

Document Type : Thesis

Document Title : *Evaluation the effect of sewage water accumulation on the vegetation formation east of Jeddah province*
تقييم تأثير مياه الصرف على تشكل الغطاء النباتي شرق محافظة جدة

Subject : biological

Document Language : Arabic

Abstract : A steady increase in population in the Governor of Jeddah and daily human activities increasing water consumption and consequence increase the wastewater. This huge used of water and other liquids add to the compilation of this water lake east of the Jeddah large quantities of these contaminated water everyday. This lake is one of the most dangerous places in the city of Jeddah, which may lead to environmental disaster in the near future despite the danger now. This research is a simple contribution to clarify some of the bad effects of the wastewater to the environment by investigate the effect of collecting wastewater east of Jeddah City on the vegetation formation and the effect of this wastewater on the accumulation of different ions in the water, soil and plant tissues especially heavy and toxic metals. Tow areas ware selected, one of them was the effected (waste water lake) and the other was not effected area (control). The vegetation was studied in both areas by quadrates methods which used to calculate the plant density, frequency, covering and then the relative importance value. Wastewater and soil samples ware analyzed; and then three plant species grow in both areas ware chosen for analysis (they are Abutilon pannosum, Cassia italica and Dipterygium glaucum) plus one species cultivated in the affected area (Typha domingensis). Leaf pigments, leaf area, dry weight, water content and organic matter for the plant species. For soil, however, the pH, EC, organic matter and soil texture also studied. The mineral elements and heavy metals such as Ca, Mg, Na, K, Fe, P, NH₄, PO₄, As, Ba, Cd, Cr, Cu, Hg, Mn, Ni, Pb, Zn and F ware analyzed in all water, soil and plant samples. The results show that there ware 16 plant species recorded in the affected area, while only 8 plant species grow in the control area. These species ware differ in there density, frequency, covering and importance value, but the affected area ware the best in the vegetation formation especially for the following three species (D. glaucum P. turgidum and T.domingensis). The results show that the wastewater solution contain high concentrations of the analyzed elements. Na and Cl ware the highest between all elements and the lowest content was for Fe and ammonia. The heavy metals concentration in the water ware high, but the highest concentration ware Ba, Cr and Cu. The soil is sandy, pH 5.5-7, high in organic matter and soluble ions. The soil also contain high quantity of some ions such as Cl, Na and Ca and high some heavy metals such as Ba and Mn. The study of the four plant species show there was a big difference between the tow studied areas in their growth and ion content. These plant species accumulate high concentration of some ions in the different tissues; such as Na, Cl, Ca, Mn, Zn, Cu Cr and Ni. This results show that those studied

species are accumulators but not a hyper accumulators, we need to cultivate some other species as phytoremediation to save the environment.

Supervisor : Prof. Hassan Saeed Al-Zahrani

Thesis Type : Doctorate Thesis

Publishing Year : 1429 AH
2008 AD