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Antimicrobial and antioxidant evaluation of Indian kitchen procured spices

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Abstract

Curry leaves and bay leaves are a culinary significant plants of Indian beginning, and furthermore been a segment of numerous definitions utilized in the Ayurvedic arrangement of prescription since numerous hundreds of years. Hemp seeds are the seeds of the hemp plant, *Cannabis sativa*. They are from indistinguishable species from cannabis (weed) yet an alternate assortment. Be that as it may, they contain just follow measures of THC, the psychoactive compound in maryjane. Hemp seeds are incredibly nutritious and wealthy in sound fats, protein and different minerals. An investigation of writing uncovers some prominent pharmacological exercises of the plant. Carbazole alkaloids which are richly present in the leaves, natural products, roots and bark of this plant, have been accounted for their antidiabetic, anticancer, antibacterial, against nociceptive and cell reinforcement exercises. Other than these exercises, the plant is portrayed to have a wide cluster of restorative exercises. The present audit gives a nitty gritty report of the phytochemical, pharmacological, clinical and pre-clinical works did on these culinary plants and the seed and furthermore illuminates there remedial prospects.

Keywords: Antioxidant activity, antimicrobial property, vibrio species, DPPH assay

Introduction

Dietary herbs are great wellsprings of cancer prevention agents, nutrients, minerals, shades and enhancing specialists. A portion of these herbs have antimicrobial property additionally (Aziman *et al.*, 2014; Sofia *et al.*, 2007) ^[3, 21]. Cancer prevention agent capability of herbs and flavors are practically identical to manufactured cell reinforcements (Alok *et al.*, 2014; Balasundram *et al.*, 2006) ^[2, 4]. Associated cancer-causing potential with engineered sustenance added substances (Chen *et al.*, 2002; Imaida *et al.*, 1983) ^[2, 12] lead to recognizable proof and utilization of normal cell reinforcement sources as an option in contrast to manufactured mixes in nourishment things. As Hippocrates said "Let nourishment be thy prescription".

Curry leaf (*Murraya koenigii*) is usually utilized as a zest all through India for its sweet-smelling esteem. In indigenous drug, curry leaves are utilized as a tonic for stomachache, stimulant and carminative. The concentrate of *Murraya koenigii* has hostile to diarrhoeal properties (Sharma *et al.*, 2012) ^[20]. It contains the cancer prevention agents tocopherol, β -carotene and lutein (Mani *et al.*, 2012) ^[15]. The ~35 kDa APC disengaged from curry leaves displayed a wide range of antibacterial movement practically identical to business anti-infection agents (Ningappa *et al.*, 2010) ^[17].

Phytochemical contemplates on Bay leaves and its natural products have demonstrated different auxiliary metabolites including alkaloids, including alkaloids, Flavanoids (Kaempferol, myricetin and quercetin), Flavones (apigenin and luteolin), glycosylated flavonoids, sesquiterpene lactone, monoterpene and germacane alcohols (Prech and Breuneton, 1982) ^[19].

Hemp concentrates utilizing natural solvents showed have displayed generally excellent antimicrobial movement against *S. aureus* (Borchardt *et al.* 2008). *In vitro* antimicrobial investigations have been led with fluid, ethanolic, and oil ether concentrates of the hempleaves (Wasim *et al.* 1995). Hemp has a long history of development for different purposes including fiber, prescription, recreational medications, and sustenance (Marks *et al.* 2009). Hemp assortments can be partitioned into fiber type, middle of the road type, and medication type (known as weed) with the Δ – trans tetrahydrocannabinol (Δ - THC) content running from <0.3%, 0.3 to 1.0%, and 1 to 20%, individually (Ahmed *et al.* 2008; Grotenhermen and Russo 2002). It has been accounted for that the restorative impact of Indian Spices in the treatment of gastrointestinal and microbial illness brought about by *Vibrio* species includes.

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An absolute 5sorts of flavors for example cinnamon, dark pepper, green cardamom, coriander, and cumin which were chosen premise of the examinations and research made on their restorative qualities. So as to decide the antimicrobial action and impact of flavors microbes *Vibrio* and its species were chosen for example cholera, Parahaemolyticus, alginolyticus. The antibacterial action of the concentrates of the considerable number of flavors were screened by dissecting the impact on the development of *Vibrio* species through their zone of hindrance created and result demonstrated most noteworthy zone of *Vibrio* species restraint in green cardamom, cumin seed and cinnamon and low zone of restraint in dark pepper and coriander. Subsequently the investigation proposes that these every one of the three flavors can be utilized for the treatment of cholera (Singh and Tripathi 2018).

