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A systematic review on natural antioxidants used in Parkinson disease

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Abstract
In this review article we have discussed about the natural antioxidant used in Parkinson disease. Parkinson disease is a second most common neurodegenerative disorder after Alzheimer's disease. The aetiology of the disease in most patients is unknown, but different genetic causes have been identified. Although familial forms of PD account for only 5%–15% of cases, studies on these families provided interesting insight on the genetics and the pathogenesis of the disease allowing the identification of genes implicated in its pathogenesis and offering critical insights into the mechanisms of disease. The cardinal motor symptoms of PD are tremor, rigidity, bradykinesia/akinesia and postural instability, PD is characterized by the loss of dopaminergic neurons in the pars compacta of the substantia nigra and by accumulation of misfolded α-synuclein, which is found in intra-cytoplasmic inclusions called Lewy bodies. Some natural antioxidants used for curing PD are- Uncaria rhynchophylla, Nardostachys jatamans, Chrysanthemuum morifolium Ramat etc.

Keywords: systematic review, natural antioxidant, herbal molecules, Parkinson disease

Introduction
Parkinson disease (PD) is that the second commonest neurodegenerative disorder after Alzheimer disease. Although most patients are managed by neurologists, PD presents initially to the primary care physician who should be able to make the diagnosis, which is based on the history and physical examination. The term "parkinsonism" refers to a clinical syndrome, including bradykinesia, cogwheel rigidity, resting tremor, a slow shuffling gait, and imbalance. The most common explanation for parkinsonism is PD but there's a lengthy medical diagnosis and therefore the challenge is to work out if the patient has PD or another cause of parkinsonism such as drug-induced or a parkinsonian syndrome, such as multiple system atrophy (MSA, formerly Shy–Drager syndrome) [1].

Early Clinical Descriptions
Defining Parkinson's Disease: Parkinson's complaint was first medically described as a neurological pattern by James Parkinsonian 1817, though fractions ofParkinsonismcan be plant inearlier descriptions (Parkinson 1817). As exemplifications, Sylvius de la Boë wrote of rest earthquake, and Sauvages described festination (Sylvius de la Boë 1680; Sauvages 1768; Tyler 1992). Much before, traditional Indian textbooks from roughly 1000 BCand ancient Chinese sources also give descriptions that suggest Parkinson's complaint (Manyam 1990; Zhang *et al*. 2006). In brief and apothegmatic English, Parkinson captured the clinical picture Parkinson reported on six case sketches, three of the cases observed in the thoroughfares of London and one only seen from a distance.

Case History: Jean-Martin Charcot, in his tutoring at the Salpêtrière over 50 times latterly, was more thorough in his descriptions and distinguished bradykinesia as a separate cardinal point of the illness (Charcot 1872). Charcot and his scholars described the clinical diapason of this complaint, noting two prototypes, the tremorous and the rigid/ akinetic form. They described in full detail the arthritic changes, dysautonomia, and pain that can accompany Parkinson's complaint. Charcot was also the first to suggest the use of the term "Parkinson's complaint" rejecting the before designation of palsy agitans or shaking paralysis, because he honoured that Parkinson's complaint cases aren't markedly weak and don't inescapably have earthquake (Charcot 1872) [2].

Clinical Features
Motor symptoms
An unselected PD population attending AIIMS was studied by Denny and Behari to assess the factors responsible for motor oscillations. Analogous to a former study, the frequency of dyskinesias was around 50 in Indian population, though the mean cure of LD causing dyskinesias was much lower [3].

Nonmotor symptoms
Although still considered a classic movement complaint, Parkinson's complaint (PD) is associated with a broad diapason of non-motor symptoms. These include diseases of mood and affect with apathy, anhedonia and

depression, cognitive dysfunction and hallucinosis, as well as complex behavioural diseases Sensitive dysfunction with Hyposmia or pain is nearly universal, as are disturbances of sleep -wake cycle regulation. Autonomic dysfunction including orthostatic hypotension, urogenital dysfunction and constipation is also present to some degree in a maturity of cases. Whilst overall non-motor symptoms come decreasingly current with advancing complaint, numerous of them can also forego the first circumstance of motor signs – most specially depression, Hyposmia or rapid-fire eye movement sleep gets complaint (RBD). Although exact clinicopathological correlations for utmost of these on-motor features are still inadequately understood, the circumstance of constipation, RBD or hyposmia previous to the onset of clinically overt motor dysfunction would appear harmonious with the thrusting thesis of PD pathology proposed by Braak and associates. Screening these Early on-motor features might, thus, be one approach towards early 'preclinical' opinion of PD. This review composition provides an overview of the clinical diapason of non-motor symptoms in PD together with a brief review of treatment options [4].

