

ANTIBACTERIAL ACTIVITY OF *HELICTERES ISORA* FRACTIONS

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**Abstract:** The aim of the present study was to evaluate the antibacterial activity of *Helicteres isora* extracts. We have tested different concentrations of three Ethanol, aqueous and hydroethanol fractions of *H. isora* root on selected pathogenic gram positive (*Staphylococcus aureus*, *Bacillus subtilis*, *Enterococcus faecalis* and *Bacillus cereus*) and gram negative bacteria (*Pseudomonas aerogenosa*, *Proteus mirabilis*, *Salmonella typhie*, *Klebsiella pneumonia*, *Proteus vulgaris* and *Escherichia coli*) with the well diffusion method in agar. All the three extracts exhibited antibacterial activity against seven strains of pathogenic bacteria. Hydroethanol extract showed best antibacterial activity as compared to both other extracts. Ethanol extract showed good antibacterial activity against *K. pneumonia* in comparison to other extracts. However aqueous extract showed minimum antibacterial activity against all the pathogens. This finding showed the good antimicrobial activity of *H. isora*, so it forms the basis for further antibacterial drug isolation from this medicinal plant.

**Keywords:** *Helicteres isora*, Antibacterial, Hydroethanol, Medicinal plant

## REFERENCES

- Aboaba, O. and Efuwape, B.M.** (2001). Antibacterial Properties of Some Nigerian Species. Biochemical and Biophysical Research Communications, 13:183-188.
- Afolayan, A.J. and Meyer, J.J.M.** (1997). The antimicrobial activity of 3, 5, 7- trihydroxyflavone isolate from the shoot of *Helichrysum aureonitens*. Journal of Ethnopharmacology, 57:177-181.
- Amensour, M.; Bouhdid, S.; Fernandez-Lopez, J.; Idaomar, M.; Senhaji, NS. and Abrini, J.** (2010). Antibacterial activity of extracts of *Myrtus communis* against food-borne pathogenic and spoilage bacteria. International Journal of Food Properties, 13:1215-1224.
- Bakkali, F.; Averbeck, S.; Averbeck, D. and Idaomar, M.** (2008). Biological effects of essential oils- a review. Food and Chemical Toxicology, 46:446-475.
- Basniwal, P.K.; Suthar, M.; Rathore, G.S.; Gupta, R.; Kumar, V.; Pareek, A. and Jain, D.** (2009). *In vitro* Antioxidant Activity of Hot Aqueous Extract of *Helicteres isora* Linn. Fruits. Natural Product Radiance, 8(5):483-487.
- Bax, R.; Mullan, N. and Verhoef, F.** (2000). The millennium bugs- the need for and development of new antibacterials. International Journal of Antimicrobial Agents, 16:51-59.
- Bean, M.F.; Antoun, M.; Abramson, D.; Chang, C.J.; Mc Laughlin, J.L. and Cassady, J.M.** (1985). Cucurbitacin B and Isocucurbitacin B Cytotoxic Compound of *Helicteres isora*. Journal of Natural Product, 48(3):500-503.
- Bhavnani, S.M. and Ballow, C.H.** (2000). New agents for Gram-positive bacteria. Current Opinion in Microbiology, 3:528-534.
- Burt, S.** (2004). Essential oils: their antibacterial properties and potential applications in foods- a review. International Journal of Food Microbiology, 94:223-253.
- Chakrabarti, R.; Reeba, K.; Vikramadithya, R.M.; Sharma, V.M.; Jagadheshan, N.; Rao, Y.N.; Sairam, P. and Rajagopalan, R.** Antidiabetic and Hypolipidemic Activity of *Helicteres isora* in Animal Models. Journal of Ethnopharmacology, 81:343-349.
- Chaudhary, U.; Sharma, V. and Sharma, S.** (2016). Quantitative and *In vitro* antioxidant potential of various fractions of *Helicteres isora* roots. World Journal of Pharmaceutical Science, 5(3):1360-1374.
- Chung, K.T.; Wong, T.Y.; Wei, C.L.; Huang, Y.W. and Lin, Y.** (1998). Tannins and human health: A review. Critical Reviews in Food Science and Nutrition, 38(6):421-464.
- Cushine, T.P. and Lamb, A.J.** (2005). Detection of galangin-induced cytoplasmic membrane damage in *Staphylococcus aureus* by measuring potassium loss. International Journal of Antimicrobial Agents, 26:343-356.
- Dama, G.Y.; Taare, H.L.; Gore, M.S.; Shende, V.S.; Deore, S.R.; Khandagale, S.T. and Kandekar, A.E.** (2011). Comparative Cardiotonic Activity of *Helicteres isora* with Digoxin on Isolated Frog Heart. International Journal of Preclinical Research, 2(2):81-86.
- Dhevi, R.; Gayathri, K.; Mohamed, M.S.; Subashini, U.; Dubey, G.P.; Victor, G.R. and Chitra, M.** (2008). A Preliminary Biochemical Screening of *Helicteres isora* L. Stem bark in Carbon Tetrachloride Induced Toxicity in Rats. Bulgarian Journal of Veterinary Medicine, 11(4):235-242.

