VERSITA

Cent. Eur. J. Biol. • 8(1) • 2013 • 78-86
DOI: 10.2478/s11535-012-0114-4

Central European Journal of **Biology**

Testing achene germinationof *Potamogeton praelongus* Wulfen

Research Article

Romana Prausová[1,*], Jana Janová[1], Lenka Šafářová[2]

[1]*Department of Biology, Faculty of Science, University of Hradec Králové, 500 02 Hradec Králové, Czech Republic*

[2]*East Bohemian Museum in Pardubice, 530 02 Pardubice, Czech Republic*

Received 14 May 2012; Accepted 14 September 2012

Abstract: The goal of this work was to determine the best method of breaking the achene dormancy in *Potamogeton praelongus* Wulfen. The ways of breaking achene dormancy studied in this experiment included methods of achene storage, stratification, UVA radiation, anaerobic conditions, mechanical disruption of achenes´outer layers and their chemical disruption by NaClO. Nine different treatments of achenes were combined with two methods of achene storage. Particular achene treatments and storage conditions were proven to have a significant impact on breaking dormancy. Although the highest germination rate (83.3%) was achieved when the dormancy was broken chemically by long effect of 100% concentrations of Savo detergent (containing 5% NaClO), the growth of the sprouts was subsequently inhibited due to toxic effects of Savo. Thus the most successful treatment was based on changing temperature, e.g. 2.5 months of cold storage followed by 14 days at room temperature (germination rate 32.7%). This treatment was also most similar to the natural process. Germinated achenes were also found in Petri dishes exposed to UVA radiation, anaerobic conditions and chemical disruption of the outer layers. Results of these treatments were influenced by the storage method.

Keywords: *Dormancy of achenes • Potamogeton praelongus • Germination tests*

1. Introduction

Potamogeton praelongus is a rare plant all over the world. It is found in northern, mildly suboceanic and circumpolar regions. It grows primarily in the northern part of Europe and in similar latitudes in Asia and North America [1]. In the Czech Republic it is considered critically endangered and currently is only found in two rather poor micropopulations in oxbows of the river Orlice near Hradec Králové [2].

The vegetative season of *P. praelongus* starts in April when overwintering shoots begin to regenerate. The flowering period is from late May to June. Fruiting shoots subsequently die and new sterile shoots grow again. At the end of the vegetation season, sterile shoots are about 0.5-0.6 m long, have living leaves and are prepared to survive cold conditions during the winter (Prausová unpublished data). They also form special apical overwintering buds on rhizomes. Apical buds are yellow and conical (banana-shaped). They are dormant storage organs that can survive and elongate under anoxia for a certain period, showing extremely strong tolerance to anaerobic conditions [3]. *P. praelongus* reproduces almost exclusively through vegetative reproduction. In the natural process, achenes are probably only used for colonisation of new sites. Achenes of *P. praelongus* are dark green, elliptic or obovate with a sharp dorsal keel, and their length is 4.5–5.8 mm [2]. Genus *Potamogeton* has a macropodous-linear embryo [4]. It does not contain an endosperm so food reserves are stored in a greatly enlarged hypocotyl [5,6]. Germination of the genus *Potamogeton* is limited primarily by dormancy. Its low germination potential can be overcome by scarification or stratification [7]. Passage of achenes through the digestive tract of aquatic birds may also facilitate

* *E-mail: R.Prausova@seznam.cz*