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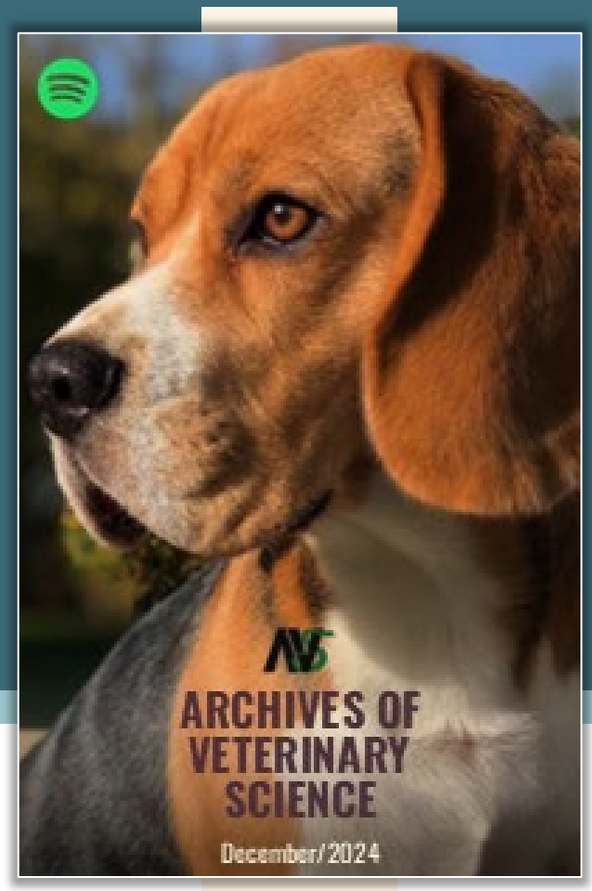

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Protective effects of melatonin against 2,2-dichlorovinyl dimethyl phosphate-induced reproductive toxicity in adult male Wistar rats

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Abstract: Organophosphorus compounds, particularly 2,2-dichlorovinyl dimethyl phosphate (DDVP), are widely used pesticides that can cause reproductive toxicity in animals. While various antioxidants have been studied to mitigate DDVP toxicity, the potential of melatonin (MLT) in preventing DDVP-induced reproductive toxicity remains underexplored. This study evaluated the fertility of melatonin-protected adult Wistar rats

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ABSTRACT

Organophosphorus compounds, particularly 2,2-dichlorovinyl dimethyl phosphate (DDVP), are widely used pesticides that can cause reproductive toxicity in animals. While various antioxidants have been studied to mitigate DDVP toxicity, the potential of melatonin (MLT) in preventing DDVP-induced reproductive toxicity remains underexplored. This study evaluated the fertility of melatonin-protected adult Wistar rats exposed to DDVP.

ABSTRACT

Sixty adult male Wistar rats were divided into four groups: control (0.2ml corn oil orally), MLT-treated (10 mg/kg intraperitoneally), DDVP-treated (1.6 mg/kg orally), and DDVP+MLT-treated (1.6 mg/kg DDVP orally + 10 mg/kg MLT intraperitoneally). The 45-day treatment regimen was followed by assessments at 24 h, and 14 and 45 days post-treatment. Blood samples were analyzed for hormone levels using ELISA. Sperm characteristics were evaluated using standard techniques, including Wells and Awa stains for morphology and Eosin-Nigrosin stain for viability.

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ABSTRACT

Results showed that chronic DDVP exposure significantly decreased testosterone and LH levels ($p < 0.05$), reduced sperm motility and viability ($P < 0.05$), and increased morphologically abnormal spermatozoa ($p < 0.05$) at 45 days post-treatment. Sperm abnormalities were primarily observed in the tails. Co-administration of MLT with DDVP significantly improved these parameters ($p < 0.05$), demonstrating its protective effects against DDVP-induced spermatotoxicity.

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ABSTRACT

No significant changes were observed in sperm morphometry or FSH and estradiol levels across all groups ($p>0.05$). Melatonin protects against DDVP-induced male reproductive toxicity in rats by improving hormonal profiles, sperm parameters, and morphology. The data suggest the potential of MLT as a protective agent against organophosphate-induced dysfunction. Further research is recommended to investigate melatonin's protective mechanisms and long-term effects.

