

Subterranean fauna in two protected caves in the Hyblean area (Syracuse, Sicily)

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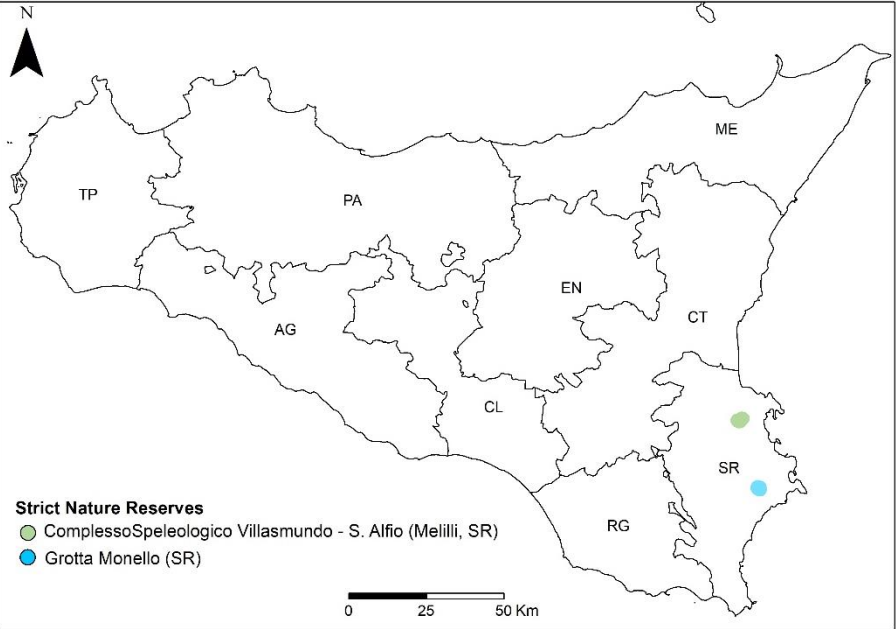


Fig. 1. Reserves location

The study areas

The reserve “Complesso Speleologico Villasmundo - S. Alfio” (70 hectares) is located inside the SAC (Special Area of Conservation) “Cozzo Ogliastri” ITA090024 (1600 hectares) of the Nature 2000 Network. The karstic system is mainly represented by two galleries, Villasmundo and Alfio caves, partially filled by underground water, and developed 2,5 km and 400 m in lengths, respectively. Villasmundo cave (Fig. 2) consists in a succession of tunnels, sinkholes and pits until the spectacular “Terminal Lake” (Fig. 3).

The reserve “Grotta Monello” (59 hectares) is located inside the SAC Grotta Monello ITA090011 (60 hectares). The cave is a system of chambers and galleries (Fig. 4) about 540 m in lengths. The peculiarity of the karst system is the massive occurrences of stalactites and stalagmites often forming columns having at places decametric dimensions (Fig. 5).



Fig. 4. Monello cave. Ph: S. Costanzo



Fig. 5. Monello cave. Ph: S. Costanzo

Methodology

Fauna in Monello and Villasmundo caves has been surveyed to provide information on the hypogean animal populations. The animals in Villasmundo were captured on sight (Fig. 6) and by using pitfalls trapping. In Monello cave cardboard sheets with bait (cheese) were used to attract the fauna which was only counted. Only a limited number of specimens were captured in case of further necessary identifications.



Fig. 6. Sight sampling in Villasmundo cave. Ph: F. Leone



Fig. 7. *Plusiocampa (Plusiocampa) tinoamorei* Sendra & Nicolosi. Monello cave. Ph: S. Costanzo



Fig. 8. *Tychobythinus villasmundi* Sabella, Amore & Nicolosi. Villasmundo cave. Ph: A. Marletta



Fig. 9. *Armadillidium lagrecai* Vandel, 1969. Monello cave. Ph: S. Costanzo



Fig. 10. *Glomeris dionysii* (Strasser, 1961). Monello cave. Ph: S. Costanzo



Fig. 11. *Armadillidium lagrecai* Vandel, 1969 (left) and *Roncus sículus* Beier, 1963 (right). Monello cave. Ph: S. Costanzo

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Fig. 2. Villasmundo cave. Ph: F. Fiorenza, CSE



Fig. 3. Villasmundo cave – Terminal Lake. Ph: F. Fiorenza, CSE

Results

The last two years monitoring activities in Villasmundo and Monello caves have allowed to detect seven cave-dwelling species. Three of them are also new for the science. Species are listed in the following table.

PHYLUM	CLASS	ORDER	SPECIES	VILLASMUNDO CAVE	MONELLO CAVE
Arthropoda	Arachnida	Pseudoscorpiones	<i>Chthonius multidentatus</i>		✓
			<i>Roncus siculus</i>		✓
	Malacostraca	Isopoda	<i>Armadillidium lagrecai</i>		✓
	Diplopoda	Glomerida	<i>Glomeris dionysii</i>		✓
		Diplura	<i>Plusiocampa tinoamorei</i>	✓	✓
	Insecta	Coleoptera	<i>Tychobythinus villasmundi</i>	✓	
			<i>Tychobythinus</i> n.sp		✓

We detected a new dipluran of the family Campodeidae described as *Plusiocampa (Plusiocampa) tinoamorei* sp. nov. (Fig. 7). It belongs to the group of *Plusiocampa* s. str. with thoracic medial posterior macrosetae. The species represents the second subterranean dipluran in Sicily (Sendra et al., 2019). It was described for Villasmundo cave and after detected also in Monello cave.

Noteworthy is also the recent discovery of two Pselaphine of the genus *Tychobythinus*: *Tychobythinus villasmundi* (Fig. 8) and *Tychobythinus* n. sp. (under description). *Tychobythinus villasmundi* is a Pselaphinae which shows some adaptations to cave life and affinities with *Tychobythinus* species from North Africa but can be easily separated from the related taxa by the different structure of the aedeagus (Sabella et al., 2019).

It has been confirmed the presence of the Isopod *Armadillidium lagrecai* (Fig. 9 and 11) and the *Glomeris dionysii* (Fig. 10), already known and described for the Monello cave. *Armadillidium lagrecai* is a troglobites species described by Vandel, 1969 for the Monello cave, which represents the only locality known for the species so far. It reaches a length of about 7 mm and shows troglobites characteristics such us depigmentation and blindness. *Glomeris dionysii* is a small Glomerida that shows a lack of pigment and the absence of furrows on the collum. Ocelli are developed, but they are lacking pigment too. Significant is also the presence of the pseudoscorpions *Roncus sículus* (Fig. 11) and *Chthonius multidentatus*, both present in Monello cave.

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