Controlling the inevitable

Now considered to be one of the greatest threats to biodiversity at a global level, the spread of invasive species is, just like pandemic diseases, a direct consequence of human activity.

Dissection of rodents in a laboratory setting, Benin.

In 2020, ten billion tonnes of goods will be transported globally by a fleet of maritime freight vessels that has more than tripled in size since the 1970s. The number of air passengers, and the corresponding aircraft capacity, are also set to double by 2037. This massive increase in the international flow of people and goods has led to an unprecedented commingling of global biodiversity, with many species finding themselves regularly or coincidentally transported to lands unknown. Once there they may disappear or else prosper and proliferate, with consequences for existing ecosystems, agriculture, the economy and the health of animal and human populations, particularly with regard to the emergence of new diseases.

It is therefore crucial to trace the routes by which such invasions spread, and their points of entry to new territories, but also to understand the mechanisms of such invasions and the characteristics shared by species which we consider to be invasive. This is no small task, not least because it is not always easy to catch invasions early. Furthermore, their routes of entry are often varied and complex. For example, some parasites and insects which cause crop damage were initially introduced as part of organic farming methods, only to invade their new territory with disastrous consequences for the existing biodiversity.

In West Africa, researchers have traced the spread of the black rat, believed to have arrived in Europe by sea during the colonial period. Starting from the continent's port cities, the black rat gradually spread at the expense of endemic rodent species, causing considerable damage to food stocks and contributing to an upswing in the transmission of the various parasitic diseases of which it is a known host, including leptospirosis.

In Benin, researchers working in partnership with the local authorities have set up a laboratory dedicated to monitoring invasive species at the port of Cotonou. In accordance with the recommendations set out in the International Health Regulations, the laboratory is focused

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··· Thanks to a multi-disciplinary approach combining law, economics, the study of transport and infrastructure development, ecology and population genetics, researchers are retracing the paw-steps of invasive rodents and assessing their impact. ···

Black rat in a trap in a warehouse on the docks in Cotonou, Benin.

on analysing rodents in order to observe their movements, identify risk factors which might lead to further invasions of black rats, house mice or brown rats, and also to monitor the pathogens carried by these rodents which might spread within cities or countries. An early warning network has also been put in place, with local agents trained to detect the presence of invasive species.

Work of a similar kind is underway in Senegal, where the progress of the black rat is being monitored by analysing rat traps in villages. The aim is to better identify the terrestrial routes followed by the rodent, as well as the parasites it carries, with regular sample-gathering campaigns. Lest we forget, this rat still carries the bacterium responsible for the bubonic plague in Madagascar, along with any number of viruses and bacteria which can be passed on to humans.

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Research
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IRD Éditions
INSTITUT DE RECHERCHE POUR LE DÉVELOPPEMENT
FRENCH RESEARCH INSTITUTE FOR SUSTAINABLE DEVELOPMENT

Marseille, 2020

Written by
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Design and page layout
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The photos in this publication come from the Indigo image bank (IRD), unless otherwise specified

Cover photo
Swim At The Lake - Henri Robert Brésil
By courtesy of www.naderhaitianart.com

ISBN print : 978-2-7099-2874-8
ISBN PDF : 978-2-7099-2875-5

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