# INVESTIGATOR'S ANNUAL REPORT

**National Park Service**

**All or some of the information provided may be available to the public**

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| **Reporting Year:**<br>1993 | **Park:**<br>Shenandoah NP |
| **Principal Investigator:**<br>Steven Broyles | **Office Phone:**<br>(607)753-2713<br>**Email:**<br>n/a |
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**Additional investigators or key field assistants (first name, last name, office phone, office email):**

No co-investigators

**Permit#:**
SHEN1993AGQC

**Park-assigned Study Id. #:**
unknown

**Project Title:**
Hybridization in Sumpatric Milkweeds (Asclepias exaltata L. and A. syriaca L.)

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| **Permit Start Date:**<br>Jan 01, 1998 | **Permit Expiration Date**<br>Jan 01, 1998 |
| **Study Start Date:**<br>Jan 01, 1993 | **Study End Date**<br>Jan 01, 1994 |

**Study Status:**
Completed

**Activity Type:**
Other

**Subject/Discipline:**
Land Use / Forestry

**Objectives:**

The potential for hybridization between these species was assessed by:; 1) examining pollinators for pollen of both species; 2) quantifying effective pollen movement between the species, and; 3) quantifying the porduction of hybrid seed on plants of both species.

**Findings and Status:**

The dominant flower visitors of A. exaltata and A. syriaca were the Cabbage Butterfly [Pieris rapae (Linnaeus)], skipper butterflies (Family Hesperiidae), honey bees observed with pollinia. The insect pollintors were remarkably consistent visitors to one species of the other, but not both. For example, only 10.2% of the pollinia retrieved from honeybees foraging on A. exaltata came from A. syriaca flowers. Similarly, 3.6% of the pollinia retrieved from honeybees foraging on A. syriaca came from flowers of A. exaltata. Butterfly species appeared to be more flower constant on A. exaltata than A. syriaca. None of the pollinia collected from butterfiles on A. exaltata were from A. syriaca. However, 34.1% of the pollinia retrieved from butterflies foraging on A. syriaca came from flowers of A. exaltata. Overall, pollinaria mixing on pollinators of A. exaltata and A. syriaca was low as only 13.9% (58 of 416 pollinia) of the retrieved pollinia were from the wrong milkweed species.; Actual levels of pollen transfer between the species were much lower than expected. Only 3.1% of the pollinia retrieved from A. exaltata stigmas came from A. syriaca flowers. Similarly, only 2.3% of the pollinia retrieved from A. syriaca stigmas came from A. exaltata. Thus, the potential for hybridization may be reduced as flowers receive a lower level of interspecific pollen than is carried on insect pollinators.; Effective hybridization levels also appear low. We have not detected a single hybrid seed from the 432 seeds that have been analzyed. Hybridization between A. exaltata and A syriaca does occur in Shenandoah National Park. Several alleles that are diagnostic for A. syriaca have been detected in low levels (<5%) in Big Meadows and Lewis Mountain populations of A. exaltata (Broyles and Wyatt, 1993). In a previous study, 0.8% of the fruits collected from A. exaltata near Fisher's Gap contained hybrid seeds (Broyles et al, 1994). Even though reports of hybridization between these species are common, the actual levels of pollen transfer and effective hybridization are extremely low. These data indicate that pollinators discriminate between the milkweeds and that flowers may selectively receive pollen from the correct pollen species.

**For this study, were one or more specimens collected and removed from the park but not destroyed during analyses?**

No

| Funding provided this reporting year by NPS: | Funding provided this reporting year by other sources: |
|---|---|
| 0 | 3000 |
| **Fill out the following ONLY IF the National Park Service supported this project in this reporting year by providing money to a university or college** | |
| **Full name of college or university:** | **Annual funding provided by NPS to university or college this reporting year:** |
| n/a | 0 |