

# Anti-oxidant characterization of Staranise (*Illiciumverum* Hook)

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## ABSTRACT

All over the world herb and spices are used as medicinal purpose other than its culinary properties. Star anise (*Illiciumverum*) a scented plant having star shaped structure is also use as a key culinary ingredient, but it also hold numerous bioactive compounds that possess significant medicinal properties. In this study the antioxidant activity of star anise is observed by employing three different solvent (ethanol, water and methanol) at three different temperature (30°C, 60°C, 90°C)for 24hours by using soxlet apparatus. Estimation of anti-oxidant activity(ug/ml), total phenolic content(mg quercetin/gm) and total flavonoid content(mg GAE/gm) were asses in star anise seeds. The significant result of total phenolic content, total flavonoid content and anti-oxidant activity was shown in ethanolic extract at 60°C.

**Keywords:** *Illiciumverum* Hook, anti-oxidant activity, conventional extraction, total phenolic content, total flavonoid content

## INTRODUCTION

Plants are an important part of the ancient medical system for treating a various health problems all around the world(Ahmad & Youssef, 2015).Bioactive compounds possess radical-scavenging capability can prevent or retard the activity of oxidative substances. These radical-scavenging compound aids in restricting stress related disorders like melanoma, heart issues, diabetes, inflammatory and neurologic diseases, and tumors (Bootaet al., 2018).Star anise (*Illiciumverum*) is an aromatic planthaving (Aly et al., 2016)five to ten boat-shaped portions projecting from the centre, which have a rough skin and a rusty color (Bootaet al., 2018).The name illicium is derived from the Latin term "alluring," which means "fragrance" (Patraet al., 2020). The particular herb grows to a height of 8 to 15 metres and is 30 cm thick, with flattened, felicitous stems and bald-headed branchlets.

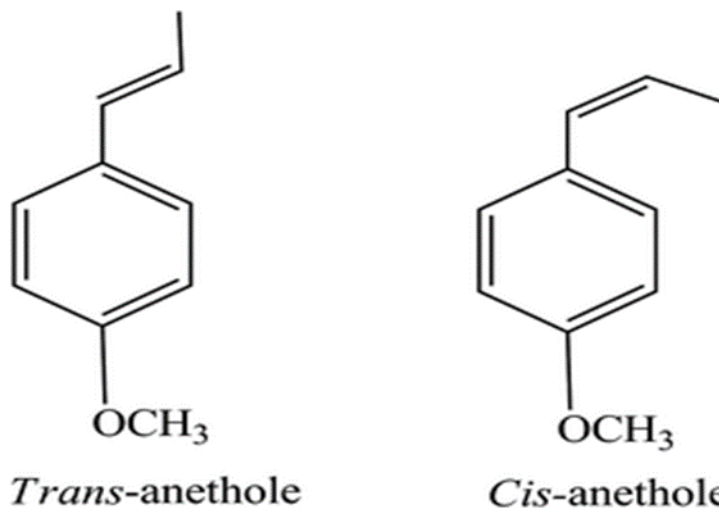


Classification of star anise	
<b>Kingdom</b>	Plantae
<b>Division</b>	Magnoliophyta
<b>Class</b>	Magnoliopsida
<b>Order</b>	Austrobaileyales
<b>Family</b>	Illiciaceae
<b>Genus</b>	Illicium
<b>Species</b>	Verum

That spice is a key ingredient in Oriental cuisine as a spice. It is a well-known medicinal plant with a variety of therapeutic benefits (Boota *et al.*, 2018). The proximate analysis of the spice with respect to macro and micro nutrients are very significant (i.e. contains vitamin A, sugars, dietary fibers, ascorbic acid, minerals including sodium, calcium, zinc, magnesium, potassium, iron and copper etc) (Destroet *et al.*, 2019). Furthermore contains pectin, mucilage and non volatile oils.

The scented odour of *Illicium verum* is as a result of volatile oil and it primarily contains trans-anethol of 2.5-3.5 percent in fresh one and 8-9 percent in dried one (Cheng & Sun, 2020).

Essential oils are made up of prenylated C6–C3 compounds, lignans, sesquiterpenes, and flavonoids,  $\alpha$ -pinene,  $\beta$ -pinene, myrcene,  $\alpha$ -phellandrene, limonene,  $\gamma$ -terpineol, linalool,  $\alpha$ -terpineol, estragole, trans-anethole,  $\alpha$ -cubebenecaryophyllene oxide, and  $\alpha$ -humulene all of them are vital for their wide range of therapeutic characteristics (Patra *et al.*, 2020; Yu, Zhang & Wang, 2021).



Apart from its culinary uses (Wong *et al.*, 2014). Because of its high concentration of phenolic constituents star anise is renowned for its antiviral, antioxidant, antimicrobial, antifungal, anthelmintic, insecticidal, secretolytic, antinociceptive, anti-inflammatory, gastroprotective, sedative, and estrogenic activities.

