

1. Personal details

Date: 3.6.2022

Name: Eeva Johanna Vainio; **ORCID ID:** 0000-0002-6739-7968

2. Degrees

30.06.2008, Ph.D. in Biology/genetics, University of Helsinki (Faculty of Biosciences), Finland

15.12.1995, M.Sc. in Biology/genetics, University of Helsinki (Department of Genetics), Finland

3. Other education and expertise

12.12.2019, Specialist Vocational Qualification in Leadership, The Institute of Marketing, Finland

4. Language skills

Finnish: native language; English: proficient user; Swedish: independent user; French: basic user

5. Current employment

Principal Scientist, Natural Resources Institute Finland (permanent position in Luke since 1.7.2016)

Career stage: Third (independent research professional capable of academic leadership)

6. Previous work experience:

Senior researcher, Academy of Finland, Natural Resources Institute Finland, 1.9.2014-30.6.2016

Academy of Finland Postdoctoral Researcher, Finnish Forest Research Institute 1.9.2011-31.8.2014

Researcher, Academy of Finland, Finnish Forest Research Institute, 1.1.2008-31.8.2011

Researcher, University of Joensuu, Finnish Forest Research Institute, 1.1.2001-18.2.2001

Researcher, Finnish Forest Research Institute, 1.10.2000-31.12.2000

Researcher, Academy of Finland, Finnish Forest Research Institute, 1.3.2000-30.9.2000

Researcher, University of Helsinki, Finnish Forest Research Institute, 1.1.2000-29.2.2000

Researcher, Maj and Tor Nessling Foundation, Forest Research Institute, 1.1.1997-31.12.1999

Researcher, Maj and Tor Nessling Foundation, University of Helsinki, 1.1.-31.12.1996

Research assistant, Academy of Finland, University of Helsinki, 1.1.-31.12.1995

Researcher, Maj and Tor Nessling Foundation, University of Helsinki, 1.6.-31.12.1994

7. Career breaks

19.02.2001-15.08.2007, family leaves (three children born in 2001, 2002 and 2004)

8. Research funding and grants as Principal Investigator:

01.05.2018 – 30.4.2021, EU Horizon 2020 Project Viroplant (Grant Agreement No. 773567; coordinated by M. Turina): Luke's funding share 238 051,50 €

01.09.2017 - 31.08.2021, Academy of Finland (decision number 309896), 491 258 €

1.9.2011-31.8.2014, Academy of Finland (decision number 251193), 310 178 €

1.1.1997-31.12.1999, Maj and Tor Nessling Foundation, 54 245 € (converted from FIM)

9. Research output

Total number of publications: **63** peer reviewed scientific reports and reviews

Patent: Method for Preventing Wood Decay, Related Biocontrol Agent and Uses, filed 9/2018, accepted in Finland 2021

10. Research supervision and leadership experience

Supervision of postdoctoral scientists: S. Sutela, A. Poimala, T. Drenkhan, R. Linnakoski

Co-supervisor of PhD theses, University of Helsinki: R. Hyder (2020), M. Kashif (2019)

MSc theses, University of Helsinki: Andreou (2021), Ping (2019), Mäkelä (2016), Hakanpää (2009)

BSc theses, Metropolia University of Applied Sciences, EVTEK University of Applied Sciences,
University of Helsinki: 1999, 2000, 2008, 2021
Lower level theses, Helsinki Vocational College: 12 theses (2009-2015)
International trainees, Leonardo da Vinci European Programme: 2009, 2010, 2012

11. Teaching merits

Pedagogical training: Basic studies of pedagogics (25 credits), University of Helsinki 2006-2007

Teaching experience: Co-lecturer, basic course on forest pathology ('Metsäpatologian perusteet'),
University of Helsinki, 2014, 2015, 2016, 2017

12. Awards and honours:

Best article award 2019, FEMS Microbiology Ecology (doi: 10.1093/femsec/fiz119)

13. Other key academic merits:

Peer review of funding applications:

Marie Skłodowska-Curie actions COFUND programme (two applications), Dutch Research Council,
National Science Foundation (USA), Czech Science Foundation, Latvian Science Council

Memberships in scientific committees:

