

Self-compatibility and spontaneous fruit set in some *Epipactis* species

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In *Epipactis*, species are considered either allogamous or autogamous according to the possibility of the pollen to fall on stigma without action of pollinator (presence of rostellum as barrier, compactness of pollinium). Several autogamous species are presumed to be derived from the widely distributed *E. helleborine* considered as allogamous species. In order to test the influence of mating system on reproductive success, we have compared effects of selfing and outcrossing on fruit set, fruit weight and embryo size in several allogamous species. Allogamous species could be sensitive to inbreeding.

Flowers of the considered allogamous species *Epipactis helleborine*, *E. palustris*, *E. atrorubens* and *E. purpurata* have been emasculated (Fig. 1), and then selfed or outcrossed with pollen collected in the same stand or from another stand. Flowers were then individually protected by a net (tissue with stitch of about 0.7 mm, Figs. 2 and 3). Inflorescences were also protected by a net (Fig. 4). Mature fruits and seeds have been observed. The presence of embryos and their size were determined with light microscopy.

Whatever the species, flowers did not produce fruits when they were protected from pollinators by a net. No significant difference in fruit set was recorded between selfing and outcrossing (Table 1). A limited success of controlled pollination has been recorded in *E. purpurata*, probably because of pollen quality. Fruit weights were not significantly affected by the type of pollination. Few empty seeds have been recorded. Embryo size (Fig. 5) did not vary significantly according to the pollen source. In these presumed allogamous species, no effect of selfing has been recorded.

Further studies are needed to determine if selfing could have late influence on seed and plant development.



Figure 1
 Emasculated and then pollinated flower of *Epipactis palustris*



Figure 2
 Inflorescence of *E. helleborine* with flowers protected by nets after controlled pollination



Figure 3
 Inflorescence of *E. palustris* with flowers protected by nets after controlled pollination



Figure 4
 Inflorescence of *E. palustris* protected by a net after controlled pollination

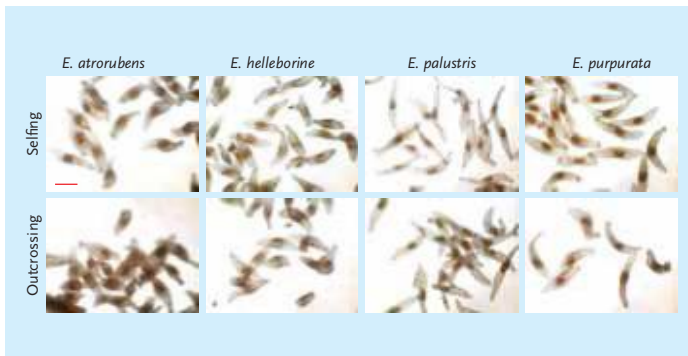


Figure 5
 Seeds of *Epipactis* species obtained after self-pollination and controlled crosses (bar represents 500 μ m)

Table 1
 Reproductive success of selfing (S) and outcrossing (O) in some *Epipactis* species

	<i>E. atrorubens</i>		<i>E. helleborine</i>		<i>E. palustris</i>		<i>E. purpurata</i>	
	S	O	S	O	S	O	S	O
Fruit set (%)	80	90	71	74	73	76	28	14
Fruit weight (mg)	30	26	24	20	18	22		
Embryo width (μm)					83	79		
Embryo length (μm)					140	136		

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