix 2 liters of drinking water to the dry ingredients (15 kg). The formed table of 15 kg is for 200 hares.

Thus, we obtained 200 briquettes of 75.0 g each, which we would then dry in the sun or, to speed up the process, in ovens at a temperature of up to 45°C. The briquettes were administered in two rounds at an interval of 14 days, in feeders, suspended with a string passed through the holes at a height of 25-40 cm from the ground.

This briquetted composition allows to effectively and economically use both the feed, the premix, and the anti-parasitic preparations. The administration of the *Granulated Alben (White)* preparation to the hare was carried out in identical doses (1.0g of the preparation included in the briquetted food of 75.0 g for a hare) (Tab. 6.4.).

Table 6.4. The effectiveness of the *Granulated Alben (White)* preparation in combating helminths in hares (*Lepus europaeus* Pallas, 1778)

Invasion	EI before the treatment, %	EI after the treatment, %
Strongyloides papillosus (Wedl, 1856)	59.4	2.2
Dicrocoelium lanceolatum (Rudolphi, 1819)	38.6	1.4
Fasciola hepatica (Linnaeus, 1758)	14.4%	0

The obtained results showed us that the *Granulated Alben (White)* preparation has a high efficacy against the most common species of helminths established in hares.

The coccidiostat *Diclazuril* from the complete vitamin-mineral premix for hares is a preparation with a wide spectrum of use against all species of coccidia in them. The mixing rate of the premix in the final ration for rabbits is 2% (Tab. 6.5.)

Therefore, the anti-parasitic preparation *Diclazuril* from the composition of the complete vitamin-mineral premix for hares, has a high coccidiostatic efficacy against all species of coccidia detected in the European hare (*Lepus europaeus* Pallas, 1778).

Therefore, the simultaneous performance of deworming with endoparasites and compensating the physiological needs of the body in vitamins, trace elements, assimilable concentrated minerals give a new qualitative effect, which allows to ensure the survival and increase the reproductive potential of field rabbits in natural conditions, as well as to reduce the risk of their capture by predators. The proposed procedure can be used in all natural and man-made biotopes in the Republic of Moldova, where the hare is found (*Lepus europaeus* Pallas, 1778).

Table 6.5. The effectiveness of the *Diclazuril* preparation in combating eimeriosis in European hare (*Lepus europaeus* Pallas, 1778)

Invasion	EI before the treatment, %	EI after the treatment, %	Effectiveness, %
Eimeria stiedae (Lindemann, 1865)	57.1	3.5	94.0
Eimeria leporis (Nieschulz, 1923)	51.4	3.8	92.6
Eimeria exigua (Yakimoff, 1934)	48.1	3.4	93.0
Eimeria magna (Pérard, 1925)	31.3	2.7	91.4
Eimeria intestinalis (Cheissin, 1948)	14.3	2.2	84.6
Eimeria perforans (Leuckart, 1879)	12.9	1.0	92.3

6.4. Innovative procedures for the diagnosis, prophylaxis and treatment of parasitosis in the pheasants (*Phasianus colchicus* L.)

In order to establish the associations of ectoparasites in wild birds of hunting interest - pheasants, parasitological research was carried out in various natural and man-made biotopes of the Republic of Moldova. Samples were collected individually and in groups. Special methods were applied to collect ectoparasites from the live birds, according to a new procedure, which is more informative [15].

In the antiparasitic therapy, a new preparation of vegetable origin *Ectogalimol*, in various concentrations, obtained by synthesis in the Laboratory of Parasitology and Helminthology of the Institute of Zoology of the MSU in collaboration with the Institute of Genetics, Physiology and Plant Protection of the MSU was used. The results of the

parasitological research carried out indicate an extensive invasion of pheasants with malophages in 90.0% of cases, fleas – 26.0% and with gamaziz mites – in 59.0% of cases. At the same time, the antiparasitic efficacy of the herbal remedy *Ectogalimol* was tested in various concentrations in vivo, compared to the control group that received distilled water.

To achieve this goal, 6 groups of pheasants aged about 2 months, 5 specimens in each batch, were formed, spontaneously infested with malophages (*Eomenacanthus stramineus, Goniodes colchicus, Menopon gallinae, Cuclotogaster cinereus, Goniocotes chrysocephalus, Goniocotes gallinae, Goniodes dissimilis, Lipeurus caponis*), one species of flea (*Ceratophylus hirundinis*) and two species of gamaziz mites (*Dermanyssus gallinae, Dermanyssus hirundinis*). The aqueous solutions of *Ectogalimol* in concentrations of 1%, 2%, 3%, 4% and 5% were used for research. Group I – control (infested, untreated); group II – infested, treated with a 1.0% concentration solution; group III – infested, treated with 2.0% solution; group IV – infested, treated with 3.0% solution; group V – infested, treated with 4.0% solution; group VI – infested, treated with 5.0% solution.

The *Ectogalimol* preparation was administered by sprinkling each bird separately with 20 ml per/body. The effectiveness of the preparation, administered in various doses, was determined over 2, 12, 24 and 72 hours after the treatment (fig. 6.1).

The results of the obtained research show us that 72 hours after the treatment, the preparation *Ectogalimol* has an antiparasitic efficacy of 40% and, respectively, 70% in groups II and III, and in groups IV, V and VI a maximum efficacy was established - approx. 100 %.

Therefore, in combating ectoparasiteses in pheasants infested with malophages (*Eomenacanthus stramineus, Goniodes colchicus, Menopon gallinae, Cuclotogaster cinereus, Goniocotes chrysocephalus, Goniocotes gallinae, Goniodes dissimilis, Lipeurus caponis*), fleas (*Ceratophylus hirundinis*) and gamaziz mites (*Dermanyssus gallinae, Dermanyssus hirundinis*), it is recommended to use the preparation of vegetable origin *Ectogalimol* in a concentration of 3.0%.

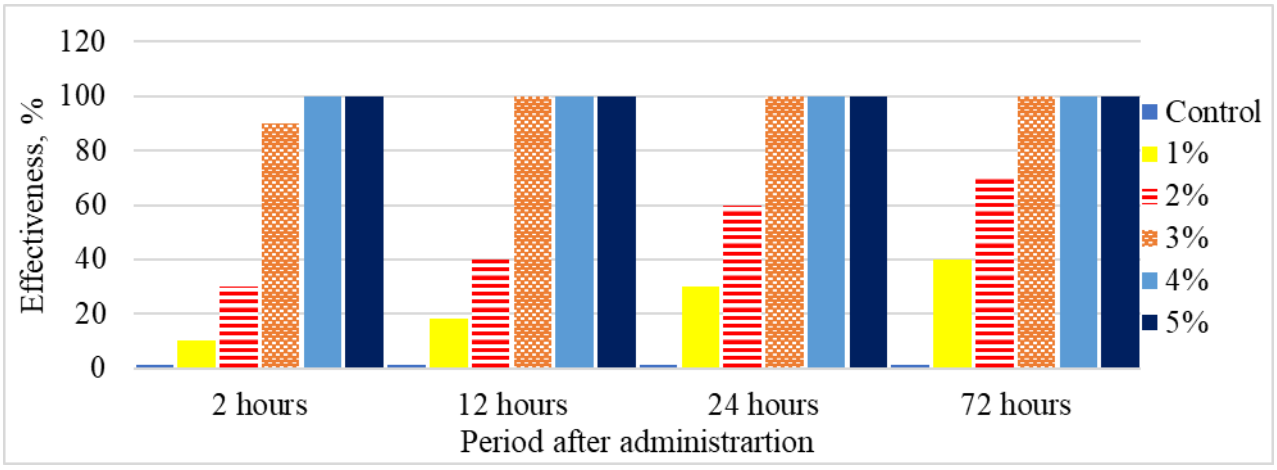


Figure 6.1. The effectiveness of the preparation *Ectogalimol* used to combat ectoparasites in pheasants (*Phasianus colchicus L.*) in various doses and periods of time

Thus, it was established that, as a result of the administration of the natural preparation *Ectogalimol* 3%, according to the proposed procedure, there was a considerable decrease in the extent of ectoparasites - up to 100%. The preparation *Ectogalimol* 3% is not toxic, for these reasons its overdose does not produce adverse effects and does not require a large volume of work, but no less important is the fact that, after treating the birds with this preparation, there are no restrictions on the consumption of products and their by-products, compared to the treatment with preparations of chemical origin, where the period of restrictions on the consumption of products and by-products can reach up to 21 days.

