

## NATURAL AIR IONS TO SPA APPRAISAL

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### Introduction

For over 100 years, are known and studied the bioactive properties of the ions contained in the air. Through inhalation, especially of small and negative ions, in atmospheres and microclimates where anomalies of their concentrations higher than 1200 ions/cm<sup>3</sup> occur; they benefit both the psychological well-being and the human body's physiological condition. The small ions exist all the time in the atmosphere, and the average concentrations of positive and negative small ions are typically 200~2500 cm<sup>3</sup>. World Health Organization (WHO) advises that the concentration of negative ion in natural fresh air should not be below 1000~1500 ions/cm<sup>3</sup> Hirsikko et al (2011). Some balneal resorts and SPA natural surroundings we can usually found 3000~4000 ions/cm<sup>3</sup> Enache et al (2005).

May In controlled exposures at local environments (outdoor or indoor aeroionotherapy – 30 minuts at 30 days) where the contents are 10000~15000 ions/cm<sup>3</sup>, to obtain therapeutic indications: increase levels of the mood chemical serotonin, treatment asthenia, depressive reactions, anxiety, irascibility, cephalaea, insomnia and general disposition Deleanu & Stamatiu (1985). Near to the Gartl waterfalls/AUT healthful performed trials to pediatric allergic asthma, stress-immunology, burnout prevention, lung and heart physiology and mucociliary clearance; with 1 hour daily at 1 week, in an atmosphere of 20000 ions/cm<sup>3</sup> Hartl et al (2013). At the Pushchino/RUS clinical center treat >40000 ions/cm<sup>3</sup> like prophylactic/therapeutic dose by 30 minutes/day inhalation Kondrashova et al (2000).

Thus, this bioactivity level are founded in 4 Brazilian SPA places with traditional health tourism visitation and with 4 distinct environments differentiated according to the natural energetic

origins to these air ions anomalies: hight background radiations (HNBRa) and talassotherapy tropical beach - Guarapari, tropical forest Cataratas waterfall near fog microclimate - Foz do Iguacu, cave speleotherapy mist - near indoor wet sauna – Itaipulandia and radon hot spring at mountain climate near thoron emanation nascent microclimate – Aguas de Lindoia (Figure 1 and Table 1).



Figure 1: Iguacu Waterfalls, Guarapari Beach and Itaipuland Sauna Cave SPA/BRA

Similar global occurrences could be found, such as: Bad Gastein/AUT Alpine waterfall with 31606 ions/cm<sup>3</sup> Kolarz et al. (2012), speleotherapeutic cave Cisaraska/CZE (pediatric bronchial asthma) with 38800 ions/cm<sup>3</sup> Roubal et al (2017), Baile Herculane/ROU radon spring with 2500 ions/cm<sup>3</sup> Constantin (2011), Motoyu hot spring, Nasu/JAP with 1920 ions/cm<sup>3</sup> Isitani (1908) and a shinki sauna indoor (pulse rates and sweat production enhanced) with 20000 ions/cm<sup>3</sup> Watanabe et al (1997).

Table 1. Air Ions Anomalies Places.

PLACE	Iguaçu Cataratas	Guarapari Beach	A. de Lindoia	Itaipuland SPA
x1000/cm <sup>3</sup>	18.53	63.4	59.79	78.95
Ocurrence	Waterfall spray	Monazite sand	Hot spring	Cave sauna

### Conclusion

These measurements and comparisons may suggest air ions as local natural therapeutic factors.