



South - Eastern
Mediterranean Sea
P r o j e c t



The Impact of Eutrophication on Water Quality

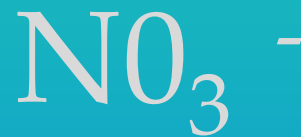
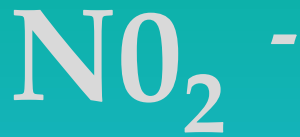
(Measurement of heavy ions from plants)

Eutrophication

- ⌘ The process by which a body of water becomes enriched in dissolved nutrients (as phosphates) that stimulate the growth of aquatic plant life usually resulting in the depletion of dissolved oxygen.



& These nutrients



& causes overdevelopment of aquatic vegetation; after their death, there are significant accumulation of organic matter, the decomposition of which requires a large consumption of dissolved oxygen. An environment without oxygen (anoxic) determine, in the first instance, the disappearance of living organisms (molluscs, crustaceans, fish, etc.) in the watercourse in question. The accumulation of organic matter leads to decreased water transparency and color changes, while lower water depth, acidity increase.



- & Experimental loads (Row 1, Row 2, Row 3, Row 4) consist in 7 pots having 3 plants (*Vigna radiata*);
- & Lot Row 1 was watered with drinking water;
- & Lot Row 2 was watered with eutrophized water;

- & Lot Row 3 was watered with biological pure water;
- & Lot Row 4 was watered with drinking water and pulverized with fungicide.
- & *All groups received the same environmental conditions (temperature and light).*





Measurement data	Row ₁ drinking water/ h _{max} cm	Row ₂ eutrophized water/ h _{max} cm	Row ₃ biologic pure water / h _{max} cm	Row ₄ drinking water + fungicid on leaves/ h _{max} cm
22.02	4	5.0	3.5	3.0
29.02	16	10.0	8.0	8.3
23.03	29	25.0	21.5	22.5
30.03	29.5	26.0	23.0	22.4
6.04	32	32.5	24.3	27.0
13.04	33	34.0	26.0	29.0