With the aim of prophylaxis and combating ectoparasites in gallinaceae within the Parasitology and Helminthology Laboratory of the Institute of Zoology, 3 extracts of natural origin were developed, patented and implemented: *Ectoscop-P* 5%, *Ectoscop-T* 5% and *Ectogalimol* 3%, which allowed us to achieve an antiparasitic efficacy in gallinaceae of about 90-100%, against various species of ectoparasites: malophages, fleas and gamy mites [12, 15].

In order to combat both ectoparasites and endoparasites in pheasants, a composition for complementary feeding of pheasants and a method of deparasitizing them with its use was developed and patented.

As a result of the parasitological research carried out, a high level of infestation of pheasants with various endoparasitic agents was highlighted, such as: *Ascaridia spp.* - 88.3%, *Capillaria spp.* - 22.5%, *Prosthogonimus ovatus* - 11.4%, *Singamus trachea* - 11.7%, *Trichostrongylus sp.* - 20.4%, and with the species *Heterakis gallinarum* in 19.4% of cases.

Also, a high level of coccidia infestation was established in pheasants: *Eimeria phasiani* -45.5%, *E. Duodenalis* - 65.2%, *E. maxima* - 34.7%, *E. brunetti* -18.5%, and with *E. tenella* in 15.2% of cases.

The proposed composition for additional feeding with deworming effect for pheasants includes nutrients and antiparasitic preparations. The additional food with the addition of the anti-parasitic preparation Ivermec OR premix (*Premix* 2% broiler growth) and kitchen salt (NaCl), being calculated for 50 pheasants (10 kg), based on the daily consumption of 200 g per specimen, was prepared accordingly: for the preparation of 10 kg of additional feed, to the mixture of 4.00 kg of corn, 3.00 kg of sunflower, 1.00 kg of oats, 1.00 kg of wheat, 670 g of soybean meal, a mixture of 1 liter of drinking water with 24.0 ml antiparasitic preparation - *Ivomec OR*, then 200.0 g *Premix* 2% broiler growth, 30 g NaCl and 100.0 g *Dextrin*. The mentioned components are mixed well and placed while stirring in a thin layer on a wooden board at a temperature of 25-30 ^{o}C. It is administered starting from the second day, during 2-3 days.

The essence of this invention consists in deworming pheasants in natural conditions and compensating for the deficiency of vitamins, trace elements, assimilable concentrated minerals, in the cold period of the year and in the spring in the pre-reproductive period of the pheasants, which allows the preservation of the flocks of healthy birds and their potential for reproduction in nature.

In order to determine the therapeutic effectiveness of the antiparasitic preparation *Ivermec OR*, biological samples were collected from helminths in pheasants, establishing the extent of the invasion with helminths initially and after the administration of the preparation. The administration of the *Ivermec OR* preparation to pheasants was carried

out in identical doses (24.0 ml of *Ivermec OR* dissolved in a liter of drinking water used to homogenize and prepare 10 kg of additional feed for the daily dose for 50 pheasants) (Tab. 6.6.).

Table 6.6. The effectiveness of the *Ivermec OR* preparation in combating helminths in pheasants *(Phasianus colchicus* L.*)*

Invasion	EI before the treatment,%	EI after the treatment,%
Ascaridia galli (Schrank, 1788)	88.0	0
Capillaria spp., (Zeder, 1800)	22.0	4.0
Trichostrongylus tenuis (Mehlis, 1846)	20.0	1.0
Heterakis gallinarum (Schrank, 1788)	18.0	0
Singamus trahea (Montagu, 1811)	12.0	2.0

According to the leaflet for use, the preparation *Ivermec OR* has a high efficacy both on helminths and on ectoparasites, thus establishing the ectoparasiticidal efficacy on the species of ectoparasites detected in pheasant (*Phasianus colchicus L.*) (Tab. 6.7.).

Table 6.7. The effectiveness of the *Ivermec OR* preparation in combating ectoparasites in the pheasants *(Phasianus colchicus* L.*)*

Invasion	EI, before the treatment, %	EI, after the treatment, %
1	2	3
Malophages		
Cuclotogaster cinereus (Nitzsch, 1866)	28.0	2.0
Goniocotes chrysocephalus (Giebel, 1874)	14.0	0
Goniodes colchici (Denny, H. 1842)	12.0	0
Eomenacanthus stramineus (Nitzsch, 1818)	26.0	0
Menopon gallinae (Linnaeus, 1758)	32.0	0
Goniocotes gallinae (De Geer, 1778)	12.0	0
Goniodes dissimilis (Denny, 1842)	10.0	0
Lipeurus caponis (Linné, 1758)	2.0	0
Fleas		
Ceratophylus gallinae (Schrank, 1803)	46.0	1.0
Ceratophylus hirundinis (Curtis, 1826)	32.0	0
Parasitiformes mites		
Dermanyssus gallinae (De Geer, 1778)	18.0	2.0
Dermanyssus hirundinis (Dugès, 1834*)*	12.0	0
Knemidocoptes mutans (Robin & Lanquentin, 1859*)*	6.0	0

Therefore, according to the data in Table 6.7., the effectiveness of the preparation *Ivermec OR* in combating ectoparasites in pheasants (*Phasianus colchicus L.*) is significantly high.

Therefore, the simultaneous performance of complex deworming (ecto- and endoparasites) and compensation of the body's physiological needs in vitamins, trace elements, assimilable concentrated minerals, give a new qualitative effect, which allows to ensure the survival and increase the reproductive potential of pheasants in conditions natural, as well as to reduce the risk of their capture by predators. The proposed procedure can be used successfully in all natural and anthropogenic biotopes in the Republic of Moldova, where the pheasant (*Phasianus colchicus L.*) is found.

