

SYNERGISTIC ANTHELMINTIC ACTIVITY OF RHIZOMES OF *ACORUS CALAMUS* AND ROOTS OF *VITEX NEGUNDO*.

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Summary

The Present study reports the synergistic anthelmintic activity of rhizomes of *Acorus calamus* and root part of *Vitex negundo*. The study shows that the ethanolic extract of *A. calamus* and *V. negundo* shows dose dependant anthelmintic activity against earthworms. Also the synergistic anthelmintic activity of *A. calamus* and *V. negundo* is significant than the individual activity of both the plants. For this study marketed drug was used as a standard reference drug. From results we can conclude that combination of *A. calamus* with *V. negundo* is more potent than individual drug for its anthelmintic action, which will be beneficial to reduce dose and any possible toxicity of the herbal drugs and will be more suitable for formulation of suitable dosage form.

Keywords: *Vitex negundo*, *Acorus calamus*, anthelmintic activity, *Pheretima posthuma*

Introduction^{1,2,3,4,5,6,7,8,9,10,11,13,14-20}

Acorus calamus (Araceae) is the botanical name of the plant more commonly known as calamus . The plant has a branched and aromatic root or rhizome from which rise its long erect leaves. The roots have a sweet fragrance and the leaves smell similar to lemon. The sword-like leaves of the plant resemble those of other similar plants so much, that before the *Acorus calamus* is in flower, it is difficult to recognize it simply by the appearance of its leaves. The plant is used traditionally as abortifacient; aphrodisiac; aromatic; carminative; diaphoretic; emmenagogue; febrifuge; hallucinogenic; homeopathy; odontalgic; sedative; stimulant; stomachic; tonic and vermifuge. The root is anodyne, aphrodisiac, aromatic, carminative, diaphoretic, emmenagogue, expectorant, febrifuge, hallucinogenic, hypotensive, sedative, stimulant, stomachic, mildly tonic and vermifuge The chemical components of *Acorus calamus* are: Hydrocarbon (C₁₀H₁₆), Acorin (C₃₆H₆₀O₆), Trimethylamine (C₃H₉N), Asarone (C₁₂H₁₆O₃) ,acorenone, beta-asarone, calamendiol, a-selinene, a-calacorene, calamusenone, camphone and shyobunone.

Vitex negundo (Lamiaceae) is the botanical name of the plant more commonly known as negundo .The leaves are astringent, febrifuge, sedative, tonic and vermifuge. They are useful in dispersing swellings of the joints from acute rheumatism, and of the testes from suppressed gonorrhoea. The juice of the leaves is used for removing foetid discharges and worms from ulcers, whilst an oil prepared with the leaf juice is applied to sinuses and scrofulous sores.They are harvested in early summer and used fresh or dried. A decoction of the stems is used in the treatment of burns and scalds. The dried fruit is vermifuge. The fruit is also used

in the treatment of angina, colds, coughs, rheumatic difficulties etc. The fresh berries are pounded to a pulp and used in the form of a tincture for the relief of paralysis, pains in the limbs, weakness etc. The root is expectorant, febrifuge and tonic. It is used in the treatment of colds and rheumatic ailments. It is harvested in late summer and autumn, and dried for later use. The plant is said to be a malarial preventative and is also used in the treatment of bacterial dysentery. Extracts of the leaves have shown bactericidal and antitumor activity. Two new flavonides-6C-glucosyl-5-O-rhamnopyranosyltrimethoxywogonin and acerosin 5-O-glucoside monoacetate isolated from bark. α -Pinene, limonene, camphene, β -phellandrene, methylheptenone, p- cymene, linalool, camphor, 4-terpineol, citral, caryophyllene oxide, caryophyllene, terpinyl acetate, benzaldehyde and cinnamaldehyde are identified from essential oil. New compounds -3,6,7,3',4'-pentomethoxyflavone-5-O-glucopyranosyl-rhamnoside; vitexin caffeate and 4'-methoxy-myricetin-3-O-[4'-O- β -D-galactosyl]- β -D-galactopyranoside are isolated from stem bark. Roots contain bentiactone, β -sitosterol, β -sitosterol acetate and stigmasterol. Camphene, caryophyllene, citral and two unidentified compounds a new iridoid-2'-p-hydroxybenzoylmussaenosidic acid-[negundoside] are isolated from leaves. Isolation and structure elucidation of a new furanoareomophilane; 6'-p-hydroxybenzoylmussaenosidic acid is isolated and characterized. Nishindaside and negundoside are isolated from leaves and structure of former determined.

Material and Methods¹⁸⁻²⁰

Plant Materials

Rhizomes of *Acorus Calamus* and roots of *Vitex negundo* were collected commercially and authenticated from department of Botany, PVP College, Loni, Maharashtra, India.

Drugs and Chemicals

Drug : Albendazole

Chemicals: Ethanol, Tween 80 and saline water

Preparation of Extract

Dried and coarsely powdered rhizomes of *A. calamus* and roots of *V. negundo* were subjected separately to extraction in Soxhlet extractor using ethanol as solvent. The respective extracts were concentrated by vacuum distillation and then evaporate to yield extracts in dry form.

