

EXECUTIVE SUMMARY

Mushrooms have been valued as edible and medicinal resources, and antitumor substances have been identified in many mushroom species. Polysaccharides are the best known and most potent mushroom-derived substances with antitumor and immunomodulating properties. Although the isolation process, structural characterization and antitumor activity of mushroom polysaccharides have been extensively investigated in the past three decades, the relationship between the antitumor activity and the chemical composition as well as the high order structure of their active components is still not well established. These studies are still in progress in many laboratories, and the role of polysaccharides as antitumor agent is especially under intense debate. Thailand is rich of natural resource especially medicinal mushroom which have been reported by many of scientists. At the moments, Thailand and other country around the world are facing with problem of the increasing of aging person due to the more advance of medical knowledge. There are not just at the end we died. There are suffering related to several diseases which came along the aging process such as heart disease cancer, diabetes, kidney disease and hypertension. Consequently, it's necessary to improve our drug to gain better prevention and treatment of these diseases. Most of the clinical evidence for antitumor activity comes from the commercial polysaccharides lentinan, PSK (krestin), and schizophyllan, but polysaccharides of some other promising medicinal mushroom species also show good results. Their activity is especially beneficial in clinics when used in conjunction with chemotherapy. Mushroom polysaccharides prevent oncogenesis, show direct antitumor activity against various allogeneic and syngeneic tumors, and prevent tumor metastasis. Polysaccharides from mushrooms do not attack cancer cells directly, but produce their antitumor effects by activating different immune responses in the host. The antitumor action of polysaccharides requires an intact T-cell component; their activity is mediated through a thymus-dependent immune mechanism. In the search for potent antioxidation and anticancer, we focused on traditional local mushroom (*Phaeogyroporus portentosus*) as the sources of polysaccharide, since they are known to have many pharmaceutical effects and health benefits.