



ABSTRACT

Usage of Batteries made of lithium ions have been enormously rising so their disposal rate is also increasing. Contamination of soil and water increased due to wider dispersal of lithium products in the environment. But research work on lithium's impact into the soil and water is very limited and their behavior to human and animals is not quite clear. Most geogenic Li in soil is insoluble and hence unavailable to plants but, when Li^+ is added to soil, there is only limited sorption of Li. Some studies indicated that lithium is more mobile element as compare to other elements present in nature and its chances to leach into water are higher. When lithium is present in free state in water it is readily taken up by plants and have other biological impacts. Lithium's consequences will eventually be observed in the whole food chain. In the current study sorption of lithium influence in soil fertility at normal soil level, slightly modified soil level by adding organic matter, and leaching impact in water quality is observed. The results of the study showed that the mean values of soil pH increase after lithium application before lithium application soil pH, ranges from 7.2 to 7.7 and after lithium application it ranges from 7.9 to 8. EC ($\mu\text{S}/\text{cm}$) ranges from 1.2 to 5.1 for soil samples which shows that soil was slightly saline in nature. Values of organic matter is better in soil samples before lithium application ranges from 0.7 – 0.9 after lithium application the value of sodium is greater than the desired value, which is not good for soil. After lithium application calcium and magnesium values decreases and become low according to soil need. Mean values of phosphorus is greater before lithium application and less after lithium application. Concentration of potassium was higher before lithium application and decreases when was applied to the soil. Leachate analysis shows that all the parameters are significantly differ except zinc and iron. EC of leachate ranges from 2286 -7188 which shows strong salinity (acceptable range 250 $\mu\text{S}/\text{cm}$). Range of phosphate in agricultural water is less than 5 and current study range of leachate is 0.2 – 0.9 it shows that it does not exceeds the limit. Standard value for potassium is 0 – 2 mg/L (FAO, 2004) and range of leachate is 141 – 354. SAR ranges form 1 – 11 which shows that it falls in marginal category Lithium in leachate ranges from 0 – 95 standard value for lithium should be less than 2.5mg /L. Sample 3 of soil with additional 10 % organic matter shows that after lithium application loss of nutrients in leachate were less as compared to other two samples which indicates that organic matter improves soil conditions and suppress the effect of lithium on soil. These results may raise concerns and risks in situations where food and fodder crops are associated with waste disposal.