Cnidoscolus Aconitifolius – An Overview

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Abstract:- **Cnidoscolus *aconitifolius*is commonly known as Chaya, tree spinach or spinach tree. It is large, fast growing and leafy perennial shrub. It has a succulent stem that exude a milky sap on creating a cut. The plant was traditionally used to treat various clinical conditions. The plant is believed to be originated in the Yutican peninsula of Mexico. It is a popular leafy vegetable in Mexico and Central America. Which is similar to spinach. The plant is rich in good source of protein, vitamins, calcium and iron and is also a powerful antioxidant. Traditionally the plant is used for the management of hypercholesteremia, obesity, diabetes mellitus, atherosclerosis, hyper lipidemic and kidney stones. The review was designed to highlight the pharmacological effects of *Cnidoscolus aconitifolius* plant.**

Key Words: Cnidoscolus aconitifolius

I. INTRODUCTION

Herbal medicines are one of the oldest remedies known to the mankind. Herbs had been used by all civilizations throughout the history of humanity. Humans depend on plants for their health care. India possess most diverse and richest cultural living traditions which are closely associated with the use of medicinal plants. Multinational pharmaceutical companies are carrying out extensive research programmes to find out the potential medicinal value of plants (1).

The use of medicinal plants is probably the first method carried out by humanity to treat diseases and are used therapeutically all over the world as important components of traditional medicine systems. The importance of complementary and alternative therapies are day by day increasing and the role of herbs is vital to carry out these therapies. It is mainly due to their natural origin, showing lesser side effects (2).There has been a swing in the universal trend, that is synthetic to herbal medicine. It is claimed as "return to nature". Medicinal plants have been used since ancient times as a source of therapeutic agent for the prevention of diseases and ailments. There is an increased demand for plant-based medicines, health products, food supplements and herbal cosmetics in both developing and developed countries (3).

Cnidoscolus aconitifolius is a deciduous shrub, which belongs to the family Euphorbiaceae. It is widely distributed in East Africa, Nigeria and Kenya. The plant is generally known as Chaya leaf(4). It has green alternate lobed leaves, which grow up to 6m in height and produces milky sap. During Precambrian period, it is used as green vegetable in maya regions of Guatemala, Belize and South East Mexico. It has continued to be used as medicine, foodandornamental plant (5). It has a thick pale trunk and propagated by stem cuttings and the leaves are rich in protein(6).

Even though the plant is cultivated as a food source, it is widely spread into the new regions due to its medicinal value. All nutrients such as macronutrients and minerals are present in adequate quantity required for the body in freshly harvested leaves (4). Traditionally, the plant is used for the management ofhypercholesteremia, obesity, diabetes mellitus, atherosclerosis, hyper lipidaemia and kidney stones (7).

II. COMMON NAMES(8)

Chaya, Tree spinach, Spinach tree

International common name

Chaya

Local common names

English - Cabbage-star, Tree spinach

Spanish - Picar

French - Ricin batard

Colombia - Manolo Martinez

Cuba - Salva hombre

Ecuador - Saya

Costarica - Chicasquil

Guatemala - Chaya del monte

Mexico - Chay

Panama - Chame

Puerto Rico – Papaya macho

Figure 1: *Cnidoscolus aconitifolius*

III. TAXONOMIC TREE(8)

Domain: Eukaryota

Kingdom: Plantae

Phylum: Spermatophyta

Sub Phylum: Angiospermae

Class: Dicotyledonae

Order: Euphorbiales

Family: Euphorbiaceae

Genus: Cnidoscolus

Species: C. aconitifolius

IV. DISTRIBUTION(8)

Asia: India, Indonesia, Philippines, Brunei

Africa: Burkina Faso, Ghana, Kenya, Nigeria, Zambia, Zimbabwe, Tanzania

North America: Bahamas, Belize, Costa Rica, Cuba, Dominican Republic, El Salvador, Grenada, Guatemala, Honduras, Mexico, Panama, Puerto Rico, U.S.Virgin Islands, United States

Oceania: Fiji, Marshall Island

South America: Bolivia, Brazil, Colombia, Ecuador, Galapagos Islands, Peru, Venezuela

V. REPRODUCTION(8)

Cnidoscolus aconitifolius reproduces by seeds or vegetative by stem cutting. Pollination happens from early morning up to noon. The pollinators found are butterflies and bees, including Apis mellifera and Trigona fulviventris. All though most of the reproduction is done through stem cutting. Sexual reproduction may still occur in wild type and some of the cultured varieties which can produce seeds.

VI. DESCRIPTION(9)

It is tree or arborescent shrub, which grow up to 3-8m height, glabrous with stinging hairs, not seen in petioles or leaf veins

Leaves are thinly chartaceous, petioles with 15-25cm long, junction of petiole and blade is present with single median dark reniform gland. Stipules are very inconspicuous and blades are broad or broad as long with 5 main lobes along with 2 smaller lobes.

Peduncles are 15-30cm long which is smooth, but armed sometimes and the first branches present are opposite.

Inflorescence are 3-6cm across at anthesis, the axes of inflorescence are densely and minutely pilose.

Flowers have the characteristics such as perianth with greenish white colour, minutely pilose outside but it is found unarmed usually with 10-14mm long along with roundish oblong lobes, stamens with filaments, anthers are 1.5mm long, also calyx segments are whitish.

Capsules are unarmed, green, minutely rugose in nature with 8-12mm long

Seeds are ecliptic and compressed with pale to dark brown in colour

VII. PHARMACOLOGICAL ACTIONS

Analgesic Activity(10)

The hot plate test in mice was measured using hot plate apparatus to determine the pain reflexes in response to a thermal stimulus. The control group of mice was injected with normal saline at 10ml/kg of body weight. The test group mice were treated with 50, 100, 200 mg/kg body weight of *Cnidoscolus aconitifolius*extractor diclofenac with 100mg/kg of body weight. Mice were placed on the hot plate at a temperature of 55 ± 1ºC. The reaction was measured at every 30 min for 2 hours. The result shows the extract prolonged the reaction time of mice towards pain in a dose dependent manner. The analgesic effect shown was lower than that of the diclofenac which is reference drug.

Diabetes Mellitus Study(7)

The streptozotocin induced diabetic rats was used in this study in which the serum glucose level was investigated. The serum glucose level of the diabetic control compared with the normal control at the end of experimentation. The effect of Cnidoscolus aconitifolius extracts on oral glucose tolerance in glucose loaded normal rats were carried out. The blood glucose level was initially at the level of 93.23 ± 1.11 mg/dl and with the loading of ethanol extract (500mg/kg), the blood glucose level reduces to 87.11 ± 1.11 mg/dl in 2 hours. The administration of methanol extract(500mg/dl), the blood glucose level reduces to 65.25 ± 2.33 from the initial level of 94.30 ± 2.20 in 2hours. n-Hexane and chloroform extracts doesn't show any notable difference in blood glucose level.

Anti Inflammatory Activity(10)

Carrageenan – induced paw oedema in rats were carried out to determine anti-inflammatory activity. 0.1mL of 1% carrageenan was injected into the right hind foot. The rats were treated orally with ethanolic extract of *Cnidoscolus aconitifolius*in a quantity of 50, 100, 200 mg/kg. 100mg/kg of ibuprofen was given as the reference drug. The inflammation quantified using plethysmometer, at 3 hours after carrageenan injection. There was a significant reduction in the paw size after 3 hours and the percentage inhibition was found to be 29.9 in 100mg/kg and 50.5 in 200mg/kg of Cnidoscolus aconitifolius.

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