

**POSTGRADUATE INSTITUTE OF SCIENCE
UNIVERSITY OF PERADENIYA
SRI LANKA**



**PGIS RESEARCH CONGRESS 2021
PROCEEDINGS
29th – 31st October 2021**

Copyright © 2021 by Postgraduate Institute of Science

All rights reserved. No part of this publication may be reproduced, distributed, stored in a retrieval system, and transmitted in any form or by any means, including photocopying, recording, or other electronic or mechanical methods, without the prior written permission of the publisher.

ISBN 978-955-8787-09-0

Published by

Postgraduate Institute of Science (PGIS)

University of Peradeniya

Peradeniya 20400

SRI LANKA

Printed by

Sanduni Offset Printers (Pvt) Ltd,

1/4, Sarasavi Uyana Goodshed Road,

Sarasavi Uyana, Peradeniya 20400,

SRI LANKA

Printed in the Democratic Socialist Republic of Sri Lanka

**PHYTOTOXICITY OF SOLVENT EXTRACTS FROM AN ENDOPHYTIC FUNGUS
ISOLATED FROM *Cardiospermum halicacabum***

**K. Samarakoon¹, D. Dissanayake¹, N.R. Amarasinghe², D. Yakandawala³, N.S. Kumar¹,
N.K.B. Adikaram¹, L. Jayasinghe^{1*}, H. Araya⁴ and Y. Fujimoto^{1,4}**

¹National Institute of Fundamental Studies, Kandy, Sri Lanka

²Department of Pharmacy, Faculty of Allied Health Sciences, University of Peradeniya, Peradeniya, Sri Lanka

³Department of Botany, Faculty of Science, University of Peradeniya, Peradeniya, Sri Lanka

⁴School of Agriculture, Meiji University, Kawasaki, Japan

*lalith.ja@nifs.ac.lk

Endophytic fungi are a promising source of bioactive substances. Naturally derived secondary metabolites from endophytic fungi may provide a source of environmentally friendly weedicides. This study investigated the phytotoxic activity of solvent extracts from an endophytic fungus isolated from fresh, mature leaves of *Cardiospermum halicacabum* (Sapindaceae) collected from the Central Province of Sri Lanka. Endophytic fungus KS/CH/F was isolated from triple sterilized leaf segments placed on potato dextrose agar (PDA). Pure fungal strains were cultured on a large scale in potato dextrose broth (PDB) medium for five weeks. The resulting culture broth was filtered, and broth and mycelium were separately extracted with Ethyl acetate (EtOAc). The freshly filtered broth was used for broth spraying assay for three-week-old cucumber (*Cucumis sativus*) plants, and observations were taken until seven days. The two EtOAc extracts were combined based on thin-layer chromatography and screened for phytotoxicity using lettuce (*Lactuca sativa*) seed germination inhibition bioassay and leaf puncture assay using two-week-old cucumber leaves. The combined EtOAc extract was subjected to column and thin-layer chromatography (silica gel column followed by Sephadex LH-20 and PTLC) to give seven compounds. Broth spraying assay showed wilting symptoms, and leaf necrosis appeared from day one of spraying and most of the plants were completely wilted by day three, with others having leaf necrosis. Leaf puncture assay for the EtOAc extract at 1000 mg L⁻¹ showed increased leaf necrosis from 24 to 72 h. The EtOAc extract showed 100% root inhibition and 99.2% shoot inhibition at 1,000 mg L⁻¹ with IC₅₀ value of 97.05 mg L⁻¹ and 241.46 mg L⁻¹ for root and shoot inhibition, respectively. Molecular identification of the fungus and structure elucidation of the isolated compounds are in progress. The present work has demonstrated that solvent extracts from this endophytic fungus show phytotoxic activity and could be used to develop eco-friendly weedicides.

Financial assistance from the National Research Council (Grant No. NRC/EWC/18-03) is acknowledged.

Keywords: *Cardiospermum halicacabum*, Endophytic fungi, Phytotoxicity