



Parasitic dermatitis in dogs: A literature review of clinical and diagnostic aspects and treatment approaches

Mykola Vovk*

Postgraduate Student

Polissia National University

10008, 7 Stary Blvd., Zhytomyr, Ukraine

<https://orcid.org/0009-0003-3804-9459>

Svitlana Hural'ska

Doctor of Veterinary Sciences, Professor

Polissia National University

10008, 7 Stary Blvd., Zhytomyr, Ukraine

<https://orcid.org/0000-0001-7383-1989>

Abstract. Parasitic dermatitis in dogs continues to be one of the most common and clinically relevant problems in modern veterinary practice due to its high incidence and considerable influence on animal health status. This study aimed to summarise current data on the prevalence, aetiology, pathogenesis, clinical manifestations, diagnosis, and treatment of dermatitis of parasitic origin in dogs. The study employed methods of analysis and synthesis of scientific literature sources. Parasitic dermatitis was found to have a polyetiological and multifactorial nature and to be most commonly caused by ectoparasites, particularly fleas, lice, chewing lice, and mites. The leading position in the general structure of the disease was taken by flea allergy dermatitis, and acariases, which are of considerable importance due to their high communicability and propensity for a chronic course, play an important role. Clinical signs were non-specific and manifested as pruritus, erythema, alopecia, crusts and scales, and the development of complications related to the development of secondary bacterial and fungal infection, which complicated the differential diagnosis. Laboratory methods for the detection and identification of pathogens using microscopic, serological and molecular genetic methods proved to be one of the main stages in making a diagnosis. Current treatment methods are based on the use of insectoacaricidal drugs, in particular, isoxazolines and macrocyclic lactones, as well as the control of secondary complications and the implementation of preventive measures. The practical value of this study is the systematisation of

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*Corresponding author (vovkkoly@gmail.com)



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current scientific approaches to the diagnosis, treatment and prevention of parasitic dermatitis in dogs in order to improve the efficiency of veterinary practice

Keywords: ectoparasites; allergic skin reactions; pathogenesis; diagnosis; insectoacaricidal therapy; secondary infections

Introduction

Skin parasitic lesions in dogs are still among the most important problems in modern veterinary practice due to the high prevalence, diagnostic problems and their high economic impact on owners and impact on animal health and welfare. The significance of the problem is not only the high incidence of parasitic dermatoses, but also the growing incidence in the conditions of urbanisation, the increase in the number of companion animals and the spread of ectoparasites. A significant point is the risk of infection of other people with some parasites and their potential zoonotic risk, which makes them a significant place among veterinary patients in the concept of One Health.

Currently, the problems of parasitic dermatitis and methods of their analysis are being widely studied, but approaches to determining its prevalence, pathogenesis, and methods of control are different. According to the research of N.G. Agu *et al.* (2020) on the prevalence of ectoparasites among companion animals, flea and mite damage are the most common forms of parasitic lesions, which are associated with animal living conditions, as well as the quality of veterinary care. The leading risk factor for the development of such complications is identified as the lack of systematic preventive actions against parasitic dermatoses.

Dermatitis of parasitic origin was found to be in high numbers among small animal dermatoses in a study on the monitoring of dermatological disease in Ukraine by A.Y. Bogdanova *et al.* (2024). The authors reported the high incidence of allergic parasitic dermatitis,

particularly flea allergy dermatitis, which occurs more often in the presence of high sensitisation of the organism to pathogen antigens. International studies likewise confirm the dominant role of ectoparasites in the structure of dermatological diseases. Specifically, H.A. Zineldar *et al.* (2023) found that the symptoms of parasitic skin infections vary significantly, while the progression of the condition is determined by the parasite species, the degree of infestation, and the animal's immune system. In their opinion, these non-specific clinical signs can make diagnosis more difficult and require laboratory testing to verify results. B.C.F. Nogueira *et al.* (2023) looked at the mechanisms underlying the development of parasitic dermatitis, noting that ectoparasites affect not only the integumentary system but also the homeostasis of the organism as a whole, including haematological indicators and immunity. Thus, they concluded that the pathological process has a systemic character and that a comprehensive approach to treatment is required.

P. Thomson *et al.* (2023) looked at the role of mites in the genesis of dermatopathies in dogs and noted that although acariases, which include sarcoptic mange and demodicosis, are characterised by distinct pathogeneses, they are both characterised by the potential for chronic inflammation and the subsequent development of infections. The authors highlight the importance of distinguishing between different types of dermatitis. M. Ilie *et al.* (2021) outlined the modern approaches to diagnosing parasitic skin diseases, giving specific attention

to molecular-genetic methods. In their analysis, the use of PCR allows one to determine the causative agent more accurately and to differentiate between parasitic dermatitis and other dermatoses. Data published between 2020 and 2025 confirm that the majority of parasitic dermatitis cases were caused by bites from fleas, which resulted in flea allergy dermatitis. Its prevalence can range from 60% to 70% depending on the climatic zone, the effectiveness of preventive measures, and the number of dogs in the population. Veterinary clinics' statistical data indicate that the frequency of parasitic dermatitis in dogs is the greatest among all recorded types of dermatoses, accounting for half of the registered cases (Tadesse *et al.*, 2019).

