VENI, VIDI, VICI: THE SUCCESSFUL ESTABLISHMENT OF THE LIONFISH *PTEROIS MILES* IN CYPRUS (LEVANTINE SEA)

C. Jimenez [1]*, A. Petrou [1], V. Andreou [1], L. Hadjioannou [1], W. Wolf [2], N. Koutsoloukas [3] and R. Abu Alhaija [4]
[1] Enalia Physis Environmental Research Centre, Cyprus - c.jimenez@enaliaphysis.org.cy
[2] QDivers, Agia Napa
[3] Ocean Aquarium, Protaras, Cyprus
[4] Energy, Environment and Water Research Center, Cyprus Institute, Cyprus

Abstract
A network of information set up in Cyprus in 2011 to monitor coral communities allowed for the establishment of the chronology of dispersion and abundance of the lionfish *Pterois miles*. Since localized first records in Autumn 2012, *P. miles* has successfully expanded to the rest of the island, except upstream, towards the eastern coast. Initially, solitary individuals were observed throughout the year at different stages of gonad maturation; during 2015, groups of up to five lionfish were frequently observed. There is an incipient consumption of lionfish flesh by locals.

Keywords: Alien species, Lessepsian migration, Levantine Basin, Suez Canal

Introduction
The Levantine Sea is among the Mediterranean basins mostly affected by exotic marine species. Not surprisingly, a large percentage of those are of Red Sea and Indo-Pacific origin, and their dispersion (as larvae or adults) is essentially through the Suez Canal. The dispersal and establishment of the emblematic lionfish (*Pterois miles* and *Pterois volitans*) in the Western Atlantic and Caribbean Sea during the last two decades have illustrated the capacity of exotic species to produce complex effects on local ecology. In the Mediterranean Sea, one single *P. miles* was observed in the early 1990s and only during the last three to four years its occurrence and abundance in the Levantine Basin has rapidly increased in what appears to be a "recent wave" [1] of very successful propagules.

Methods
By means of an island-wide network of collaborators in Cyprus (professional and recreational divers and fishermen, port and governmental authorities, volunteers and observers of opportunity) set up in 2011 initially to monitor coral communities and more recently lionfish, it was possible to acquire records of sightings, specimens and what is usually more difficult, a chronology of the dispersal and development of *P. miles* populations. Observers were asked to record or provide (by formulated interviews) a set of standard observations, such as number of individuals, estimated size, substrate, depth, locality, and, when possible, to capture specimens for taxonomic, morphometric, sexing (MEDITS protocol), genetic and stomach content analyses. Whenever possible, live specimens were kept in aquaria for observation.

Results
The taxonomy of nine specimens (14-29.4cm max. length; five males, stages 2 and 4; three females, stages 1 to 3; one not sexed) from different locations was resolved based on fin (dorsal and anal) ray meristics confirming that *P. miles* was found along the coast of Cyprus. Earliest records (Autumn 2012) were from the Southwestern area of Limassol (Fig. 1) of solitary juveniles (n=3, 5-10cm max. length) associated with rocky and coralligenous substrates between 20 and 35m depth. During the Winter 2012/13, other specimens (n=5, 10-25cm max. length, 15-20m depth) were observed at other rocky-coralligenous or artificial substrate locations of the Limassol and Cape Pyla areas (Fig. 1); two additional specimens were reported by local authorities in the national press. Sightings for the rest of 2013 (n=6, 15-20cm max. length, 10-30m depth) were restricted to those same areas. It is during 2014 that the number of lionfish specimens increased significantly (n=13, 8-30cm max. length, 10-25m depth) as well as the number of locations along the coast (Fig. 1). Noteworthy is the fact that until 2015 only solitary individuals were observed. In 2015, numerous reports (n=52, 8-30cm max. length, 2-35m depth) were made all over Cyprus except from the easternmost coast (Fig. 1); groups of 2 to 5 fish were observed. There are four independent reports of lionfish consumption by local fishermen. Spines and skin were carefully removed and the flesh grilled.

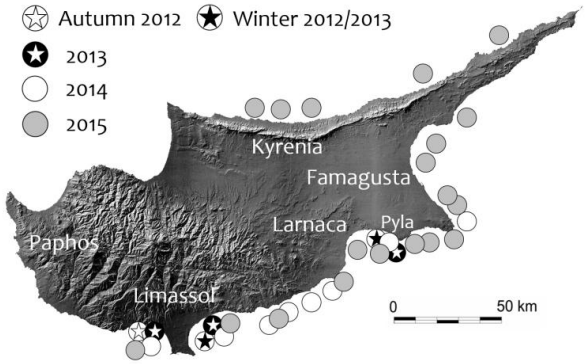

Fig. 1. Chronological distribution of lionfish reports in Cyprus.

Discussion and conclusions
Similar pattern of rapid increase in lionfish abundance and distribution has been observed elsewhere (e.g. Caribbean coast of Costa Rica). In Cyprus, initial reports were restricted mainly to two areas and in about three years *P. miles* started being observed along almost all coastal areas of the island. Currently, pairs or small groups of lionfish are known among local divers/fishers to be recruited to specific substrates (rocky and shipwrecks) in spite of high abundance of a known *P. miles* predator, the bluespotted cornetfish (*Fistularia commersoni*) [2]. The pattern of dispersal and abundance described here is not considered an artefact of sampling since lionfish are very conspicuous and hard to go unnoticed. Additionally, the same sampling effort occurs since 2011. These considerations suggest that for the lionfish in Cyprus, a "recent wave" of dispersal was followed by successful recruitment and survivorship is effectively in motion.

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References
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