Haryana Veterinarian (June, 2026) **65(1),** 75-79 ISSN 0033-4359 (P)

Research Article

ACUTE FASCIOLOSIS IN A SHEEP – A DETAILED STUDY ON HEPATIC HISTOPATHOLOGY AND PARASITOLOGICAL FINDINGS

SRINIVASA NAIK H., CHARITHA GNANI V[1]*, JYOTHI C. and YUGANDHAR C.
Department of Veterinary Pathology, [1]Department of Veterinary Parasitology,
College of Veterinary Science, Proddatur, Sri Venkateswara Veterinary University, SVVU, Tirupati, Andhra Pradesh

Received: 21.09.2025; Accepted: 12.11.2025

ABSTRACT

Acute fasciolosis, a zoonotic trematode infection caused by *Fasciola hepatica* and *Fasciola gigantica*, poses a significant challenge to ovine health and productivity, particularly in regions transitioning from non-endemic to endemic status. This report details an unanticipated outbreak in a flock of 1,000 sheep under extensive management in the arid Proddatur region of Andhra Pradesh, India, investigated in May 2024. Postmortem examination of a representative four-year-old male sheep revealed hemoperitoneum, extensive hepatic migratory tracts, and immature flukes, corroborated by histopathological evidence of severe parenchymal necrosis and hemorrhage of liver. Parasitological analysis confirmed the presence of juvenile *F. gigantica*. The emergence in a typically dry zone underscores the perils of suboptimal anthelmintic regimens and the introduction of infected stock from waterlogged endemic areas. These findings advocate for robust, integrated parasite control strategies to mitigate disease dissemination in vulnerable agroecological zones.

Keywords: Acute fasciolosis, *Fasciola gigantica*, hepatic histopathology, ovine health, zoonosis, parasite management, Proddatur

How to cite: Srinivasa Naik, H., Charitha Gnani, V., Jyothi, C. and Yugandhar, C. (2026). Acute fasciolosis in a sheep - A detailed study on hepatic histopathology and parasitological findings. *Haryana Veterinarian.* **65(1)**: 75-79.

Parasitic infestations constitute a perennial threat to livestock health, particularly in agrarian economies where they cause substantial economic losses and compromise food security. Among these, fasciolosis, induced by the liver flukes *Fasciola hepatica* and *Fasciola gigantica*, stands out due to their zoonotic potential and impact on ruminant productivity (Mas-Coma *et al.*, 2005). These trematodes rely on lymnaeid snails, notably *Galba truncatula*, as intermediate hosts, restricting their prevalence to moisture-rich environments conducive to snail proliferation (Smith *et al.*, 2024). Acute fasciolosis, occurring 2-3 weeks post-infection, is characterized by extensive hepatic damage from migrating juvenile flukes, whereas chronic fasciolosis results from adult flukes residing in bile ducts, leading to protracted morbidity (Fairweather, 2011).

Sheep exhibit heightened susceptibility to acute fasciolosis due to their limited innate immunological resilience compared to cattle, which demonstrate greater tolerance (Mezo *et al.*, 2013). Goats, conversely, are less affected, likely due to selective grazing habits minimizing exposure to contaminated pastures (Charlier *et al.*, 2008). The arid Proddatur region of Andhra Pradesh, traditionally considered non-endemic for fasciolosis, experienced a sudden mortality in five sheep from a flock of 1,000 under extensive management. This investigation, undertaken by the Department of Veterinary Pathology and Parasitology at Sri Venkateswara Veterinary University, elucidates the pathological and parasitological characteristics of a representative case, offering critical insights into the epidemiology and control of fasciolosis in atypical ecological settings.

*Corresponding author: dr.charithagnani@gmail.com

MATERIALS AND METHODS

A four-year-old male sheep exhibiting acute clinical signs (anorexia, weakness and icterus) was selected from the affected flock following sudden death. Necropsy was performed within 6 hours at the College of Veterinary Science, Proddatur, adhering to institutional ethical guidelines (IAEC/SVVU/2024/05). Gross lesions were photographed and tissue samples (liver, spleen, intestines) were collected in 10% Neutral Buffered Formalin (NBF) for histopathological analysis.

