

# Ectoparasite infestation in goats victims of the Mount Semeru eruption disaster

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**ABSTRACT:** The slopes of the volcano have soil fertility and environmental conditions suitable for businesses in the livestock and agricultural sectors. Raising livestock at the foot of an active volcano requires disaster mitigation against the risk of health problems and even death, which can be accomplished through a health examination. This research aims to identify ectoparasite infestations in goats victims of the Mount Semeru eruption disaster. Ectoparasite examination of each symptomatic goat in Kamarkajang Hamlet, Sumberwuluh Village, Lumajang Regency, East Java in March 2022 after the eruption of Mt. Semeru was carried out by taking samples directly from the lice and the eggs. Identification of ectoparasites using light microscopy. The identification results showed that *Linognathus* sp. and *Bovicola* sp. infested goats. There were 130 goats from 14 different cages; 6 goats (4.6%) in one cage were infested with lice, and 1 goat (0.8%) in another cage was suspected of scabiosis.

**Keywords:**

volcanic eruptions, goats, ectoparasites, Mount Semeru

## INTRODUCTION

Indonesia has several volcanoes because it is located on three active tectonic plates. Volcano slopes have soil fertility and environmental conditions suitable for businesses in the livestock and agricultural sectors (Widodo *et al.* 2017). However, raising livestock at the foot of an active volcano requires disaster mitigation against the risk of animals becoming sick or even dying, one of which is through health checks (Ragil *et al.* 2020). Health problems can be caused, among other things, by parasites that infect livestock and are often neglected in maintenance.

Parasites are detrimental to the host, and their spread is influenced by several factors, including life cycle, climate, socio-cultural/economic, and hygiene. The ectoparasites that infest goats are mites, fleas, ticks, fleas, and flies. The common ticks that infest are *Bovicola caprae* and *Linognathus africanus* (Daniel *et al.* 2019). Ectoparasites in livestock victims of the eruption were reported to be more dominant owing to a lack of nutrition (Nogales *et al.* 2022) and high levels of stress (Pedersen *et al.* 2012). However, to date, reports regarding health checks on livestock victims of volcanic eruptions in Indonesia are very limited. This research aims to identify ectoparasite infestations in goat victims of the Mt. Semeru eruption.

## MATERIALS AND METHODS

Samples were collected from symptomatic goats that appeared to be infested by ectoparasites (Figure 1) in Kamarkajang Hamlet, Sumberwuluh Village, Lumajang Regency, East Java, in March 2022 after the eruption of Mt. Semeru. Morphological examination of the samples was

performed at the Parasitology Laboratory, Faculty of Veterinary Medicine, Brawijaya University. Samples in the form of ectoparasite eggs attached to hair were collected by cutting the hair. Collection of ectoparasites attached to the skin by taking them directly either with bare hands or using tweezers. Ectoparasites were carefully removed so that the specimen was not damaged (Dwiyani *et al.* 2014). Breeders do not allow for skin scrapping. Ectoparasite samples were placed in a labelled plastic clip in a box stored at room temperature without preservation, so that they were examined immediately after collection. Morphological identification was performed using a light microscope. Inspection of the cage area was also performed.

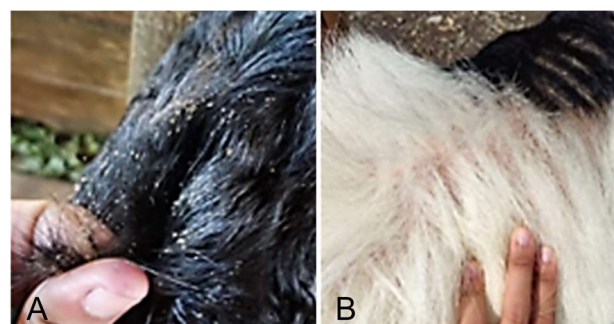


Figure 1 Conditions of goat victims of the Mt. Semeru eruption disaster with flea infestation in Kamarkajang Hamlet, Sumberwuluh Village, Lumajang Regency. (A) Goats with lice infestation showing the presence of lice eggs and lice in their hair and (B) other goats experiencing alopecia and thickening of the skin.

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## RESULTS AND DISCUSSION

Ectoparasite was examined in 14 breeder pens with 130 Etawah Crossbred and Senduro goats. The results of the identification of six goats in one cage showed that around 4.6% of the population were infested with lice, and one goat (0.8%) in another cage was suspected of scabiosis (Table 1).

Table 1. Results of ectoparasite examination in goat victims of the Mt. Semeru eruption disaster in 14 livestock pens in Kamarkajang Hamlet, Sumberwuluh Village, Lumajang Regency.

