

## Research Article

# Prevalence of *Sarcoptes scabiei* var. *caprae* in Goats of Dera Ghazi Khan, Punjab, Pakistan

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## Abstract

The present study was conducted to examine the prevalence of *Sarcoptes scabiei* var. *caprae* in goats in and around Samina Sadat village of Dera Ghazi Khan district of Punjab province. The data regarding the effect of age, sex and breed of the hosts on the prevalence of skin disease was also studied. A total of 300 goats (72 males and 228 females) were examined. Depending upon the age, these hosts were divided into four groups viz, 3-23 (n=128), 22-44 (n=121), 45-65 (n=40) and 66-86 (n=11) months. Out of 300 hosts examined 84 were found infested with *S. scabiei* var. *caprae* showing an overall prevalence of 28%. The prevalence of *S. scabiei* var. *caprae* in female hosts was 30.26% versus 20.83% in males, the difference was statistically significant ( $P < 0.05$ ). The prevalence was highest (54.54%) in age group of 66-86 months and lowest (21.09%) in age groups of 3-23 months. The difference was statistically significant ( $P < 0.05$ ). Among the three breeds (Nachi, Teddy and Beetle), the highest prevalence (35.48%) was recorded in Nachi while the lowest prevalence (21.55%) was recorded in Teddy. The difference was statistically significant ( $P > 0.05$ ). In conclusion the sex and breed of host had significant effect on the prevalence of *S. scabiei* var. *caprae*.

**Keywords:** Goat, Age, Sex, Breed, *S. scabiei* var. *caprae*

## Introduction

Pakistan being an agriculture country places a significant dependence on livestock. It contributed approximately 55.1 % to the agricultural value added and 11.6 % to national GDP during 2010-12. The goat population of the country is to be estimated 63.1 million heads. Goats in the country are raised for various purposes including milk, meat and skin production and breeding and as means of cash income. Skins and hides of livestock have the largest share of export in Pakistan. Annually 779,000 tons of milk, 629000 tons of mutton 24,237000 pieces of skins 11,318000 pieces of kid skins is produced in the country (Anonymous, 2012).

The common skin parasites of small ruminants are ticks, mange mites, lice and ked. The mange mites are notorious external parasites of sheep/goats and are responsible for great economic losses due to damaged skin and wool, anemia, poor physical condition, reduced milk and meat production and suboptimal lambing/kidding and growth rates (Fthenakis *et al.*, 2000). In many species of animals, the prevalence of scabies is very high and often causes death if left untreated (Kemp *et al.*, 2002).

Scabies may occur in farm animals of any age, especially those kept under poor management. Mites spread through direct contact between goats or from goat

to kid while suckling (Schmidt, 1994). It mostly infests goats during winter.

As they are highly contagious, heavy infestations can be fatal. Animals can die from dehydration, toxic reactions, secondary infections, or hypothermia due to excessive hair loss (Baniecki, 1999). Sarcoptic scabies not only causes direct economic loss to the farmer through animal mortality and poor growth and reproduction, the skin of mange-infested animals often must be downgraded or rejected at the tannery. This leads to economic losses to the tannery industry and ultimately the country (Mekonnen *et al.*, 1999).

Although considerable work has been done in various parts of the world (Alonso-de-Vega *et al.*, 1998; Leon-Vizcayno *et al.*, 1999; Zeleke and Bekele, 2001; Rodriguez-Vivas *et al.*, 2003; Damriyasa *et al.*, 2004; Mahran and Saleh, 2004; Gonzalez-Candela *et al.*, 2004; Alterio *et al.*, 2005; Balestrieri *et al.*, 2006; Yakhchali and Hosseine, 2006) and in Pakistan (Jabeen *et al.*, 1998), but no work has been done on goat scabies in Dera Ghazi Khan. Keeping in view the importance of parasite, the present study was designed to know the overall prevalence of *S. scabiei* var. *caprae* in goats and the relationship between sex, age and different breeds of goats and *S. scabiei* var. *caprae*.

