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## ON THE OCCURRENCE OF A NEW POPULATION OF *POTAMON FLUVIATILE LANFRANCOI* AT WIED GHAJN ZEJTUNA, MELLIEHA, MALTA

Arnold SCIBERRAS<sup>1</sup>, Jeffrey SCIBERRAS<sup>2</sup> & Saviour VELLA<sup>3</sup>

### ABSTRACT

*Potamon fluviatile lanfrancoi* is being recorded in this study from a new locality in Malta: Wied Ghajn Żejtuna, Mellieha. Individual crabs, exuviae, carcasses, snail shell fragments and excavated mud piles were discovered at various points of the valley, conclusively indicating the presence of the species.

**Keywords:** *Potamon fluviatile lanfrancoi*, crabs, valley

### INTRODUCTION

*Potamon fluviatile lanfrancoi* is listed in the “Red Data Book for the Maltese Islands” as endemic (subspecies level), endangered and with a restricted distribution in the Maltese Islands. (Schembri & Sultana, 1989). It has only been recorded from a few freshwater streams, namely San Martin, It- Tilliera, Wied il-Gnejna, Wied il-Bahrija, l-Imtahleb, Wied il-Gordajna and Wied il-Lunzjata in Gozo. It was also previously known from Marsa and Bingemma, but these populations are nowadays extinct (Debrincat & Schembri, 2007).

#### Description of site and records and field observations in situ

Wied Ghajn Żejtuna is a moderately wide valley nestling between the cliff sides of two major ridges, namely the Qortin ridge and the Mellieha Heights ridge. Topographically, this valley and its main stream rise at Fortress Hill, where the Mellieha water reservoir, is situated between St. Michael Street and Żnuber Street. Although rows of houses and streets have now cut across the natural course of the water from Fortress Hill down to Ghajn Żejtuna Valley proper, storm water still flows down from these heights and arrives via side streets and flights of steps to the top of Triq Ghajn Żejtuna, and proceeds from there down into the depths of the valley.

The valley rock surface is characterized by upper coralline limestone overlying a consistent layer of blue clay. This gives rise to several streams that flow from Fortress Hill (which also feeds the Wied tal-Madonna stream) and from the Qortin Ridge and Mellieha Heights ridge. Thus, fresh water streams flow underground from various directions and converge on the actual riverbed of the valley which currently extends for over a kilometer before it flows into Santa Marija Bay. Throughout its course, this stream is alternately dominated by extensive stands of *Rubus ulmifolius*, *Pistacia lentiscus*, *Arundo donax*, *Phoenix canariensis*, *Pinus halepensis*, *Ceratonia siliqua*, and *Prunus dulcis*. Numerous other floral species occur less frequently along the watercourse (Sciberras.J, unpublished data).

<sup>1</sup> – 131 `Arnest`, Arcade Str, Paola – [bioislets@gmail.com](mailto:bioislets@gmail.com) (Corresponding author)

<sup>2</sup> - 1 Marmir Bountempo Estate, Balzan- [wildalienplanet@gmail.com](mailto:wildalienplanet@gmail.com)

<sup>3</sup> - 101 , Main Street, Mellieha, MLH 2314– [salvador@onvol.net](mailto:salvador@onvol.net)

The valley has been extensively developed for residential purposes and the majority of residences have incorporated extensive soft-landscaped areas, which extend the available faunal habitat beyond the actual riverbed and banks. There is considerable evidence of regular faunal cross traffic between the riparian natural areas and the amenity areas of residential areas.

In late 2003 it came to the authors' attention from local residents that *Potamon fluviatile lanfrancoi* occurs in the Ghajn Zejtuna valley, mainly amongst undergrowth associated with the giant reed stands and bramble growing along the bed of same valley. Subsequently, the authors explored intensively the whole length of the valley in search of the species, but all twenty-four (24) visits proved fruitless. Only a cavity, very similar to what is generally considered as a burrow of the species, was recorded during these visits.

