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Food for the brain: Tropical vegetables and spices with neuroprotective properties

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Neurodegenerative diseases are generally characterized by memory loss, cognitive dysfunction, neuronal damage and death. The pathogenesis of neurodegenerative diseases such as Alzheimer's Disease (AD) and Parkinson's Disease (PD) are not well understood. However, these diseases are multifactorial etiology, which involves complex mechanisms such as disruption of neurological cascades, oxidative stress, impaired neurochemistry, protein misfolding and aggregation as well as deposition of senile plaques and insoluble fibrils in the brain. Management of age-related diseases including AD and PD have been associated with consumption of functional foods which could be whole, fortified, enriched or enhanced foods that provides health benefits beyond the provision of essential nutrients. These foods contain phytochemicals such as polyphenols, alkaloids, carotenoids, anthocyanin's and many more which are capable of improving cognitive function, learning, general brain and wellbeing. Tropical vegetables and spices are among one of the most consumed food either singly or as part of other dishes. In our lab, we have employed various experimental models including *in vitro* screenings, *in vivo* studies in rats and fruit fly (*Drosophila melanogaster*) to study the biochemical and molecular basis of neuroprotective properties of several tropical vegetables and spices. This review major findings from our lab on the neuroprotective properties (as well as the underlying biochemical and molecular mechanisms) of some tropical vegetables and spices in various experimental models. Experimental findings on tropical green leafy vegetables including Amaranth (*Amarantus cruentus*), Water bitter leaf (*Struchium sparganophora*), Pumpkin (*Telfairia occidentalis*), Horseradish (*Moringa olifera*), African Jointfir (*Gnetum africanum*) and spices such as pepper varieties (*Capsicum spp.*), Ginger (*Zingiber officinale Roscoe*), Turmeric (*Curcuma longa*), Alligator pepper (*Aframomum melegueta*), and Bastard Melegueta (*Aframomum danieli*) were presented. Furthermore, characterized phytochemicals especially polyphenols and alkaloids from these tropical foods is also elucidated. It is believed that our findings would provide useful information on the neuroprotective properties of these functional foods which could form basis for their adoption as functional foods and nutraceuticals for the management of related neurodegenerative disease.

Biography

Ganiyu Oboh, Nigerian biochemist, researcher. Achievements include development of bio-system network for the re-utilization of cassava peels and wastewater by-products. Member of Nigerian Society Experimental Biology, Biotechnology Society Nigeria, Nigerian Society Biochemistry and Molecular Biology (chapter secretary).

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