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# JALASE VILLAGE RESERVE – A PROSPECTIVE AREA FOR BRYOPHYTE CONSERVATION IN ESTONIA

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**SUMMARY** — *Jalase Village Reserve, founded in 1990, is situated in Rapla county in western Estonia. This region has been settled for more than 2,000 years, and the reserve was established to ensure the continuity of this ancient natural lifestyle. The area of the reserve is 4093 ha, but the richness of the flora in this relatively small area is due to the diversity of habitats. In all, 207 species, or 40 % of all Estonian bryophyte species, have been recorded there. Eight of these species are very rare, being found at only 1-3 localities in Estonia: Anastrophyllum hellerianum, Bartramia pomiformis, Bryum funckii, Campylium halleri, Orthotrichum stramineum, Orthotrichum tenellum, Saelania glaucescens and Weissia squarrosa.*

**KEYWORDS** — *Bryophyte conservation, Estonia, rare species, mosses, hepatics*

**ZUSAMMENFASSUNG** — *Das Reservat 'Dorf Jalase' – Ein zukünftiges Gebiet für Mooschutz in Estland*

*Das 1990 gegründete Reservat 'Dorf Jalase' liegt in der Provinz Rapla im Westen von Estland. Dieses Gebiet ist seit über 2'000 Jahren besiedelt, und das Reservat wurde eingerichtet, um die Kontinuität einer natürlichen Lebensweise sicherzustellen. Die Fläche des Reservates beträgt 4'093 ha; aber dieses relativ kleine Gebiet verdankt seine reiche Flora der Vielfalt an Lebensräumen. Im ganzen wurden bisher 207 Arten oder 40% der estnischen Moosflora nachgewiesen. Acht dieser Arten sind sehr selten, indem sie in Estland nur von einem, zwei oder drei Fundorten bekannt sind: Anastrophyllum hellerianum, Bartramia pomiformis, Bryum funckii, Campylium halleri, Orthotrichum stramineum, O. tenellum, Saelania glaucescens und Weissia squarrosa.*

## 1. Introduction

Jalase is a small village, surrounded by woodlands and bogs, which is situated in Rapla county in western Estonia. Jalase Village Reserve was established in 1990 with the aims of: preserving the village landscape which reflects the history of settlement and land exploitation of the alvar<sup>1</sup> forest area during nearly two thousand years; protecting objects and sites having ethnographical, archaeological, geological or biological significance; ensuring the continuity of ancient natural lifestyle through environmental education and through promotion of popular knowledge about the nature of the village and the surroundings (Heinsalu & al. 1994).

