INVESTIGATING THE IMPACT OF METHANOLIC EXTRACT OF RHIZOME OF CURCUMA LONGA ON FROG HEART RATE

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ABSTRACT

Turmeric plants have long, simple leaves with long petioles (leaf stalks) and grow to a height of around 1 meter (3.3 feet). The branching rhizomes that are located close below the soil's surface give rise to the leaves. The length of dried rhizomes ranges from roughly 2.5 to 7.5 cm (1 to 3 inches). This plant is used as an Inflammation, Degenerative eye conditions, Metabolic syndrome, Arthritis, Hyperlipidemia (cholesterol in the blood),Anxiety. Turmeric contain wide varieties of bioactive form different phytochemical group like volatile oil, resin, zingiberaceous, curcuminoids, Curcumin (50–60%). A focus was placed on the cellular and molecular mechanisms that underlie the protective effects of turmeric and turmeric-derived compounds against diabetes and CVD, compiled from the findings obtained with cell-based and animal models. Evidence from clinical trials is also presented to identify potential preventative and therapeutic efficacies These finding suggest that curcumin could be a potential source of tachycardia activity for the treatment of Cardiovascular disorders associate.

Key words: Tachycardia activity, Curcuma longa, Methanolic extract.

INTRODUCTION

Curcumin, extracted from the dried rhizomes of Curcuma longa (or turmeric), is one of the most studied natural compounds within the context of complementary medicine . Curcumin's health benefits are well-documented, including anti-cancer, antiviral, antioxidant, anti-inflammatory, antimicrobial, hypoglycemic, to name a few[1]. The active ingredient of turmeric (Curcuma longa), a golden spice, and Curcuma xanthorrhiza oil is curcumin, also referred to as diferuloylmethane. It was first manufactured by Lampe and described by Milobedeska[2]. An essential postoperative symptom, tachycardia can indicate a number of conditions, including insufficient cardiac output or oxygen supply, a reaction to pain, or a direct medication impact (e.g., epinephrine, atropine). The age at which tachycardia is diagnosed varies and gets lower as the child gets older[3]. Tachycardias can be broadly classified as: sinus tachycardia, postural orthostatic tachycardia syndrome, supraventricular tachycardia, atrial flutter with rapid ventricular response; atrial fibrillation with rapid ventricular response; junctional tachycardia; or ventricular tachycardia[4]. Frequent exercise has been shown to have a number of health benefits and is thought to be an effective strategy for preventing metabolic disorders such as diabetes, obesity, cancer, and cardiovascular disease (CVD).Turmeric shows tachycardia like activity means it used to treat bradycardia[5].

Epinephrine is a hormone and neurotransmitter used to treat allergic reactions, to restore cardiac rhythm, and to control mucosal congestion, glaucoma, and asthma[6]. Epinephrine is a sympathomimetic catecholamine that exerts its pharmacological effects on α- and β-adrenergic receptors through a G-protein–linked second messenger system. At small doses, epinephrine has a greater affinity for β-receptors. However, large doses produce selective action on α-receptors. β2 receptor activation produces bronchodilation, which can be useful as an adjunct treatment for asthma exacerbations, as well as vasodilation, tocolysis, and increased aqueous humor production.Epinephrine is available in various forms depending on the diagnosis. In advanced cardiovascular life support (ACLS), epinephrine can be administered IV or IO as needed[7].

REVIEW OF LITERATURE

Turmeric (Curcuma longa) is a perennial herbaceous plant that belongs to the ginger family. Curcumin, the primary active ingredient of turmeric, is extracted from the rhizomes of the Zingiberaceae plant C. longa. About 200 years ago, Vogel and Peltier discovered curcumin when they isolated a "yellow substance" from the rhizomes of C. longa Linn and named it such. Turmeric, which is indigenous to southern India and Indonesia, is grown extensively both on the Indian Ocean's mainland and on its islands. Turmeric plants have long, simple leaves with long petioles (leaf stalks) and grow to a height of around 1 meter (3.3 feet). The length of dried rhizomes ranges from roughly 2.5 to 7.5 cm (1 to 3 inches)[8].

Fig.1: Photograph Showing Curcuma Longa.

- **Uses :**
  1. Inflammation.
  2. Degenerative eye conditions.
  3. Metabolic syndrome.
  4. Arthritis.
  5. Hyperlipidemia (cholesterol in the blood)
  6. Anxiety.
  7. Antioxidant

MATERIALS AND METHODS

A. Plant Collection, Authentification And Extraction -

- **Plant material**

The dried rhizomes of Curcuma Longa, were collected in around Dighanchi, Maharashatra the authentication by Prof. Mulani Alisha department of Botany, Ishwarrao More Patil Arts , commerce and science Mahila Mahavidyalaya Ektanagar Dighanchi Atapadi. A voucher specimen has been deposited at the museum of college.

