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Scientific validation of ethnobotanicals used against parasites in Pakistan

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The objective of the current study was to evaluate the anti-tick, anthelmintic and anticoccidial activities of a herbal formulation based on leaves of *Azadirachtaindica* and *Nicotianatabacum*, flowers of *Calotropisprocera* and seeds of *Trachyspermumammi*.

The herbal formulation demonstrated anti-tick activity by inhibiting the egg laying, larval mortality and reduced tick intensity/infestation on animals. Anthelmintic activity of herbal formulation was evident from the *in vitro* mortality of *Haemonchuscontortus*, ovicidal effects in egg hatch test and fecal egg count reduction in sheep naturally parasitized with gastrointestinal nematodes. Anticoccidial effects of herbal formulation were confirmed by reduction in the oocyst counts in feces, oocyst scores, bloody diarrhea and FCR in chicks treated with herbal extracts compared with infected unmedicated chicks. The survival rate and weight gain was higher in chicks treated with herbal extract compared with infected unmedicated chicks. Interestingly, values of some parameters were either comparable or even better than those of amprolium treated and/or uninfected unmedicated chicks pointing to some growth promoting factors in the herbal extract.The herbal formulation is suitable for the resource-poor farmers as a broad spectrum antiparasitic. The contents of the formulation are cheap, commonly available, and easy to use as a decoction. Moreover, it is not a new animal husbandry input as farmers are already using these plants individually in animal health and production. Incorporation of this herbal formulation in integrated parasite management practices will add to the sustainability and thus, income of the farmers.

The herbal formulation seems promising as a broad spectrum antiparasitic. Large scale controlled studies are, however, recommended for standardization of the doses and applications of the product. Studies on fraction based activity of formulation will be useful in identifying the active principles leading to development of a refined product with better antiparasitic efficacy. All the plants used in this study are commonly used and available in the rural areas and farmers can easily make water decoctions as done in this study. Future experiments may be planned to understand the mechanism of absorption as well as developing an appropriate delivery agent for herbal extract inside the tick body. Studies on shelf life of the plant extract and its residual activity need to be carried out. The extract, however, may be recommended for use at farm level based on empirical evidence of its anti-parasitic activity. Pharmaceutical companies may also be encouraged to market the product in crude form after setting standardization of some quality criteria.

Biography

Muhammad Arfan Zaman holds a Ph.D. in the field of Parasitology and Ethnopharmacology at Dr. Zafar Iqbal laboratory, University of Agriculture, Faisalabad, Pakistan. His Ph.D. project was to evaluate the anti-tick, anthelmintic and anticoccidial activities of a herbal formulation based on leaves of *Azadirachta indica* and *Nicotiana tabacum*, flowers of *Calotropis procera* and seeds of *Trachyspermum ammi*. He got further expertise from Dr. Dwight D. Bowman (Professor of Parasitology, Cornell University, New York, USA). He has published research papers in the journal of international repute. So far, his impact factor is 13.045.

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