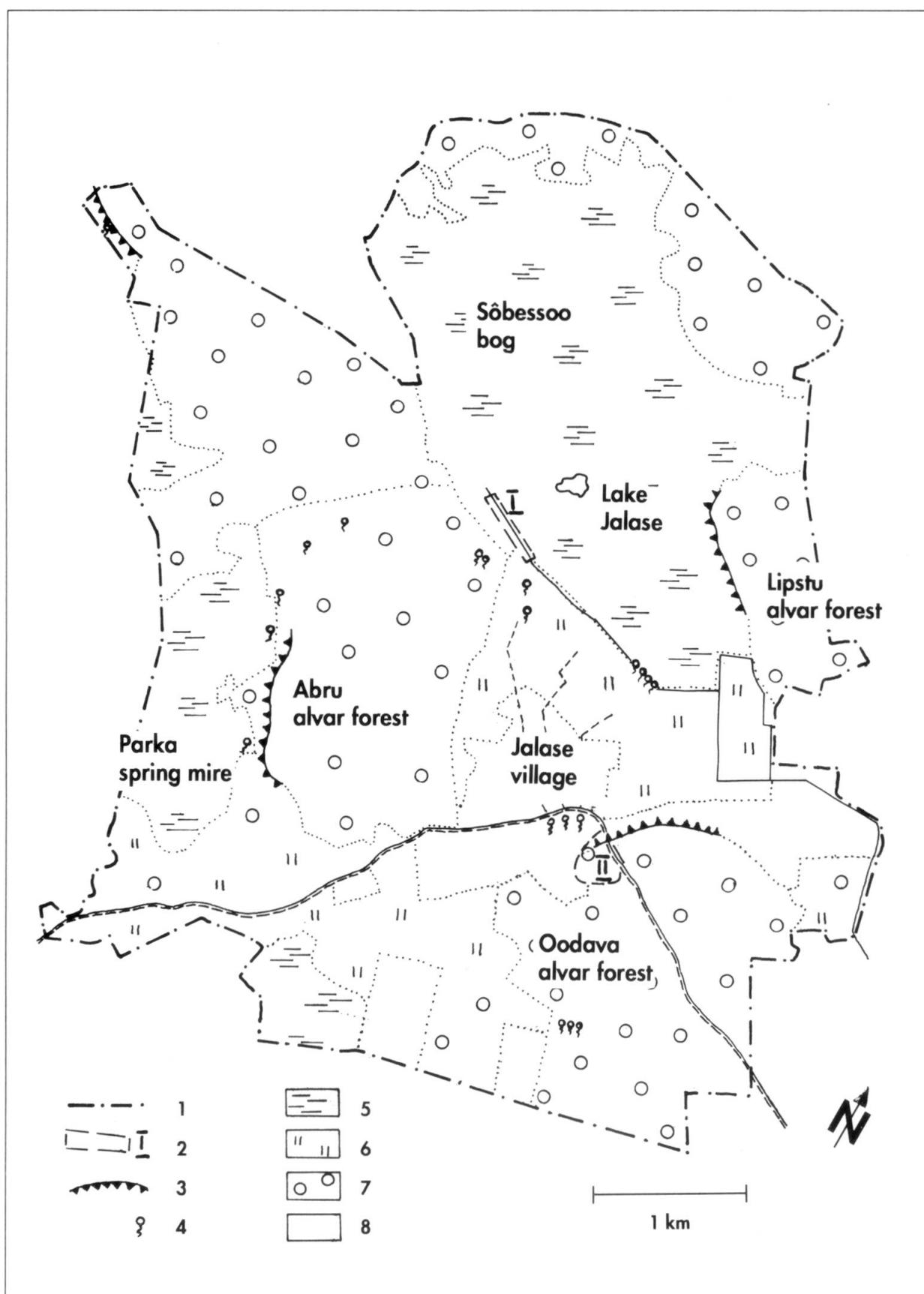
### 1.1. Jalase village

The old village lies only 5 km from Varbola-Jaanilinn, the most imposing hillfort in the Baltic countries, and at an important east-west road. It was one of the most significant settlements of western Estonia (Tamla 1992). Archaeological finds, cult stones and graves found in the village allow us to date the site age back to the first millennium B.C. Small stone heaps marking ancient fields are also present in Abru forest. The first written record of Jalase dates back to 1241. Obviously the ancient village landscape and layout, including radial lanes leading to the springs, have been maintained up to now. The decline of rural life and settlement of the countryside began in the 1940's. There are now 14 permanent and 12 summer houses in the village.

### 1.2. Landscape

The reserve is situated in the southern part of the North-Estonian plateau. It belongs to the Märjamaa region of limestone plateaus and moraine plains, alvar forests and fields (Varep

<sup>1</sup> Alvars are landscapes characterized by thin soil on Silurian and Ordovician carbonate rock and by pastures and forest.



**MAP.** Jalase Village Reserve. 1 = border of reserve, 2 = planned microreserve for bryophytes, 3 = cliff, 4 = spring, 5 = mire, 6 = meadow, 7 = forest, 8 = field.