During the 2004-2009 period, over 70 specimens of terrestrial gastropods, collected in situ, further indicated the presence of the freshwater crab species in the Ghajn Zejtuna valley, since they exhibited patterns of breakage normally associated with predation by *Potamon fluviatilis lanfrancoi*. Following a heavy storm in 2006, remnants of a carapace were found at the mouth of the Wied Ghajn Zejtuna stream where the valley emerges onto the beach. This carapace was identified as belonging to *Potamon fluviatile*, but this was not considered to be sufficient evidence in confirming definitely the presence of freshwater crab species in the valley. Similar results were obtained in 2007, when other carapace remnants belonging to the same species were discovered along the valley bed after a heavy storm. It was only on 13/i/ 2008 that an adult live specimen was observed under one of the main bridges (the Triq il-Qasab bridge - just uphill from the *Pinus halepensis* afforestation site). On 24/v/ 2008, five live specimens were observed in the vicinity (Figure 1), and in 5/i/ 2009 seven live specimens were observed, again along the upper stretches of the valley. On 5/v/ 2009, another live specimen was located further upstream, close to the *Rubus ulmifolius* site in the vicinity of Triq il-Pont. Subsequently, a few shallow burrows, where the specimens might have sought refuge, were also located. A number of other sightings of the species by residents from the area also exist, but since they could not be substantiated, they have not been listed in the current note.



**Figure 1:** *Potamon fluviatile lanfrancoi* around 50 cm away from the water bed at Wied Ghajn Zejtuna on 24/v/ 2008. (Photo credit-A.Sciberras)

## DISCUSSION

The occurrence of this species in this valley is particularly interesting due to its location, which is the northernmost one on the island of Malta. The closest known population is that of San Martin. Whilst not excluding possible wilful introduction by humans of the species at Ghajn Zejtuna, especially since the species was not previously recorded from the site (this may also be because the species is rare and with good refuge), interaction between various local populations of *P. fluviatile* appears unlikely, in view of the significant distances and intervening topographical, microclimatic and ecological barriers. Such interaction, however, should not be entirely discounted without further investigation (Camilleri & Cachia, 2000). In fact, Cachia's (1996) observations do not rule out the remote possibility that relatively large distances may be travelled by the crabs. In addition, radio-tracking studies in Toscana (Italy) indicate that *P. fluviatile* is capable of long-distance movements of up to 100 meters across areas that lack surface water (Gherardi et al., Gherardi & Vannini, 1989). The nearest (to the Ghajn Zejtuna one) populations for the species are located at much larger distances.

It is presumed that the population of *Potamon fluviatile lanfranconi* at Ghajn Zejtuna valley is a small one, although its inaccessibility could contribute to its under-estimation. The authors main concern is that, due to the various development-related modifications of the valley, storm water is rushing down the riverbed towards the sea at a faster rate, consequently carrying a greater amount of debris, including loose stones, even though the direct physical impact of this phenomenon on individual specimens of the species have not been studied. Despite this, on one occasion, areas that had previously hosted several burrow-like structures were subsequently – after a heavy rainstorm – been found to be completely swamped with large quantities of debris. In these cases, all the burrows, which had been excavated in the clay beneath cane reed roots, had been completely buried by sand, gravel and stones. Nevertheless, the destruction of burrows need not necessarily imply the destruction of the specimens occupying such burrows.

The authors intend to extend their observations in this area in order to collect more extensive and definitive evidence related to the dynamics of this species' interaction with this habitat and how it reacts to seasonal upheavals. It is important to establish whether the resident population is thwarted from establishing a thriving colony mainly as a result of anthropogenic disturbance or as a result of other factors, including predation. Further field sampling is necessary to establish the status of the *Potamon fluviatile lanfranconi* population at Ghajn Zejtuna valley.

In view of the above considerations, the authors welcome the recent scheduling of this valley by the Malta Environment and Planning Authority (MEPA).

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