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Nordic Forest Research  
Co-operation Committee (SNS)


Send the report to SNS-secretary Katrine Hahn Kristensen ([hahn@life.ku.dk](mailto:hahn@life.ku.dk))

## FINAL REPORT for CAR

Please notice that the size of text sections in the form can be adjusted if needed.  
The length of the final report should not exceed 3 pages. **Supplementary information can be attached**

1. CAR titel	<b>PATHCAR-Virtual Centre of Advanced Research (CAR) in Forest Pathology</b>
2. CAR coordinator (name, address, telephone, e-mail)	Prof. Jarkko Hantula Finnish Forest Research Institute PO. Box 18 Vantaa Finland +358-10-2115419 <a href="mailto:jarkko.hantula@metla.fi">jarkko.hantula@metla.fi</a>
3. Duration	2006-2011
4. Cost	SNS-funding: 151036,71 €      Other funding: estimated 650000 €
5. The purpose of the CAR / main problems / hypotheses addressed	PATHCAR is a Nordic research network in forest pathology established by Nordic forest research institutes and universities which should <ul style="list-style-type: none"><li>• promote and co-ordinate collaboration among Nordic/Baltic forest pathologists</li><li>• make Nordic/Baltic forest pathology more efficient</li><li>• be of technical and scientific excellence</li><li>• develop and conduct advanced forest pathology research projects</li><li>• be a competitive research network in Europe</li><li>• disseminate research results to different end-users and stakeholders in the Nordic/Baltic countries</li><li>• to enable the flow of methodological developments among Nordic/Baltic countries</li></ul>
6. Brief description of the network and research plan and of possible larger deviations from the plan	The network was composed of researchers from all Nordic and Baltic countries. The idea was to utilize the most advanced knowledge and infrastructure available in different research institutions within the PATHCAR-area by enabling inter-institutional mobility of researchers. Research was focused on the most important or topical issues, e.g., <i>Heterobasidion</i> root rot, ash decline and <i>Dothistroma</i> needle blight.

<p>7. Results (max 2 pages)</p>	<p>Within the PATHCAR project three Nordic/Baltic meetings were arranged in Norway, Finland and Lithuania. All the meetings were successful in distribution information among Nordic/Baltic forest pathology researchers.</p> <p>Mobility of the researchers among Nordic/Baltic institutes was supported. Most actively young Lithuanian and Latvian researchers took advantage on the possibilities provided by Swedish University of Agricultural Sciences, and Estonian young scientists have used infrastructure in Metla.</p> <p>The project also actively supported Nordic participation in the <i>Heterobasidion</i> genome project by supporting travel costs to the project meetings. This possibility was actively used by scientists in all phases of their career.</p> <p>A third kind of human mobility, albeit not so much used, was provided to more senior researchers in enabling meetings intended for research planning or special know-how. This possibility was most actively used between Norway and Finland.</p> <p>The project leader also visited all participating research organizations.</p> <p>It should be noted that support of all above-described human mobility cases was not restricted only to PATHCAR members, but was available also for all Nordic/Baltic researchers in the field.</p> <p>As PATHCAR was not a research project, its role mostly included providing flexibility to the projects with basic funding from other sources. However, it is clear that the network speeded up the recognition of two top-rated forest tree pathogens, - <i>Chalara fraxinea</i> and <i>Dothistroma pini</i> in both Finland and Norway. Also novel scientific knowledge on both of these topics, such as, e.g., population structure of <i>D. pini</i> in Estonia and Finland, was obtained. The genome of <i>Heterobasidion</i> was sequenced, and Nordic participation on this achievement was higher than it would have otherwise been. The population genetics of the possible hardwood sprout control agent <i>Chondrostereum purpureum</i> has been investigated applying international co-operation. Expert knowledge was also used in many fields, although, for example, black alder pathogen <i>Phytophthora alni</i> has not been detected in Estonia despite integrated expertise of Finnish researchers.</p> <p>During this project <i>C. fraxinea</i> was also reported for the first time to infect North America and Asia ash species <i>Fraxinus nigra</i>, <i>F. Pennsylvanica</i>, <i>F. americana</i> and <i>F. mandschurica</i>.</p> <p>Overall, the PATHCAR project successfully promoted the Nordic co-operation; and today even the youngest Nordic/Baltic forest pathologists have met each other and elder colleagues personally. This helps in distributing information and initiating new projects in the future. During and after the PATHCAR project, new projects including Nordic co-operation have been conducted or proposed at EU-, Nordic- and national levels.</p>
<p>8. What advantages have been gained by the Nordic collaboration</p>	<p>The most important goal and advantage of the PATHCAR project was enabling close co-operation among Nordic/Baltic forest pathologists. As regards scientific results, there were also significant achievements: <i>Heterobasidion</i> genome was sequenced, ash decline was better understood, and dangerous invasive tree pathogens such as <i>Sphaeropsis sapinea</i>, <i>Mycosphaerella pini</i>, <i>M. dearnessii</i> and <i>Chalara fraxinea</i> were for the first time detected in certain Nordic/Baltic countries. Also, genetic structure of <i>M. pini</i> populations was shown to be similar to that of native <i>Mycosphaerella</i> species.</p>
<p>9. Publications and other communication activities (International scientific peer reviewed journals,</p>	<p>Vartiamäki, H., Uotila, A., Vasaitis, R. &amp; Hantula, J 2008. Genetic diversity in Nordic and Baltic populations of <i>Chondrostereum purpureum</i> - a potential herbicide biocontrol agent. For. Path., 381-393.</p> <p>Hanso, M., Drenkhan, R. 2008. First observations of <i>Mycosphaerella pini</i> in Estonia. Plant Pathology 57: 1177.</p>