## Material and Methods

The present study was conducted from October, 2012 to

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February, 2013 in and around Samina Sadat village which is located 20 Km away from Dera Ghazi Khan district, Punjab, Pakistan. Dera Ghazi Khan is a mid-country city located on the junction of all the four provinces of Pakistan i.e. Sindh, Punjab, Balochistan and Khyber Pukhtunkhwa. It has beautiful and unique landscape including Indus River, Green fields, Pachad Desert and the Sulaiman Mountains. It is located at 30°03' N and 70°38' E. The overall climate of the study area is dry with little rainfall. The winter is relatively cold and the climate is hot during the remaining part of the year, but it is very hot in summer. The temperature during summer is usually about 115 °F (46 °C), while during winter season the temperature is as low as 40 °F (4 °C).

A total of 300 goats including 228 females and 72 males were examined for the prevalence of *S. scabiei* var. *caprae*. The collected samples were transferred to labeled bottles containing 10% formalin. The hosts sex, age and breed were also recorded. Skin scrap from each affected areas animal, were collected using sterile scalpel after moistening the area by glycerol. The samples were collected in sterile plastic bottles containing 70% alcohol. The collected samples were send to the laboratory of Parasitology, Institute of Pure and Applied Biology for diagnosis. Mites were extracted from the collected skin scraps using technique described by (Cable, 1985) after addition of suitable amount of potassium hydroxide 10 %. The specimens were dehydrated with graded series of alcohol i.e. 10, 30, 50, 70, 90 and 100% alcohol. The dehydrated specimens were cleared in xylene, mounted in canada balsam and identified under the light microscope with 10X lenses. Specific identification of the parasite was performed following the descriptions given by Cable, 1985. Results are expressed in percentages and the values between various groups were compared by Chi square test.

## Results and Discussion

### The overall prevalence of *S. scabiei* var. *caprae* in goats

According to the present study a total of 300 hosts were studied. Out of these 84 goats were infested with *S. scabiei* var. *caprae*. The overall prevalence was 28%. Research has been carried out on the prevalence of *S. scabiei* in different parts of the world. Welsh and Bunch (1983) conducted a survey to study the prevalence of *Psoroptic scabies* in desert bighorn goat in northwestern Arizona and found the prevalence of *Psoroptic scabies* in live-captured goat for the years 1979, 1980 and 1981, was 25, 27 and 0%, respectively. Yakhchali and Hosseine (2006) out of 77 sheep, two sheep (2.6%) were infested by *S. scabiei* during their studies on the prevalence of ectoparasites fauna of sheep and goats flocks in Urmia suburb, (northwest region of Iran). Asghar *et al.* (2011) reported 6.5% prevalence in native goats, during the Hajj season in Makkah, Saudi Arabia.

This difference in the prevalence of *Sarcoptes* spp. reported from various studies may be due to the managemental differences in resistance to infection, host

age, sex, crowding, poor nutrition, grazing habits and breeds of the host.

### The relationship between sex and *Sarcoptes scabiei* var. *caprae* in goats of Dera Ghazi Khan

In the present study, out of 72 male hosts 15 were infected with *Sarcoptes scabiei* var. *caprae* with the prevalence of 20.83%. In female goats the prevalence was 30.26% (Table 1). Thus the higher ( $P < 0.05$ ) prevalence was observed in females than males.

The higher prevalence in females as compared to males has also been reported earlier (Leon-Vizcayno *et al.*, 1999). Alexander and Stinson (1988) reported that female animals were more prone to infection with protozoan parasites than males. There are various other factors which may break down the immunity in females e.g., changes in sex associated hormones, environmental factors, age, nutrition and pregnancy (Craig *et al.*, 2001, Gonzalez-Candela *et al.*, 2004).

### The relationship between age and *Sarcoptes scabiei* var. *caprae* in goats of Dera Ghazi Khan

The relationship between age and *S. scabiei* var. *caprae* in goats showed higher prevalence 54.54 in age group of 66-86 months and lowest prevalence 21.09% in age groups of 3-23 months (Table 2). The prevalence was increased as the age of animal increased.

Pence and Windberg (1994) reported that the age of animal is important factor in the prevalence of parasite. The adults were more ( $P < 0.001$ ) frequently infected than other age classes during the stationary phase of peak prevalence. There were more cases of severe mange among adult males ( $P < 0.01$ ) during the stationary than the decline phase. Reduced ovulation and pregnancy rates were associated with greater mange severity in adult females.

