Table 2. Number of flowers per harvested berry for the different clones in the years 2006, 2007 and 2008.

Clone	2006	2007	2008	Totally
002	2,26	1,16	2,72	2,04
102	2,88	2,07	2,56	2,45
104	15,63	32,11	41,29	24,31
106	92,00	63,25	389,00	112,22
202	2,52	1,57	2,73	2,41
206	2,37	1,39	3,61	2,34
208	4,05	2,68	3,02	2,98
304	2,93	1,69	2,38	2,34
306	3,48	1,30	1,98	1,88
404	15,54	27,11	73,33	26,64
602	4,29	2,03	3,12	2,90

The northern clones might be expected to be best adapted to the environmental conditions in Tromsø. However, the clones with the highest berry production all had a southern origin. At the same time other southern clones produced few berries, so there were no obvious tendencies concerning origin when berry production was considered. For flower production, the three clones from Aust Agder (102, 104 and 106) all produced above average, while the clones from Nordland and Hedmark produced at different levels. In total, origin did not explain the variations in production.

Based on these evaluations, selection based on the number of flowers and the number of pistils may theoretically entail a risk of selecting genotypes with high potential, but low ability for production under certain environmental conditions. Thus, there may be genotype-environment interactions involved, such that specific genotypes are adapted to specific environmental conditions. More knowledge about the genetic and environmental basis for berry production is needed to find the optimal selection criteria. The genotypes evaluated here are also planted at different natural sites in Norway. Registrations from these sites may provide additional information about the different genotypes and environmental factors influencing berry production.

Further evaluations will be done before the selection of new cultivars for release. In addition to production traits, the new selection criteria most likely will include berry contents, such as the level of antioxidants.

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FUNGAL DISEASES OF *VACCINIUM MACROCARPON* IN LATVIA
VACCINIUM MACROCARPON SLIMĪBAS LATVIJĀ

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Abstract

The American cranberry (*Vaccinium macrocarpon* Ait.) has been known for fifteen years, but fungal diseases have been investigated only last years in Latvia. Upright dieback and berries rot were observed several years ago, but growers did not know the causal agents of these symptoms. The aim of the study was to detect the causal agents of cranberry diseases in Latvia. Samples of upright dieback (in summer) and berries (during the harvesting) from different regions of Latvia were collected for causal agent detection. *Botrytis cinerea*, *Fusiccocum putrefaciens*, *Phomopsis vaccinii*, *Pestalotia vaccinii*, *Discosia artocrea*, *Physalospora vaccinii* were detected from upright dieback. *Botrytis cinerea, Allantophomopsis cytisporea, Fusiccocum putrefaciens, Phomopsis vaccinii, Coleophoma empetri, Phyllosticta elongata, Physalospora vaccinii, Pestalotia vaccinii, Gloeosporium minus* and *Discosia artocreas* were detected from rotted berries. In the future *Fusiccocum putrefaciens* and *Phomopsis vaccinii* could become the most harmful fungi in the cranberry plantations, because it is difficult to control them.

Kopsavilkums
Lielogu dzērvenes (*Vaccinium macrocarpon* Ait.) Latvijā jau ir zināmas vairāk kā piecpadsmit gadus, bet to slimības pētītas tikai pēdējos gados. Lai gan audzētāji dzinumu atmiršanu un ogu puves pazīmes bija novērojuši jau iepriekš, tomēr neviens īsti nezināja, kas ierosina šīs slimības. Lai noteiktu slimību ierosinātājus, no lielogu dzērveņu stādījumiem dažādos audzēšanas rajonos Latvijā vasarā tika ievākti vertikālo dzinumu atmiršanas paraugi, bet ogas - ražas vākšanas laikā. No vertikāliem atmirušiem dzinumiem tika noteiktas sekojošas slimības: *Botrytis cinerea, Fusiccocum putrefaciens, Phomopsis vaccinii, Pestalotia vaccinii, Discosia artocrea, Physalospora vaccinii.* No puves bojātām ogām tika noteikti: *Botrytis cinerea, Allantophomopsis cytisporea, Fusiccocum putrefaciens, Phomopsis vaccinii, Coleophoma empetri, Phyllosticta elongata, Physalospora vaccinii, Pestalotia vaccinii* and *Discosia artocreas.* Turpmāk nopietnus bojājumus varētu izraisīt *Fusiccocum putrefaciens* un *Phomopsis vaccinii* izplatība dzērveņu stādījumos, jo šo ierosināto slimību ierobežošana ir sarežģīta.