The dynamics of the prevalence of parasitic diseases are influenced by the geographical and climatic conditions of the area. In general, systematic reviews and meta-analyses showed that in tropical and subtropical countries, a high rate of infestation is typical due to the favourable environmental conditions for the development of the parasites and their vectors, which are high temperatures, high humidity, and a large population of stray animals (Dantas-Torres *et al.*, 2020). In temperate climatic conditions, however, mainly in the northern regions of Europe, the indicators were lower (Baneth *et al.*, 2016). Simultaneously, a marked difference can be noticed even on the territory of Europe: the occurrence of individual types of parasitic infection in Mediterranean countries can be high, while in the central and northern parts – relatively low. In the tropics, in connection with the permanent infection of animals with many types of parasites, the intensity and variety of infestations are higher on average. At the same time, the results of local epizootiological studies reveal significant variation in the occurrence rate even within the borders of individual territories. For example, according to the research of E. Lara-Reyes *et al.* (2021), the occurrence of endoparasites in dogs was 37.2%,

while ectoparasites was 13.1%, which proves the importance of the region and living conditions of the dog on the infestation rate.

In Ukraine, like in many other regions, flea dermatitis accounts for more than half of all reported cases, which highlights the need for preventive activities. This highlights the need for systematic prevention. The spread of parasites and the problem on a global scale is supported by the following factors: the growth of urbanisation, the density of dogs in cities, their migration between regions, and the lack of regular use or lack of antiparasitic drugs at all (Derevianchenko & Petrov, 2023). Also, other ectoparasites of insects and mites can be aetiological agents. Among insects, second in prevalence is the dog chewing louse, among the mites – the causative agents of mange are fairly widespread.

Thus, parasitic dermatitis in dogs is a serious and widespread veterinary disease of global importance, which has a considerable impact on the health of animals. The high prevalence of the disease, different aetiologies of the lesions, a wide range of clinical manifestations, dependence on environmental and social factors, indicate the need for systematic prevention, further diagnostics, and the development of effective treatment for the disease. At the same time, current scientific data on the relationship between the species composition of ectoparasites, the mechanism of the appearance of skin lesions and the variability of clinical manifestations in dogs is not sufficiently systematised, which makes it more difficult to establish timely diagnosis and choice of effective therapy. This scientific gap determined the need for the present study.

This study aimed to systematise and critically analyse current scientific information on the aetiological structure, mechanism of development, clinical course, diagnostic and treatment of parasitic skin lesions in dogs, as well as to identify modern problems and prospects for

improving their prevention in veterinary practice in current conditions. To achieve the stated aim, the following objectives were set: to study scientific literature on the prevalence and aetiology of parasitic skin lesions in dogs, to systematise scientific data on the pathogenesis of the formation of skin parasitic lesions, and to describe the main clinical signs, considering their variability and significance for diagnosing skin parasitic lesions in dogs.

The study was conducted in the form of a narrative review of scientific literature devoted to parasitic dermatitis in dogs. A search for scientific literature was conducted in the databases: Scopus, Web of Science, PubMed, Google Scholar, and ScienceDirect in the time interval 2020-2025. The search utilised keywords and combinations thereof in English and Ukrainian: "parasitic dermatitis in dogs", "ectoparasites", "canine demodicosis", "sarcoptic mange", "flea allergic dermatitis", "dog skin parasites". The review includes peer-reviewed scientific articles, clinical and experimental research, systematic reviews, and some monographs in which the etiopathogenesis, clinical manifestations, diagnosis, and treatment of parasitic dermatitis in dogs are discussed. Conference abstracts, non-peer-reviewed publications, sources of insufficient evidence, duplicate sources, as well as those that did not meet the criteria of the topic and those whose data were no longer relevant were excluded. In the process of the analysis, the information contained in over 130 sources was considered, among which 54 of the most pertinent studies were chosen to form the review as a result of applying the criteria of source selection. The results were processed by the methods of thematic, comparative, and systematic analysis, which made it possible to summarise up-to-date approaches to the study of parasitic dermatitis in dogs and points of contention regarding the interpretation of the mechanisms underlying the

development, diagnosis and treatment of these conditions.

