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## Epidemiology of sarcoptic mange infestation in a Pulikulam Cattle herd of Tamil Nadu

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### Abstract

The skin scrapings of animal showing dermatological symptoms were collected from a Pulikulam Cattle herd having 70 animals, located in Manamadurai, Sivaganga District, Tamil Nadu and subjected to microscopic examination for the presence of mange infestation. The total of 24 samples were examined and revealed the overall prevalence of 34.29 percent sarcoptic mange infestation. Among that 37.29 and 4.55 percent of prevalence found in female and male animals respectively. The age-wise prevalence in females were 61.54, 46.15 and 33.33 in 1-2 year, 2-3 year and >3 year age group respectively whereas no positivity noticed in <1 year age group. Among the males, highest prevalence (66.66%) found in more than 3 year age group and the herd is not maintaining the bull calves beyond 6 month age. All the affected animals were treated with Ivermectin at the rate of 300 mcg per kilogram body weight and found recovery of 20 animals two injection at one month interval and 4 animals were recovered within single injection. The study revealed that the confirmation of sarcoptic mange report in Pulikulam Cattle first of its kind and ivermectin is found to be effective to control the sarcoptic mange in Pulikulam Cattle.

**Keywords:** Pulikulam cattle, herd, prevalence, mange, ivermectin

### Introduction

Pulikulam cattle is the one of the native breed of India and is rearing as herds in the southern Tamil Nadu. The Pulikulam bull is mainly used for Bull baiting game (Jalli Kattu) which is the major game celebrated during Pongal at Tamil Nadu. Cattle are generally prone for several parasitic infestation, among that *Sarcoptes scabiei* is one of the common usually affecting sparsely haired parts of the body viz., base of tail, the inner thigh, under the neck and brisket and is considered as one of the serious and contagious parasitic skin disease of cattle in Indian subcontinent [1]. Animals in poor condition, poor nutrition, cold weather, stress, overcrowding and immune suppression were the major predisposing factors for the occurrence of this disease [2, 3]. The mange infestation is characterised by pruritus, alopecia, crusted lesion and erythema [4].

The diagnosis of mange infestation is based on clinical signs but it can be mimic with other infestation like ring worm, ticks and flea allergy. Hence, the confirmation of eggs, nymph and adult mites is carried out through microscopic identification of skin scrapings in the laboratory. This is the method practised throughout the world and there no commercial serological and molecular diagnosis assay with high sensitivity [5].

As the Pulikulam cattle is predominantly reared by the people of southern Tamil Nadu and they are getting income by selling the bull calves. The status of mange infestation in the Pulikulam Cattle breed was unknown to the scientific community. Therefore, the current study was carried out to assess the prevalence of manage infestation in the suspected cases of skin disorder and effect of Ivermectin in the control of skin infection as first its kind in Pulikulam Cattle.

### Materials and Methods

The study was carried out in a Pulikulam Cattle herd having 70 animals at Manamadurai, Sivaganga District of Tamil Nadu, India where the animals had shown skin disorders in different age groups. Twenty four skin scraping samples were collected with animals showing alopecia, erythema and pruritus viz., 8 samples from 1-2 year, 6 samples from 2-3 year age group and 10 samples from 3-4 year age group. The hairs of the affected area were shaved and cleaned with 10% KOH solution. The skin scrapings were carried out through surgical blades and stored in the storage tubes containing 70% ethanol.

The affected skin area was scrapped deep enough until appearance of blood drop and stored.

The skin samples were exposed to 10% KOH and placed in the incubator for 30 minutes followed by a drop of samples was placed in a clean glass slide and observed under the microscope for the presence of mites. The identification of mange mite species was carried out through morphological parameters described in the laboratory manual of parasitology [6]. The prevalence was calculated in different age group and both the sex and tested for significance using chi-square test. The affected animals were treated with Ivermectin at the dose rate of 300 mcg per kilogram body weight and based on repeated examination at the interval of 30 days until the animal with negative result in the skin scrapings as per the method previous worker [7] with slight modification in the

dosage rate.

