



## Isolation, characterization of Berberine from *Berberis aristata* DC for eradication of resistant *Helicobacter pylori*

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### ABSTRACT

**Objective:** *H. pylori* have gradually acquired resistance to the commonly used antibiotics because of their use in many parasitic and anaerobic infections, which leads to treatment failure of various gastric and duodenal diseases associated with *H. pylori* infection. The present research work aimed to isolate and characterize the bioactive compound from the methanol extract of stem of *Berberis aristata* DC. This is traditionally used for the treatment of dyspepsia, dysentery and diarrhea against antibiotic resistant gastric pathogen *H. pylori*.

**Methods:** The *in vitro* antimicrobial activity of Berberine an active isolated compound from methanol extract of stem of *Berberis aristata* DC against drug resistant *H. pylori* strain isolated from North Indian GERD patients. The *H. pylori* strain was only collected from those, who were devoid of any kind of anti-*H. Pylori* therapy. The methodology was in determining the Minimum inhibition concentration (MIC) using the microdilution method and disk diffusion method.

**Results:** *H. pylori* isolate was included in this study. Berberine from methanol extract of stem of *Berberis aristata* DC showed its potency on *H. pylori*-infected isolated from GERD patients with a maximum inhibition at 0.000075 µg/ml.

**Conclusion:** Prevalence of metronidazole resistance ranges between 50 and 90% in developing countries including India. The emergence of dual drug resistance was reported in various studies. This study suggests that Berberine an isolated compound from methanol extract of stem of *Berberis aristata* DC used commonly known as Daru Haldi potentially active for the treatment of drug-resistant *H. pylori* infection. Berberine from methanol extract of stem of *Berberis aristata* DC with a concentration of 0.000075 µg/ml shows a positive effect safely and effectively.

### 1. Introduction

*Helicobacter pylori* (*H. pylori*) having spiral (shape), gram negative (micro aerophilic) bacterium, usually found in humans' gastric mucosa, which can live for decades (Safavi, 2016). *H. pylori* is the gastric pathogen affecting more than 50% of the world population (Lahar et al., 2017). Most of them remain asymptomatic in whole life and survive without any major clinical outcomes (Lahar et al., 2017). *H. pylori* commonly induce the upper gastrointestinal (GI) disease such as induction of peptic ulcer (duodenal and gastric), gastric cancer, gastric

mucosal linked lymphoid tissue lymphoma and chronic gastritis (Wyle, 1991). *H. Pylori* is a typically infection related with the asymptomatic gastritis, But more serious health effects, such as duodenal and stomach ulcers and finally induces the stomach cancers; occur in up to 10% or 1% of contaminated patients, respectively. Every year approximately 780, 000 cases of *H. pylori* induced gastric cancer found worldwide, which are the 6.2% cases among the all cases of cancer (Debraeckeleer and Remant, 2018). However, 90% of cases develop duodenal ulcers and 70% of cases develop gastric ulcers (Preda et al., 2009) and a small proportion are diagnosed with MALT lymphoma or gastric malignancies including

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