Theoretical foundations and etiopathogenesis of parasitic dermatitis in dogs

The multifactorial nature of parasitic dermatitis should be considered from the standpoint of various fields of science, such as veterinary dermatology, parasitology, and immunology. As noted by J. Miller *et al.* (2023), these conditions result from a complex interaction of parasite and host organism, in which skin barrier status and immune response play a major role. A.Y. Bogdanova *et al.* (2024) also emphasises that parasitic diseases are one of the leading ones in terms of the structure of dermatological diseases in small animals. Consequently, contemporary studies consider parasitic dermatitis not merely as a local skin disorder, but as a systemic process with an immunopathological component. Parasitic dermatitis in dogs belongs to a group of polyetiological diseases with the causative agents of ectoparasites of the phylum Arthropoda Gravenhorst, 1843, and belong to the classes Insecta Linnaeus, 1758 and Arachnida Lamarck, 1801 (subclass Acari Leach, 1817). The greatest veterinary importance among them belongs to insects: fleas and chewing lice, among mites – the causative agents of sarcoptic mange, demodicosis, and otodectic mange. The biological and ecological features of these parasites that influence the mechanism of transmission, the nature of localisation of lesions, the degree of contagiousness and clinical features are the focus of research attention in recent years. A. Prohic (2024) noted that the classification of parasitic dermatitis should take into account not only the parasite species but also the nature of its interaction with the host organism, the duration of parasitism, and the depth of skin involvement. According to current approaches,

parasitic dermatitis is divided into entomoses and acariases. These diseases are categorised based on the taxonomic group of the parasite, the specific area of parasitisation, the nature of the dermatological lesion, and the mechanism of pathogenic activity. Consequently, parasitic dermatitis is considered a large group of diseases that have high economic significance for veterinary practice. They require a systematic approach to diagnosis, treatment, and prevention, and represent one of the main problems of veterinary dermatology today.

According to B.C.F. Nogueira *et al.* (2023), ectoparasites cause harm in dogs due to mechanical action, the development of an allergic reaction, or the occurrence of a favourable condition for secondary microflora. Analysing these mechanisms, H.A. Zineldar *et al.* (2023) emphasised that the nature of disease progression depends on the parasite species, its biological characteristics, and the immune reactivity of the dog's organism. A similar view was expressed by V. Yevstafieva *et al.* (2024), who highlighted the role of sensitisation in the development of chronic forms of the disease. In turn, A.E.C. Cardoso *et al.* (2020) demonstrated that the nature of the inflammatory response is largely determined by the type of exudate and the depth of tissue involvement. Thus, the key pathogenic factor is not merely the presence of the parasite, but also the individual response of the host organism.

Entomoses include dermatitis caused by insects. In dogs, flea allergy dermatitis and trichodectosis are recorded most frequently. Flea allergy dermatitis is a result of the impact of fleas (*Ctenocephalides canis* Curtis, 1826, *C. felis* Bouché, 1835). Flea saliva contains a complex of biological substances that consist of enzymes, anticoagulants, and haptens, which cause both immediate and delayed hypersensitivity in dogs, accompanied by pruritus, erythema, oedema, and excoriations.

With repeated bites, sensitisation increases and causes a chronic process in the disease; the disease progresses with the occurrence of bacterial or fungal infection. This disease is seasonal and is characterised by high activity in summer and autumn, while acariases follows a constant course (Lara-Reyes *et al.*, 2021; Authoy *et al.*, 2023). According to L. Cornegliani *et al.* (2024), a single flea bite can cause a strong manifestation of hypersensitivity, which leads to the development of severe itching and inflammation. The cause of the development of this disease is related to the effect of the parasites' saliva components, antigens, which stimulate the activation of all stages of immune responses. In addition, Y. Ali *et al.* (2020) and Y.T.H. Nguyen *et al.* (2025) drew attention to the role of the neurogenic component in sustaining pruritus, which leads to mechanical damage to the skin. Thus, flea allergy dermatitis represents an example of a pathology in which an immunological mechanism predominates.

Trichodectosis is caused by chewing lice (*Trichodectes canis*, De Geer, 1818), which live permanently on the body of the dog. They feed on epidermal scales and skin secretions. As noted by J. Guillot & R. Bond (2020), the condition is manifested by severe pruritus, hair loss, dryness, and scaling of the skin. At the same time, L.C. Panait *et al.* (2025) emphasised that prolonged parasitism maintains chronic inflammation, which may be complicated by pyoderma and fungal infections. Areas affected by these diseases become a source of unpleasant sensations in the animal and lead to deterioration in the appearance in chronic disease forms. A comparison of these data indicates that, in entomoses, the severity of lesions is determined by the duration of infestation and housing conditions. Acariases are a type of dermatitis caused by mites. They are characterised by high contagiousity, a tendency towards chronicity, and a significant impact on the overall

