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17.1 INTRODUCTION

Plants contain a wide variety of free radical scavenging molecules, such as phenolics, flavonoids, vitamins and endogenous metabolites. These plant-derived antioxidants have been shown to function as single and triplet oxygen quenchers, peroxide decomposers, enzyme inhibitors and synergists (Kivits et al. 1997). Electron acceptors, such as molecular oxygen, react easily with free radicals to become radicals themselves and they are also referred to as reactive oxygen species (ROS). ROSs, such as superoxide anions, hydrogen peroxide, hydroxyl, nitric oxide and peroxy nitrite radicals, play an important role in oxidative stress related to the pathogenesis of various important diseases (Halliwell and Gutteridge 1999; Finkel and Holbrook 2000). In healthy individuals, the production of free radicals is balanced by the antioxidative defense system; however, oxidative stress is generated when equilibrium favors free radical generation as a result of a depletion of antioxidant levels. The oxidation of lipids, DNA, proteins, carbohydrates and other biological molecules by toxic ROSs may cause DNA mutation and serve to damage target cells or tissues, and this often results in cell death. Moreover, the knowledge and application of such potential antioxidant activity in reducing oxidative stresses *in vivo* has prompted many investigators to search for potent and cost-effective antioxidants from various plant sources (Liu and Ng 2000; Hu and Kitts 2000; Wang et al. 2004). *Breynia retusa* is commonly known as the cup saucer plant and belongs to the family Euphorbiaceae. The juice of the stem is used in conjunctivitis (Pullaiah 2006). The leaves and fruit of *B. retusa* is a rich source of total protein, total carbohydrates, vitamins and polyphenolic compounds, which possess antioxidant and antidiabetic activity (Murugan et al. 2016). These studies can be taken as a strong platform to implement antioxidant potential in *B. retusa*. Hence, the present investigation on stems was undertaken to study the total phenolic, vitamin contents and antioxidant properties.

17.2 MATERIALS AND METHODS

17.2.1 CHEMICALS

All the chemicals used in the study were of analytical grade; 2,2-diphenyl-1-picrylhydrazyl (DPPH), 2,2 azino-bis(3-ethylbenzothiazoline)-6-sulfonic acid diammonium salt (ABTS) and 6-hydroxy-2,5,7,8-tetramethylchroman-2-carboxylic acid (Trolox) were purchased from Sigma chemicals Co (St. Louis, MO, United States). All the other reagents were obtained from Himedia Laboratories (Mumbai, Maharashtra, India).