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Review article

PEST DES PETITS RUMINANTS IN EASTERN EUROPE: AN EMERGING THREAT

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Peste des petits ruminants is a highly contagious viral disease affecting small ruminants, with significant socioeconomic impact, particularly in regions with extensive livestock farming. It poses a growing threat to animal health and food security, making its surveillance and control a global priority. This review aims to assess the current epidemiological status of PPR in Europe during 2024–2025, focusing on affected countries. Official data from national veterinary authorities and international reporting systems such as ADIS and WOAH were analyzed. The review synthesizes recent trends in PPR outbreaks, concerning their timeline and geographic spread, assesses the prevention and control strategies adopted by the affected countries, and highlights challenges that encumbered effective disease management. Additionally, the paper documents clinical and pathological features observed during confirmed outbreaks in Tulcea, Romania, in 2024, providing a practical insight into the field presentation of the disease. In 2024–2025, Peste des petits ruminants re-emerged in Southeastern Europe, with confirmed outbreaks reported in Romania, Greece, Bulgaria, Hungary, and Albania. Delays in detection and insufficient cross-border coordination have significantly hindered containment efforts. While emergency measures—such as culling and enhanced surveillance—were implemented, structural or decisional ongoing challenges in veterinary systems and limited awareness among livestock owners continue to pose major challenges. Moreover, negative public responses to necessary control measures may further impede timely reporting and detection of future outbreaks. These findings highlight the urgent need for strengthening the regional cooperation and capacity-building to improve early warning systems and response capabilities. Without timely field recognition and coordinated interventions, the risk of a broader

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regional spread increases, threatening the EU's PPR-free status and undermining global eradication efforts.

Keywords: Emergent, outbreaks, Peste des petit ruminats, transboundary.

INTRODUCTION

Pest des petits ruminants (PPR), also known as goat plague, is caused by the Small ruminant morbillivirus (SRM), a member of the *Morbillivirus* genus within the *Paramyxoviridae* family [1]. SRM is an enveloped, single-stranded RNA virus [2]. It is classified into four lineages (I-IV), all of which have the potential to cause severe disease. The virus primarily targets lymphoid tissues, causing immunosuppression and predisposing animals to secondary infections [3].

PPR is characterized by high fever, cough, anorexia, nasal and lacrimal discharge that changes from initially serous to purulent in later stages, diarrhea, stomatitis, enteritis and bronchopneumonia [4].

SRM is closely related to the rinderpest virus, which was eradicated in 2011. Despite significant control efforts, PPR continues to spread geographically, posing a significant threat to livestock industries and food security.

Historically confined to sub-Saharan Africa, the Middle East, and parts of Asia, PPR has more recently been reported in Turkey, since 1999 [5] and in Bulgaria, in 2018 [6], indicating a spread towards Europe, with confirmed cases emerging in 2024, marking a significant shift in its epidemiological distribution. Factors contributing to the spread include uncontrolled animal movement, lack of effective vaccination coverage, and wildlife reservoirs.

MATERIALS AND METHODS

The present review provides a detailed evaluation of the epidemiological progression of PPR in Europe during July 2024 – June 2025, with particular regard to the countries affected by recent outbreaks. The general timeline of recent PPR evolution was compiled by using the information available in official reports issued by the national veterinary authorities, from the Plants, Animals, Food and Feed (PAFF) Animal Health and Welfare committee meetings presentations, focusing on PPR, during July 2024 – June 2025, and from international surveillance systems, including the European Union Animal Diseases Information System (ADIS), World Organization for Animal Health (WOAH), and Department for Environment, Food and Rural Affairs (DEFRA), for the same period. Based on the identified data, a descriptive, qualitative synthesis of outbreaks' timeline and territorial distribution was constructed, complemented by a summarization of aspects related to transmission and disease control and prevention, outlining enforced intervention measures and challenges, as part of efforts to achieve PPR elimination in the affected countries. Moreover, clinical and pathological findings

from confirmed outbreaks in 2024, in Tulcea-Romania, are further presented, illustrating the potential for timely diagnostic action through prompt recognition of PPR clinical signs and characteristic lesions.