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- Fred, C.T.** (2006). Mechanisms of antimicrobial resistance in bacteria, *The American Journal of Medicine*, 119:S3–S10.
- Gortzi, O.; Lalas, S.; Chinou, I. and Tsaknis, J.** (2006). Reevaluation of antimicrobial and antioxidant activity of *Thymus* spp. extracts before and after encapsulation in liposomes. *Journal of Food Protection*, 69:2998-3000.
- Hammer, K.A.; Carson, C.F.; Dunstan, J.A.; Hale, J.; Lehmann, H.; Robinson, C.J.; Prescott, S.L. and Riley, T.V.** (2008). Antimicrobial and anti-inflammatory activity of five *Taxandria fragrans* oils in vitro. *Microbiology and Immunology*, 52:522-530.
- Kirtikar, K.R. and Basu, B.D.** (1991). *Indian Medicinal Plants*. 2<sup>nd</sup> ed. Allahabad: Bishan Singh Mahendra Pal Singh, pp. 371-372.
- Kumar, G. and Murugesan, AG.** (2008). Hypolipidemic Activity of *Helicteres isora* L. Bark Extracts in Stretozocin Induced Diabetic Rats. *Journal of Pharmacology*, 116:161-166.
- Kumar, S.; Jena, P.K.; Kumari, M.; Patnaik, N.; Nayak, A.K. and Tripathy, P.K.** (2013). Validation of tribal claims through pharmacological studies of *Helicteres isora* L. leaf extracts: an Empirical Research. *International Journal of Drug Development and Research*, 5 (1): 279-285.
- Nagaraju, N. and Rao, K.N.** (1990). A Survey of Plant Crude Drugs of Rayalaseema, Andhra Pradesh, India. *Journal of Ethnopharmacology*, 29:137-158.
- Pasqua, D.R.; Betts, G.; Hoskins, N.; Edwards, M.; Ercolini, D. and Mauriello, G.** (2007). Membrane toxicity of antimicrobial compounds from essential oils. *Journal of Agricultural Food and Chemistry*, 55(12):4863-4870.
- Perez, C.; Pauli, M. and Bazerque, P.** (1990). An antibacterial assay by agar well diffusion method. *Acta Biologica Et Medica Express*, 15:113-115.
- Phate, A. R.; Sandesh, R.; Wayal, and Oswal, R.J.** (2011). Study of antimicrobial activity on *Citrullus colocynthis*. *Imperial Journal of Pharmacognosy and Natural Products*, 1(1):14-18.
- Qu, W.H.; Li, J.G. and Wang, M.S.** (1991). Chemical Studies on the *Helicteres isora*. *Zhongguo Yaoke Daxue Xuebao*, 22(4):203-206.
- Raghunath D.** (2008). Emerging antibiotic resistance in bacteria with special reference to India. *Jornal of Bioscience*, 33:593-603.
- Sabale, P.M.; Grampurohit, N.D.; Banerjee, S.K.; Gaikwad, D.D. and Gadhave, M.V.** (2012). Recent Advances on the Phytochemical and Pharmacological Profile of Plant *Helicteres isora* Linn. *International Research Journal of Pharmacy*, 3(4):14-17.
- Shriram, V.; Jahagirdar, S.; Latha, C.; Kumar, V.; Dhakephalkar, P.; Rojatkar, S. and Shitole, M.G.** (2010). Antibacterial and antiplasmid activities of *H. isora* L. *Indian Journal of Medical Research*, 132:94-99.
- Tambekar, D.H. and Khante, B.S.** (2010). Antibacterial properties of traditionally used medicinal plants for enteric infections by Adivasi's (bhumka) in melghat forest (Amravati district). *International Journal of Pharmaceutical Sciences and Research*, 1(9):120-128.
- Tambekar, D.H.; Khante, B.S.; Panzade, B.K.; Dahikar, S.B. and Banginwar, Y.S.** (2008) Evaluation of phytochemical and antibacterial potential of *Helicteres isora*. fruits against enteric bacterial pathogens. *African Journal of Traditional, Complementary and Alternative Medicines*, 5(3): 290-293.
- Tsuchiya, H.; Sato, M.; Miyazaki, T.; Fujiwara, S.; Tanigaki, S.; Ohyama, M.; Tanaka, T. and Inuma, M.** (1996). Comparative study on the antibacterial activity of phytochemical flavanones against methicillin-resistant *Staphylococcus aureus*. *Journal of Ethnopharmacology*, 50:27-34.
- Vaghasiya, Y. and Chanda, V.S.** (2007). Screening of methanol and acetone extracts of fourteen Indian medicinal plants for antimicrobial activity. *Turkish Journal of Biology*, 31:243-248.
- Varghese, Elsa, Pappachen, K.L. and Narayanan, S.S.** (2012). Isolation and Evaluation of Antimicrobial Properties of Isolated Phytoconstituents of Fruits of *Helicteres isora* Linn. *Research Journal of Pharmaceutical, Biological and Chemical Sciences*, 3;(3):959-964.
- Venkatesh, S.; Sailaxmi, K.; Reddy, B.M. and Ramesh, M.** (2007). Antinoceptic Activity of *Helicteres isora*. *Filoterapia*, 78:146-148.