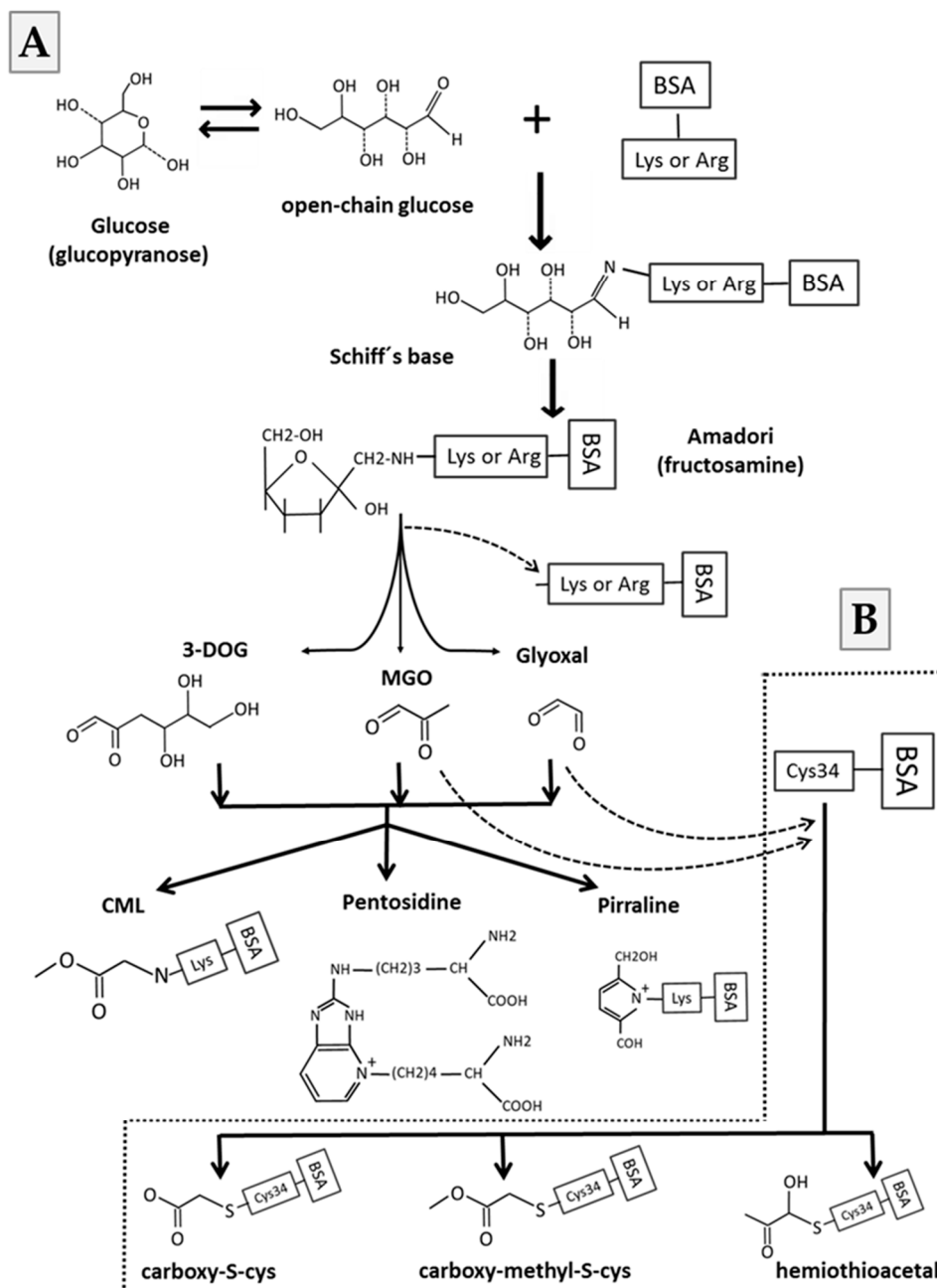


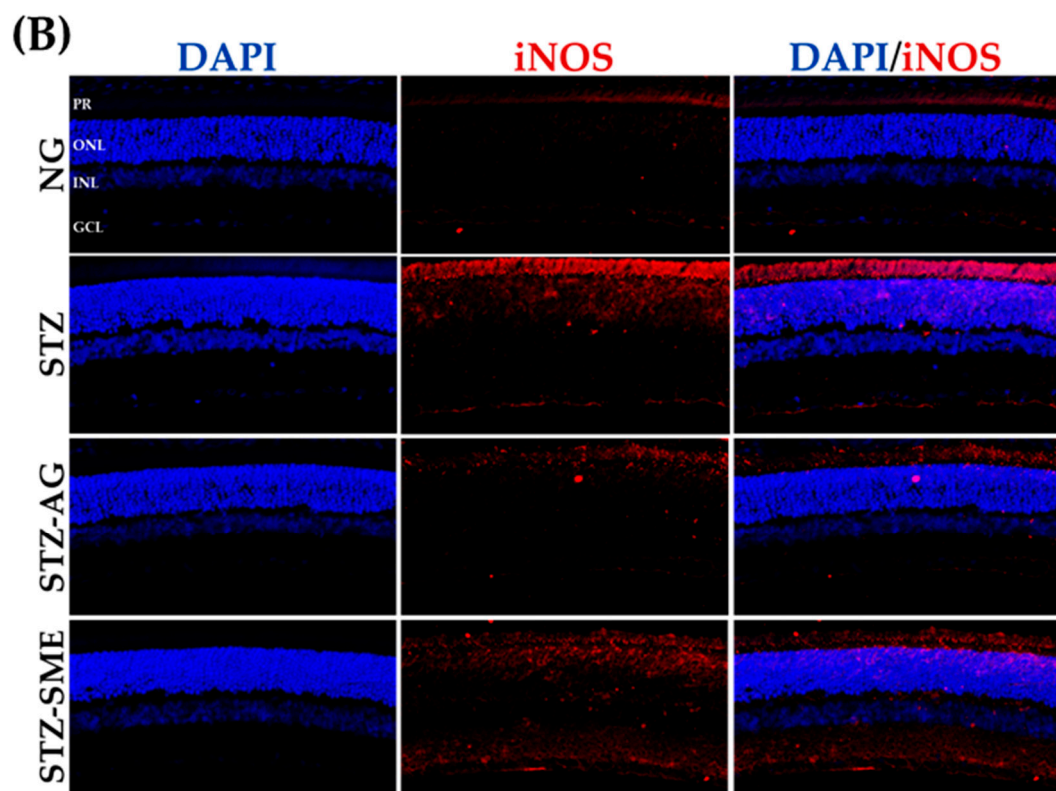
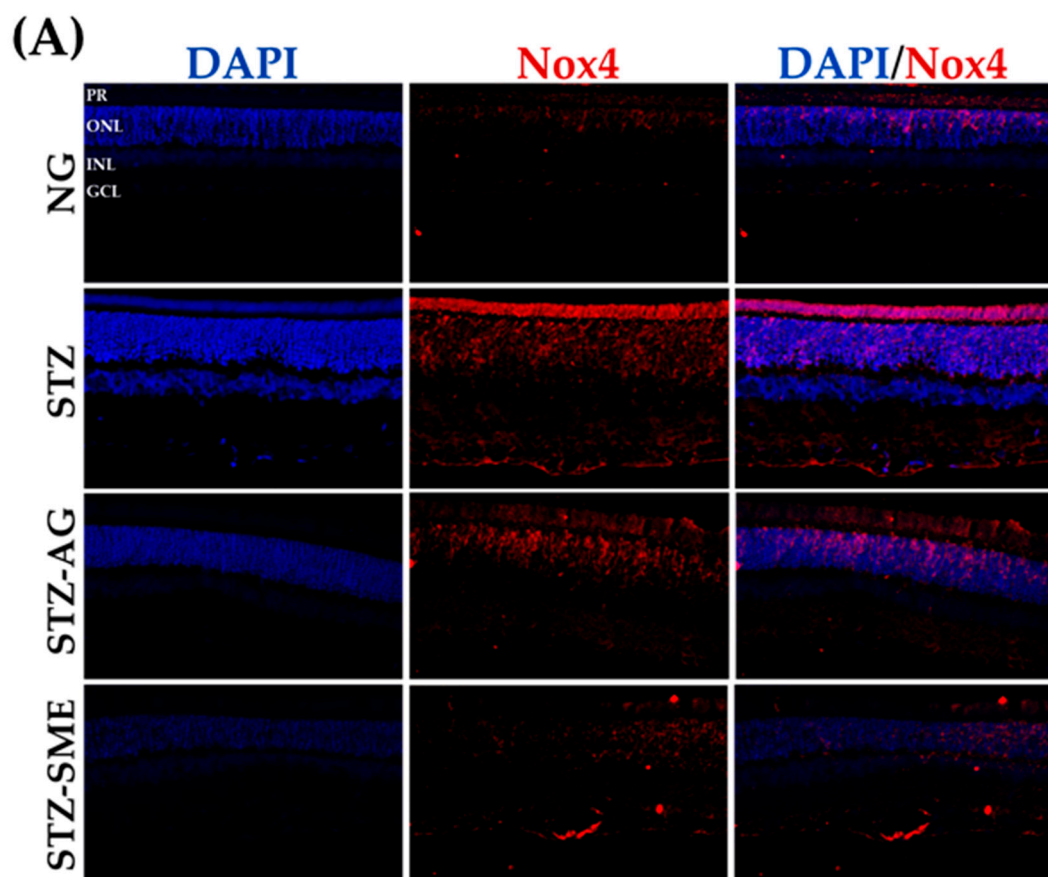
**Supplement 1.** Chemical structures of main compounds isolated from aerial parts of *S. oleracea* which including several phenolic compounds (flavones, flavonoids, coumarins) carotenoids (lutein and/or zeaxanthin).