RESULTS

Temporal and spatial trends in PPR outbreaks in Eastern Europe

In the last decade and a half, PPR represented an important health threat to sheep and goats flocks in over 65 endemic countries from Africa, the Middle and Near East, and South Asia, gradually spreading towards Central Asia and Eastern Europe [7]. The rapid and concerning spread of the disease has drawn significant attention from the Food and Agriculture Organization (FAO) and the WOAH, leading to coordinated efforts aimed at its control and eradication, targeting elimination by 2030 [8,9]. SRM strains classified into lineages I and II have been exclusively identified in West and Central Africa, SRM lineage III strains are characteristic to Eastern Africa and the Arabian Peninsula, and lineage IV strains have been identified in Asia, the Middle East, and Northern Africa [10].

The first confirmed PPR outbreaks in Europe occurred in 2000 in Istanbul, Thrace region, Türkiye, followed by an outbreak, in February 2016, in Georgia – Tbilisi region, on a sheep farm (around 3740 susceptible animals) [11]. In June 2018, Bulgaria confirmed cases in three sheep and goat herds, in Yambol region, near the Turkish border. Of all the susceptible animals (380 sheep and 160 goats), two sheep were infected and one of them died [6]. By July 18, a total of 7 outbreaks were reported by the Bulgarian veterinary authorities, according to ADIS [12]. Georgia reported a second outbreak in March 2024, in a sheep flock with approximately 1700 susceptible animals, from Kvemo Kartli Region. The flock had been previously moved from a region near the border with Armenia and Türkiye [11]. The first-ever confirmed case of PPR in Greece was reported on July 11, 2024, in a mixed flock of sheep and goats in Trikala, Thessaly, following the onset of clinical signs in late June and the death of 50 animals [13]. By September 13th 2024, a total of 71 outbreaks has been confirmed in various regions of the country, both on mainland, Central Greece, Thessaly, West Greece, Macedonia, Attica, Thrace, Mesino and Peloponnese area, and Greek islands, Crete and Ionian Islands [14]. The last outbreaks in Greece were reported in October 2024, summing up to a total of 86 outbreaks reported in 2024 [15]. The geographical distribution of the reported outbreaks appeared dispersed and lacked continuity, suggesting the possibility of multiple independent introductions or localized transmission events, likely facilitated by the movement and transport of animals. Additionally, the disease was reported in both small-scale holdings, typically comprising up to 300 animals and commonly found in the Peloponnese, western Greece, Macedonia and Thrace region, as well as in large commercial flocks, some of

approximately 3,000 animals, predominantly located in Thessaly and central Greece [15,16].

On July 15th, 2024, Romania detects its first outbreak, in a sheep fattening farm in Tulcea County, in the south-east region, near the Black Sea coast. The outbreak involved 2,028 cases and deaths within a herd comprising 51,119 sheep [13,16,17]. By July 24th, additional five outbreaks were confirmed — four in Tulcea County and one in Constanţa County, with both counties in the Black Sea coast — bringing the total to six outbreaks, comprising four commercial farms and two backyard holdings, one of which reported 132 deaths among 424 goats [17].

By August 5th, 2024, the number of PPR outbreaks in Romania had escalated markedly, reaching a total of 46 confirmed events. Of these, 45 were concentrated in the Black Sea region, with 42 reported in Tulcea County, predominantly clustered around Baia and Stejaru — the area where the initial six outbreaks had been detected. Additional cases included one outbreak in Balabancea, involving three clinical cases within a mixed sheep-goat herd, as well as three outbreaks in Smârdan near the border with Moldova, and three more in Topalu, Constanţa County. Notably, on July 25th, an outbreak was also confirmed in Clopodia, Timiş County, in western Romania near the Serbian border, affecting 959 animals on a single sheep farm, representing the first outbreak identified outside the Black Sea region [18,19].

By the end of 2024, a total of 68 outbreaks had been reported in Romania, with additional cases emerging in August and September [19]. These new outbreaks, recorded between August 5th and September 9th, were predominantly located in previously affected regions: 10 outbreaks in Tulcea County, 3 in Constanţa County (both in eastern Romania), 1 in Ialomiţa County (further west), and 6 outbreaks in Clopodia, Timiș County (western Romania, near the Serbian border), involving sheep populations [16, 19]. Despite the proximity of some outbreaks to the borders with Moldova and Bulgaria, no significant cross-border or geographic spread was observed. Subsequently, only one additional outbreak was reported by the end of 2024 — affecting a mixed sheep-goat herd (comprising 555 susceptible animals) in Constanţa County on September 19th [16,19].

