The state of Kerala is the leading producer of rubber in India and many industries are depending on NR processing. The rapid growth of this industry generates large quantities of effluents which can lead to huge problems because this wastewater possesses high BOD and contains ammonia, sulfate and various other process chemicals. The utilization of industrial effluents for the irrigation of crop plants is the highly beneficial solution for the prevention of pollution. Effluents should be assessed properly prior to its application. The evaluation of toxicity of these wastes by biological testing after physicochemical analysis is therefore extremely important.

The present study attempts to evaluate the physicochemical and biological characteristics of treated and non treated rubber factory effluent and their effects on the growth of selected plants. The effluent for the present study was collected from centrifuged rubber latex concentration unit, Neerackal Latex Pvt. Ltd. situated at Kaduthuruthy panchayath, Kottayam district, Kerala. The effluents collected were analysed with regard to physical, chemical and biological parameters. Cytological studies with treated and non-treated effluent were conducted on Allium cepa. Effect of effluent was tested on crop plants under laboratory conditions and field conditions. The crops for field studies were selected by conducting preliminary laboratory studies in five crop seeds using treated and non-treated effluent.

Soil analysis was carried out before and after harvesting of the crop plants. Observations were carried out on the various morphological parameters and the data for field evaluation pertaining the effect of different
concentration of effluent on morphological, anatomical, physiological and biochemical level on the crop plants were collected. SEM study was adopted to study the responses brought about by the effluent on the surface of two crop seeds.

Phytoplankton collected from the treated effluent reported the occurrence of ten genera belonging to different groups. Cytological studies revealed that the root growth was found to be inhibited and was not observed in *Allium cepa* placed in different concentrations of non treated effluent. The result of the soil analysis indicated that there was a remarkable increase in sulphur and decrease in soil pH in effluent irrigated soil samples irrespective of the crops grown in it.

The results of the field study showed that the highest values for morphological physiological and yield characteristics were reported in 50 percent effluent treatment in *Abelmoschus esculentus* and 75 percent effluent treatment in *Vigna unguiculata*. The utilization of centrifuged rubber latex factory effluent after proper treatment and suitable dilution is recommended for the irrigation of these two crops.

**Key words:** Centrifuged rubber latex factory effluent, Physiochemical analysis, Crop seeds, Germination percentage, Phytoplankton.