

## ABSTRACT

*Catharanthus roseus* Linn. (*Vinca rosea*) has been used to cure chronic as well as inherited diseases from the centuries. *C. roseus* flowers have wound healing, anti-asthmatic properties and flower extract had also been used for eyewash in infants. Two extraction schemes were followed. In scheme-I, the flowers of two *C. roseus* subspecies (pink & white) were extracted, by soaking the fresh chopped material in n-hexane, chloroform, methanol and ethanol, while in scheme-II, methanol extract was made by soaking dried, ground flowers in methanol for 15 days with regular shaking. The isolation of natural compounds from CRH and CRC was carried out through column chromatography and preparative thin layer chromatography. All the extracts were evaluated for DPPH free radical, FRAP, AChE and protease inhibition assays. Total phenolics and flavonoids were also estimated for all extracts.

GCMS analyses of the solvent extracts scheme-I indicated 3-allyl-6-methoxyphenol and 1,3-dioxolane,2,4,5-trimethyl as the major components in the alcoholic solvents, while hexane and chloroform extracts were rich in tricosane. An interesting aspect of our study is the identification of hydrocarbons in the flower extracts of *C. roseus*, which constituted 93-97%, 81-85%, 42-53%, 45% in the hexane, chloroform, methanol and ethanol extracts respectively.

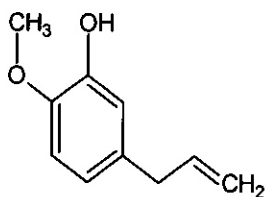
The reducing potential of scheme-I extracts ranged from  $91.96 \pm 1.26$  to  $20.53 \pm 1.04\%$  in DPPH assay while  $0.307 \pm 0.05$  to  $0.572 \pm 0.01$  mmoles in FRAP assay, phenolics and flavonoids estimation show that methanol and ethanol extracts contain large amount of phenolics and flavonoids. A linear relationship was found in between antioxidant potential and phenolic content of the extracts of white and pink flowers ( $R^2 = 0.902$ ) and ( $R^2 = 0.819$ ) respectively. The percentage inhibition of acetylcholinesterase was ranged from  $36.5 \pm 2.6\%$  to  $60.7 \pm 0.8\%$  ( $IC_{50} = 58-109$  ug/mL), while inhibition of protease was in the range from  $29.7 \pm 3.05\%$  to  $83.0 \pm 0.25\%$  ( $IC_{50} = 57.96-299.01$ ) for white and pink extracts respectively.

The percent inhibition of DPPH shown by the extracts of scheme-II ranged from 35-82% while  $IC_{50}$  values range from 120.90 to 280.74 ug/mL. The amount of total

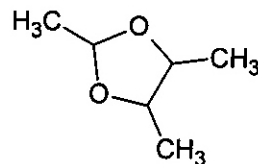
phenolics varied in different extracts of scheme-II and ranged from 0.231-0.044mg GAE/g of dry extract. The results showed the correlation studies of total phenols with % inhibition in DPPH in scheme-II extracts are  $R^2 = 0.6243$ . While with FRAP and polyphenols showed the correlation  $R^2 = 0.554$ . Scheme-II extracts AChE with  $IC_{50}$  ranged from 44-69 ug/mL. Protease inhibitory potential  $IC_{50}$  ranged from 69.44 to 154.47 ug/mL.

Natural compounds isolated (N-1 to N-12) from CRH and CRC extracts did not show significant antioxidant activity against DPPH assay.  $IC_{50}$  calculated in AChE assay for N-1 to N-12 ranged from 21.22-33.11 ug/mL and for protease inhibition was  $IC_{50}$ =63.97-116.49 ug/mL.

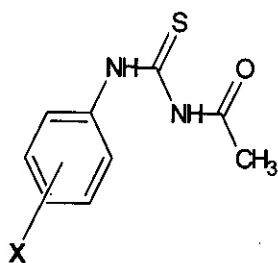
Seventeen thiourea derivatives TUM-1 to TUM-17 were prepared and subjected to various biological activities. The results obtained in different bioassays were; DPPH ( $IC_{50}$ =107.68 to 250.68); FRAP ( $0.133 \times 10^6$  to  $0.623 \times 10^6$  uM  $FeSO_4 \cdot 7H_2O$ ); AChE ( $IC_{50}$ =15.75-36.58) and protease inhibition activity ( $IC_{50}$ =54.91-185.52).



3-allyl-6-methoxyphenol



2,4,5-trimethyl-1,3-dioxolane



X=-H, -CH<sub>3</sub>, -Cl, -NO<sub>2</sub>, -COOH

Thiourea derivatives