In December 2024, Bulgaria reported to WOAH its first PPR outbreak since 2018, detected in Velingrad, southern Bulgaria [20]. The outbreak affected 1769 small ruminants across five family-owned holdings practicing extensive grazing, where animals were kept together on common pastures. Initial suspicions arose on November 20th, with laboratory confirmation on November 25th, identifying 25 clinical cases [21].

Up to early March 2025, no additional PPR outbreaks had been reported in Romania, reflecting a stabilized epidemiological situation over the preceding months [20]. However, on March 5th 2025, a new outbreak was confirmed in Bihor County, western Romania, close to the Hungarian border, marking the first recorded occurrence of PPR in this county (Figure 1). The outbreak affected a commercial holding, housing 664

sheep (including adult ewes, rams, young sheep, and lambs), with 12 animals reported dead and 652 culled [22]. The epidemiological investigation revealed that animals had recently been introduced from several non-commercial farms. Furthermore, the farm operated a livestock assembly center which, although empty at the time of the outbreak, had accommodated animals from various counties in the preceding two months. This outbreak represents a significant geographic shift, expanding the known distribution of PPR in Romania beyond the previously affected eastern and southern regions [20,22].

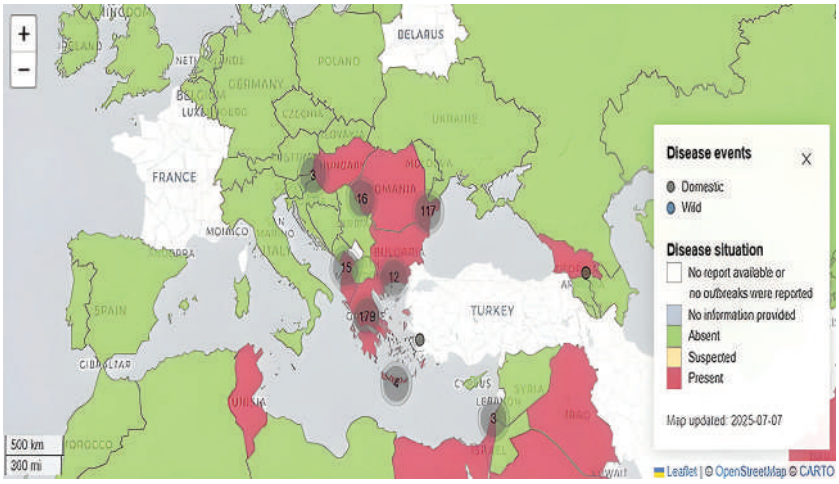

Figure 1. Map displaying the geographical distribution of PPR events in Europe, between 1.01.2024 – 29.06.2025 (generated on https://animal-diseases.efsa.europa.eu/PPRV)

The phylogenomic analysis carried out by the EU Reference Laboratory for Peste des Petits Ruminants (EURL-PPR) in September 2024 demonstrated that PPR virus genomes from Romania and Greece are highly similar, with 99.5% nucleotide identity, and show the closest relatedness to a Georgian strain from 2016 (98.3% nucleotide identity) [23]. These findings confirm that the Romanian and Greek isolates are part of Lineage IV, specifically the North-East Africa sub-clade, and strongly suggest a shared origin for the outbreaks in both countries. Genomic analysis of the Bulgarian PPRV genome revealed that it belonged to the same lineage and subclade as Romanian and Greek isolates, highlighting evidence of transboundary transmission and emphasizing the need for strengthened regional surveillance and coordinated disease control measures [24].

On January 27th, 2025, the WOAH reported Hungary's first confirmed outbreak of PPR on a sheep farm in Zala County, near the borders with Austria, Slovenia and Croatia [19,20]. The outbreak was detected following the death of 12 sheep on a farm housing 1810 animals. Notably, the infected sheep had been legally imported from Romania in January 2025, originating from a non-restricted area [15]. Additionally, on February 5th, 2025, two secondary outbreaks were confirmed, both epidemiologically

linked to the initial case: one on a farm located 5 km away, holding 1146 sheep, and another on a small holding outside the restricted zone, with 20 sheep. These events represent the first documented spread of PPR within Hungary, triggering intensified surveillance and control measures [20,25]. Genetic analysis identified the viral strain as belonging to lineage IV, closely related to strains previously detected in Romania, Bulgaria, and Greece, confirming a common origin for the outbreaks reported in these countries [24,25].

