

methanolic extracts of *Tylophora indica* was compared with the control group and percentage mortality was assessed by applying formula:

Percentage mortality = % test mortality

-% control mortality /100

-% control mortality × 100

3. Result

The methanolic extract of *Tylophora indica* exhibited greater anthelmintic activity, the methanolic extract resulted 100% mortality after 6 hours exposure at 50 mg/ml of concentration, the 90% of mortality shows after 6 hours exposure at the concentration of 25 mg/ml and 80% of mortality shows after exposure 6 hours at concentration of 12.5 mg/ml. Therefore a 100% of mortality of worms in a presence of albendazole (used as a reference standard drug) within 4 hours. Post exposure and no mortality of worms was observed in PBS. That shows in table no. The dose dependant effect of the *Tylophora indica* extract shows the greater tendency to kill worms at the concentration 50 mg/ml.

| <i>In-vitro</i> Anthelmintic effect/ efficacy of Methanolic extract of <i>Tylophora indica</i> on <i>Haemonchus contortus</i> of sheep | | | | | | | |
|--|-------------|---|--------------------|--------------------|--------------------|--------------------|----------------------|
| Treatment | Conc. mg/ml | Mean ± SEM of <i>Haemonchus contortus</i> worms showing motility (Percent motility) | | | | | |
| | | 0 hr | 1hr | 2hr | 4hr | 6hr | Fresh PBS for 30 min |
| Crude Methanolic Extract | 50.00 | 20±0.0 | 7±0.0 (65.00%) | 4±0.4 (80.00%) | 2±0.2 (90.00%) | 0±0.0 (100.00%) | 0±0.0 (100.00%) |
| | 25.00 | 20±0.0 | 12±0.0 (40.00%) | 9±0.1 (55.00%) | 6±0.3 (70.00%) | 2±0.4 (90.00%) | 2±0.4 (90.00%) |
| | 12.50 | 20±0.0 | 14±0.0 (30.00%) | 11±0.5 (45.00%) | 7±0.0 (65.00%) | 4±0.2 (80.00%) | 4±0.2 (80.00%) |
| Albendazole (Positive Control) | 10.00 | 20±0.0 | 6±0.2 (70.00%) | 3±0.3 (85.00%) | 0±0.0 (100.00%) | 0±0.0 (100.00%) | 0±0.0 (100.00%) |

4. Discussion

Pharmaceutical and scientific communities have recent time gained the attention of the traditional medicines, as the herbal remedies prepared by the whole plant are relatively safe with fewer side effects when used in the proper therapeutic dosages. In view the effect of extracts *Tylophora indica* on inhibition of mortality of the *Haemonchus contortus* worms and for mortality of the worms became much faster in methanolic extract treatment. We reported that methanolic extract reveals good in vitro anthelmintic activity and it could be due to presence of a higher concentration of phytoconstituents in methanolic extract.

Conclusion

This revelation of an effective remedy derived from plants will become a key development in anthelmintic, microbial infection therapies. This result indicates that plant extract possess compounds with anthelmintic properties which can be further researched for antimicrobial activity. This anthelmintic study of the plant extracts revealed that traditional medicine might be as effective as modern medicine to overcome pathogenic micro-organisms. The further investigation is required to isolate the active principles from the plant extracts and also to carry out Pharmaceutical studies.

