

A survey of the possible protective effects of Ceratonia siliqua extract on the testicular toxicity induced by the cadmium in mice

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Introduction

Cadmium (Cd) is a hazardous heavy metal, and its exposure can lead to a range of health issues, including significant adverse effects on reproductive health in animals and humans. Recently, there has been increasing recognition of the antioxidant benefits of Ceratonia siliqua (carob) extract (CSE). Accordingly, this investigation endeavors to explore the therapeutic potential of CSE in mitigating testicular injury and spermatogenesis impairment induced by Cd.

Results

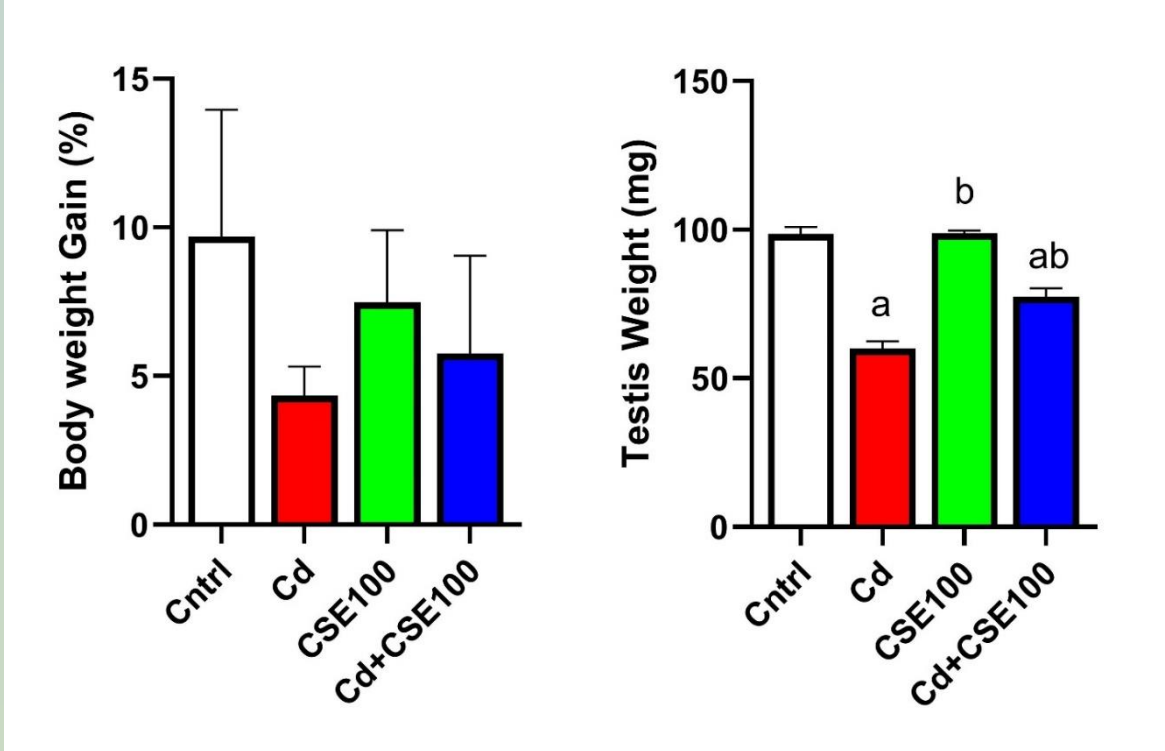
Our findings revealed that CSE restored spermatogenesis by improving sperm count, motility, viability, morphology, and chromatin integrity. Testosterone levels and the histopathology of the testes also showed significant improvement in the CSE-administrated groups. More notably, Cd administration significantly induced oxidative stress in testicular tissue; however, CSE restored antioxidant status by enhancing TAC levels and ameliorating NO and MAD levels.

