Phytochemical investigation of Psiadia punctulata for analgesic agents
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URI: http://erepository.uonbi.ac.ke:8080/xmlui/handle/123456789/6846
Date: 2012

Abstract:
Most body illness manifests as pain which can vary in intensity from mild to severe pain, from acute to chronic pain. Pain from illness or on its own influences a person's overall quality of life. There are different types of drugs taken for management of pain; such drugs are referred to as analgesics. The analgesics currently in use have variable side effects and some are very expensive for majority of the people who live in the third world countries. Some side effects such as dependency and addiction towards narcotic analgesics by terminally ill patients have created controversy pitting morality against medical values. Therefore there is need to identify alternative analgesic agents that have less side effects and are accessible to the poor. Psiadia punctulata (family Compositae, also referred to as Asteraceae), a plant which is widely distributed in Kenya, is traditionally used to relieve pain including abdominal pain. This research on P. punctulata represents a strategy towards the discovery and development of new analgesic agents. Thus the leaf exudate and the stem extracts of P. punctulata were subjected to chromatographic separation on silica gel which led to the isolation of eight compounds. These compounds were characterized fully by the use of NMR and UV spectral data. The compounds isolated include four trachylobane diterpenes [ent-trachyloban-17-19-dioic acid-19 methyl ester (1), ent-trachyloban-2p,6p,19-triol (2), 6p, 17, 19-ent-trachylobanetriol (3), 2-oxo-enttrachylobane-18,19-diol (4)], one kaurene diterpene [psiadin (5)] and three flavones [ 5-hydroxy-2',3',4',5',7-pentamethoxyflavone (6), 3',5,7-trihydroxy-2',4',5'-trimethoxyflavone (7), 5,7,4'trihydroxy-2',3',5'-trimethoxyflavone (8)]. The trachylobane diterpene ent-trachyloban-17-19-dioic acid-19 methyl ester (1) is a new natural product. Compounds 2-6 were isolated from both the leaf exudate and the stem extracts, while compound 1, 7 and 8 were isolated from the leaf of Psiadia punctulata. The leaf exudate of P. punctulata showed analgesic properties in a mouse tail flick experiment. The diterpenes 6~17,19-trachylobanetriol (3), at a dose of 50 mg/kg of body weight was found to have appreciable analgesic effect with a p-value of 0.02 when compared with aspirin using ANOV A. 5-hydroxy-2',3',4',5',7 pentamethoxy flavone (6), a flavone, at a dose of 50 mg/kg of body weight was found to have a relative lower analgesic effect with a p-value of 0.31 which indicated no significant effect when compared with aspirin. Aspirin was used as a mild analgesic while morphine was used as a strong analgesic for comparison purpose.