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Spiculosiphon oceana (Foraminifera) a new bio-indicator of acidic environments related to fluid emissions of the Zannone Hydrothermal Field (central Tyrrhenian Sea)

Letizia Di Bella, Michela Ingrassia, Virgilio Frezza, Francesco L. Chiocci, Raffaella Pecci, Rossella Bedini, Eleonora Martorelli



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1 ***Spiculosphon oceana* (Foraminifera) a new bio-indicator of acidic environments related to**
2 **fluid emissions of the Zannone Hydrothermal Field (central Tyrrhenian Sea)**

3 Letizia Di Bella ^{a, *}, Michela Ingrassia ^b, Virgilio Frezza ^a, Francesco L. Chiocci ^a, Raffaella
4 Pecci ^c, Rossella Bedini ^c, Eleonora Martorelli ^b

5
6 ^a Department of Earth Science, Sapienza University of Rome, Piazzale A. Moro 5-0018 Roma,
7 Italy

8 ^b CNR-IGAG (Istituto di Geologia Ambientale e Geoingegneria), UOS Roma, Piazzale A. Moro
9 5-00185 Roma, Italy

10 ^c Technologies and Health Dpt., Biomaterials and Contaminants Section, ISS (Istituto Superiore
11 di Sanità), Viale Regina Elena 299-00161 Roma, Italy

12 * Corresponding author.

13 E-mail address: letizia.dibella@uniroma1.it (L. Di Bella)

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15 **ABSTRACT**

16 The new record of a shallow-water submarine hydrothermal field (<150 m w.d.) in the western
17 Mediterranean Sea (Tyrrhenian Sea, Italy) allows us to study CO₂ fluid impact on benthic
18 foraminifers. Benthic foraminifers calcification process is sensitive to ocean acidification and to
19 local chemical and physical parameters of seawater and pore water. Thus, foraminifers can
20 record specific environmental conditions related to hydrothermal fluids, but at present their
21 response to such activity is poorly defined. The major outcome of this study is the finding of a
22 very uncommon taxon for the Mediterranean Sea, i.e., the *Spiculosphon oceana*, a giant
23 foraminifer agglutinating spicules of sponges. This evidence, along with the strong decrease of
24 calcareous tests in the foraminiferal assemblages associated to hydrothermal activity, provides
25 new insights on the meiofauna living in natural stressed environment. In particular, observations
26 obtained from this study allow us to consider *S. oceana* a potential tolerant species of high CO₂
27 concentrations (about 2-4 times higher than the normal marine values) and a proxy of acidic
28 environments as well as of recent ocean acidification processes.

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