Floral Morphology And Reproductive Success In The Orchid

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To document geographic variation in floral morphology, ability to produce seeds through autogamy, and reproductive success in E. helleborine, we sampled 13 populations from three geographic regions along a latitudinal gradient of c. 1000 km from northern to southern Sweden. In the southernmost region, populations in dry and mesic habitats were compared.

Floral morphology and reproductive success in the orchid ...

We studied the variation on floral traits of Narcissus cyclamineus, a species endemic to the northwestern Iberian Peninsula. We analyzed the effect of different breeding systems and the degree of herkogamy and stigmatic exertion on female reproductive success. Results showed that, while variation on floral structures is relatively low (i.e. less than 25% for all sterile structures), CVs for ...

Floral morphology and reproductive success in herkogamous ...

Floral morphology and reproductive success in herkogamous. Narcissus cyclamineus (Amaryllidaceae) Asier R. Larrinaga Æ Pablo Guitia ´ n Æ. Jose Luis Garrido ´ Æ Javier Guitia n. Abstract We studied the variation on floral traits of Narcissus cyclamineus, a species endemic to the north- western Iberian Peninsula. Weanaly zed the effect of different breeding systems and the degree of herkogamy and stigmatic exertion on female reproductive success.

Floral morphology and reproductive success in herkogamous ...

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(PDF) Floral morphology and reproductive success in the ...

in reproductive success is related to variation in floral morphology (see Herrera 1993, and refer-ences therein).The results of the present study indicate that, in Petrocoptis grandiflora, flowers with larger petals are more likely to set fruit, and when they do, they produce more seeds than flow-ers with small petals. Similar results have been

Variation in floral morphology and reproductive success in ...

Variation in floral morphology and plant reproductive success in four Ipomoea species (Convolvulaceae) with contrasting breeding systems R. Delgado‐Dávila Escuela Nacional de Estudios Superiores, Universidad Nacional Autónoma de México, Morelia, Michoacán, México

Variation in floral morphology and plant reproductive ...

Floral rewards are expected to directlyin fl u encepollinatorbehaviorandconsequentlyaffe ctplant reproductivesuccess,eitherincreasing pollinatorvisitfrequencyor pollination quality. However, it is still not known, whether or not night-shelter as a reward for pollinators could indeed improve the plant's reproductive success.

Floral morphology and reproductive

biology of Dendrobium ...

The goals were twofold: (1) to conduct a survey of the floral and reproductive characters in the genus Acer with an emphasis on comparative floral morphometrics in A. ginnala Maxim., A. tataricum L., and their hybrid A. ginnala × tataricum and (2) present a compilation and phylogenetic inferences about the reproductive biology of Acer based on the literature. These three species were chosen for investigation because they are ideal set to determine the degree of intermediacy in vegetative ...

Floral morphology and reproductive biology in selected ...

Morphology of Flower Flowers are attractive, colourful and often fragrant structures of flowering plants. They are the primary reproductive organs of the plants. Let ’ s understand more about the flower structure and morphology.

Morphology of Flower: Flower Structure, Parts, Videos ...

The phenotype may affect the reproductive success directly (G ó mez, 2000; Strauss & Whittall, 2006; Lay et al., 2011), for example due to differences in pollen germination or pollen loss (Song et al., 2013), or indirectly, for example due to effects on flower visitor communities. However, our data do not allow separating direct effects of the plant's phenotype from indirect pollinator‐mediated effects on individual female fitness (i.e. seed set).

Time‐invariant differences between plant individuals in ...

References. Numerous experiments have suggested that in many species higher floral display can be more attractive for pollinators, but the possibility of between-flower self-pollination, namely geitonogamy may reduce the floral longevity, the fitness of both individuals and the offspring. In this study we investigated how phenological parameters (mainly floral display) change temporally and how they affect the female reproductive success of cymose Iris sibirica.

Flowering phenology, floral display and reproductive ...

in the highest reproductive success) should depend on the morphology and behaviour oflocalpollinators,andintraspeci fi cvariation in fl oral morphology has been found to be correlated with variation in the pollinator fa unainseveralplantspecies/taxa(e.g.Rob-ersonandWyatt1990,SteinerandWhitehead 1990,Galen1996,Johnsonetal.1998,Thomp-

Floral morphology and reproductive success in the orchid ...

Abstract. The relationships between floral morphology and the particular pollinator, flower shelter function and reproductive success as well as details of the breeding system of Dendrobium jiajiangense were investigated at Fotang Mountains in Jiajiang County, Sichuan Province, China. D. jiajiangense is pollinator-specific, being pollinated by Andrena parvula.

Floral morphology and reproductive biology of Dendrobium ...