Vibrio species significantly causes cholera and gastrointestinal tract sicknesses and the medicinal impacts of Indian flavors, are utilized on everyday schedule to limit the movement of *vibrio* species. The Phyto-synthetic concoctions are antimicrobial substance, which are equipped for pulling in advantages and repulse hurtful life forms. Various assortment of phytochemical to be specific isoflavones, anthocyanins and flavonoids are available in flavors (Rahman *et al.*, 2018).

Material and Methodology

Extract preparation

Around 10 grams of each plant parts, for example, curry leaves (*Murraya koenigii*), Bay leaves (*Laurus Nobilis*), Hemp seeds (*Cannabis sativa*), Black pepper (*Piper nigrum*), was taken and blended in 150 ml of ethanol. The blend was taken into 250 ml clean cone shaped jars, stopped with sterile cotton and kept in Shaking Incubator with the 200 rpm for 48 hours. The arrangement was separated by Whatman's channel paper this procedure was rehashed multiple times after which a reasonable concentrate of the plant parts was taken and kept.

Antibacterial activity of spice extract

The circle dissemination technique is utilized to assess of the each plant remove. The plant separate deposits (50 mg) were re-broken up in 2.5 ml of ethanol, disinfected through Millipore channel (0.22 µm) at that point stacked over sterile channel paper circles (8 mm in distance across) to acquire last centralization of 10 mg/plate. Ten ml of Mueller-Hilton agar medium was filled sterile Petri dishes (as a basal layer) pursued with 15 ml of seeded medium recently immunized with bacterial suspension (100 ml of medium/1 ml of 10⁷ CFU) to accomplish 10⁵ CFU/ml of medium. Sterile channel

paper circles stacked with plant remove convergence of (10 mg/ml) were set on the highest point of Mueller-Hilton agar plates. Channel paper plates stacked with 5 µg of Ciprofloxacin was utilized as positive control. The plates were kept in the cooler at 5 °C for 2 h. to allow plant separates dissemination at that point brooded at 35 °C for 24 h. The nearness of hindrance zones were estimated by Vernier caliper, recorded and considered as sign for antibacterial movement.

Antioxidant activity of spices

Cell reinforcement action assurance utilizing DPPH free radical searching strategy

The DPPH free radical searching action of each example was estimated utilizing Spectrophotometer (UV-Vis Systronics 2002) as per the strategy for Burda and Oleszek (2001), which altered. Quickly, a 0, 1 mM arrangement of DPPH in ethanol was read. Each concentrate (1 ml) was added to 2 ml of ethanolic DPPH arrangement until the shade of test wound up purple. At that point, the blend was shaken utilizing a vortex and left to remain at room temperature for 30 minutes in a dim spot. Besides, it was blended again utilizing a vortex. The absorbance of the arrangement was estimated at 517 nm. The level of decoloration of the arrangement shows the searching proficiency of the additional substance. The free radical rummaging movement was determined as a level of DPPH decoloration utilizing the accompanying condition: Free radical searching activity=100 x (1 – absorbance of test/absorbance of reference).

Results and Discussions

DPPH free radical searching action The assurance of DPPH free radical rummaging movement depends on the decrease of DPPH radicals in ethanol which causes an absorbance drop at 515 nm (wong *et al.*, 2006) [24]. The shade of arrangement changes from purple to yellow. This change happens when DPPH was caught by cell reinforcements which expel H particles to frame a stable DPPH-H (Frankel, 1998; Nenadi dan Tsimidou, 2002) [11, 16] The DPPH free radical rummaging action of curry leaves and salam leaves are appeared in Figure 2. It demonstrates that the sort of dissolvable gave an alternate cell reinforcement movement of concentrates. Fluid concentrates of curry leaves and salam leaves demonstrated higher cancer prevention agent movement and fundamentally unique in relation to the concentrate utilizing ethanol and hexane dissolvable. As per Chang *et al.* (1997) [27], the extremity will decide the extraction result and cancer prevention agent movement contained in the concentrate.

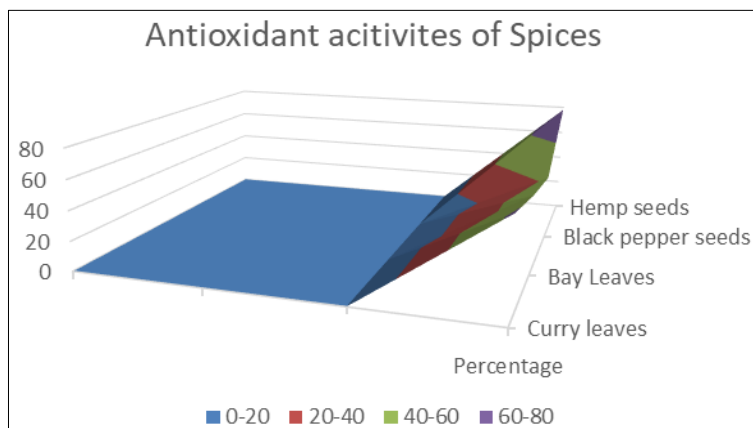


Fig 1: Graph showing the relative comparison represented in percentage for antioxidant activity of different spices

Antimicrobial activity of Hemp seeds, Black pepper seeds, Bay leaves, Curry leaves

After completion of test procedure for observing sensitivity of selected Indian spices, on infective strain of *vibrio* species, along with control ciprofloxacin gave zone of inhibition. The zone of inhibition was mostly formed due to effective

compounds and antimicrobial properties as bioactive products in selected spices.