The first confirmed case of PPR in the Republic of Albania occurred on June 4th, 2025, in the village of Domen (Postribë administrative unit, Shkodër Municipality), near the border with Montenegro, in a goat farm [19,26]. As of June 26th, 2025, a total of 12 outbreaks has been confirmed in the Republic of Albania, according to ADIS. According to WAHIS database, these outbreaks have affected 2293 small ruminants, with 418 cases and 145 reported deaths [19].

Transmission risks

The introduction of SRM into new regions, on long distance, is most commonly associated with the movement and trade of live infected animals [27,28], but also animal products and by-products can pose a transmission risk [29]. In Europe, the risk was considered to be related to illegal transport of animals, especially in the context of stringent border control measures and the overall readiness of member states to implement rapid response strategies in the event of an incursion [30]. In 2024, reports suggest that PPR introduction into Greece was linked to animals imported from Romania, and subsequent distribution of breeding stock across multiple Greek regions facilitated further spread [18]. Similarly, the 2025 outbreak in Hungary was traced to animals legally imported from a non-restricted Romanian zone, in January. In Romania, the primary driver of PPR outbreaks could have been the introduction of infected animals, particularly via illegal movements.

The diseases can cause extremely high morbidity—often reaching 90–100%—with mortality rates up to 80%, especially in naive small ruminant populations [13].

Clinical Presentation

Clinical signs, observed in the outbreaks in Romania, in Tulcea county, suspected by the Sanitary and Food Safety Department Tulcea veterinarians and confirmed by Romania's Institute for Diagnosis and Animal Health, included: adynamia, anorexia, diarrhea, and rapid weight loss within a short timeframe. In some cases, positive animals exhibited no clinical signs. Affected animals often exhibited discharge from the eyes and nostrils (Figure 2), and lesions at the commissures of the lips. Nodular lesions may develop around the mouth and nostrils, accompanied by erosions at the base of the teeth, oral mucosa, and tongue. The disease progressed to recumbency and ultimately death.

Figure 2. Nasal purulent secretions which crusts at the level of the nostrils, sheep; Original photo – Maftei D.N., outbreak in Tulcea County, Romania, 2024

Morbidity and mortality rates initially rise gradually, but can escalate sharply, particularly in intensive fattening conditions involving young sheep. Animals under one year of age are the most severely affected, while adults with pre-existing health conditions demonstrate increased susceptibility. Notably, in the outbreaks from Tulcea county, goats, typically considered more sensitive than sheep, have been largely unaffected.

According to reports from Bulgarian official veterinary services, cases of mortality and abortion were documented [31]. Clinical signs in affected animals were generally mild, and included elevated body temperature, ocular discharge, diarrhea, and depression. In lambs, coughing was also reported.

Additional signs were recorded in Greece, with a more severe clinical picture in the affected animals, characterized by fever, diarrhea, respiratory distress, oculo-nasal discharge, necrotic stomatitis, halitosis, oral lesions, and bruxism (teeth grinding) [32].

In Hungary, some lambs were reported to exhibit clinical signs such as fever, nasal discharge, melena, and oral sores [33].

Lesions

In the Romanian outbreaks, in Tulcea County in 2024, the most frequently lesional field observations included ocular discharges, along with mucous and mucopurulent nasal secretions. Marked congestion and hemorrhages were observed on the conjunctival (Figure 3) and nasal mucosae, as well as the pharyngeal, tracheal (Figure 4), and bronchial mucosae (Figure 5). Interstitial bronchopneumonia of varying severity was a major contributor to mortality in acute cases (Figure 6). Enlargement, congestion, and hemorrhages in the mesenteric lymph nodes were commonly observed. Hemorrhages were also observed in the subcutaneous tissues and occasionally on the skin.