ORIGINAL ARTICLE Floral morphology and reproductive success in herkogamous Narcissus cyclamineus (Amaryllidaceae) By . Abstract. Abstract We studied the variation on floral traits of Narcissus cyclamineus, a species endemic to the north-western Iberian Peninsula. We analyzed the effect of different breeding systems and the degree of herkogamy ...

ORIGINAL ARTICLE Floral morphology

and reproductive ...

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Floral Morphology And Reproductive Success In The Orchid

Floral morphology has been found to be important in reproductive success (e.g., Galen 1989;Herrera 1993; Guitian et al. 1997), pollinator specialization (Muchhala 2003) and isolation between plant...

Variation in floral morphology and reproductive success in ...

Floral Morphology And Reproductive

Success In The Orchid Author: www.delapac.com-2020-10-26T00:00:00+00:01 Subject: Floral Morphology And Reproductive Success In The Orchid Keywords: floral, morphology, and, reproductive, success, in, the, orchid Created Date: 10/26/2020 1:07:00 AM

Floral Morphology And Reproductive Success In The Orchid

Variation in floral morphology and plant reproductive success in four Ipomoea species (Convolvulaceae) with contrasting breeding systems. Delgado-D á vila R (1) (2), Mart é n-Rodr í guez S (3), Huerta-Ramos G (1).

Variation in floral morphology and plant reproductive ...

Reproductive System and Female Reproductive Success. During 2012, we selected 35 plants of D. strigosa and 20 of D.

oinochrophylla and marked five flowers on each plant. Each flower received one of the following pollination treatments: (1) apomixis, flowers were emasculated; (2) autonomous pollination, flowers were left intact; (3) hand-self-pollination, flowers were pollinated with pollen from flowers of the same plant (i.e., geitonogamous pollination); (4) hand-cross pollination, flowers ...

Studies in floral biology are largely concerned with how flowers function to promote pollination and mating. The role of pollination in governing mating patterns in plant populations inextricably links the evolution of pollination and mating systems. Despite the close functional link between pollination and mating, research conducted for most of this century on these two fundamental aspects of plant reproduction has taken quite separate courses. This has resulted in suprisingly little cross-fertilization between the fields of pollination biology on the one hand and plant mating-system studies on the other. The separation of the two areas has largely resulted from the different backgrounds and approaches adopted by workers in these fields. Most pollination studies have been ecological in nature with a strong emphasis on field research and until recently few workers considered how the mechanics of pollen dispersal might influence mating patterns and individual plant fitness. In contrast, work on plant mating patterns has often been conducted in an ecological vacuum largely devoid of information on the environmental and demographic context in which mating occurs. Mating-system research has been dominated by population genetic and theoretical perspectives with surprisingly little consideration given to the proximate ecological factors responsible for causing a particular pattern of mating to occur.

Flowering phenology and floral morphology are both directly tied to overall reproductive success of flowering plants. The match between pollinator abundance and timing of flowering can greatly affect plant fitness, and flower shape and size affect attractiveness of plants to pollinators. I measured quantitative genetic parameters for flowering time (date of first flower) and floral morphology in a polycarpic desert annual, Ipomopsis longiflora subsp. australis to determine the potential for these traits to respond to selection. Significant heritabilities and coefficients of genetic variation (CVA) were found for flowering phenology and most of the floral traits measured, indicating these traits can likely respond to natural selection in natural populations. Although significant genetic correlations were calculated between many of the floral characters to assess possible constraints on floral evolution, none were detected between flowering time and floral morphology. Flowering time did have a significant genotype-by-environment interaction (GxE) in response to greenhouse and field growing conditions, indicating that there is genetic variation in plasticity for flowering time in Ipomopsis longiflora. Plasticity in flowering time may be adaptive in Ipomopsis longiflora due to temporally varying selection pressures associated with differing growing and reproductive seasons faced in the desert southwest.

Recent studies have revealed remarkable complexity and diversity in orchid-pollinator relationships. These studies comprise a vast literature currently scattered in numerous, often obscure, journals and books. The Pollination Biology of North American Orchids brings together, for the first time, a comprehensive treatment of this information for all native and introduced North American orchids found north of Mexico and Florida. It provides detailed information on genetic compatibility, breeding systems, pollinators, pollination mechanisms, fruiting success, and limiting factors for each species. Distribution, habitat, and floral morphology are also summarized. In addition, detailed line drawings emphasize orchid reproductive organs and their adaptation to known pollinators. This, the first of two volumes, furnishes a brief introduction to the general morphology of the orchid flower and the terminology used to describe orchid breeding systems and reproductive strategies. It treats the lady’s-slippers of genus Cypripedium, subfamily Cypripedioideae, and nine genera of the subfamily Orchidoideae, including the diverse rein orchids of genus Platanthera. The Pollination Biology of North American Orchids will be of interest to both regional and international audiences including: Researchers and students in this field of study who are currently required to search through the scattered literature to obtain the information gathered here. Researchers and students in related fields with an interest in the co-evolution of plants and insects. Conservation specialists who need to understand both the details of orchid reproduction and the identity of primary pollinators in order to properly manage the land for both. Orchid breeders who require accurate and current information on orchid breeding systems. General readers with an interest in orchid biology. Charles Argue, Ph.D., is a plant biologist at the University of

