CHAPTER 6-
DISCUSSION
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During study period, a total of 315 cattles were examined from different localities of Agra district for tick prevalence study and found that overall prevalence of ticks was 39.68%. Similar finding have been reported by Misra (1984), Kumar (1996), Vatsya et al. (2008) Sajeed et al. (2009). In contrast to present findings, Manan et al. (2007) and Vatsya et al. (2007) published that the prevalence rate of ticks in cattle were 20.40% and 41.78 %, respectively. Difference among the results of present and previous study might be due to variation in geographical locations, climatic conditions of the experimental area, region and method of study and selection of samples (Kabiret al. 2011).

Month wise prevalence of ticks was found maximum in August (adults= 48.18% and calves= 61.53%). Earlier studies have reported maximum prevalence in September (75 % in cattle) and minimum in the month of January (46.07 %). Similar results were earlier reported by Kumar and Ruprah (1979) and Khan and Srivastava(1994). Lahkar et al. (1994) reported that highest tick activity during November to February and minimum in the month of May to June. The difference in tick infestation in different month may be due to the change in the climatic condition. As in the month of August and September the relative humidity (75.91–78.24 %) and environmental temperature (30.64–28.81 °C) in the area under study is optimum for the growth of tick population.

While studying the effect of the age of the animal on the infestation rate of ticks it was found that young ones were more susceptible for tick infestation as compared to the adults. Low tick infestation on adults is probably due to resistance acquired following repeated infestations from very early life (Misra 1984; Das 1994b).
Similar findings were reported by a large number of workers (Das 1994b; Mananet al. 2007; Vatsyaet al. 2007; Kabiret al. 2011).

Ectoparasites of cattles cause economic loss being pests as well as vectors of various diseases. Till now, several chemicals including hydrocarbons and organophosphates were commonly used. Tick production losses largely result from meat quantity loss caused by tick worry, and the death of cattle from tick fever and the reduction in meat quantity associated with tick infestation were estimated (Sing et al. 1983). Nanoparticles play an indispensable role in drug delivery, diagnostics, imaging, sensing, gene delivery, artificial implants, and tissue engineering (Moroneset al. 2005). The biosynthesis of nanoparticles is useful over chemical and physical methods because it is a cost-effective and environment-friendly method, where it is not necessary to use high pressure, energy, temperature, and toxic chemicals (Goodsell 2004). AgNPs may be released into the environment from discharges at the point of production, from erosion of engineered materials in household products (antibacterial coatings and silver-impregnated water filters), and from washing or disposal of silver-containing products (Benn and Westerhoff 2008). Using plants for nanoparticle synthesis can be advantageous over other biological processes because it eliminates the elaborate process of maintaining cell cultures and can also be suitably scaled up for large-scale nanoparticle synthesis (Shankar et al. 2004). Synthesis of nanoparticles using microorganisms or plants can potentially eliminate this problem by making thenanoparticles more biocompatible. Nanoparticles, generally considered as particles with sizes of up to 100 nm, exhibit completely new or improved properties compared to the larger particles of the bulk material that they are composedof, based on specific characteristics such as size, distribution, and morphology (Willems and van den Wildenberg 2005). In recent years, the
biosynthesis method using plant extracts has received more attention than chemical and physical methods, and even more than the use of microbes, for the nanoscale metal synthesis due to the absence of any requirement to maintain an aseptic environment. Nanoparticles have attracted considerable attention because of their various applications. AgNPs are reported to possess anti-viral (Rogers et al. 2008), anti-bacterial (Sathishkumar et al. 2009) and anti-fungal properties (Panacek et al. 2009). There is no report till date on the most resistant stage of tick life cycle where silver nanoparticles have been used to control them however, few reports are available against larval stages of ticks. This is the first report on acaricidal effect of AgNPs where significant reduction was observed in the RI of treated *Rhipicephalus microplus* engorged females.