The results of present study are supported by Yeruham *et al.* (1999) in Israel, Mahran and Saleh, (2004) in Shalatin city and Gonzalez-Candela *et al.* (2004) in Spain. The immunity in the older hosts may be lowered, due to various stresses, e.g. pregnancy, poor nutrition and reduced ovulation.

### The relationship between breed and *Sarcoptes scabiei* var. *caprae* in goats of Dera Ghazi Khan

The three breeds of goats, the Nachi, Teddy and Beetle were sampled in present study (Table 3). According to these results, the prevalence of *S. scabiei* var. *caprae* was highest in Nachi breed (35.48%) and lowest in Teddy (21.55%). Tadesse *et al.*, 2011 also found the significant breed differences in susceptibility to *S. scabiei* var. *caprae* infection in Northeastern Ethiopia. The present results are also supported by Asghar *et al.*, 2011, who found that the breeds of host showed difference in parasitic infection. They explained that the breed differences could be due to differences in resistance to parasitic infection, because some breeds are more resistant than others.

In conclusion, the present study indicated that sex, age and breed are important factors which influence the prevalence of skin parasitic infection in goats in D.G. Khan Punjab, Pakistan. The infections may be very important economically leading to retarded growth; reduced productivity and animals are more susceptible to other infections. Moreover extension services and training programs aiming at creation of awareness about the importance and prevention of *S. scabiei* var. *caprae* among small holder animal producing farmers is recommended.

**Table 1:** The relationship between sex and *Sarcoptes scabiei* var. *caprae* in Dera Ghazi Khan

Sex	Male hosts	Female hosts
No. of hosts examined	72	228
No. of hosts infected	15	69
Prevalence%	20.83	30.26

The difference was statistically significant ( $P < 0.05$ ).

**Table 2:** The relationship between age and *Sarcoptes scabiei* var. *caprae* in goats of Dera Ghazi Khan

Age of hosts in months	No. of hosts examined	No. of hosts infected	Prevalence %
3-23	128	27	21.09
24-44	121	37	30.57
45-65	40	14	35.0
66-86	11	6	54.54

The difference was statistically significant ( $P < 0.05$ ).

**Table 3:** The relationship between different breeds of goat and *Sarcoptes scabiei* var. *caprae* in Dera Ghazi Khan

Names of goat breeds	No. of hosts examined	No. of hosts infected	Prevalence %
Nachi	93	33	35.48
Teddy	116	25	21.55
Beetle	91	26	28.57
Total	300	84	28

The difference was statistically significant ( $P < 0.05$ ).