Minnesota specializing in the study of pollen grains. His articles have appeared in numerous journals including the American Journal of Botany, International Journal of Plant Sciences (formerly Botanical Gazette), Botany (formerly Canadian Journal of Botany), Grana, Pollen et Spores, North American Native Orchid Journal, The Native Orchid Conference Journal, Fremontia, and as chapters in a number of books.

ABSTRACT: Among flowering plants, floral form is inherently linked to reproductive success and is therefore a key element in the evolution of angiosperm lineages. Variations in floral form and associated mating systems have demonstrated that flowers are well adapted in many cases to promote predominantly either outcrossing or self-fertilization among members of a given lineage. The focus of this work is to examine the developmental interactions and consequent effects on the morphology of two such flower types within individuals of Houstonia procumbens (J.F. Gmel.) Standl. (Rubiaceae). The two flower types in question are distylous and cleistogamous. Distyly is a form of heterostyly, wherein the reproductive organs of flowers in a given population are spatially separated (herkogamy) and arranged reciprocally to one another (reciprocal herkogamy) among individuals that represent two alternate morphotypes. Cleistogamy refers to the production of both flowers that open (chasmogamous) to interact with pollinators and flowers that self-pollinate precociously in bud (cleistogamous) on individuals of a given species. While both of these pollination syndromes, distyly and cleistogamy, appear to have arisen convergently, multiple times, across angiosperms both pollination syndromes apparently co-occur in only one species H. procumbens, an annual, herbaceous member of the coffee family (Rubiaceae). The goal of this work is to examine the interactions of these two pollination syndromes in H. procumbens by comparing the form and development of the various flower morphs (distylous morphs and cleistogamous flowers) of this species to those of closely related taxa that produce either distylous or cleistogamous flowers, but not both. The first chapter of my dissertation establishes the degree to which discoveries about the heterostylous, cleistogamous flowering plant species H. procumbens are applicable to other species. I use literature searches to establish that other species that are both heterostylous and cleistogamous are currently unknown, and I use phylogenetic inference and ancestral state reconstruction for the Rubiaceae to establish that heterostyly arose 27-36 independent times in the family and that the origin of heterostyly for H. procumbens occurred in an ancestor that produced at least 820 extant, descendent species. I also show that the joint probability of heterostyly and cleistogamy in angiosperm families, genera, and species is quite low, and the observed numbers of taxa in which the two co-occur at the ranks of family and genus (but not species) is greater than expected, though not significantly so. The second chapter addresses the effect of cleistogamy on reproductive organ reciprocity for H. procumbens. I use comparisons among close relatives to show that the overall reciprocity of H. procumbens changed little with the evolution of cleistogamy but that reciprocity in a close distylous relative, H. caerulea, was sufficiently low to qualify it as "style dimorphic" by some standards--a situation that I suggest calls into question the use of the reciprocity index for such distinctions. I also demonstrate that H. procumbens does not have a pollen size or staining dimorphism, as is seen in other heterostylous members of Houstonia, making assessments of disassortative pollen transfer difficult. The third chapter examines the chasmogamous and cleistogamous flower development of H. procumbens and chasmogamous flower development of H. caerulea. I demonstrate that differences in the rate of elongation of styles and corollas lead to the difference in stigma and anther heights seen in the two chasmogamous morphs of H. procumbens and H. caerulea, and that this dimorphism in growth rates is established early in development. Additionally, I show that there is a relatively small anther-stigma distance in the early stages of floral development of H. caerulea, which is unexpected, since one might expect this to be a developmental pattern that makes cleistogamy (e.g., as in H.

procumbens but not H. caerulea) evolutionarily simpler (by reaching sexual maturity in those earliest stages). Instead, I show that H. procumbens reduces the anther-stigma distance in its cleistogamous flowers by reaching sexual maturity when the corolla is short (and the anthers low) and by producing helical styles.

