ABSTRACT

Oral infections and oral cancer are the most prevalent cause in the world. In India, oral cancers are in the third position among all cancers. The treatment for oral cancer is radiotherapy or chemotherapy or both which will cause side effects and mental stress to the patients undergoing above treatment. Hence it is necessary to identify the herbal medicine to cure or reduce the symptoms of oral infections and oral cancer. This study is focused to identify the traditional remedy for oral microbial infections and oral cancer. Six medicinal plants (Glycyrrhiza glabra, Matricaria chamomilla, Eclipta alba, Morus alba, Asparagus racemosus and Murraya koenigii) were selected based on its traditional uses. The phenol and flavonoid content and GC-MS analysis were done for the methanol extracts of all the plants. Among the tested sample M. koenigii showed higher phenolic content and G. glabra showed higher flavonoid content. The antioxidant, antibacterial, antifungal activities and mechanism of antifungal action of effective plants were also identified by SEM, TEM and flow cytometry. The higher radical scavenging activity was observed in M. koenigii (ABTS assay) and M. chamomilla (DPPH assay). In Transmission electron microscopy, treated cells showed the elongated surface with rough appearance and most of the cells were completely deteriorated by the release of cellular constituents which indicate the cell membrane and cytoplasmic damage of fungi. The cytotoxic effects of all the plants extract were carried out against human oral cancer KB cell lines. M. chamomilla showed the highest percentage of
cytotoxicity. Out of six plants, *M. chamomilla* was selected for the *in vivo* studies based on the results obtained from the radical scavenging activity and cytotoxicity. The C57 black mice were divided into 5 groups and each group contains 6 mice. Oral carcinoma was induced in C57 black mice by 7, 12-Dimethylbenz (a) anthracene. Morphological identification of tumor (latency, burden and weight) enzymes (SGOT, SGPT, ALP and VIT.C) and antioxidant enzymes (SOD, CAT, LPO and GPx) were estimated and compared between positive control, negative control, standard drug treatment, treatment with plant extract (low and high dose). *M. chamomilla* showed an excellent response in all the tests performed. Histopathological studies of liver, kidney and buccal mucosa were also performed by hematoxylin and eosin staining which showed the reduction in cancer in the treated groups. The IHC markers (COX 2, p53 and Ki -67) were also determined for all the groups. *M. chamomilla* showed an excellent response towards the oral cancer.