GENERAL CONCLUSIONS AND RECOMMENDATIONS

1. The analysis of the parasitofauna in cervids from the Natural Reservation "Plaiul fagului" and in the cattle grazing near the reservation, allowed to highlight the presence of 3 species of specific parasites for cervids (*Eimeria austriaca, E. ponderosa, E. capreoli*) and 11 common species for domestic ruminants (*Dicrocoelium lanceolatum, Fasciola hepatica, Paramfistomum cervi, Strongyloides papillosus, Cooperia punctata, Ostertagia ostertagi, Toxocara vitulorum, Trichostrongylus axei, Moniezia benedeni, Eimeria asymmetrica, E. bovis*).
2. From the total of parasitic species identified in wild boars from various natural biotopes (13 species): 2 species (15.5%) are specific only for wild boars (*Gongylonema pulchrum; Eimeria debliecki*), 8 species (61.5%) (*Trichocephalus suis, Strongyloides ransomi, Metastrongylus elongatus, Oesophagostomum dentatum, Physocephalus sexalatus, Ascaris suum, Hyostrongylus rubidus, Macracanthorhynchus hirudinaceus*) are common to other wild and domestic animal species, and 3 species (23.0%) (*Fasciola hepatica, Dicrocoelium lanceolatum* and *Globocephalus urosubulatus*), are common in both animals and humans.
3. In the European hare, 16 species of parasites were identified, of which: 10 species (62.5 %) are specific only for rabbits (*Trichuris leporis, Trichocephalus leporis, Passalurus ambiguous, Graphidium strigosum, Eimeria leporis, Eimeria magna, Eimeria stiedae, Eimeria perforans, Eimeria exigua, Eimeria intestinalis*); 4 species (25.0%) are common to other wild and domestic animal species (*Strongyloides papillosus, Trcihostrongylus probolurus, Trichostrongylus retortaeformis, Nematodirus abnormalis*), and 2 species (12.5 %) (*Fasciola hepatica, Dicrocoelium lanceolatum*), are common both for animals and humans.
4. The complex parasitological results, performed on pheasant flocks, from various natural and anthropogenic biotopes of the Republic of Moldova, show that the biological phenomenon of polyparasitism in them has a permanent character, although the structure of polyparasitism is in continuous dynamics both quantitatively and qualitatively, and the cause being the direct contact of pheasants with domestic birds and irregular parasites or even the lack thereof.
5. For the first time, a new procedure for selecting cervids according to the type of stress – reactivity was developed, patented and implemented in practice, by applying the adrenalin test formulated by Ahmadiev G. [279] and modified [186] for the purpose of selection and formation of cervid populations with a high resistance to parasitic infestation from 10% to 50% and with a high antiparasitic therapeutic efficacy of approx. 100%.
6. The analyzes of the biochemical indices of the blood serum, carried out in both groups of cervids with various types of stress-reactivity, made it possible to highlight

deviations in the cholesterol content in the examined groups, which is by 17.75% (t_d =4.6; P≤0.01), more increased in the stress-reactive group, compared to the values of this index in the stress-resistant cervid group.

7. It was established that the number of total eosinophils, in cervids with various types of stress-reactivity, made it possible to establish their level at the initial stage with 22.8% (t_d =3.2; P ≤ 0.05), higher in the group of stress-reactive cervids, compared to the stress-resistant group, and after the antiparasitic treatment, in both groups of cervids a decrease in the number of total eosinophils is observed, which, on the 7th day after the treatment, their number being 25.0% (t_d =4.2; P≤0.01), more increased in stress-reactive ones, compared to stress-resistant ones.
8. As a result of the analysis of the leukocyte formula in non-infested, mono- and polyparasitized wild boars, a decrease in the number of eosinophils was found in group I – non-infested by 29.0% (t_d =5.0; P ≤ 0.001), compared to group II - spontaneously infested with *Strongyloides ransomi*, with 18.0% (td =2.3; P ≤ 0.05), compared to group III - spontaneously infested with *Dicrocoelium lanceolatum* and, respectively, 40.8% (td =7.8; P≤0.001), more diminished, compared to group IV with polyparasitized boars (*Dicrocoelium lanceolatum, Strongyloides ransomi, Metastrongylus elongatus and Eimeria debliecki*), and the indices of hemoglobin content, hematocrit, number of erythrocytes, clotting time and VSH vary and are more increased in group I with uninfested boars, compared to those in the mono- and polyparasitated groups.
9. The variation of some morphofunctional indices in pheasants (average erythrocyte hemoglobin concentration, average erythrocyte volume, platelet count, leukocyte indices, protein and ionogram indices) was highlighted, as a response to the action of ectoparasite associations with malophages, fleas, gammazis mites, which offered the possibility to argue and interpret the manifestation characteristics of the infested organism depending on the parasitic load.
10. For the first time, harmless biological methodologies and procedures for collecting and combating ectoparasites from live gallinaceae were developed, patented and implemented, which consists in spraying them with natural plant extracts (*Ectoscop-P* 5%, *Ectoscop-T* 5%, Ectogalimol 3%, 5%) finding that restrictions on the consumption of products and by-products from treated and investigated birds are excluded, compared to the application of products of chemical origin.
11. In order to solve the problem of anti-parasitic protection of humans and animals, based on the concept of prophylaxis and integrated treatment, innovative methodologies and procedures for diagnosis, prophylaxis and combating parasitosis in animal species from hunting fauna (cervids, wild boars, hares, pheasants), which allow deworming them in natural conditions and compensating the deficit, in the cold period of the year, with vitamins, trace elements, assimilable concentrated minerals, which ensure the preservation of healthy animal populations and their high potential of reproduction in nature were developed, patented and implemented.

Practical recommendations

1. Parasitofauna, the impact of parasitosis on the body of the common pheasant (*Phasianus colchicus L.*), prophylaxis and treatment. (Methodological Guide),

Chisinau. 2020. - 80 p. ISBN 978-9975-151-89-4 (co-authors: Erhan D., Savin A., Zamornea M., Rusu V., Railean N., Toderas I.)

2. It is recommended, both for the purpose of diagnosis and for combating ectoparasites in gallinaceae, to apply the patent "Procedure for collecting ectoparasites from live gallinaceae", No. 9849 (13) Y, A61P 33/14. (co-authors: Erhan D., Zamornea M., Toderas I.).
3. Hematophagous insects (*Hippoboscidae*), hair rodents (*Bovicolae*) in domestic animals, methods of prophylaxis and treatment. Methodical indications for animal breeders. Chişinău, 2005, 22 p. (co-authors: Luncasu M., Erhan D., Zamornea M.).
4. Measures to prevent and combat echinococcosis/hydatidosis. Methodical indications. Chisinau, 2010, 34 p. (co-authors: Chihai O., Anghel T.).
5. It is recommended to use the invention patent "Procedure for assessing the sensitivity of cervids to stress factors". No. 1667 Y 2023.01.31, which allows the formation of cervid populations with resistance to infestation and high antiparasitic therapeutic efficacy (co-authors: Erhan D., Savin A., Toderas I., Zamornea M., Chihai O., Rusu V., Gologan I.)
6. Selection of agricultural animals according to the type of reactivity – an effective procedure for increasing adaptive and productive capacities. Newsletter. Veterinary Medicine. National Institute of Economy and Information. Chisinau, 2004, № 22, 4 p. (co-authors: Erhan D., Pavaliuc P.).
7. Selection of stress-resistant cattle with increased productive, adaptive and curative potential. Methodical indications for animal breeders. Chisinau, 2005, 19 p. (co-authors: Erhan D., Pavaliuc P.).
8. It is recommended, according to the invention patents "Deworming method of cervids", No. 1049 (13) Y, A61K 31/4184 and "Deworming method for cervids" No. 1303 (13) Y, A61K 31/53, with curative-prophylactic purpose in cervids during the cold period of the year, administration in their ration of a mixture of fodder, antiparasitic preparation, premix based on vitamins, trace elements and minerals, which allows to increase the survival and reproductive potential of cervids in natural conditions (co-authors: Toderas I., Erhan D, Zamornea M. et al.)
9. It is recommended, for curative-prophylactic purposes, according to the invention patent "Composition and process for feeding and deworming pheasants", No. 1164 (13) Y, A23K 50/70, as in the frosty months of the year, when everything around is covered with snow, as well as in early spring in the pre-reproductive period of pheasants, the administration in their ration of a mixture of fodder, prepared antiparasitic, premix based on vitamins, trace elements and necessary minerals (co-authors: Toderas I., Savin A., Erhan D. et al.).
10. In order to protect the hunting fauna, in particular the wild boar populations, it is recommended to widely apply into practice the invention patent "Composition and method of complementary feeding and deworming of wild boars", No. 1405 (13) Y, A61K 31/4184, which simultaneously provides additional feeding and deworming of wild boar herds during the cold period of the year and is essential for their reproduction, growth and development in a healthy environment (co-authors: Toderas I., Erhan D., Savin A. et al.).
11. In order to increase the survival and reproductive potential of the populations of European hare in natural conditions, it is recommended to widely apply in practice the

invention patent "Composition and method of supplementary feeding and deworming of European hares", No. 1350 (13) Y. A23K 10/30. (co-authors: Toderas I., Savin A., Erhan D. et al.).

