

New localities of *Conomurex persicus* (Swainson, 1821) (Gastropoda: Strombidae) from Tunisia, Corfu, Naxos and other Aegean islands (Greece), and a brief overview of its distribution in the Mediterranean Sea

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Abstract: The first record of *Conomurex persicus* (Swainson, 1821) in Tunisia is reported. Living specimens were found in November 2005 at Port El Kantaoui, the westernmost site in the Mediterranean. We also report the first record of *C. persicus* for the Ionian Sea, with individuals of this species found in the waters off Corfu in 2016, and off Naxos in 2014, as well as from other Aegean islands in Greece. This paper provides a brief overview of the current distribution of *C. persicus* in the Mediterranean.

Keywords: Alien Strombidae, *Conomurex persicus*, first record, Tunisia, Corfu, Naxos, Aegean islands, Greece

Zusammenfassung: Der erste Nachweis von *Conomurex persicus* (Swainson, 1821) für Tunesien wird gemeldet. Lebende Exemplare wurden im November 2005 in Port El Kantaoui gefunden, dem westlichsten Fundort im Mittelmeer. Weiters werden die ersten Nachweise für das Ionische Meer in den Gewässern von Korfu im Jahr 2016 und Naxos aus dem Jahr 2014, Griechenland gemeldet. Es wird ein kurzer Überblick über die derzeitige Ausbreitung im Mittelmeer gegeben.

Schlüsselwörter: Gebietsfremde Strombidae, *Conomurex persicus*, Erstnachweis, Tunesien, Korfu, Naxos, ägäische Inseln, Griechenland

Introduction

Conomurex persicus was first recorded in the Mediterranean in 1978 in Iskenderun (southern Turkish coast) (Nicolay 1986). Nicolay & Romagna-Manoja, 1983 described the new Mediterranean invader as *Strombus* (*Conomurex*) *decorus raybaudii* n. ssp.

With the first findings from the northwest coast of Cyprus, the characteristics of the radula of *Strombus decorus* (referred to as *Strombus persicus* in this paper) from the Mediterranean Sea were described using SEM images (Wawra & Sattmann 1988). The shells (Fig. 1A) were collected in 08/1983 and are in the private collection of the first author.

In 1991 this species (Fig. 1B) was also discovered for the first time by the first author on the south coast of Cyprus.

Ten years after its description, the taxonomic position and correct identification were finally established by Moolenbeek & Dekker (1993).

Conomurex decorus (Röding, 1798) and *Conomurex persicus* are clearly different species. *C. persicus* is restricted to the south coast of Arabia and the Persian Gulf

(Moolenbeek & Dekker 1993) and does not live in the Red Sea. In the Indo-Pacific region, *C. persicus* lives on sandy bottoms and in coral sand from shallow water to a depth of about 19 m (Abbott 1960). In the Mediterranean, adult *C. persicus* inhabit sandy or slightly gravelly bottoms and feed on seaweeds and detritus (Mutlu 2004). This also corresponds with the authors' own observations.

How this invasive species was introduced is still unclear. It has been postulated that *C. persicus* may have arrived in Iskenderun in the ballast water of oil tankers coming from the Persian Gulf (Oliverio 1995). However, the gastropods were found far away from the oil terminals, and as tankers did not have segregated ballast tanks at that time, ships carrying oil would not have carried ballast water (Galil & Zenetos 2002).

Off the Israeli coast the shallow sandy littoral is littered with them: 'one can speak of an invasion, hundreds of dead shells on the beaches and shoals of *Strombus*, of all sizes, colors and patterns, feeding on the seabed up to 20 m depth' (Curini-Galletti 1988).

Conomurex persicus is a fast-growing gastropod and can reach considerable population densities. In August 1988, large quantities of this invasive species were found

