

HEAVY METALS FROM SOLID WASTE AND ITS BIOREMEDIATION

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ABSTRACT

In most of developing countries, solid wastes are being dumped on land without adopting any acceptable sanitary land filling practices. Precipitation that infiltrates the solid wastes disposed on land mixes with the liquids already trapped in the crevices of the waste and leach compounds from the solid wastes. The leachate thus formed contains dissolved inorganic and organic solutes. In course of time, the leachate formed diffuses into the soil and changes the physico-chemical characteristics of water. Leachate from a solid waste disposal site is generally found to contain major elements like calcium, magnesium, potassium, nitrogen and ammonia, trace metals like cadmium, copper, chromium, nickel, lead and organic compounds like phenols, polyaromatic hydrocarbons, acetone, benzene, toluene, chloroform etc. Uncontrolled heavy metal containing leachate to the environment can be detrimental to humans, animals and plants. This study is a review about impact of leachate characteristics on water quality and public health. Also, natural treatment methods of heavy metals in aquatic environment is evaluated. The treatment methods include the use of microorganisms, biomass and live plants. Protozoans have been found to be present in and metabolizing leachate effluents contaminated by toxic metal ions such as Cu^{+2} , Hg^{+2} , Ni^{+2} , Pb^{+2} , Zn^{+2} and Cd^{+2} and toxic compounds. The long-term survival of protozoa in media containing relatively high concentrations of heavy metal ions shows that these organisms have strategies to tolerate, resist or detoxify organic substances and heavy metals. Heavy metals act as toxic when exceeding the limit tolerated.

Key words: solid wastes, leachate, heavy metals, public health, natural treatment, protozoa

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EVALUATION OF THE RELATIONSHIP BETWEEN FERTILIZERS AND NITROGEN FORMS IN AGRICULTURAL SOILS OF DURRES AND KRUJA CITIES

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ABSTRACT

This paper material aims to present a statistical analysis to make an assessment of relationships between several indicators of agricultural lands as organic measures, the amount of chemical fertilizers and content of the two forms of nitrogen in soil nitrate and ammonium. Both organic matter and nitrogen forms of soil are analyzed in the lands of several greenhouses cities of Durres and Kruja during the 2005.

The methodology given by QTTB Fushe-Kruje, which is still in use today, was used in the analysis of the soil. Ammonium and nitrate ions were determined with the Kejdal method and then subtitled with NaOH. Organic matter was measured by combustion. Most of these cases represent a medium content of organic matter within 4 to 8% levels, but there were also cases of low content of organic matter under 4% and cases of high content of it over the 8% level. Likewise in the analyzed soils we came across all levels of ammonium and nitrate ions concentration, but in all the cases the concentration of the nitrate ions was higher than those of ammonium ions. In most of the cases the analysed soils are evaluated as soils with high nitrogen concentration. Between the amount of fertilizers used and the content of nitrate ions was found a good correlation with $R = 0.92$, and between the amount of fertilizers used and ammonium content was found a moderate good correlation with $R = 0.77$.

Key words: correlation, soil, indicators, fertilizers, nitrogen

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Study of Organchlorinated pollutants in Sediments of North Albania

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ABSTRACT

PCBs and other chlorinated pollutants, particularly the highly chlorinated ones, have been known to persist in soils, water, sediments and biota for long periods of time. The deposition of particle-bound PCBs from the atmosphere and the sedimentation of them from water are largely responsible for their accumulation in sediments and soils. Data reported here are parts of a study to determine the concentration and distribution of polychlorinated biphenyls in sediments of North Albania: Velipoja (Adriatic Sea), Buna River to Shkodra Lake. Sediments were sampled in May 2009. Ultrasonic extraction was used for extracting polychlorinated biphenyls from sediment samples. Clean-up procedure for sediment samples was performing using metallic mercury following an open florisil column. Analysis of PCBs was based on the determination of the seven PCB markers (IUPAC Nr. 28, 52, 101, 118, 138, 153 and 180) measured by gas chromatography electron capture detection. Results of surveillance on polychlorinated biphenyls markers was in levels comparable within sediments of these three water resources, because their same origin.

Keywords: Adriatic Sea; Shkodra Lake; PCBs; Buna River; Gas Chromatography

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STONINESS AND EROSION PROBLEMS IN CULTIVATED LANDS OF KONYA PROVINCE (TURKEY) AND SOLUTION SUGGESTIONS

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ABSTRACT

Soil and water are vital resources for agricultural land and human life. Productive utilizing of these sources is an important topic for sustainable cultivation. This study was investigated to determine areas of stoniness and erosion problems by using data obtained from different government organizations from past to present in Konya province (Turkey). The study was based on records obtained in different years (1968, 1978, 1985, 2003). The findings were evaluated with each other by considering record years. However, all problematic areas within arable lands and some improved lands in those problematic lands for Konya were shown in maps. The current problem areas of stoniness, water-wind erosion are 915.584 ha, 2.804.633 ha, respectively. In addition, improvement studies were not conducted after 1985. Consequently, solution of these problems in cultivated land may be possible when we use suitable techniques of soil cultivation by improving soil against stoniness and erosion problems and pay attention to forestation.

Keywords: Stoniness, water erosion, wind erosion, sustainable cultivation.