Farm no.	Owner	Number of Goat	Results
1	Gito	9	Negative
2	Harimulyono	5	Negative
3	Sutikno	2	Negative
4	Suyirno	5	Negative
5	Sugiono	4	Negative
6	Ngadiri	5	Negative
7	Suyit	4	Negative
8	Jumari	21	Negative
9	Nur	6	Positive
10	Akbar	11	Negative
11	Pujiono	8	Suspect
12	Lagiono	10	Negative
13	Supar	4	Negative
14	Hargo	36	Negative
Negative from Ectoparasite (%)			94.6
Positive from Ectoparasite (%)			4.6
Suspect from Ectoparasite (%)			0.8

Touching and brushing with a finger on the goat's hair revealed the presence of small insects and eggs in Mr. Nur's goats. Upon examination of one of the goats belonging to the farmer, Mr. Pujiono, he could see thickening of the skin area and skin reflexes which occurred especially in the head area, the edges of the earlobes and lips, as well as the knee area. The skin around the head, neck, feet, ears, and eyelids experiences baldness (alopecia), redness or erythema, and hyperkeratosis.

The results of the sample examination revealed two species of ectoparasite, *Linognathus* sp. and *Bovicola* sp. (Figure 2). *Bovicola caprae* and *Linognathus africanus* infest goats (Daniel *et al.* 2019). *Linognathus* sp. The body was divided into three parts: the head, thorax, and abdomen. This tick has a pointed head, pair of segmented antennae, and three pairs of segmented legs (Sari 2020). *Bovicola* sp. were observed to have a flat body with a round and large head. The body is divided into three parts: the head, thorax, and abdomen. Body segments are clearly visible and have a pair of antennae and three pairs of legs. The tick was reddish-yellow in colour. These ticks do not have wings (Khaula *et al.* 2020).

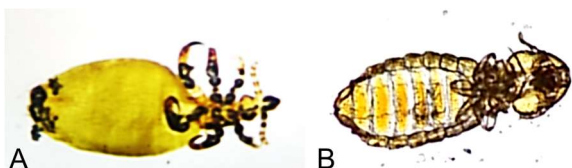


Figure 2 Findings of lice in victims of the Mt. Semeru eruption disaster in Kamarkajang Hamlet, Sumberwuluh Village, Lumajang Regency. (A) *Linognathus* sp. (B) *Bovicola* sp.

The condition of the Mr. Nur's cage is quite damp because it is close to land covered with bushes and trees. Ectoparasites can be treated with routine antiparasitic injections. Simple treatment can be done using 2-3% sulfur when bathing livestock, or using a motor vehicle lubricating oil to kill ectoparasites on the livestock's body, maintaining clean sanitation in the pen, separating healthy and sick animals, and placing sick animals in isolation pens for more intensive treatment., and cleaning the cage and cage environment using an anti-parasitic fluid (Asih 2020).

## CONCLUSION

The lice that infested goats affected by the Mount Semeru eruption were *Linognathus* sp. and *Bovicola* sp. Lice infestation occurred in 4.6% of the population concentrated in one of the cages, and 0.8% were suspected of scabiosis.

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## REFERENCES

- Asih AR, Wiryawan KG. 2020. Bimbingan teknis manajemen pemerahan dan kesehatan ternak kambing perah kepada anggota MT. An-Nahl BEM Fakultas Peternakan UNRAM. Prosiding PEPADU. 2:329-336.
- Daniel G, Biruk A, Yakob R. 2019. Prevalence of small ruminant ectoparasites in and around Hawassa, Ethiopia. International Journal of Advanced Multidisciplinary Research. 6(4):1-7.
- Dwiyani NP, Setiati N, Widyaningrum P. 2014. Ektoparasit pada ordo artiodactyla di Taman Margasatwa Semarang. Life Science. 3(2):124-129.
- Khaula K, Kamal S, Isfanda I. 2022. Karakteristik serangga ordo pthireptera (kutu) pada kambing (*Capra aegagrus hircus*) dan domba (*Ovis aries*) Aceh Besar. In Prosiding Seminar Nasional Biotik. 8(1):39-42.
- Nogales M, Guerrero-Campos M, Boulesteix T, Taquet N, Beierkuhnlein C, Campion R, Fajardo S, Zurita N, Arechavaleta M, García R, Weiser F. 2022. The fate of terrestrial biodiversity during an oceanic island volcanic eruption. Scientific Reports. 12(1):19344.
- Pedersen SC, Popowics TE, Kwiecinski GG, Knudsen DE. 2012. Sublethal pathology in bats associated with stress and volcanic activity on Montserrat, West Indies. Journal of Mammalogy. 93(5):1380-1392.
- Ragil C, Pramana AY, Efendi H. 2020. Kearifan lokal dalam miti-gasi bencana di wilayah lereng Gunung Merapi studi kasus Kecamatan Cangkringan, Kabupaten Sleman. Reka Ruang. 3(1):10-18.
- Sari NV. 2020. Prevalensi ektoparasit pada kambing kacang di Kecamatan Prambon Kabupaten Nganjuk. Doctoral dissertation. Universitas Airlangga.
- Widodo DR, Nugroho SP, Asteria D. 2017. Analisis Penyebab Masyarakat Tetap Tinggal di Kawasan Rawan Bencana Gunung Merapi (Studi di Lereng Gunung Merapi Kecamatan Cangkringan, Kabupaten Sleman Daerah Istimewa Yogyakarta). Jurnal Ilmu Lingkungan. 15(2):135-142.