

Potential clinical applications of capsaicinoids

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Abstract

Capsaicinoids are specifically found in fruits of chili pepper and render them the peculiar pungent spicy flavor. These belong to the secondary metabolite class alkaloids that act as strong irritants in humans and deterrents for animals and fungi. Commonly occurring capsaicinoids are capsaicin (70%), dihydrocapsaicin (20%), nordihydrocapsaicin (8%), homocapsaicin (1%), and homodihydrocapsaicin (1%). Biosynthesis of the capsaicinoids occurs in placenta of chilli pepper fruits where the enzyme capsaicin synthase is specifically localized. Capsaicin biosynthesis in plants involves two pathways that synthesize the two of its precursors- the phenylpropanoid pathway from which vanillamine is derived and, fatty acid metabolism from which 8-methyl-6-nonenoyl-CoA is derived. Capsaicin is widely used as an effective analgesic and has been used in pharmaceutical preparations meant for pain syndromes such as post-herpetic neuralgia, diabetic neuropathy and chronic musculoskeletal pain. Topical application of 8% capsaicin has been shown to produce a significant decrease in pain in cases of post herpetic neuralgia and post traumatic pain. Capsaicin is also effective in weight reduction against obesity. It can decrease ad libitum food intake and suppress exogenous sensation or the desire to eat excessively. It can inhibit glucose tolerance by inhibiting adipose tissue inflammatory response in obesity. Capsaicin is also recognized as anticancerous compound. In humans bladders cancer cell line 5637, capsaicin has been reported to induce G0/G1 phase arrest by inhibiting cycle dependant kinase CDK2, CDK4, CDK6. Other pharmaceutical applications of capsaicin include treatment of itch or pruritus, gastric disorders, urological disorders, airway diseases and cardiovascular conditions.

Keywords: Capsaicinoids, capsaicin, pharmaceutical applications, analgesic, anticancerous compound.

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