

# Additions to the gastropod assemblage of the Pliocene of Estepona, southwestern Spain, 2. The genus *Spiricella* Rang, 1828 (Umbraculida; Umbraculidae)

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The presence of *Spiricella unguiculus* Rang, 1828, is reported from the Pliocene of the Estepona Basin (Spain). This species, both fossil and present-day, is always extremely rare. So far, no occurrences of the animal have been reported, only the shells are known. It is possible that its unusually long stratigraphical longevity may be artificial and that we are dealing with a series of cryptic species, but at present we do not feel that the separation of fossil and actual populations is justified, based on shell characters alone.

Key words: *Spiricella unguiculus*, Pliocene, Estepona, southern Spain.

## INTRODUCTION

A tradition has developed surrounding the opisthobranch genus *Spiricella*, in which there are almost as many papers written on the genus as there are specimens. True to this tradition we find ourselves writing the third paper on the genus in less than ten years.

Silva & Landau (2007) reviewed the published occurrences for *Spiricella unguiculus* Rang, 1828 in Eu-

rope and noted that this thermophilic opisthobranch species, which occurs today in the eastern Atlantic from southern Portugal to Mauritania, and the Mediterranean (Romani, 2014) has an extraordinarily long history starting in the Early Oligocene, Rupelian age. Back then the species had a much broader geographic distribution, including also the North Sea Basin and more northern Atlantic coasts of Western Europe. The authors traced the sharp southward contraction of its northern geographical distribution during the Cenozoic to present time and concluded that this contraction was in accordance with the general biogeographic trend observed in other thermophilic Atlanto-Mediterranean gastropod taxa and with the Neogene to present-day Northern Atlantic cooling scenario.

The genus *Spiricella* was long thought to be monotypic. However, Silva & Landau (2008) described a second extant species from the western Atlantic *Spiricella redferni* from Abaco Island, Bahamas, Caribbean.

In this third paper we report the presence of *S. unguiculus* in the Pliocene of Estepona. From a palaeobiogeographical standpoint, its presence in the Western Mediterranean Pliocene is to be expected. Although the opisthobranchs in the Estepona assem-

blages still need to be published (apart from the holoplanktonic gastropods) this record of *S. unguiculus* is noteworthy as this is such rare and enigmatic species, and yet useful in palaeobiogeography (Silva & Landau, 2007).

Despite these advancements in our knowledge of its palaeontological history and its greatly increased fossil and present-day distribution, the genus continues as elusive as ever. We still know nothing of the animal to which these shells belong, nor its ecology (Romani, 2014).

#### MATERIAL AND METHODS

The material described herein was collected from the sandy lens (SA of Landau et al., 2003, text-fig. 1) representing a coastal intertidal environment, with numerous small gastropod specimens in a good state of preservation. This assemblage was dated as lower Piacenzian (lower Upper Pliocene) by Guerra Merchán et al. (2002) (Coordinates: X=312135.3903; Y=4036362.4822), an age corroborated by the assemblage of Euthecosomata (Janssen, 2004). The material is housed in the André Jansen collection.

Abbreviations: EsVeSA = Estepona Velerín Sandy lens (André Jansen collection); SA = sandy lens, Velerín, Estepona.

#### SYSTEMATIC PALAEOLOGY

Subclass Heterobranchia

Order Umbraculida Odhner, 1939

Superfamily Umbraculoidea Dall, 1889

Family Umbraculidae Dall, 1889

#### *Spiricella* Rang, 1828

*Spiricella* Rang, 1828: 226. Type species (by monotypy): *Spiricella unguiculus* Rang, 1828, Miocene, Mérignac, France.

#### *Spiricella unguiculus* Rang, 1828 (Figs 1-3)

*Spiricella unguiculus* Rang, 1828: 227, pl. 1 figs. 1-5.

*Spiricella unguiculus* Rang, 1827 [sic] – Angioy & Nicolay, 1993: 20, unnumbered figure.

*Spiricella unguiculus* Rang & Des Moulins [sic], 1828 – Silva & Landau, 2007: 21, fig. 3 (with synonymy).

*Spiricella unguiculus* Rang & Des Moulins [sic], 1828 – Silva & Landau, 2008: 307, fig. 10 A, B.

