



Ecological inheritance for a post COVID-19 world

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Main text

While the 2020 coronavirus pandemic disrupted the global economy and has been controlling the social behavior of the human population (Bavel et al. 2020), it is uncertain if it will mitigate the current biodiversity crisis and help nature to return to a “healthier” state. COVID-19 put billions of humans in isolation worldwide and reduced local and global traffic, indirectly affecting nature in many ways (Corlett et al. 2020; Bates et al. 2020). Given this ‘anthropause’ (Rutz et al. 2020), coronavirus became an ecologically powerful force that can also modify the extinction risks for various non-human species. In the Anthropocene, human activities are driving countless species to extinction (Ceballos et al. 2015). In our globalized world, amphibians in particular have been imperiled by anthropogenic trade, as the spread of *Batrachochytrium dendrobatidis* has endangered hundreds of frog species worldwide (Scheele et al. 2019). Curtailing the spread of a human virus by reducing trade, traffic and human movements, in our opinion, will also protect frogs from this pathogenic fungus (Fig. 1). In addition, it can minimize the chances of spillback of various infectious diseases (Liu 2020), some of them affecting wild and domestic animals worldwide (Robertson et al. 2006).

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Fig. 1 The common midwife toad (*Alytes obstetricans*), the European amphibian most susceptible to emerging pathogens

While the exact origin of COVID-19 is not yet known, the fact that bats and other animals can serve as a reservoir (Shereen et al. 2020) can further alienate people from wildlife. This can have negative consequences, particularly for pangolins (Neupane 2020) and bats (Fenton et al. 2020). Shutting down the live trade of wild animals as food sources or pets may be a relief for global biodiversity, since these activities impose strong threats on certain already threatened species (Nijman 2010). International pressure to ban or better monitor such activities might increase after this pandemic.

Restrictive policies can strongly reduce, albeit temporarily, the magnitude of anthropogenic impacts, despite the minimal attention environmentalism currently receives from governments and the ever-so-decreasing financial support for research in conservation biology. While some effects of the COVID-19 outbreak are undoubtedly negative for biodiversity (e.g. postponing invasive species eradication on remote islands (Cooper 2020) and the relaxation of environmental laws in the USA and other countries), we are also experiencing a reduction in the rate and scale of local and global travel, as well as fossil fuel consumption.

We have always been told that it was impossible to slow down the global machine of economic growth, but if a single virus could break down these false premises in a couple of months, it becomes clear that other options are on the table. Now we have a golden opportunity to show human society the strong link between public policies and environmental outcomes and that cultural inheritance can be changed in a way that favors biodiversity conservation. Isolation is not a novel solution in a post COVID-19 world and we think that this difficult time could drive people to adopt new habits that reduce their ecological footprint and thereby help to safeguard biodiversity (Bavel et al. 2020). If we are successful in communicating the benefits of these new habits, a greener economy (Agon et al. 2020) will eventually become a reality in an improved world. Virtual

connectivity and social organization based on home office are rapidly emerging and technologies may help to recover the economy and decrease our carbon footprint.

In local perspectives, while the rich countries are expecting swift economic recovery along with environmental progress and reduced impacts (Hepburn et al. 2020), the pandemic is clearly aggravating the vulnerabilities of traditional and small populations in developing nations (ACAPS 2020), including indigenous people living in or around conservation units (Ferrante and Fearnside 2020; Hockings et al. 2020). While some positive actions have arisen, such as food sharing and collaborative communities (Bennett et al. 2020), in some places the lack of tourist dollars has driven local people to hunt wild animals (Conservation International 2020). While the impacts of regulated tourism are reduced in these areas, illegal hunting activities and opportunistic extractive industries potentially increase (Buckley 2020). Therefore, the economic disparities that exacerbate environmental problems deserve more attention and policy-makers should consider the guidelines prepared by conservation scientists (Evans et al. 2020), creating effectively and equitably managed systems (Hockings et al. 2020).

While now we should focus on saving human lives and adapt to a “new normality”, support for environmental sciences and funding for nature conservation including habitat restoration can result in a healthier relationship between nature and society in the post COVID-19 world. This can also better prepare us humans for the inevitable reemergence of an existing zoonosis or a new, unknown disease.

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Compliance with ethical standards

Conflict of interest The letter represents original ideas of the authors and we have no conflict of interest to declare.

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