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3.1. Articles in Journals included in the international database in WoS/Scopus databases:

1. CHIHAI, O., ERHAN, D., **RUSU, Ş.,** STRATAN, N., MELNIC, G., ZAMORNEA, M., ANGHEL, T. Particularităţile parazitismului asociat la taurine de diferite vârste în infestare naturală.//Al X –lea Simpozion Naţional de buiatrie cu participare internaţională. Revista Română de Medicină Veterinară. Vol.17 Nr.2.-2007.–P.276-280. ISSN: 1220-3173.
2. CHIHAI, O., UMHANG, G., ERHAN, D., BOUE, F., TĂLĂMBUŢĂ, N., **RUSU, Ş.,** ZAMORNEA, M. Slaughterhouse survey of cystic echinococcosis in cattle and sheep from the Republic of Moldova. In: *Journal of Helminthology*. 2016, nr. 3(90), pp. 279-283. ISSN 0022-149X. DOI: https://doi.org/10.1017/S0022149X15000103
3. CHIHAI, O., UMHANG, G., ERHAN, D., BOUE, F., TĂLĂMBUŢĂ, N., **RUSU, Ş.,** MELNIC, G., MEREUŢĂ, M. Cystic Echinococcosis in sheep from Republic of Moldova. The 24th International Congress of the hungarian association for buiatrics „Impact of periparturient diseases on productivity". Hunguest Hotel Béke, Hajdúszoboszló, October 15-18. 2014, 253-254. ISBN 978-963-87942-7-7.
4. **RUSU, Ş.,** ERHAN, D., CHIHAI, O., STRATAN, N. Efectul economic obţinut prin selectarea bovinelor după tipul de reactivitate la stres. // Al X –lea Simpozion Naţional de buiatrie cu participare internaţională. Revista Română de Medicină Veterinară. Vol.17 Nr.2.-2007.-P.18-22. ISSN: 1220-3173.
5. **RUSU, Ş.,** ERHAN, D., ZAMORNEA, M., CHIHAI, O., RUSU, V., GLIGA, O., GOLOGAN, I., BOTNARU, N., CHIHAI, N., RUSU, M. Composition and process for additional feeding and deworming of hares. International Conference „*Agriculture for Life, Life for Agriculture*", University of Agronomic Sciences and Veterinary Medicine of Bucharest. Animal Science. Ed. "CERES" Publ. House. Vol. LXVI. No.1, categoria ISI, Bucharest, 2023, p. 56-68. ISSN 2285-5750, ISSN Online 2393-2260.
6. **RUSU, Ş.,** ERHAN, D., ZAMORNEA, M., TODERAȘ, I., CHIHAI, O., GOLOGAN, I., RUSU, V., BOTNARU, N., CHIHAI, N., RUSU, M. Natural remedies used in fighting ectoparasites in gallinaceous birds. International Conference „*Agriculture for Life, Life for Agriculture*", University of Agronomic Sciences and Veterinary Medicine of Bucharest. Animal Science. Ed. "CERES" Publ. House. Vol. LXVI. No.2, categoria ISI, Bucharest, 2023, p. 32-45. ISSN 2285-5750, ISSN Online 2393-2260.
7. SASANELLI, N., KONRAT, A., MIGUNOVA, V., TODERASH, I., IURCU-STRĂISTARU, E., **RUSU, Ş.,** BIVOL, A., ANDONI, C., PASQUA, V. Review on control methods against plant parasitic nematodes applied in southern member states (C zone) of the european union. In: *Agriculture (Switzerland)*. 2021, nr. 7(11), pp. 1-19. ISSN 2077-0472. DOI: https://doi.org/10.3390/agriculture11070602
8. SASANELLI, N., TODERASH, I., PASQUA, V., IURCU-STRĂISTARU, E., **RUSU, Ş.,** MELILLO, M., CABONI, P. Abamectin efficacy on the potato Cyst nematode *Globodera pallida*. In: Plants. 2020, nr. 1(9), p. 45-53. ISSN 2223-7747. DOI: https://doi.org/10.3390/plants9010012

9. UMHANG, G., CHIHAI, O., BASTID, V., GRENOUILLET, F., ERHAN, D., HOTINEANU, A., LUNGU, V., **RUSU, Ş.**, GRENOUILLET, F., BOUE, F. Molecular identification of cystic echinococcosis in humans and pigs reveals the presence of both *Echinococcus granulosus* sensu stricto and Echinococcus canadensis G6/G7 in the hyperendemic focus of the Republic of Moldova. In: *Parasitology Research*. 2019, nr. 10(118), pp. 2857-2861. ISSN 0932-0113. DOI: https://doi.org/10.1007/s00436-019-06432-5