Fixed liver samples were processed using standard paraffin embedding techniques, sectioned at 5 µm and stained with hematoxylin and eosin (H&E). Additional sections were subjected to Masson's trichrome staining to assess fibrosis. Slides were examined under a light microscope (Olympus BX53) at 10× and 40× magnifications, with digital images captured for documentation. Liver tissue was minced and examined under a stereomicroscope (Leica S8 APO) to identify immature flukes. Fecal samples from the carcass were processed using the sedimentation technique to identify fluke eggs.

Flock history was reviewed, including deworming practices, water sources and recent animal introductions. Meteorological data from May 2024 (India Meteorological Department) confirmed atypical rainfall (150 mm, 120% above average), potentially facilitating snail habitat development.

RESULTS AND DISCUSSION

The post-mortem examination revealed a bloated carcass distended, with pale mucous membranes and subcutaneous tissue changes suggestive of significant blood loss due (Fig. 1). Upon opening the abdominal cavity, approximately 2 liters of dark red blood were

Fig.1. Bloated carcass with pale visible mucous membranes

Fig. 2. Haemorrgaic peritoneum and blood in the abdominal cavity

Fig. 3. Blood clot on the diaphragmatic surface of the liver

Fig. 4. Cut section of liver showing adult flukes and migratory track on visceral surface

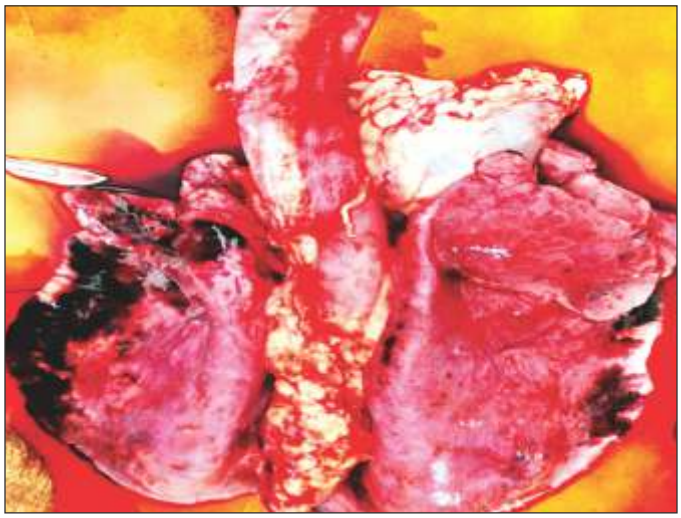

Fig. 5. Diaphragmatic lobes of lungs showing dark consolidation

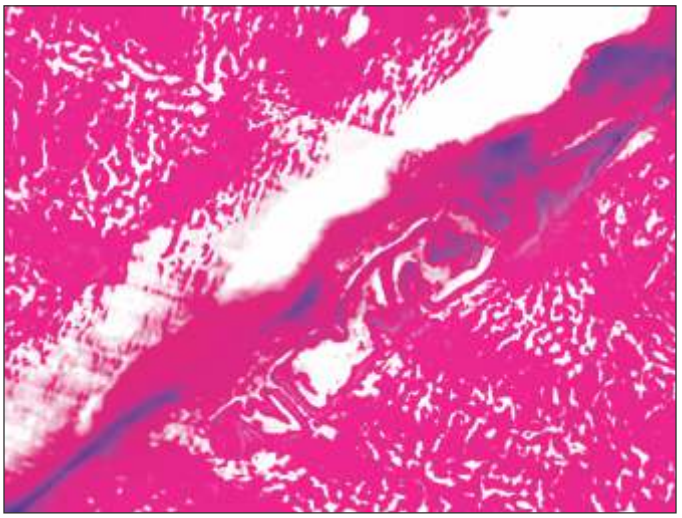

Fig. 6. Liver histopathology section showing presence of the parasite (H&E 10X)

