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Short communication

Prevalence and associated risk factors for bovine tick infestation in two districts of lower Punjab, Pakistan

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ABSTRACT

Bovine tick infestation is still a serious nuisance to livestock and the dairy industry of Pakistan. The current paper reports the prevalence and associated risk factors for bovine tick infestation in the districts Layyah and Muzaffargarh of lower Punjab, Pakistan. A questionnaire-based survey was conducted to identify and to quantify variation in the prevalence of bovine tick infestation with respect to host (age, species, sex, and breed) and environmental (geographical area and climate) determinants. Multiple stage cluster random sampling was used and 3500 cattle and buffaloes from the two districts were selected. Prevalence of bovine tick infestation was significantly higher (OR = 1.95; $p < 0.05$) in cattle (1076/1475; 72.9%) than in buffaloes (957/2025; 47.3%). *Hyalomma anatolicum anatolicum* was the major tick species (33.5%; 1173/3500), followed by *Rhipicephalus sanguineus* (13%; 456/3500). The highest monthly prevalence in both the districts was found in July. Ticks were not found in Layyah from November to March and in Muzaffargarh from December to March. The average number of ticks was proportional to the prevalence of infestation. Also, tick infestation in a 7 cm × 7 cm dewlap of the animal was proportional to that of the rest of body. Prevalence of tick infestation was associated ($p < 0.05$) with district, host species and breed. In cattle, prevalence of tick infestation was associated ($p < 0.05$) with age and sex of host. The results of this study provide better understanding of disease epidemiology in the study districts, which will help for planning of control strategies.

1. Introduction

Ticks (Acari: Ixodidae) have been recognized as important ectoparasites of livestock. They are known to cause lowered productivity (Sajid et al., 2007), mortality (Niyonzema and Kiltz, 1986) and transmit such diseases as babesiosis, theileriosis, and anaplasmosis (Norval et al., 1984).

In Pakistan, the prevalence of bovine tick infestation (BTI) has been observed to exceed 50% (Sajid et al., 2008a,b) but so far, only a few investigations concerning prevalence of tick infestation, taxonomy and acaricidal efficacy have been conducted (Chaudhry et al., 1969; Siddiqi and Jan, 1986; Iqbal, 1971; Khan et al., 1998; Sajid et al., 2008a,b, 2009). As far as we can ascertain, no report is available on the prevalent tick species causing BTI in the districts of Layyah and Muzaffargarh of lower Punjab.

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Therefore, the present longitudinal study was focused on assessing the prevalence of predominant tick species infesting dairy cattle (*Bos indicus* and *Bos taurus*) and buffalo (*Bos bubalus bubalis*).

2. Materials and methods

2.1. The study area

The study area included the districts of Layyah and Muzaffargarh (M. Garh) of the lower Punjab (Pakistan). It is a somewhat triangular piece of land situated north and south of the Indus and Chenab rivers in the Sindh Sagar Doaba with its base to the north and apex at the confluence of the two rivers (Fig. 1). The lower part of the study area (district M. Garh) lies between 28°57′ and 30°46′N and 70°30′ and 71°47′ E. The northern part of this triangle contains district Layyah and lies between 30°45′ and 31°24′N and 70°44′ and 71°50′E. District M. Garh has four sub-divisions (Tehsils): M. Garh, Alipur, Jatoi and Kot Addu. District Layyah has three sub-divisions: Layyah, Karor Lal Esan and Chaubara. There are four seasons in the study area: summer (May–July), autumn (August–October), winter (November–January) and spring (February–April).

2.2. Sampling of animals

Multistage cluster random sampling was used to select a total of 1750 bovines from each of districts Layyah and M. Garh. The sample size of primary units (union councils), secondary units (farms) and elementary units (animals) were randomly selected using formulae given by Thrus-

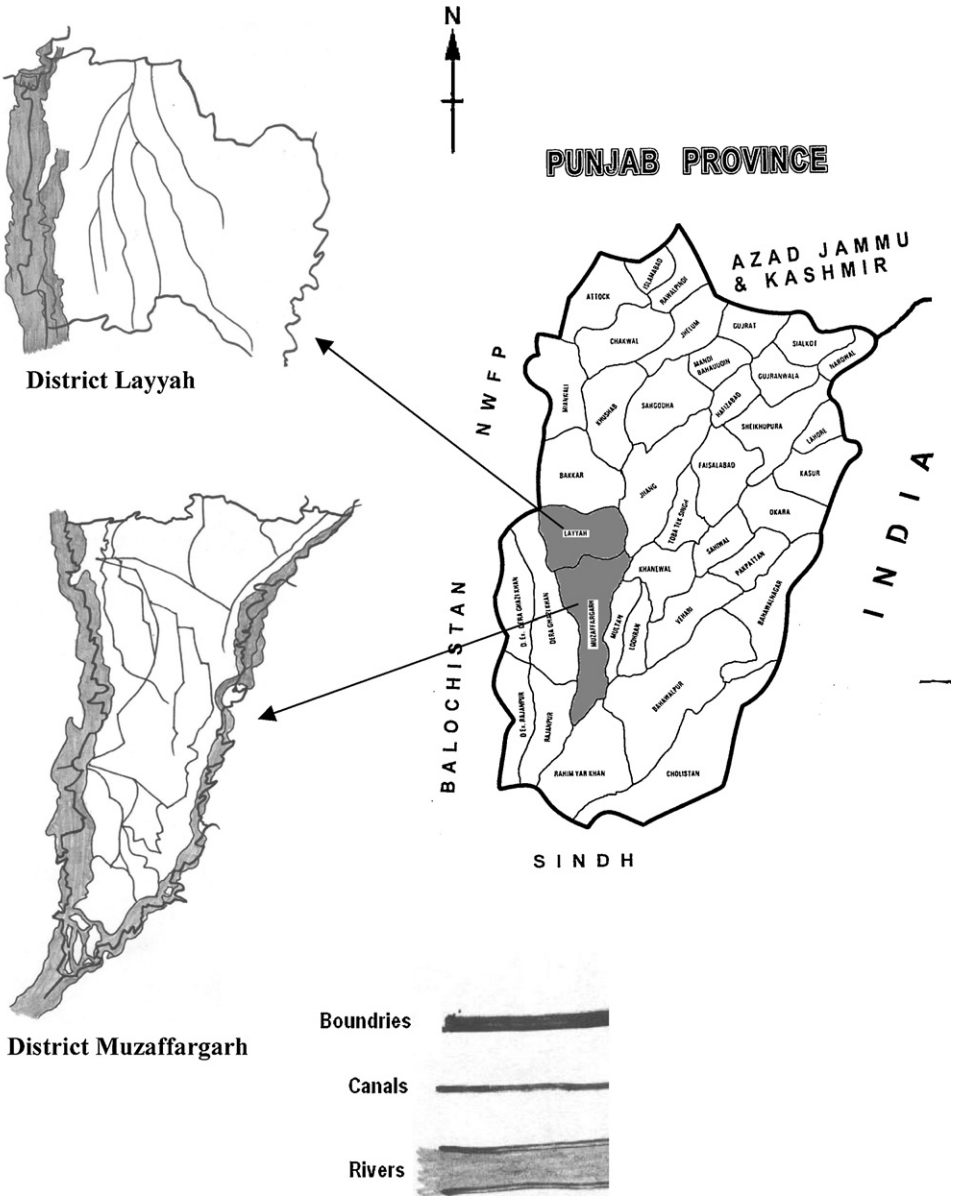

Fig. 1. Physical maps of Punjab Province and districts Layyah and Muzaffargarh, lower Punjab, Pakistan.