

Reptiles, other exotic pets and risk of emerging infectious diseases

DAVID MODRÝ

Dept. of Parasitology, University of Veterinary & Pharmaceutical Sciences, Palackého 1-3, CZ-61242 Brno, Czech Republic, and Institute of Parasitology, Academy of Sciences of the Czech Republic, České Budějovice, Czech Republic; E-mail contact: modryd@vfu.cz

The past decades started so severe anthropogenic changes to the environment, that a variety of alterations affect actually all ecosystems worldwide. Various detrimental effects increasingly threaten the survival of wild species.

Biological invasions, resulting from the continuous globalization of the environment are generally considered to represent one of main threats for the biodiversity. The variety of invasive organisms includes also various pathogens. Recently, the term “pathogen pollution” was introduced to describe the introduction of pathogenic parasites (i.a. viruses, bacterium, protozoan or metazoan organisms) to a new host species or population. Pathogen

pollution might result into severe loss of the biodiversity, affecting not only individual species, but leading finally into the alteration of whole ecosystems.

Problems resulted from the pathogen pollution includes infectious diseases, that are generally termed Emerging infectious diseases (EID). These diseases are usually defined as those that recently increased the geographical range, host range or prevalence. Such infections in human population are intensively monitored for decades; however, analogous problems in wildlife were nearly overlooked. Over the past few years, a number of disease outbreaks reported from wildlife organisms increased and mass mortalities leading to severe population decline or even extinction were reported. Reduction of seal populations by morbilliviral infections, decline of Gyps vultures, amphibian decline, decline of Serengeti lions and many others can be listed as prominent examples.

Reasons resulting into plethora of various EIDs can be only hardly summarized in few sentences. Within the talk, I tried to organize them into following categories: (i) ecosystem alteration, (ii) movement of biota all around the Earth, (iii) evolution of pathogens and, (iv) the global climatic changes.

The ubiquitous alteration of ecosystems includes e.g. encroachment of human and domestic animals into wildlife habitat (i.a. infection of mountain gorillas), agricultural changes (historically e.g. rinderpest, currently e.g. spongiform encephalopathies). Several further

cases throughout the talk are used to demonstrate direct impact of movement of organism including humans. Myxomatosis, various morbilliviral infections and amphibian chytridiomycosis represent such examples. The pathogen evolution is further aspect underlying several EIDs. Howsoever stochastic the changes in pathogen genom are, the above mentioned global increase of the movement of biota strongly increases the chance of appearance of new variants of pathogens. Global climatic change is further case of recent outbreaks of infectious diseases, including e.g. human malaria or bacterial diseases of corals.

Increasing trend in keeping of exotic animals in captivity represent one of the significant risk factors, associated with emergence of EIDs. The exotic animal trade is surely one of the most important driving forces, facilitating the worldwide movement of exotic pathogens. So far, the veterinary control and quarantine measures are more or less formal and could not significantly diminish the risk of infection spreading. Moreover, part of the animal trade is illegal and out of any control.

The ZOOs and facilities of private keepers form points, in which the new, unnatural contacts of various animals occur. Importantly, high proportion of kept animals still originates from the wild, usually from tropical countries. The contact of various animals logically leads to the cross-transmissions of various pathogens. Newly introduced pathogenic organisms then represent

a direct threat for captive exotic animals, but, importantly, they can affect also local wildlife.

Several infections of captive reptiles are given as examples of potentially or actually serious EIDs, namely amphibian chytridiomycosis, saurian cryptosporidiosis, coccidian infections of Yemen chameleons, mycoplasmal infection of North American tortoises and Q-fever in African pythons.

Hopefully, the talk will increase the general interest of exotic animal keepers in the area of EIDs and, importantly, also their awareness of responsibility.