## References

- Alexander, J. and W. H. Stinson (1988). Sex hormones and the course of parasitic infection. *Parasitol. Today*, 4: 189-193.
- Alonso-de-Vega, F., Mendez-de-Vigo, J., Sanchez, J. O., Pleite, C. M., Serrano, A.A. and Carnero, M. R. R. (1998). Evaluation of the prevalence of sarcoptic mange in slaughtered fattening pigs in southeastern Spain. *Vet. Parasitol.*, 76: 203-209.
- Alterio, G. L. D., Callaghan, C. Just, C., Manner-Smith A., Foster, A. and Knowles, T. G. (2005). Prevalence of *Chorioptes* spp. mite infestation in alpaca (*Lama pacos*) in the south-west of England: implications for skin health. *Small Rumin. Res.*, 57: 221-228.
- Asghar, A., Hassanien, O., Alsadi, A., Feda, H. and Fathi, S. (2011). Prevalence of Scabies Diagnosed in Sheep and Goats During Hajj Season in Makkah. *J. Agri. Vet. Sci.* 4: 37-43.
- Balestrieri, A., Remonti, L., Ferrari, N., Ferrari, A., Tatiana-Lo-Valvo, Roberto, S. and Orusa, R. (2006). Sarcoptic mange in wild carnivores and its co-occurrence with parasitic helminths in the Western Italian Alps. *Eur. J. Wildl. Res.*, 52: 196-201.
- Baniecki, J. F., and Dabaan, M. E. (2000). Crop profile for cattle (beef) in West Virginia.
- Cable, R. M. (1985). An illustrated laboratory manual of parasitology. *J. Parasitol.*, 5: 225-269.
- Craig W, R William and James W.A. (2001). Sex associated hormones and immunity to protozoan parasites. *Clin. Microbiol.*, 144: 76-488.
- Damriyasa, I. M., Failing, K., Volmer, R., Zahner, H. and Bauer, C. (2004). Prevalence, risk factors and economic importance of infestations with *Sarcoptes scabiei* and *Haematopinus suis* in sows of pig breeding farms in Hesse, Germany. *Med. Vet. Entomol.*, 18: 361-367.
- Fthenakis, G. C., Karagiannidis, A., Alexopoulos, C., Brozos, C. and Papadopoulos, E. (2001). Effects of sarcoptic mange on the reproductive performance of ewes and transmission of *Sarcoptes scabiei* to newborn lambs. *Vet. Parasitol.*, 95: 63-71.
- Gonzalez-Candela, M., Leon-Vizcaino, L. and Cubero-Pablo, M. J. (2004). Population effects of Sarcoptic mange in Barbary sheep (*Ammotragus lervia*) from Sierra Espuna Regional Park, Spain. *J. Wildl. Dis.*, 40: 456-465.
- Jabeen, F., Ahmad, N., Chaudhry, M. A. and Javed, I. (1998). Epidemiology and treatment of sarcoptic mange in buffalo calves around Lahore (Pakistan). *Pak. Vet. J.*, 18: 39-42.
- Kemp, D.J., Walton, S.F., harumal, P., Currie, B.J. (2002). The scourge of scabies. *Biologist (London)* 49: 19-24.
- Leon-Vizcaino, L., Ruyz-de-Ybanez, M. R., Cubero, M. J., Ortyz, J. M., Espinosa, J., Perez, L., Simon, M. A. and Alonso, F. (1999). Sarcoptic mange in Spanish ibex from Spain. *J. Wildl. Dis.*, 35: 647-659.
- Mahran, O. M. and Saleh, M. A. (2004). Prevalence of ectoparasites and their effect on some biochemical indices in camels (*Camelus dromedarius*) at Shalatin City. *Assiut Vet. Med. J.*, 50: 164-187.
- Mekonnen, K., Gizaw, S. and Desta, L. (1999). Yeku integrated watershed development project feasibility study report. Bahir. Dar. 13: 39-46.
- Pence, D. B. and Windberg L. A. (1994). Impact of a sarcoptic mange epizootic on a coyote population. *J. Wildl. Mang.*, 58: 624-633.
- Rodriguez-Vivas, R. I., Ortega-Pacheco, A., Rosado-Aguilar, J. A. and Bolio, G. M. E. (2003). Factors affecting the prevalence of mange-mite infestation in stray dogs of Yucatan, Mexico. *Elsevier B.V.*, 115: 61-65.
- Schmidt, H.W. (1994). Dogs as transmitter of sarcoptic mange to other domestic animals and man. *Vet. Bull.* 22: 643.
- Tadesse, A., Fentaw, E., Mekbib, B., Abebe, R., Mekuria, S. and Zewdu, E. (2011). Study on the prevalence of ectoparasite infestation of ruminants in and around Kombolcha and damage to fresh goat pelts and wet blue (pickled) skin at Kombolch Tannary, Northeastern Ethiopia. *Ethiop. Vet. J.*, 15: 87-101.
- Welsh, G. W. and Bunch, T. D. (1983). Psoroptic scabies in desert bighorn sheep (*ovis Canadensis nelsoni*) from northwestern Arizona. *J. Wildl. Dis.*, 19: 342-344.
- Yakhchali, M. and Hosseine, A. (2006). Prevalence of ectoparasites fauna of sheep and goats flocks in Urmia suburb, Iran. *Vet. Arhiv.* 76: 431-442.
- Zelege, M. and Bekele, T. 2001. Effect of season on the productivity of camels (*Camelus dromedarius*) and the prevalence of their major parasites in Eastern Ethiopia. *Trop. Anim. Health Prod.*, 33: 321-329.