An Acad Bras Cienc (2021) 93(2): e2021932 DOI 10.1590/0001-376520212021932
Anais da Academia Brasileira de Ciências | *Annals of the Brazilian Academy of Sciences*
Printed ISSN 0001-3765 I Online ISSN 1678-2690
www.scielo.br/aabc | www.fb.com/aabcjournal

EDITORIAL NOTE

Amazon biodiversity – *quo vadis?*

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Over the years, much has been discussed about the failure to protect the environment, which ends up negatively affecting biodiversity. Since the Convention on Biological Diversity (e.g., CBD 2012) and the Nagoya Protocol (e.g., CBD 2011), there have been debates on how to achieve a more equitable distribution of the benefits of biological variety and variability of life on our planet. Nonetheless, there is little doubt that we are in the midst of a sixth mass extinction (e.g., Ceballos et al. 2020), and that our actions are undermining efforts to rationally explore the potential benefits of biodiversity, triggering several researchers, scientific institutions, and common people from around the world to demand concrete actions.

Among the areas of greatest concern is the Amazon. In 2018, a bilateral Brazil-France symposium on biodiversity was organized to discuss several aspects and ways to address and protect the diversity of animals and plants, with particular attention to the Amazon rainforest (e.g., Val & Moura Neto 2019). Over the years, this region has been experiencing record devastation (e.g., Daly 2020), a trend that does not appear to end in the near future (e.g., Silva et al. 2021), particularly with the present environmental agenda of the Brazilian government. Now we have the deleterious effects of Covid-19, whose extent of negative consequences for the economy has yet to be established (e.g., Kellner 2020).

Biodiversity is commonly cited as an important commercial asset, as several natural products have great potential for different applications, including the discovery of new drugs for pharmacological purposes (e.g., Barreiro 2019), whose sales often reach revenues in the billions of US dollars (e.g., Dias et al. 2016). This situation can be considered critical in the Amazon region, as there is a general perception that many species are becoming extinct even before they are properly documented by science, not to mention the negative influence of deforestation on the global climate (e.g., Ellwanger et al. 2020), affecting ecosystems in other parts of the world.

Another aspect that has become pressing due to the virus SARS-CoV-2 is related to the risks that deforestation in areas such as the Amazon can pose to humanity. As has been pointed out several times, the biodiversity of this region contains a plethora of microorganisms, including (but not limited to) viruses, which are present in repository animals and could infect people leading to epidemics or even pandemics (e.g., Val 2020). Examples are numerous, from primates (e.g., Chen et al. 2011) to bats (e.g.,

Pereira et al. 2017), the latter considered to have played a major role in the current pandemic (e.g., Lu et al. 2021). Not to mention the diversity of Amazonian insects, which act as an important reservoir of viruses (e.g., Olmo et al. 2019), most still unknown.

In the last years, genetic sequencing has become an important tool for biodiversity (e.g., Stange et al. 2021), but not without problems. Although sequencing costs are increasingly affordable, there have been several issues with public storing of this metadata and how public access should be handled (e.g., Amann et al. 2019). The huge amount of genetic material has led to what some call digital sequence information (DSI), which has raised concerns about how this information can be used in distinct countries and how it might impact the development of biological research (e.g., Rohden & Scholz 2021). Brazil is not immune to these changes, with profound legal implications that can affect future scientific activities in the country with the richest biodiversity (e.g., Alves et al. 2018).

One way or another, efforts to protect biodiversity at a global scale, with the Amazon as a central focus, must be made. For all, actions should concentrate to close the gap of the knowledge that is available and the knowledge that is needed to guide the decision-making process of all aspects involved (e.g., Magnusson 2019). Gathering this knowledge, however, is costly and requires investments in basic science. This has become a very difficult task for countries like Brazil, where resources for research have been systematically reduced in recent years. The present economic perspectives that appear on the horizon indicate that funding for science will become even more challenging in the post-pandemic world, but paths must be found that result in the protection of biodiversity, if not for the good of flora and fauna, then at least for the benefit of human society.

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How to cite

KELLNER AWA. 2021. Amazon biodiversity – *quo vadis*? An Acad Bras Cienc 93: e2021932. DOI 10.1590/0001-376520212021932.

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