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Keywords: Organophosphorus compounds, reproductive toxicity, spermatotoxicity, antioxidant protection

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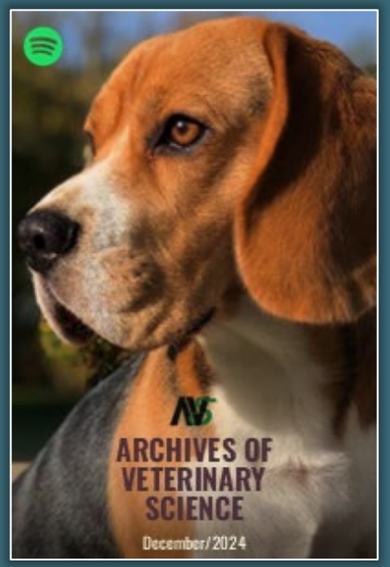
Overview of this study



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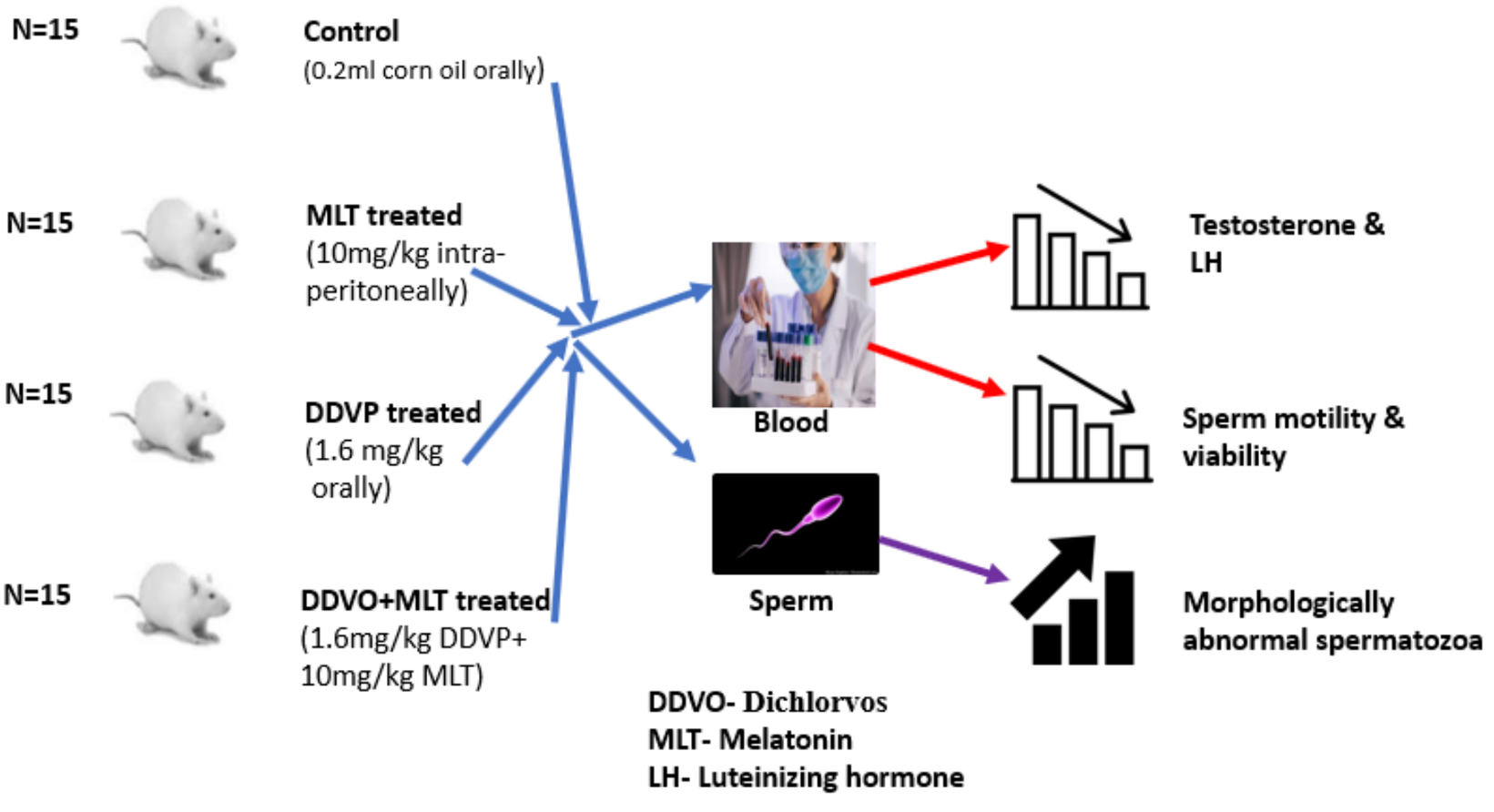

