

ANTIOXIDANT ACTIVITY OF TRIPHALA ASSESSED BY DPPH RADICAL SCAVENGING ASSAY

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INTRODUCTION

Triphala is a well-known polyherbal combination widely used in Ayurveda formulations.^[1] “Triphala” literally means “three fruits,” referring to the dried fruits of *Emblica officinalis* (Amla), *Terminalia chebula* (Haritaki), and *Terminalia bellirica* (Bibhitaki), which are combined in equal proportions.^[2] Each of these components contributes distinct pharmacological properties.^[3]

Triphala has been prescribed as a Rasayana in Ayurveda, signifying its role in rejuvenation, detoxification, and maintenance of systemic balance.^[4] It is being used for promoting health and in treatment of various disorders.^[5] The broad spectrum of therapeutic effects attributed to Triphala has led to growing scientific interest in validating its medicinal properties through experimental and clinical studies.

Phytochemical investigations have revealed that Triphala is rich in bioactive compounds such as phenolic acids, flavonoids, tannins, and vitamin C, which are known for their antioxidant and anti-inflammatory activities.^[6] These constituents play a crucial role in scavenging free radicals and reducing oxidative stress, a key factor implicated in the development of chronic diseases.^[7]

In recent years, Triphala has gained global recognition as a natural antioxidant and therapeutic agent, prompting extensive research into its pharmacological potential and safety profile.^[8]

Oxidative stress caused by free radicals plays a significant role in the pathogenesis of several chronic diseases.

Antioxidants neutralize free radicals and thereby reduce oxidative damage. Triphala is widely used in Ayurveda and is believed to possess potent antioxidant properties. The present study aimed to evaluate the antioxidant activity of

Triphala using the 2,2-diphenyl-1-picrylhydrazyl (DPPH) radical scavenging assay, with vitamin C serving as the standard reference antioxidant.

MATERIALS AND METHODS

Preparation of Samples:

Triphala powder was suspended in 50% aqueous methanol, mixed thoroughly, and centrifuged to obtain a clear supernatant, which was used for subsequent antioxidant assay.

DPPH Radical Scavenging Assay

The DPPH reagent was prepared in methanol at a concentration of 1 mM. Aliquots of the sample extracts were incubated with 2 mL of DPPH reagent for 20 minutes at room temperature in the dark. The optical density was measured at 520 nm using a spectrophotometer. The percentage of radical scavenging activity was calculated, and the **IC₅₀ values (Inhibitory concentration 50%)** were determined. Vitamin C was used as the standard antioxidant.^[9]

RESULTS

The antioxidant activity of Triphala was evaluated based on its IC₅₀ value in comparison with vitamin C. Triphala demonstrated strong free radical scavenging activity, although less potent than the standard antioxidant.

IC₅₀ values (µg/mL):

- **Triphala:** 5.83 ± 0.16
- **Vitamin C:** 1.75 ± 0.01

DISCUSSION

The present findings demonstrate that Triphala possesses significant antioxidant activity. Although its potency was lower than that of vitamin C, Triphala exhibited strong free radical scavenging capacity, highlighting its potential as a natural antioxidant source.^[10]

The comparatively higher IC₅₀ value of Triphala than vitamin C can be attributed to the fact that vitamin C is a pure, well-characterized antioxidant, whereas Triphala is a polyherbal formulation composed of *Emblica officinalis*, *Terminalia chebula*, and *Terminalia bellirica*.^[11] The antioxidant activity of Triphala arises from the synergistic effects of multiple bioactive compounds such as phenolics, flavonoids, tannins, and ascorbic acid, rather than a single active molecule.^[12]

Several studies have reported that *Emblica officinalis* contributes significantly to the antioxidant potential of Triphala due to its high content of vitamin C and hydrolysable tannins, which effectively neutralize reactive oxygen species.^[13]

Meanwhile, *Terminalia chebula* and *Terminalia bellirica* are rich in gallic acid, chebulinic acid, and ellagic acid, which further enhance the overall free radical scavenging activity of the formulation.^[14]

CONCLUSION

Triphala exhibits substantial free radical scavenging activity and may serve as a valuable natural antioxidant, particularly when long-term safety, synergistic actions are considered.

REFERENCES

1. Sabu MC, Kuttan R. Antioxidant activity of Triphala, a popular preparation of Ayurvedic medicine. **Indian J Pharm Sci.**, 2002; 64(6): 540–543.
2. Baliga MS. Triphala, Ayurvedic formulation for treating and preventing cancer: a review. **J Altern Complement Med**, 2010; 16(12): 1301–1308.
3. Peterson CT, Denniston K, Chopra D. Therapeutic uses of Triphala in Ayurvedic medicine. **J Altern Complement Med**, 2017; 23(8): 607–614.
4. Sharma PV. *Charaka Samhita*. Varanasi: Chaukhambha Orientalia, 2001.
5. Singh A, Malhotra S, Subban R. Anti-inflammatory and analgesic agents from Indian medicinal plants. **Int J Integr Biol**, 2008; 3(1): 57–72.
6. Naik GH, Priyadarsini KI, Bhagirathi RG, Mishra B, Mishra KP, Banavalikar MM, et al. In vitro antioxidant studies and free radical reactions of Triphala, an Ayurvedic formulation. **Phytother Res**, 2005; 19(7): 582–586.
7. Halliwell B, Gutteridge JMC. *Free radicals in biology and medicine*. 4th ed. Oxford: Oxford University Press, 2007.
8. Rasool M, Sabina EP, Lavanya B. Therapeutic potential of Triphala in human diseases. **Int J Pharm Sci Rev Res**, 2015; 30(1): 25–30.
9. Ahmad et al. Antioxidant activity assessment using DPPH radical scavenging assay, 2018.
10. Sabu MC, Kuttan R. Antioxidant activity of Triphala, a popular preparation of Ayurvedic medicine. **Indian J Pharm Sci**, 2002; 64(6): 540–543.
11. Baliga MS. Triphala, Ayurvedic formulation for treating and preventing cancer: a review. **J Altern Complement Med**, 2010; 16(12): 1301–1308.
12. Naik GH, Priyadarsini KI, Bhagirathi RG, Mishra B, Mishra KP, Banavalikar MM, et al. In vitro antioxidant studies and free radical reactions of Triphala, an Ayurvedic formulation. **Phytother Res**, 2005; 19(7): 582–586.
13. Scartezzini P, Speroni E. Review on some plants of Indian traditional medicine with antioxidant activity. **J Ethnopharmacol**, 2000; 71(1–2): 23–43.
14. Saleem A, Husheem M, Härkönen P, Pihlaja K. Inhibition of cancer cell growth by crude extract and phenolics of *Terminalia chebula* Retz. fruit. **J Ethnopharmacol**, 2002; 81(3): 327–336.