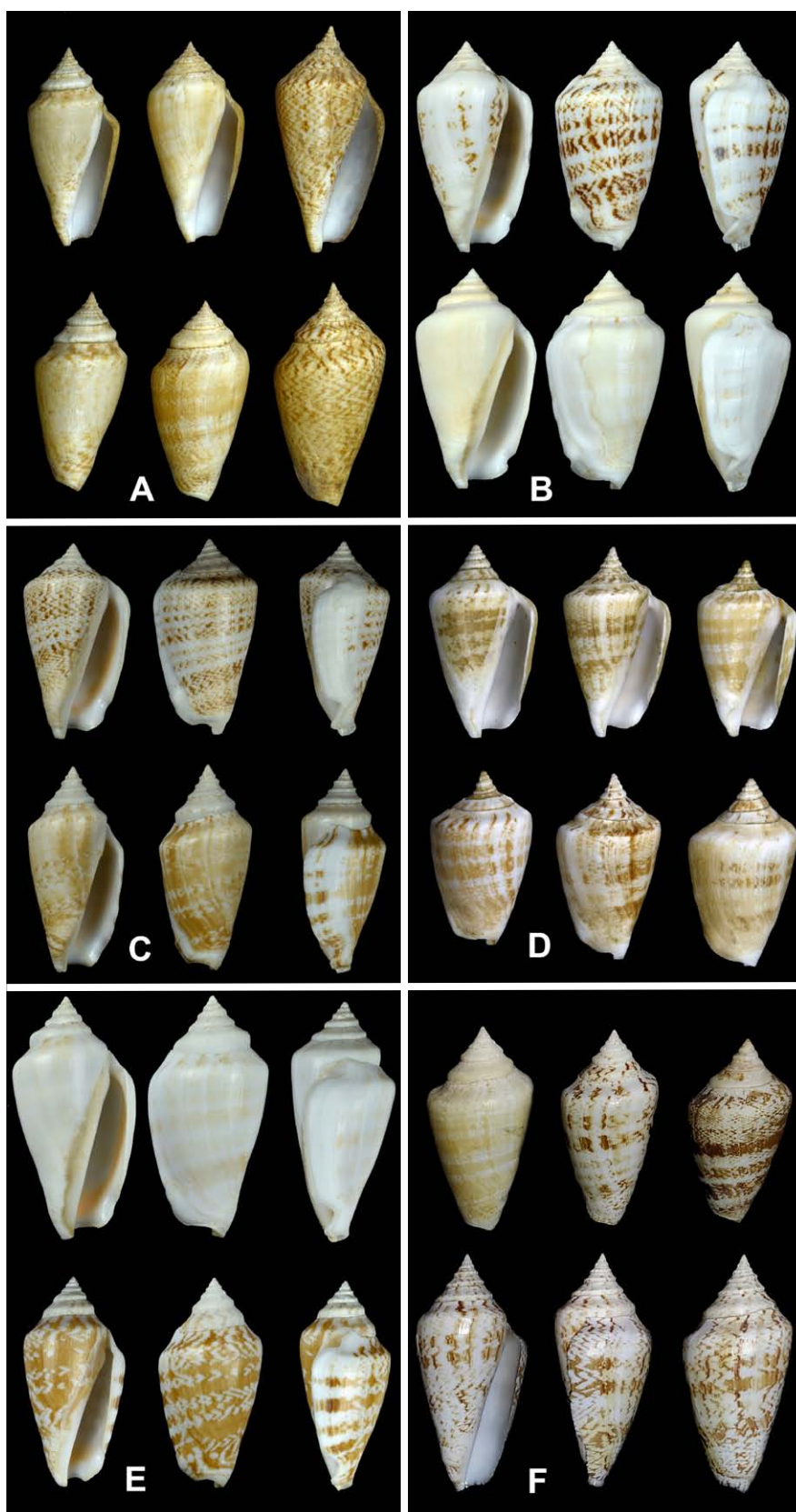


Fig. 1: *Conomurex persicus* **A:** near Bath of Aphrodite, Polis, Cyprus, shell height: 48.3, 48.5, 49.9 mm, leg: W. Fischer 08/1983, Coll: W. Fischer Nr.: M1300. **B:** Ayios Yeoryios, Peyia, Cyprus, size: 48.9, 50.5 mm, leg: W. Fischer 09/1991, Coll: W. Fischer Nr.: M1295. **C:** Latsi, Polis, Cyprus, size: 46.2, 48.9 mm, leg: W. Fischer 09/1988, Coll: W. Fischer Nr.: M1294. **D:** Port El Kantaoui, Sousse, Tunisia, size: 45.5, 48.9, 48.2 mm, Coll: W. Fischer Nr.: M3013. **E:** Phaselis, Kemer, Turkey, size: 56.6, 49.4 mm, leg: W. Fischer 09/1992, Coll: W. Fischer Nr.: M1296. **F:** Naxos, size: 55 mm, 52 mm, 48 mm, 52 mm, 52 mm, 52 mm. leg: C. Zeimbekis. Photos: C. Zeimbekis

for the first time by the first author in Latsi, Polis (Cyprus) and collected for tasting (Figs. 1C, 2). They proved to be particularly palatable. Mienis (1999) mentions that they were offered at a market in Haifa. The species has been exploited in Rodos Island over recent years and sporadically offered for human consumption in fish restaurants (Katsanevakis et al. 2008).