References

- 1) S. Geerts B. Gryseels, *Anthelmintic resistance in human helminths: A review*, *Tropical Medicine & International Health*, Wiley online library, 2002; 6(11): 915-921.
- 2) H.D. Alan Lindquist, John H. Cross, *Helminths, Clinical Microbiology: Parasites, Infection diseases, 4th edition*, 2017; 2: 1763-1779.
- 3) Mahesh Bandappa Manke, Shashikant Chaburao Dhawale, Prasad Govindrao Jamkhande, *Helminthiasis and medicinal plants: a review*, *Asian Pacific Journal of Tropical Disease*, 2015; 5(3): 175-180.
- 4) D. Whittier, A. Zajac, and H. Umberger, *Control of internal parasites in sheep*, Virginia Cooperative Extension, 2003.
- 5) K. O. Soetan, O. T. Lasisi, and A. K. Agboluaje, *Comparative assessment of in vitro anthelmintic effects of the chloroform extracts of the seeds and leaves of the African locust bean (Parkia biglobosa) on bovine nematode eggs*, *Journal Cell and Animal Biology*, 2011; 5: 109-112.
- 6) S. Nazara, M.A. Hussain, A. Khana, G. Muhammad, S.N.A. Bukhari, *Alkaloid-rich plant Tylophora indica; current trends in isolation strategies, chemical profiling and medicinal applications*, *Arabian Journal of Chemistry*, 2020; 13: 6348-6365.
- 7) A. Sabitha Rani, Sudeshna Patnaik, G. Sulakshana and, B. Saidulu, *Review of Tylophora indica- An Antiasthmatic plant*, *FS Journal of Research in Basic and Applied Sciences*, 2012; 1(3): 19-21.

- 8) GopalKrishnan.C, ShankarnarayanD,Kameswaran L, Natarajan.S, *Pharmacological investigation ofTylophorine, Indian Journal of Medical Research, 1979; 69: 513-520.*
- 9) Shivpuri DN, Menon MP, Prakash D, *Preliminary tudies in 6932 Tylophora indicain the treatment of asthma and allergic rhinitis, J. Assoc. Physicians India, 1968; 16(1): 9-15.*
- 10) Gopal Krishnan C, Shankarnarayan D,Kameswaran L, Natarajan. S, *Pharmacological investigation ofTylophorine, Indian Journal of Medical Research, 1979; 69: 513-520.*
- 11) Ratanagiriswaran AN, Venkatachalam K *The chemical examination of T.asthmatica and isolation of the alkaloids Tylophorine and Tylophorinine, Indian Journal of Medical Research, 1935; 22(3): 433-441.*
- 12) SheelaThorat S. Gurunath Dadde S. Swapnali A. Mohite, Rohan Kumar R. Chavan, Mr. Ramling D Mali, *Comparative Study of Antibacterial Activity of Tamarindusindica and Tageteserecta, Research Journal of Pharmacognosy and Phytochemistry, 2019; 11(3): 186-188.*
- 13) Dhadde G.S, Yadav J.P , Sapate R.B, Mali H.S, Raut I.D, *In vitro Anthelmintic Activity of crude extract of flowers of Bougainvillea Spectabilis Wild against PheretimaPosthuma, International Journal of Pharmacy and Pharmaceutical Research, 2020; 17: 1-18.*
- 14) AkshadaKakade, Yuvraj Dange, Pradip Patil, Sanjay Pawar, Swapnil Patil, CS Magdum, SK Mohite, Indrayani Raut, *A review on Cissusquadrangularis and evaluation of its in-vitro anthelmintic activity, Centre for Information Biotechnology, 2014; 3(1).*
- 15) Snehal Chandanshive³ AkankshaJagdale, Dr. Sandeep Patil¹ , Hanmant Mali², *In-Vitro Antispasmodic Efficacy of Ethanolic Extract of Leaves of SesbaniaGrandiflora, World Journal of Pharmaceutical Research,2020; 9(2): 915-921.*
- 16) S.K. Mohite Bhagyashree S. Patil, I.D. Raut, M.A. Bhutkar,*Evaluation of anthelmintic activity of leaves of Tragiainvolucrata Linn, Journal of Pharmacognosy and Phytochemistry, 2015; 4(1): 155-159.*
- 17) R. S. Adnaik, D. A. Bhagwat, I. D. Raut, S. K. Mohite, C. S. Magdum. *Laxative and Anthelmintic potential of cassia alata flower extract. Research Journal of Pharmacy and Technology. 2011; 04(01): 98-100.*