condition of the animal. Among them are sarcoptic mange, demodicosis, and otodectic mange. Sarcoptic mange is caused by the mite *Sarcoptes scabiei* var. *Canis* Linnaeus, 1758. It burrows tunnels within the stratum corneum of the skin, resulting in intense pruritus, erythema, crust formation, and alopecia. Parasitisation for a long time in an animal is a condition that leads to sensitisation and to the occurrence of a chronic form of the disease. This process often involves secondary microflora infection and aggravates the condition. F. Moog *et al.* (2021) described sarcoptic mange as a contagious disease that is accompanied by a significant increase in pruritus and a rapid spread in animal groups, as well as a high degree of contagiousness of the parasite. In severe cases, it is associated with symptoms of intoxication and general weakness in dogs.

Demodicosis arises from *Demodex* Leydig, 1859 mites, which reside in hair follicles and sebaceous glands. The animals may be carriers of these mites for quite some time, but do not present any clinical signs; only in cases of immunosuppression can the mites cause pathology. The clinical signs of demodicosis are alopecia, scaling, erythema, and itching. The generalised form has a serious clinical course with the development of large areas of skin lesions, secondary infection, and intoxication of the whole organism. Young dogs and certain breeds with a genetic predisposition are particularly susceptible to demodicosis (Gholin-zhad *et al.*, 2023; Bhusal *et al.*, 2025).

Otodectic mange is caused by the mite *Otodectes cynotis* Hering, 1838, which parasitises the external auditory canal. A. Melezhyk *et al.* (2024) describe demodicosis as an exudative, pruritic, and inflammatory disease that can involve the tympanic membrane in cases of severe infestation. The highest prevalence of this disease is found in dogs with long ear carriage and dense hair coats. The source of

the infestation is a sick animal, and the path of transmission is direct. As noted by C. Briceño *et al.* (2020), the possibility of direct contact between the animals and the development of contact infestation leads to the rapid spread of the disease within animal populations, so epizootiological measures to prevent the disease are very important.

The occurrence of parasitic dermatitis depends on age, breed of dogs, living conditions, and the degree of veterinary supervision. Young dogs are more likely to develop demodicosis, while dogs with a dense undercoat are more susceptible to chewing lice and other superficial ectoparasites. Factors that increase the likelihood of infestation include crowded housing, lack of preventive actions, and failure to use insectoacaricidal drugs in a timely manner. An increase in the number of ectoparasitoses of dogs is noted in urban areas by S.J. Coates *et al.* (2020) and B. El Hamzaoui *et al.* (2020) due to an increase in the number of animals, an increase in their activity, as well as ongoing urbanisation processes. V. Yevstafieva & K. Horb (2020) noted a strong association between the living conditions of dogs and age-related dynamics of the occurrence of ectoparasites. The study shows that the prevalence of skin lesions in animals kept in apartments was lower than in individuals from the category of the private housing fund. Moreover, for animals in apartments, with an increase in age, the level of infection increases, which may be explained by less careful care and conducting a course of disinfection specifically aimed at young individuals. However, in the conditions of kennel maintenance, the inverse dynamics is observed – the extent of infection indices and their severity decrease with age, which is due to the activation of the mechanisms of the development of resistance, the thickening of the epidermis, and the formation of immunity depending on age.

Despite the diversity of aetiological factors, parasitic dermatitis shares common pathogenetic features, namely the development of an inflammatory response, pruritus, a tendency towards chronicity, and frequent complications from secondary infection. At the same time, there are significant differences in the mechanisms underlying individual forms, which necessitate a differentiated approach to diagnosis and treatment. This indicates a lack of standardisation in contemporary understanding of the pathogenesis of parasitic dermatitis and highlights the need for further comprehensive research.

Clinical signs and diagnosis of parasitic dermatitis

Insects and mites parasitise on the skin and hair of dogs, causing skin and hair follicle lesions, inflammation, pruritus, alopecia, and the development of secondary infections. In their studies, M.A. Fouda *et al.* (2021) emphasised that the clinical picture is often non-specific, which is consistent with the findings of K. Mason & M. Ruutu (2023) regarding the difficulty of differentiating ectoparasitoses on the basis of clinical signs alone. Pruritus is the principal symptom of parasitic dermatitis. Some researchers associate these clinical signs with the effects of allergens produced by ectoparasites, whereas B.C.F. Nogueira *et al.* (2023) further clarified the role of immune hyperreactivity and mast cell degranulation. It is crucial to recognise that pruritus does not always accompany demodicosis, a fact that creates a diagnostic trap and points to a completely different pathogenic course for this disease. Erythema and inflammation represent a universal cutaneous response to infestation. A.K. Gupta *et al.* (2025) described these as a consequence of histamine release, whereas H.A. Zineldar *et al.* (2023) emphasised microvascular changes. When comparing these data, one can conclude that

clinical signs are the result of the combined effect of an immune and vascular response, and not of direct parasite exposure.

