

## Evaluation of *in vitro* antimicrobial activity of *Portulaca quadrifida* L.

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Accepted : April, 2009

### SUMMARY

The antimicrobial activity of hexane, methanol and aqueous extracts of *Portulaca quadrifida* (Portulacaceae) was tested by agar gel diffusion method. All the three extracts at a concentration of 100mg/ml showed zone of inhibition ranged from 15-25 mm against  $1 \times 10^7$  microbial cells. Methanol extract was most effective against both bacteria and fungi. Hexane extract showed moderate where as aqueous extract showed low activity. The largest zone of inhibition against *E.coli* indicates that the extract was simply inhibitory towards this microorganism and *Bacillus subtilis* was most resistant bacteria. All extracts of *Portulaca quadrifida* showed different levels of antifungal activity against *Aspergillus niger* and *Candida albicans*. Tetracyclin and Nystatin were used as standard reference.

**Key words :** *Portulaca quadrifida*, Antibacterial activity, Antifungal activity

*Portulaca quadrifida* is a prostrate, mat-forming annual or short-lived perennial herb with much-branched, spreading, articulated, fleshy stems up to 30 cm long or longer, rooting freely from the nodes, often flushed reddish; nodes with a dense whorl of whitish hairs (Kiritkar and Basu, 1933). Vernacular names are small-leaved purslane; single-flowered purslane; ten o'clock plant; stone-crop; chicken-weed (En). *Portulaca quadrifida* may contain oxalates in toxic quantities which may cause death in live stock. In some soils it also tends to accumulate nitrates and thus should be consumed in moderate quantities (Burkill, 1997). The plant is used in skin diseases and in diseases of the kidneys, bladder and lungs (Chopra and Chopra, 1958). The general uses are as a diuretic, to treat rheumatism and gynecological diseases, as a sedative, analgesic and cardiogenic, to treat fever, disorders of the urinary tract, worm diseases, as a tonic and choleric, to treat dysentery, and to apply externally to ulcers, eczema and dermatitis (Kokwaro, 1993). The leaves are diuretic, used in dysuria and externally applied in erysipelas. Seeds used as a verminifuge. The aim of present study is the screening of antibacterial and antifungal activity of *Portulaca quadrifida*.

### MATERIALS AND METHODS

#### Plant material:

Whole plants of *Portulaca quadrifida* were collected from rural area of Visakhapatnam district and

authenticated by curator of Botany Department, Andhra University, Visakhapatnam. A voucher specimen was deposited in our laboratory. The plant material was shade dried at room temperature until extraction.

#### Preparation of extractions:

Hundred grams of shade dried and coarsely powdered plant material was exhaustively extracted for seven hours with hexane (62-65°C) in soxhlet apparatus. The hexane extract was distilled and evaporated under reduced pressure using Rota-Vapor (Heidolph, Heizbad, Laborota 4001, Germany, 2000). The extracted plant material was then air dried, repacked in soxhlet apparatus and exhaustively extracted with methanol (98.8%) until color changed into normal. The methanol extract was filtered, distilled and evaporated under reduced pressure using rota-vapor. The extract was dissolved in dimethyl-sulfoxide to make the final concentration to 100 mg/ml which kept in refrigerator till used (Williams *et al.*, 2003).

Simultaneously, aqueous extract was prepared by infused in distilled water until complete exhaustion. The extract was then filtered using Whatman No.1 filter paper and the filtrate was evaporated in vacuo and dried using rotary evaporator at 60°C (Kandil *et al.*, 1994). The final dried samples were stored in refrigerator.

#### Microorganisms:

The slants of seven organisms, five bacteria and two fungi were procured from Institute of Microbial Type Culture Collection (MTCC) and Gene Bank, Chandigarh, India. The bacterial strains are *Escherichia coli* (MTCC 2401), *Klebsiella pneumoniae* (MTCC 2405), *Proteus vulgaris* (MTCC 1771), *Bacillus subtilis* (MTCC 2274) and *Staphylococcus aureus* (MTCC 1144) and the fungi are *Aspergillus niger* (MTCC 2594) and *Candida*

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