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Noni fruit juice reverses the adverse effects of 3-Methyl-4-Nitrophenol in rat spleen

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Noni plant is recognized for its antioxidant properties and broad therapeutic effects. 3-Methyl-4-Nitrophenol (PNMC) poses toxic effects on various organs. This study aimed to investigate the effects of PNMC, a substance to which both animals and humans are exposed through diesel exhaust particles and widely used pesticide fenitrothion, on the number of plasma cells in the spleen and also whether Noni could alleviate PNMC-induced spleen damage in rats by assessing spleen index, plasma cell counts, and levels of TNF-α and iNOS. Eight rat groups were treated with different doses of PNMC, either alone or combined with Noni, or only Noni, or vehicle (PBS with 0.05% Tween 80, s.c.) for five days. In histological analysis, plasma cells were counted in methyl green-pyronin stained sections, and TNF-α and iNOS levels were assessed immunohistochemically. PNMC exposure significantly reduced (P <0.001) plasma cell counts in the spleen, while Noni reversed this effect, particularly in the 10 mg/kg PNMC group. Noni caused a statistically insignificant decrease (P <0.05) in the TNF-α index in the 1 mg/kg PNMC group. A significant rise (P <0.001) in iNOS levels was observed in the 100 mg/kg PNMC+Noni group, while the 1 mg/kg PNMC+Noni combination significantly reduced (P <0.001) iNOS values. These findings indicate that the inflammatory response to PNMC and its modulation by Noni are dose-dependent. Notably, Noni restored plasma cell counts in inflamed spleen to levels comparable to the control group, suggesting its protective potential in PNMC-induced spleen damage.

Keywords: Diesel exhaust particles, Pesticide, *Morinda citrifolia*, Plasma cell, Rat, Spleen index