Fig.2: Photograph Showing Curcuma Longa.

➢ **Preparation Of Extract Of Turmeric[9]**

- **Collection And Authentification Of Plant:**

  The dried rhizomes of curcuma longa where collected locally during the month February.

- **Drying And Size Reduction Of Plant Material:**

  The rhizomes curcuma longa where dried under the shade in laboratory it was pulverized into coarse powder.

- **Extraction Of Plant:**

The extraction powder was continued by approach by solvent extraction method. Solvent extraction was used for the extraction using ethanol and acetone as a solvent. A 10gm of coarsely dried powdered were solvent using 100 ml of methanol for the principle defatting for 6-7hr. The yield obtained was found to be 18%. The crude methanolic extract was stored in refrigerator of defatting for 10℃ for further studies.

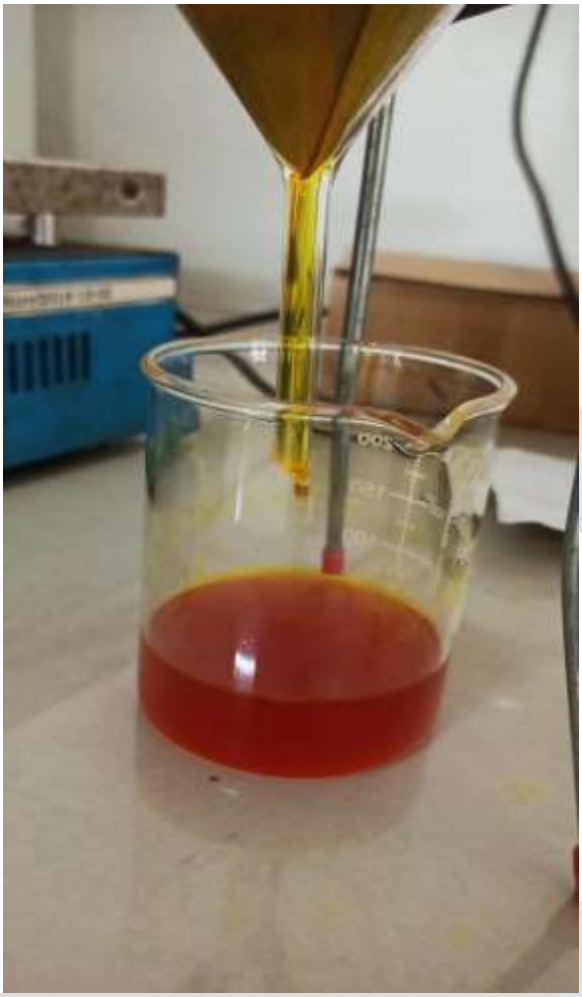

Fig.3: Solvent MEOROCL.

B. Isolation Of Frog Heart[10]

1. Attach the frog to the frog board using pith.
2. Make an abdominal incision at the midline. To reveal the heart, remove the pectoral girdle.
3. Gently separate the pericardium and cover the heart with a few drops of frog ringer.
4. Put a thread around the inferior venacava and make a small cut to insert the venous cannula, which is then attached to a perfusion bottle that contains frog ringer. To ensure that the cannula stays in place, insert it into the vein and secure it with the thread.
5. For the perfusate to emerge, make a little incision in one of the aortas.
6. Change the perfusion bottle's height to achieve an appropriate venous presser of 2-4 cm. The height in centimeters between the ringer level in the perfusion bottle and the venous cannula is the effective venous pressure. Maintaining the steady pressure is made easier by using Marriott's bottle. To begin the perfusion, open the screw clamp that is fastened to the tubing.
7. Tie a thin pin hook to the free limb of the universal lever that is fastened to a stand using a fine thread that is attached to the hook after passing it through the tip of the heart's apex. Adjust the lever's height to achieve the right tension and magnification. On the smoked drum, see the heart's typical contraction.
8. After injecting 0.1, 0.2, 0.5, and 1 milliliters of the each drug stock solution in that order, observe how the contraction's amplitude and pace alter. The each dose of the medication should be administered at least five minutes apart. The medication is injected into the perfusion tube in close proximity to the venous cannula. Take precaution to avoid any leaking of the medicine from the tube and the injection of air bubbles.

9. Use the "fixing solution" to label and correct the tracing.

C. Tachycardia Activity Assay Procedure[11]

1. First, adrenaline concentration depend response were recorded using sherringtons recording drum and frontal writing liver (at doses of 0.1,0.2,0.3,0.4 and 0.5 ml). For proper recording of the reaction in the presence of plane frog ringer solution as stock-1 solution, contact time of 60 sec. and baseline of 30 sec. time cycle were used.
2. The same approach was then used to record the concentration dependent response of curcuma longa extract for a stock-2 solution that included a blend of frog ringer solution.
3. At last, the same concentration-dependent response of adrenaline and curcuma longa in combination were recorded.