Methods

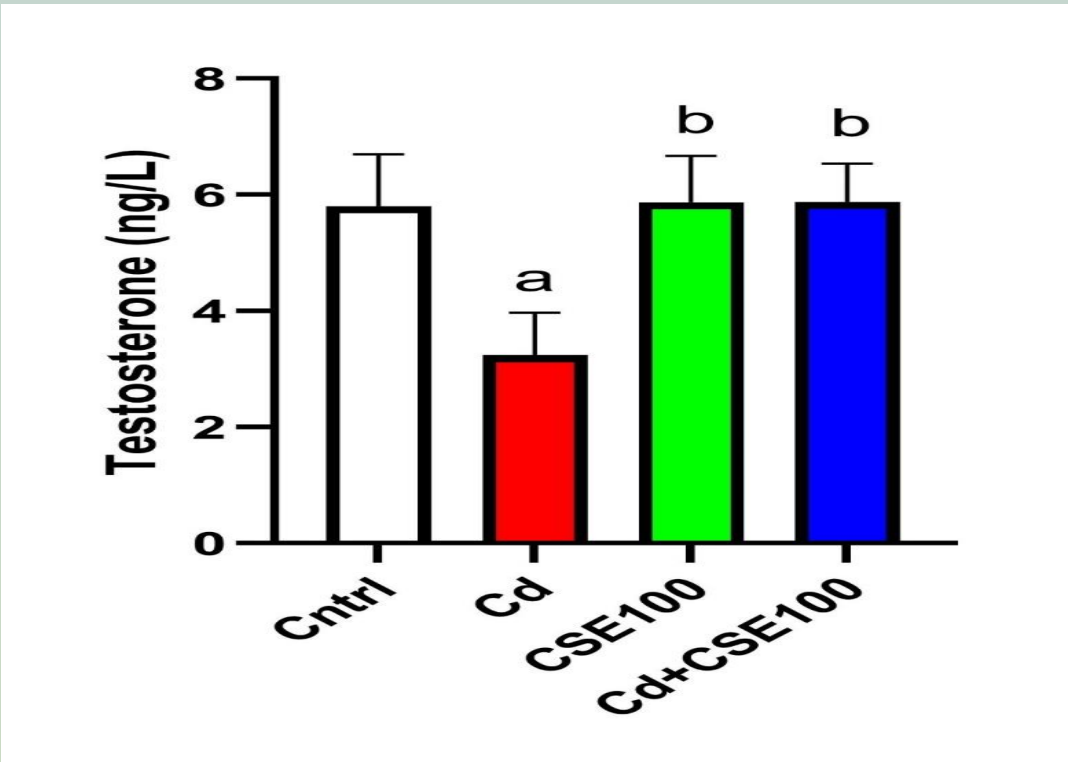
Mice were randomly divided into 4 groups: control, Cd, CSE (100 mg/kg), and CSE (100 mg/kg) plus Cd. Adult male mice were intraperitoneally (i.p.) injected with 0.35 mg/kg of Cd for 35 days, with or without CSE. At the end of the study, sperm parameters, sperm DNA integrity, testicular histopathology status, testosterone hormone level, and testicular levels of malondialdehyde (MDA), nitric oxide (NO), and total antioxidant capacity (TAC) were assessed.