Key words: cranberry diseases, upright dieback, berries rot, causal agent.

Introduction
The American cranberry (*Vaccinium macrocarpon*) is a perspective and marketable culture in the market of Latvia. The climate and peat bogs are similar to the cranberry growing areas in North America (Ripa, 1996). Fungal diseases are one of the most important problems, because they reduce and damage the quality of the harvest in America. The cranberry is a well known cultivated fruit crop for fifteen years in Latvia as well, and some investigations of cranberry diseases started in 2004, but significant studies - in 2006. Mainly uprights dieback, blossom blight and berry rot were caused by fungi in North America and in Latvia as well. Detection of cranberry diseases is important to make control options in future.
The study aim was to detect the causal agents of cranberry diseases in Latvia.

Materials and methods
Eight cranberry plantations (Jelgava, Talsi, Riga, Kuldiga, Liepaja, Aluksne, Cesis and Gulbene districts) in 2007 were inspected during the flowering and harvesting time. From cranberry plantations in different regions in Latvia were taken samples of upright dieback, blossoms, ovaries in summer, but berries were taken at harvest time.
Samples of upright dieback, blossoms and ovaries blight were put in a moisture camera (wet filter paper in Petri dishes) and kept at room temperature (20 – 25 ^{o}C) in sunlight.
At harvest from each farm 200 sound berries were collected randomly along a diagonal through the plantation; in total 1200 berries from six plantations. Berries were kept in plastic bags in refrigerated storage at +5 ^{o}C for up to 4 months. At the end of each month (December – March) the berries were counted and the rotted berries were placed with the cut surface down on potato-dextrose agar for causal agent of storage rot detection
The samples of cranberry diseases before being placed on PDA were surface-disinfested in 70 % alcohol and then rinsed in sterile water twice and pieces of samples put on PDA. The growing fungal colonies were transferred on PDA and pure cultures were incubated at room temperature 20 – 25 ^{o}C for 3 to 4 weeks. Fungi were identified directly on the isolation plates by comparing the morphological characteristics of the spores and spore bearing structures with descriptions in the literature (Caruso *et al.*, 1995; Kačergius *et al.*, 2004; Горленко *et al.*, 1996). Morphological characteristics of discovered fungi were fixed using microscope OLYMPUS CX31, magnifier MEIJI EMZ and camera SONY DSC – H2. Liga Vilka took the photos for fungi identification and collected them for the archive database of cranberry diseases in Latvia.

Results

First time upright dieback in Latvia was observed in 2004. In the last three years the incidence level of upright dieback was only 1-3 % (from 100 uprights). In the beginning of the summer uprights of the previous year usually were dark brown or red-brown, but young uprights - bronzing brown, with top slope and died. These symptoms could be caused by non parasitic diseases (sun, drought or rain, fertilization problems, etc.) or by fungi.

In Latvia from upright dieback 6 causal agents were detected (Table 1), and mainly they caused blossom and ovaries blight and berries rot. From berries damaged by rot 9 causal agents were detected (Table 1).

