Evaluation of serum antibody responses of Madras Red sheep to excretory/secretory antigen of Haemonchus contortus

S ARUNKUMAR1, S ABDUL BASITH2 and GOMATHINAYAGAM3

Tamil Nadu Veterinary and Animal Sciences University, Chennai, Tamil Nadu 600 051 India

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1640 medium at 37°C for 24 h and the culture supernatant was used as antigen. Immuno blot analysis revealed that the E/S antigen showed 5 reactive bands at 24, 29, 46, 66 and 93 kDa. On immunization trial, sheep were immunized with 500 mg of E/S antigen along with montanide as adjuvant on day 0, 30 and 60 intramuscularly. Further, the assessment of serum antibody levels in immunized sheep was made by enzyme linked immuno sorbent assay (ELISA). Based on absorbance values, it was observed that the serum antibody levels were significantly higher up to 20 weeks post immunization in immunized sheep compared to control sheep.

Key words: Antibody, Excretory /Secretory antigen, ELISA, Haemonchus contortus, Sheep

Infections with Haemonchus contortus are a major constraint on sheep and goat health and production (Scoed 1981) worldwide. Adult worms feed on blood resulting in poor growth rate and weight loss, and heavy infections can result in death (Newton and Muna 1999). Gastrointestinal nematodes control depends on the repeated use of anthelminitics and pastures management. There are concerns regarding drug residues in meat and the environment. Therefore, control of H. contortus infection through immunoprophylaxis would be an alternative strategy. Experimental vaccines against gastrointestinal nematodes have been divided into 2 classes. Antigens derived from the intestine of the parasite, are not exposed to the immune system during natural infection whereas the natural or conformational antigen recognized during infection are not exposed to the immune system during the immune response induced by exposure under field conditions (Krohn and Smith 2001). Therefore, control of H. contortus infection through immunoprophylaxis would be an alternative strategy. The E/S products have role in host tissue penetration, degradation of host proteins for nourishment, modulation of host immune response and prevention of blood clotting etc. (Karana et al. 1993, Yatsuda et al. 2003 and Sachitra and Joshi 2005). Attempts were made to characterize E/S products of H. contortus as these substances could be potential target for immunological control of the disease. Work on H. contortus control using E/S antigens is scanty. Hence, the present study was undertaken to evaluate the efficacy of excretory / secretory antigens of H. contortus as vaccine candidate in the control of ovine haemonchosis.

MATERIALS AND METHODS

Preparation of excretory / secretory antigens of Haemonchus contortus: Adult Haemonchus contortus worms were collected from abomasum of sheep slaughtered at corporate slaughterhouse, Perumbur, Chennai. The collected worms were washed 5 times in normal saline and subsequently washed 5 times in phosphate buffered saline (PBS) after ultrasonic shaking for 30 min after preparing the antigens.

The fresh and highly motile worms were transferred to RPMI 1640 medium containing penicillin (500 IU/ ml) and streptomycin (5 mg/ml) and cultured at a concentration of approximately 50 worms / ml in a culture flask at 5% CO2 atmosphere at 37°C for 24 h. The medium was changed every 6 h after incubation and fresh medium was added with 2% glucose throughout incubation. Worm viability was monitored throughout this period on the basis of motility, integrity of the worms. Moreover, random samples of the