ORGANOCHLORINATED PESTICIDE RESIDUES IN MARINE WATER IN THE SOUTH OF ALBANIA

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ABSTRACT

This article, presents data of organochlorinated pesticides levels in marine waters in the south of Albania. Stations in the study were: Tri Port (bay of Vlora, the Adriatic Sea), Karaburun Peninsula (Bay of Vlora, the Adriatic Sea) and Dhërmi (Ionian Sea). Water samples were taken in the period May-July 2010. Organochlorinated pesticides are a widespread class of organic compounds for agricultural purposes and also known for many environmental problems. They are persistent, apolar compounds and can accumulate easily in fat tissues. These chemicals can be transported via air routes and movement of water from pollution sources. Analysis of organochlorinated pesticides in water samples was performed by gas chromatography technique using electron capture detector (GC/ECD), based on EPA Method 8081. In the analytical method combined liquid-liquid extraction and florisil treatment with 5% water for cleaning of the samples as pretreatment procedure. Rtx-5 capillary column was used for isolation and determination of organochlorinated pesticides. In the studied samples were detected regularly in large amounts of DDT and its metabolites, Lindane and its isomers and HCB. Presence of organochlorinated pesticides was as a result of their previous uses for agricultural purposes, due to inflows of rinse from agricultural lands and from miss management of waste for organochlorinated pesticides stocks after 90'. One important factor with significant impact in the profile of pesticides is the movements of marine currents within the Bay of Vlora. Found levels of organochlorinated pesticides are comparable to levels reported for similar studies in the Adriatic Sea and Ionian Sea.

Keywords: Adriatic Sea; Ionian Sea; Organochlorinated Pesticides; Gas Chromatography

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THE EVALUATION OF INSOLATION INDEXES IN THE SOUTH EASTERN AREA OF ALBANIA

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ABSTRACT

Eco climatic indicators have a physical nature and find their expression in special meteorological elements such as: sun light, temperatures, rain, air moisture etc. The evaluation of insolation indexes, lighting accepted by FAO (1985), based on the active and potential radiation report gives the following classification: lighting of a value < 0.6 of I/L is low, lighting of a value $0.6-0.8$ of I/L is average, lighting of a value > 0.8 of I/L is high. Eco-climatic indicator of sun light is provided on the basis of real measurements carried out in meteorological stations. These indicators have been measured for a period including many years. Evaluation of three micro zones of Voskopoje, Korçe and Sheqeras under study about the indicator of sun light results as follows: The greatest quantity of sun light is in Voskopoje micro zone with 2413.6 annual hours, with its minimum in December with 88 hours, and its maximum in July with 313.8 hours. I/L proportion is evaluated with 0.55. The greatest quantity of sun light is in Korçe micro zone with 2329.3 annual hours, with its minimum in December with 68.5 hours, and its maximum in July with 284.9 hours. I/L proportion is evaluated with 0.53. The greatest quantity of sun light is in Sheqeras micro zone with 2220.8 annual hours, with its minimum in December with 63.8 hours, and its maximum in July with 281.9 hours. I/L proportion is evaluated with 0.50. In conclusion, the evaluation according to FAO model of micro zones under study about the indicator of sun light, should be taken into consideration for the agro climatic regionalization of cultivated plants.

Key words: evaluation, insolation, indexes, area, Albania

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HERBAL TREATMENT'S IMPORTANCE FOR SUSTAINABLE LIFE AND STUDY ON WETLANDS IN THIS CONTEXT

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ABSTRACT

Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs (WCED 1987). According to this definition, “water”, indispensable element of life, must be protected in order to ensure the continuity of life. There are many methods for water treatment. However, only some of these methods can perform the purification process without harming the environment which called natural treatment systems. Furthermore, one of these natural systems is artificial wetlands. There are lots of advantages of artificial wetlands such as requiring less labor, being more economical and being compatible with nature.

Key words: Sustainable life, natural treatment systems, artificial wetlands.

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RAILWAY TRACK, ROAD NETWORK AND ELECTRIFICATION OF HABITATS IN AND AROUND RAJAJI NATIONAL PARK: A SERIOUS THREAT FOR NORTH-WEST POPULATION OF ASIAN ELEPHANT

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ABSTRACT

Increasing train traffic in Haridwar–Dehradun railway track and vehicle traffic in national highways/motor roads running across Rajaji National Park has caused elephant's population fragmentation in Shivalik Elephant Reserve No. 11. Besides, electrification of habitats is putting the long-term survival of some 418 elephants at risk. In between 1987–2002, a total of 20 elephants have been killed on railway track from Motichur to Kansrao whereas no any elephant causality has been observed since last nine years. However rapid increasing vehicle traffic on motor roads has hindered the frequent movement of elephant's especially of groups. On an average, 14,100 vehicles were found to run across Haridwar–Dehradun national highway No. 72, whereas 9,900 vehicles have been observed to sprint daily across the Haridwar–Bijnor national highway No. 74 and due to this Motichur–Chilla wildlife corridor has been affected severely, which links Rajaji and Corbett National Parks. High-tension electric lines, which exist over to elephant's habitat has killed 8 elephants since 2008 in Rajaji–Corbett wildlife corridor. Elephant's population in Rajaji is appearing to be fragmented and their unnatural death rate is increasing (>50 elephants died since 2007). Hence, further efforts to enhance elephant's movements and resolve man–elephant conflict are still needed to minimize conservation threats.

Keywords: Asian elephant, railway track, national highway, high-tension electric line, conservation threats, Rajaji National Park, north India