Peppers are excellent sources of polyphenols which act to prevent and treat diseases. Four varieties of peppers were evaluated in this study: Capsicum baccatum (CB), Capsicum frutescens (CF), Capsicum frutescens sp (CSP) and Capsicum annuum (CA). The phenolic content and the antioxidant properties were evaluated in ethanolic extracts from fresh and lyophilized materials. A statistical design was conducted by varying the ratio solute/solvent and the concentration of the solvent for extraction of polyphenols. The quantification of the phenolic compounds was carried out by the Folin-Ciocalteau assay. The antioxidant activities of the extracts were determined by the DPPH* (free radical) assay and the β-carotene/linoleic acid system. The highest extraction yield was obtained with 40% ethanol and 0.5 g of fresh and 0.05 g of lyophilized peppers. The content of polyphenols (mg GAE/100g) for the fresh samples were: CB – 463 ±12.8, CF – 495 ± 6.4, CSP – 386 ± 6.4, CA – 504 ± 6.4. In lyophilized samples the amounts of polyphenols were: CB – 435 ± 12.8, CF – 472 ± 6.4, CSP – 366 ± 25.7, CA – 458 ± 12.8. Among the samples, the highest antioxidant activity by the (DPPH*) test was detected in CF sample (59% ± 31.0). The highest value for β-Carotene linoleic acid assay was found in CF pepper (77.5% ± 0.69). The EC50 of the antioxidant activity of the samples were calculated by linear regression. The highest and the lowest values were 31.4 µg/mL (CF) and 5,8 µg/mL (CB), respectively, considering that the smaller the value the greater the antioxidant potential.