Alopecia (focal hair loss) is observed in most cases of parasitic dermatitis. According to A.D. Michalka *et al.* (2022), its pathogenesis is based on the destruction of hair follicles and chronic scratching. L.C. Panait *et al.* (2025) indicated that in trichodectosis, lesions are more spread, but in local infestations – within the reach of the animal's paws. This implies different severities of damage to the hair apparatus in various species of ectoparasites. With a chronic course of the disease, there is a development of hyperkeratosis, scales, and crusts. This is associated with the prolonged persistence of the parasites and constant stimulation of the inflammatory response. F. Moog *et al.* (2021) focused on the effect of long-term antigenic exposure, and V. Yevstafieva *et al.* (2024) noted the role of secondary bacterial infection as a cause of chronicity. Secondary infections are a common complication. Staphylococci, streptococci, and the fungus *Malassezia* are most frequently involved, leading to pyoderma, seborrhoeic dermatitis, unpleasant odour, and systemic intoxication (Hobi *et al.*, 2024). M. Kazemi (2025) pointed to the frequent involvement of staphylococci, while V. Brue *et al.* (2022) demonstrated that the microbiota determines the severity of the clinical course. This allows the conclusion that parasitic dermatitis should be regarded as a multifactorial pathology.

Clinical manifestations vary according to the type of parasite. M.A. Fouda *et al.* (2021) described flea allergy dermatitis as being characterised by papulo-crustous eruptions and intense pruritus in the region of the croup, tail, and hind limbs, whereas K. Mason & M. Ruutu (2023) emphasised behavioural changes in the animal as an early diagnostic marker. Louse infestation (trichodectosis) manifests as lesions of the skin of the neck, back, and flanks,

hair loss, and the presence of nits attached to hair shafts. A.D. Michalka *et al.* (2022) and L.C. Panait *et al.* (2025) pointed out the location of lesions on the neck and back, allowing for the detection of certain topographical specificity in parasitic dermatoses.

Sarcoptic mange is manifested by acute and persistent pruritus and lesions of the ears, elbows and belly. At the sites of parasite activity, papules with fluid content and thin, winding lines – the remnants of mite burrows – appear. F. Moog *et al.* (2021) described these “burrowing tunnels” as a pathognomonic sign, whereas V. Yevstafieva *et al.* (2024) emphasised the role of hypersensitivity, which explains the disparity between the low number of parasites and the high severity of clinical symptoms.

In otodectic mange, A. Melezhyk *et al.* (2024) pointed out more specific clinical signs: it scratches its ears, and from the auditory canal, there is an abundant, dark brown, tar-like secretion with an unpleasant smell. In demodicosis, the animal does not scratch as long as there is no secondary microbial infection. The main clinical signs are the appearance of areas of hair loss, peeling, inflammatory skin changes, and papules, which subsequently turn into pustules. In generalised forms, pustules merge into inflammatory infiltrates; the disease is accompanied by an unpleasant acid smell (“red mange”) (Kumar & Shekhar, 2020).

The final stage of the diagnosis of parasitic dermatitis is laboratory confirmation of the parasite. This includes the determination, identification and differentiation of parasites, as well as assessment of the severity of infestation. Diagnostic materials involve the collection of skin scrapings, exudate from the external auditory canal, contents of hair follicles, scales, crusts, hair, and earwax. For entomoses, parasites can be collected mechanically because of their usually visible size to the naked eye. Methods of diagnosis include microscopy

(light and electron) and sedimentation and flotation, culture methods, serological testing, and molecular genetic diagnostics (e.g. PCR for differentiation of the species belonging to *Demodex*). As emphasised by M. Ilie *et al.* (2021) and P. Thomson *et al.* (2023), these represent the transition to etiologically targeted diagnostics. The so-called “wet paper test” helps detect blood remains in flea faeces to diagnose flea allergy dermatitis. Nits attached to hair shafts or adults, as well as skin heating in some cases, aid in the diagnosis of pediculosis (Ali *et al.*, 2020). Other, more modern methods, such as serological assays and immunohistochemistry, are able to detect parasitic antigens and provide an accurate diagnosis. With the latter having special significance in differentiating parasitic conditions from allergic dermatoses, as emphasised by L. Chng *et al.* (2021).