1976). The area of the reserve is 4093 ha, of which only 290 ha are fields and grasslands. There are several elevated areas of base rock up to 1.5-2 km in diameter consisting of Silurian limestone which are covered by very thin Quaternary sediments (0.1 - 0.5 m). The soils are mainly rendzic leptosols on limestone and till. The limestone outcrops at the highest point. In places these elevated areas are characterized by well-developed karst features, narrow cavities and hollows. Numerous steeply sloping karst depressions, locally called 'abrud', were probably formed before the Ice Age (Heinsalu 1991; Heinsalu & al. 1994). They may be permanently dry, or seasonally dry with swampy temporal water bodies or springs. Steeper slopes form cliffs at the border of the elevations, up to 1.5 m high, with erratic boulder fields which mark the former coastline of the Baltic Ice Lake (ca 10,000 years ago). Nowadays these elevated areas are mainly covered by alvar forests, such as Abru (420 ha), Oodava (370 ha) and Lipstu forests. They are surrounded by swamp forests which grade into fens and raised bogs, namely Sõbessoo (the largest one, covering 1738 ha), Parka spring mire and Kõrvetaguse bog (belongs partly to the reserve). Sõbessoo has a lake and a subterranean stream with outflows in the southern part of the bog (see map).

The village and ancient fields are located between two elevated areas, where the Quaternary cover is thicker and the soil is more fertile.

## 2. Vegetation and bryoflora

According to Lippmaa's (1935) plant geographical divisions of Estonia, the reserve belongs to the Northwest-Estonian sub-district (*Estonia inferior*) of the Silurian district. All plant communities described by Lippmaa for this sub-district are also represented in the reserve. The dominant plant communities are alvar forests, spring and calcareous fens and raised bogs. Wet meadows, park and alvar meadows are less frequently represented. The flora of the reserve is rich in species, 520 of which are vascular plants. 40 out of them are protected in Estonia and grow abundantly in some places or form unique communities at Jalase.

### 2.1. Bryophytes in the vegetation

Forest covers 44% of Estonia's landscape. Alvar forests cover only 1%. The bryoflora of Estonian alvar forests and treeless alvars (meadows and pastures) is very rich, especially in Bryopsida: 158 species (Kannukene 1987) of which 111 species are found at Jalase. In the reserve, alvar pine and spruce forests cover more than half of its territory. In the forest with thicker soil cover (*Calamagrostis* type) the moss layer is continuous with typical forest mosses such as *Hylocomium splendens*<sup>2</sup>, *Pleurozium schreberi* and *Dicranum polysetum* dominating, while *Plagiochila asplenioides* is found in depressions. In the forests with very thin or nearly missing soil cover (*Arctostaphylos* type) the moss layer is a mosaic of different species and patchy. On limestone outcrops *Ditrichum flexicaule* and *Tortella tortuosa* are dominant and *T. fragilis*, *Encalypta streptocarpa* and *Dicranum scoparium* are also common. *D. drummondii*, which is rather rare elsewhere in Estonia, also forms large patches. On the walls of karst crevices and sheltered cliffs *Ctenidium molluscum*, *Encalypta streptocarpa*, *Eurhynchium praelongum* and *Anomodon longifolius* grow together with *Platydictya jungermannioides* and *Campylium halleri*, which are rare in Estonia. Erratic boulders in alvar forests are richly covered with mosses and boulders may bear up to 15 species. On well lit and semi-sheltered boulders *Grimmia trichophylla*, *Hedwigia ciliata*, *Racomitrium microcarpon*, *R. heterostichum*, and *Schistidium apocarpum* are common, whereas on sheltered boulders *Hypnum cupressiforme*, *Paraleucobryum longifolium*, *Dicranum scoparium* and *D. montanum* are common. Rare moss species, *Racomitrium lanuginosum* and *Andreaea rupestris*, are also found.

Mires cover about 22% of Estonia and harbour 188 species of bryophytes (Kannukene & Kask 1982), of which 73 are represented in the mires at Jalase. Spring mires with *Schoenus ferrugineus*<sup>3</sup>, *Carex davalliana* and *C. hostiana* are very interesting. Here *Drepanocladus cossonii*

<sup>2</sup> Nomenclature according to Ingerpuu & al. (1994).

