

A natural source of brine and sapropelic mud for therapeutic purposes

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The mining of salt of Tortonian and Aquitanian age began in Romania ca 3,500 years ago through surface pits and sub-terranean excavations (1). By flooding, these excavations became the so-called anthroposaline lakes; the natural dissolution of salt rock generated karstosaline lakes (1,2). In the Sovata area, located in the eastern part of Transilvanian Basin, both anthroposaline (Negru) and karstosaline (Ursu, Alunis, Rosu and Verde) lakes are related to the presence of a rock salt body of Tortonian age (3). The main lake is Ursu (Fig.1), considered by most researchers as karstosaline and formed in 1878 by natural dissolution process followed by a collapse within the salt body (4). The resulting basin (18 m max. deep with a surface area of 40,200 sqm.) contains chlorosodic (salinity 11-272 g/L) and acid (pH 5.5-6.8) water with a moderate Secchi transparency (25-200 cm). The sediments are mostly organic-rich, sapropelic muds with predominance of Cl, Na and SiO₂; their formation (peloidogenesis) includes mainly leaves of circumlacustrine forest vegetation (5). The water and mud biota are dominated by phytoplankton and phytobenthos (21 species of Bacillariophyta, 9 species of Cyanophyta and 6 species of Chlorophyta); zooplankton is subordinated (3 species of Ciliata, 4 species of Crustacea and 2 species of Insecta) (6).

The therapeutic qualities of lake are given by both its physico-chemical stratification of the water (i.e. heliotherapy of crenogenic and biogenic origins, known about a century ago (7) but studied in detail later (8,9)), and chemical characteristics of black, unctuous, organic-rich muds (10). As in the case of other lakes of similar origin, cure recommendations include the amelioration and/or healing of various diseases mostly gynecologic, rheumatic and traumatic, by outdoor/indoor bathing in the lake water and applications of heated mud (11). Indoor treatments are made all around the year in balnear sanatoria.

In order to protect the therapeutic qualities of lake water and mud, beside general measures (12), specific measures are needed to: control the salt dissolving effects of fresh water; consolidate the substratum of the surrounding circumlacustrine area; prevent overloading and collapse of underground gaps through which water percolates; prevent pollution and degradation of water and mud quality; increase peloidogenesis; conserve heliotherapy; monitor physical, chemical and biological parameters of water and mud; periodically survey terrain movements.

REFERENCES

1. V.A.C.Bulgăreanu, Lakes & Reservoirs Research and Management, 2 (1996) 211.
2. Th.P. Ōnzaru, Lucr.ştiinţ., Inst. Pedag. Oradea. Ser.A (1969) 249
3. Gh.Popa, Probl.geogr., VII (1960) 283
4. I.Sfariac, Bul.Soc.Ştiinţe Geogr., III (LXXIII) (1973) 1157
5. V.A.C.Bulgăreanu, V.Ionescu E.Ioanişescu, Rev.Roum.Biol. ser.Biof.veget., 34/2(1989) 149
6. V.Ionescu, M.Năstăsescu, L.Spiridon & V.A.C. Bulgăreanu, Int.J.Salt Lake Res., 7(1998) 45
7. I. Al. Maxim, Rev.muz.geol. mineral.Univ.Cluj, III/1 (1929) 51
8. V.A.C.Bulgăreanu, M.Sitaru & D.Hannich, Theor. Appl. Karstol., 2(1985) 165
9. I.Panait & A.Bobeică, Hidrot., gospod.apelor, meteo., 13/6(1968) 269
10. S.Kiss, D.Ravdulescu, M. Drăgan-Bularda, V.A.C. Bulgăreanu & G.Nicula, Stud.Univ.Babes-Bolyai, Biology, 24/2(1979) 54
11. E.Ţereanu & L.Grigore, Sovata. Mic îndreptar turistic, Edit.Sport-Turism Bucureşti, 1989
12. V.A.C. Bulgăreanu, Int. J. Salt Lake Res., 2/2(1993) 165

Fig.1. Lake Ursu(Sovata, Romania). A, bathing area; B, non-bathing area(to conserve heliothermy); C, therapeutic sediments (mainly black, unctuous muds); D, non-therapeutic sediments(mostly sandy); E, forest; F, line of buoys; AU,TO, Auriu and Toplița brooks(freshwater inflows); V, saltwater inflow from lake Verde; AL, saltwater outflow to lake Aluniș.

