Cytotoxic activities of alkaloid constituents from the climbing stems and rhizomes of Sinomenium acutum against cancer stem cells

Abstract

From the methanolic extract of the climbing stems and rhizomes of Sinomenium acutum, two new aporphine analogues, acutumalkaloids I and II, were isolated together with fifteen known compounds including lysicamine. The chemical structures of the isolated new compounds were elucidated based on chemical/physicochemical evidence such as NMR and MS spectra. For acutumalkaloids I and II, the absolute configurations were established by comparison of experimental and predicted electronic circular dichroism (ECD) data. We compared anti-proliferative activities of isolated compounds with reported naturally occurring Wnt/β-catenin pathway inhibitor, nuciferine. Among the isolated compounds, we found lysicamine have anti-proliferative activity against both of HT-29 human colon cancer cell line and its cancer stem cells (CSCs). The IC50 values of lysicamine against non-CSCs and its CSCs were lower than that of nuciferine. In addition, the results of western blotting analysis suggested that lysicamine inhibited the expression of Wnt/β-catenin pathway target protein such as survivin. These results suggested that lysicamine show cytotoxic activity via inhibition of Wnt/β-catenin pathway.