3.2. Articles in Journals accepted in the ANACEC database:

1. CHIHAI, O., ERHAN, D., NISTREANU, V., LARION, A., TĂLĂMBUȚĂ, N., **RUSU, Ş.,** MELNIC, G., ZAMORNEA, M. Parasitological studies of the species from genus apodemus (rodentia, muridae) from the "Plaiul fagului" natural reservation, Republic of Moldova. In: *Oltenia - studii si comunicari stiintele naturii*. 2019, nr. 1(35), pp. 86-91. ISSN 1454-6914. CZU: 576.89:599.322/324:502.7(478) (CAB Abstracts, EBSCO).
2. CHIHAI, O., ERHAN, D., **RUSU, Ş.,** MELNIC, G., ZAMORNEA, M., ANGHEL. T. Polyparazitism consequences and complex antiparazitic teatment (*Brovitacoccid, Avomec, Tilozin 200*) upon the postvaccin immunity in boviane. Bulletin of University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, România, Vol. 64/2007. – P.374-380. ISSN 1843-5270; Electronic ISSN 1843-5378. (AGRIS, DOAJ). DOI: https://doi.org/10.15835/buasvmcn-vm:64:1-2:2437
3. CHIHAI, O., ERHAN, D., **RUSU, Ş.,** NISTREANU, V., LARION, A., TĂLĂMBUȚĂ, N., MELNIC, G., ZAMORNEA, M., ANGHEL, T. Parasite fauna of Myodes glareolus from the Natural Reservation "Plaiul Fagului" of the Republic of Moldova. In: *Oltenia - studii si comunicari stiintele naturii*. 2018, nr. 1(34), pp. 83-88. ISSN 1454-6914. CZU: 576.89:599.323.4:502.7(478) (CAB Abstracts, EBSCO). http://olteniastudiisicomunicaristiintelenaturii.ro/cont/34_1/III.%20ANIMAL%20BIOLOGY%20III.a.%20INVERTEBRATES%20VARIOUS/12.%20CHIHAI%20Oleag.pdf
4. CHIHAI, O., ERHAN, D., TALAMBUTSA, N., **RUSU, Ş.,** PAVALIUC, P., MELNIC G., ZAMORNEA, M., GANEA, C. The diversite of parasitic invasions upon the cattle of different ages in the Republic of Moldova. *Bulletin of University of Agricultural Sciences and Veterinary Medicine*. Cluj-Napoca, 2011, 68 (2), 90-92. ISSN 1843-5270; Electronic ISSN 1843-5378. (AGRIS, DOAJ). DOI: https://doi.org/10.15835/buasvmcn-vm:2:68:6881
5. CHIHAI, O., ERHAN, D., TALAMBUTSA, N., **RUSU, Ş.,** PAVALIUC. P., MELNIC, G., ZAMORNEA, M. Diversity of Parasitosism in Bovines in the Republic of Moldova //Bulletin of University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca. 2012. - Vol. 69 (1-2). - P.320-323. ISSN 1843-5270; Electronic ISSN 1843-5378. (AGRIS, DOAJ). DOI: https://doi.org/10.15835/buasvmcn-vm:69:1-2:8858
6. CHIHAI, O., ERHAN, D., TĂLĂMBUȚĂ, N., LUNGU, V., **RUSU, Ş.,** CRESCIUC, O. Parazitofauna la *Canis familiaris* din mun. Chişinău Republica Moldova. În: S. 2009, vol. 19, nr.1-2, p.18-19.ISSN 1221-1796. (CAB Abstracts, EBSCO).
7. CHIHAI, O., TODERAȘ, I., ERHAN, D., **RUSU, Ş.,** TĂLĂMBUȚĂ, N., NISTREANU, V., LARION, A., ZAMORNEA, M., MELNIC, G., NAFORNIȚĂ N. Epidemiology of *Plagiorchise legans* in small rodents from wet and dry biotopes of the Republic of Moldova // Scientia Parasitologica.2020, vol. 21, №3.120-130.ISSN 1582-1366 (CAB Abstracts), https://ibn.idsi.md/sites/default/files/imag_file/Epidemiology%20of%20Plagiorchis%20elegans%20in%20small%20rodents.pdf

8. ERHAN, D., CHIHAI, O., **RUSU, Ş.,** TĂLĂMBUȚĂ, N., MELNIC, G., ZAMORNEA, M., BUZA, V.; ANGHEL, T. Index of the impact and the convalescence of the antiparasitic chemotherapy (Avomec 1%, 2.5% Rombendazol, Tylosinum 200) at infected cattles (S. papillosus, D. lanceolatum). *Bulletin of University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca*. 2010, 67(2), 70-73. ISSN 1843-5270; Electronic ISSN 1843-5378. (AGRIS, DOAJ). DOI: https://doi.org/10.15835/buasvmcn-vm:67:2:5924
9. ERHAN, D., PAVALIUC, P., **RUSU, Ş.,** CHIHAI, O. Particularities of minerals balance and its correlation with functional status and organism aging in early postnatal ontogenesis. În: Al 8-lea Simpozion Internaţional „Perspective ale Agriculturii Mileniului III". 7-10 octombrie, 2009. Cluj-Napoca. Bulletin of University of Agricultural Sciences and Veterinary Medicine. Cluj-Napoca, 2009, vol. 66 (1), p. 202-206. ISSN 1843-5270; Electronic ISSN 1843-5378. (AGRIS, DOAJ).
DOI: https://doi.org/10.15835/buasvmcn-vm:66:1:3888
10. **RUSU, Ș.,** ERHAN, D., TODERAȘ, I., ZAMORNEA, M., CHIHAI, O., GLIGA, O., GOLOGAN, I. RUSU, V., BONDARI. L. Composition for complementary feeding and deworming of wild boars // Bulletin of University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca. Veterinary Medicine 2023. - Vol. 80, No 1. ISSUE 1. MAY - P.47-52. ISSN 1843-5270; Electronic ISSN 1843-5378.
DOI: https://doi.org/10.15835/buasvmcn-vm:2022.0031. (AGRIS, DOAJ).
11. **RUSU, Ș.,** ERHAN, D., TODERAȘ, I., ZAMORNEA, M., RUSU, V., GOLOGAN, I. Evaluation of morpho-functional and curative status in deer with various type of reactivity at stress //The Scientific International Conference *The museum and Scientific Research. The 29th Edition* Craiova, 15-17 September, 2022. – P.75. ISSN 2668-5469; ISSN-L 2668-5469. CZU: 576.89:599.322/324:502.7(478) (CAB Abstracts, EBSCO).

3.3. Articles in journals from the National Register of professional magazines (indicating the category)

1. ERHAN, D., TODERAȘ, I., **RUSU, Ş.,** ZAMORNEA, M. Diversitatea parazitofaunei Zimbrilor din Rezervaţia Naturală „Pădurea Domnească" şi animalelor domestice din zona adiacentă. *Buletinul Academiei de Ştiinţe a Moldovei*. *Ştiinţele vieţii*. 2014, nr. 1 (322), 103-111. ISSN 1857 064X. **Categoria B.**
https://ibn.idsi.md/sites/default/files/j_nr_file/1.2014_1.pdf
2. **RUSU, Ş.** Diversitatea parazitofaunei la mistreți din Rezervația Naturală „Plaiul Fagului" din Republica Moldova. Revista *Studia Universitatis Moldaviae.* Seria „Ştiinţe reale şi ale naturii", Biologie**.** 2020, №1 (131), p.149-155. ISSN 1814-3237. **Categoria C.** http://doi.org/10.5281/zenodo.3954021
3. **RUSU, Ş.** Parasitic fauna in wild boars from the reservation "Codrii", Republic of Moldova. Buletinul AŞM. Ştiinţele vieţii. Nr. 1(340) 2020. P.118-126. ISSN 1857 – 064 X. **Categoria B.**
4. **RUSU, Ş.** The diversity of the pheasant parasitofauna from various natural and anthropized biotopes of the Republic of Moldova. Buletinul AŞM. Ştiinţele vieţii. Nr. 2(341) 2020. P.108-118. ISSN 1857 – 064 X. **Categoria B.**
https://ibn.idsi.md/sites/default/files/j_nr_file/ultim%20variantBu.%20ASM%20Ştiinţele%20vieţii%202-2020%20(2).pdf
5. **RUSU, Ş**. Variaţia unor indici morfofiziologici la bovinele poliparazitate şi cu variat tip de stresreactivitate la influenţa unor factori stresogeni. Buletinul ştiinţific al Muzeului

Naţional de Etnografie şi Istorie Naturală a Moldovei Volumul 16 (29) Chişinău, 2012, p. 70-74. ISSN 1857-0054. **Categoria C.**