Table 1. Detected causal agents of cranberry diseases in Latvia, 2007 – 2008

Causal agents from upright dieback	Causal agents from berries rot
Botrytis cinerea Pers.:Fr.	*Botrytis cinerea* Pers.:Fr.
Fusicoccum putrefaciens Shear vaccinii Groves)	*Fusicoccum putrefaciens* Shear vaccinii Groves)
Phomopsis vaccinii Shear in Shear, N. Stevens, & H. Bain	*Phomopsis vaccinii* Shear in Shear, N. Stevens, & H. Bain
Discosia artocreas (Tode) Fr.	*Discosia artocreas* (Tode) Fr.
Pestalotia vaccinii (Shear) Guba	*Pestalotia vaccinii* (Shear) Guba
Physalospora vaccinii (Shear) Arx & E. Müller	*Physalospora vaccinii* (Shear) Arx & E. Müller
	Phyllosticta elongata G. J. Weideman in G. J. Weideman, D. M. Boone, & Burdsall
	Coleophoma empetri (Rostr.) Petr.
	Allantophomopsis cytisporea (Fr.: Fr.) Petrak

Causal agents survive and reproduce during the vegetation season on berries or other plants parts, increasing the incidence level of the diseases in the next year.

Botrytis cinerea caused upright dieback, blossom and ovaries blight and yellow rot in Latvia. Flowers and ovaries were yellowish brown and later became dark brown. Upright dieback was bronzing brown, the end of the top sloped. Berry rot was yellow or yellowish brown. Yellow rot mostly appeared in the field, few of berries were affected during storage. Yellow rot can be easily confused with end rot caused by *Fusicoccum putrefaciens.* The fungus grew rapidly at 20 – 24 ^{o}C on the PDA. At first the colonies were white, with loose aerial mycelium. Later the mycelium became pale gray-brown. On the surface after 10 days white sclerotia appeared, after maturation they turned black. From black sclerotia developed conidiophores and on the top ovate or elliptical, green-grey conidia appeared. In the moisture camera on upright diebacks, blossoms and ovaries conidia appeared as well. According to the symptoms of cranberry disease and fungus peculiarities in the moisture camera and pure culture, upright dieback, blossom and ovaries blight and yellow rot was caused by *Botrytis cinerea* Pers.:Fr. The causal agent of the disease was identified based on symptoms and the morphological characteristics as described by Горленко *et al*., 1996 and Caruso F. L., 1995.

Fusicoccum putrefaciens caused upright dieback, blossom and ovary blight and end rot in Latvia. Uprights, blossoms and ovaries turned brown and died. Some damaged berries of end rot were observed in the field, but mostly berry rot appeared in storage. Berries, damaged in field, were soft, wet, pale yellow, but those damaged during storage turned pale rosy or yellowish brown. Damage from rot on berries mostly appeared at the calyx; probably berries were infected by fungus during blossoming. Later in storage life the rotted berries shrunk. Upright dieback and end rot caused by *Fusicoccum putrefaciens* were the widely distributed cranberry diseases in Latvia. The fungus grew rapidly on PDA at 20 – 24 ^{o}C. Aerial mycelium was fluffy, compact, grey-yellow or olive-yellow. Pycnidia under mycelium matured, and on the surface appeared a pale orange cream spore mass. Separately conidia were hyaline, elliptic to fusiform, with aseptate or pseudosaptate, measurement on average 2.0 x 8.8 µm (1.5 – 3 x 6-11µm) (Figure 1).

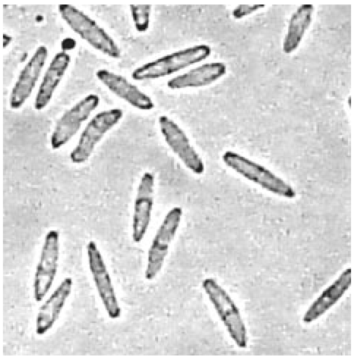

Figure 1. Conidia of *Fusicoccum putrefaciens* on PDA (400x).

According to symptoms upright dieback, blossom and ovary blight and end rot were caused by *Fusicoccum putrefaciens* Shear. The teleomorph stage caused by *Godronia cassandrae* Peck f. vaccinii Groves was not found in Latvia. The causal agent of the disease was identified based on symptoms and the morphological characteristics described by Горленко *et al*., 1996 and Caruso F. L., 1995.

