

Ramon Margalef Award for Ecology 2012

Daniel Simberloff: Creative and devastating

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I WOULD LIKE TO START by expressing the immense satisfaction I felt at the presence of Daniel Simberloff at the Faculty of Biology of the University of Barcelona on the occasion of the award of the *Premi Margalef d'Ecologia 2012* (2012 Margalef Ecology Award). It was a privilege to introduce him to all those present, especially to our students, who were there in the expectation of something truly special.

It is in fact as students taking our first steps into the world of ecology that communities is one of the paths we tread most often. Just as the biologist is expected to have the skill to recognise the commonest species in a specific taxonomic group, so ecologists are expected to interpret the sense of the specific make-up of samples and thus the general distribution of species, analysing what we have come to call the *structure of the community*. The work of the ecologist therefore consists of organising a data table of species sorted into samples and squeezing it numerically in a convenient way. In essence, what is being sought is the empiric verification of how competition among species has organised their distribution into different degrees of abundance and into different rates of occurrence in samples. This would finally allow us to verify the activity of competition (note the vicious circle) and thus understand the niche of each species.

And I say 'would', as at the turning of the 1970s and into the 1980s the validity of this procedure for gaining access to what we imagined were the great issues of ecology, this quick way of ecology, was shattered to pieces, and the theory that had supported the analysis became something close to a fairytale. At that time, acclaimed authors still used

similar reasoning applied to the distribution of birds in the set of islands making up remote archipelagos, in order to list rules and more rules for the assembly of communities from the organising principle of competition, as if the patterns observed in Nature would directly reflect the processes or mechanisms involved.

It was in fact Daniel Simberloff who woke us up suddenly from this dream. In a devastating article in 1979, Daniel Simberloff and Edward Connor rebutted one by one all the ecological mechanisms that the observed patterns seemed indisputably to reveal [1]. In the exposure of scientific hypotheses as false, it was made clear that it was urgent to help to mature the assumptions of ecology. Classical niche ecology, that nourished by Hutchinson and MacArthur with their charismatic style, was fatally shaken, and with it the presuppositions of an idealistic, metaphysical and deductive way of doing science.

From then on, observations began to have their own personality and an intrinsic refutation value, and ceased to be considered simple degenerate deformations of unattainable ideal models, like the deformed shadows projected onto the cave of the philosopher. The ecology of communities had still not managed to free itself from them, deeply rooted as it was in the doctrine that worshipped the Logistic Equation above all contrary evidence.

The Simberloff school, based at Florida State University at Tallahassee, kept developing null models for the different hypotheses gathered over the years—hypotheses that seem naive to us now—about the structure of communities. The so-called Tallahassee Mafia played a leading role in the turbulent 1980s. With the relevant null models there appeared patterns that were too similar to those observed, and this time only from independent—not interdependent—processes. In fact, null models generated patterns through the randomisation of the supposed mechanism they were meant to test. But we should say that Dan Simberloff does not like talking about chance, but rather about independence [6]. If we preserve some simulation variables resembling sufficiently the conditions observed, the null model provides us with the expected patterns under inde-

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pendence instead of interdependence, in the absence of the mechanism, while the remaining factors imitate observed reality. The interest of Dan Simberloff in laying down alternative hypotheses and fighting against fairytales had a long background. In 1969, the insular theory having just been launched, the supposedly informative indices of the evolutionary mechanisms in islands was already questioned in an article he sent to *Evolution* [4].

But despite the collapse of the paradigm and the apparent anarchy in how communities began to be interpreted, Simberloff did not abandon this discipline at all. Yet many ecologists did so, clutching at the straw that the ecology of ecosystems offered them as a salvation tending towards a less problematic sphere and objectives, framed in modernity. An escape towards a discipline that has been recently enriching itself with the complexity of adaptive functional traits, but which at that time added apparently little to the understanding of how nature works. It perpetuated, using a renewed terminology, the myth of the Balance of Nature [2] that had always been so difficult to resist.

The ecology of today is the offspring of those changes, traumatic in their way, in the subject. It is not by chance that ecology should have emerged into a period in which neutrality is the real ruler and in which, stochastic processes generate their own patterns. We are late in tracing the steps of evolutionary biology itself, where for a time it has been necessary for neutralism to rule, before making it possible, in an era technically much more sophisticated, to recover interest in the activities of natural selection.

For all the reasons set out, Daniel Simberloff has been defined as an iconoclast, even though I would think it more appropriate to define him as a scientist committed to the improvement of scientific progress understood as a tool for the perception of the material reality that surrounds us, so stripping that reality of anachronistic idealisms.

In him, as in Margalef, we detect the clear profile of the man of science—one involved, committed and independent, both creative and destructive, especially when detaching himself from concepts that, if ever they had once been useful, regular science has transformed into obstacles, or, as Slobodkin put it, has reified them, thus thwarting progress. Margalef outlined his own way of understanding ecology by removing himself from the reigning *statu quo* under the niche theory, about which he eventually went on to affirm that ‘it was simply a function of our dissection skills and had no positive characteristics’ and that ‘the concept of niche, just as that of trophic chain, had already

come to the end of its mission and was not worth keeping in an active role’ [3]. One discovers here a personal style identical in the deep conviction and determination with which both scientists express their positions, as when Simberloff writes in regard to the hypothesis of the existence of a minimum quotient of measures among competing species that this rule has outlived its own usefulness.

Despite all that we have said, Dan Simberloff has greatly contributed to grasping specific situations in which competition is the dominant driving agent, as in the detection of the evolutionary displacement of characters. In addition, he has not spared creativity when suggesting new mechanisms, such as *invasional meltdown*, in an already classic article, a kind of invasive shock whereby at least two non-native species establish positive responses by increasing their effect on the local community [5].

Dan Simberloff's dedication to invasive species in the last two decades bears witness to the strength of his internal agenda and to his commitment to the real problems of ecology. A coherence that leads from the freshness of his youth, where he became involved in insular theory through experimentation, and the fertile and combative period of his early maturity, to his full maturity where we see him making use of his rigorous scientific spirit to reorganise disciplines involving complex socio-environmental problems that go beyond any academic debate and necessitate taking stances in the social arena as well.

Finally, I would like to stress that, over and above specific styles and preferences, it is the ‘emerging’ traits such as valour, honesty and sincerity, that best unite great scientists: individualities that, as seen in Simberloff and Margalef, we appreciate above all as they tell of exemplary human beings and extraordinary individuals. ■

References

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