

RESEARCH ARTICLE

Evaluation of a natural compound extracted from *Dolichandrone atrovirens* as a novel antioxidant agent using *Caenorhabditis elegans*

Manoj Limbraj Yellurkar¹✉, Vibhavana Singh^{1,2}✉, Vani Sai Prasanna¹, Pamelika Das¹, Satheeshkumar Nanjappan³, Ravichandiran Velayutham^{1,2,3}, Somasundaram Arumugam^{1,2}✉

1 Department of Pharmacology and Toxicology, National Institute of Pharmaceutical Education and Research, (NIPER) Kolkata, Kolkata, West Bengal, India, **2** Department of Pharmacology and Toxicology, National Institute of Pharmaceutical Education and Research, (NIPER) Hajipur, Hajipur, Bihar, India, **3** Department of Natural Products, National Institute of Pharmaceutical Education and Research, (NIPER) Kolkata, Kolkata, West Bengal, India

✉ These authors contributed equally to this work.

✉ somasundaram143@gmail.com



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Abstract

The compound methyl cinnamoyl catalpol (DAM-1) was isolated from the methanol extract of *Dolichandrone atrovirens*. Studies have already reported the antioxidant activity of *Dolichandrone atrovirens* bark extract, but till date the antioxidant activity of the isolated compound DAM-1, remains unexplored. The endogenous process of reactive oxygen species generation which leads to various degenerative diseases, can be broken down using these exogenous moieties from plant origin, herein this study we sought to evaluate the antioxidant potential of the DAM-1 compound using *Caenorhabditis elegans* (*C. elegans*), which is the primary model to study the antioxidant activity of compounds. Cytotoxicity assay results showed that DAM-1 treatment in the concentration of 10, 25 and 50 µg/ml has shown 100%, 91%, and 50% survival respectively with overall $p < 0.0001$ (treatment v/s control group). 3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyltetrazolium bromide–Formazan (MTT) assay results showed that treatment had better survival rates than the control group at different time intervals i.e. 48 h, and 72 h with $p < 0.01$. *Mechanosensation (behavioral study) as well as in vivo study results showed that* at 0 h, 10 µg/ml of DAM-1 treatment showed a better anti-oxidative activity than the control group, 25 and 50 µg/ml of DAM-1 treated groups with $p < 0.001$ but at 2.5 h incubation with 10, 25, 50 µg/ml of DAM-1 showed an increased anti-oxidative activity than the control group with $p < 0.001$. Thermoresistance assay confirmed that the treatment group had more survival than control group with $p < 0.001$. Absorption study of DAM-1 in *C. elegans* has shown that the absorption of the drug increases up to 180 mins with a slight decrease after 360 mins and then constant absorption up to 1440 mins. This study paves the way towards the initiative to explore the pharmacological role of DAM-1 in various oxidative stress mediated diseases at molecular levels and the absorption study points out its potential role which could be utilized in the metabolomics and proteomics analysis of this compound in other studies.