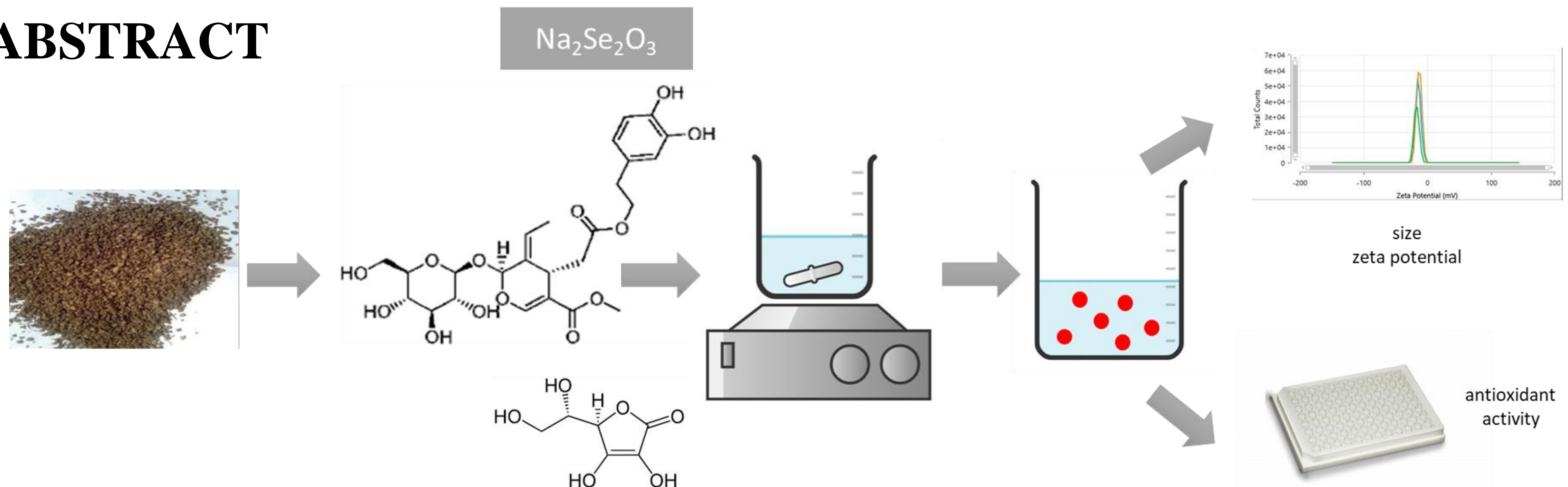


# APPLICATION OF OLIVE POMACE EXTRACT IN BIOGENIC SYNTHESIS OF SELENIUM NANOPARTICLES

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## ABSTRACT



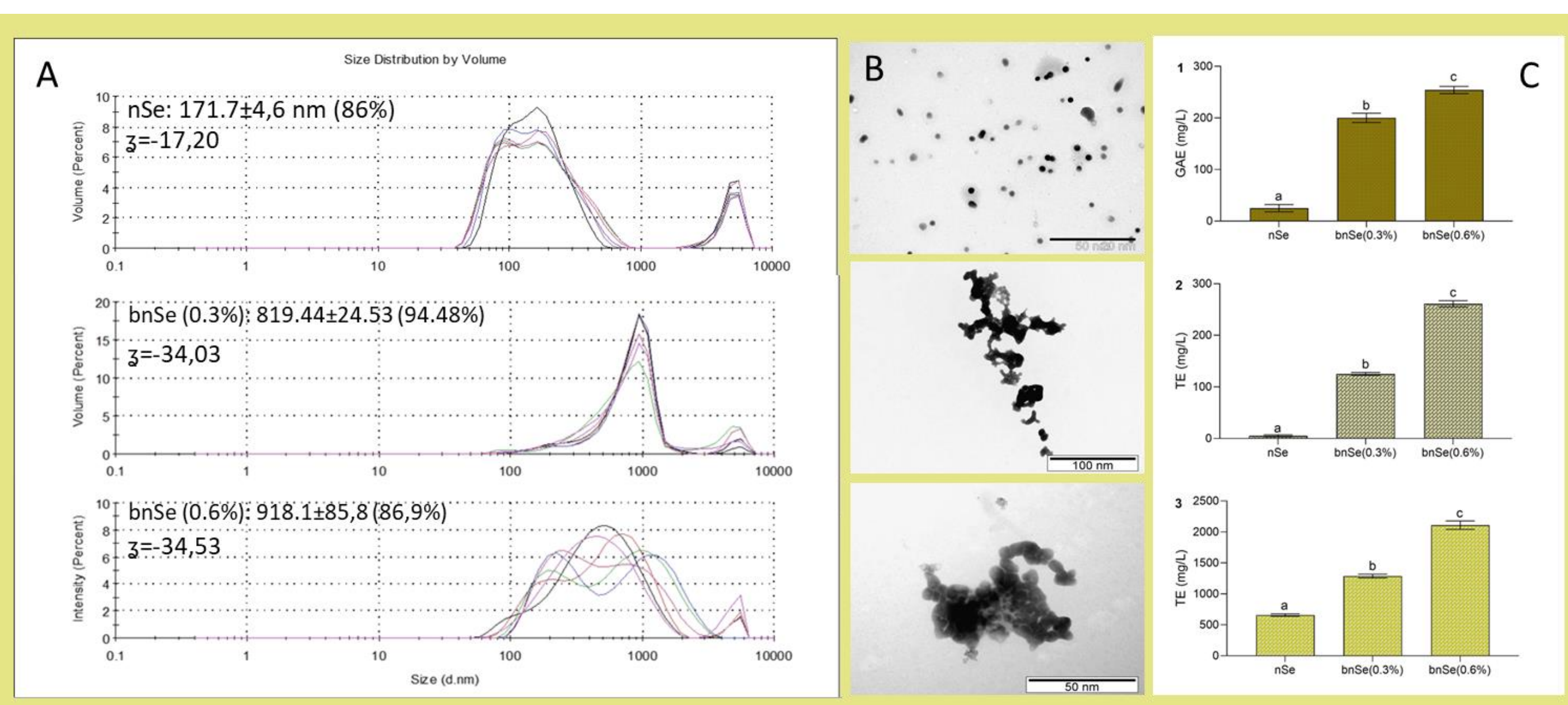
## METHODS

- Isolation and purification of polyphenol rich olive pomace extract (OPE)
- Chemical and biogenic synthesis of nanoSe
- Comparison of PVP and OPE:
  - TEM analysis
  - size distribution and zeta-potential (DLS analysis)
  - antiradical activity (TEAC and ORAC method) and reductive capacity (Folin-Ciocalteu method)

