ABSTRACT

The use of medicinal plants for treatment of various ailments has a long history in traditional system of medicine. Plants synthesize a number of different chemical compounds for various functions, including self-defence against insects, fungi, diseases, and herbivorous mammals. A large number of phytochemicals with established biological activity have been reported. Since a single plant contains different types of phytochemicals with different biological activities, therefore using whole plant as a medicine is not suitable. Further, the phytochemical content and pharmacological actions, if any, of many plants having medicinal potential remain unassessed by rigorous scientific research to define efficacy and safety. Drug research makes use of ethnobotany to search for pharmacologically active substances in nature, and has in this way discovered hundreds of useful compounds which include aspirin, digoxin, quinine, and opium. There are different types of compounds present in plants most of which are grouped in four major classes: alkaloids, glycosides, polyphenols, and terpenes. Medicinal plants are widely used in non-industrialized societies, mainly because they are readily available and cheaper than modern medicines. The valley of Kashmir has been a hub for medicinal plants. The people there are using these medicinal plants for the cure and prevention of various ailments from ancient times. A total of 937 plant species belonging to 129 families have so far been reported to have a traditional medicinal use by indigenous communities of Jammu and Kashmir. To check the traditional claim that these plants have significant antimicrobial activities (as is reported in the traditional knowledge of the indigenous people as both the plants are used in the treatment of gastrointestinal infections, respiratory infections, liver and skin infections), the present work undertaken to elucidate the Phytochemical constituents present in Rheum emodi and Podophyllum hexandrum and to study the antibacterial and antifungal activity of these ethnobotanically important medicinal plants. The qualitative estimation of phytochemical constituents from Rheum emodi showed that alkaloids, flavonoids, terpenes, saponins and anthraquinones were highly present in methanolic extract while in aqueous extract they were moderately present. The carbohydrate, tannins, glycosides, terpenoids and phenols were moderately present in methanolic extract while in aqueous extract only trace amounts were present. Both aqueous and methanol extract showed the absence of amino acids. In Podophyllum
*hexandrum* steroids, flavonoids and amino acids were moderately present in methanolic extract while in aqueous extract only trace amounts of tannins, terpenes, glycosides, terpenoids, saponins and phenols were present. Both aqueous and methanol extract showed the absence of alkaloids, carbohydrates, anthraquinones. The aqueous extract of *Podophyllum hexandrum* also showed the absence of terpenes, saponins, amino acids and phenols. The quantitative estimation of phytochemical constituents from methanol and aqueous extract from the said plants exhibited high amount in methanolic extract as compared to aqueous extract. The amount of estimated phytocompounds was significantly higher in *Rheum emodi* in both the extracts. The four concentrations of aqueous and methanolic extracts 2.5 mg/ml, 5 mg/ml, 7.5 mg/ml and 10 mg/ml from *Rheum emodi* and *Podophyllum hexandrum* were used to study their antibacterial and antifungal effects on bacterial strains *Bacillus megaterium* and *Pseudomonas aeruginosa* and fungi strains *Fusarium solani* and *Aspergillus flavus*. Both of these endangered medicinal plants demonstrated significant antimicrobial activity against the test bacterial and fungal strains used. The results show that aqueous extract of *Rheum emodi* exhibited zone of inhibition upto 11.4 mm and 11 mm *Pseudomonas aeruginosa* and *Bacillus megaterium* respectively while methanol exhibited zone of inhibition upto 12 mm in respect of *Bacillus megaterium* and upto 11.5 in respect of *Pseudomonas aeruginosa*. Similarly methanol extract of *Rheum emodi* exhibited higher zone of inhibition against both the tested strains of fungi. The methanol extract of *Podophyllum hexandrum* also showed higher zone of inhibition in both bacterial as well as fungal test strains. Over all the *Rheum emodi* extracts showed higher amounts of various Phytochemical constituents as against *Podophyllum hexandrum* and exhibited significant antibacterial and antifungal activity and showed higher zone of inhibition than *Podophyllum hexandrum*.

**Key words:** *R. emodi, P.hexandrum*, Antibacterial, Antifungal, Phytocompounds