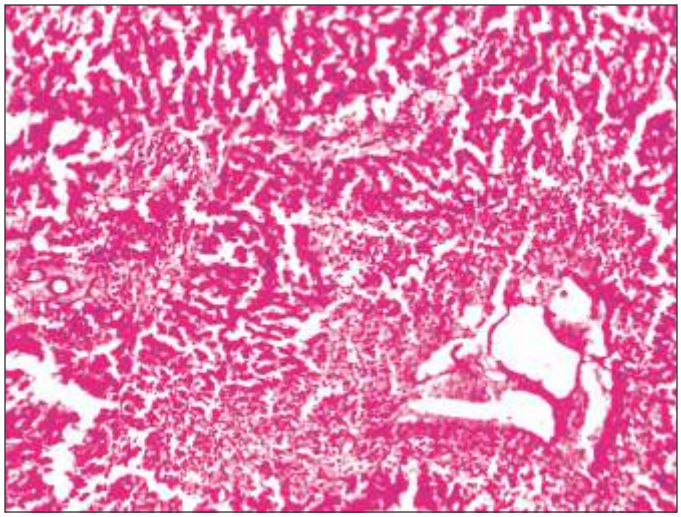

Fig. 7. Liver section showing severe infiltration of inflammatory cells (H&E 10X)

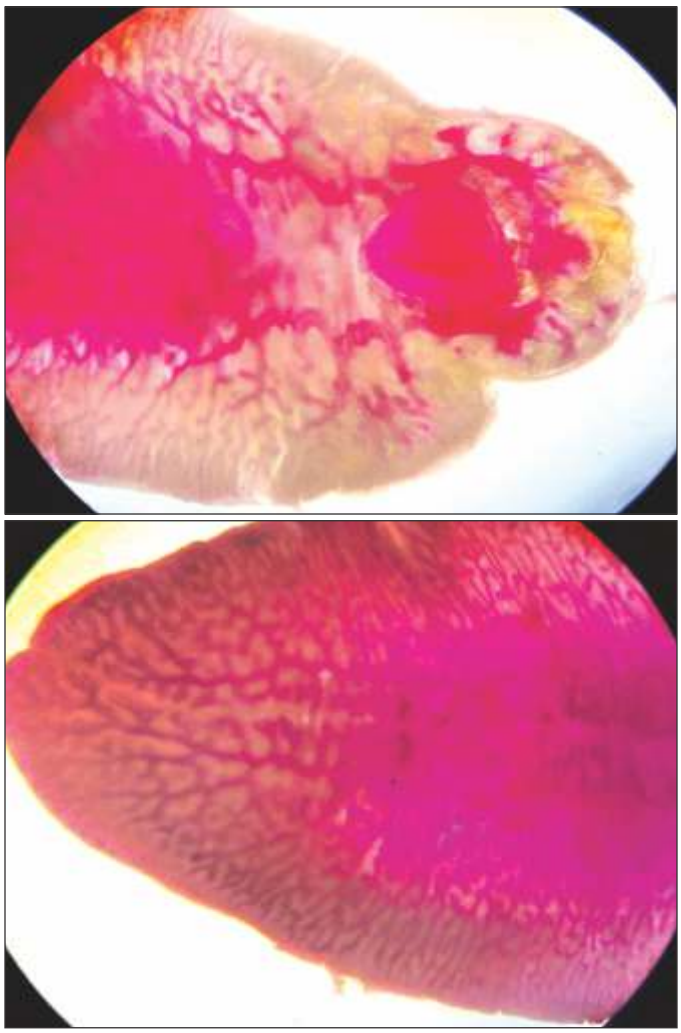

Fig. 8-9. Anterior and posterior end of carmine stained *Fasciola giagntica* worm with intestinal caecae showing internal diverticulations (5X)

observed, indicating hemoperitoneum (Fig. 2). A clotted mass of blood, weighing around 400 to 500 grams, was found on the diaphragmatic surface of the liver (Fig. 3). The visceral surface exhibited migratory tracks with focal

