

10. CONCLUSION

To our knowledge, this is the first study to investigate and report the compounds from *G.acerosa* and to identify the molecular targets and elucidate the mechanism of action of the algal compounds. The study has identified novel PI3K and Akt inhibitors, which did not induce adverse side effects in animals. Hence, these compounds can be utilized by the pharma industry for the development of novel and specific PI3K inhibitors in the management of PI3K related diseases. The compounds reported in the current study are effective against the most common cancers (Lung, colon, cervix and liver) and hence can be utilized for the management of these cancers. The study has identified specific inhibitors targeting the cell survival genes.eg, GAC 1 & 3 are dual inhibitors which can inhibit both PI3K and Akt, GAC 2 is a specific Akt inhibitor, which is highly specific against lung adenocarcinoma and hence this compound can be utilized in the development of new anticancer drugs for lung cancer. Similarly, the GAC 3 was effective against hepatic tumors *in vivo*, which suggests the specificity of the compound against hepatic carcinoma. As these compounds inhibit the PI3K, they can also be antidiabetic and can be used in the development of antidiabetic drugs. The compounds reported in the study are antimetastatic hence; they can be used in the treatment of metastasis, which is the main cause for poor prognosis and disease relapse in cancer. Further, the compounds can be used to develop anti-inflammatory drugs for the management of inflammatory disorders. The toxicity induced by current therapies and therapeutics can be overcome by the use of these drugs. The economic burden imposed by cancer on the human society can be reduced as these compounds are from natural sources pertinent to India.