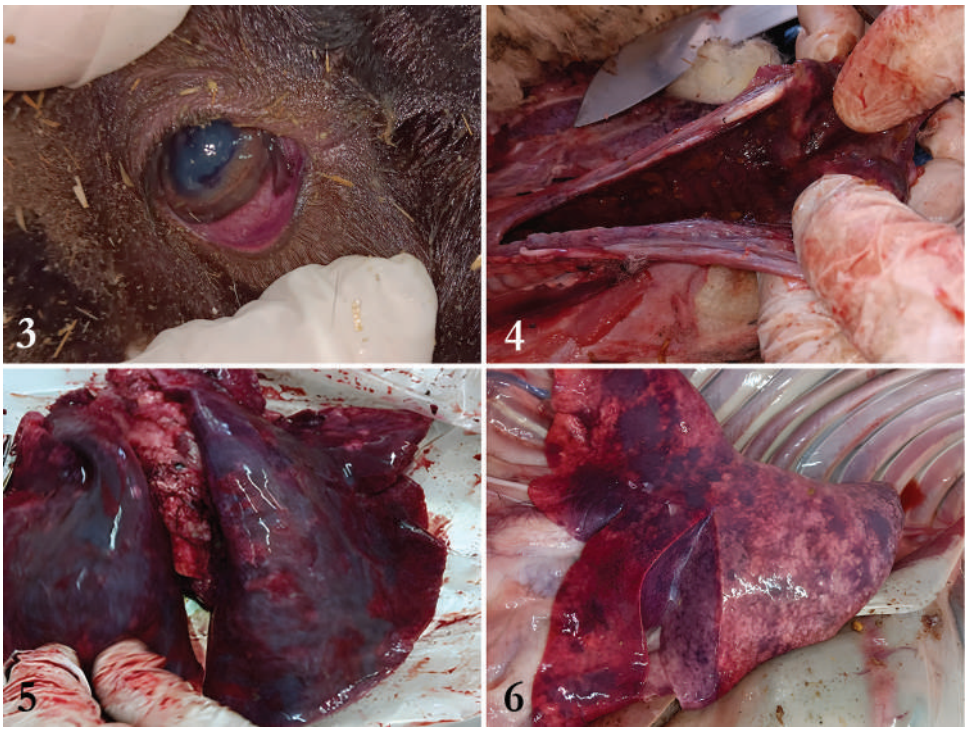

Figure 3. Congestion of conjunctiva. Original photo – Maftei D.N., outbreak in Tulcea County, Romania, 2024
Figure 4. Tracheal congestion and hemorrhages, sheep. Original photo – Maftei D.N., outbreak in Tulcea County, Romania, 2024
Figure 5. Lung congestion, sheep. Original photo – Maftei D.N., outbreak in Tulcea County, Romania, 2024 – Interstitial bronchopneumonia with pleural thickening (the lesion occured in subacute forms, but sometimes, when hemorrhagic lesions are more pronounced, this lesion also appears in acute forms). The differentiation is the absence of pleural thickening. Here it is in the subacute form. Hard red-violet foci are observed in the pulmonary parenchyma.
Figure 6. Interstitial diffuse pneumonia, with numerous red-violet indured foci, sheep. Original photo – Maftei D.N., outbreak in Tulcea County, Romania, 2024

Severe gastrointestinal lesions were characterized by diffuse hemorrhages throughout the digestive tract, with hemorrhagic-necrotic lesions of Peyer's patches. Subacute cases frequently showed hemorrhagic gastritis with catarrhal and hemorrhagic enteritis (Figure 7), often associated with mesenteric lymph node lesions. Characteristic striped congestion of the terminal colon was observed. Gingival hyperemia and erosive lesions (Figure 8) were also observed in the oral cavity. Furthermore, the gross pathological examination revealed multisystemic hemorrhagic lesions, primarily involving the spleen, liver, and kidneys, with occasional serosal and intramuscular hemorrhages, including the tongue.

