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QUALITATIVE ANALYSIS AND ANTIOXIDANT POTENTIAL OF *VANDA ROXBURGHII* R.BR. KANYAKUMARI, SOUTH INDIA

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ABSTRACT

Vanda roxburghii R.Br. is a potent medicinal epiphytic orchid used in the Indian system of medicine. Benzene extract of *Vanda roxburghii* R.Br. leaf showed the presence of terpenoid, flavonoid, alkaloid, saponin, tannin and steroid; ethanol extract showed the presence of terpenoid, flavonoid, alkaloid, tannin and steroid; acetone extract showed the presence of terpenoid, alkaloid, tannin, steroid and chloroform extract showed the presence of flavonoid, reducing sugar, alkaloid and steroid. DPPH radical scavenging activity of *Vanda roxburghii* R.Br. leaf extracts varied from 17.98 % ± 0.570 (20µl) of chloroform extract to 61.91% ± 1.196 (100µl) of ethanol extract and hydroxyl radical scavenging activity of *Vanda roxburghii* R.Br. leaf extracts varied from 11.98 % ± 0.789 (100µl) of chloroform extract to 58.5 % ± 0.475 (500µl) of ethanol extract highlight the medicinal importance of the sampling plant.

KEYWORDS: Orchid, *Vanda roxburghii*, Phytochemicals, antioxidant.

INTRODUCTION

Orchidaceae is a diverse and widespread family of flowering plants with blooms that are often colourful and often fragrant commonly known as the orchid family (White and Sharma, 2000). India is one of the richest orchid habitats about 2,500 species in 167 genera represented in six sub-families, 17 tribes and 30 sub-tribes (Hedge, 1997). Phytochemicals are biologically active, naturally occurring chemical compounds found in plants, which provide health benefits for humans than those attributed to macronutrients and micronutrients (Hasler *et al.*, 1999). Roots of *V. roxburghii* were reported to possess antibacterial, antitubercular properties, anti-inflammatory activity and aphrodisiac activity (Das *et al.*, 1967; Lawler, 1984).Antioxidants are believed to play a very important role in the body defense system against reactive oxygen species (ROS), which are the harmful by products generated during normal cell aerobic respiration (Rao *et al.*, 2012).

MATERIALS AND METHODS

Collection of Plant Material

The epiphytic orchid *Vanda roxburghii* R. Br. was collected from Agastheeswaram Taluk at an altitude of about 250 feet of Kanyakumari District, the southernmost end of the peninsular India lies between 8º-20º north of the equator and between 70º-85º in longitude**.** Photographs of the vegetative and reproductive (inflorescence) parts were compared with the description published in orchids of Nilgiris (Joseph, 1987).

Processing and Preparation of extracts

The freshly collected ***Vanda roxburghii*** R.Br. leaf was harvested and properly washed in tap water and then rinsed in sterile distilled water. The harvested leaves were dried in the hot air oven at 40º C for 3 days and the dried leaves were pulverized using sterile laboratory mortar and pestle to obtain a powered form. The powdered samples were stored in airtight glass containers for further analysis. The dried powder of *Vanda roxburghii* R. Br. leaf was extracted with benzene, ethanol, acetone and chloroform in soxhlet extractor for 72 hours and after exhaustive extraction, the leaf extracts were filtered with the help of rotary evaporator.

METHODOLOGY

Phytochemical constituents of ***Vanda roxburghii*** R.Br. leaf extracts was determined as per the standard procedures (Harborne, 1973). Antioxidant Activity was determined as per the standard procedure (DPPH radical scavenging activity of Yohozowa *et al.*, 1998 and

hydroxyl radical scavenging activity of Elizabeth *et al.*, 1990).

RESULTS AND DISCUSSION

Green plants synthesis and preserve variety of bio-chemical products many of which are extractable and are used as chemical feed stocks or as raw material for various scientific investigations. Suja and Williams, (2016) reported that the ethanol extract of *Acampe praemorsa* (Roxb) leaves revealed the presence of flavonoid, phenol, tannin and steroid constituents. The result of phytochemical activities showed that bioactive compounds such as alkaloid, terpenoids, flavonoids, phenols, tannins, steroids and glycosides were present in the whole plant extracts of *V. tessellata (*Bakul Bhattacharjee *et al*., 2014). Phytochemical analysis of *Vanda tessellata* (Roxb.) Hook. showed the presence of flavonoid, glycoside, terpenoid and tannin (Maridass *et al*., 2008). The present study revealed that the benzene extract of *Vanda roxburghii* R.Br. leaf showed the presence of terpenoid, flavonoid, alkaloid, saponin, tannin and steroid; ethanol extract showed the presence of terpenoid, flavonoid, alkaloid, tannin and steroid; acetone extract showed the presence of terpenoid, alkaloid, tannin, steroid and chloroform extract showed the presence of flavonoid, reducing sugar, alkaloid and steroid.