Phomopsis vaccinii from upright dieback, blossom and ovary blight and viscid rot samples was detected. Uprights, blossoms and ovaries turned brown and died, but viscid rot was off-color, slightly mottled or yellowish brown and firm but wet inside with a viscous, sticky substance. Viscid rot was common in the field and during the first months of storage. Colonies on the PDA grew up to 15 mm per day; white, circular, and near to centre dark rings were produced. The aerial mycelium was not compact, was grayish white, and toward the centre a wall was produced. The pycnidia mostly set on the wall. They were 1 – 4 mm in diameter, partly embedded, leathery, pale grey and then turned black (Figure 2). From maturity pycnidia emitted a yellow creamy spore mass in the moisture camera on uprights dieback and the pure culture. *P. vaccinii* had two types of spores (Figure 3). Alfa conidia were hyaline, one-celled, ellipsoid, with two oil globules at both ends and measured 7.8 x 3.1μm (4.3 – 9.8 x 2.0 – 4.4 μm). Beta conidia were unicellular, hyaline, filiform – hook-shaped at the end, and measured 18.6 x 0.8 μm (13.4 – 22.1 x 0.3 – 1.2 μm).

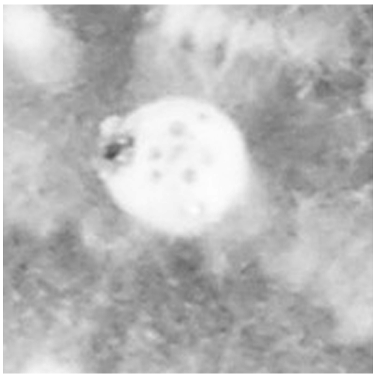

Fig. 2. Pycnidia of *P.vaccinii* on PDA (10 x).

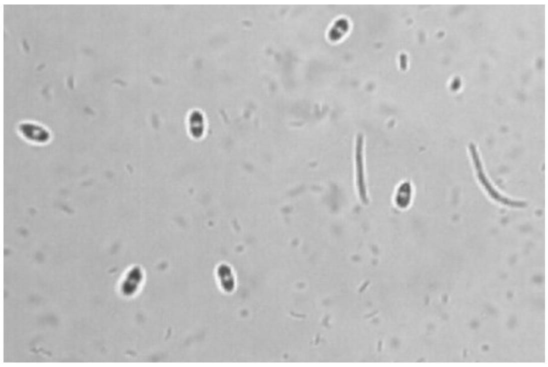

Fig. 3. α and β conidia of *P. vaccinii* on PDA (400 x).

According to the symptoms of cranberry disease and fungus anamorph morphological peculiarities in the moisture camera and pure culture, upright dieback, blossom and ovary blight and viscid rot were caused by *Phomopsis vaccinii* Shear in Shear, N. Stevens, & H. Bain. The teleomorph stage, which is caused by *Diaporthe vaccinii* Shear in Shear, N. Stevens, & H. Bain., was not detected in Latvia. The causal agent of the disease was identified based on symptoms and morphological characteristics as described by EPPO, 1997 and Kačergius *et al*., 2004.

Discosia artocreas from upright dieback, blossom blight and berry rot was detected only in few samples. Young uprights were bronze, brown with end of the top sloped and the uprights of last year were dark brown. Blossoms damaged by disease were brown, but discosia fruit rot was with yellowish brown spots. *Discosia artocreas* mostly was detected from upright dieback. The fungus grew rapidly on PDA at 20 – 24 °C. Aerial mycelium was low, compact, leathery and pale gray. Mycelium produced paler irregular rings. Colonies were dark pale. In the moisture camera on uprights dieback and pure culture appeared pyriform, dark grey pycnidia. From maturity pycnidia emitted a yellowish white, creamy spore mass. Separately conidia were hyaline or pale grey, oblong, measured 3.2 x 14.2 µm (2-4 x 12-17 µm); 2 – 3 septates, end of tops had two long appendages (Figure 4). In the pure culture septates and appendages of conidia hardly were observed.