OBSERVATION AND RESULT:

- Effect of Adrenaline on frog heart reflected an increased in heart activity which shows Tachycardia effect as shown in fig.4. The effect of Adrenaline dose on frogs heart it could rise 50-80 beats/min.

Table 1: Dose Response Relationship Observation Of Adrenaline.

Sr. no.	Drug	Dose	Response
1	Adrenaline	0.1ml	1.8cm
2	Adrenaline	0.2ml	2cm
3	Adrenaline	0.3ml	2.1cm
4	Adrenaline	0.4ml	2.3cm
5	Adrenaline	0.5ml	2.4 cm

Fig.4: Response Of Adrenaline

- Effect of Turmeric on frog heart reflected an increased in heart activity which shows Tachycardial effect as shown in fig.5. The effect of Turmeric dose on frogs heart it could rise 100-120 beats/min.

Table 2: Dose Response Relationship Observation Of MEOROCL.

Sr. no.	Drug	Dose	Response
1	MEOROCL.	0.1ml	1.4cm
2	MEOROCL.	0.2ml	1.6cm
3	MEOROCL.	0.3ml	1.7cm
4	MEOROCL.	0.4ml	1.9cm
5	MEOROCL.	0.5ml	2.0cm

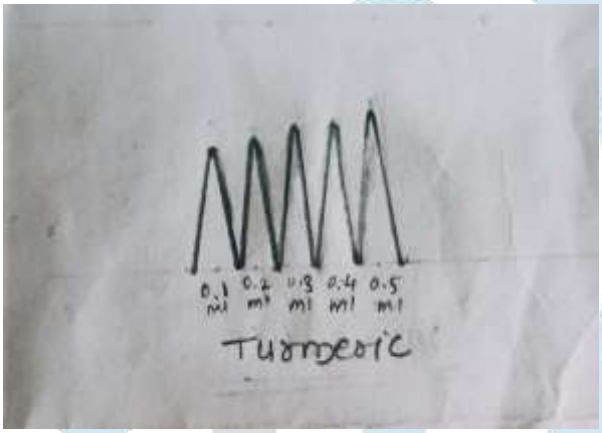

Fig.5: Response Of MEOROCL.

- Adrenaline increases heart activity and MEOROCL also increases heart activity, but in comparison turmeric show less heart activity as given in fig.6.

Table 3: Dose Response Relationship Observation Of Adrenaline With MEOROCL.

Sr. no.	Drug	Dose	Response
1	Adrenaline	0.1ml	1.7cm
	MEOROCL	0.1ml	1.1cm
2	Adrenaline	0.2ml	1.8cm
	MEOROCL	0.2ml	1.2cm
3	Adrenaline	0.3ml	2cm
	MEOROCL	0.3ml	1.4cm
4	Adrenaline	0.4ml	2.2cm
	MEOROCL	0.4ml	1.6cm
5	Adrenaline	0.5ml	2.3cm
	MEOROCL	0.5ml	1.7cm

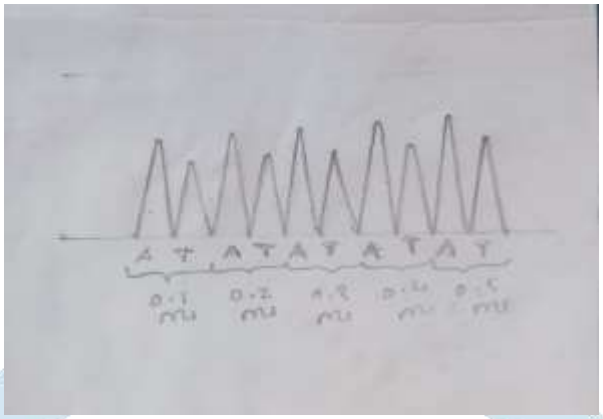

Fig. 6: Response Curve Of Adrenaline with MEOROCL.

DISCUSSION

According to finding of the current study, Adrenaline one promotes contraction of the frog heart; however, when given the MEOROCL, a substantial increase in heart contraction was seen. This shown that MEOROCL has strong tachycardia effect by inhibiting adrenergic receptor.

CONCLUSION

It was determined from all the data collected during the current investigation that the MEOROCL displays promising tachycardia effect. Also it was discovered that Turmeric has comparatively less powerful tachycardia efficacy than adrenaline. Our study suggests that turmeric concentrate intake can increase heart activity and improve antioxidant, anti-inflammatory status and arterial compliance. Turmeric may improve exercise performance and ameliorates oxidative stress.

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