

Annotated Bibliography on the Ecology and Management of Invasive Species:

Daphne (Daphne laureola)

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Alonso, Conchita and Carlos M. Herrera, 1996.

Title: Variation in herbivory within and among plants of *Daphne laureola* (Thymelaeaceae): Correlation with plant size and architecture.

Source: *Journal-of-Ecology*. 1996; 84 (4) 495-502.

Language: English

Abstract:

1. Herbivory by noctuid moth larvae (Lepidoptera, Noctuidae) on plants of *Daphne laureola* L. (Thymelaeaceae) was studied under natural conditions in a south-eastern Spanish montane habitat. The main objective of the study was to determine how size and architectural features correlated with herbivory level (mean percentage leaf area removed by the end of the larval growth season) and herbivore load (mean number of caterpillars recorded per day) both among and within plants.
2. A significant correlation was found between herbivore load and herbivory level of individual plants. Herbivory levels differed widely (range = 0.1-12.8% leaf area) and were considerably smaller than those often used in artificial defoliation experiments.
3. Variation among plants in the incidence of noctuid larvae was directly related to the number of leaf whorls, and inversely to the mean basal diameter of stems. These responses to size and architectural traits may be explained by discrimination by ovipositing females.
4. Within plants, larvae preferentially selected leaf whorls having shorter supporting stems and lower branching orders. Movement costs may be reduced by larvae using plant architectural traits as cues for within-plant food selection.
5. The reasons for and potential implications of the different features used by adult noctuids discriminating between plants and by their larvae selecting leaf whorls are discussed.

Alonso, Conchita and Carlos M. Herrera, 2000.

Title: Seasonal variation in leaf characteristics and food selection by larval noctuids on an evergreen Mediterranean shrub.

Source: Acta-Oecologica. [print] July-October, 2000; 21 (4-5): 257-265.

Language: English

Abstract: Despite year round availability of foliage, abundance of generalist noctuid larvae (Lepidoptera: Noctuidae) in evergreen-dominated Mediterranean forests has a narrow, distinct spring peak. This restricted larval period has been suggested to result in part from avoidance of the nutritionally poor mature foliage, and preference for nutritionally superior spring-produced young leaves. This study examines this hypothesis by (i) documenting differences in nutritional characteristics between expanding (April) and mature (June) young leaves of the evergreen Mediterranean shrub *Daphne laureola* L. (Thymelaeaceae), and (ii) experimentally studying the feeding preferences of noctuid larvae for young leaves, old leaves (gtoreq 1 yr old), and developing fruits of this species in one south-eastern Spanish locality. Young leaves of *D. laureola* declined in nutrient concentration and specific dry mass from April to June. The responses of noctuid larvae, in terms of both relative preference and total consumption, to this seasonal variation in chemical and physical features of young leaves were also investigated. When noctuid larvae were simultaneously offered young leaves, old leaves and developing fruits, they exhibited similar preferences for young leaves and developing fruits, and rejected old leaves developed during the previous year. Noctuid larvae did not modify their consumption of young leaves relative to old leaves and developing fruits in response to seasonal changes. Food selection patterns exhibited by *D. laureola* noctuid herbivores, notably the rejection of old leaves in favour of young ones, are consistent with the hypothesis relating restricted larval periods of these generalist consumers with the low food value of the previous season leaves of evergreen Mediterranean plants.

Percival, Joe, 1997.

“In response to a Spurge-laurel scourge: A restoration proposal for Witty’s Lagoon Park.” Paper for the Restoration of Natural Systems Program, University of Victoria. ER312.

Abstract: *Daphne laureola* (Spurge laurel) is an invasive woody shrub, is of particular concern to the CRD Parks. Little specific information is known about the ecological impact of this plant within the Coastal Douglas-fir biogeoclimatic zone. A full park survey was done to map the relative densities of *Daphne laureola* and three vegetation plots (two heavily infested, one lightly infested) were surveyed. Heaviest concentrations of the shrub were found to occur in the Whitney-Griffiths Point Area, an archaeological resource site, and along Ruby Creek in sites northwest of the Point. All are within, or adjacent to, areas classified as Zone 1 (Special Preservation). Species lists

from the three survey plots reflect typical Douglas-fir ecosystem plant assemblages. In these experimental plot designs, trials of manual eradication and enhancement by native plantings are recommended. Areas of less dense invasion and of less sensitive nature (e.g. outside of known and potential archaeological sites) are suggested as immediate target areas for uprooting and clipping. These experimental procedures should produce data for eventual full park restoration and control of this Spurge laurel scourge.

Percival, Joe, 1999.

“Riddin’ the Midden of an Unbidden: A Thymelaeaceous Threat, Cultural History and Ecorestoration in a Regional Park.” Paper for the Restoration of Natural Systems Program, University of Victoria. ER 390 Final project.

Abstract: In a follow-up to a 1997 proposal for control and eradication of *Daphne laureola* (an exotic Eurasian shrub) at Witty’s Lagoon Regional Parks, Metchosin BC, a hands-on winter program of both uprooting and deflowering was undertaken in February and March of 1999. Project planning followed a five-stage process of restoration work based on the methodology of Nuzzo and Howell (1990) and consisted of: 1) site analysis, 2) development of objectives, 3) design development, 4) Implementation and scheduling, and 5) Monitoring. Based on the original site analysis and updated concerns, site-specific objectives were determined, aimed at the control and eradication on a locally well known midden site and its intermediate buffer zones, as well as a complementary public education initiatives. Initial monitoring of treated sites indicates a modest increase in the spread of several natives species (e.g. *Rubus ursinus*, *Gaultheria shallon* and *Satureja douglasii*) and a long term monitoring /control program based on a volunteer restoration team approach is now in process. As well, a cottage industry component demonstrating a positive use for uprooted plants was woven into the project. Through such a multi-levelled design, an effort of maximum practicality, efficiency and ecocultural integrity has hopefully been begun leading to the eventual expulsion of *Daphne laureola* from this park, thereby protecting regionally significant ecological and cultural values.

Useful Web Sites

www.natureweb.cwc.net/daphne.html

pictures of *Daphne laureola*

<http://museum.government.ns.ca/poison/daphne.htm>

from Province of Nova Scotia Museum. General information on *D. laureola*, especially poisons.

www.biologie.uni-ulm.de/systax/dendrologie/Daphnlurfw.htm

Author Frederic Tournay. Picture and description.

www.scs.leeds.ac.uk/cgi-bin/pfaf/arr_html?Daphne+laureola

Author Plants For A Future, United Kingdom. Information on range, habitats, medicinal uses, cultivation etc.