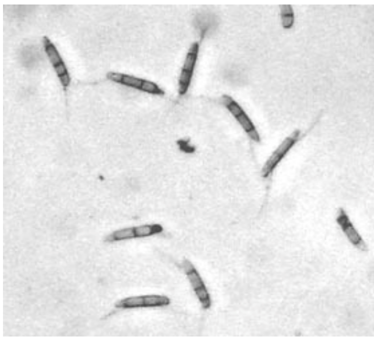

Figure 4. Conidia of *Discosia artocreas* in moisture camera and PDA (400 x).

According to the symptoms of cranberry disease and fungus morphological peculiarities in moisture camera and pure culture was caused by *Discosia artocreas* (Tode) Fr. The teleomorph stage of the fungus caused by *Gnomonia setae* was not detected. The causal agent of the disease was identified based on symptoms and morphological characteristics as described by Горленко *et al*., 1996.

Pestalotia vaccinii caused upright dieback, blossom blight and pestalotia fruit rot in Latvia. Uprights were bronze, with end of the top sloped. They were spread only in several cranberry plantations and the incidence level was not high. In storage on some berries appeared yellow-brown, circular, slightly sunken rot spots with darker, concentric rings. Fungus grew rapidly on the PDA, at 20 – 24 °C. The aerial mycelium was fluffy, at the centre lemon-white, up to margins white appeared. Colonies were lemon-yellow. In the culture through mycelium appeared black, watery, and spore mass was scroll-shaped (Figure 5). In the moisture camera on uprights dieback acervuli matured also. The conidia were elongated fusoid, straight or slightly incurved and measured 5.8 x 27.5 (4.7 - 6.8 x 22 - 32 µm). The conidia had five-cells, the apical and basal cells were hyaline, but inside three cells were green-brown (Figure 6). The conidia had appendages at both ends. The end of the basal cell had on average a 13.7 µm (9.5 – 18 µm) long appendage, but the end of the apical cell had 3 – 4 on average 23.9 µm (16 – 33 µm) long moustached appendages. In the culture appeared hyaline, ellipsoid, curved microconidia, in diameter 2.0 x 6.3 µm (1.3 - 2.7 x 4.5 – 7.8 µm).

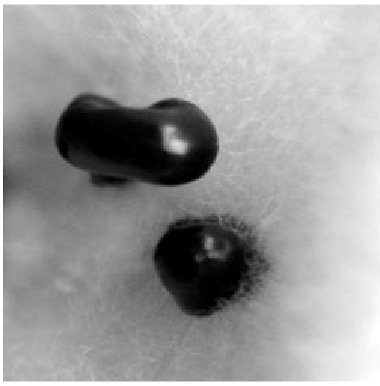

Figure 5. Spore mass of *P. vaccinii* on PDA.

Figure 6. Conidia of *P. vaccinii* on PDA(400x).

According to the symptoms of cranberry disease and fungus morphological peculiarities in the moisture camera and the pure culture was caused by *Pestalotia vaccinii* (Shear) Guba. The causal agent of the disease was identified based on symptoms and morphological characteristics described by Горленко *et al*., 1996.

Physalospora vaccinii from upright dieback and blotch rot was detected. Uprights from last year were dark brown or red-brown and they were collected only from some cranberry plantations. On berries pale rosy, circular, flattened or sunken spots were observed. Gradually the berries became dried and shriveled. Only after three or more months in storage blotch rot was observed. Rot damage on berries mostly appeared at the calyx, probably berries were infected by fungus during blossoming. The fungus had two different strains. On the PDA the white colony type produced poor, low, yellowish white mycelium, which was most common in Latvia. The dark colony produced poor, low, brownish grey or green-grey mycelium. In the pure culture both strains after two weeks at 20 – 24 ^{o}C abundantly produced perithecia, but ascospores matured only after 5 weeks. The perithecia of the dark strain were slightly smaller than the perithecia of white strain (Figure 7). They were globose to pyriform, dark brown, at the end of ostiole and had black spines. White stain on average was 199.2 x 42.1 µm (133–251 x 19.6 – 64.1 µm) large, hyaline, fusoid with eight spores asci produced. Ascospores of white strain were acuminated obovoid, pale yellowish brown, with a punctate surface (Figure 7) and measured 43.5 x 17.4 µm (33.8 – 53.8 x 12.3 – 24.9 µm). When ascospores were not mature they were hyaline. Ascospores of the dark strain were slightly smaller (26.5 – 33.2 x 12.3 – 18.6 µm), broadly obovoid with blunt ends. Both of strains had a lot of large paraphyses (Figure 8).

