

**ANTHELMINTIC ACTIVITY OF RHIZOMES OF *CURCUMA LONGA* AND *ZINGIBER OFFICINALE* (ZINGIBERACEAE)**

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**Summary**

The present study reports comparative anthelmintic activity of methanolic extracts obtained from the rhizomes of *Curcuma longa* and *Zingiber officinale* Linn. against earthworms, *Pheretima posthuma*. Amongst both extracts, methanolic extract of *Curcuma longa* showed potent anthelmintic activity as compared with methanolic extract of *Zingiber officinale*.

**Key words:** *Curcuma longa*, *Zingiber officinale* anthelmintic activity, *Pheretima posthuma*.

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## Introduction

*Curcuma longa* is commonly known as turmeric. It is a tall annual herb with sessile cylindrical tubers, which are orange coloured inside. Leaves are long, petiolate, lanceolate, acuminate, upper surface is dark green and dotted below and tapering to the base with cylindrical spikes. Flowers are pale yellow with pale green flowering bracts. Rhizomes are fleshy and branched<sup>1</sup>. Turmeric contains volatile oil and coloring pigments curcuminoids, curcumin, demethoxy curcumin, bis demethoxy curcumin, 5'-methoxy curcumin, dihydrocurcumin and  $\alpha$ -curcumin. Turmeric is bitter, diuretic, emollient, improves complexion, useful in swelling, boils, snakebite, sprains and in blood disorders. Ginger is stomachic, digestive, useful in heart disease, throat inflammation, asthma and vomiting.<sup>1,2</sup> *Zingiber officinale* is commonly known as ginger. Rhizomes are stout tuberous with erect leafy stems, with narrow subsessile, linear-lanceolate, glabrous leaves. Flowers are greenish with a small dark purple to purplish black lip. Ginger contains diarylheptenones *viz.* gingerenone-A, B and C, isogingerone, gingerone, shogaol,  $\alpha$ -zingiberene and gingerol.<sup>1,3</sup> Both possess actions *viz* carminative, anthelmintic, pungent, heating, laxative, aromatic, anti-inflammatory and stimulant.<sup>1,4</sup> present work was undertaken to compare anthelmintic action of both plant rhizomes as these are the common ingredients used for the treatment of helminthes.

## Materials and methods

### Plant material collection and extraction

The rhizomes of *Curcuma longa* and *Zingiber officinale* were collected from Ahmednagar district of Maharashtra in March 2006. The rhizomes were shade dried, reduced to coarse powder and subjected to extraction using methanol as a solvent in reflux condenser. Extracts were vacuum dried.

### Anthelmintic Activity<sup>5</sup>

The anthelmintic activity was evaluated on adult Indian earthworms, *Pheritima posthuma* due to its anatomical and physiological resemblance with the intestinal roundworm parasites of human beings.<sup>6,7</sup> Four groups each containing of six earthworms of approximately equal size were released into 10 ml of desired formulation. Each group was treated with one of the following, vehicle (5% Tween 80 in normal saline), albendazole (20 mg/ml) or methanolic extract of *Curcuma longa* or methanolic extract *Zingiber officinale* (20, 40 and 60 mg/ml, each) in vehicle. The living or viable worms were kept under close observation and the times taken for complete paralysis and death were recorded. The motionless worms were transferred to warm water at 40 °C to confirm that they were dead.

## Results and Conclusions

Result in Table 1 showed that the methanolic extracts of *Curcuma longa* and *Zingiber officinale* showed dose dependent anthelmintic activity against earthworms tested in three different concentrations. The activity is comparable with standard drug albendazole. Amongst both extracts, methanolic extract of *Curcuma longa* showed potent anthelmintic activity as compared with methanolic extract of *Zingiber officinale*.

**Table 1** Anthelmintic Activity of Methanolic Extracts of *C. longa* and *Z. officinale*

Treatment	Concentration (mg/ml)	Time taken for paralysis (min)	Time taken for death (min)
Methanolic extract of <i>C. longa</i>	20	0.28±0.16	1.20±0.94
	40	0.14±1.12	1.16±1.23
	60	0.12±1.22	0.79±0.18
Methanolic extract of <i>Z. officinale</i>	20	0.71±0.13	3.92±0.41
	40	0.50±0.98	3.12±0.89
	60	0.40±0.73	3.05±1.65
Albendazole	20	0.46±0.55	1.08±0.32
Control	5% Tween 80 in normal saline	-	-

All the observations are expressed as mean ± SEM (N=6). Control worms were alive upto 24 hrs.

### References

1. Kirtikar KR, Basu BD. Indian Medicinal Plants, Vol. IV, 2<sup>nd</sup> Edn., Dehradun: Bishen Singh Mahendra Pal Singh, 1991: 2423-2438.
2. Anonymous. The wealth of India, A Dictionary of Indian Raw materials and Industrial Products, Vol. II, New Delhi: Council of Scientific and Industrial Research, 2004: 283-290.
3. Anonymous. The wealth of India, A Dictionary of Indian Raw materials and Industrial Products, Vol. V, New Delhi: Council of Scientific and Industrial Research, 2004: 407-411.
4. Nadkarni AK. Indian Materia Medica, Vol. I, 3<sup>rd</sup> Edn., Bombay: Bombay Popular Prakashan, 1991: 414-418, 1308-1315.
5. Nirmal SA, Malwadkar G, Laware RB. Anthelmintic activity of *Pongamia glabra*. Songklanakarin J. Sci. Technol. 2007; 29: 755-757.
6. Thorn GW, Adams RD, Braunwald E, Isselbacher KJ, Petersdorf RG. Harrison's Principle of Internal Medicine, New York: Mcgraw Hill Co., 1977: 1088.
7. Vigar Z. Atlas of Medical Parasitology, 2<sup>nd</sup> ed., Singapur: P.G. Publishing House, 1984: 216.