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# Beware of invasive aliens

Despite its appealing flower, the Hottentot of Kaffir fig is listed as an invasive alien species.

A recent conference held in Malta under the aegis of the Council of Europe and within the framework of the Bern Convention (on the conservation of European wildlife and natural habitats) highlighted one of the most insidious threats to biodiversity – that posed by invasive alien species (IAS).

Globalisation has not only led to enhanced mobility for people but also for various animal and plant species which are crossing borders and colonising new regions of the world at an unprecedented rate.

Within the Convention on Biology Diversity, an alien species is defined as "a species, sub-species or lower taxon, introduced outside its natural past or present distribution; it includes any part, gametes, seeds, eggs, or propagules of such species that might survive and subsequently reproduce".

In layman's terms, an alien species is one that has been wilfully or accidentally introduced into a new region where it has established some form of a viable population.

Most alien species do not pose a tangible threat to indigenous or native species since they establish only small populations within the new regions. However, invasive alien species exert undue pressure on indigenous (native) species by outcompeting them, mostly by virtue of a lack of natural predators. For instance, the introduced American mink and the American grey squirrel are inexorably stifling native European mink and red squirrel populations respectively.

Several interesting presentations were delivered at the Malta conference. A presentation on the eradication of the black rat from a number of Italian islands in order to safeguard nesting populations of seabirds was reminiscent of similar work conducted at Rdum tal-Madonna as part of the Yelkouan shearwater project and at St Paul's Islands.

The presentation revealed that the black rat is by far the most widespread mammal species on most Mediterranean islands. In Italy, the situation is dire, with just two islands larger than 10 hectares not populated by this successful invader.

Since 1999, Italian authorities have embarked on a rigorous black rat eradication campaign, with the rodent being removed from 10 islands, although it subsequently recolonised three of them.

A very telling sentence is still seared in my memory – "Ornamental plants and animals, as well as pets, will not cause a problem if they remain in gardens, aquariums or homes" – underpinning the menace posed by custodians releasing their exotic pets or ornamental plants into the wild, as in the case of the burgeoning population of the alien Bedriaga's frog species which has seemingly elbowed out the native painted frog at the freshwater pool of Ta' Sarraflu in Gozo.

Malta might be shorn of ad hoc zoo facilities but private exotic animal breeders are on the increase. Escapees from zoos have been implicated in some major colonisations by IAS – a case in point is the ruddy duck, seven individuals of which were introduced in the UK in 1948 for display purposes, with 90 individuals of this species escaping into the wild between 1953 and 1973, and establishing feral (wild) populations that are competing with the native white-headed duck.

The scale of the problem is such that 17 different European and North African states are today actively engaged in controlling and eradicating the ruddy duck.

Aquariums have a similar compelling role to play – for instance, the green alga Caulerpa taxifolia, which wreaks havoc with seagrass meadows and which cannot be eaten by herbivorous species since it is toxic, has spread to large swathes of the Mediterranean Sea after being released from aquarium facilities in Monaco.

While the impact of IAS on biodiversity might not raise everyone's eyebrows, the economic ramifications of the introduction of such species might. For instance, the muskrat and the coypu, both introduced during the last century by the European fur industry, wreak havoc on river banks through their digging activities and thus exacerbate the impact of flooding in central and eastern Europe.

The introduction of the American comb jelly (Mnemiopsis leidyi) in the Black and Azov Seas has almost sounded the death knell for the anchovy and sprat fisheries.

The impact of numerous alien parasite species (fungi, bacteria, viruses, insects) on agricultural, forestry and fisheries yields has also been widely documented, with one of the most notorious examples being that of the fungus causing Dutch elm disease.

The subject of IAS is especially relevant to Malta. In fact, the stunningly rich biodiversity of islands is particularly vulnerable to invasions because increased travel and trade break down the natural barriers that have protected and forged these biotas over millions of years.

As a result, the number of invasive alien species on European islands is increasing exponentially and has led to an unprecedented extinction crisis of the islands' endemic species.

The Malta Environment and Planning Authority is currently drawing up a list of alien species of flora and fauna currently domiciled on our shores, besides drafting guidelines on managing non-native plant invaders.

The thematic of alien species is being taken very seriously by various organisations and legislative bodies, not least by the European Commission, which funded a large-scale, web-based project named Delivering Alien Invasive Species Inventories for Europe (Daisie – www.europe-aliens.org), which provides updated information on different marine alien species online.

Daisie lists the 163 'worst invasive species' threatening biodiversity in Europe, with about 25 of these species being recorded from Malta to date, including the brown rat, the tree-of-heaven and the kaffir or Hottentot fig, with the latter still ominously occupying pride of place on our roundabouts.

The 10th conference of parties that are signatories of the Convention on Biological Diversity, one of the most far-reaching conventions ever ratified, with almost 200 contracting countries, adopted 20 headline targets for 2020, organised under five strategic goals.

One such target (Target 9) is tailor-made to spearhead the fight against IAS: 'By 2020, invasive alien species and pathways are identified and prioritised, priority species are controlled or eradicated and measures are in place to manage pathways to prevent their introduction and establishment'.

IAS also feature prominently in a number of European 2020 biodiversity strategy targets, which include the development of a fully-operational European early warning and response system on IAS by 2013, the approval of a list of IAS to be excluded from trade, the eradication of European priority IAS by 2015, the phasing out of IAS plants used as biofuels and the endorsement of codes of conduct on IAS and a number of activities (horticulture, recreational fishing, botanic gardens, zoos, pet trade) by 2016.

Some of these codes of conduct have already been finalised – namely, the European Plant Protection Organisation (EPPO – www.eppo.org) and the Council of Europe have jointly published a code of conduct on horticulture and invasive alien plant species for European and Mediterranean countries.

Among the recommendations included in this code of conduct are the need to avoid using invasive or potentially alien plants in large-scale public plantings and to the need to exercise caution when disposing of plant waste and unwanted stock of plants, among other sound advice. One hopes that these are taken on board by local landscaping consortiums.

The scenario beneath the waves is even more sobering, with many of the unheralded introductions going unnoticed. Estimates vary, but to date about 1,000 alien marine species have been recorded in the Mediterranean Sea, 80 per cent of which have infiltrated from the Red Sea through the Suez Canal.

Approximately 20 per cent of fish species in the Mediterranean are now of an alien nature.

While the ecological impact of most exotic marine species eludes us so far, for some species the impact is only too glaring. For instance, the alien nomadic jellyfish species (Rhopilema nomadica – so far not recorded in Maltese waters) has showed up along coastlines in the eastern Mediterranean every summer since the mid-1980s, forming large swarms which devalue the touristic nature of coastal areas and clog fishing nets.

In 2001, the Israel electric company was forced to remove tons of biomass of the voracious exotic jellyfish from its seawater intake pipes, at an estimated cost of $50,000.

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