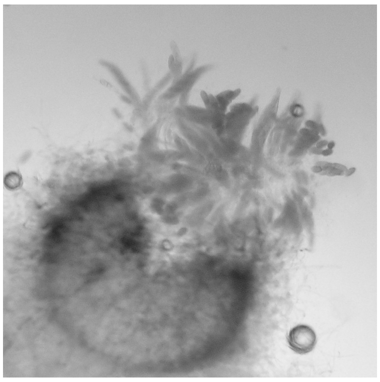

Figure 7. Asci and perithecia of *P. vaccinii* paraphyses of *P. vaccinii on* white strain on PDA(100 x).

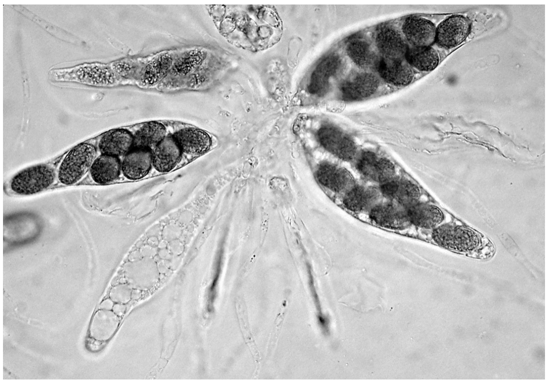

Figure 8. Asci, ascospores and PDA (400 x).

According to symptoms of cranberry disease and fungus teleomorph morphological peculiarities in pure culture, blotch rot and upright dieback were caused by *Physalospora vaccinii* (Shear) Arx & E. Müller. *P. vaccinii* has no anamorph stage known in the world. The causal agent of the disease was identified based on symptoms and morphological characteristics as described by Caruso F. L., 1995 and Oudeman 1998.

Phyllosticta elongata caused fruit rot only in storage. At first on the berries appeared small, light-colored spots then they developed soft, watery rot. In the centre of the rot spots dark red rings appeared. Fungus on the PDA grew rapidly, produced dark, ranges in color from blue-gray to green-grey and thick colonies. The aerial mycelium was floury, pale blue-grey. In the culture after few days at 20 – 24 ^{o}C there appeared globose and black and a lot of pycnidia. From maturity pycnidia emitted a pale grey spore mass. The conidia were hyaline, single-celled, obovate to oblong and measured 13.5 x 5.6 µm (10.1 – 16.4 x 3.9 – 7.3 µm) (Figure 9). At the end the conidia had a mucilaginous, long appendage. When conidia were flown off, the pycnidia turned black.

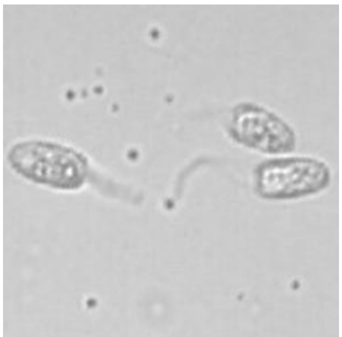

Figure 9. Conidia of *Physalospora vaccinii* on PDA (400 x).

According to symptoms of cranberry rot and fungus morphological peculiarities in pure culture, fruit rot was caused by *Phyllosticta elongata* G. J. Weideman in G. J. Weideman, D. M. Boone, & Burdsall. The teleomorph stage *Botryosphaeria vaccinii* (Shear) Barr) in the laboratory was not detected. The causal agent of the disease was identified based on symptoms and morphological characteristics described by Caruso F. L., 1995 and Weidemann 1983.

