

Anthropogenic disturbance increases disease emergence risk through predictable changes in parasite community structure

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Abstract

Niche theory predicts specialists will be more sensitive to environmental perturbation compared to generalists, a hypothesis receiving broad support in free-living species. Based on their niche breadth, parasites can also be classified as specialists and generalists, with specialists infecting only a few and generalists a diverse array of host species. Here, using avian haemosporidian parasites infecting wild bird populations inhabiting the Western Ghats, India as a model system, we elucidate how climate, habitat and human disturbance affects parasite prevalence both directly and indirectly via their effects on host diversity. Our data demonstrates that anthropogenic disturbance acts to reduce the prevalence of specialist parasite lineages, while increasing that of generalist lineages. Thus, as in free-living species, disturbance favors parasite communities dominated by generalist vs. specialist species. Because generalist parasites are more likely to cause emerging infectious diseases, such biotic homogenization of parasite communities could increase disease emergence risk in the Anthropocene

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