1. Abstract:

Strongyloidiasis, hookworm infection and opisthorchiasis are public health problem Thailand caused by soil-transmitted helminthes: *Strongyloides stercoralis*, *Necator americanus*, and carcinogenic liver fluke: *Opisthorchis viverrini* respectively. The correctly defining disease distribution and disease risk map is an important step in the control and prevention of diseases. This study use geographical information systems (GIS) and remote sensing (RS) technologies within the MaxEnt ecological niche modeling program to determine the climatic and environmental factors (Bioclim, NDVI, NDWI, LST, precipitation, tmin, tmax, tmean, altitude, Land cover, soil texture and soil pH) on transmission patterns of strongyloidiasis, hookworm infection and opisthorchiasis. Disease case occurrence points are from the literature reviews. Climatic and environmental data are compiled from MODIS satellite imagery, and WorldClim data for Thailand. A range of climate variables was used: the Hadley Global Environment Model 2 - Earth System (HadGEM2-ES) climate change model and also the IPCC scenarios A2a for 2050 and 2070.

The MaxEnt model's internal jackknife analyses of variable importance indicated that land cover had the highest percent contribution (22.5%). Maximum temperature in October (12.2%), Mean temperature of driest quarter (9.6%), precipitation of coldest quarter (9.6%) and normalized difference vegetation index (8.9%) were the most important individual variables influencing distribution of *S. stercoralis* in Thailand. The current distribution predicted for *S. stercoralis* in Thailand are primarily in southern and some parts of central, northern and northeastern Thailand. For hookworm infection, land cover had the highest percent contribution (24.1%). Altitude (15.1%), Minimum temperature in October (13.2%), Mean temperature of driest quarter (9.3%), were the most important individual variables influencing distribution of hookworm in Thailand. Suitable climatic and environmental conditions for hookworm are mainly in southern and some parts of central, northern and northeastern Thailand.

The current distribution of *O. viverrini* is significantly affected by precipitation and minimum temperature. According to current conditions, parts of Thailand climatically suitable for *O. viverrini* are mostly in the northeast and north, but the parasite is largely absent from southern Thailand. Under future climate change scenarios, the distribution of *O. viverrini* in 2050 should be significantly affected by precipitation, maximum temperature and mean temperature of the wettest quarter, whereas in 2070, significant factors are likely to be precipitation during the coldest quarter, maximum and minimum temperatures. Maps of predicted future distribution revealed a drastic decrease in presence of *O. viverrini* in the northeast region.

The information gained from this study should be a useful reference for implementing long-term prevention and control strategies for *S. stercoralis*, hookworm and *O. viverrini* in Thailand.

Keywords : *S. stercoralis*, hookworm, *O. viverrini*, ecological niche modeling, climate change