Coleophoma empetri from ripe rot in storage was detected. Berries were off-colored, soft, watery inside, and squirted fluid when squeezed. Symptoms of rot were similarly to end rot caused by *Fusicoccum putrefaciens.* Ripe rot is common in Latvia. Fungus on the PDA produced a dark, thick, colony, but started it with a whitish color. Aerial mycelium was low, fluffy and dark grey. In the culture appeared dark grey – brown or black, globose at first, but then turned into a disc shape with fluffy walls. Pycnidia formed in a ring near the outer edge of the colony by group or scatter. The conidia were hyaline, straight, uniformly cylindrical, and slightly punctuated and measured 3.0 x 14.8 µm (2.6 – 3.4 x 12.2 – 17.08 µm).

Figure 10. Pycnidia of *Coleophoma empetri* on PDA (10x).

Figure 11. Conidia of *C. empetri* on PDA (400 x).

According to the symptoms of cranberry rot and fungus morphological peculiarities in pure culture, ripe rot were caused by *Coleophoma empetri* (Rostr.) Petr. Teleomorph stage was not detected yet. The causal agent of the disease was identified based on symptoms and morphological characteristics described by Caruso F. L., 1995.

Allantophomopsis cytisporea caused black rot in the field, but mostly during the first months in storage. At first damage appeared like pale brown spots, afterwards berries became uniform black or dark grey. Their mass was firm and dry, but gradually the berries became dried and shriveled. The fungus grew rapidly on potato-dextrose agar at 20 – 24 ^{o}C. The colonies were dark green-gray and produced poor, low aerial mycelium. In the moisture camera on berries and the pure culture appeared globose to pyriform, dark grey pycnidia (Figure 12). From maturity pycnidia emitted a black, little creamy spore mass. The conidia were hyaline, unicellular, allantoid to lunate, binucleate and measured 7.6 x 2.7 µm (6.6 – 8.6 x 2.2 – 3.8 µm), end of top mucoid appendages were hardly observed (Figure 13).

Figure 12. Pycnidia of *Allantophomopsis cytisporea* on PDA(10x).

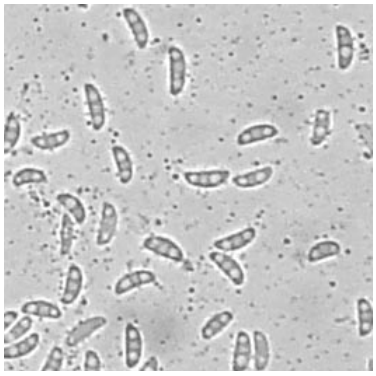

Figure 13. Conidia of *A. cytisporea* on PDA (400x).

According to symptoms of cranberry rot and fungus morphological peculiarities moisture camera and pure culture, black rot were caused by *Allantophomopsis cytisporea* (Fr.: Fr.) Petrak. The causal agent of the disease was identified based on symptoms and morphological characteristics described by Caruso F. L., 1995 and Горленко *et al*., 1996.

Discussion

Conclusions after two years (2007, 2008) investigations: in Latvia are distributed the same causal agents of cranberry diseases as in North America. According to the literature in the USA and Canada *Colletotrichum acutatum, Pestalotia vaccinii, Phyllosticta vaccinii, Physalospora vaccinii, Phomopsis vaccinii* and *Coleophoma empetri* are the most common fungi isolated from sound fruit in storage (Olatinwo *et al.* 2003; Oudemans *et al.*, 1998). The fungus *Fusicoccum putrefaciens* was recovered in less than 1 % of the total isolations, it is a minor fungal pathogen in the USA according to investigations carried out in Michigan (1999 – 2001) and New Jersey (1994 – 1996) (Olatinwo *et al.* 2003; Stiles *et al.*, 1999). Shear C. L. and Bain H. F. investigated the life cycle of fungus in cranberry plantations and established that *Fusicoccum putrefaciens* grows well at low temperatures and in some seasons causes significant losses (Stiles *et al.* 1999). End rot was mostly spread in Latvia (2007). The weather conditions are suitable for cranberry growing in Latvia. Upright dieback caused by *Phomopsis vaccinii* are widely distributed in the USA. In Latvia the incidence level of *Phomopsis vaccinii* is still low, but in the future it could be an economically important disease in Latvia as well.

