

# Spatial distribution and ecological niche model of most intestinal parasites in Ardabil province by using of GIS and MaxEnt

## Abstract

**Background and Objective:** Intestinal parasites are a health problem in many countries, especially in developing countries. Today, despite the high costs incurred annually by the World Health Organization and governments in eliminating, preventing, and treating these parasites, their existence is still evident. Intestinal parasites commonly affect children in low-income areas and developing countries. According to the World Health Organization, more than 30% of the population in developed countries suffers from parasitic diseases each year. More than 2 million deaths occur in developing countries due to this cause. A wide variety of worms and protozoa can cause infection or colonization in the digestive system of humans and animals. These organisms are usually transmitted indirectly through the fecal-oral route, including contaminated food, water, and soil; However, direct human-to-human and animal-to-human transmission is also possible in many cases

**Methods:** In this study, we first extracted the characteristics of all intestinal parasites that have been detected and reported by all private sector laboratories in health laboratories and hospitals in the cities of the province in rural and urban areas, extracted their geographical coordinates and saved them in Excel format. Then it was produced using GIS10.4.1 software in the form of distribution maps in cities and then using MaxEnt3.3 software one of the intestinal parasites that has a high dispersion. Its ecological niche was determined using climatic and environmental factors.

**Results:** The prevalence of different types of intestinal parasites was as follows: *Giardia lamblia* (79.4%), *Entamoeba coli* (10.5%), *blastocystis hominis* (4.2%), *Ascaris* (2.5%), *Heminolpis nana* (2.1%), *enterobius vermicularis* (0.8%) and *Entamoeba histolytica* (0.4%). The prevalence of intestinal parasites was higher in men than women. The prevalence was higher in rural area than in urban.

**Conclusion:** In this study, risk areas are the center of the province and the most important parasite that is prevalent is *Giardia*, which should be planned to study pathogenicity, epidemiology and other factors affecting the prevalence of these parasites in the province, especially in the central part of the province.

**Keywords:** Parasitic Infection, Intestinal Parasites, Ecological Niche, GIS, Ardabil