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## UNDERWATER ENVIRONMENT EXPLORATIONS: THE CASE STUDY OF THE MARGIONE CAVE (RG)

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In the Hyblean area (south-eastern Sicily), carbonatic successions mostly crop out. For this reason, this area is largely affected by karst processes. The Margione cave, object of the present study, is located along the right side of the Tellesimo torrent (tributary of the Tellaro river), in the administrative territory of Modica. It sits on the Ragusa formation, along an east-west oriented fracture. The Hyblean speleological Club explored and mapped the Margione cave for the first time in 1993. The cave is quite difficult to be explored in wintertime, because of heavy rainfall, which causes overflowing of a large amount of water in the entrance. The aerial section of the cave extends for about 70 meters from the entrance; afterwards, the exploration continues under submerged conditions (which was carried out for the first time in May 2014 with ARA equipment) along the small terminal lake extending for about 180 m. At the end of the submerged part there is a large aerial chamber; here the air is not breathable because of the large amount of CO<sub>2</sub>. Many surveys are currently to be carried out in order to complete the cave mapping and to define the nature and provenance of CO<sub>2</sub>.

## CITIZEN SCIENCE PROJECTS FOR MONITORING ALIEN MACROPHYTES

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To understand the invasive potential and the spread dynamics of an alien species, any newly colonized area needs to be quickly detected. Therefore, regular monitoring programs and public awareness campaigns are essential. Since intensive monitoring activities involving scientists are expensive, the occurrence and spread of marine species could remain undetected or could be detected only years after the initial colonization. Citizen Science initiatives, a potential solution to this problem providing supplemental information that would otherwise be lost, are able to involve different groups of volunteers: students, tourists, divers, underwater photographers, amateurs and fishermen.

Volunteers are encouraged to collaborate by providing data on the occurrence of alien species together with photos and environmental information which are published after validation by taxonomic experts. Websites and social networks play a fundamental role in the coordination, sharing and flow of all the collected data. The aim of this paper is to report the experience of two citizen science projects. The Participated Project “Caulerpa cylindracea – Egadi Islands” and the

citizen science platform “Seawatchers”. The first one is a two-year Participated Project (sponsored by the Department of Biological, Chemical and Pharmaceutical Sciences and Technologies-STEBCICEF, University of Palermo and the Egadi Islands Marine Protected Area) launched on 27th August 2014 and aimed at creating a database on the spread dynamics and the levels of threat of *C. cylindracea* within the Egadi Islands MPA. The second one is a platform of projects, coordinated by the Institute of Marine Sciences of Barcelona (CSIC, Spain), that relies on the collaboration among citizens and scientists. The results of these projects highlight how important the contribution of citizen scientists is for collecting new data and information on non-native marine species, and can be also used as an early-warning system. Moreover, they represent an opportunity to promote the creation of a permanent observatory “a warning system” for alien species within the Mediterranean Sea.