Examining the ecological processes generating evolutionary patterns is crucial to understanding how biodiversity arises and evolves. One of the most striking examples of evolutionary diversification is provided by the flowering plants (angiosperms) and their flowers. Pollinators are traditionally considered to be the most important selective agents and drivers of floral diversity. However, many angiosperms have a generalized floral morphology and are visited by a diverse and overlapping suite of pollinators, making it unclear how pollinators could have driven diversification in these taxa. In addition, flowers and plant reproductive success are likely to be influenced by factors other than pollinators, such as herbivores, precipitation, and temperature. These factors need to be considered along with pollinators in order to improve our understanding of angiosperm evolution and diversification. In my thesis, I focussed on the processes influencing adaptation and diversification in flowering plants in the genus Mertensia (Boraginaceae), which have relatively unspecialized flowers that attract a variety of nectar- and pollen-feeding insects. In Chapter One, I explored correlations among floral traits, vegetative traits, and flowering phenology across 12 Mertensia species. In Chapter Two, I assessed reproductive isolating barriers between related Mertensia species occurring in sympatry. In Chapter Three, I examined the ecological function of floral orientation in two Mertensia species with respect to pollinators and precipitation. First, across Mertensia species, I found that early-flowering species were shorter, produced fewer flowers, and occurred at higher altitudes than late-flowering species-suggesting a life-history trade-off between plant size and flowering phenology, as well as an altitudinal effect on both traits. Interspecific variation in floral traits was not strongly associated with variation in flowering phenology or plant size. Second, between sympatric M. brevistyla and M. fusiformis populations, I found weak reproductive isolating barriers and possible hybridization. Most pre-pollination barriers were weak, as the two Mertensia species shared similar habitats, flowering phenology, and pollinator assemblages. The two relatively strong barriers were floral (ethological and mechanical) isolation and post-pollination isolation: Pollinators transferred significantly more of a pollen analogue among conspecific than heterospecific plants in mixed-species arrays, and flowers yielded higher seed set when receiving conspecific rather than heterospecific pollen in hand-pollination experiments. Lastly, I found that floral orientation was more likely to be under selection by precipitation than by pollinators, in that paternal fitness (i.e., pollen germination) was reduced by contact with water and that pollinator-mediated selection via maternal fitness (i.e., seed set) was not detected. A more pendant floral orientation likely protects the relatively long and exposed anthers of M. fusiformis from rain, while the less pendant M. brevistyla does not require this protection because of its shorter, more concealed reproductive structures. Although I detected an effect of floral orientation on seed set, I was not able to identify the selective agents driving this effect. In summary, my results suggest that pollinators play a minor role in influencing floral adaptation and diversification in Mertensia. Instead, the dominant influences on the traits I examined appear to be life-history trade-offs, environmental conditions that vary along altitudinal gradients, and abiotic variables (e.g., precipitation). It is important to consider these factors and their influences on paternal and maternal fitness in order to gain a broader perspective on floral evolution in plants with generalized pollination systems.

Important breakthroughs have recently been made in our understanding of the cognitive and sensory abilities of pollinators, such as how pollinators perceive, memorize, and react to floral signals and rewards; how they work flowers, move among inflorescences, and transport pollen. These new findings have obvious implications for the evolution of floral display and diversity, but most existing publications are scattered across a wide range of journals in very different research traditions. This book brings together outstanding scholars from many different fields of pollination biology, integrating the work of neuroethologists and evolutionary ecologists to present a multidisciplinary approach.

Abstract: Plant morphology and pollination system can vary across time, and this can impact the overall reproductive success of a species. In this study, we looked at the reproductive biology of Phlox divaricata across two years and discovered that there was a difference in plant height between years, but not in floral display or flower size. The main pollinator was Lepidoptera in 2014 and Syrphidae in 2015. Preliminary

results indicate Phlox divaricata cannot self-fertilize and that across all years, Phlox divaricata is not experiencing pollen limitation. Our results indicate that this prairie species has a more generalist reproductive biology that is potentially robust to changing environmental factors.

The research reported in this paper explores various measures to maximize crop production through the effective use of pollinators. Methods used in the research primarily involve investigating bee activity & pollen dispersal within & between crop cultivars. Six projects are described that investigated the following: bumblebee (Bombus impatiens) pollination activity in tomato greenhouses covered by plastics having different optical properties; honeybee movement on flowers, and within & between trees, as well as gene flow & male reproductive success in high density apple orchards; honeybee pollination of field cucumbers; measurement of floral morphology of highbush blueberries to determine which cultivar would be most effectively pollinated by honeybees; pollination of squash & pumpkin by the hoary squash bee, Peponapis pruinosa; and a comparison of the red clover pollination efficiency of bumblebees, honeybees, and native bees under field conditions.