

Invasion of the Alien Plants

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Biography

Isabel Martínez-Solís PhD is university professor at the Universidad CEU Cardenal Herrera (Spain) and she has established a collaborative research relationship with Botanical Garden of Universitat de Valencia. She has a long experience in the area of Botany, medicinal plants, drugs and natural resources use. Her specialty is Botany as basic science and applied science to the study of medicinal, toxic and narcotic plants, and plant foods. She is the coordinator of a multi-disciplinary and inter-university research group named SEPLAN. In terms of scientific production, she has research publications in national and international journals, book chapters and books, as well as communications to national and international conferences. In addition, she has participated in research projects as principal researcher and as member of the research team. She has directed and is currently directing Doctoral Thesis in botanical and health fields.

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Not so very long ago, some media of my country, Spain, invited me to express my opinion on the current situation of the Albufera Natural Park (Valencia, Spain). This enclave is part of our landscape, history, economy and culture; this is our lives. Within this discussion framework, the issue of invasive alien species (IAS) arose, among which are invasive plants. This organism type is a problem that affects Albufera biodiversity, leading to a negative impact on it. When the EC Agriculture Journal asked me to write an editorial article, I immediately remembered the Albufera and the invasive plants. I thought that it was a good opportunity to comment on this problem derived from globalisation, which affects the entire world. For this reason, I want to express my warmest thanks to the journal that give me the opportunity to share with you my concerns: Are IAS invading our ecosystems?

The use of foreign plants is lost in the history of mankind. Mainly since the beginning of agriculture and gardening, humans are moving plants from one place to another. Inderjit, *et al.* (2005) commented that humans carried alien plants with them in the colonisation of the continents. However, at some point this interest in alien plants, some of them invasive, was transformed from a purely utility to an environmental concern that caused scientific interest. This change possibly happened when the invasion rate began to threaten native landscapes and ecosystems, because alien species trigger not only ecological consequences but also produce economic and human health impacts. Humans do not bear the full responsibility for the migration of plants, but that plants colonize territories and ecosystems naturally, being biological invasions a fundamental aspect of nature that have occurred ever since life first appeared on the Earth. Inva-

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sion is as integral to the face of nature as any other mechanism or process. It was required for the speciation phenomenon and increase of biodiversity. The problem arises when human activity favors the invasive phenomenon that increases unprecedentedly and rapidly. Given the age of human presence on Earth, it is often very difficult to establish with certainty the origin of some plant species. Thus, the regional scale is used as spatial reference for evaluating the colonization of foreign plants. I am now thinking back to my Albufera, the Canary Islands, the cases of Argentina, California, New Zealand or Hawaii, and all the places where alien plants have invaded ecosystem and the recovery of them is very difficult, if not impossible in certain cases, especially vulnerable areas [1]. In view of this situation, are we ready to lose our current ecosystems? Our native landscapes? Part of our culture and identity? What can we do? The answer is “to know and understand in order to develop strategies”. Therefore, it is necessary to ask, “What is an invasive plant?” Based on Ballester, *et al.* [2] an indigenous plant is one that originated and exists within its area of natural distribution and dispersion. An alien plant is one that is not native to the region in which it is growing, but not all alien plants are invasive plants. Finally, an invasive alien species is a naturalised exotic species that is an agent of change and threatens environmental health, economy, and/or indigenous biological diversity [3]. Many alien species never become naturalised plants and only some of them become invasive plants. However, current trends in globalisation of international trade and the consequences of climate change are factors that cause an increase in the problem of biological invasions, which will be more serious in the near future. The great distribution capacity is a characteristic of invasive plants that have great capacity to reproduce, colonise and install, displacing or not native plants, but always producing changes to the original landscape and environment, so they are dangerous. Given this situation, is it a good activity to use alien plants in agriculture and gardening? The direct answer is “no”. However, answers such as “yes”, “no”, “everything” or “nothing” are not reasonable responses that solve the problem. Let us be realistic, we need to grow species outside their natural habitat, because we need vegetable resources for a large population that will increase significantly in the future. Well then, what can we do? On the one hand, the answer lies in the investigation on the behavior of this plant type before they are allowed to be used. On the other hand, it is interesting the awareness-raising measures for citizens and to foment citizen collaboration [4]. It is needed to study the invasive potential of alien species, and they should only be used if they are non-invasive. Mechanisms should also be established to monitor their biology and behavior in each habitat and ecosystem where they were introduced. Is it necessary to abandon the growing of rice in Spain? oranges in California? coffee in Brazil or cocoa in Africa? We can consider that this situation is a crazy and grotesque idea, but, if we do not act with the reason and the knowledge derived from the investigation, we can find ourselves faced with this type of approach. It can also happen that we have no approach or strategy and invasive plants change ecosystems and landscapes.

Some time ago, when my children were young, we visited Javalambre (Teruel, Spain), we saw an original grass landscape, known as “leopard skin”, on top of the mountain. My son said “This is beautiful, mom! Will it forever remain that way?” I explained him that it was not easy because of factors, such as evolution, human activity, etc. would act. I showed him the landscape changes in the ski resort and we commented on invasive plants. After a while, we visited an oasis in the Sahara desert (Tunisia). My youngest daughter, who was very young, was looking thoughtfully at the landscape and asked me: Mom, will evolution, human activity, etc. transform Javalambre into

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