

# Antimicrobial Potential of Acetone and Methanol extracts of *Rhus parviflora* Roxb.

Manish Panwar, Vijay Laxmi, Dharam Chand and M.C. Nautiyal

**ABSTRACT :** *Rhus parviflora* Roxb. (Anacardiaceae) is commonly known as “small flowered poison sumac”. It is found in Nepal, India, Bhutan and Sri Lanka at an altitude of 700–1100 masl. *R. parviflora* is recorded in Ayurvedic pharmacopoeia as having therapeutic uses for Vata vikara, which are the complications related to neurological disorders including anxiety, insomnia, epilepsy and rheumatoid arthritis. In present piece of work an effort is made to investigate the antimicrobial potential of acetone and methanol extracts were tested against various bacterial species viz., *Bacillus cereus*, *Listeria monocytogenes*, *Escherichia coli*, *Staphylococcus aureus*, *Salmonella pullorum* by using Agar well diffusion methods and against the fungal species (*Rhizoctonia solani*, *Alternaria alternata*, *Fusarium solani*, *Aspergillus humicola*, *Aspergillus ochraceus*, *Penicillium canadense*) by Poisoned food technique. Results highlighted antimicrobial potential of *R. parviflora* extracts against the range of microbes, gram positive bacteria as well as gram negative bacterial species and fungal species, so that the extract from these plants can be used as broad spectrum antibiotic in near future.

**KEYWORDS:** Antibacterial, Antifungal, Poisoned food technique, Agar well diffusion, *Rhus parviflora*.

## INTRODUCTION

Antibiotic resistance has become a global concern (Westh *et al.*, 2004). There has been an increasing incidence of multiple resistances in human pathogenic microorganisms in recent years, largely due to indiscriminate use of commercial antimicrobial drugs commonly employed in the treatment of infectious diseases. Search for new antimicrobial agents should be continued by screening many plant families. Recent work revealed the potential of several herbs as sources of drugs (Iwu, 2002). The screening of plant extracts and plant products for antimicrobial activity has shown that higher plants represent a potential source of novel antibiotic prototypes (Afolayan, 2003).

*Rhus parviflora* Roxb commonly known as “small flowered poison sumac” belongs to the family Anacardiaceae. Known as Tungala, Raitung, Tumra, Tung in Hindi and Tintidika, Tintrini in Sanskrit. *R. parviflora* is found in Nepal, India, Bhutan and Sri Lanka at the altitudes of 700–1100 meters (2,300–3,600 ft) (Shreshta *et al.*, 2013). It is a much-branched shrub bearing stalked leaves with three leaflets; the end leaflet is larger than the other two. The leaflets are obviate, with rounded tips, tapering bases and irregularly toothed margins. The flowers are tiny, yellowish and fragrant. The fruit is small, round and red when ripe (Revis, 1832).

*R. parviflora* is recorded in Ayurvedic pharmacopoeia as having therapeutic uses for Vata Vikara, which are the complications related to neurological disorders including anxiety, insomnia, epilepsy, and rheumatoid arthritis (Shreshta *et al.*, 2013). In Nepal, *R. parviflora* fruit is also used for human consumption (Bajracharya *et al.*, 1980) and decoctions of fruit or stem bark are used to cure dysentery (Bhattarai, 1991). Biologically active constituents in *R. parviflora* fruits include flavonoids, biflavonoids and phenolic compounds. Biflavonoids from *R. parviflora* have shown cytotoxic and neuroprotective effects as well as induction of sleep through the positive allosteric modulation of GABAA benzodiazepine receptors (Shrestha *et al.*, 2012). It is also used in treatment of stomach disorders (Shrestha *et al.*, 2013).

The aim of this study was to investigate the antibacterial and antifungal activity of the acetone and methanol extract of leaves, stem and fruits of *R. parviflora*, against various pathogenic microbes.

## MATERIALS AND METHODS

### Plant Materials

The leaves, stem and fruits of *Rhus parviflora* were collected from the nearby forest of the High Altitude Plant Physiology Research Centre (HAPPRC), HNB Garhwal University, Srinagar Garhwal in District Pauri Garhwal of Uttarakhand in the month of February, 2014. Fresh plant material was washed under running tap water, air dried and then homogenized to fine powder and stored in airtight bottle

### Microorganism

The following bacterial and fungal microbes were obtained from the laboratories of HAPPRC- *Bacillus cereus*, *Listeria*