Guava : A promising memory enhancer in rodents

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SUMMARY

Psidium guajava commonly known as Guava in English and *Amrood* in Hindi is widely used as a fruit throughout the world. The present study was undertaken to investigate the effects of *Psidium guajava* fruit on memory of mice and rats. A total of 408 Swiss mice and 120 Wistar rats were used in the present study. The exteroceptive behavioral models employed in the present study to test memory were passive avoidance apparatus, Hebbs William's maze and elevated plus maze. *Psidium guajava* fruit (5, 10 and 15% w/w of diet) produced significant improvement in memory of young and aged rodents and reversed successfully the amnesia induced by scopolamine (0.4mg/kg, i.p.) and diazepam (1mg/kg, i.p.). Interestingly, brain cholinesterase activity, malondialdehyde levels and peripheral cholesterol levels were all reduced by *Psidium guajava* fruit. The memory-enhancing effect of *Psidium guajava* fruit may be attributed to its (i) acetyl cholinesterase inhibitory activity (ii) reduced malondialdehyde levels (iii) cholesterol lowering property and/or anti-oxidant activity. Thus, *Psidium guajava* fruit appears to be a promising memory enhancer.

Dementia is a collective name for progressive degenerative brain syndromes, which affect memory, judgment, thinking, behavior, emotions and communication skills. The most common cause of dementia is Alzheimer's disease, which is a progressive neurodegenerative disorder associated with loss of cholinergic neurons in distinct brain areas. The central cholinergic pathways play a prominent role in learning and memory processes (Nabeshima, 1993). Centrally acting antimuscarinic drugs (e.g. scopolamine) impair learning and memory both in animals (Higashida and Ogawa, 1987) and human beings (Sitaram *et al.*, 1978). Epidemiological studies of Indian population reveal that dementia is largely a hidden problem and the number of patients suffering from dementia is increasing especially in rapidly developing and heavily populated regions such as India, China and Latin America (Parle *et al.*, 2005). Prevalence rates for dementia increase with advancing age (Kawas *et al.*, 2000). Management of neurodegenerative disorders is one of the thrust areas of research in the present scenario. Although, few medicines are available for the treatment of Alzheimer's diseases, the outcomes are often unsatisfactory, therefore, neurobiologists all over the world are looking for new directions and alternative strategies for managing cognitive

disorders. In the light of above, we were interested to investigate the potential of guava fruit in the management of dementia.

The present study was undertaken to investigate the effects of *Psidium guajava* fruit on memory of rodents using elevated plus maze, passive avoidance apparatus and Hebbs–William's maze. Furthermore, the effects of guava fruit on brain acetylcholinesterase activity, total cholesterol and malondialdehyde levels were investigated in mice.

MATERIALS AND METHODS

Preparation of Amrood paste:

The fresh fruits of *Psidium guajava* (*Amrood*) were purchased from local market in Hisar, Haryana. The fresh fruits of *Amrood* were separately ground into a fine paste using an electric grinder. Different concentrations of *Amrood* paste (C_5, C_{10} and C_{15} *viz.* 5, 10 and 15% w/w) were fed to separate groups of rodents through a specially prepared diet. This special diet comprised of a mixture of *Amrood* Paste, wheat flour kneaded with water and a pinch of salt (sodium chloride), to impart taste. Each animal consumed around 3 g/day of this specially prepared diet. Control animals received the normal diet consisting of wheat flour, kneaded with water and a pinch of salt but was without *Amrood* paste.

Animals:

A total of 408 Swiss mice divided in 68 groups and 120 Wistar rats divided into 20 different groups were

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