Epidemiology

The prevalence and frequency of PD increases with advancing age, being present in 1 of people over the age of 65 times. Early- onset Parkinson's complaint (EOPD) is defined as the onset of parkinsonian features before the age of 40 times. It accounts for 3-5 of all PD cases. It's classified into the' juvenile' (being before the age of 21 times) and youthful onset PD (YOPD, being in the age range of 21 -40times). PD doubly as common in men than in women in utmost populations. A defensive effect of womanish coitus hormones is observed. The presence of gender- associated inheritable mechanisms or/ and gender-specific differences in exposure to environmental threat factors might explain this manly transcendence. There's no homogenous and large epidemiological data on PD from India. Razdan *et al*, reported a crude frequency rate of14.1 per amongst a population of from pastoral Kashmir in the northern part of India. The frequency rate over the age of 60 times was247/100, A low frequency rate of 27/100, was reported from Bangalore, in the southern part of India, and16.1/ from pastoral Bengal, in the eastern part of India. Bharucha *et al*., reported a high crude frequency rate of 328.3/ among a population of Parsis living in colonies in Mumbai, Western India [5].

Herbal Treatment in Parkinson Disease

Herbs	Family	Extract	Effect	Reference
Acanthopanax senticosus Harms	Alariaceae	Stem, Bark	Bradykinesia, Catalepsy, increase in the Dopamine level in the striatum or action, Cryoprotection in the SN and VTA, Inhibiting the depletion of DA Cells.	Takahiko Fujikawaa *et al*., 2005 [6]
Withania somnifera	Solanaceae	Roots	Improvement in motor neurons Function, Catecholamines, Potential antioxidant levels, prevent lipid peroxidation Reduced elevated levels of TBARS	Srinivasagam *et al*., 2009 [7]
Uncaria rhynchophylla	Rubiaceae	Hooks	In invitro PC12 cells, URE significantly reduced neuronal cell death, Increased GSH Levels, Attenuated ROS and inhibited the activation of caspase-3 in dose Dependant manner induced by 6-OHDA.	Jin Sup Shima *et al*., [8]
			In in-vivo low dose of extract decreased the number of APO induced rotations by attenuating super sensitivity mediated by a selective irreversible MAO-B Inhibitor of URE, in the striatum and protect DA neurons	disease, Journal of Ethnopharmacology *et al*.,2009 [9]
Nardostachys jatamans	Valirenaceae	Ethanolic	Increase in drug induced rotations and deficits in locomotor activity Muscular coordination which is a reliable marker for nigrostriatal dopamine depletion. Increased D2 receptor population in striatum, Increased activities of SOD, CAT and GSH significantly restored by pre-treatment with Jatamansi by GSH - enhancing or antioxidant effect in 6- OHDA lesioned rats Increased TH-IR fiber	Muzamil Ahmad *et al*., 2006 [10]
Chrysanthemum morifolium Ramat	Asteraceae	Water Extract	inhibit the mitochondrial apoptotic pathway, significantly ameliorate the Bax/Bcl-2 ratio elevation in SH-SY5Y cells, suppress the accumulation of ROS	Su Kima *et al*.,2009 [11]

			and attenuate SH-SY5Y cell death in a dosedependent manner attenuated induced capase-3 expression,	
Plumbago scandens	Plumbaginace	Crude ethanolic extract	)Decrease locomotor activity, the presence of catalepsy and palpebral ptosis, acts against parkinsonism	Muzamil Ahmad *et al*.,2005 [12]
Ginkgo biloba	Ginkgoaceae	Standard crude extra	prevent the degradation of DA and increase its availability, The locomotor deficits were restored, causes increase in the content of GSH and decrease in the extent of lipid peroxidation. Ginkgo biloba appears to act via antioxidant, free radical scavenging, MAO-B-inhibiting DAenhancing mechanisms that rescue the compromised cells within the dopaminergic lesions	Muzamil Ahmad *et al*., 2005 [13]
Curcuma longa		Ethanolic extract; maceration		Pintatum A *et al*., 2020 [14]
Green Tea		Methanol/water 70:30; maceration		Zaiter A *et al*., 2016 [15]
Hypericum perforatum		Ethanol/water 80:20		Silva BA *et al*., 2005. [16]

1. Acanthopanax senticosus (Rupr. et Maxim) Harms (Araliaceae), also called Siberian Ginseng, Eleutherococcus senticosus, and Ciwujia in Chinese, is a widely used traditional Chinese herb that could widely used for its high medicinal value, such as Parkinson, antifatigue, anti-inflammation, antistress, anti-ulcer and cardiovascular functions, in China, Korea.