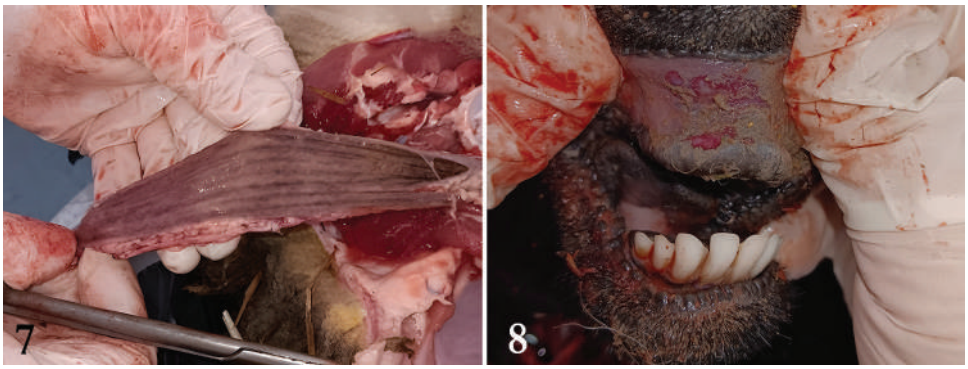

Figure 7. Hemorrhagic lesions along the mucosal folds of the distal portion of the large intestine. Original photos – Maftei D.N., outbreak in Tulcea County, Romania, 2024
Figure 8. Erosive lesions on mucous membranes in the oral cavity. Original photo – Maftei D.N., outbreak in Tulcea County, Romania, 2024

Prevention and Control Measures

PPR is a high-impact transboundary animal disease (TAD) and is listed as a notifiable disease by the WOAH. Due to its significant economic and epidemiological impact, PPR has been designated a priority by the FAO–WOAH Global Framework for the Progressive Control of Transboundary Animal Diseases (GF-TADs) Steering Committee for Europe [35]. In response to the substantial burden posed by the disease, the FAO and WOAH jointly launched the Global Strategy for the Control and Eradication of PPR in 2015, with the overarching goal of achieving global eradication by 2030 [8].

In accordance with the EURL-PPR guidance, all member states, affected by PPR in 2024–2025, implemented similar diagnostic protocols for PPR, centered on molecular detection via Real-time PCR and serological ELISA tests [22,31-34]. Sample collection followed standardized protocols, primarily using ocular or nasal swabs, blood, and tissue [22,31-34].

During the 2024–2025 PPR outbreaks in Europe, European Union Veterinary Emergency Team (EUVET) missions to Romania, Greece and Bulgaria identified significant challenges in outbreak detection and control. In Romania, delays in culling and limited sampling restricted to clinically affected herds led to missed asymptomatic cases, with several healthy-appearing animals testing positive by RT-PCR and ELISA [39]. The mission emphasized the need for expanded serological surveillance, through randomized sampling beyond outbreak zones. In Greece, the focus was on strengthening epidemiological investigation and laboratory preparedness, highlighting the need for a targeted response to PPR outbreaks, through strengthened surveillance, rapid diagnostics, reinforced biosecurity, and sustained financial and human resources, to contain the spread and prevent recurrence [40]. In Bulgaria, common findings included delayed PPR detection, limited enforcement of control measures, and weak farmer cooperation, highlighting the urgent need for stricter biosecurity, movement

controls, transparent veterinary communication. and improved regional collaboration to contain PPR and prevent its spread within the EU [41].

Robust prevention of PPR demands uncompromising biosecurity at national borders, with a primary focus on halting the movement of vulnerable livestock from endemic regions into PPR-free areas. This is achieved through stringent import regulations, pre-movement testing, enforced quarantine procedures, and reliable systems for animal traceability. Following outbreak confirmation, rapid culling of infected herds, safe carcass disposal, thorough sanitation, and prompt farmer compensation are critical for an effective response. Containment is reinforced through movement restrictions, establishment of protection and surveillance zones, mandatory animal inventories, clinical surveillance, vehicle disinfection, and continuous stakeholder engagement. All affected countries applied a similar set of control measures, mainly based on zoning, movement restrictions and stamping-out, consistent with EU legislation, Regulation (EU) 2016/429 and Delegated Regulation (EU) 2020/687 [22,31-33,36,37].

In Serbia, effective measures to prevent introduction and occurrence of PPR are undertaken after the SRM presence was confirmed in neighboring Romania. Veterinary service is being informed on measures to prevent SRM introduction throughout continuous education. Furthermore, the National reference laboratory for PPR is acting within its authority on fast and reliable diagnostics of PPR.

In Romania, post-confirmation control measures included the implementation of zoning protocols, with the delineation of protection and surveillance zones. Infected flocks were subjected to stamping out, with carcasses disposed of through on-site burial (Figures 9 and 10) [22,37]. Movement restrictions were strictly enforced, accompanied by thorough cleaning and disinfection procedures. Additionally, enhanced biosecurity protocols were instituted, alongside clinical surveillance and targeted sampling of susceptible flocks within the designated zones, but also animal surveillance outside of restricted area [22,37].

