

Fall 2015

Impact of Invasive Species *Datura arborea* on Plant Species Richness In the West Usambara Mountains

Megan Foley

SIT Graduate Institute - Study Abroad, mfoley20@villanova.edu

Follow this and additional works at: http://digitalcollections.sit.edu/isp_collection



Part of the [Natural Resources and Conservation Commons](#), and the [Plant Sciences Commons](#)

Recommended Citation

Foley, Megan, "Impact of Invasive Species *Datura arborea* on Plant Species Richness In the West Usambara Mountains" (2015). *Independent Study Project (ISP) Collection*. Paper 2179.
http://digitalcollections.sit.edu/isp_collection/2179

This Unpublished Paper is brought to you for free and open access by the SIT Study Abroad at SIT Digital Collections. It has been accepted for inclusion in Independent Study Project (ISP) Collection by an authorized administrator of SIT Digital Collections. For more information, please contact digitalcollections@sit.edu.

Impact of Invasive Species *Datura arborea* on Plant Species Richness

In the West Usambara Mountains

Megan Foley

Villanova University

SIT Tanzania: Wildlife Conservation and Political Ecology

Fall 2015

Acknowledgments

I would like to begin by thanking Sokoine University of Agriculture and Mr. Kiparu for making our stay at Mazumbai possible. The forest is an inspiring, idyllic place that would not exist without their dedication.

Thank you to David and Richard, whose cooking and hospitality made our stay very enjoyable.

A big thank you to my forest guide, Juma. His machete and extensive knowledge of the forest made my work very easy. His enthusiasm and positive attitude made sampling plots a highlight of the day.

To the SIT Tanzania program, Baba Jack, and staff, thank you for the opportunity to study and learn in countless locations across the northern half Tanzania. Thank you for the time and effort you all put into preparing us for, and guiding us up to, ISP time.

To Dr. Adam Langley and Dr. Samantha Chapman at Villanova University for their enthusiasm, support, and advice on all of my research endeavors.

Abstract

Invasive species have the potential to alter the evolutionary trajectory of ecosystems and native species; however, our understanding of the community level effects of invasive plants remains poor. The Eastern Arc Mountain Chain is listed as one of the top 25 biodiversity “hotspots” of the world, yet also as one of the 17 most threatened tropical forest ecosystems worldwide. The primary threat to biodiversity in the EAM is accredited to human encroachment; however, the impact of invasive species in the EAM, and across Tanzania, remains poorly understood. National biodiversity and resource management policy do not directly address invasive species, and many institutions lack clearly defined long term strategies to address the issue. This study investigated the impact of an invasive species, *Datura arborea*, on plant species richness in the West Usambara Mountains in the Eastern Arc Mountain Chain. The species richness’ of plots of varying levels of *D. arborea* invasion were compared. A tight negative correlation was found between species richness and the extent of invasion (Fig 2. $y = -15.563x + 76$, $R^2 = 0.8599$). Tukey’s range test, in conjunction with ANOVA, showed mean species richness was reduced by 51.15% from uninvaded plots to highly-invaded plots; by 27.72% from uninvaded plots to low-invasion plots; and by 32.38% from low-invasion plots to highly-invaded plots ($p=0.0310$ Table 1, $q_{1,2,3}>26.98$ Table 2). Suppression of native species may be accredited to the quick growth strategy, as well as the ability to form homogenous stands, of *D. arborea*. In consideration of the exceptionally high endemism, biodiversity, and fragility of the West Usambara Mountains, this study calls for the monitoring of *D. arborea*, as well as decisive action on how national policy will directly address the issue of invasive species as a threat to the biodiversity of the biota in Tanzania.

Table of Contents

Acknowledgements	i
Abstract	ii
Introduction	1
Study Site	4
Methods	6
Results	7
Discussion	12
Limitations and Recommendations	15
Conclusion	17
Citations	18