6. **RUSU, Ş.,** ERHAN, D., CHIHAI, O., MELNIC, G., ZAMORNEA, M., BUZA V. // Efectul preparatelor antiparazitare *Avomec, Valbazen, Brovitacoccid* în tratamentul bovinelor poliparazitate cu variat tip de reactivitate // Analele Ştiinţifice ale Universităţii de Stat din Moldova. Chişinău - 2006. - P. 139. ISSN 1811-2617. **Categoria C.**
7. **RUSU, Ş.,** ERHAN, D., PAVALIUC, P., CHIHAI, O., ANGHEL, T. Influenţa factorilor stresogeni, în funcţie de reactivitate şi vârstă, asupra unor indici ai statusului morfofuncţional la bovine. // Revista ştiinţifică. Analele Ştiinţifice ale Universităţii de Stat din Moldova. Chişinău - Nr.2/2008. P.129-132. ISSN 1857-1735. **Categoria C.** https://ibn.idsi.md/sites/default/files/imag_file/28%20Influenta%20factorilor%20stresogeni.pdf https://natural.studiamsu.md/wp-content/uploads/2022/01/28-p129-132.pdf
8. **RUSU, Ş.,** ERHAN, D., PAVALIUC, P., CHIHAI, O., ANGHEL, T. Influenţa factorilor stresogeni, în funcţie de reactivitate şi vârstă, asupra unor indici ai statutului morfofuncţional la bovine. Chişinău. Revista ştiinţifică „Studia Universitatis", 2008, p. 126-129. ISSN 1857-1735. **Categoria C.**
9. **RUSU, Ş.,** ERHAN, D., PAVALIUC, P., CHIHAI, O., STRATAN, N., ANGHEL, T. Unii indici morfofuncţionali şi productivi la tineretul bovin selectat după tipul de reactivitate // Revista ştiinţifică. Analele Ştiinţifice ale Universităţii de Stat din Moldova. Chişinău- Nr.1/2007. P.19-23. ISSN 1857-1735. **Categoria C.**
10. **RUSU, Ş.,** ERHAN, D., SAVIN, A., ZAMORNEA, M., CHIHAI, O., GHERASIM, E., GOLOGAN, I., CHIHAI, N., PRUTEANU, M., ANGHEL, T., RUSU, V. Măsuri inovative de diminuare și combatere a parazitozelor la cervide în Republica Moldova //Buletinul Academiei de Ştiinţe a Moldovei. Ştiinţele vieţii. 2018, 3 (336), p. 125-130. ISSN 1857-064X. **Categoria B.** https://ibn.idsi.md/sites/default/files/imag_file/125-130_4.pdf
11. **RUSU, Ş.,** ERHAN, D., TODERAŞ, I., ZAMORNEA, M., GOLOGAN, I., RUSU, V. Particularitățile bioecologice și răspândirea insectelor hematofage invazive din familia Hippoboscidae (Diptera) la animale din Republica Moldova // Buletinul Academiei de Ştiinţe a Moldovei. Ştiinţele vieţii. 2021, № 1 (341). ISBN 978- 9975-157-82-7. **Categoria B.**https://doi.org/10.52388/1857-064X.2021.1.10
12. **RUSU, Ş.,** ERHAN, D., TODERAŞ, I., ZAMORNEA, M., RUSU, V., MELNIC, G., GOLOGAN, I. Evaluarea impactului mono- şi poliinvaziilor asupra unor indici morfofuncţionali la mistreţi (*sus scrofa*). *Studia Universitatis Moldaviae, 2022,* nr.1(151), *Seria „Ştiinţe Reale şi ale Naturii",* ISSN 1814-3237 ISSN online 1857-498X p. 56-65. **Categoria C.** https://doi.org/10.5281/zenodo.6695130.
13. **RUSU, Ş.,** ERHAN, D., ZAMORNEA, M., CHIHAI, O., SAVIN, A., CILIPIC, G., PRUTEANU, M., ANGHEL, T., BUZA, V. Extensivitatea invaziei şi asociaţiile poliparazitare la cervide din Rezervaţia Ştiinţifică "Plaiul Fagului". *Buletinul Academiei de Ştiinţe a Moldovei. Ştiinţele vieţii*. 2014, nr. 2 (323), 134-142. ISSN 1857-064X. **Categoria B.**
14. **RUSU, Ş.,** ERHAN, D., ZAMORNEA, M., CHIHAI, O., SAVIN, A., GHERASIM, E., MELNIC, G., BUZA, V., PRUTEANU, M., ANGHEL, T. Fauna poliparazitară a mamiferelor sălbatice din Rezervaţia Naturală "Codrii" din Republica Moldova //Revista *Studia Universitatis Moldaviae.* Seria Ştiinţe ale naturii, Biologie**.** 2015, № 6 (86), p.68-72. ISSN 1814-3237. **Categoria C.** https://oaji.net/articles/2016/2052-1455188140.pdf
15. **RUSU, Ş.,** ZAMORNEA, M., ERHAN, D., TODERAŞ, I., BOTNARU, N., RUSU, V., MELNIC, G. Endoparazitofauna la galinacee din Zona de Centru a Republicii

Moldova. *Studia Universitatis Moldaviae, 2022*, nr.2, *Seria „Științe Reale și ale Naturii”* ISSN 1814-3237 ISSN online 1857-498X p.87-92. **Categoria C.** https://doi.org/10.5281/zenodo.7442578.

16. **RUSU, Ș.,** ZAMORNEA, M., ERHAN, D.,CHIHAI, O., GOLOGAN, I., BOTNARU, N., ANDONI, C., RUSU, V., CHIHAI N., PORCESCU, M. Parazitofauna păsărilor domestice întreţinute în sistem de exploatare tradiţional din zona de centru a Republicii Moldova. Studia Universitatis Moldaviae, 2020, nr. 6 (136), „Seria Științe reale și ale naturii”, P.27-32, ISSN 1814-3237. ISSN online 1857-498X. **Categoria C.** http://doi.org/10.5281/zenodo.4431483
17. TODERAȘ, I., ZAMORNEA, M., **RUSU, Ș.,** ERHAN, D., SAVIN, A., CHIHAI, O., GLIGA, O., BOTNARU, N., GOLOGAN, I., PORCESCU, M. Cuantificarea unor indici biochimici și productivi la fazanii infestați cu ectoparaziți. În: Buletinul Academiei de Științe a Moldovei 2(338), Chișinău, 2019. p.112-117. ISSN 1857-04X **Categoria B.** https://ibn.idsi.md/sites/default/files/imag_file/112-117_3.pdf
18. ZAMORNEA, M., ERHAN, D., **RUSU, Ș.** Parazitofauna la iepurele-de-câmp (*Lepus europaeus* Pallas, 1778) din Zona de Nord a Republicii Moldova. *Buletinul Academiei de Ştiinţe a Moldovei. Ştiinţele vieţii.* Nr2(346) 2022 p.48-53. ISSN 1857-064X. **Categoria B.** DOI: https://doi.org/10.52388/1857-064X.2022.2.05

