

2nd International Conference and Exhibition on Pharmacognosy, Phytochemistry & Natural Products

August 25-27, 2014 DoubleTree by Hilton Beijing, China

Subchronic exposure of mice to crude khat extract (*Catha edulis F.*) alters short-term memory without affecting learning, long-term memory and morphology of dentate granule cells

Ephrem Engidawork¹, Ashenafi Girma¹, Asfaw Gerbi², Faiz mohammed¹ and Girma Seyoum²
Addis Ababa University, Ethiopia

Chewing of khat (*Catha edulis F.*, Celastraceae) is thought to produce euphoria, alertness and improve learning and memory. These effects have made the habit popular among large segment of the population in khat belt countries. Although comparative studies of amphetamine and khat on physiological and psychological behaviour are extensive, little is known about the effect of khat on learning and memory. The aim of this study was therefore to evaluate the effect of acute, sub-acute and subchronic exposure of mice to crude khat extract on learning and memory in rodents. To this effect, animals were administered crude khat extract obtained using a mixture of chloroform and diethyl ether (1:3) orally in doses of 100, 200, 300/400 mg/kg or Tween 80 2% v/v in water for various period. Morris water maze (MWM), and multiple T-maze (MTM) paradigms were used to obtain learning and memory parameters, including escape latency, time spent in the target quadrant and latency to reach the goal box. In addition, the effect of the extract on morphology of dentate granule cells was assessed using stereological methods. Parameters such as brain weight, volume of dentate granule cell layer, numerical density, total number and mean diameter of dentate granule cells were measured. Acute and subacute administration of khat did not have any effect on MTM and MWM tasks. Subchronic administration of khat had no appreciable effect in learning as well as long-term memory in both models. Short-term memory, however, was significantly impaired by 200 mg/kg ($p < 0.01$) and 300 mg/kg ($p < 0.001$). Whilst brain weight of khat-treated rat was found to be smaller than controls, no apparent difference was noted in geometrical properties of dentate granule cells between the two groups. These findings collectively indicate that khat alters only short-term memory without affecting morphological characteristics of dentate granule cells implicated in memory formation.

ephrem.engidawork@aau.edu.et