Animals

Indian adult earthworms (*Pheretima posthuma*) collected from moist soil and washed with normal saline to remove all faecal matter were used for anthelmintic study. The earthworms of 3 - 5 cm in length and 0.1 - 0.2cm in width were used for all the experimental protocol due to their anatomical and physiological resemblance with the intestinal roundworm parasites of human beings.

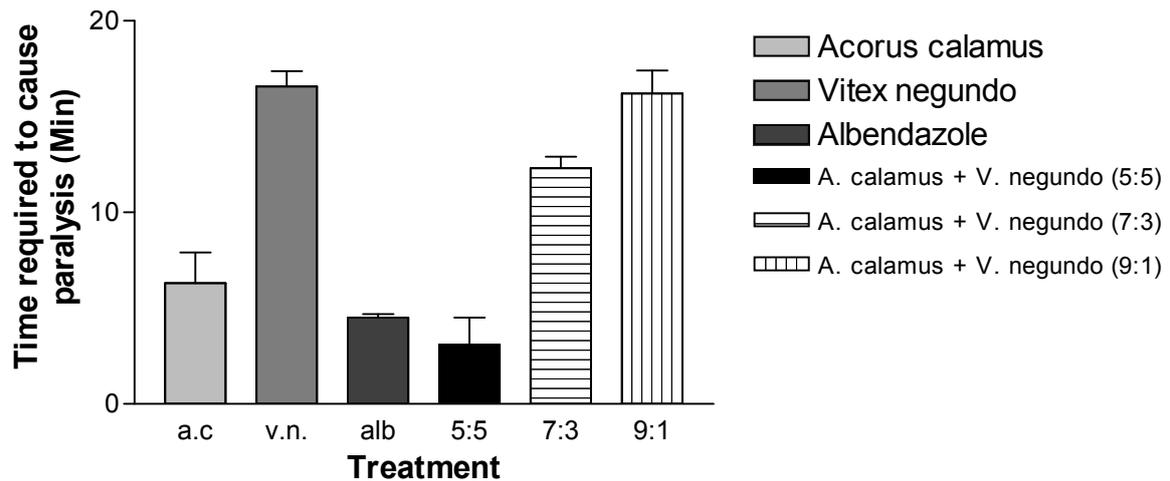
Anthelmintic Activity^{12,13}

The extracts of *A. calamus* and *V. negundo* were dissolved in vehicle (1 % Tween 80 in saline water) and then volume was adjusted to 10 ml with saline water. Extracts and drug solution were freshly prepared before starting the experiments. Seven groups, of six earthworms in each group were released into 10 ml of desired formulations as follows: Albendazole, ethanolic extract of *A. calamus*, ethanolic extract of *V. negundo*, ethanolic extract of *A. calamus* and *V. negundo* (5:5, 1:9 & 3:7) and vehicle. Observations were made for the time taken to paralysis. Paralysis was said to occur when the worms did not revive even in normal saline.

Results

From results we can conclude that combination of *A. calamus* with *V. negundo* (5:5) is more potent than individual drug for its anthelmintic action, which will be beneficial to reduce dose and any possible toxicity of the herbal drugs and will be more suitable for formulation of suitable dosage form.

Figure 1: Synergistic anthelmintic effect of *A. calamus* and *V. negundo*



All observations are recorded as mean \pm SEM; Control worms were alive up to 24 hrs.

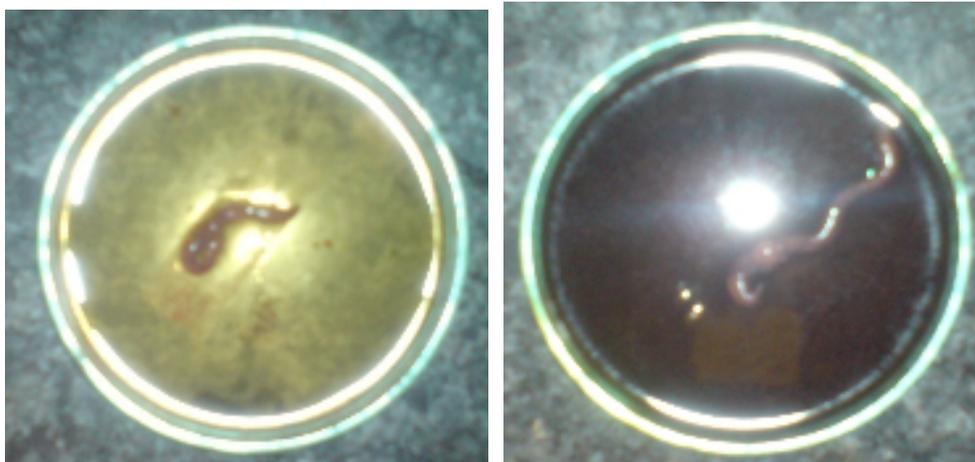


Figure 2: *Pheretima posthuma* used for the anthelmintic study

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