Material and Methods

The new records from Corfu (Benitses area on the east coast) and Naxos (Agios Sozon area SW on the island) are from hand sampling/dives of the authors. The new record of Tunisia (Port El Kantaoui) comes from the former collection of Didier Bertinex (Belgium)(Table 1). Distribution data come from private collections as well as from observations and existing literature.

Results

Living specimens of *C. persicus* (Fig. 1D) were found in November 2005 at Port El Kantaoui, Tunisia, which is to this date, the most western site in the Mediterranean with a population of *C. persicus*. There is no information about their habitat preferences from this area.

The 2016 discoveries off Corfu in the Ionian Sea, Greece, are so far the most northerly location for living species in the Mediterranean. *C. persicus* (Fig. 3) from Corfu were discovered in large numbers by the second author (Michał Poklękowski) in 2016 in the Benitses area on the east coast. They inhabited a muddy bottom at a depth of 5–8 m and were clearly visible in their habitat. The largest specimen reached a remarkable size of 75.1 mm. Abbott (1960) described an average size of 40–51 mm.

Conomurex persicus (Fig. 1F) from Naxos were collected by the third author (Christos Zeimbekis) in 2014 in the Agios Sozon area SW of the island. He collected six shells from a rocky plateau, which was in a depth of 2 m.

Evidence for the southern Aegean is also presented for the first time, this would be Evia (west of Karystos, leg. K. Apostolos 08/2020), Samos, (east coast, leg. Tali Horhe 04/2005), Kalymnos (Vlychadia, leg. A. Avrithis 07/2022), Kos (Kos Town, leg. A. Avrithis 07/2022), Kea-Kythnos (Kythnos, leg. P. Ovalis 08/2022), Salamina (leg. P. Ovalis 09/2012), Ikaria (Fourni, leg. P. Ovalis 07/2021) and for the Korinthiakos Gulf, near Apepochori (leg. P. Ovalis 07/2019) (Table 1).

Discussion

The occurrences of *C. persicus* on the Greek coast were published in 2003 by Zenetos et al. (2003, 2004) and focused on the northern coast of Crete, the Peloponnese



Fig. 2: Individuals of *Conomurex persicus* from Latsi, Polis, Cyprus, caught for food. Photo: W. Fischer

(south and east coast to Corinth) and Rhodes. For the Attiki coast near Athens, see Young 2007.

Now, 20 years later, a new picture of this invasive species is emerging. It now partially colonises the Aegean, especially the southern islands such as Karpathos, Naxos, Kos, Kalymnos and Evia. It is currently unknown how far it has spread into the northern Aegean. In Zenetos et al. (2003) there was also no confirmation for the Ionian Sea.

Furthermore, today *C. persicus* inhabits the coast from southern Turkey (Nicolay & Romagna-Manoja 1983;



Fig 3: *Conomurex persicus* from Corfu, left = 75.1 mm, right = 73 mm, leg.: M. Poklękowski, Photos: M. Poklękowski

Conomurex persicus in the Mediterranean

Table 1: Data of collected and observed *Conomurex persicus* from 1978 – 2022 in the Mediterranean Sea.
In the collections W. Fischer (*), C. Zeimbekis (**), M. Poklękowski (***).