Conclusions

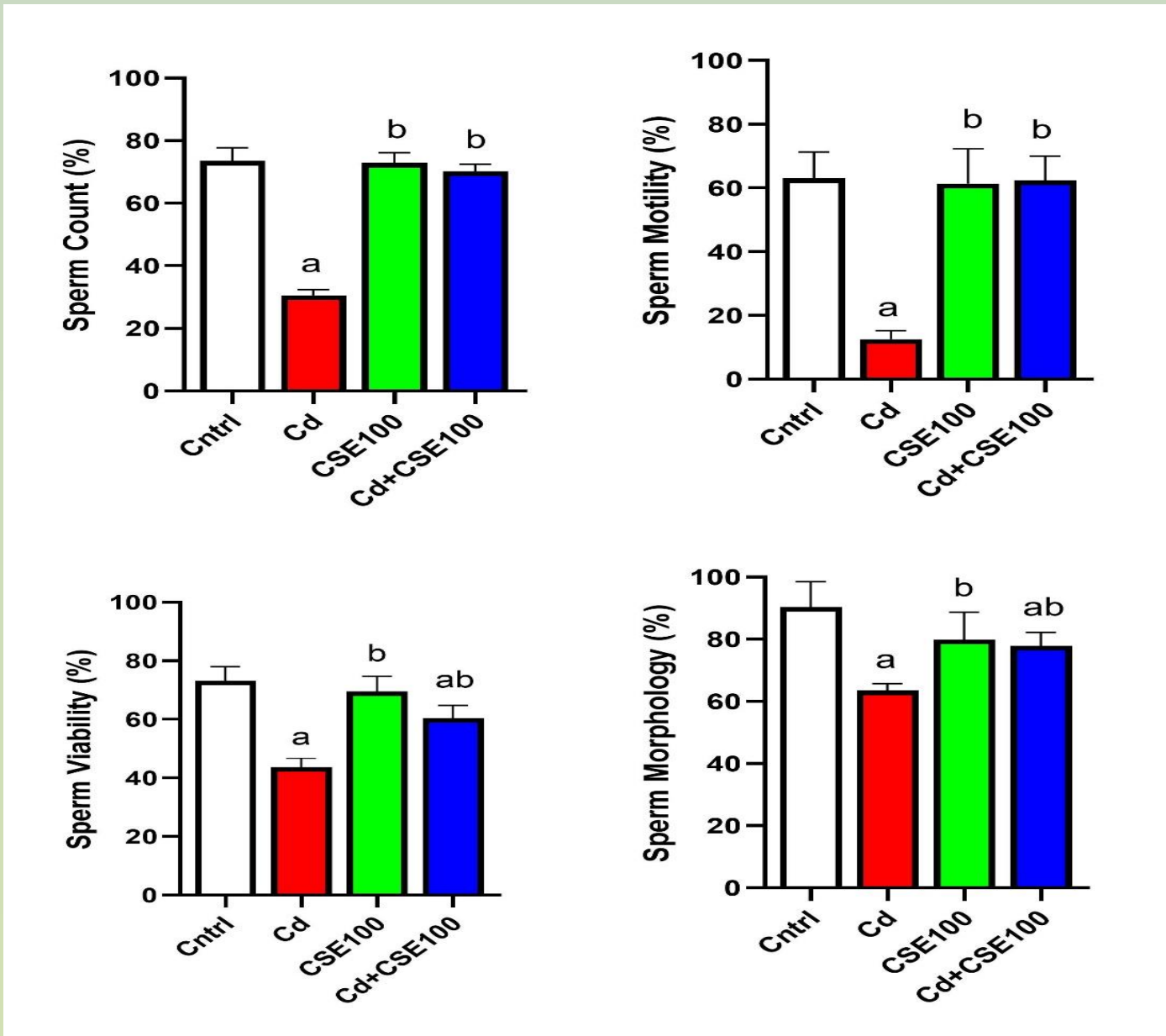
Collectively, administering CSE could potentially enhance testis function and semen parameters against chronic Cd exposure-induced reproductive toxicity, likely due to improving testosterone secretion and its antioxidant properties. The study provides evidence for CSE as a promising natural therapy against environmental pollutants-related reproductive toxicity and male sub/infertility.



