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NATIVE OR EXOTIC? A WIDESPREAD AND OFTEN USELESS DEBATE

by Francesco Ferrini

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The debate on the choice between exotic and native species has always been rather heated but often excessively simplified (native “good”, exotic “bad”). In particular, it is not supported by scientific evidence. This is especially true for parks and gardens in urban areas. The concept of native, strictly speaking, in an alien environment like that of our cities, does

not make sense, therefore it seems appropriate to reconcile controversial positions and have an objective, rational approach rather than a subjective, empathetic and emotional one, as often happens.

First of all, the meaning of exotic should be made clear. In our common sense we associate this word with tropical and equatorial countries when, in fact, from the etymological point of view, the word derives from the Greek, *exotikos*, which in turn derives from *exo*, outside. It should refer to anything originating or being imported from other regions that are not necessarily warm and/or equatorial.

There is no doubt that urban diversity requires a different approach because the urban environment is often very heterogeneous. The mental image linked to the adjective "urban" leads us to identifying this environment as one where "constructions" are more prevalent than other components. However, Sempione Park in Milan is urban, created at the end of the 1800s on farmland, yet placed in the city center, like Florence's Cascine Park in Florence (originally a farm property of Cosimo I de' Medici) or Rome's Villa Borghese. In these environments, there are few limitations to growing plants and certainly far fewer than for those located on the avenue a few tens of meters away.

Many cities also include residual ecosystems resulting from natural or traditionally rural cultural landscapes absorbed into the urban fabric. Other green spaces have been created by humans over the centuries. Some have emerged as new ecosystems in former industrial sites (e.g., Ruhr, Portello Park in Milan, Parc André-Citroën in Paris). The adoption of a single general strategy for all urban habitats is thus unreasonable, no matter if the talk is about "using only natives" or whether "exotics are better."

But then are the exotics better or worse? The right answer depends almost always on the context. The *Robinia pseudoacacia*, a highly invasive North American species is a classic example. It is known that it tends to replace, especially in road slopes or in marginal and disused urban areas, native species. Yet the black locust is also an urban tree of great value, well-adapted to climate change, rustic, with beautiful flowering and can accommodate a good animal biodiversity. Other invasive species such as eucalyptus may, however, disturb the ecological relationships between species that have co-evolved over thousands of years. This is the reason planting eucalyptus should be avoided, especially where it has invasive potential (e.g. southern Italy and coastal areas of central Italy), and be replaced with such native plants such as oaks and other Mediterranean species that support biodiversity more than any other landscape.

With regard to urban areas only in the event that the negative impacts on native species or natural habitats are obvious, exotic species (in this case invasive) must be managed and limited (however their management is often highly expensive and, like ' experience of many management projects shows, often not effective). Otherwise, in cases where there are no native species suitable to a particular context and in which it is ascertained the non-invasiveness of a species, it is possible, sometimes even desirable, to plant exotic species. They are accepted as part of the continuing evolution of ecosystems and this

differentiation allows ecosystems to evolve themselves and save resources.

To clarify some of the concepts, it is perhaps useful to give an example. The black alder is very widespread in Europe, but it is found almost only on the edge of rivers and lakes and even along the urban stretches of rivers in our cities. However, this is a totally different environment from the one that can be found only 100-200 meters away from the river in a sunny square of the same city. In such a situation it is clear that the alder cannot survive. Some exotic species are much more suitable, such as, for example, the *Gleditsia triacanthos* (native to North America) that was introduced in Europe in the 17th century and in Italy in 1712, as an ornamental plant and for land stabilization. The gleditsia (obviously using the thornless and also sterile cultivars) has a rapid rate of growth and can tolerate such adverse environmental conditions as air pollution, summer droughts, cold winters, limited room for growth, and also salt accumulation. So why not use it?

New ecosystems are thus created. New connections between native and exotic species are established. As said previously, exotic species are often prevalent in the new urban ecosystems and are the basis of a range of ecosystem services. It is therefore reasonable to integrate non-native species in the new green infrastructures, especially where native species are not working to create a mix of native and non-native species. The new "natural areas" dominated by non-native species have been successfully integrated into a series of parks in Europe with good results.

In conclusion, both native and exotic species are inseparable components of urban ecosystems. They are found in combinations that are formed to meet the needs of the various urban environments. Both species groups supply the ecosystem services we need. Non-native species may endanger indigenous biodiversity, but this often depends very much on the context. It is necessary to analyze the diverse local situations before taking action, ever ready to improve urban biodiversity, weighing the risks and opportunities of the single species in individual cases, for both native and exotic species. Differentiation instead of simplification is the most effective strategy for improving urban biodiversity in a changing world.

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