## Results and Discussion

During March 2023 to April 2023, a total of 24 animals with skin disorder were examined in a Pulikulam Cattle herd having 70 animals. Out of that total, 34.29% of Cattle were found to be infected with *Sarcoptes scabiei*. The highest prevalence of 66.67% was noticed in the male animals more than 3 years of age. The overall prevalence was found to be high in females (37.29%) than male animals (4.55%) and statistically significant difference was noticed in prevalence of mange infestation in Pulikulam Cattle ( $p < 0.05$ ) in different sexes. The age-wise and sex-wise prevalence depicted in the Table 1.

**Table 1:** The Age-wise and Sex-wise Prevalence of Sarcoptic mange infestation in a Pulikulam cattle herd

Age	Total No. of animals		No. of Positives		Percentage of Positives	
	Male	Female	Male	Female	Male	Female
< 1 year	8	9	-	-	-	-
1-2 year	-	13	-	8	-	61.54
2-3 year	-	13	-	6	-	46.15
> 3 year	3	24	2	8	66.67	33.33
Total	11	59	2	22	4.55	37.29
Over all Prevalence					34.29	

The present report has full agreement with previous reports [8, 9, 10, 11] and they concluded highest prevalence in females. Further, the breeding bulls could also be recognised to the transmission of diseases to a number females as more than one year old females were kept as a separate herd.

The prevalence of mange mite infestation was higher in 1-2 year age group (61.5%) as age advances, the prevalence rate was decreased. This would be due to the animals with soft and tender skin, huddling tendency and immature immunity in 1-2 year age group and significant difference in the prevalence noticed between 1-2 year and <3 year age group ( $p < 0.05$ ).

This report is in contrast to the previous reports [8, 12] as they concluded that there was no significant in the prevalence of mange infestation among different age groups and sexes whereas other research [13] found higher prevalence in less than one year old buffaloes (31.57%) than older animals.

The affected animals were treated with Ivermectin and only 4 animals (16.66%) viz., 2 animals each from 1-2 year and > 3 year age groups were recovered with only one treatment where as the remaining 83.34% of animals were recovered after receiving second dose of Ivermectin at a month interval. The results are depicted in Table 2.

**Table 2:** Pulikulam Cattle recovery after Ivermectin treatment and identification of *Sarcoptes scabiei*

Age	No of animals	No. of animals detected with presence of <i>Sarcoptes scabiei</i>		
		1 <sup>st</sup> sampling and treatment 1 <sup>st</sup> day	2 <sup>nd</sup> sampling and treatment 30 <sup>th</sup> day	3 <sup>rd</sup> sampling at 60 days
< 1 year	17	-ve	-ve	-ve
1-2 year	13	8	6	-ve
2-3 year	13	6	6	-ve
> 3 year	27	10	8	-ve

The result is in full agreement with the previous reports [1, 14] and they found high responses after first treatment (16.66%) whereas other finding [15] revealed that a gradual decrease in the number of mites after multiple doses of Ivermectin administered at regular intervals as found 83.34% of the animals were recovered after two doses of Ivermectin in this study.

Further, the Pulikulam Cattle are reared more numbers in a herd as compared to males due to economic reason and in generally the male calves are sold below 1 year of age. Hence, the highly populated Pulikulam Cattle females maintained in a herd so it could be the contributing factor for higher prevalence in female animals. The different physiological condition of female animals might favour the occurrence of more prevalence as reported by earlier findings [13]. The Ivermectin found to be effective in the control of Sarcoptic mange in Pulikulam cattle breed.

## Conclusion

The present study confirms the prevalence of Sarcoptic mange infestation first of its kind in the Pulikulam Cattle breed and still date no data is available in the disease susceptibility of Pulikulam cattle breed. The animals are well responding to Ivermectin treatment and can be concluded that Ivermectin at the dose rate of 300 mcg per kilogram body weight is the drug of choice for controlling sarcoptic mange in Pulikulam Cattle breed.

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