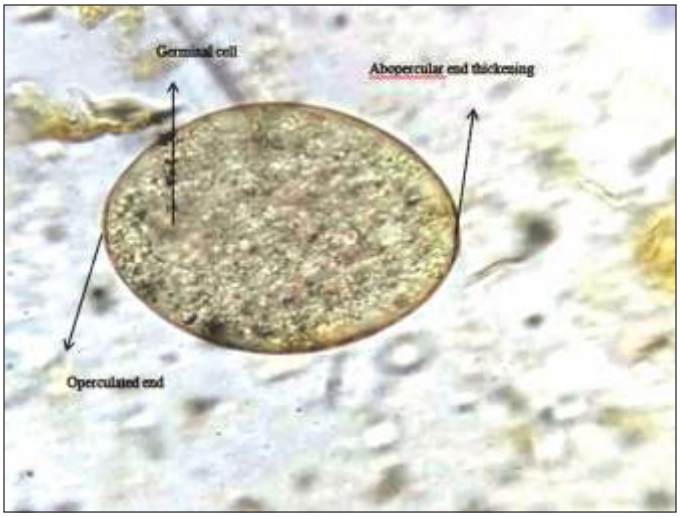

Fig. 10. *Fasciola* egg- note the large size (~ 160 µm long) thin wall with small operculum and abopercular end with thickening (40x)

necrotic and hemorrhagic areas. Mild hepatomegaly with moderately distended gallbladder was also noted. On the cut section, numerous leaf-like immature or juvenile *Fasciola* worms, approximately 3 cm in size, were observed (Fig. 4). Consolidated areas were present in the diaphragmatic and apical lobes of the lungs, and the cut sections revealed immature flukes (Fig. 5). Frothy content was noted in the trachea and lungs, while the heart appeared pale with endocardialhemorrhages and scanty blood clots. These gross lesions are consistent with the findings of Ashoor and Wakid (2023) and Elmonir *et al.* (2015).

Histopathological examination of the liver revealed migratory tunnels associated with hemorrhagic areas and necrosis with fibrin deposition. Cross-sections of the parasite were visible, along with degenerative changes in hepatocytes and dilated, congested blood vessels. Multifocal areas showed severe infiltration of mononuclear cells, such as macrophages and lymphocytes, with disruption of hepatic cords. Bile ductul hyperplasia and mononuclear cell infiltration were evident (Figs. 6 & 7). Further, the worms collected in NBF were subjected to parasitological examination wherein permanent mounting with borax carmine staining was performed as per the methodology of Singh and Srivastava (1977) and the worms (Figs. 8 & 9) were identified as *Fasciola gigantica* based on morphological features as described by Soulsby (1982). Further, sedimentation of fecal samples revealed characteristic *Fasciola* eggs (Fig. 10).

The highly pathogenic parasitic disease, fasciolosis, affects both humans and livestock is caused by liver flukes, of the genus *Fasciola*. Despite the global distribution of *Fasciola hepatica* and *Fasciola gigantica*, infections caused by these parasites are among the most neglected zoonotic diseases (Mas Coma *et al.*, 2005). The presence of standing

water and suitable snail hosts allows *Fasciola* spp. to sustain their life cycle, as these conditions promote the development and dissemination of metacercariae. (Jaja *et al.*, 2017; Martin and Cabrera, 2018). However, Proddatur in the Kadapa district, a dry and arid region, has reported no cases in the past five years, with only 1% of cases documented (Jalajakshi and Varaprasad, 2023) (Reference). The current outbreak might be due to purchase and transport of fifty sheep by the farmer from the waterlogged Guntur district. Although fasciolosis typically occurs in autumn and summer, infection can occur anytime of the year when sheep graze on contaminated plants (Jaja *et al.*, 2017; Nyirendra *et al.*, 2019). The favorable ecological conditions for snails and the parasite likely contributed to the disease's occurrence. Furthermore, sheep confined to sheds during winter and fed hay contaminated with metacercaria in summer, without proper deworming, are at a higher risk of infection (Valero *et al.*, 2018; Sah *et al.*, 2020). Sheep with fasciolosis may exhibit acute, subacute, or chronic symptoms. Acute fasciolosis, common in sheep, presents as severe anemia and sudden death, often without prior signs. The cut section of the liver reveal multiple immature liver flukes. The migrating flukes releases proteolytic enzymes, causing extensive liver tissue damage and hemorrhage (Derso and Genet, 2015; Yusuf *et al.*, 2016). The extensive migration of juvenile flukes can rupture the liver capsule, leading to blood leakage into the peritoneal cavity, peritonitis and death due to traumatic hepatitis (Abdisa 2017). The inflammatory response triggered by hemorrhagic and necrotic lesions attracts immune cells (Zafra *et al.*, 2013). The secretion of cytokines and chemotactic factors perpetuates this process, resulting in sustained cellular infiltration (Molina *et al.*, 2015). Histopathological examination of the liver showed severe infiltration of inflammatory cells and migratory tracts, accompanied by fibrous connective tissue proliferation, consistent with the findings of Dow *et al.* (1967) and Smith *et al.* (1972).