Anti-microbial activity of plants extract on *vibrio fluvialis* *vibrio vulnificus* *Vibrio parahaemolyticus* *vibrio cholera*

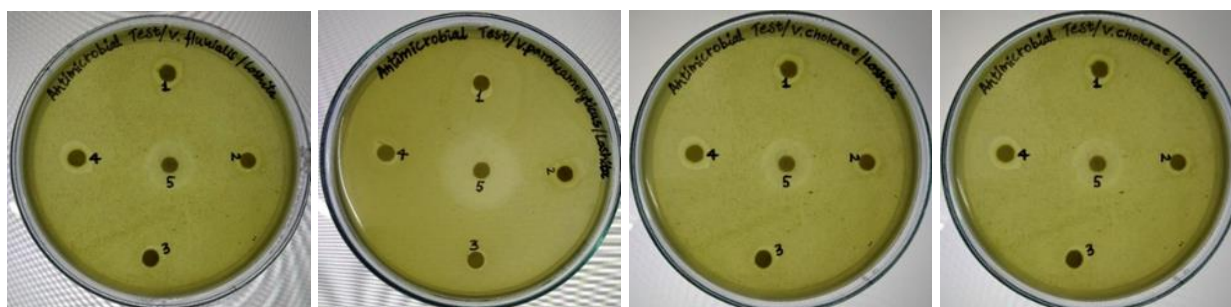


Fig 2: The above figure depicts positive anti-microbial activity of Curry leaves-1, Bay leaves-2, Hemp seeds-3, Black pepper seeds-4, control-5 on *vibrio fluvialis*, *Vibrio parahaemolyticus* as a zone of clearance is visible around the disks.

Fig 2: Antimicrobial activities of spice extracts represented as Zone of Inhibition

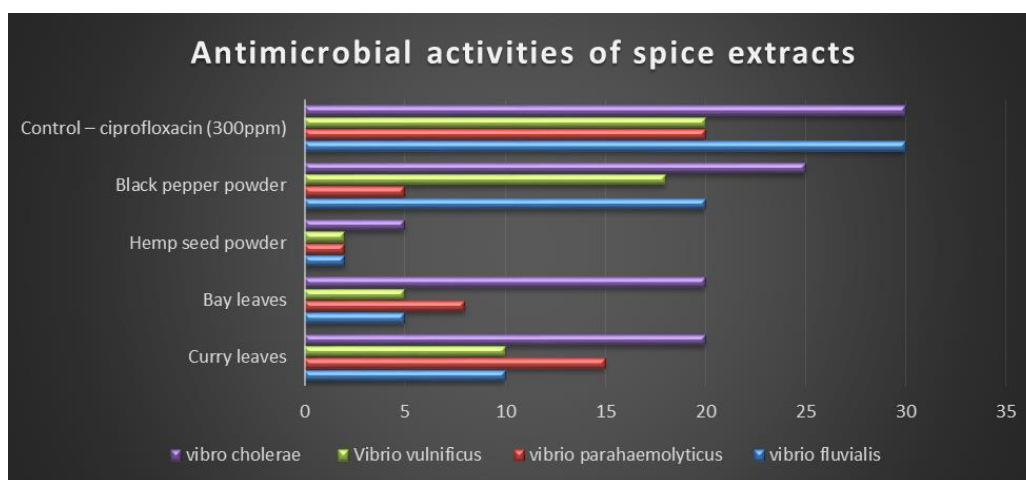


Fig 3: The graph above represents the zone of Inhibition of different spices against four vibrio species

Conclusion

Four spices namely *Piper nigrum* *Laurus nobilis* *Cannabis sativa* *Murraya koenigii* were investigated to evaluate their antibacterial activity against vibrio species obtained from sewage water sample the highest activity in all the isolates was found to be of black pepper seeds remarkable activities of these extracts were observed for *vibrio cholera* by hemp seeds. Traditional Indian food has remarkable potential of health benefits one among them is their antioxidant properties among the analysis made Hemp seeds and Black pepper showed tremendous antimicrobial and antioxidant activity.

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