The purpose of this study is to analyze phytochemical property of star anise and evaluate the anti-oxidant activity of star anise.

## MATERIALS & METHOD

### Plant material collection:

The seeds of star anise were procured from a local super market. Cleaned its extraneous matter and ground into fine powder then stored in air tight container in a refrigerator.

### Extraction and Separation:

The ground powder was soxhlet extracted with different solvent at different temperature for 24 hours. Solvent are separated from extracted sample by rotary evaporator.

### Phytochemical Screening Test

#### Total Polyphenol Content

The total phenolic content was determined by employing Folin–Ciocalteu assay. The results were expressed as mg gallic acid equivalent (mg GAE)/g dry extract.

#### Total Flavonoid Content

The total flavonoid content was determined by employing aluminium Chloride Colorimetric assay will be. The results were expressed as mg quercetin equivalent (mg QE)/g dry extract.

#### 1,1-Diphenyl-2-picrylhydrazyl (DPPH) Radical Scavenging Assay

For antioxidant activity, DPPH method is applied on extracted sample and spectrophotometrically absorbance were measured at 517 nm.

## RESULT & CONCLUSION

In this study we have studied impact of antioxidant activity of star anise at different temperature. The result shows that the total phenolic content of ethanol at 60°C show higher activity as a (mg quercetin/gm), total flavonoids content as a (mg GAE/gm) and total antioxidant capacity as a (IC50).

Star anise is one of those spices that possess a variety of beneficial bioactive compounds that can make star anise as an anti-viral, anti-oxidant, anti-flu suppressant agent and so on. From above studies it was suggest that as an anti-oxidative agent star anise can further be utilized in form of supplement, pills or incorporated in food and not just used as a spice.

#### Total phenolic content (mg quercetin/g) of *Illiciumverum* extracts.

Solvents	30 °C	60 °C	90 °C
Ethanol	97.29± 2.918	123.78± 6.189	118.25± 3.547
Water	45.12± 0.451	82.46± 2.473	66.03± 0.660
Methanol	79.35± 1.587	102.68± 4.107	93.67± 1.873

#### Total flavonoid content (mg GAE/g) of *Illiciumverum* extracts

Solvents	30 °C	60 °C	90 °C
Ethanol	19.52± 0.195	30.67± 1.533	24.36± 0.731
Water	09.45± 0.094	16.67± 0.166	12.44± 0.124
Methanol	15.57± 0.467	22.89± 0.686	17.38± 0.347

**Total antioxidant activity (DPPH activity IC<sub>50</sub>) (ug/ml) of *Illiciumverum* extracts.**

<b>Solvents</b>	<b>30 °C</b>	<b>60 °C</b>	<b>90 °C</b>
<b>Ethanol</b>	0.65± 0.005	0.72± 0.005	0.68± 0.004
<b>Water</b>	0.27± 0.001	0.36± 0.002	0.32± 0.002
<b>Methanol</b>	0.49± 0.003	0.57± 0.004	0.52± 0.003

**REFERENCES**

1. Ahmad, A. F., & Youssef, M. S. (2015). Chemical composition and bioactive properties of *Illiciumverum* (star-anise) extracts prepared by different methods. *Journal of Chemical, Biological and Physical Sciences (JCBPS)*, 5(2), 1160.
2. Boota, T., Rehman, R., Mushtaq, A., & Kazerooni, E. G. (2018). Star anise: A review on benefits, biological activities and potential uses. *International Journal of Chemical and Biochemical Sciences*, 14, 110-114.
3. Aly, S. E., Sabry, B. A., Shaheen, M. S., & Hathout, A. S. (2016). Assessment of antimycotoxigenic and antioxidant activity of star anise (*Illiciumverum*) in vitro. *Journal of the Saudi Society of Agricultural Sciences*, 15(1), 20-27.
4. Patra, J. K., Das, G., Bose, S., Banerjee, S., Vishnuprasad, C. N., delPilar Rodriguez-Torres, M., & Shin, H. S. (2020). Star anise (*Illiciumverum*): Chemical compounds, antiviral properties, and clinical relevance. *Phytotherapy Research*, 34(6), 1248-1267.
5. Destro, B. G., Jorge, R. M., & Mathias, A. L. (2019). Optimization of High-Concentration Trans-Anethole Production through Hydrodistillation of Star Anise. *Brazilian Journal of Chemical Engineering*, 36, 823-830.
6. Cheng, H., & Sun, T. (2020). Study on the Different Method of Extraction of Star Anise Oil. In *E3S Web of Conferences* (Vol. 213). EDP Sciences.
7. Wong, Y. C., Lee, P. P., & Nurdiana, W. W. (2014). Extraction and antioxidative activity of essential oil from star anise (*Illiciumverum*). *Oriental Journal of Chemistry*, 30(3), 1159.
8. Yu, C., Zhang, J., & Wang, T. (2021). Star anise essential oil : chemical compounds, antifungal and antioxidant activities: a review. *Journal of Essential Oil Research*, 33(1), 1-22.