

Investigation of water structures in mixed combinations of

Yunosato Spa waters by NIRS and Aquaphotomics

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Introduction

Yunosato Spa has Bronze, Silver and Gold waters that have unique structures and functions. There are two types of waters made by mixing those three waters. The purpose of the experiment is to make new combinations of the three waters and investigate their structures and functions.

Materials and methods

The experiment was done using Bronze (B), Silver (S), Gold (G) waters, as well as Kongo water (a ratio combination of G1:S1:B1) and Milli Q as controls. The new ratios were made as follows:

Name	G	S	B
G2:S1:B1	2	1	1
G3:S1:B1	3	1	1
G4:S1:B1	4	1	1
G5:S1:B1	5	1	1
G6:S1:B1	6	1	1
G7:S1:B1	7	1	1
G8:S1:B1	8	1	1

Name	G	S	B
G1:S2:B1	1	2	1
G1:S3:B1	1	3	1
G1:S4:B1	1	4	1
G1:S5:B1	1	5	1
G1:S6:B1	1	6	1
G1:S7:B1	1	7	1
G1:S8:B1	1	8	1

Name	G	S	B
G1:S1:B2	1	1	2
G1:S1:B3	1	1	3
G1:S1:B4	1	1	4
G1:S1:B5	1	1	5
G1:S1:B6	1	1	6
G1:S1:B7	1	1	7
G1:S1:B8	1	1	8

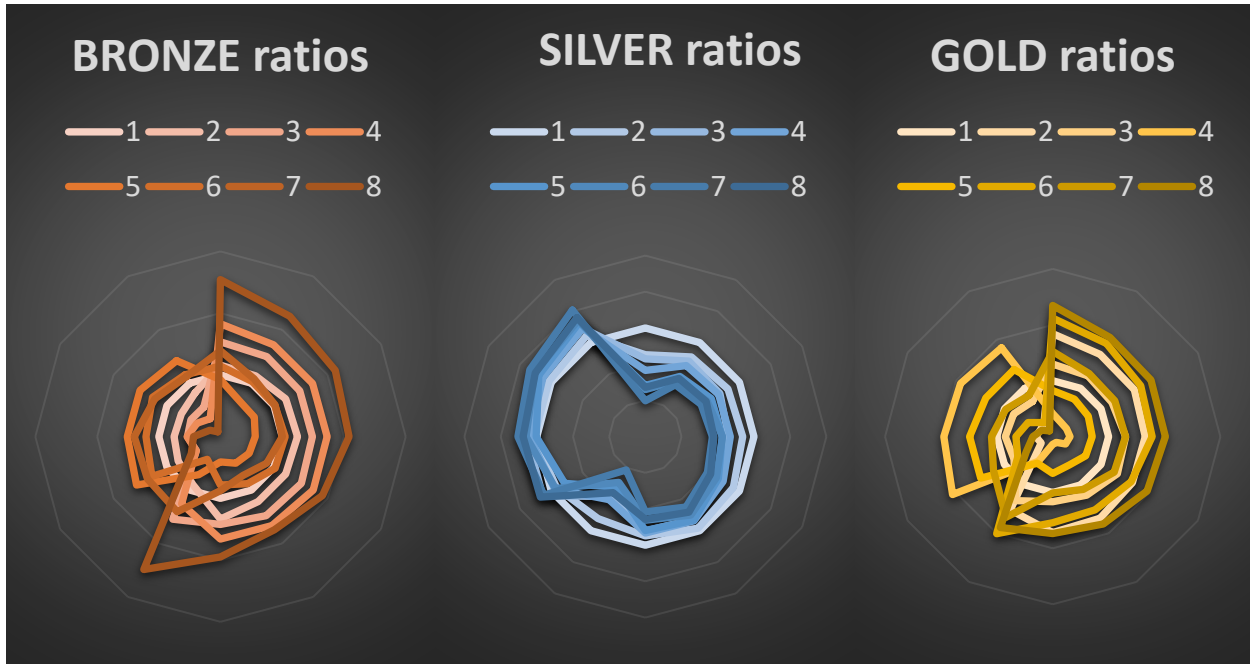
Name	G	S	B
G1:S2:B3	1	2	3
G1:S3:B2	1	3	2
G5:S7:B6	5	7	6
G6:S5:B7	6	5	7
G6:S7:B5	6	7	5
G7:S5:B6	7	5	6
G7:S6:B5	7	6	5

The samples were put into quartz cuvette and were measured using the XDS spectrometer with the RLA (Rapid Liquid Analyzer component), which has a range of 400-2499.5 nm with a 0.5nm step. Samples were made with two repeats and each one was measured five consecutive times.