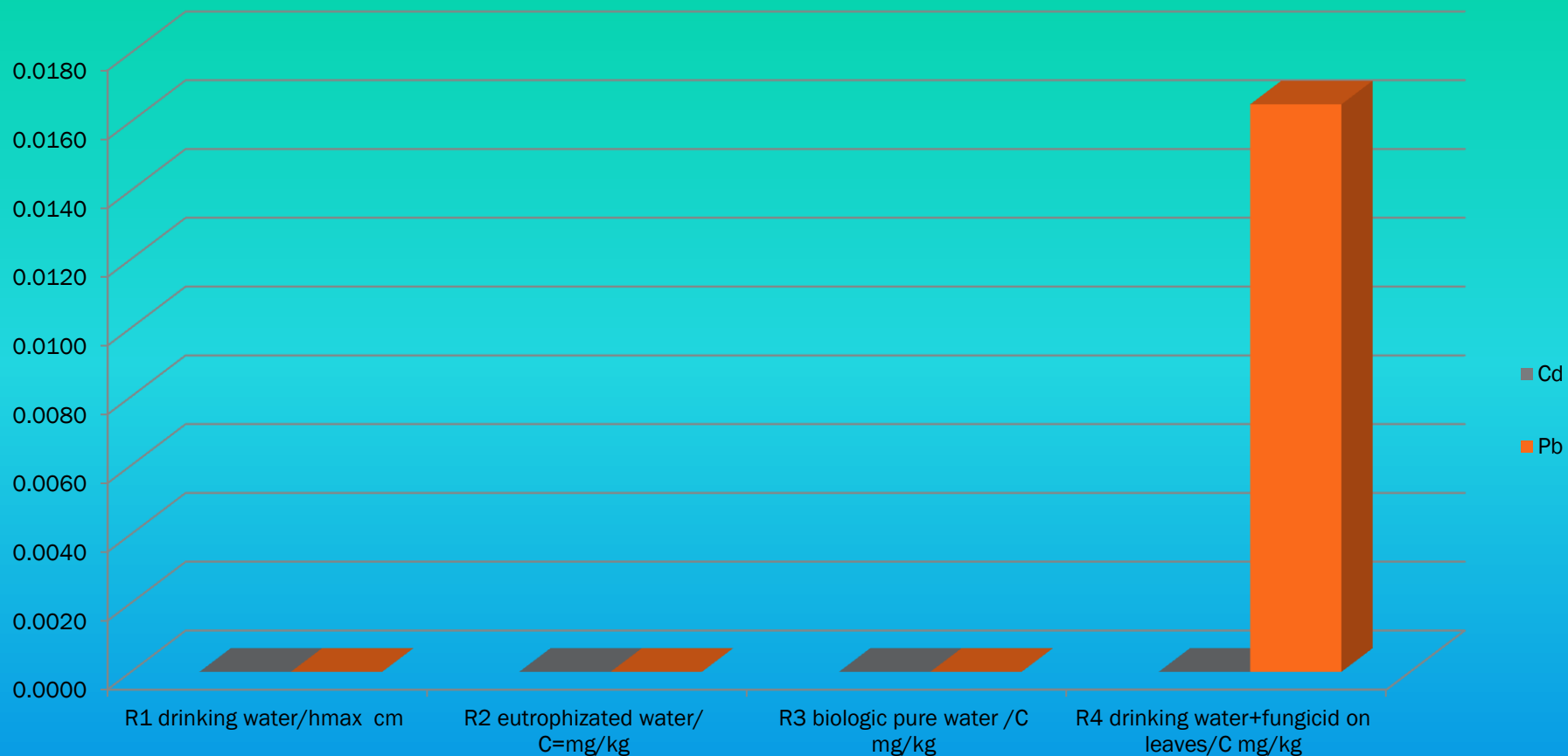
⌘ By definition, **heavy metals** are chemical elements that are specific weight of at least 5 times greater than that of water.

Water has specific weight 1.0
arsenic 5.7, cadmium 8.6, 7.9
iron, lead and mercury 11.3 13.5.

⌘ **Non-essential metals** (lead, arsenic, mercury, cadmium) are highly toxic even at very low levels, especially if they accumulate in the metabolic active sites.

The body is forced to limit non-essential metals accumulation or pass them in nontoxic forms. Toxic metals interfere with normal metabolic functions essential elements. By binding to the protein macromolecules occurs a disturbance of the normal biological function.

Metal catalyzed formation of oxygen radicals is involved in the production of many pathological changes, including mutagenicity, carcinogenicity and aging (Depledge and Rainbow, 1990).



	Row ₁ drinking water/ h _{max} cm	Row ₂ eutrophicated water/ h _{max} cm	Row ₃ biologic pure water / h _{max} cm	Row ₄ drinking water + fungicid on leaves/ h _{max} cm
Cd	0.0000	0.0000	0.0000	0.0000
Pb	0.0000	0.0000	0.0000	0.0165

- ✂ **Cd values** were lower than the limit of quantification (LOQ = 0.0027 mg / kg) for lots Row 1, Row 2, Row 3, Row 4 and the value was lower than the method detection limit (LOD = 0.0013 mg/ kg);
- ✂ For lots Row 1 and Row 3 values of **Pb concentrations** were lower than the limit of detection LOD = 0.0025mg / kg and Row 2 value was lower than the limit of quantification method LOQ = 0.005 mg / kg. For Row 4 group was determined Pb concentration of 0.0165 mg / kg.
- ✂ We mention that this concentration is within the maximum limit for lead in food (according to EC Regulation no. 1881/2006).
- ✂ **From the above we can conclude that the presence of Pb in the group Row 4 could come from fungicide used because the group Row 4 was soaked with water and sprayed on the leaves with a fungicide in comparison to the group Row 1 which has not been used fungicide only drinking water .**

Thank you!

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