Accordingly, the diagnosis of parasitic dermatitis is a complex process combining clinical assessment and laboratory investigation. It enables differentiation from other dermatological diseases, identification of the specific pathogenic role of the causative agent, and selection of an appropriate treatment regimen (Chng *et al.*, 2021). Therefore, the diagnosis of parasitic dermatitis is a complex process that combines clinical and laboratory methods and enables the differentiation of the disease from other types of dermatology, the identification of the pathological role of the aetiology and selection of the appropriate therapy.

Treatment and prevention of parasitic dermatitis

Therapy for parasitic dermatitis in dogs is a complex and multicomponent process that requires a combination of aetiotropic, pathogenetic and symptomatic methods. The purpose of therapy is not just the elimination of the parasite, but also the resolution of inflammation, restoration of the skin's protective barrier,

prevention of the development of secondary complications, and prevention of relapse. As indicated by V. Brue *et al.* (2022), modern treatment strategies are based on the principles of multimodality, adequate duration and monitoring of treatment effectiveness. Also, N. Amanzougaghene *et al.* (2020) emphasised that the high rate of mixed parasitic lesions and the development of resistance of some parasites to the usual drugs require constant improvement of the treatment strategy.

Modern forms of medication include systemic and topical treatments. As pointed out by V.E. Defalque (2022), combination therapy is the most effective, as it acts on various links of the life cycle of the parasite. The main groups of active substances include the following: isoxazolines (fluralaner, sarolaner, afoxolaner, and lotilaner) – modern systemic preparations that block the parasites' nerve channels, causing paralysis and death. According to I.L. Gonçalves *et al.* (2021), these pharmaceuticals act in a broad range, covering fleas, ticks, and some other ectoparasites, and provide an extended duration of protection ranging from 4 to 12 weeks (the specific term depends on the substance). Importantly, isoxazolines have advantages over older contact agents, namely the fact that a systemic effect is observed, regardless of the external integument's integrity. According to R. Chiummo *et al.* (2020), prolonged exposure to the acaricidal activity of fluralaner ensures therapeutic success in the treatment of sarcoptic mange. A similar view was expressed by M.O. Dumitrache & M. Cadiergues (2023), who, in a critical review of current studies, noted the high efficacy of fluralaner in canine sarcoptic mange and its advantage in terms of faster parasitological cure compared with certain macrocyclic lactones. At the same time, the authors also highlighted certain limitations associated with the use of isoxazolines. N. Bates *et al.* (2024) and D. Gaens *et al.* (2019)

reported the possibility of the emergence of adverse neurological reactions (tremors, ataxia, seizures). The authors emphasised the need for careful use of the described agents in dogs with a history of neurological disorders. Meanwhile, contemporary studies show the high safety level of isoxazolines in dogs and the superiority of these agents over older generations of insecto-acaricidal agents.

Macrocyclic lactones (ivermectin, moxidectin, selamectin) are widely used for treating ectoparasitic, parasitic, and helminth infections. According to C. Romero-Núñez *et al.* (2020), they exhibit high activity against mites and certain types of helminths but have some limitations in their use. In particular, in Collies, Shetland Sheepdogs, Australian Shepherds, and some related breeds, severe toxidermia is observed due to the presence of a mutation of the MDR1 gene. The authors emphasised that there is a trend in modern veterinary medicine towards the gradual replacement of macrocyclic lactones by isoxazolines because of the threat of neurotoxicity. Topical preparations remain an important place in the treatment, especially in the case of superficial forms of entomoses and mild forms of acariases. According to F. Martínez-Ibañez *et al.* (2026), amitraz is still used to treat generalised demodicosis due to its pronounced acaricidal activity. However, the use of the latter is restricted due to the high toxicity and risk of side effects (sedation, hypothermia, bradycardia, local reactions in the form of irritation). Fipronil exhibits a better safety profile than amitraz. Fipronil-based preparations have been shown by I. Yuskiv *et al.* (2024; 2025) to be especially active against fleas and lice, while being significantly inferior to systemic agents in the treatment of sarcoptic mange and demodicosis. It can be concluded that when selecting the most suitable treatment strategy, it is necessary to take into account the type of parasite involved, the severity

of the condition, and the general condition of the animal. In the research of O.V. Kruchynenko (2020), it is shown that in the set of agents used to treat and prevent ectoparasitoses in dogs, preparations based on fipronil, permethrin, or selamectin prevail.

