

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

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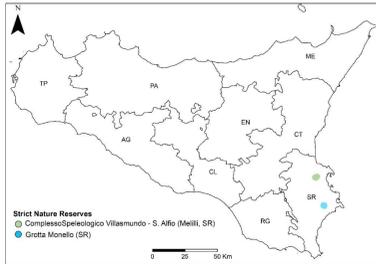


Fig. 1. Reserves location

Over the last two years, extensive fieldwork has been carried out in two protected caves (Villasmundo and Monello) in eastern Sicily, in the Syracuse administrative territory (Fig. 1). The caves, located respectively within the Strict Nature Reserves “Compleso Speleologico Villasmundo - S. Alfio” and “Grotta Monello”, are managed by Cutgana Centre of the University of Catania. Both caves are two of the most important karst systems of the Hyblean area and show speleothems of great scientific value such as stalactites, stalagmites, and columns. The caves, geosites since 2015, consist of interconnected karstic conduits and galleries within the Mt. Climiti Formation (lower - middle Miocene). The study has further increased our knowledge about the existing cave fauna, and focused on the optimization of good conservation practices of hypogean environments. Systematic investigations have confirmed the presence of a rich arthropod fauna community, and above all have highlighted species of great importance, some of which are new to science.

The study areas

The reserve “Compleso Speleologico Villasmundo - S. Alfio” (70 hectares) is located inside the SAC (Special Area of Conservation) “Cozzo Ogliastrì” 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



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>		✓
			<i>Glomeris dionysii</i>		✓
	Diplura	Diplura	<i>Plusiocampa tinoamorei</i>	✓	✓
			<i>Tychobythinus villasmundi</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 as 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 siculus* (Fig. 11) and *Chthonius multidentatus*, both present in Monello cave.

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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 siculus* Beier, 1963 (right). Monello cave. Ph: S. Costanzo

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