*Spiricella unguiculus* Rang & Des Moulins [sic], 1828 – Moths et al., 2011: 93, table 26, Fig. 3a-b, 4, 11, 12 a-c.

*Spiricella unguicula* [sic] Rang, 1828 – Perna, 2013: 247, 2 unnumbered figures.

*Spiricella unguiculus* Rang, 1828 – Romani, 2014: 515, fig. 9.

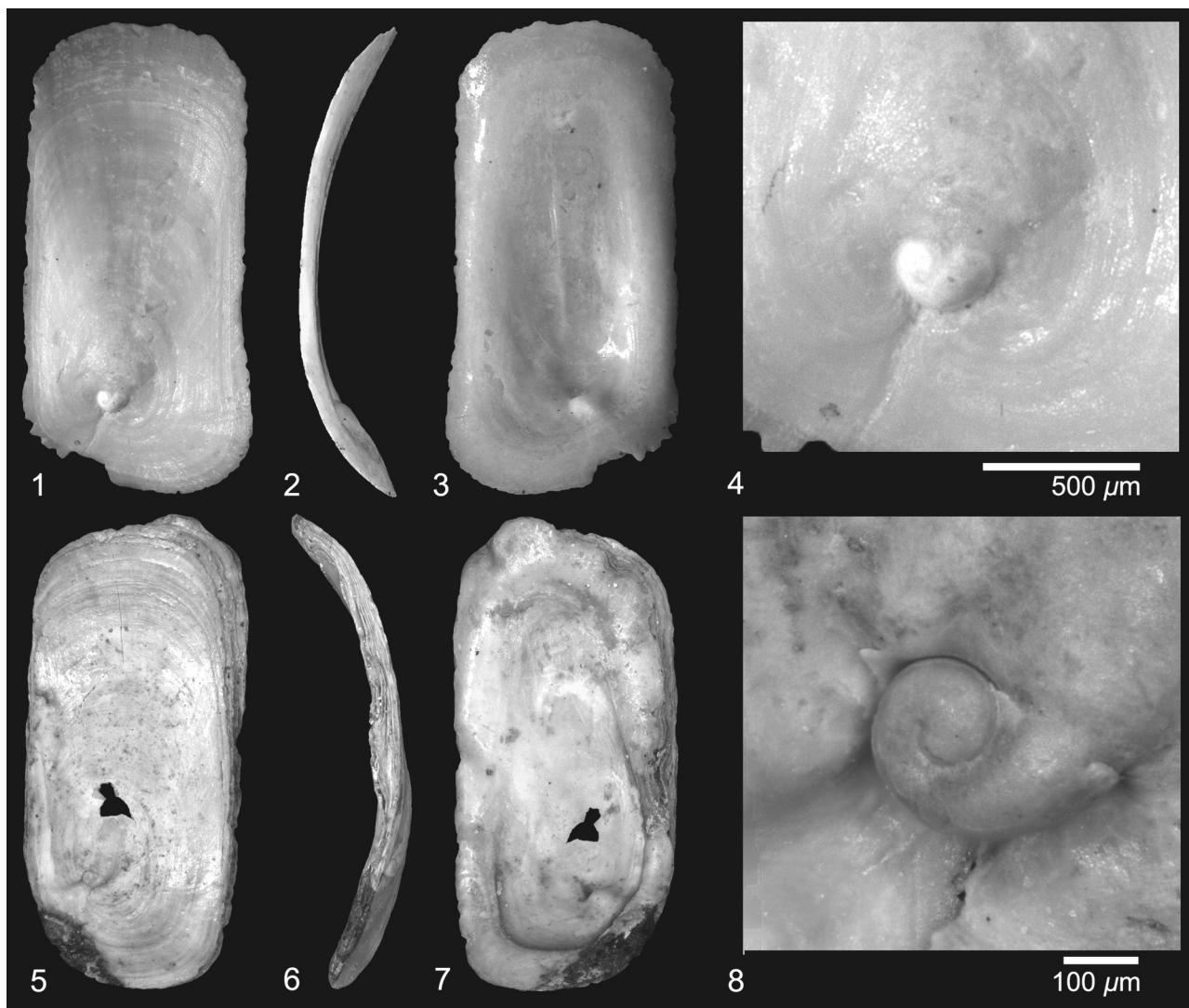
Material – Maximum length 5.0 mm. EsVeSA (1), SA.