An antioxidant is a chemical compound that inhibits the oxidation of other molecules. 1, 1-diphenyl-2-picryl hydroxyl is a stable free radical scavenging activity react with DPPH reduce it to DPPH-H and as consequence, the absorbance decreases. DPPH radical scavenging activity of *Cottonia peduncularis* of acetone leaf extract showed highest percentage of inhibition (53.18%) (Nagananda *et al*., 2013). DPPH radical scavenging of the benzene extract of *Vanda roxburghii* R.Br. leaf varied from 25.29% ± 1.618 (20µl) to 59.29% ± 1.255 (100µl); ethanol extract varied from 27.28% ± 0.196 (25µl) to 61.91% ± 1.196 (100µl); acetone extract varied from 20.98 ± 1.618% (20µl) to 50.86% ± 0.287 (100µl); chloroform extract varied from 17.98% ± 0.570 (20µl) to 45.87% ± 0.287 (100µl) and antioxidant potential of the standard antioxidant ascorbic acid varied from 28.17% ± 0.672 (20µl) to 67.17% ± 0.490 (100µl) (Fig: 1).

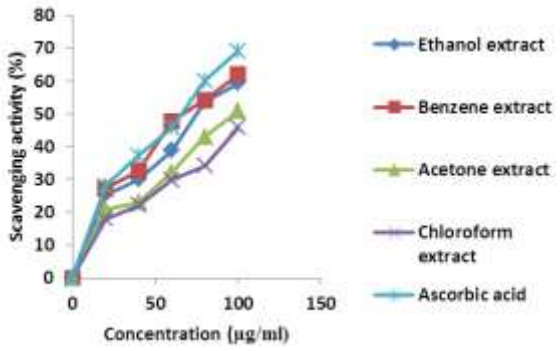

Fig. 1: DPPH Radical Scavenging.

Hydroxyl radical scavenging is an extremely reactive free radical formed in biological system. Uddin *et al*., (2015) reported that the *Vanda roxburghii* chloroform extract posses potential hydroxyl radical scavenging activity. Ethanol extract of *Vanda roxburghii* R.Br. leaf varied from 18.12% ± 0.461 (100µl) to 58.5% ± 0.475 (500µl); benzene extract varied from 13.45% ± 0.280 (100µl) to 43.65% ± 0.667 (500µl); acetone extract varied from 12.8% ± 0.879 (100µl) to 40.78% ± 0.787 (500µl); chloroform extract of *Vanda roxburghii* R.Br. leaf varied from 11.98% ± 0.789 (100µl) to 39.76% ± 0.678 (500µl) and antioxidant potential of the standard antioxidant ascorbic acid varied from 19.98% ± 0.903 (100µl) to 63.82% ± 0.000 (500µl) (Fig: 2).

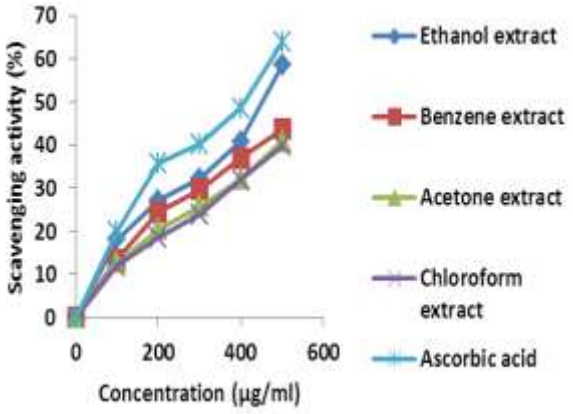

Fig. 2: Hydroxyl Radical Scavenging.

CONCLUSION

The phytochemical constituents and antioxidant potential of the sampling plants justified the traditional use of the plants further experiments are required to elucidate their mechanism of action at cellular and molecular levels.

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