Despite their close morphological resemblance and overlapping geographical occurrence, these two species exhibit distinct morphological, biological and epidemiological characteristics that influence the clinical presentation and transmission dynamics of the disease (Mas-Coma *et al.*, 2005). India, being a tropical country, reports a predominance of *F. gigantica* infections in cattle and buffaloes, with *F. hepatica* occurring sporadically in high-altitude temperate zones (Lalrinkima *et al.*, 2021). The carmine stained specimens (Figs. 8 and 9) were identified based on distinct morphological characteristics viz., leaf-shaped, dorsoventrally flattened body with anterior cephalic cone with less prominent shoulders, branching pattern of intestinal caeca, and the configuration of reproductive organs and posteriorly tapering end, consistent with the morphology of *Fasciola gigantica* in accordance with the diagnostic keys proposed by Soulsby (1982). In addition, coprological examination of fecal samples from infected animals was conducted using the sedimentation technique. The analysis revealed the presence of characteristic *Fasciola* eggs with large, operculated, ellipsoidal ova with a distinct yellowish shell confirming active infection in the herd (Fig. 10). The concurrent detection of adult flukes in bile ducts and eggs in fecal samples provided conclusive evidence of acute fasciolosis, corroborating the pathological and clinical observations recorded during the study.

CONCLUSION

This investigation elucidates the pathological and parasitological profile of acute fasciolosis in an unexpected ovine outbreak in Proddatur, driven by ecological and management factors. Effective control of fasciolosis requires a multifaceted and evidence-based approach that combines chemotherapy, environmental management and host-targeted interventions. Comprehensive strategies such as, regular deworming, quarantine of introduced stock and snail habitat management are imperative to prevent recurrence. Moreover, draining swampy areas and using molluscicides can effectively control the intermediate host population and reduce indirect economic losses.

REFERENCES

Abdisa, T. (2017). Review on ovine fasciolosis in Ethiopia. *J. Vet. Sci. Res.* **2(2)**: 000132.

Ashoor, S.J., Wakid, M.H. (2023). Prevalence and hepatic histopathological findings of fascioliasis in sheep slaughtered in Jeddah, Saudi Arabia. *Sci. Rep.* **13**: 6609.

Charlier, J., De Meulemeester, L., Claerebout, E., Williams, D. and Vercruysse, J. (2008). Qualitative and quantitative evaluation of coprological and serological techniques for the diagnosis of fasciolosis in cattle. *Vet. Parasitol.* **153**: 44-51.

Derso, S. and Genet, A. (2015). Prevalence of bovine fasciolosis and its associated risk factors in and around Dangila District, Awi Administration Zone, Northwestern Ethiopia. *Eur. J. Biol. Sci.* **7**: 114-119.

Dow, C., Ross, J.G. and Todd, J.R. (1967). The pathology of experimental fasciolosis in calves. *J. Comp. Path.* **77**: 377-386.

Elmonir, W., Mousa, W. and Sultan, K. (2015). The prevalence of some parasitic zoonoses in different slaughtered animal species at abattoir in the Mid-Delta of Egypt; with special reference to its economic implications. *Alexandria J. Vet. Sci.* **47**: 1-10.

Fairweather, I. (2011). Reducing the future threat from (liver) fluke: realistic prospect or quixotic fantasy? *Vet. Parasitol.* **180(1-2)**: 133-143.