Location	Date	Collector	References
Mersin Bay, Turkey	1978		Nicolay & Romagna-Manoja 1983
west of Silifke, Turkey	03/1983	M. Blocher	Blocher 1984
near Bath of Aphrodite, Polis, Cyprus*	08/1983	W. Fischer	Wawra & Sattmann 1988, Fischer 1993
Ixia, Rhodes, Greece	08/1983	R. De Roover	Verhecken 1984
beach of Shiqmona, Israel	1983	B. Singer	Mienis 1984
Antalya, Turkey*	1984	O. Schiller	this paper
Lattakia, Syria	1985		Gosselck et al. 1986
Ayia Napy, Cyprus*	09/1985	O. Hopfinger	this paper
10 km east of Kyrenia, Cyprus			Bazzocchi 1985
Alanya, Turkey*	09/1986	O. Hopfinger	this paper
Jounieh Bay, Lebanon	1987		Bogi & Khairallah 1987
Iskenderum Bay, Turkey	1987	Enzenross	Bakır et al. 2012
Latsi, Polis, Cyprus*	08/1988	W. Fischer	Fischer 1993
Akamas, Cyprus		J. Robinson	Robinson 1989
Kyrenia, Cyprus*	10/1990	O. Hopfinger	this paper
Larnaca, Cyprus	07/1990	F. Swinnen	this paper
Ayios Yeoryios, Peyia, Cyprus*	08/1991	W. Fischer	this paper
Phaselis, Kemer, Turkey* (Fig. 1E)	09/1992	W. Fischer	this paper
Nissi Beach, Ayia Napa, Cyprus	08/1994	F. Swinnen	this paper
Ormideia, Cyprus	08/1994	F. Swinnen	this paper
Bay of Salandi, Peleponnesus, Greece	08/1998		Russo 1999
Erdemli, Mersin, Turkey	05/2000		Mutlu & Mehmet 2006
Side, Turkey*	10/2000	E. Fischer	this paper
Kalamaki in the Messiniakos Gulf, Greece			Jaux 2001
Argolikos Gulf, Greece		A. Zenetos	Zentos et al. 2004
Lakonikos Gulf, Greece		A. Zenetos	Zentos et al. 2004
Kalivia beach, Attiki coast near Athens, Greece	10/2004		Young 2007
Port El Kantaoui, Sousse, Tunisia*	03/2005	excoll: D. Bertinex	this paper
east coast, Samos, Greece	04/2005	Tali Horhe	this paper
Tripolitania, Lybia	2006		Souissi & Zaouali 2007
Diafani, Karpathos Greece	07/2012		Thessalou-Legaki et al. 2012
Potamos, Chalki Isl., Greece	07/2012		Thessalou-Legaki et al. 2012
Salamina, Saronikos Gulf, Greece	09/2012	P. Ovalis	this paper
Agios Sozon, Naxos, Greece**	2014	C. Zeimbekis	this paper
Porto Palermo Bay, Albania	08/2015	E. Xharahi	Gerovasileiou et al. 2017
Benitses area, east coast, Corfu, Greece***	08/2016	M. Poklękowski	this paper
Alexandria, Egypt	2016		Mytilineou et al. 2016
Agioi Theodoroi, Corinth, Greece*	2018	N. Kastoudi	this paper
Apeporchori, Korinthiakos Gulf, Greece	07/2019	P. Ovalis	this paper
Tingaki, Kos, Greece	04/2020	E. Scoumpourdi	this paper
west of Karystos, Evia, Greece	08/2020	K. Apostolos	this paper
Akra Pleora, Agios Nicolaos, Crete, Greece	2021	F. Swinnen	this paper
Fourni, Ikaria, Greece	07/2021	P. Ovalis	
Linosa, Island, Pelagie Archipelago, Agrigento, Sicily, Italy	11/2021		Corso 2022
Kos Town, Kos, Greece	07/2022	A. Avrithis	this paper
Vlychadia, Kalymnos, Greece	07/2022	A. Avrithis	this paper
Kythnos, Kea-Kythnos, Greece	08/2022	P. Ovalis	this paper

Blocher 1984; Bakır et al. 2012; Mutlu & Mehmet 2006), including Cyprus (Wawra & Sattmann 1988; Fischer 1993; this paper), through Syria (Gosselck et al. 1986), Lebanon (Bogi & Khairallah 1987), Israel (Mienis 1984), Egypt (Mytilineou et al. 2016), Libya (Souissi & Zaouali 2007) and Tunisia (this paper).

To get a better understanding of the rapid spread of the invasive *C. persicus*, many new locations have been added which are summarized with all known records of this species in Table 1.

An accidental introduction of *C. persicus* into the northern Adriatic is suggested by a few empty shells found off Muggia (Trieste/Italy) (De Min and Vio, 1998). However, *C. persicus* is unlikely to establish in the Northern Adriatic due to the cold winter conditions (Zenetos et al. 2003); no specimens were recorded during the present field studies by Crocetta (2011).

The finding in Albania (Porto Palermo beach) was questioned as it was a single dead individual, but with the detection of *C. persicus* in Corfu, only 40 km of the coast of Porto Palermo beach, a population in Albania is no longer unlikely.

Conclusions

Conomurex persicus has spread from its first discovery in 1978 on the Turkish Mediterranean coast both westwards (Ionian Sea) and eastwards to the Syrian and Israeli coasts, from there westwards to Egypt, Syria and Tunisia in the western Mediterranean. There is a gap in the northern Aegean between the west coast of the Peloponnese and the Gulf of Patras to Corfu, where no records have been published. In any case, this invasive species has become very well established in the Mediterranean, forming mass colonies.

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