

EPIPACTIS HELLEBORINE - UPDATE ON A LONG TERM STUDY

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Samenvatting

In aanvulling op eerdere publicaties besteedt de auteur aandacht aan de geringe vruchtzetting in de onderzochte populatie en aan het slechte kiemen van zaden *in vitro*. De populatie lijkt voor haar voortbestaan afhankelijk van het inwaaien van zaden uit nabijgelegen populaties. In een tabel worden de jaarlijkse aantallen nieuwkomers en de afwijkingen van de gemiddelde neerslag weergegeven.

Zusammenfassung

Als Ergänzung zu früheren Veröffentlichungen beschreibt die Autorin die geringe Frucht-bildung in der untersuchten Population und die schlechte Samenkeimung *in vitro*. Die Population scheint für ihren Erhalt abhängig vom Einwehen von Samen aus benachbarten Populationen. In einer Tabelle werden die jährlichen Zahlen der Jungpflanzen und die Abweichungen vom durchschnittlichen Niederschlag gezeigt.

We began our long term study of *Epipactis helleborine* in Gatineau Park, Québec, Canada, in 1985. Data collection methods at the 135 sq m dry, upland forest Site 1 have been previously described (Light & MacConaill, 1991a, 1991b, 1994). All annual recruits and re-emergents have been labelled, mapped and scored as flowering or non-flowering plants and as to the number of leaves, flowers and fruits. The study has revealed some interesting aspects of this species and its behaviour within the environment. Our observations suggest that under the drier habitat situation of Site 1, individual plants are essentially monocarpic (M. H. S. Light, unpublished data). More than 60 percent of plants emerged one time only over 14 years of observation (1985-1998) (n = 1368).

Persistence of an orchid population is dependent upon seed production over the long term. The population at Site 1 was at its highest in the mid 1980's but has since decreased for reasons yet to be determined (Table 1). Flowering plants at this site rarely produce seed capsules that reach dehiscence because of loss to predation or drought. Seeds sampled from this population have not germinated *in vitro* whereas seeds from plants at other nearby but seasonally damp sites germinate readily under the same *in vitro* conditions (Light, 1995; Light & MacConaill, 1998). We suspect that seeds from other populations are likely the ones contributing to the recruitment at Site 1. The study of molecular genetics of this population has suggested that the diversity rests with the population and not with a few individuals (Squirrell *et al* in press). The low number of

recruits in recent years in Site 1 may actually reflect the lower emergence and flowering observed in nearby colonies known to produce germinable seeds. Why these plants have emerged in fewer numbers could be related to seasonal precipitation patterns or some other factor(s).

TABLE 1 - Number of new recruits of *Epipactis helleborine* appearing over 16 years in Site 1, Gatineau Park, Québec, Canada

YEAR	RECRUITS	DEVIATION FROM AVERAGE PRECIPITATION*
1985	231	-22.8
1986	83	297.3
1987	212	37.7
1988	123	43.6
1989	96	-14.2
1990	89	77.2
1991	134	-133.3
1992	119	57.6
1993	61	40.8
1994	46	87.2
1995	47	136.7
1996	54	149.2**
1997	32	-33.4
1998	41	18.3
1999	42	18.1
2000	21	13.8

* Deviation from seasonal precipitation (463 mm) as recorded at Ottawa International Airport, May 1 to Oct 31.

** A localized torrential rainfall of 130 mm in one day was not recorded at the airport but has been added here.

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