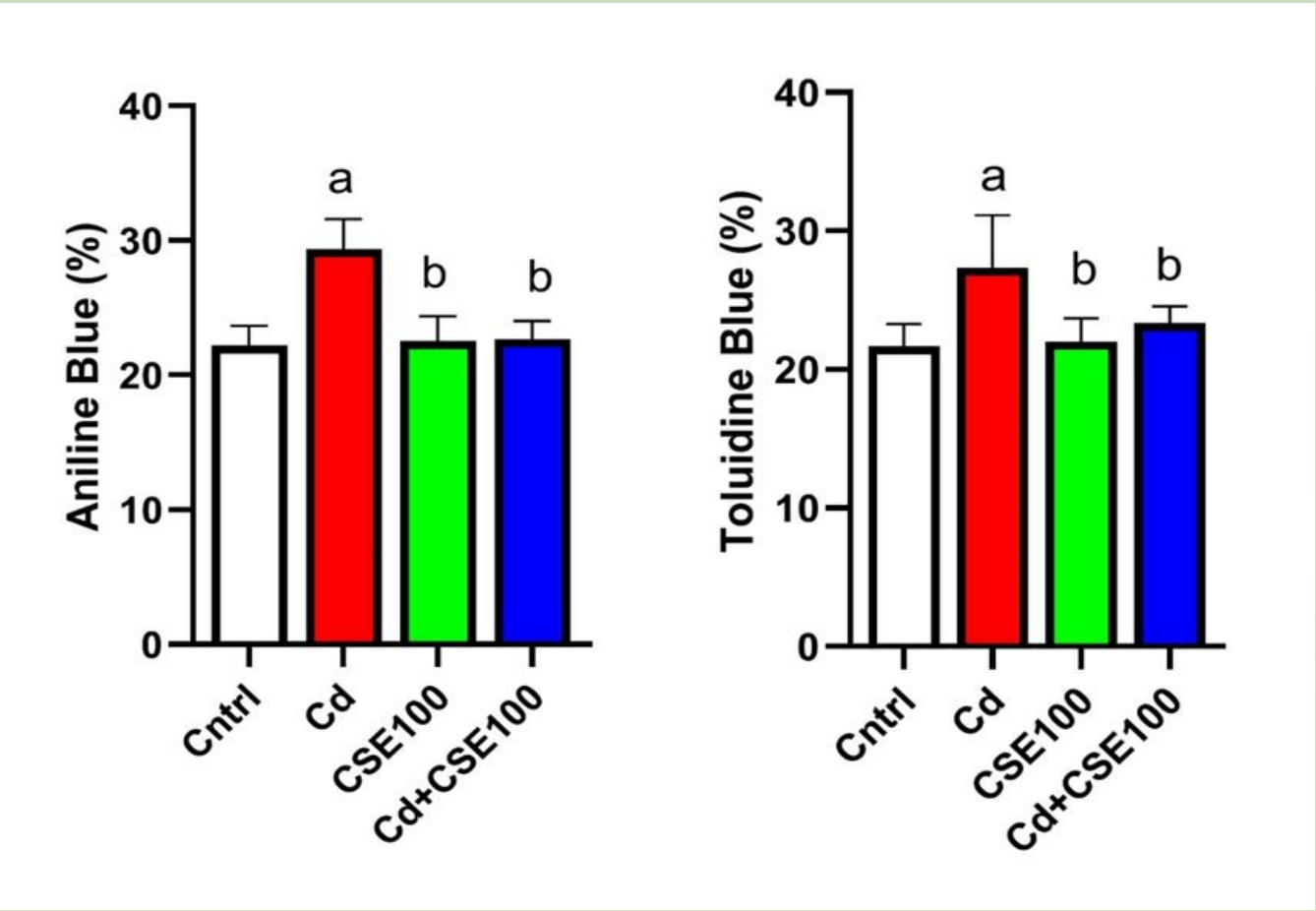
The effect of cadmium with or without carob extract on body weight gain (%) and testis weight (mg).