Probably causal agents with seedling material have been imported to Latvia. American cranberries mostly propagate using uprights. It is the most common method in all the world. Next year after over wintering fungi can develop and infect blossoms, ovaries, uprights and berries again. In the future a system should be developed how to control spread of cranberry diseases in plantations.

Cranberry growers still do not know all specific agro technical methods of cranberry growing. Damage to cranberries can be caused also by non-parasitic diseases like drought and wrong fertilization.

Conclusion

Upright dieback of cranberry was caused by several agents. In the Latvian Plant Protection Research Centre laboratory 6 fungi from upright dieback and 9 causal agents from fruit rot were detected. Mainly the fruit rot symptoms were similar; therefore precise detection of the causal agent is so important.

In the future causal agents *Fusicoccum putrefaciens* and *Phomopsis vaccinii* could be dangerous, because they cause upright dieback, blossom blight and fruit rot and their control could be difficult in the future.

In the future research into to cranberry diseases should be continued.

Acknowledgements

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STORAGE ROTS OF *VACCINIUM MACROCARPON* SPREAD AND DEVELOPMENT IN LATVIA
VACCINIUM MACROCARPON OGU PUVES IZPLATĪBA LATVIJĀ

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Abstract

American cranberries (*Vaccinium macrocarpon* Ait.) have been cultivated for ten years in Latvia and their plantations have a tendency to enlarge every year. Latvian cranberry growers realize mainly fresh berries, because it is difficult to keep quality during prolonged storage. One of the main why quality is reduced is berry rot caused by different fungi. Berries from six cranberry plantations in different regions in Latvia for rot detection were taken at harvest time.

Different berry rot appeared on 61 % of all berries in storage. In the berries *Botrytis cinerea* (yellow rot), *Allantophomopsis cytisporea* (black rot), *Fusiccocum putrefaciens* (end rot), *Phyllosticta elongata* (Botryosphaeria fruit rot), *Physalopora vaccinii* (blotch rot), *Phomopsis vaccinii* (viscid rot), *Pestalotia vaccinii* (Pestalotia fruit rot), *Coleophoma empetri* (ripe rot), *Discosia artocreas* (Discosia fruit rot) were detected. Causal agents of berry rot had different dynamics of development. These fungi had different incubation periods. This is important information for the growers that helps to determine the real time for realization, before rotting is started. After four months of storage, the amount of causal agents was different from each plantation area.

In further investigations it is necessary to establish conditions influencing the development of causal agents.

Kopsavilkums

Lielogu dzērvenes (*Vaccinium macrocarpon* Ait.) Latvijā ir zināmas jau piecpadsmit gadus un to platības turpina palielināties. Latvijas lielogu dzērveņu audzētāji saražoto produkciju realizē svaigā veidā, pārstrādā un, ja iespējams, sasaldē, jo galvenokārt puve uz ogām parādās jau līdz decembrim. Ražas laikā 2007. gadā, lai noteiktu ogu puves ierosinātājus, tika ievāktas ogas no sešām dažādām lielogu dzērveņu audzēšanas vietām Latvjā.

Uzglabāšanas laikā 61 % ogu bija puves bojātas. No puves bojātām ogām, galvenokārt, tika konstatētas: *Allantophomopsis cytisporea* (ogu melnā puve), *Fusiccocum putrefaciens* (ogu galotnes puve), *Phyllosticta elongata* (Botryosphaeria ierosinātā ogu puve), *Physalopora vaccinii* (ogu gaišā puve), *Phomopsis vaccinii* (viskozā ogu puve), *Coleophoma empetri* (gatavo ogu puve). Ogu puves ierosinātājiem glabāšanas laikā ir atšķirīga attīstības dinamika, tas nozīmē, ka sēnēm ir