4. Articles in the international digests:

1. BUZA, V., ERHAN, D., ENCIU, V., RUSU, Ș., CHIHAI, O., MELNIC, G., SEROTILĂ, P. Utilizarea imunomodulatoarelor în tratamentul bovinelor poliparazitate // Revista română de parazitologie Vol. VII, 2002, pag. 114. ISSN 1221-1796.
2. CHIHAI, O., TODERAȘ, I., ERHAN, D., **RUSU, Ș.,** TĂLĂMBUŢĂ, N., NISTREANU, V., LARION, A., ZAMORNEA, M., MELNIC, G., NAFORNIȚĂ, N. Epidemiology of Plagiorchis elegans in small rodents from wet and dry biotopes of the Republic of Moldova// Sci Parasitol 21(3) June 2020 p. 120-130. ISSN 1582-136. http://www.zooparaz.net/scientia/2020_21_03/SP3-2020-120-130-Chihai.pdf
3. CHIHAI, O., ERHAN, D., BUZA, V., **RUSU, Ş.,** MELNIC, G., ZAMORNEA, M., ANGHEL, T. Imonodeficiency in bovine as consequence of polyparasite and drug factors. Xth European Multicolloquium of Parasitology Program. Paris, august 24-29, 2008, p. 156. ISBN 887587459X, 9788875874599
4. CHIHAI, O., ERHAN, D., **RUSU, Ş.,** TĂLĂMBUŢA, N., MELNIC, G., ZAMORNEA, M., ANGHEL, T., MUNTEANU, M. Antiparasite chemotherapy – supressing factor of cell immunity in bovine. Al 7-lea Simpozion Internaţional „Perspective ale agriculturii mileniului III”. Cluj-Napoca, 2-4 octombrie, 2008. p. 221-223. https://doi.org/10.15835/buasvmcn-vm:65:2:1519
5. ERHAN D., **RUSU Ş.,** CHIHAI O. Răspândirea poliparazitizmului la bovine în Republica Moldova // Revista Română de Parazitologie Vol. XIV, 2004, pag. 130-131. ISSN 1221-1796
6. ERHAN, D., CHIHAI, O., MELNIC, G., **RUSU, Ş.,** BUZA, V., ANGHEL, T. Index of parasitic impact upon the physiologic indices in bovines. În: *Scientific symposium „Progresses and perspectives in veterinary medicine” 10-11 june 2010*. Iaşi, 2010, 53(12), p. 683-687. ISSN: 1454-7406. https://www.uaiasi.ro/revmvis/index_htm_files/vol_53_2010-3.pdf
7. ERHAN, D., CHIHAI, O., **RUSU, Ş.,** BUZA V. Incidenţa unor parazitoze la bovine în Republica Moldova. Al X –lea Simpozion Naţional de buiatrie cu participare internaţională. Revista Română de Parazitologie. Vol.17 Nr.2.-2007.P. 81. ISSN 1221-1796.

8. ERHAN, D., RUSU, Ș., BUZA, V., ENCIU, V. Variația unor indici biochimici și hematologici la bovinele poliparazitate și cu variat tip de reactivitate la stres după tratamentul antiparazitar. Revista Română de parazitologie Vol. XIII, 2003, pag. 130-131. ISSN 1221-1796
9. ERHAN, D., **RUSU, Ş.,** CHIHAI, O., BUZA, V., ZAMORNEA, M., GHERASIM, E., ANGHEL, T. The impact of parasitosis on the result of the allergic test for detecting tuberculosis in bovines. The 24th International Congress of the hungarian association for buiatrics „Impact of periparturient diseases on productivity". Hunguest Hotel Béke, Hajdúszoboszló, October 15-18. 2014, 253-254. ISBN 978-963-87942-7-7.
10. ERHAN, D., RUSU, Ș., MELNIC, G. Unii indici productivi la bovine cu reactivitate variată la stres. Al XII-lea Simpozion Naţional de Parazitologie cu participare Internaţională, 4-5 octombrie 2002, Galaţi. Revista Română de Parazitologie. 2002, vol. XII, №2, p.84-85. ISSN 1221-1796
11. ERHAN, D., **RUSU, Ş.,** PAVALIUC, P., CHIHAI O. Corelaţia dintre reactivitatea organismului şi nivelul de infestare parazitară la bovine. Revista Română de Parazitologie, Vol. XVII, supliment 2007, P. 82. ISSN 1221-1796.
12. ERHAN, D., **RUSU, Ş.,** PAVALIUC, P., CHIHAI, O., ZAMORNEA, M., BUZA, V., ANGHEL, T., CILIPIC, G. Epidemiology of dicroceliosis and changes in some chemical indices of muscular tissue and liver of cattle in the Republic of Moldova. În: *Culegerea Facultăţii de Medicină Veterinară Iaşi consacrată jubileului „50 de ani de învăţământ medical veterinar la Iaşi",,Lucrări ştiinţifice, vol. 54 (13), Medicină Veterinară, Nr.1*. Iaşi: Editura „Ion Ionescu de la Brad", 2011, p. 143-149. ISSN: 1454-7406. https://www.uaiasi.ro/revmvis/index_htm_files/vol_54_2011-1.pdf
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ANNOTATION (ROMANIAN)

RUSU Ștefan „Parazitofauna, impactul parazitozelor asupra speciilor de importanţă cinegetică, profilaxia și tratamentul”, teză de doctor habilitat în științe biologice, Chișinău, 2023.

Structura tezei: introducere, șase capitole, concluzii generale și recomandări practice, bibliografia din 374 de titluri, 43 de anexe, 239 de pagini text de bază, 47 de figuri, 57 de tabele. Rezultatele obținute sunt publicate în 137 de lucrări ştiinţifice.

Cuvinte-cheie: mono-, poliinvazii, fauna cinegetică, zooantroponoze, impact parazitar, indici productivi, procedee inovative, profilaxie, tratament.

Scopul lucrării: Elaborarea și fundamentarea științifico - practică a metodologiilor conceptual - strategice inovative de diagnostic, profilaxie și tratament a parazitozelor la speciile de animale de importanță cinegetică.

Obiectivele cercetării: Efectuarea unor cercetări fundamentale privind stabilirea componenței parazitofaunei la speciile de importanță cinegetică din diverse biotopuri naturale și antropizate ale Republicii Moldova; evaluarea gradului de infestare și evidențierea statusului morfo-funcţional şi curativ la cervide cu variat tip de reactivitate la stres; stabilirea și determinarea impactului mono- şi poliinvaziilor asupra unor indici ai statusului morfo-funcţional şi biochimic la speciile de importanţă cinegetică; estimarea și evaluarea impactului mono- şi poliinvaziilor asupra unor indici productivi la speciile principale de importanţă cinegetică; elaborarea și implementarea metodologiilor și procedeelor inovative de diagnostic, profilaxie şi combatere a parazitozelor la speciile principale de importanță cinegetică.

Noutatea şi originalitatea ştiinţifică: Pentru prima dată, în Republica Moldova, a fost abordată și soluționată o problemă științifico-practică complexă exprimată prin: stabilirea componenței parazitofaunei la speciile de importanță cinegetică; relevarea nivelului de infestare, aprecierea statutului morfo-funcţional şi curativ la cervide cu variat tip de reactivitate la stres; evaluarea impactului mono- şi poliinvaziilor asupra unor indici morfo-funcţionali, biochimici, productivi și curativi; elaborarea, brevetarea și implementarea unor noi metodologii și procedee moderne, înalt eficace în profilaxia și tratamentul parazitozelor la speciile de importanţă cinegetică.

Rezultatele principale: S-a stabilit nivelul infestării, rolul speciilor de importanţă cinegetică în formarea, menţinerea și răspândirea celor mai periculoase zooinvazii la animalele sălbatice, domestice şi om. S-a determinat impactul mono- și poliinvaziilor asupra organismului-gazdă. Pentru prima dată a fost elaborat, brevetat și implementat în practică un nou procedeu de apreciere a sensibilităţii cervidelor la factorii de stres, ce ar avea drept scop formarea șeptelurilor de animale cu o rezistență majoră la infestarea cu agenți parazitari și cu o eficacitate terapeutică antiparazitară înaltă.

Semnificația teoretică: Pentru prima dată a fost abordată și soluționată o problemă interdisciplinară majoră a domeniului medical veterinar din Republica Moldova, ce a pus în evidență rezultatul acțiunii asupra organismului-gazdă a mono-, poliinvaziilor și a terapiei antiparazitare, s-a determinat impactul acestora asupra siguranței alimentare, stabilită specificitatea paraziților față de organismul gazdă, evidențiate cele mai periculoase zooinvazii pentru om și animale, identificate, brevetate și implementate metodologii și procedee inovative de diagnostic, profilaxie și combatere a parazitozelor la animale din fauna cinegetică.