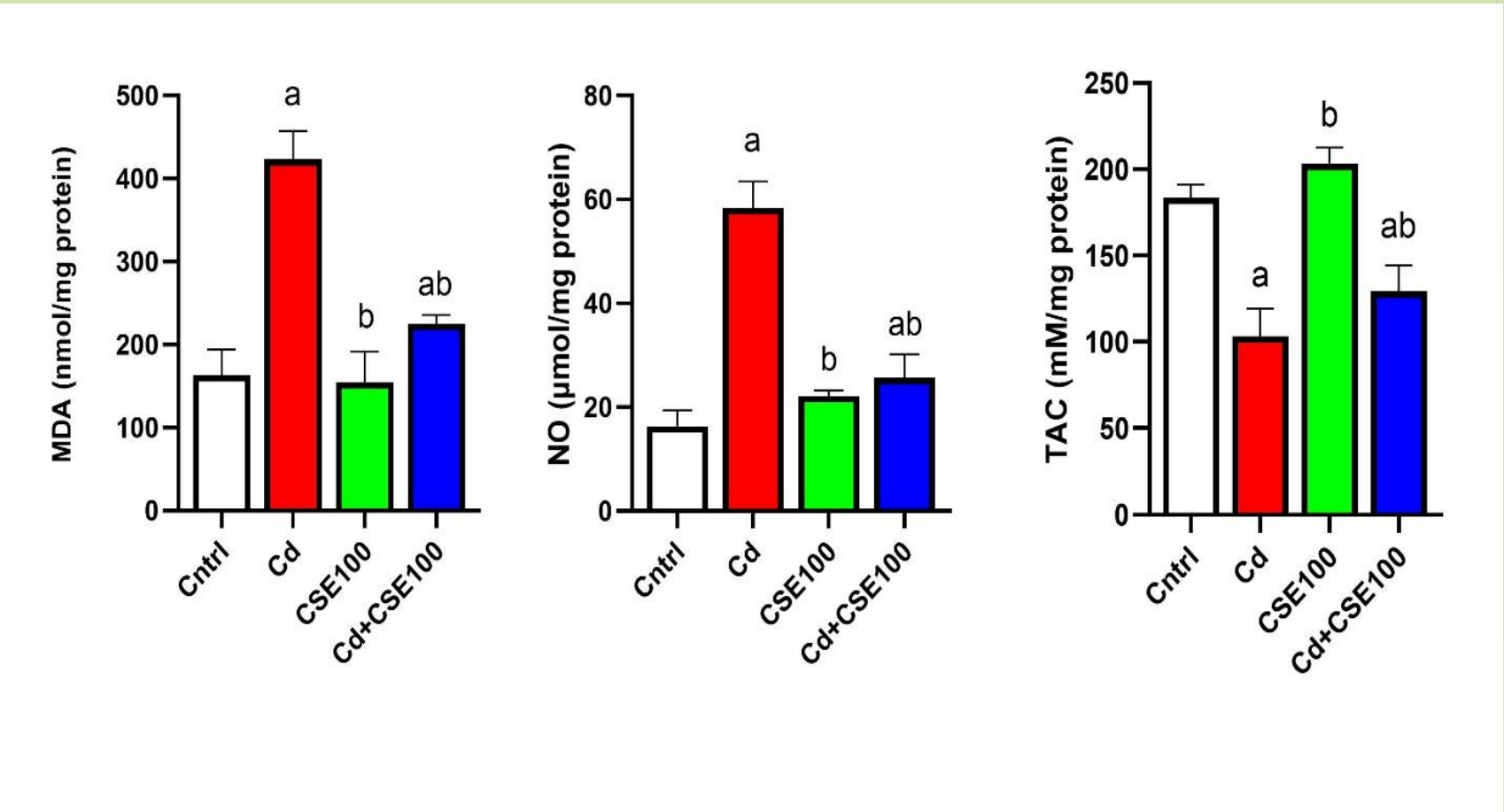
The effect of cadmium with or without carob extract on testosterone levels



The effect of cadmium with or without carob extract on sperm count, sperm motility, sperm viability, sperm morphology



The effect of cadmium with or without carob extract on the percentage of AB+ and TB+ sperm



The effect of cadmium with or without carob extract on malondialdehyde (MDA), nitric oxide (NO), and total antioxidant capacity (TAC)