Book Review: D.I. Theodoropoulos, “Invasion biology. Critique of a pseudoscience”

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Book review

Invasion biology: Critique of a pseudoscience.

By David I. Theodoropoulos.
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It became clear by the mid-1980s that biological invaders harm indigenous species, communities, and ecosystems and cause enormous economic damage (Simberloff 2000, Mack et al. 2000). Reliable data demonstrated that non-indigenous species are the second-leading causes (after habitat degradation and loss) of putting indigenous species at risk of extinction (Wilcove et al. 2000). As a consequence, much effort is devoted today to defining, evaluate, and comparing the impact of introduced species and to devise ways of protecting indigenous communities and ecosystems from past, present, and future invaders (Parker et al. 1999).

It is therefore surprising that, in the last few years, just as policymakers, managers, scientists, and the public are recognizing that the uncontrolled introduction of species can produce environmental problems, a growing number of criticisms have been raised against invasion biology. The criticisms are incredibly diverse and span the fields of history, philosophy, sociology, gardening, landscape architecture, and popular culture (Simberloff 2003). Several authors even reached the point of denigrating the theoretical basis of the discipline and vilifying it as a form of racism and xenophobia (Subramaniam 2001).

"Invasion biology: Critique of a pseudoscience" by David Theodoropoulos is one of the most recent attacks against invasion biology. Under the label of a "conservation biologist who has worked in the field of ethnobotany and plant germplasm conservation for thirty years", the author analyzes three different features of the "invasive species hysteria" (p. XI). His first and main point of criticism is that invasion biologists view phenomena through a distorting "funhouse mirror" (p. 100). Their work shows "serious and pervasive violations of the basic principles of sound scientific method" (p. 125). This leads to: non-operational constructs of its foundation, unfalsifiable hypotheses, dependence on narrative assertion, confirmatory collection of anecdote, observational bias, selection of data, low standards of evidence, invalid generalizations, errors of attribution, circular reasoning, anthropomorphism, reinterpretation of data to confirm preconceptions, the collation of unrelated phenomena and many other practices that are indicative of a pseudoscience.

The second negative attribute the author assigns to invasion biology is in its makeup of a "conspiracy theory" (p. 89). Its constructs underestimate the complexity and dynamics of ecological processes, ascribing results in a linear manner to certain intentions, and connect various facts by a causality that is not demonstrated (p. 89). And, third, the context and structure of the foundational structure of invasion biology and the recurring motifs of its main themes are identical "in all key points" to those of racist, xenophobic nationalism, and fascist ideologies (p. 99).

The attack becomes even more direct when the author observes that invasion biology is "inextricably interwined with politics and economic exploitation" (p. 136), to the extent that it may even be financed by herbicide manufacturers ("the herbicide connection", p. 141). On the contrary, science must be neutral in its essence, being exclusively devoted to investigating phenomena.

From the perspective of an invasion biologist, it is not difficult to use this same exact reasoning against the author himself and his claims. Most of the examples he cites in support of his arguments are patently false or biased in their interpretation or accurately selected from the vast body of the literature available in the field of invasion biology. Alas, the author forgets or ignores the numerous papers published in peer-reviewed journals, "Biological invasions" included. Against the Manichean view of considering introduced species as generically "bad" and native species as generically "good" (pg. 99), invasion biologists do not suffer of the multiple psychopathologies the author finds in nativism (Chapter 7), but they are the first to recognize the enormous benefits of some introduced species (SIMBERLOFF 2003).
To counteract the biodiversity crisis, the author proposes programmes of deliberate anthropogenic dispersal and of the establishment of species in new areas (p. 181) that will "create safe, *ex-situ* populations to guard against extinction, and increase local biological diversity, providing a buffer against the effects of lowered diversity attributable to anthropogenic extinction, as well as increasing local ecosystem resilience, helping adaptation to changing conditions" (p. 175). On the contrary, invasion biologists manifest a pessimistic attitude towards the deliberate intervention by man in species dispersal. Their pessimism arises from the several failures of predictions on which species, among a suite of potential introductions, are likely to be problematic (MACK et al. 2000). The stakes are high and it is far more difficult (often impossible) to remove introduced species once they are established. As a consequence, the "innocent until proven guilty" (or perhaps "innocent for granted") philosophy to which David Theodoropoulos seems to adhere should be more cautiously replaced with the philosophy of "guilty until proven innocent" (MACK et al. 2000), for the sake of biodiversity conservation.

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