<p>other scientific publications, short communications, web etc.)</p>	<p>Hanso, M., Drenkhan, R. 2009. <i>Diplodia pinea</i> is a new pathogen on Austrian pine (<i>Pinus nigra</i>) in Estonia. <i>Plant Pathology</i> 58: 797.  Drenkhan, R., Hanso, M. 2009. Recent invasion of foliage fungi of pines (<i>Pinus</i> spp.) to the Northern Baltics. <i>Forestry Studies</i> 51: 49–64.  Drenkhan, R., Hanso, M. 2010. New host species for <i>Chalara fraxinea</i>. <i>New Disease Reports</i> 22: 16.  Kenigšvalde, K., Arhipova, N., Gaitnieks, T., Laivins, M. 2010. Fungus <i>Chalara fraxinea</i> as a causal agent for ash decline in Latvia. <i>Mezzinatne</i> 21(54): 110-120.  Rytkönen, A., Lilja, A., Drenkhan, R., Gaitnieks, T. &amp; Hantula, J. 2011. First record of <i>Chalara fraxinea</i> in Finland and genetic variation of samples from Åland, mainland Finland and Estonia. <i>For. Path.</i> 41, 169-174.  Lygis, V., Vasiliauskaite, I., Stenlid, J. &amp; Vasaitis, R., 2010. Impact of forest fire on occurrence of <i>Heterobasidion annosum</i> s.s. root rot and other wood-inhabiting fungi in roots of <i>Pinus mugo</i>. <i>Forestry (Oxford)</i> 1, 83-92.  Solheim H &amp; Vuorinen M 2011. First report of <i>Mycosphaerella pini</i> causing red band needle blight on Scots pine in Norway. <i>Plant Disease</i> 95(7): 875.  Drenkhan, R., Hantula, J., Vuorinen, M., Jankovský, L. &amp; Müller, M. 201x. Evidence for the intensification of a hitherto inconspicuous pathogen <i>Dothistroma septosporum</i> in Northern Europe. Submitted.  Lygis, V., Bakys, R., Burokienė, D. &amp; Vasiliauskaite, I. 201x. <i>Chondrostereum purpureum</i>-based stump sprouting control of seven hardwood species in Lithuania. Submitted to <i>Baltic Forestry</i>.  Lygis, V., Vasiliauskaite, I., Matelis, A., Pliūra, A. &amp; Vasaitis, R. 201x. Community dynamics of wood-inhabiting fungi in 120-year-old <i>Pinus mugo</i> plantations following three disturbance scenarios. Manuscript, intended for <i>Fungal Diversity</i>.</p>
<p>10. CAR summary (about 1/3 page) for possible use in the News &amp; Views section of Scandinavian Journal of Forest Research</p>	<p>The Virtual Centre of Advanced Research in Forest Pathology (PATHCAR) project enabled the Nordic/Baltic forest pathologists to combine their skills and research infrastructure in answering the most important and topical questions in the field of tree disease. The project promoted early finding of new pathogens in different Nordic and Baltic countries by using international expertise skills, enabled substantial Nordic participation in the <i>Heterobasidion</i> genome project and organized three Nordic/Baltic meetings in forest pathology. As a result of promoted human mobility within the PATHCAR area, the Nordic/Baltic pathologists can easily communicate with each other, and today many of them also co-operate in research projects at EU-, Nordic- or National levels.</p>
<p>11. Date and signature</p>	<p>Date: January 17, 2011</p> <p>Signature of CAR coordinator: </p>