A RAPD Assessment of Outcrossing and Invasion in Cheatgrass (Bromus tectorum)

Michael C. Ashley and William S. Longland
U.S. Department of Agriculture/Agriculture Research Service

Abstract

Cheatgrass (Bromus tectorum) is a self-pollinating exotic invasive annual weed that typically, but not always, outcrosses to seed established populations. The current report examines the absence of outcrossing is due to the absence of dioecy in the new population. The study was designed to assess self-fertilization rates and outcrossing in Cheatgrass populations and to determine if the absence of outcrossing is due to the absence of dioecy in the new population.

Material and Methods

We first screened six cheatgrass samples with Qiagen-Operon decamer primer kits A, F, and S. We then performed 30 additional primers in 30 combinations to look for polymorphic polymorphic loci. We exposed two null and two codominant marker bands, a data pruning strategy similar to that suggested by Lynch and Milligan (1994). We estimated diversity for the total population and the two blocks with lowest mean similarity in the middle block (Table 4). Between block mean similarity differed only slightly from the total, 0.783 ± 0.006 (n = 390).

Discussion

We found a large amount of genetic diversity in the native cheatgrass population sampled in the Big Horn Mountains study. The level of diversity was much greater than was previously reported for the species. This genetic diversity is important for the evolution of invasiveness in Cheatgrass populations. The estimated diversity for the total population and the two blocks with lowest mean similarity in the middle block (Table 4). Between block mean similarity differed only slightly from the total, 0.783 ± 0.006 (n = 390).

Introduction

Cheatgrass is a highly invasive annual grass that has spread across much of North America and Europe. The species was introduced to North America from Asia in the early 1900s (Mack 1981). Since its introduction, the species has spread rapidly and has become a major problem in many areas. The species has been shown to spread rapidly and has become a major problem in many areas. The species has been shown to spread rapidly and has become a major problem in many areas. The species has been shown to spread rapidly and has become a major problem in many areas. The species has been shown to spread rapidly and has become a major problem in many areas.