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**International Conference on Frontiers of Cancer Biology
and Biotechnology for Next-Gen Innovations
(ICFCBNI 2025)**

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**Comprehensive analysis of phytochemicals and antioxidant properties of quinoa
seed extracts**

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Quinoa (*Chenopodium quinoa*) is a food crop grown in the Andean region of Bolivia and Peru. It is regarded as a pseudo-cereal and beneficial for addressing metabolic conditions in the human body. It is known for its high nutritional and antioxidant properties. The purpose of this research is to determine the phytochemical and antioxidant efficacy of quinoa seed extract. Phytochemical screening and quantitative analysis of various solvent extracts revealed the presence of several bioactive compounds in the sample. Alkaloids, glycosides, and volatile oils were identified in ethanol, methanol, and water extracts, while steroids were detected only in the aqueous extract. Quantitative estimation showed that alkaloids (3.2 mg) were highest in the ethanol extract, glycosides (3.0 mg) and volatile oils (1.8 mg) peaked in the methanol extract, and steroids (1.0 mg) were predominant in the aqueous extract. The antioxidant activity was evaluated using different assays, and all results were compared with standard antioxidants. The concentrations of quinoa seed extract ranges from 50-250µg/ml were used for the analysis. The IC₅₀ values obtained from various antioxidant assays were as follows: 70.12 µg/mL for the SOD assay, 271.5 µg/mL for the RP assay in the ethyl acetate extract, 79.80 µg/mL for the hydroxyl radical scavenging assay, 262.27 µg/mL for the H₂O₂ assay, 145.97 µg/mL for the DPPH assay, 79.01 µg/mL for the ABTS assay in the methanol extract, and 25 µg/mL for the nitric oxide (NO) scavenging assay in the ethyl acetate extract. These findings indicate that quinoa seed extracts exhibit notable antioxidant activity, particularly in the methanol and ethyl acetate extracts. The results highlight quinoa's potential as a valuable natural source of bioactive compounds for nutraceutical and therapeutic applications.

Keywords: Quinoa (*Chenopodium quinoa*); Phytochemicals; Antioxidant activity; IC₅₀ value; Bioactive compounds