

A comprehensive assessment of drinking water quality in Kondopoga, Kareliya

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The aim: to compare characteristics of the tap, bottled water and water from the five springs of Kondopoga and Prionezhsky districts for their drinking suitability with using the test-object *Ceriodaphnia affinis*.

The questions: Could the spring water substitute tap water and bottled water? Could the test-object *Ceriodaphnia affinis* be used for bioassay tests of drinking water quality?

Results

1. Bacteriologic analysis

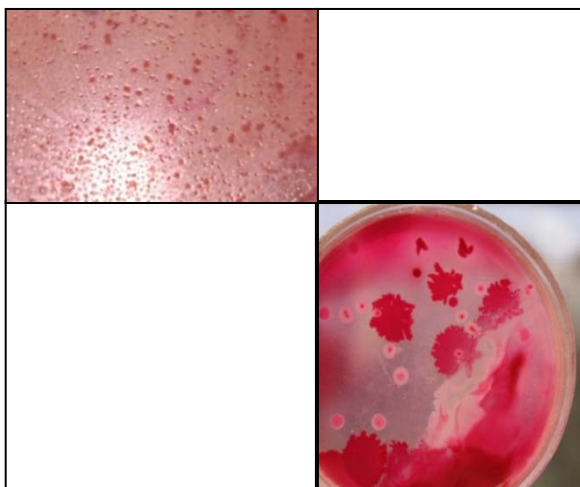


Fig.1. Not allowed bacteriological cultures in water from the springs and bottled water

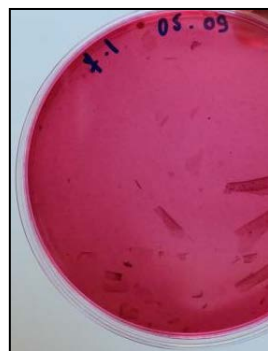


Fig.2. Bacteriological state of tap water

2. Analysis of daphnia activity

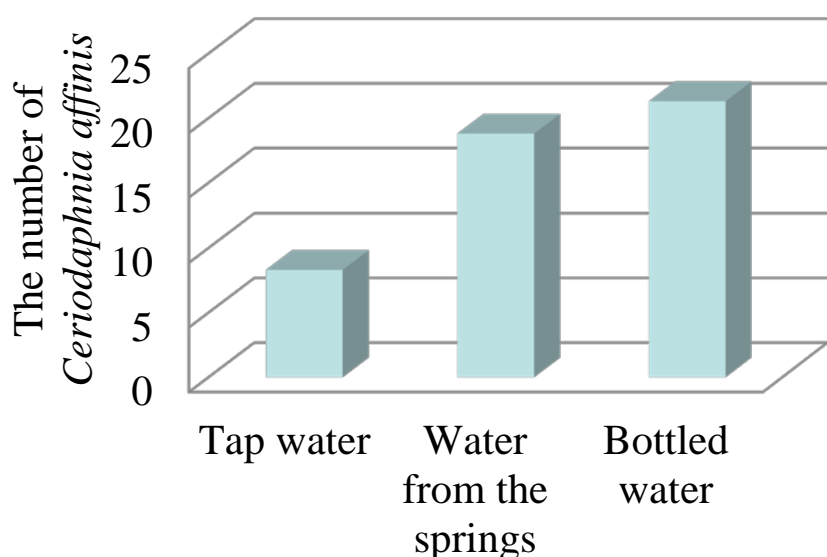


Fig.3. Viability of *Ceriodaphnia affinis* in the studied water

3. Physical and chemical analysis

Studied parameters: physical - color, turbidity; chemical indicators – pH, COD, PO_4^{3-} , Cl^- , NO_3^- , NO_2^- , NH_4^+ , $Fe^{3+,2+}$, Mn^{2+} , Ca^{2+} , K^+ , Mg^{2+} , Na^+

	Spring water	Bottled water	Tap water	MPL
Color, degrees	49	49	67*	30
COD, mg/l	37	60	36	30
NH_4^+ , mg/l	4	5	0,3	2
Turbidity, mg/l	5	1,5	6*	3,5
$Fe^{3+,2+}$, mg/l	<5 mkg / l	<5 mkg / l	0,34	0,3
NO_3^- , mg/l	135	8	6	45
K^+ mg/l	2	43	0,4	12

Table. Comparison of some physical and chemical indicators with maximum permissible level

*High color and turbidity parameters in the tap water are associated only with iron concentration.

Conclusions

- It is not recommended to drink unauthorized spring water and water from plastic bottles. It contains a lot of bacteria and unwanted chemicals in concentrations above the prescribed MPLs.
- The tap water continues to be the safest source of drinking water.
- *Ceriodaphnia affinis* could be used as a test object in water quality studies. Utilization of daphnia is economically profitable, because it costs almost 40 times less than a complex analysis of water quality.