There is a current trend in veterinary dermatology towards comprehensive and combined approaches to the treatment of parasitic dermatitis, involving the use of both systemic and topical insectoacaricidal agents. R.S. Mueller *et al.* (2012) noted in their clinical guidelines for the treatment of canine demodicosis that successful treatment should not only be aimed at eradicating parasites but also at eliminating predisposing factors such as immunodeficiency, endoparasitism, endocrinopathy, and secondary bacterial infections. It is also noted that generalised demodicosis is often accompanied by pyoderma, in which case it is recommended to conduct additional treatment with topical or systemic antimicrobials. The authors found that amitraz given once a week was effective, as well as the use of macrocyclic lactones: ivermectin, milbemycin oxime, and moxidectin. On the other hand, the authors noted that in sensitive animals, especially herding breeds, there may be a risk of side effects in the form of neurotoxicity; therefore, these drugs should be used slowly in a dose-escalating fashion and be closely monitored. Furthermore, V. Brue *et al.* (2022) state that depending on the form and severity of parasitic skin diseases, the speed of response to treatment and the effectiveness of specific aetiotropic treatment can differ. On these grounds, after establishing the correct diagnosis, they suggest adding symptomatically applied antipruritic drugs, which improve the quality of life for both the pet and the owner.

A separate place in the scheme of current prevention and treatment of ectoparasitoses is taken by combined topical formulations. In this respect, the study by M. Varloud &

J.J. Fourie (2015), in which the efficacy of three topical ectoparasiticides was compared against ticks of *Rhipicephalus sanguineus* in dogs, is worth noting. According to these authors, the products containing permethrin had a better and longer-lasting residual acaricidal action than those containing fipronil. Thus, using the product Vectra 3D (dinotefuran, permethrin and pyriproxyfen) ensured more than 90% protection for one month after the first application, while products based on fipronil showed much lower efficacy. They also emphasised that formulations containing permethrin act faster and have an excellent repellent effect on ticks and fleas, which is important to prevent reinfection. Therefore, based on the analysis of this information, it is clear that combined formulations are more effective for treating ectoparasitoses, since their use includes both acaricidal and repellent activity and also acts against different stages of the life cycle.

In addition, great importance in this field is given to the treatment of secondary infection caused by parasitic dermatitis. It is known that to combat secondary infections in the skin of animals, various antibiotics and antifungals are used, depending on the susceptibility of the microflora. A. Loeffler *et al.* (2025) note that chronic skin damage and persistent self-trauma create favourable conditions for the development of bacterial pyoderma and *Malassezia* dermatitis. According to J. Miller *et al.* (2023), effective insectoacaricidal therapy cannot bring about full recovery in dogs with secondary microflora; therefore, in cases of chronic dermatitis, it is recommended to carry out a bacteriological examination and determine the microflora's sensitivity to antibiotics. In addition to etiotropic therapy, pathogenic and symptomatic treatment is also important. According to M. Kazemi (2025), the use of omega-3 fatty acids, zinc, B-group vitamins, and antioxidants improves the restoration of the

epidermal barrier and reduces the intensity of inflammation. In addition, R.S. Mueller *et al.* (2012) reported a beneficial effect of immunotherapy in dogs with generalised demodicosis, especially those with relapses. This analysis of the described treatment methods shows that modern therapy for parasitic dermatitis is primarily directed at restoring the functional state of the skin and the immune reactivity of the host animal.

Prophylactic management of parasitic dermatitis is one of the main measures to reduce the incidence of ectoparasitosis. According to J. Miller *et al.* (2023), controlling parasitic factors is a key element in the prevention of secondary dermatological conditions. Preventive measures are primarily based on regular application of insectoacaricidal agents, sanitary treatment of premises, and control of contact between animals. V. Colella *et al.* (2020) emphasise that inadequate preventive treatment compliance is one of the most important risk factors for relapses of flea allergy dermatitis in urban dogs. The results of any preventive measures are greatly influenced by the quality of the comprehensive approach applied. In a comparative study of ectoparasiticides, M. Varloud & J.J. Fourie (2015) emphasised that control of tick and flea infestations should involve regular animal treatment along with environmental and in-contact animal management to reduce the risk of reinfestation. Moreover, the seasonal increase in tick activity in summer should be mentioned as a risk factor necessitating more careful preventive measures. At the same time, C. Becskei *et al.* (2016) in a multilevel study on sarolaner efficacy, the authors reported that the long-term use of modern systemic isoxazolines ensures a high level of anti-flea/anti-tick protection. Rapid elimination of parasites by using these treatments may be considered a significant component contributing to the reduction of clinical manifestations of flea allergy derma-

titis. Another very important part of prevention is to conduct educational work with the owners of animals. According to V. Brue *et al.* (2022), many recurrent cases are due to delayed or poorly performed antiparasitic treatment. The authors suggest that educating the owners about the biology and epidemiology of the parasite (its cycle of development, ways of transmission, and the need for preventive treatment) may significantly improve the results.

In conclusion, modern treatment approaches to parasitic dermatitis should involve a combined strategy of treatment with systemic and topical insectoacaricidal agents, secondary infection control and restoration of normal skin physiology. Based on an analysis of recent research, the most promising strategy appears to be the combined use of therapeutic protocols based on a broadspectrum agent, primarily isoxazolines. At the same time, treatment outcomes depend largely on timely prevention, sanitary control, and adherence to regular treatment schedules for animals.

