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Plant-mediated synthesis and characterization of iron oxide nanoparticles using *Tribulus terrestris*

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The plant *Tribulus Terrestris* locally named "Sadeng" is one of the native medicinal plants of the Baluchestan region of Iran. The plant is traditionally used as an anti-infective agent and kidney stone treatment ([1]). Many types of organic compounds, such as alkaloids, phenols, and flavonoids have been reported in phytochemical investigations of this medicinal plant ([2]).

Iron oxide nanoparticles (Fe_3O_4-NPs) is an important nanoparticle with exclusive physicochemical behaviors, such as specific surface area, magnetic segregation properties, and unique lattice plane ([3]). Several physical and chemical techniques have been applied for the preparation of Fe_3O_4-NPs ([3]). However, these techniques need high energy and solidly built equipment to prepare the Fe_3O_4-NPs. In recent years, researchers have been focused on the plant-mediated synthesis of Fe_3O_4-NPs instant of previous methods, because of the economical and environmentally-friendly processing approach.

In the current study, the aqueous extract of *Tribulus terrestris* was employed for the phyto-fabrication of iron oxide nanoparticles. The biosynthesized extract-mediated iron oxide nanoparticles (INPs) was characterized through different methods containing FT-IR (Fourier transform infrared spectroscopy), FESEM (Field emission scanning electron microscopy), EDS (Energy-dispersive X-ray spectroscopy), and XRD (X-ray diffraction). The results demonstrated that the average size of Fe_3O_4-NPs nanoparticles was found to be 30-40 nm with spherical morphology.

Keywords: Green synthesis, Nanoparticles, Plant extract, Iron oxide

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