A Mission to Preserve Planetary Biodiversity

Heineken Lecture by Paul Hebert, laureate of the 2018 Dr A.H. Heineken Prize for Environmental Sciences

Abstract

We share this planet with millions of multi-cellular species, the offspring of lineages which have survived and diversified for half a billion years. They now confront an unprecedented situation – a mass extinction event driven not by a physical cataclysm, but by a species. Humans have become the dominant agent of biotic change; extinction rates are now at least 100 times above background levels. We are burning the books of life.

Until recently, life's sheer diversity, the fact that millions of species await description, represented a serious barrier to action. Genomic science is now empowering humanity to conquer this barrier; it will allow us to complete the inventory of species in a few decades rather than a few millennia. This progress rests upon the discovery that DNA barcoding, the analysis of sequence diversity in short standardized gene regions, enables the automation of specimen identification and species discovery.

By revolutionizing our ability to inventory biodiversity, DNA barcoding will allow the activation of a global bio-surveillance system tracking our impacts on life in near real time. Its launch will advance our ability to rescue threatened species while also ensuring we retain genomic records for those which cannot be saved. Through such action, genomic technologies will transform biodiversity science with important implications for humanity and the species that share our planet.