

17.3.4.7 Superoxide Anion Radical Scavenging Activity

Superoxide anion radicals are a reactive oxygen species that can be generated in the human body by auto oxidative processes and are very harmful to cellular components. ROSs have a casual relationship with oxidative stress and the superoxide radical scavenging assay is based on the capacity of plant extracts to inhibit formazan formation by scavenging the superoxide radicals generated in riboflavin-light NBT systems (Halliwell and Gutteridge 2002). The result of superoxide anion scavenging activity of stems is shown in Figure 17.3. The extracts were found to be an efficient scavenger of superoxide radical generated in riboflavin-NBT-light systems *in vitro*. The scavenging activity of methanol extract was found to be 36.79% compared to standard ascorbic acid (55.97%). From this assay, using different extracts of *B. retusa*, it is noted that the inhibition of the formation of blue formazan and the percentage of inhibition are directly proportional to the concentration of plant extracts. The probable mechanism of scavenging superoxide anion radicals by *B. retusa* can be due to the active principles in the stem extracts which may eliminate the superoxide anion radicals which are generated through the photo-illumination process.

17.3.4.8 Lipid Peroxidation Inhibition Assay

The inhibition of Fe^{2+} -induced lipid peroxidation was assayed by the TBARS formation assay. Malonaldehyde is a naturally occurring product of lipid peroxidation and prostaglandin biosynthesis that is mutagenic and carcinogenic (Marnett 1999). Malonaldehyde is, in many instances, the most abundant individual aldehyde resulting from lipid peroxidation, and its determination by thiobarbituric acid is one of the most common assays in lipid peroxidation studies. *In vitro* malonaldehyde can alter proteins, DNA, RNA and many other biomolecules (Schauenstein et al. 1977). As shown in Figure 17.4, *B. retusa* extracts exhibited a strong inhibitory effect on lipid peroxidation and the inhibitory effect was concentration dependent. The methanol extract (49.78%) showed a higher percentage of inhibition at 500 μ g concentration.

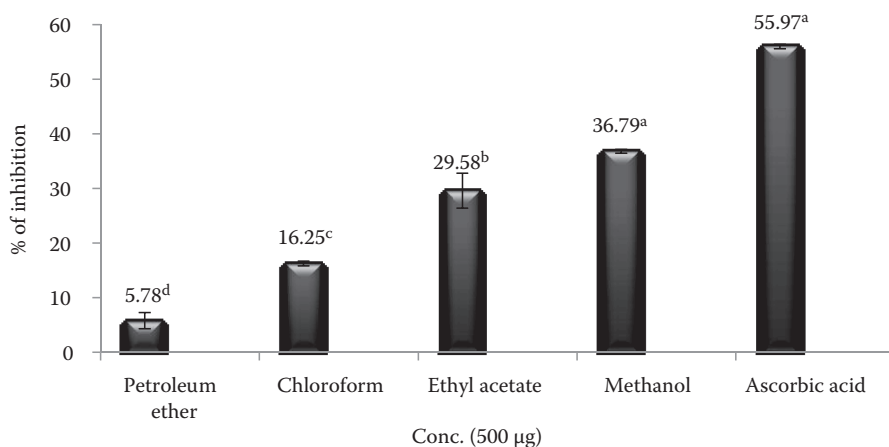


FIGURE 17.3 Superoxide anion radical scavenging activity. Values are mean of triplicate determination ($n = 3$) \pm standard deviation; statistically significant at $p < 0.05$ where $a > b > c > d$.