

Antioxidative potential of *Flemingia praecox* in managing male infertility: A comparative study with *mucuna pruriens*

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In the fight against male infertility, which accounts for half of all infertility cases, oxidative stress plays a significant role. With the limitations of synthetic antioxidants, this study explores natural solutions, specifically examining the antioxidative capabilities of *Flemingia praecox*, as employed by tribal populations in India, against the established *Mucuna pruriens*.

Employing *in vitro* assays, this research assessed the total phenolic and flavonoid contents, alongside a spectrum of antioxidant activities (DPPH, FRAP, ABTS, DMPD) and DNA damage protection ability of both *F. praecox* root and *M. pruriens* seed extracts. The study extended to evaluate the inhibition of key male infertility enzymes, namely phosphodiesterase 5 (PDE5) and arginase, to provide additional insight into their therapeutic potential.

Notably, *F. praecox* roots demonstrated higher total flavonoid content, DPPH radical scavenging activity, total antioxidant activity (ABTS, DMPD assays), and PDE5 enzyme inhibition. In contrast, *M. pruriens* seeds exhibited superior outcomes in total phenolic content, ferric-reducing power (FRAP assay), and DNA damage protection. Compared to standard synthetic antioxidants, *F. praecox* antioxidative activity is promising.

The study concludes that *F. praecox* exhibits potential as an effective natural agent for combatting oxidative stress-induced male infertility, paralleled with the recognized benefits of *M. pruriens*. As this condition is increasingly tied to serious health issues, including metabolic disorders and hereditary implications, the results advocate for a deeper exploration into *F. praecox*'s clinical applicability in treating male reproductive conditions. These preliminary findings could herald a new avenue for plant-based remedy development, addressing not only fertility concerns but also broader health implications associated with oxidative stress. Further in-depth and clinical investigations are needed to confirm *F. praecox*'s usefulness and unlock its therapeutic mechanisms.

Keywords: Male infertility, oxidative stress, *Flemingia praecox*, *Mucuna pruriens*, antioxidants, traditional medicine, sperm health.