

Global dynamics for the spread of ectoparasite borne diseases

Attila Dénes

Bolyai Institute, University of Szeged

denesa@math.u-szeged.hu

A mathematical model is introduced to simultaneously study the dynamics of ectoparasite infestation and infectious diseases spread by those ectoparasites.

The system has four potential equilibria. We identify three reproduction numbers that determine whether the infectious or the non-infectious parasites can invade the population, and whether a population already infested by non-infectious parasites can be invaded by the infection. By using Lyapunov functions and persistence theory, we show that the solutions always converge to one of the equilibria, depending on those three reproduction numbers. Hence the global dynamics is completely characterized by the reproduction numbers.

References

- [1] A. Dénes, G. Röst *Global dynamics for the spread of ectoparasite borne diseases*, submitted