**Literature review**

*Heamonchus contortus* commonly known as the twisted stomach worm is a bloodsucking nematode parasite, primarily occurring in the abomasum of small ruminants, notably sheep and goats. It has been ranked as the most important parasite of small ruminants in all regions across the tropics/subtropics (Anonymous, 1992). Haemonchosis, the disease caused by this nematode is responsible for considerable economic losses. In India *H. contortus* has been recognized as an economically important and highly prevalent nematode of sheep and goat due to the conducive environmental conditions prevalent for the development of infective larval stages. Haemonchosis is an acute problem of small ruminants throughout India.

The major weapons used for this problem are “Anthelmintic” used since long to combat the problem of gastrointestinal parasitism but due to the excessive use of that drugs developed the resistance. The frequent use of these anthelmintics over many years has inevitably led to the development of drug resistance to each class in parasitic nematodes. *H. contortus* has been documented to be resistant to all three broad spectrum families of anthelmintics viz. benzimidazole, imidazothiazole and ivermectin (Singh *et al*., 2002) and against drugs with narrow spectrum of activity such as salicylanilides (Rolfe *et al*., 1990; Singh *et al*., 1996; Swarnkar *et al*., 1999). Due to the development of the resistance in chemical drugs many scientist used plant extract as the anthelmintic.

Iqbal *et al.* (2004) demonstrated that the consumption of the whole plant extract of *Artemisia brevifolia* resulted in a 62% reduction of the abomasal nematode *H. contortus* egg counts. The consumption of fagara leaves (*Zanthoxylum zanthoxyloides*), a native tree from Africa, believed to have antiparasitic activity, resulted in reduced egg excretion by the same nematode in sheep, when consumed regularly in small amounts (Houngangbe-Adote *et al*., 2005). Similarly, Lespedeza (*Sericea lespedeza*), a grazing perennial legume native of Eastern Asia showed promising anthelmintic activity when offered to goats either fresh (Min *et al*., 2004) or as hay (Shaik *et al*., 2004; Lange *et al*., 2006).

*Zizyphus jujuba* plant possess some medicinal value like antioxidant and antilisterial effect, antisteroidogenic activity, antiobesity activity, sedative and hypnotic, anxiolytic, anticancer (Huang et al., 2007). The leaves and stems of *Zizyphus jujuba* contain saponins 3-o-
[2-α-D-glucopyranosyl-3-β-D-glucopyranosyl-α-L-arabinopyranosyl] Jujubogenin (Pandey et al., 2008).

The parasite biochemistry has great practical importance in chemotherapy and vaccine production and in understanding of the complex association involved in the host-parasite relationship. Premvati et al. (1979) studied in vitro variation of glycogen content in three sheep nematodes. Kapur et al. (1985) studied H. contortus: qualitative and quantitative analysis of lipids.


Literature review clearly indicates that considerable amount of research has been carried out to test anthelmintic activity of various plant extract on Haemonchus contortus. However, anthelmintic potential of silver nanoparticles has not been evaluated against Haemonchus contortus. Therefore, the present study highlights anthelmintic effect of biological synthesized silver nanoparticles on biochemical parameters of H. contortus by using Zizyphus jujuba leaf extract.