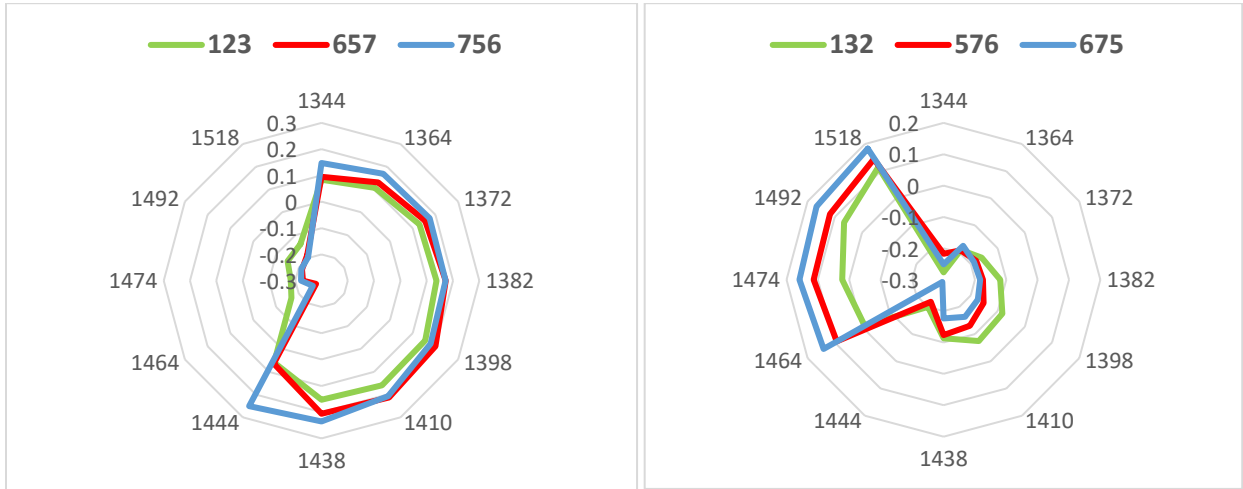
Results and discussion

The new ratios have different structures and functions according to their water content. The ratios with the most of one of the three waters show most similarities to that water's data – the more you add one water to the ratio, the more that ratio changes its structure to that water.

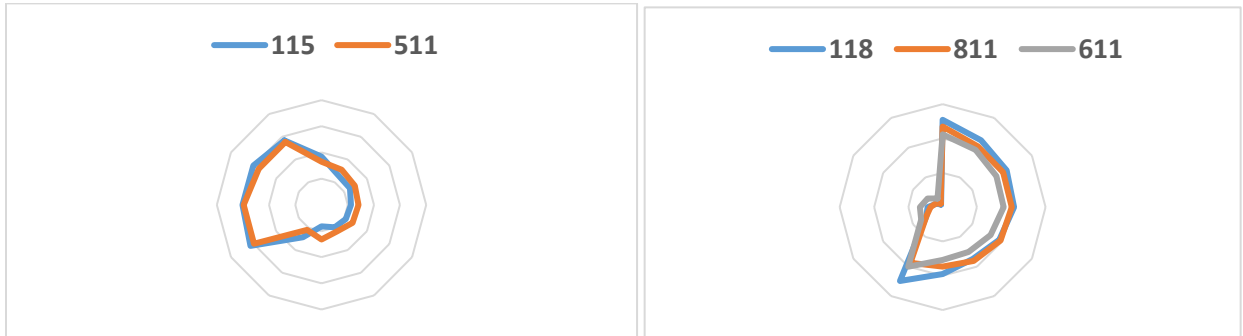




All Silver water ratios have stable structuring with smooth transition between its ratios.



Bronze and Gold water ratios have similar structures compared to Silver water ratios.



Conclusion

New structures and functions can be observed when mixing Yunosato waters. Classification of the data can be observed according to the water type. Silver water ratios have the most stable structuring while Gold and Bronze water ratios share many similarities.

Reference

- *“Water spectral pattern as holistic marker for water quality monitoring”*
Kovacs, Z., Bazar, G., Oshima, M., Shigeoka, S., Tanaka, M., Furukawa, A., Nagai, A., Osawa, M., Itakura, Y., Tsenkova, R. (*Talanta* 147: 598-608, 2016)