Discussion – The date of publication of this species is sometimes quoted as 1827, which is the date of the title page of the second volume of the Bulletin d'Histoire Naturelle de la Société Linnéenne de Bordeaux. However, it was also published as a separate paper with the same title, Bordeaux (Laguillotièrre & Co): 1-31, 3 pls, with a note on the title page: 'Extrait du Bulletin d'Histoire naturelle de Bordeaux, tome II, 6.<sup>e</sup> livraison, 23 Décembre 1828' (Arie Janssen personal communication, 2015).

The single specimen from Estepona is beautifully preserved and has the apex and associated sulcus in the position described by Silva & Landau (2008, fig. 10 B) for *S. unguiculus*. This is the second fossil record for *S. unguiculus* in the Iberian Pliocene. It was reported from roughly coeval beds from the Mondego Basin, Central-West Portugal by Silva & Landau (2007).

As discussed above, *S. unguiculus* is first recorded from Lower Oligocene deposits and continues to the present day. It would be quite unusual for a species to be so long lived, and it is possible that we are dealing with cryptic species; difficult to separate due to the paucity of discriminating shell features and extreme rarity within the deposits they are found.

The Pliocene shell from Estepona has weak, but distinct rounded radial ribs externally, also seen in the Mondego Basin specimen, albeit even more weakly developed. The specimen described and depicted by Hoeksema & Janssen (1984, p. 9; Figs 4 - 8 in this paper) has no distinct radial ribs externally, although the authors say "some very faint radiating lines are visible between the apex and the shell margins". In the Estepona shell these ribs produce slight crenulations where they terminate at the margin, not seen in the Mondego Basin specimen, or the few present-day specimens illustrated. The Estepona specimen has straight lateral margins, as does the Mondego Basin assemblage one, whereas the modern shells have concave lateral margins. There is a weak longitudinal ridge internally in both the Estepona and Mondego specimens, not seen in present-day shells. The size (diameter protoconch Estepona specimen 320  $\mu\text{m}$  vs. 350  $\mu\text{m}$  for the modern shells) and position of the protoconch is similar in the present-day and fossil specimens (see Romani, 2014, fig. 9, table 2). A further look at the Miocene specimen illustrated by Hoeksema & Janssen (1984) and the Oligocene specimen illustrated by Valdés & Lozouet (2000) shows that both have very indistinct radial ribs externally, straight lateral margins like the Pliocene specimens, no longitudinal ridge internally like the present-day specimens and the protoconch has a similar number of whorls in all specimens. The diameter of the protoconch of the



**Figs 1-8** *Spiricella unguiculus* Rang, 1828. 1-4, EsVeSA75, maximum length 5.0 mm, width 2.0 mm. Velerín sands, Estepona, Spain, lower Piacenzian, lower Upper Pliocene; 5-8, RGM.225666 (same specimen illustrated by Hoeksema & Janssen, 1984), maximum length 6.7 mm, width 3.1 mm. Miste, Winterswijk, The Netherlands, Breda Formation, Aalten Member, Miste Bed, upper Burdigalian-Langhian, upper Lower to lower Middle Miocene (photograph: Petra Sonius and Ed de Vogel, Naturalis, Leiden).

Oligocene specimen (328  $\mu\text{m}$ ) is similar to that of both the Pliocene and modern shells. The Miocene specimen is quoted as having a nucleus diameter of only 0.14 mm. New photographs taken of the Miste specimen show it to have a protoconch diameter of about 305  $\mu\text{m}$ , nuclear diameter of 100  $\mu\text{m}$ . Hence, all specimens from Oligocene to the present day have a protoconch diameter of 300-350  $\mu\text{m}$ . Therefore, whilst we may well be dealing with cryptic species rather than a single extremely long-lived one, we do not feel there are sufficient grounds to separate these populations convincingly based on shell morphology alone. If the present-day specimens were found to be distinct, they would have to be ascribed to a new taxon, with a new name, as *S. unguiculus* is based on fossil Miocene material.

*Spiricella redferni* Silva & Landau, 2008 from the present-day Bahamas differs in having the apex placed more peripherally, in not having a sinus associated with the apex (see Silva & Landau, 2008, fig. 10) and in having a smaller protoconch.

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