<sup>3</sup> Nomenclature of phanerogams according to Tutin & al. (1964-80).

is dominating the moss layer, but *Campylium stellatum*, *Ctenidium molluscum*, *Fissidens adianthoides* and *Palustriella commutata* are also frequent. The latter is mainly found in spring streams with *Scorpidium scorpioides*. All these species are also dominant in wet depressions in alvar forests and around springs while *Calliergon giganteum* is frequently found in water. Transitional mires around the raised bogs are dominated by *Sphagnum* species. The northern part of the Sõbessoo raised bog is treeless, with numerous pools and hollows, covered with *Eriophorum vaginatum* and *Trichophorum caespitosum* turfs. Here, the most common mosses are *Sphagnum capillifolium*, *S. magellanicum* and *S. fuscum*. Between the turfs, *S. tenellum* is found, and in places also *Dicranum bergeri*. In the *Rhynchospora alba* depressions *Sphagnum cuspidatum* is dominant. In pine bog grow, in addition to *Sphagnum* species, *Aulacomnium palustre*, *Pleurozium schreberi*, *Dicranum polysetum*, and *D. leioneuron*, this last rather rare for Estonia.

## 2.2. Bryoflora and rare species

An inventory of the bryoflora started in autumn 1992. The authors of this paper, together with bryologists from Tartu, N. Ingerpuu, A. Kalda and M. Leis have participated in this work. At present, 207 species and 4 varieties of bryophytes (37 hepatics and 170 mosses) are known from the reserve. This corresponds to 40% of the Estonian bryoflora. 17 bryophyte species found in Jalase reserve are rare in Estonia and are on the Red List (Kalda & al. 1992; Ingerpuu & al. 1994). They belong to the following categories:

Category I - endangered species: *Aplodon wormskioldii* (very rare, not found after 1950).

Category II - vulnerable species: *Andreaea rupestris*, *Dicranum leioneuron*, *Racomitrium lanuginosum* and *Splachnum ampullaceum*.

Category III - rare species: *Barbilophozia lycopodioides*, *Bryum neodamense*, *Platydictya jungermannioides* and *Timmia bavarica*. Rare species known only from two new localities (after 1950), one of them being Jalase, are *Anastrophyllum hellerianum*, *Bryum funckii*, *Campylium halleri* and *Weissia squarrosa*. Worth to be mentioned are the rare species *Bartramia pomiformis* and *Saelania glaucescens*, as well as *Orthotrichum stramineum* (known only from the literature, Malta 1930). *Orthotrichum tenellum* is new for Estonia and is restricted to the reserve.

Four species, namely *Aplodon wormskioldii*, *Bryum neodamense*, *Splachnum ampullaceum*, and *Timmia bavarica* were collected by H. Aasamaa (1937; private herbarium) in the 1930's at Jalase, but have not been found since.

To preserve all rare and protected plant species and their habitats, 20 micro-reserves with stricter protection are planned. Two of these will be for bryophytes (see map).

I - A drainage ditch on the border of Sõbessoo in order to protect *Saelania glaucescens* and *Bartramia pomiformis*. They grow on the shaded and peaty ditch-bank. *Saelania glaucescens* has been found only twice before: at Tartu in 1862 and in Orgassaare (north-eastern Estonia) in 1932; and *Bartramia pomiformis* only once in 1932 at Väike-Pungerja (north-eastern Estonia).

II - Northern part of the Oodava alvar forest (Hiiemets) in order to protect the especially rich flora of hepatics including *Anastrophyllum hellerianum*. In Estonia it was known for a long time only by one record from 19th century at Tartu. It was found again in 1976 in the Rangu alvar forest (not far from Jalase) and now in Hiiemets.

## 3. The Importance of the Jalase Reserve

Jalase Village Reserve will be an important bryophyte reserve for several reasons.

- Typical northern and western Estonian plant communities, in which bryophytes are ecologically important and play a dominant role, are well represented.
- Alvar forests, unique in Europe and rich in bryophyte species, are well represented.
- 40% of the Estonian bryoflora is present.
- Many rare and infrequently met bryophyte species are represented.

- Human influence has been rather limited and natural plant communities are well-preserved.
- Research is undertaken in other disciplines as well (botany, geology, archaeology, etc.), providing many additional information.
- An Educational Center was established in order to collect information, to inform the public about the unique locality, and to promote environmental education and understanding.

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