

## First report of *Alvania scuderii* Villari, 2017 (Gastropoda: Mollusca) from Tyrrhenian Sea: some biogeographic implications

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### ABSTRACT

The cryptic gastropod *Alvania scuderii* Villari, 2017, recently described from the Strait of Messina as new species inside the *A. scabra* (Philippi, 1844) group, was known by restricted areas of eastern and southern Sicily. Some records from the type locality and south-eastern Tyrrhenian sea, which provided new data on habitat and bathymetric range, also enlarged northward, in a further basin, the known areal. Such areal, that overlaps a Mediterranean western-eastern biogeographic boundary, may be considered a further clue of an hydrological front that is responsible of a West-Mediterranean footprint more marked than in nearby North-westernmost areas.

**Keywords:** Motile fauna, Hard bottom, Rissoidae, *Alvania*, Biogeography, Mediterranean sea







Satellite thermography's, in fact, show a well distinct “cold strip” superimposed to the southern and eastern Sicily shelf, and overflowing into the southern Tyrrhenian sea through the Messina Strait (Bôhm et al., 1987), which determines a substantial continuity throughout the whole *A. scuderii* areal. Such coastal waters, that are colder than the close Ionian and Tyrrhenian typical water masses, have different origin, since southward they are tied to a wind-induced upwelling regime (Levi et al., 2003), whilst northward the effect of the Messina Strait tidal upwelling is recognizable (Bôhm et al., 1987). The records from the isle of Linosa, although concerning an area that is almost peripheral in respect to the core of such peculiar water-masses, can be explained by the Atlantic-Ionian Current pathway, one branch of which originates an anticyclonic gyre circling around Linosa, before flowing towards Sicily (Reyes Suarez et al., 2019). We may suppose, in agreement with Cuttitta et al. (2016), that mesoscale oceanographic structures play a key role in shaping the actual distribution of *A. scuderii*. This species, in fact, whose paucispiral protoconch indicates a non-planktotrophic larval development (Nützel, 2014), has a moderate dispersion capacity, on turn conditioned by the effectiveness of lateral supply and availability of neighboring steppingstones. In this respect, we suggest that *A. scuderii* might almost continuously occur throughout the completely southern and eastern coast of Sicily, up to a southeastern Tyrrhenian area which is still affected by the Strait of Messina tidal regime. Such distribution, whose effectiveness is however conditioned by the recent splitting of *A. scabra* in a rich species complex which includes *A. scuderii* (Amati et al., 2020), contributes to a patchiness of closely related species which together, but also individually (*A. scabra*), cover the whole Mediterranean western basin.

## Conclusion

The occurrence of *A. scuderii*, in particular, contributes to define a Mediterranean western-eastern biogeographic boundary line, which however cannot be considered as an ecotone, but as a front whose oceanographic features allow a West-Mediterranean footprint more marked than in nearby North-westernmost areas.

## Compliance with Ethical Standard

**Conflict of interests:** The authors declare that for this article they have no actual, potential or perceived conflict of interests.

**Ethics committee approval:** Approved by institutional, regional and national animal ethical statements.

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