In the European Union, vaccination against PPR is permitted in emergency situations and must be carried out under the authority and supervision of the competent national bodies, as stipulated in Commission Delegated Regulation (EU) 2023/361 [38].

Although no PPR vaccinations have been conducted so far within the EU [38], a dedicated EU vaccine bank is in place to enable swift response if needed, with live, attenuated homologous vaccines being available [34].

Figure 9. Disposal of carcasses – ensuring the impermeabilization of the pit for carcass burial. Original photo – Maftei D.N., outbreak in Tulcea County, Romania, 2024
Figure 10. Disposal of carcasses by burial – application of powdered disinfectant layers. Original photo – Maftei D.N., outbreak in Tulcea County, Romania, 2024

DISCUSSION

Effective control of PPR in Romania and Greece is essential, as both countries hold prominent positions in the EU's small ruminant population. Romania ranks second with approximately 11.86 million live sheep and goats, followed by Greece in third place with around 10.35 million, based on reported and estimated values from Eurostat, after Spain [42]. These sizable small ruminant populations underscore the high stakes for disease containment to protect both agricultural activities and rural livelihoods.

The 2024–2025 outbreaks of PPR in southeastern Europe revealed a set of challenges that undermined early detection and effective control. Delayed identification of cases was a recurring issue, often due to reliance on symptom-based surveillance, which is unsuitable for detecting subclinical infections, clinical similarities with other diseases (e.g., bluetongue), and limited awareness among farmers [34].

Surveillance efforts were largely reactive, focusing on clinically affected herds, which led to the under-detection of asymptomatic or subclinical cases. This was particularly evident in Romania, where laboratory-confirmed infections were later detected in animals showing no clinical signs. The narrow focus on symptomatic herds failed to capture these hidden infections, prompting EUVET recommendations for active, targeted serological surveillance that includes sampling from apparently healthy animals [39]. The subsequent spread of the disease within the territory, especially over long distances, highlighted significant gaps in risk assessment for live-animal movement.

Weaknesses in veterinary infrastructure—particularly in diagnostic capacity at local and regional levels—may also significantly delay disease confirmation and subsequent response actions. In this context, EUVET missions recommended improving sample collection practices [20]. Furthermore, misattributing PPR symptoms to bluetongue or bacterial infections resulted in diagnoses being made in regional laboratories lacking PPR diagnostic capabilities [34]. To address these issues, increasing awareness among field veterinary staff and strengthening the diagnostic capacity of local and regional laboratories across the entire country, not just in risk border areas, could help reduce response delays and limit further disease spread.

The expanding host range and increasing frequency of SRM or specific antibody detection in new species, particularly among wild ruminants [43-46], highlight the virus's potential to significantly affect both economically important livestock and wildlife. This includes possible consequences for endangered species, underscoring the importance of including all susceptible domestic and wild species into surveillance programs, especially in regions with high domestic–wildlife interaction, to prevent spillover events and support eradication efforts. Additionally, increasing attention has been directed towards the potential epidemiological role of pigs in SRM spread. Field and experimental studies, including serological data [47] and transmission trials with virulent strains [48], demonstrate that domestic pigs and wild boar could become a possible source of SRM. This is of particular importance especially in multi-species livestock farming or household farms, commonly encountered in countries like Romania, Greece, Bulgaria, Albania already affected by PPR, and also in neighboring countries like Serbia, North Macedonia or Croatia. Genomic analyses reveal that SRM strains from domestic and wild/unusual hosts in the same geographical region present a close phylogenetic relationship, provide further support for potential interspecies virus circulation [47,49]. These observations point to the importance of including both wildlife and suids in PPR surveillance programs and warrant further research into their potential function in the transmission of SRM, under different ecological and epidemiological conditions.

The outbreaks of PPR reported in 2024 in Greece and Romania, and subsequently in Bulgaria and, in 2025 in Hungary and the Republic of Albania, resulted in significant economic losses. These were primarily driven by high morbidity rates in affected sheep and goat populations, reduced livestock productivity, implementation of costly stamping-out policies, and imposition of trade restrictions. The required control measures—including movement bans, depopulation, and decontamination—further contributed to the overall economic burden through direct intervention costs and disruption of local and international trade.

