

## Resource allocation of chilean herbs in response to climatic and microclimatic factors

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### Abstract

Resource allocation to aerial vegetative, underground vegetative, and reproductive biomass is studied in four Chilean herbs: the annuals *Chaetanthera ciliata*, *Erodium cicutarium*, *Trisetobromus hirtus*, and the perennial *Solenomelus peduncularis*. Absolute (weight), and relative (% vegetative/total, % root/shoot) changes in biomass were determined in relation to concomitant changes in a climatic (rain regime in two subsequent years) and a microclimatic factor (spatial distribution of herbs, whether under or between shrubs). In regard to the climatic factor, taking as basis the normal rainfall year, our results can be summarized as: 1) All herbs studied exhibit greater production in the rainy year. This is accounted for by increases in the biomass of all herbs' fractions, i.e. in aerial vegetative, underground vegetative and reproductive. 2) All annuals exhibit greater vegetative fractions (i.e. smaller reproductive fractions) in the rainy year. The perennial does not change its vegetative: reproductive balance. 3) Herbs studied exhibit contrasting responses to rainy year concerning root/shoot ratio: *C. ciliata* increasing it, *E. cicutarium* decreasing it, *T. hirtus* and *S. peduncularis* not changing it. In regard to the microclimatic factor, taking as basis the patterns exhibited by *T. hirtus* and *S. peduncularis* under shrubs, our results can be summarized as: 1) Both species exhibit smaller production in exposed areas between shrubs, whether in the rainy or normal year. 2) *T. hirtus* does not change its vegetative fraction between shrubs neither in the rainy nor in the normal year. *S. peduncularis* exhibits a smaller vegetative fraction (i.e. greater reproductive fraction) between shrubs only in the normal year. 3) Neither species change its root/shoot ratio between shrubs, neither in the rainy nor in the normal year. Results obtained are interpreted on basis of the theory of life-history strategies.