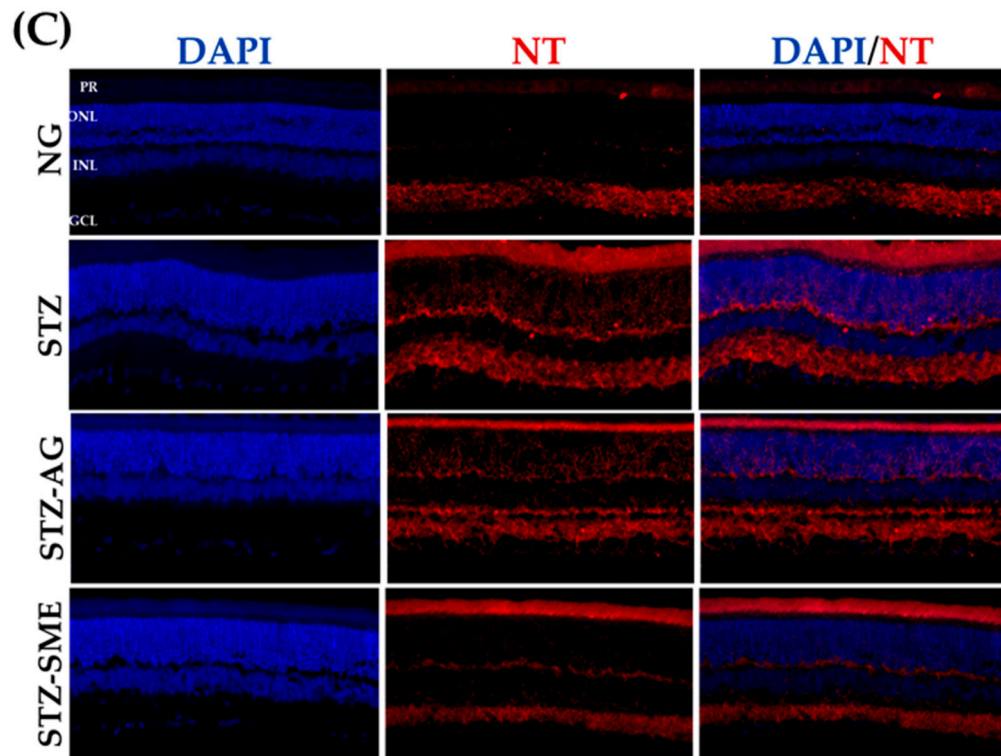


**Supplement 2 A.** Formation of fructosamine, di-carbonylic compounds, and AGE molecules by Maillard reaction when incubating bovine serum albumin (BSA) with reducing sugars (glucose or fructose) or with MGO by non-enzymatic reactions. The dicarbonyl intermediate compounds as glyoxal, MGO, and 3-DOG are formed by non-oxidative rearrangement and hydrolysis of Amadori products. These carbonyl compounds lead to AGEs formation as the CML, pentosidine, and pirraline [40,41]. **B.** The probable transformations of the reduced thiol group of Cys34 from BSA to Carboxy-S-cys, Carboxymethyl-S-cys, and hemithioacetal induced by MGO and glyoxal are shown as has been proposed in other reports [40,43].

#### Abbreviations:

BSA: bovine serum albumin, Lys:lysine, Arg:arginine, 3-DOG: 3-deoxiglucosona, MGO: methylglyoxal, AGEs: advanced glycation end products, N $\epsilon$ -carboxymethyl lysine: CML, Cys34: cysteine 34, Carboxy-S-cys: carboxy-S-cysteine, Carboxy-S-methyl-cys: carboxymethyl-S-cysteine.





**Supplement 3.** Representative micrographs of immunofluorescent staining with the antibodies for NADPH oxidase 4 (Nox-4) (A), inducible nitric oxide synthase (iNOS) (B), and nitrotyrosine (NT) (C) in normoglycemic rats (NG), STZ, treated with aminoguanidine (STZ-AG) and treated with SME (STZ-SME); the nuclei were stained with 4',6-Diamidine-2'-phenylindole dihydrochloride (DAPI) (blue). Magnification 200×.