

SCREENING AND ISOLATING EASTERN REDCEDAR PHYTOCHEMICALS FOR CREATING ECONOMIC OPPORTUNITIES IN MISSOURI

Eastern Redcedar (ERC) is one of the most widely distributed tree species in Missouri. The ERC is an important source of bioactive secondary metabolites, but very few of these biologically active compounds have been identified, purified or commercialized. An interdisciplinary collaboration between MU scientists was initiated in 2007 to identify and isolate biologically active phytochemicals from ERC tissues for possible commercial application. Our team has identified and purified biologically active compounds from leaves (needles) and fruit of the ERC. Many of these isolated diterpenoids not only have shown strong anti-microbial activities against a wide range of pathogenic bacteria, but also strong inhibitory activities against melanin biosynthesis. Recently, the isolated tricyclic diterpenoids have been recognized as promising anti-inflammatory, anti-microbial, and skin whitening agents by cosmetic and pharmaceutical industries. The objectives of the proposed study are to: 1) isolate and characterize the biologically active phytochemicals, and 2) elucidate chemical structures of active compounds and their associated mode of actions. The first of these compounds to be characterized is the purified bioactive diterpenoid. The purified bioactive diterpenoid was found to have a significant inhibitory effect on the growth of all Gram positive pathogens tested. This inhibition of Gram positive bacteria is likely due to action on the cell division machinery, for affected cells elongate without proper separation. Additional compounds have activity on fungal agents, as well as potential anti-melanin activities. The knowledge generated from our research will provide the opportunities to turn abundant, low-value, renewable materials from the ERC into a lucrative, high technology industry in Missouri.

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