

学 位 論 文 要 旨	
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題 目	The bioactive functions and underlying mechanisms of <i>Cordyceps militaris</i> spirits soaked in sweetpotato <i>shochu</i> (サツマイモ焼酎の冬虫夏草スピリッツの機能性解析及び作用機序に関する研究)
<p>Alcoholic drinks are favorite drinks for many peoples. However, alcoholic drinks may adversely affect health. The research and development of healthy alcoholic drinks are desired for consumers. <i>Cordyceps militaris</i> is a traditional Chinese medicine from a genus of ascomycete fungi, which produce a diverse variety of bioactive metabolites including cordycepin, mannitol, polyphenols and polysaccharides. Accumulated data have showed that <i>Cordyceps militaris</i> has anti-inflammatory, anti-cancer and immune-enhancing activities, and been used as healthy supplement. To utilize the bioactivity of <i>Cordyceps militaris</i>, the spirits, named <i>Kinkirishima</i> (SCS), was manufactured by soaking <i>Cordyceps militaris</i> in sweetpotato <i>shochu</i>. In the present study, the bioactive fractions were then separated from SCS by HP20 column, Sephadex G-25 column and HPLC (ODS column). The anti-inflammatory, anti-cancer activities were then investigated at cellular and animal levels, and the bioactive compound was finally identified at chemical structure.</p> <p>First of all, the anti-inflammatory effects of SCS extracts were investigated in mouse macrophage cells (RAW264.7). The fraction 1C-III (F1C-III) showed a significant inhibition on cyclooxygenase-2 (COX-2) expression induced by lipopolysaccharide (LPS). In the model of mouse paw edema, F1C-III significantly reduced the level of IL-6 and TNF-α in serum and further attenuated the paw edema induced by LPS.</p> <p>Secondly, the anti-cancer activities of SCS extracts were determined by investigating the abilities of proliferation inhibition and apoptosis induction in both human promyelocytic leukemia cells (HL-60) and human colon carcinoma cells (HCT-116). F1C-III had significant inhibition on the proliferation of both HL-60 and HCT-116 cells. Molecular data showed that F1C-III induced apoptosis of both HL-60 and HCT-116 cells as characterized by DNA fragmentation, activation of caspase-3, and cleavage of poly (ADP) ribose polymerase (PARP).</p> <p>Finally, F1C-III was identified as cordycepin, a major bioactive component in <i>Cordyceps militaris</i>, using HPLC, FT-IR, NMR and LC/MS-IT-TOF analyses.</p> <p>In summary, the data demonstrated that <i>Cordyceps militaris</i> spirits soaked in sweetpotato <i>shochu</i> possesses anti-inflammatory effects in both cell and animal models, and also showed anti-cancer activities through the suppressing the proliferation inhibition and inducing apoptosis in both human promyelocytic leukemia and human colon carcinoma cells. These results provide insight for understanding the bioactive functions and underlying mechanisms of <i>Cordyceps militaris</i> spirits soaked in sweetpotato <i>shochu</i>.</p>	