

The marine aliens phenomenon



The blue swimmer crab, a non-indigenous marine species recently found in local waters.

Many eyebrows were raised when EU Commissioner for the Environment, Maritime Affairs and Fisheries Karmenu Vella recently raised the issue of invasive alien species during one of his speeches. The term 'alien species' is no longer challenging for many, but is the phenomenon of the introduction of such species so bad?

Of the estimated 1,000 marine non-indigenous species (also known as exotic, alien, non-native or allochthonous species) recorded to date in the Mediterranean, more than half are considered to be established or spreading. Among them, the highest number are crustaceans, followed by molluscs and fish.

The entry point for almost 500 of the newcomers is the Suez Canal so they are called 'Lessepsian' migrants. Ferdinand de Lesseps was the French diplomat who steered through plans to build the canal in the 19th century. The other 500 come from warm regions of the eastern Atlantic, and are thus expanding their native range by moving into the Mediterranean through the Straits of Gibraltar.

A small number of the aliens are deemed invasive, and intervention measures are currently focused on these species. In fact, in January 2016, a list of 'invasive alien species of Union concern' is scheduled to be published by the EU Commission. Last January, EU Regulation 1143/2014, which seeks to regulate the spread of invasive species in Europe through targeted interventions, came into force.

Many times, the accusing finger has been pointed at shipping as the main cause for these invasions, through ballast water, hull-fouling and waterways such as the Suez Canal. While these are common ways through which non-indigenous marine species are introduced, they are not the sole culprits, with aquaculture and the aquarium industry also sharing part of the blame.

In fact, a recent parliamentary question sheds some light on the magnitude of the trade in tropical species for display in aquaria. For instance, it transpired from such a PQ that almost 800,000 individual animals were imported in the Maltese islands from non-EU countries between 2013 and 2015, with tropical fish constituting the lion's share.

The Suez Canal, already the world's busiest waterway, has recently been widened and upgraded through the excavation of 35 kilometres of additional canals and the dredging of the existing ones to accommodate even larger vessels. Consequently, Egypt's annual revenues from the canal are projected to surge from the current \$1.5 billion (€1.3bn) to \$4 billion (€3.5bn), and the waiting time for vessels has been slashed by eight hours.

The expanded Suez Canal will obviously constitute an even wider motorway for the marine aliens coming from the warmer waters of the Red Sea and from even further afield, such as the Indo-Pacific region, to swim through or hitch a ride in vessels using the canal. Furthermore it is very easy for marine aliens to swim through the Suez Canal as it has no locks and the sea level in the Red Sea is slightly higher than in the Mediterranean, with the consequence that water flows downhill in our direction.

The Suez Canal's widening has galvanised the Mediterranean biological community into appealing to the international community for action to be taken. The proposed action is not unfeasible, such as the closure of the canal, but less radical measures. These include the introduction of salinity barriers along the canal's through locks or even the installation of air bubble 'curtains' at its entrances.

These appeals have been largely met with silence. In fact, only a single MEP, Ricardo Serrão Santos of Portugal, made a statement about the canal at the Parliament.

The expanded Suez Canal will constitute an even wider motorway for marine aliens

He said: "I would like to draw your attention to the enlargement of the Suez Canal. This process will increase marine pollution, including more alien species. The expected impact goes far beyond the proposing country and will have implications across the Mediterranean Sea, as indeed has the actual Suez Canal. For this reason I call for a proper environmental impact study that is holistic, comprehensive, deep, international and, more importantly, consequential."

No further action was taken by the Parliament. Bella Galil from the National Institute of Oceanography in Israel, dubbed the silence as "the wilful myopia by the bodies whose mission it is to protect the sea despite urgent requests from a growing body of international scientists".

Fortunately, some international bodies break the mould of inaction and have embarked on some important initiatives.

For instance, in 2004 the International Maritime Organisation steered through the Ballast Water Management (BWM) Convention which will come into force 12 months after at least 30 countries, representing 35 per cent of global mercantile tonnage, have ratified the agreement. Since almost 33 per cent have ratified the agreement to date, frantic meetings have been held in recent months between ship owners, ship registers and the IMO to allay fears that registers that ratify the convention early might end up footing a bill of fines.

The convention lists a number of measures to stave off the inadvertent transport of marine alien species through ballast water, such as treatment technologies involving chemicals or radiation, the discharge of ballast water in offshore, deep and non-coastal waters, the disposal on land of sediments coming from the cleaning of ballast water tanks, and the issuing of compliance certificates for vessels that adhere with ballast water management plans.

Once they pass through the Suez Canal, the newcomers are normally first detected in Israeli waters and then they spread in an anticlockwise route which takes them along the Turkish coast, into the Aegean and the Adriatic, and eventually reaching the central Mediterranean, where they are first recorded along the eastern Sicilian coast.

Some eastern newcomers embark on a different dispersion route, meandering along the North African coast such that they eventually show up in the Gulf of Gabes in Tunisia. The more ambitious newcomers manage even to overcome the Straits of Sicily, a barrier to many aliens coming from the east, spreading into the western Mediterranean, with notorious examples of such species including the blue cornet fish, the two species of rabbitfish and the reticulated leatherjack.

The influx is unremitting indeed – for instance, in the Suez Canal's first 50 years, 10 Red Sea species travelled to the Mediterranean. In its second 50 years, the number increased nearly tenfold. Today, there are 447 Red Sea species in the Mediterranean, the majority of which have migrated in the past forty years as the canal became wider, deeper, and less salty.

The next logical question clamouring for attention is what impact the newcomers may have on humans. In a nutshell, why should we be concerned about such an influx?

The ecological impact of newcomers obviously depends on how competitive and invasive they are, as this will determine their ability to displace local, indigenous species.

Some interesting case studies conducted in Israeli waters shed light on what such ecological impacts might be if things get out of hand.

For instance, prior to 1980, the most common commercial fish in Israel was the indigenous meager. Now, it is rarely caught and the major catch is the narrowbarred Spanish mackerel hailing from the Red Sea. The Red Sea tiger prawn now fills Mediterranean fishermen's nets, as well as plates in upmarket Mediterranean restaurants.

At least two introduced species have had pronounced socio-economic impacts on coastal communities. The nomadic jellyfish is a large species that can weigh up to 10kg and grow to a diameter of 50cm. Since it first entered the Mediterranean in the early 1990s it has wreaked havoc. Due to its sheer abundance it has had a severe impact on bathers, and coastal power stations in Israel, such as the Rutenberg Power Station in Ashkelon, regularly have to be shut down.

Meanwhile, the silver-cheeked toadfish, one of the 10 species of puffer fish currently recorded in the Mediterranean, has hospitalised people who were oblivious to its toxicity when eaten. The species is also a voracious predator, with estimates suggesting that it has cost Turkey's small-scale fisheries sector \$10 million (€8.73m).

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