



UNION INTERNATIONALE DE SPELEOLOGIE

COMMISSION DE SPELEOTHERAPIE

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INTERNATIONAL SYMPOSIUM OF SPELEOTHERAPY  
SOLOTVINO (UKRAINE)  
September 22 — 25, 1993



*Solotvino — UKRAINE 1993*

# CASTELCIVITA CAVES: CHEMICAL AND MICROBIOLOGICAL POLLUTION.

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The study of the pollution in the environment is one of the principal problems of this century. The possibility to find pollutants in the places that can appear infected has driven us to estimate such possibility in the karst-areas.

The study has taken into consideration a portion of the karst-system on Alburni Mount (province of Salerno, Campania, South Italy); the karst-whole which we take in examination has been that of Castelvita caves.

This cave represents, about dimensions and importance geologic and tourist the most interesting place to investigate. After a preliminary study of cropping up of stratum, we have started to execute drawing of water, which we have taken in examination some of the index of the pollution ( $T^\circ$ , pH,  $\text{NO}_2^-$ ,  $\text{NO}_3^-$ ,  $\text{NH}_4^+$ , chloride, calcium, sulphate, chromium total, B.O.D.<sub>5</sub>, C.O.D., coliforms group, fecal coliforms, fecal streptococcus).

To effect out the drawing we use some sterile bottles of glass and we have transferred them to laboratory inside a thermic bag at  $4^\circ\text{C}$  to analyse. For the microbiological parameters, we have executed a filtration on membranes of  $0.45\ \mu\text{m}$  directly at the places of drawing, used a syringe with a valve at two way and a support for the filtration; the membrane was deposited in Petri-plates that held worldy suitables and put it into a thermostat portable. The measuring of the pH and of the temperature, was executed on the place with an apparatus portable. The methods used for the determinations of parameters that were investigated are those of Standard Methods (APHA 1984).

We have compared the data (table), those were drawn on the places of drawing autumnal and spring. Particularly interesting turned are the considerable diminutions of  $\text{NO}_3^-$  at the points 4 and 5, the rise of chloride at the point 3 and the diminutions of it at the point 1. A difference significant to note at the points 1,2,3,4 for the sulphate; for the calcium only at the points 1 and 2; the chromium show power of concentration most low except for the point 4. The microbiologic load must consider the themselves important, almost stationary at all the points excluded the 4 that we can observe a sensitive diminution.

After this first year of study, the first and not final valuation, we can show that the load the pollutants will be reduced in spring season, maybe also acting of rise of it, in the increasing range of the karst-waters.

For a decree absolute and most near at the real environmental situation, we thought it right to conclude this work on biennial study.

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Table: Means\* of the values for the parameters considered.

PARAMETERS	POINTS OF DRAWING									
	1		2		3		4		5	
	autumn	spring	autumn	spring	autumn	spring	autumn	spring	autumn	spring
$T^\circ$	14.60	14.00	14.00	13.50	15.30	15.10	15.00	14.50	16.40	16.00
pH	7.70	7.70	7.50	7.70	7.30	7.10	6.90	8.00	6.70	7.50
$\text{NH}_4^+$ mg/l	0	0	0.28	0.13	0.07	0	0.02	0.05	0.12	0.02
$\text{NO}_2^-$ mg/l	0.05	0.05	0.20	0.15	0.02	0	0.59	0.06	0	0.05
$\text{NO}_3^-$ mg/l	0	4.70	1.9	1.9	2.25	0	20.61	8.20	27.14	1.72
Chloride mg/l	100.00	42.00	42.00	63.00	63.00	105.00	90.00	70.00	90.00	56.00
Sulphate mg/l	18.40	39.50	9.40	40.00	16.20	24.50	10.80	35.20	60.50	52.40
Calcium mg/l	131.60	11.80	163.60	51.00	80.60	72.20	78.00	66.30	96.50	91.90
B.O.D. <sub>5</sub> mg/l	5	0	5	0	5	10	100	0	10	0
C.O.D. mg/l	83.00	3.91	137.00	26.50	25.00	21.30	55.00	5.65	39.00	39.60
Chromium mg/l	0.09	0.07	0.13	0.03	0.14	0.08	0.09	0.09	0.32	0.07
Colif.gruop./dl	54	10	46	20	20	150	10000	8	35	4
Fec. Colif. /dl	0	10	0	40	10	0	2000	4	10	0
Fec. Strept./dl	1	0	0	0	0	0	100	0	1	0

\*10% < C.V. < 20%

Legend:

1 = "Lago Terminale" Castelvita caves;

2 = "Lago Orrido" Castelvita caves;

3 = "Sifone Condotta M" Castelvita caves;

4 = "1° Lago" Ausineto caves;

5 = "Risorgenza" on the Calore river.