Fig 1

2. Withania somnifera, known commonly as ashwagandha or winter cherry, is an annual evergreen shrub in the Solanaceae or nightshade family and is a small woody plant with yellow flowers that grows in India and North Africa. It's classified as an adaptogen, as it's believed to help your body manage stress better.

Fig 2

3. Uncaria rhynchophylla (Miq.) Jacks (Rubinaceae), a common herbal medicine known as Gou-teng in Chinese, is commonly used in Chinese medicine practice for the treatment of convulsions, hypertension, epilepsy, eclampsia and other cerebral diseases.

Fig 3

4. Nardostachys jatamansi is a flowering plant of the valerian family that grows in the Himalayas. It is a source of a type of intensely aromatic amber-coloured. It is used as a good stimulant, antispasmodic, tonic, laxative and antiepileptic. Jatamansi has been traditionally used in treatment of wide range of disorders, which include digestive system, circulatory system, nervous system, respiratory system, urinary system, reproductive system and skin diseases.

Fig 4

5. Chrysanthemum × morifolium (also known as florist's daisy and hardy garden mum, or in China juhua) is a species of perennial plant from family Asteraceae. Chrysanthemum is used to treat chest pain (angina), high blood pressure, type 2 diabetes, fever, cold, headache, dizziness, and swelling. In combination with other herbs, chrysanthemum is also used to treat prostate cancer.

Fig 5

6. Plumbago scandens L. Plumbago zeylanica, commonly known as Ceylon leadwort, doctor bush or wild leadwort, is a species of plumbago with a pantropical distribution. Carl Linnaeus described the paleotropical P. zeylanica and Neotropical P. scandens as separate species, but they are currently considered synonymous. Leadwort is a potent medicinal agent used in the treatment of stubborn chronic rheumatoid arthritis, skin

diseases and tumorous growths as recommended by Ayurveda. It also finds its use in correcting chronic menstrual disorders, viral warts and chronic diseases of nervous system.

Fig 7

7. Ginkgo biloba, or maidenhair, is a tree native to China that has been grown for thousands of years for a variety of uses. Ginkgo biloba has many health benefits. It's often used to treat mental health conditions, Alzheimer's disease, and fatigue. It's been used in traditional.

Fig 8

8. Curcuma longa (family Zingiberaceae), or turmeric, is a perennial herb with pointed leaves that bears funnel-shaped yellow flowers. Curcuma longa L., is commonly used as a spice in curries, food additive and also, as a dietary pigment. It has also been used to treat various illnesses in the Indian subcontinent from the ancient times.

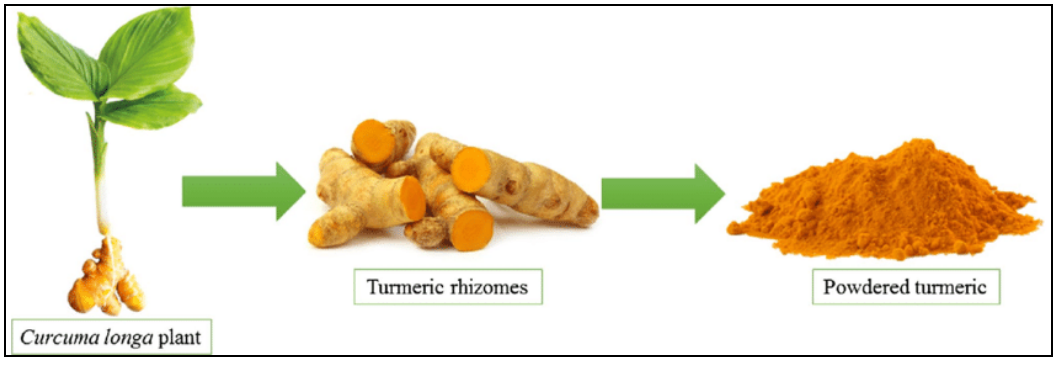

Fig 9

9. Green tea is a type of tea that is made from Camellia sinensis leaves and buds that have not undergone the same withering and oxidation process used to make oolong teas and black teas. Green tea originated in China, and since then its production and manufacture has spread to other countries in East Asia. Green tea has also been shown to help block the formation of plaques that are linked to Alzheimer's disease. Green tea seems to help keep blood sugar stable in people with diabetes. Because catechins lower cholesterol and blood pressure, they can help protect against the damage a high-fat diet can cause, Ochner says.

Fig 10

10. Hypericum perforatum is a perennial plant, with worldwide distribution, commonly known as St. John's wort. It has been used for centuries in traditional medicine for the treatment of several disorders, such as minor burns, anxiety, and mild to moderate depression.

Fig 11

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