
Antidiabetic and protective effects of the aqueous extract of Arbutus unedo L. in streptozotocin-nicotinamide-induced diabetic mice

DOI: 10.1515/jcim-2017-0165

Abstract
Diabetes mellitus (DM) is currently a major health problem and the most common chronic disease worldwide. Traditional medicinal plants remedies remain a potential adjunct therapy to maintain better glycemic control while also imparting few side-effects. Arbutus unedo L. has been traditionally used to manage several diseases including diabetes. This study was undertaken to contribute the validation of the traditional use of Arbutus unedo L. (Ericaceae) in the treatment of diabetes. In-vitro antidiabetic effect of the A. unedo roots aqueous extract was conducted using α-glucosidase and α-amylase assays. While in-vivo antidiabetic activity was conducted using streptozotocin-nicotinamide (STZ-NA) induced diabetic mice. Diabetic animals were orally administered the aqueous extract in 500 mg/kg of body weight to assess the antidiabetic effect. The blood glucose level and body weight of the experimental animals were monitored for 4 weeks. In addition, the histopathological examination of the treated mice pancreas was also conducted to observe the changes of β-cells during the treatment process. The extract produced a significant decrease in blood glucose level in diabetic mice. This decrease was equivalent to that which observed in mice treated with a standard after 2-4 weeks. In addition, the plant extract exhibited a potent inhibitory effect on α-amylase and α-glucosidase activity with IC50 values of 730.15±0.25 μg/mL and 94.81±5.99 μg/mL, respectively. Moreover, the histopathologic examination of the pancreas showed a restoration of normal pancreatic islet cell architecture which observed in the diabetic mice treated with plant extract. The aqueous A. unedo roots extract has a significant in vitro and in vivo antidiabetic effects and improves metabolic alterations. The revealed results justify its traditional medicinal use. © 2018 Walter de Gruyter GmbH, Berlin/Boston.

Author Keywords
antihyperglycemic activity; Arbutus unedo L.; histopathologic diagnosis; α-amylase; α-glucosidase

Index Keywords
alpha glucosidase, amylase, antidiabetic agent, Arbutus unedo extract, glucose, metformin, nicotinamide, plant extract, unclassified drug; animal experiment, animal model, animal tissue, antidiabetic activity, aqueous solution, Arbutus unedo, Article, body weight, drug safety, enzyme inhibition assay, Ericaceae, glucose blood level, glycemic control, histopathology, IC50, in vitro study, in vivo study, male, mouse, nonhuman, pancreas, pancreas islet beta cell, plant root, streptozotocin nicotinamide induced diabetes mellitus, streptozotocin nicotinamide induced diabetes mellitus, streptozotocin-induced diabetes mellitus, traditional medicine, treatment duration, validation process

Publisher: De Gruyter

ISSN: 15533840