Valoarea aplicativă: În baza rezultatelor obținute s-au elaborat și editat peste 137 lucrări științifice inclusiv patru monografii, un Ghid metodologic, 13 brevete de invenție și cca 32 acte de implementare atât a metodologiilor inovative de diagnostic, profilaxie și combatere a parazitozelor la animale, cât și a procedeelor avansate de diminuare și redresare a prejudiciilor economice în sectorul cinegetic și zooveterinar, esenţiale pentru selecția cervidelor rezistente la invaziile parazitare și cu un potențial curativ înalt.

Implementarea rezultatelor ştiinţifice: S-au elaborat și implementat în practică procedee inovative de diagnostic, profilaxie şi combatere a parazitozelor la speciile principale de importanţă cinegetică din cele mai importante habitate ale Republicii Moldova.

ANNOTATION (RUSSIAN)

РУСУ Штефан „Паразитофауна, влияние паразитозов на виды охотничьего значения, профилактика и лечение”, диссертация доктора хабилитат, Кишинэу, 2023.

Структура диссертации: введение, 6 глав, общие выводы и рекомендации, библиография из 374 источников, 43 приложения, 239 страниц основного текста, 47 рисунков, 57 таблиц. Полученные результаты опубликованы в 137 научных работах.

Ключевые слова: моно-/полиинвазии, фауна охотничьего интереса, зооантропонозы, паразитарное влияние, показатели продуктивности, инновационные процедуры, профилактика, лечение.

Цель работы: Разработка и научно - практическое обоснование концептуально-стратегических и инновационных методологий по диагностике, профилактике и лечению паразитозов у животных охотничьего интереса.

Цели исследования: Выявление состава паразитарной фауны у животных охотничьего интереса; определение уровня заражения, морфо-функционального и реабилитационного состояния оленьих с различными типами стрессореактивности; оценка влияния моно-/полиинвазий на морфо-функциональные, биохимические показатели и разработка инновационных процедур профилактики и борьбы с паразитозами.

Научная новизна и оригинальность: Впервые для Республики Молдова была определена и разрешена комплексная проблема научно-практического характера посредством: определения паразитофауны животных охотничьего интереса; оценки морфо-функционального и реабилитационного статуса оленьих с различными видами стрессореактивности, влияния моно-/полиинвазий на морфо-функциональные, биохимические показатели и продуктивность; разработки, патентования и внедрения новых эффективных методологий профилактики и борьбы с паразитозами животных охотничьего интереса.

Основные результаты: Были определены уровень заражённости и роль животных охотничьего интереса в формировании и распространении самых опасных зооинвазий у диких, домашних животных и человека. Было определено влияние моно- и полиинвазий на организм хозяина. Впервые была разработана, запатентована и внедрена на практике процедура определения устойчивости оленей к факторам стресса, нацеленной на формирование поголовья животных с повышенной устойчивостью к заражению паразитами, имеющая также высокую терапевтическую эффективность.

Теоретическая значимость: Впервые была рассмотрена и разрешена значимая междисциплинарная проблема в области ветеринарной медицины Республики Молдова, выявившая результат воздействия на организм хозяина моно-/полиинвазий и антипаразитарного лечения; влияние на продовольственную безопасность; специфичность паразитов в отношениях с организмом хозяина; наиболее опасные зооинвазии для человека и животных охотничьего интереса. Были запатентованы и внедрены инновационные методики и процедуры диагностики, профилактики и борьбы с паразитозами данных животных.

Прикладное значение работы: По полученным результатам разработаны более 137 научных работ, в том числе четыре монографии и методическое пособие, 13 патентов и более 32 протоколов о внедрении инновационных методик диагностики, профилактики и борьбы с паразитозами животных, обладающих высоким лечебным потенциалом, а также продвинутые процедуры по снижению экономических потерь в охотничьем и зооветеринарном секторе и по селекции оленьих, устойчивых к паразитарным инвазиям.

Внедрение научных результатов: Были разработаны и внедрены на практике инновационные методики диагностики, профилактики и борьбы с паразитозами основных видов животных охотничьего интереса из наиважнейших биотопов Республики Молдова.

ANNOTATION (ENGLISH)

RUSU Stefan „Parasitofauna, the impact of parasitosis on species of the hunting importance, prophylaxis and treatment”. Thesis of doctor habilitatus in biologic sciences, Chisinau, 2023.

Thesis structure: introduction, six chapters, general conclusions and recommendations, bibliography of 374 sources, 43 annexes, 239 pages of basic text, 47 figures and 57 tables. The obtained results have been published in 137 scientific works.

Keywords: mono-, poliinvasions, fauna of the hunting interest, zooanthroponosis, parasitic impact, productivity indices, innovative procedures, prophylactics, treatment.

Aim: Elaboration and scientific - practical establishment of the conceptually strategic and innovative methodologies of diagnostics, prophylaxis and treatment of parasitosis in animals of the hunting interest.

Research target interests: Determining the componence of the parasitic fauna in the main species of the hunting importance in Moldova; evaluating the level of infestation, morpho-functional and rehabilitation status in cervids with various types of reactivity to stress; establishing the impact of mono- and poli invasions on some indices of morpho-functional, productivity and biochemical status; elaboration of the innovative procedures of prophylactics and control of the parasitizes in the main species of animals of the hunting interest.

Scientific novelty and originality: For the first time in the Republic of Moldova, the complex issue of the scientific and practical character was addressed through determining the parasitic fauna in species of the hunting interest; establishing the correlations between the level of infestation, morpho-functional and rehabilitation status of cervids with various types of reactivity to stress; evaluating the impact of mono- and poli invasions on some morpho-functional, biochemic, rehabilitation indices and productivity as well as through developing, patenting and implementing of the innovative efficient procedures of prophylactics and control of parasitizes in the main species of animals of the hunting interest.

The main results obtained: There was determined the role of animal species of the hunting interest in initiating, maintaining and spreading out of the most dangerous zoo invasions in the wild, domestic animals and humans. The impact of mono- and poli invasions on the body of the host animals was also determined. For the first time, the procedure of determining the sensibility of cervids to stress factors has been developed, patented and implemented into the practice, aimed at shaping the board of animals with the increased resistance to infestation with parasites and with a high therapeutic antiparasitic efficiency.

The theoretical significance: For the first time, the significant inter-disciplinary issue in the veterinary medicine field of the Republic of Moldova has been addressed, allowing to establish the impact of the mono- and poliinvasions on the host animals, food security and of the antiparasitic treatment; the specificity of the parasitic impact on the host organism and of the most dangerous zooinvasions on humans and animals. The innovative methodologies and procedures for diagnosis, prophylaxis and combating parasitosis in the animals of the hunting interest have been elaborated, patented and implemented into practice.

The application value: Based on the results obtained, more than 137 scientific works were elaborated including four monographs and a methodological guide, 13 invention patents obtained and more than 32 protocols on implementing both innovative methodologies for animal parasitosis diagnosis, prophylaxis and control as well as advanced procedures to attenuate economic losses in the hunting and zoo-veterinary sectors have been elaborated, useful also for the selection of cervids resistant to parasitic invasions and with a high curative potential.

Implementation of the scientific results: The innovative procedures for the diagnosis, prophylactics and control of parasitizes in the main species of the animals of the hunting interest from their major habitats in the Republic of Moldova have been developed and implemented into the practice.

RUSU STEFAN

PARASITOFAUNA, THE IMPACT OF PARASITOSIS ON SPECIES OF HUNTING IMPORTANCE, PROPHYLAXIS AND TREATMENT

165.05 - PARASITOLOGY

Abstract of the Thesis of the Doctor Habilitatus in Biological Science

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