Conclusions

The study involved a systematic review of the current scientific literature on the causes and mechanisms of the disease, the clinical course, diagnosis and treatment of parasitic skin diseases in dogs. This study analyses modern approaches to the formation of the aetiology of parasitic diseases, mechanisms of their occurrence, methods of clinical diagnosis and treatment of the disease. It is established that parasitic dermatitis is a polyetiological disease that develops due to the effect of various types of ectoparasites and abiotic factors. The analysis shows that the pathogenesis of these diseases is multifactorial and includes damage to the skin with mechanical factors, the manifestation of an immune response, and the development of secondary infectious processes. The clinical course of parasitic skin lesions is often

similar in terms of the signs of manifestation, which makes it difficult to accurately diagnose parasitic dermatitis without laboratory testing. It has been established that modern diagnostic approaches are based on a combination of traditional and molecular methods, each of which has its own advantages and limitations. Modern methods of treating parasitic dermatitis are considered to be the most effective, which include the combined use of modern insectoacaricidal drugs, symptomatic and pathogenetic therapy, as well as the prevention of the disease. The findings obtained synthesise current understanding of parasitic dermatitis in dogs and confirm its multifactorial nature, which underlines the need for a systematic approach to both study and control. This is of considerable importance for the development of veterinary dermatology and for improving the effectiveness of clinical veterinary practice.

Future studies should include a more thorough study of the morphological changes in the skin during different forms of parasitic damage, immunological reasons for the development of these pathologies, and ways of their differential diagnosis and treatment. It is expected that the results of an in-depth morphological

and immunological analysis will help to clarify the mechanisms of skin damage, as well as the role of immune sensitisation and secondary microflora in the development of the pathological process. They will also contribute to the development of criteria for the early diagnosis of these diseases, improve their differentiation and substantiate personalised treatments depending on the species of the parasite and individual immune reactivity of the patient. Furthermore, the anticipated results will serve as the basis for the formation of effective methods of prevention and treatment, contributing to the reduction of the number of recurrent skin diseases and the prevention of the appearance of complications, and increasing the overall quality of veterinary treatment of dogs suffering from parasitic dermatitis.

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Conflict of Interest

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Дерматит паразитарної етіології в собак: огляд літератури щодо клініко-діагностичних аспектів та підходів до лікування

Микола Вовк

Аспірант

Поліський національний університет
10008, б-р Старий, 7, м. Житомир, Україна
<https://orcid.org/0009-0003-3804-9459>

Світлана Гуральська

Доктор ветеринарних наук, професор
Поліський національний університет
10008, б-р Старий, 7, м. Житомир, Україна
<https://orcid.org/0000-0001-7383-1989>

Анотація. Дерматит паразитарної етіології в собак є однією з найбільш поширених і актуальних проблем сучасної ветеринарної медицини через високу частоту реєстрації та значний вплив на здоров'я тварин. Метою роботи було узагальнення сучасних даних щодо поширення, етіології, патогенезу, клінічних симптомів, діагностики та лікування собак за дерматиту паразитарної етіології. У роботі використано методи аналізу та узагальнення наукових літературних джерел. Встановлено, що дерматит паразитарної етіології має поліетіологічну та багатофакторну природу і найчастіше спричиняється ектопаразитами, зокрема блохами, вошами, волосоїдами та кліщами. Доведено, що провідне місце у структурі захворюваності займає алергічний блошиний дерматит, тоді як значну роль відіграють акарози, які характеризуються високою контагіозністю та схильністю до хронічного перебігу. Визначено, що клінічні прояви є переважно неспецифічними та включають свербіж, еритему, алопеції, утворення кірок і лусочок, а також ускладнюються вторинними бактеріальними і грибковими інфекціями, що ускладнює диференційну діагностику. Обґрунтовано, що ключовим етапом встановлення діагнозу є лабораторна індикація та ідентифікація збудників із застосуванням мікроскопічних, серологічних і молекулярно-генетичних методів. Показано, що сучасні підходи до лікування базуються на застосуванні інсектоакарицидних препаратів, зокрема ізоксазолінів і макроциклічних лактонів, у поєднанні з комплексною терапією вторинних ускладнень та профілактичними заходами. Практична цінність роботи полягає в узагальненні сучасних наукових підходів до діагностики, лікування та профілактики в собак дерматиту паразитарної етіології для підвищення ефективності ветеринарної практики

Ключові слова: ектопаразити; алергічні реакції шкіри; патогенез; діагностика; інсектоакарицидна терапія; вторинні інфекції