We lose about three species of seed-bearing plants every year

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Abstract. This short paper aims to signal a new large-scale study, relevant to understanding the alarming situation in which the diversity of plants finds itself. According to the largest survey of plant extinctions, seed-bearing plants throughout the world are disappearing at a rate of almost three species per year since 1900. In addition, many species that are not considered extinct are in critical condition and it is only a matter of time until they are extinct. Under these conditions, we need comprehensive studies that illustrate the real dynamics of plant populations at risk of extinction. However, these studies must be followed by concrete measures of conservation, reproduction, repopulation and protection of plant species at risk.
Key Words: diversity loss, extinction, seed-bearing plants.

The oldest taxonomic evidence we have. The first scientist who tried to classify living organisms using binomial names was Carl Linnaeus (Figure 1). Among his other works, Linnaeus published a compendium of plant species, entitled Species Plantarum (1753). This book lists every plant species known at that time, classified into genera. This work was the starting point for the plant names, but also a primitive plant species inventory.

A large-scale study reveals an alarming rate of extinction of plant species. According to the largest survey of plant extinctions (where the project looked at more than 330000 plant species), seed-bearing plants of the world have been disappearing at a rate of almost three species per year since 1900, which is up to 500 times higher than expected under natural conditions (Humphreys et al 2019; Ledford 2019).

A careful work that lasted over 30 years. The work comes from a database compiled by botanist Rafaël Govaerts at the Royal Botanic Gardens, Kew, London (UK). R. Govaerts started creating the database since 1988 to track the status of each known plant species. As part of that project, he extracted information from the scientific literature and created a list of species of seed-bearing plants that disappeared, and noted which of them were later rediscovered (Humphreys et al 2019; Ledford 2019). This laborious study is a dynamic inventory of seed-bearing plant species.

In 2015, R. Govaerts teamed with Evolutionary Biology specialist Aelys Humphreys from the University of Stockholm, Sweden, and other scientists world-wide to analyze the data. The team of researchers found that about 1234 species were reported as extinct since the publication of Carl Linnaeus's plant species compendium from 1753. However, more than one half of these species have been either rediscovered or reclassified as a different living species, which means that a remaining number of 571 species are still considered extinct (Humphreys et al 2019; Ledford 2019).

An extinction map of the seed-bearing plants produced by the team mentioned above shows that flora in high biodiversity areas and booming human populations, such as Madagascar, Brazilian tropical forests, India and South Africa, presents the highest

risk of extinction. Humphreys et al (2019) say that extinction rates in the tropics exceed the values expected by researchers, and islands are particularly sensitive to risk, as they are likely to contain species found nowhere else in the world and are particularly susceptible to risk caused by environmental changes (Tang et al 2018). Beside global warming, land use changes and waste processing are other factors involved in plant diversity loss (Tang et al 2018).

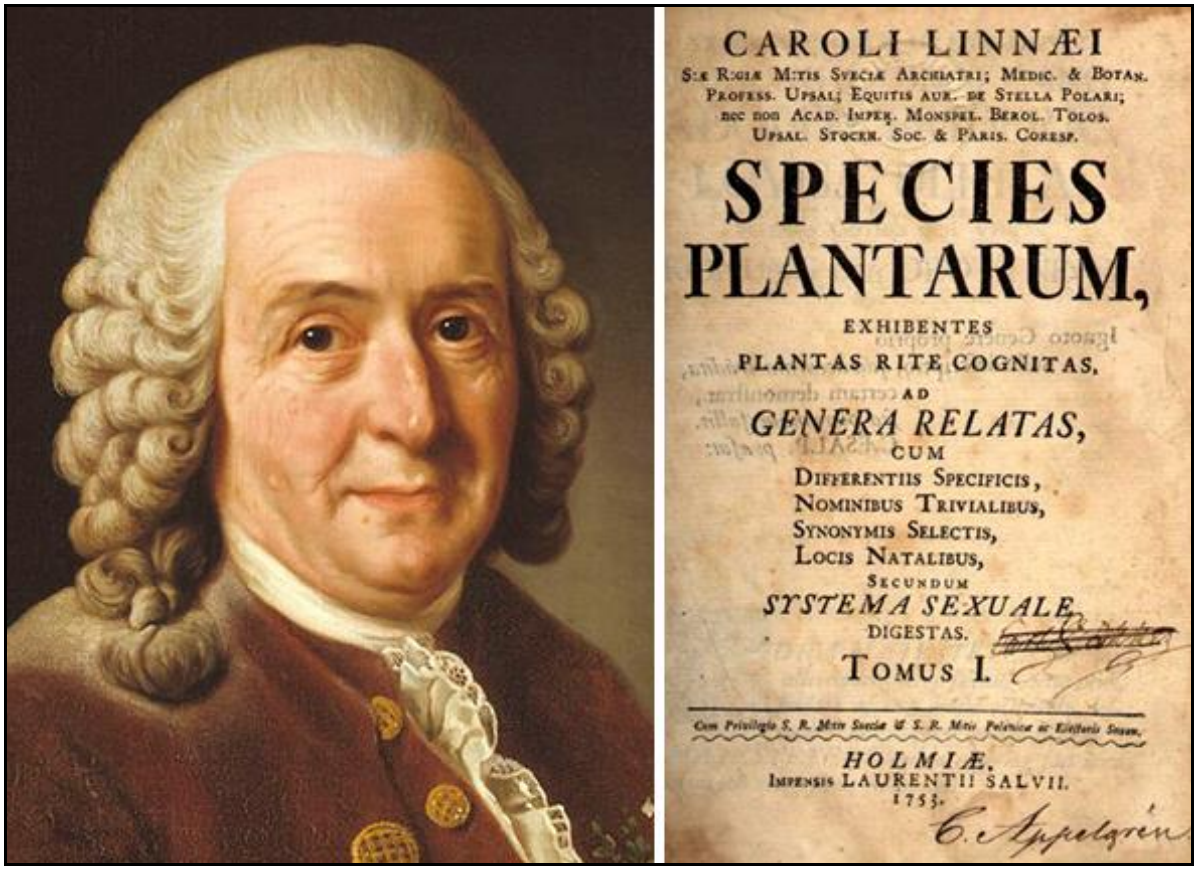

Figure 1. Carl Linnaeus (1707-1778, left), the author of Species Plantarum (1753, right). Soirce: https://en.wikipedia.org/.

Beyond statistics, the situation is even worse. Some species have disappeared in the wild, but they still survive in botanical gardens or dendrological parks. Therefore, they are not considered extinct, but "functionally extinct". In addition, thousands of populations decimated to a few specimens are not considered extinct species yet, but it is only a matter of time until they completely disappear (Humphreys et al 2019; Ledford 2019).

Conclusions. The high rate of extinction of seed-bearing plants is alarming. According to the largest survey of plant extinctions, the seed-bearing plants of the world have been disappearing at a rate of almost three species per year since 1900. In addition, many species that are not considered extinct are in critical condition and it is only a matter of time until they are extinct. The question is not whether, but when their turn to disappear will come. Under these conditions, we need comprehensive studies that illustrate the real dynamics of plant species at risk of extinction, but the studies must be followed by concrete measures of reproduction, repopulation and protection of plant species at risk.

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Received: 18 December 2019. Accepted: 21 December 2019. Published online: 30 December 2019.
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How to cite this article:
Petrescu-Mag I. V., Păpuc T., 2019 We lose about three species of seed-bearing plants every year. AAB Bioflux 11(3):141-143.