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CONCLUSION

Melatonin demonstrates significant protective effects against 2,2-dichlorovinyl dimethyl phosphate-induced reproductive toxicity in adult male Wistar rats, as evidenced by improved hormonal profiles, sperm parameters, and morphology. These findings suggest that melatonin has a protective action against organophosphate-induced male reproductive dysfunction.

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CONCLUSION

Therefore, they are suitable for consumption and commercialization. However, the lack of criteria for water activity and standard counts of mesophilic bacteria highlights the importance of determining parameters that represent the reality of stingless bee honey, both to help the producer market the product and to prevent fraud.

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CONCLUSION

Further research is recommended to investigate melatonin's protective mechanisms, optimize dosing regimens, and evaluate its long-term effects and safety. Studies should also explore melatonin's efficacy against other organophosphates and its potential use in occupationally exposed human populations.

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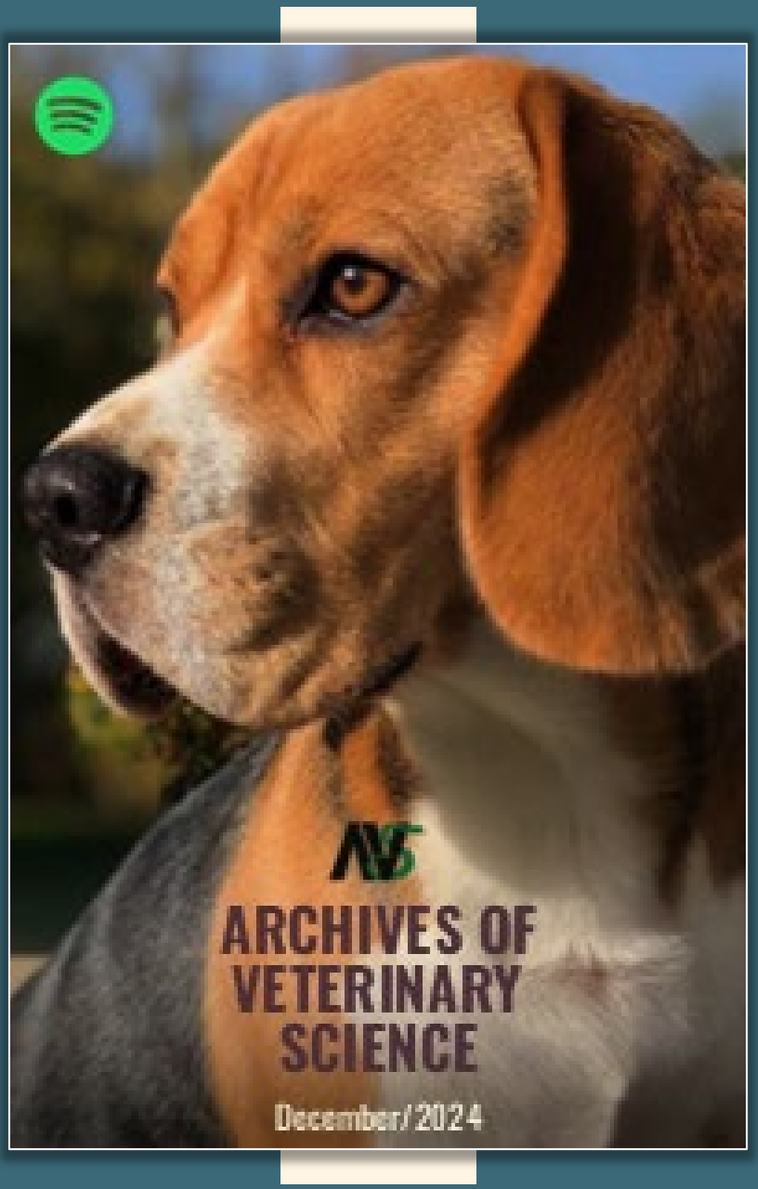

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