Despite active global eradication initiatives, the 2024–2025 outbreaks in Europe reaffirm that PPR remains a pressing transboundary threat. The transboundary nature of PPR transmission was further highlighted by Hungary's outbreak, which was linked to live animal imports from Romania. The primary route of disease spread over long distances is through the movement of infected animals, although secondary indirect

transmission can also affect nearby flocks on a smaller, regional scale. This underscores the need for improved cross-border coordination and harmonized surveillance protocols.

Strengthening awareness among veterinarians, livestock keepers, and decision-makers is essential for timely detection, swift containment, and robust biosecurity, particularly in light of reported negative public reactions [31,36]. Sustained efforts in education, disease monitoring, and emergency preparedness are vital to safeguarding animal health and mitigating economic disruption, prompting the rollout of targeted awareness campaigns across affected regions.

CONCLUSION

The progression of PPR during 2024 – 2025, in Europe, exposed key weaknesses in regional readiness and response capacity, emphasizing the urgent need for sustained investment in veterinary infrastructure, farmer engagement, and cross-border collaboration. Strengthening these areas is essential to prevent future outbreaks and to align with global PPR eradication targets.

Beyond its direct impact on animal health, PPR severely disrupts livelihoods, food security, and rural economies. Effective control would not only boost small ruminant productivity and regional trade but also enhance the resilience of veterinary services, contributing meaningfully to broader One Health objectives and sustainable development goals.

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Authors' contributions

LEO, IAR, and AV contributed to the conceptualization of the study and were responsible for data curation. AV, LEO, IAR, and DP developed the methodology. JK, VM, and BK conducted the formal analysis. DNM carried out the field investigation. IAR and LEO prepared the original draft of the manuscript. IAR, JK, VM, BK, and AV contributed to the review and editing of the manuscript. LEO and AV supervised the study. All authors have read and agreed to the published version of the manuscript.

Declaration of conflicting interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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KUGA MALIH PREŽIVARA U ISTOČNOJ EVROPI: NOVA PRETNJA

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Kuga malih preživara (PPR) je izrazito zarazna virusna bolest koja pogađa male preživare, sa značajnim socioekonomskim uticajem, posebno u regionima sa ekstenzivnim stočarstvom. Predstavlja sve veću pretnju po zdravlje životinja i bezbednost hrane, što njen nadzor i kontrolu čini globalnim prioritetom. Ovaj revijalni rad ima za cilj da proceni trenutni epidemiološki status PPR-a u Evropi tokom 2024–2025. godine, fokusirajući se na pogođene zemlje. Analizirani su zvanični podaci nacionalnih veterinarskih institucija i međunarodnih sistema izveštavanja kao što su ADIS i WOAH. Pregled sintetiše nedavne trendove u epidemijama PPR-a, u vezi sa njihovim vremenskim okvirom i geografskim širenjem, procenjuje strategije prevencije i kontrole koje su usvojile pogođene zemlje i ističe izazove koji su opterećivali efikasno upravljanje bolestima. Pored toga, rad dokumentuje kliničke i patološke karakteristike primećene tokom potvrđene epidemije u Tulči, u Rumuniji, 2024. godine, pružajući praktičan uvid u terensku prezentaciju bolesti. U periodu 2024–2025, kuga malih preživara ponovo se pojavila u jugoistočnoj Evropi, a potvrđene epidemije su prijavljene u Rumuniji, Grčkoj, Bugarskoj, Mađarskoj i Albaniji. Kašnjenja u otkrivanju i nedovoljna prekogranična koordinacija značajno su otežali napore za suzbijanje bolesti. Iako su sprovedene hitne mere – kao što su klanje i pojačan nadzor – strukturni ili odlučivački tekući izazovi u veterinarskim sistemima i ograničena svest među vlasnicima stoke i dalje predstavljaju velike izazove. Štaviše, negativne reakcije javnosti na neophodne mere kontrole mogu dodatno ometati blagovremeno prijavljivanje i otkrivanje budućih epidemija. Ovi nalazi ističu hitnu potrebu za jačanjem regionalne saradnje uz izgradnju kapaciteta kako bi se poboljšali sistemi ranog upozoravanja i sposobnosti reagovanja. Bez blagovremenog prepoznavanja bolesti na terenu i koordinisanih intervencija, povećava se rizik od regionalnog širenja, što ugrožava status EU kao zemlje bez PPR i potkopava globalne napore za iskorenjivanje.