

Siliceous SPA Waters Hydrodiversity to the Medical Hydrology Bioactivities Potential – Brazil, Poland and Spain cases.

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Introduction

The dissolved silica grade was found to be a useful indicator for the authenticity of natural mineral water and to distinguish them from surface water (Lau & Luk, 2002). Some environments can influence your water silicon content and species occurrences forms, for example: H₂O temperature, wheatear (tropical), pH, TDS, Al (rock-fluid-clay). Because this, normally Si are used like good geothermometers.

The element occurs naturally in foods as silicon dioxide and silicates. It is also present in water as orthosilicic acid or hydroxyaluminosilicate (HAS) colloids, playing an important role in controlling the biological availability of aluminum and its toxicity in living organisms. The actual fascination with silicic acid and health probably originates from the reputed health benefits of both bathing in and partaking of mineral or spa waters rich in it, since the twentieth century. Indeed biological has continued research until today to strongly support the notion that living things grow better and are healthier when their environment is replete with silicon.

Beverages, especially mineral waters are considered as one as the best nutritional sources of silicon. The silicon levels in mineral waters ranged from 3.33-30.05 mg/l, in spring waters 3.66-11.23 mg/l, and in fruit juices ranged from 0.21-1.93 mg/100g. (Prescha et al., 2011). The essential daily absorption of silicon have in drinking water an exceptional source, were these intakes would increase slightly when presented at light TDS water. At nature, in oceans waters 2.9 mg/l, mg/l, rivers 5.64 m/l and in groundwater 8.4 mg/l (Hem, 1989; Shvartserv, 2008).

Siliceous waters can pursuit a beneficial action on old people, especially with gastrointestinal diseases, diabetes and metabolism dysfunction. Also, they are prescribed with skin diseases; have anti-inflammatory

action, amplify antitoxic liver function with the help of adsorptive properties of silicic acid for some countries requirements or standards (Yasoveev, 1997). In Brazil, this focus do not exist.



Figure 1. Marajó-Amazon/BRA, Sudetes Mt./POL and Ourense-Galizia/SPA.

To illustrate comparative cases, was selected samples from Brazil (Amazon Region), Poland (Mt. Sudetes Region) and Spain (Galicia Region) (Table 1). Were was showed Figure 1.

Table 1. Si H₂O SPA Database.

| Group | #Sample | SiMedian | °C/pH/TDS/AlMedian |
|--------------|---------|----------|--------------------|
| BRAZIL | 57 | 21.6 | 29/6/282/0.2 |
| POLAND | 574 | 5.5 | 7/6.5/50/0.02 |
| SPAIN | xx | xx | x/x/x/x |
| WORLD BOTTLE | 711 | 21.4 | 20/7/877/0.18 |

Unity pH, Temperature and mg/l values.

Conclusions

The Si element value to the characteristic biological activity, at concentrations that ensure the therapeutic status of water and specify how it can used for medical treatment and epidemiological/nutritional essentiality. Some these grades was founded in especially in these 3 regions, because different causes origins and with potential to interesting applications. Brazilian maximum anomaly was founded in Marajó Island groundwater with 462 mg/l Si; Sudetes 14 mg/l Si, Galicia xx m/l Si and www.mineralwaters.org (2012) with 78 mg/Si.