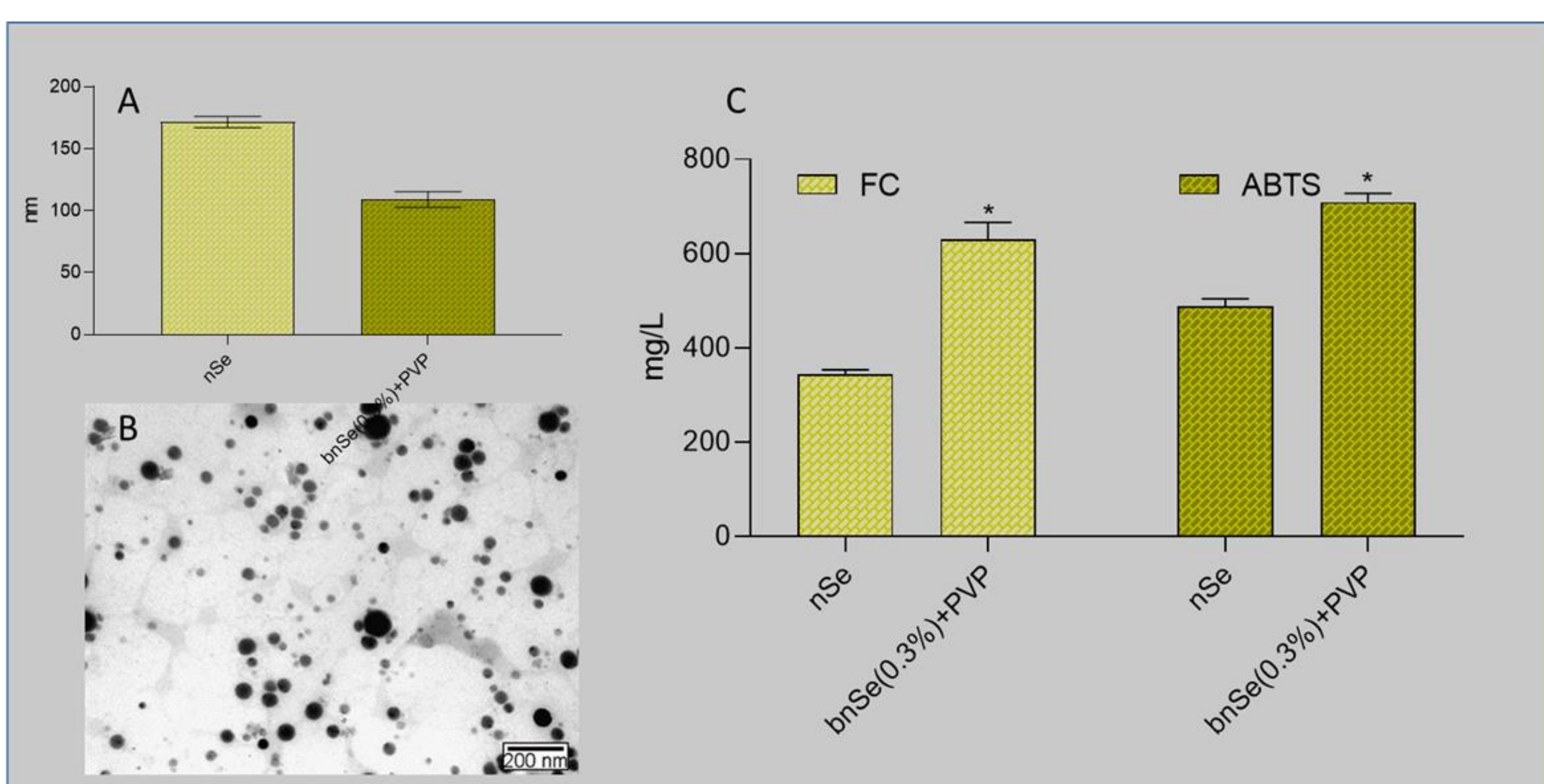


**Figure 1.** Chemical and biogenic synthesis (A) and purification by dialyzing tubing (B) of selenium nanoparticles

## RESULTS



**Figure 2.** Particle size distribution (A), TEM analysis (B), and antioxidant activity of selenium nanoparticles (C)



The application of 0.3% OPE resulted in stable SeNPs dispersion with much larger average particles compared to PVP-coated SeNPs, while the further increase in OPE amount in reaction mixture increased the mean particle size and led to formation of polydispersed system surface charge of biologically synthesized SeNPs that was more negative (-34 mV) compared to PVP-SeNPs (-17.2 mV) (Figure 2A and 2B). Antioxidant and reductive efficacy of biologically synthesized SeNPs was significantly higher than for SeNPs prepared by chemical synthesis (Figure 2C). Combination of PVP and OPE (0.3%) resulted in formation of stable, monodispersed system with average particle size of 109.1 nm (Figure 3A and 3B). Biogenically synthesized nanoSe showed significantly higher antioxidant activity in comparison to reference sample (Figure 3C).

**Figure 3.** Comparison of chemical and optimized biogenic synthesis of nano-selenium: average particle size (A) TEM analysis (B) and antioxidant activity of selenium nanoparticles (C)

## CONCLUSION

Obtained results demonstrated advantages of using natural polyphenol rich plant extracts in preparation of stable SeNPs in terms of development of green synthesis processes and improved functional properties of obtained nanomaterials.