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Antimicrobial Activity of Fruit Extracts of Morinda citrifolia

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Abstract

Antibacterial activity of various extracts of the fruit powder of Morinda citrifolia was studied against E coli, Staphylococcus aureus and Proteus vulgaris by cup plate method in nutrient agar medium. The activity was compared with standard levofloxacin under similar conditions. All the extracts of Morinda citrifolia were found to exhibit moderate antibacterial activity against S. aureus and Proteus vulgaris compared to standard levofloxacin.

Keywords: Morinda citrifolia, Noni, antibacterial activity, Cup plate method.

Introduction

Morinda citrifolia (Noni) is a versatile medicinal plant with a broad spectrum of pharmacological activities and traditionally being used for the treatment of various diseases. Morinda citrifolia reported to possess hepatoprotective [1, 2], anticancer [3], immuno- modulator [4], anti-inflammatory [5], wound healing [6], antioxidant [7], anti-tubercular [8] and wide spectrum of biological activity [9] and is safe medicinal plant [10]. The present work investigates the antibacterial activities of various extracts of the fruit powder of Noni against E. coli, Staphylococcus aureus and Proteus vulgaris by cup plate method in nutrient agar medium. The activity was compared with the standard levofloxacin under similar conditions.

Experimental

The fruit of *Morinda citrifolia* was collected from the Amrita Institute of Medical Science campus, Cochin and dried. The dried fruit powder of *Morinda citrifolia* was extracted (cold maceration method) with acetone, chloroform, methanol and ethanol for five days. It was then filtered to get the crude extracts which was then evaporated to dryness under vacuum and the dried extracts of acetone (AMCF), chloroform (CMCF), ethanol (EMCF) and methanol (MMCF) were used for antibacterial activity.

Anti-bacterial activity

The estimation of potency of various extracts of the fruit powder of Noni was performed for

antimicrobial activity by Cup Plate Method [11]. This method is based on the measurement of zone of inhibition of microbial growth by extracts. The extracts of *Morinda citrifolia* was placed on the well of the agar medium, previously inoculated with a culture of Staphylococcus aureus, Proteus vulgaris and E coli. The inhibition produced by the extracts of *Morinda citrifolia* (100 mg/ml in DMF) was compared with that of standard levofloxacin (10 mg/ml in DMF) under similar condition. Antibacterial activity of various extract of *Morinda citrifolia* is presented in Table 1.

Table 1. Antibacterial activity of fruit extracts of *Morinda citrifolia.*

Extracts	Zone of inhibition (mm)		
	E. coli	S. aureus	Proteus vulgaris
AMC	14	16	21
CMC	13	21	14
EMC	15	17	16
MMC	18	15	17
Levofloxacin	35	34	36

Results and Discussion

Results of antibacterial activity (Table 1) indicate that various extracts of Morinda citrifolia exhibit moderate antibacterial activity (Zone of inhibition: 13-21 mm) against E. coli, Staphylococcus aureus and Proteus vulgaris compared to standard levofloxacin (Zone of inhibition: 35 mm) under similar conditions.

Morinda citrifolia, commonly called Noni, has a long history as a medicinal plant and its use as a botanical dietary supplement has grown tremendously in recent years. This has prompted a concomitant increase in research on the phytochemical constituents and biological activity of Noni [9]. Products derived from Noni fruit (*Morinda citrifolia*) have been commercialized in the USA since the 1990s and are increasingly distributed all over the world. A large number of beneficial effects have been claimed for Noni. Fruit juice of Noni has been approved as a Novel Food by the European Commission in 2003. The knowledge on the chemical composition of Noni fruit has considerably increased over recent years. A number of in vitro and, to a certain extent, in vivo studies demonstrate a range of potentially beneficial effects. Based on a toxicological assessment, Noni juice was considered as safe. Due to recent reports of cases of hepatotoxicity, the safety issue has been re-examined in Europe. While the European Food Safety Authority sees no link between adverse effects on liver and consumption of Noni juice, a continuing monitoring of the situation is desirable and some vigilance advised [12]. Antibacterial activity of Noni fruit is relatively less explored and present study reveals that noni fruits exhibited moderate antibacterial activity against E. coli. S. aureus and P. vulgaris.

Conclusions

Morinda citrifolia L (Noni) is used for the treatment of various diseases including microbial infection in alternate system of medicine [12], so there is a need scientific study for confirmation of ancient therapeutic uses of Noni. The studies reported in this paper will serve as a plateform for establishing the antibacterial activity of Noni.

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