Jaja, I.F., Mushonga, B., Green, E. and Muchenje, V. (2017). Financial loss estimation of bovine fasciolosis in slaughtered cattle in South Africa. *Parasite Epidemiol. Control*. **2**: 27-34.

Jalajakshi, K. and Varaprasad Reddy, L.S.S. (2023). Prevalence and

management of acute fasciolosis in Nellore Brown sheep. *Indian J. Small Rumin.* **29(2)**: 329-332.

Lalrinkima, H., Lalchhandama, C., Jacob, S.S., Raina, O.K. and Lallianchhunga, M.C. (2021). Fasciolosis in India: an overview. *Exp. Parasitol.* **222**: 108066.

Martin, G.L. and Cabrera, E.C. (2018). Morphological characterization of emerging cercariae among lymnaeid snails from Barangay Cawongan, Padre Garcia, Batangas. *J. Parasitol. Res.* **5241217**: 1-13.

Mas Coma, S., Bargues, M.D. and Valero, M.A. (2005). Fascioliasis and other plant-borne trematode zoonoses. *Int. J. Parasitol.* **35(11-12)**: 1255-1278.

Mezo, M., González-Warleta, M., Castro-Hermida, J.A., Manga-González, M.Y., Peixoto, R., Mas-Coma, S. and Valero, M.A. (2013). The wild boar (*Sus scrofa* Linnaeus, 1758) as secondary reservoir of *Fasciola hepatica* in Galicia (NW Spain). *Vet. Parasitol.* **198(3-4)**: 274-283.

Molina-Hernández, V., Mulcahy, G., Pérez, J., Martínez-Moreno, Á., Donnelly, S., O'Neill, S.M. *et al.* (2015). *Fasciola hepatica* vaccine: we may not be there yet but we're on the right road. *Vet. Parasitol.* **208**: 101-111.

Nyirenda, S.S., Sakala, M., Moonde, L. (2019). Prevalence of bovine fascioliasis and economic impact associated with liver condemnation in abattoirs in Mongu District of Zambia. *BMC Vet. Res.* **15**: 33.

Sah, R.P., Yadav, M.P., Kanu, S.P. and Rijal, T.R. (2020). Study on ovine fascioliasis: case study, associated risk factors and economic significance at Sheep and Goat Research Program, Guthichaur, Jumla, Nepal. *Int. J. Vet. Sci. Anim. Husb.* 5(4): 164-168.

Singh, S.K.R. and Srivastava, H.D. (1977). Diagnosis and treatment of helminth infections. Division of Parasitology, Indian Veterinary Research Institute, Uttar Pradesh, India.

Smith, C.D., Morgan, E.R. and Jones, R.A. (2024). Environmental influences on the distribution and ecology of the fluke intermediate host *Galba truncatula*: a systematic review. *Parasitology.* **151(11)**: 1234-1248.

Smith, H.A., Jones, T.C. and Hunt, R.D. (1972). Veterinary Pathology. (4th Edn.), Lea and Febiger, Philadelphia.

Soulsby, E.J.L. (1982). Helminths, Arthropods and Protozoa of Domesticated Animals. (7th Edn.), ELBS and Baillière Tindall, London.

Valero, M.A., Bargues, M.D. and Calderón, L. *et al.* (2018). First phenotypic and genotypic description of *Fasciola hepatica* infecting highland cattle in the State of Mexico, Mexico. *Infect. Genet. Evol.* **64**: 231-240.

Zafra, R., Pérez-Écija, R.A., Buffoni, L., Moreno, P., Bautista, M.J., Martínez-Moreno, A. *et al.* (2013). Early and late peritoneal and hepatic changes in goats immunized with recombinant cathepsin L1 and infected with *Fasciola hepatica*. *J. Comp. Pathol.* **148**: 373-384.

THE HARYANA VETERINARIAN

Editors/Editorial Board Members are highly thankful to all the distinguished referees who helped us in the evaluation of articles. We request them to continue to extend their co-operation and be prompt in future to give their valuable comments on the articles for timely publication of the journal.