ABSTRACT:

Radiation devices used to diagnose, treat, and monitor health conditions are the potential sources of ionizing radiations to which humans are being exposed frequently. This could trigger biological lesions in normal cells. Amifostine was the clinically used radio protector during radiotherapy, which was discontinued due to its toxic side effects. Plants being rich sources of antioxidants could be used as prospective radioprotectors with minimum toxic effects. This study focuses on the radiomodulating effects of *Psidium guajava* and *Persea americana* leaf extracts in living systems. Presence of flavonoids in the leaf extracts were confirmed by HPLC and antioxidant properties were confirmed by standard procedures. All *in vivo* studies were carried out in adult albino Wistar rats. Mean lethal dose (LD50/30) of X-rays delivered through LINAC accelerator as determined by Probit analysis was 6.66 Gy. Pretreatment with both plant extracts have protected the radiation induced DNA damage in PBL as assessed by comet assay and decreased the numbers of micronucleated MCE and PCE. Apoptotic index of PBL decreased significantly with a significant improvement in haematological parameters along with restoration of normal architecture of the GIT. There was an improvement in the oxidative and inflammatory status in the liver homogenate of the animals, preserving the integrity of normal cells. Dose Reduction Factor for *P. guajava* & *P. americana* were determined to be 1.36 & 1.28 respectively. This study thus establishes the importance of these plants as radioprotectors. In future, isolation of the active principles could be of use in designing safe radio protectors as adjuncts during radiation therapy in cancer patients and increase the overall efficacy of the treatment.