

ABSTRACT

The incidence of chronic diseases increase has been increasing since last decades and it will be more pronounced according to the arrival of aging society. This research aimed to investigate the pharmacological activities of local plants grown on the highland in Northern Thailand in order to provide supported information guiding for elderly product developments. At least fifteen local plants grown on the highland in Northern Thailand were extensively reviewed according to their traditional uses, and the biological activities namely, anti-inflammatory, antioxidant activity, blood pressure-lowering, and blood glucose-lowering properties. Seven of them have promisingly demonstrated the potential use for bone and joint diseases. Those plants were *Achyranthes aspera* L., *Osbeckia stellata* L., *Plantago major* L., *Equisetum debile* Roxb. ex Vaucher, *Bidens pilosa* L., *Camellia sinensis* var. *assamica* and *Amaranthus viridis* L. Four of them for cardiovascular diseases which were *Azadirachta indica* A., *Acacia catechu*, *C. sinensis* var. *assamica*, and *Zizania latifolia*. Besides, four of them for cognitive impairment such as Alzheimer's disease which were *Acorus calamus* L., *Bixa orellana* L., *Euphorbia hirta* L. and *Perilla frutescens*. The appropriate part of each plant was extracted with ethyl alcohol to obtain crude extracts. They were subsequently semi-purified by liquid-liquid extraction to yield ethanolic fraction. Both of the crude extract and ethanolic fraction of *Camellia sinensis* var. *assamica* contained the highest amount of total phenolic and total flavonoid compounds. In cell-based assays, the crude extract and ethanolic fraction prepared from *Osbeckia stellata* L. increased alkaline phosphatase (ALP) activity without the cytotoxic effect against primary human osteoblast (HOBs) and MG-63 cells. The crude extract and ethanolic fraction from *O. stellata*, *C. sinensis* var. *assamica*, *Achyranthes aspera* L., and *Plantago major* L. significantly inhibited nitric oxide production from combined LPS-IFN- γ induced RAW 264.7 mouse macrophage cells. The crude extract and ethanolic fraction of *Perilla frutescens* significantly decreased acetylcholinesterase activity. The crude extract and ethanolic fraction prepared from *Acacia catechu* inhibit α -amylase activity. Interestingly, the crude extract and ethanolic fraction of *C. sinensis* var. *assamica* strongly inhibit angiotensin converting enzyme (ACE) and HMG-CoA reductase activities. Furthermore, all of the crude extracts and ethanolic fractions did not show the cytotoxicity to human fibroblasts, human hepatocellular carcinoma cells (HepG2), and colorectal adenocarcinoma cells (HT-29). It can be suggested here that there is the potential use of local plants grown on the highland in Northern Thailand that contained phenolic and flavonoid compounds as the active ingredients for elderly product developments.