International Committee on Taxonomy of Viruses (ICTV, member Id 1478), Chair of *Curvulaviridae* study
group, Member of three SGs (Fungal and Protist Viruses Subcommittee)

Editorial board membership in scientific journals:

Associate editor: Frontiers in Microbiology, June 2020 onwards (Review editor Nov 2016 onwards)
Editorial Board Member, fungal pathogens: Pathogens, January 2021 onwards

Referee for scientific journals (more than 50 ad hoc reviews):

Annals of Applied Biology, Applied and Environmental Microbiology, Archives of Virology, Canadian
Journal of Forest Research, Environmental Microbiology, FEMS Microbiology Ecology, Forest Pathology,
Frontiers in Microbiology, Fungal Biology, Fungal Ecology, Forests, Journal of General Virology, Journal of
Virology, Molecular Ecology, Mycological Research, Pathogens, Plant Pathology, PLOS Pathogens, Silva
Fennica, Virology, Virus Evolution, Virus Research

Significant invited international lectures:

13th International dsRNA Virus Symposium. 24-28 September 2018, Houffalize, Belgium

Ecology of Soil Microorganisms 2018, Helsinki 17.-21.6.2018

International Symposium on Plant Biotic Interactions and Plant Health, Huazhong Agricultural
University, Nov 18-19, 2021 (online presentation)

iVoM2 #4: Endless virus diversity most beautiful, Viruses of microbes webinar series, 22.2.2022

Organising scientific conferences:

Organizer, Seminar on Forest and Plant Health: biannual international seminar in Luke, 2017→

14. Scientific and societal impact of research:

Total number of peer-reviewed articles in scientific journals: **63**

Contributions at international or national scientific conferences or symposia: **35**

Articles popularizing science, non-refereed scientific articles, articles in Finnish: **7**

H-index (Google Scholar) = **28** (June 2022)

Name: Eeva Johanna Vainio

A Peer-reviewed scientific articles

63. Raco M, Vainio EJ, Sutela S, Eichmeier A, Hakalová E, Jung T and Botella L (2022) High diversity of novel viruses in the tree pathogen *Phytophthora castaneae* revealed by High-Throughput Sequencing of Total and Small RNA. *Front. Microbiol.* 13:911474. doi: 10.3389/fmicb.2022.911474
62. Wagemans J, Holtappels D, Vainio E, Rabiey M, Marzachi C, Herrero S, Ravanbakhsh M, Tebbe C, Ogliastro M, Ayllón M, Turina M (2022). Going Viral: Virus-based biological control agents for plant protection. *Annual Review of Phytopathology* 2022 60:1
61. Drenkhan T, Sutela S, Veeväli V, Vainio EJ (2022). *Phlebiopsis gigantea* strains from Estonia show potential as native biocontrol agents against *Heterobasidion* root rot and contain diverse dsRNA and ssRNA viruses. *Biological Control*, 104837. doi: 10.1016/j.biocontrol.2022.104837
60. Sutela S, Piri T, Vainio EJ (2021). Discovery and community dynamics of novel ssRNA mycoviruses in the conifer pathogen *Heterobasidion parviporum*. *Frontiers in Microbiology* 12:70787. doi: 10.3389/fmicb.2021.770787
59. Kashif M, Jurvansuu J, Hyder R, Vainio EJ, Hantula J (2021). Phenotypic recovery of a *Heterobasidion* isolate infected by a debilitation-associated virus is related to altered host gene expression and reduced virus titer. *Frontiers in Microbiology*, 12:661554. doi: 10.3389/fmicb.2021.661554
58. Piri T, Vainio EJ, Nuorteva H, Hantula J (2021). High Seedling Mortality of Scots Pine Caused by *Heterobasidion annosum* s.s. *Forests*, 12(9):1289. doi: 10.3390/f12091289
56. Levanova AA, Vainio EJ, Hantula J, Poranen MM (2021). RNA-dependent RNA polymerase from *Heterobasidion* RNA virus 6 is an active replicase in vitro. *Viruses*, 13(9), 1738; doi: 10.3390/v13091738
55. Rumbou A, Vainio EJ, Büttner C (2021). Towards the forest virome: next-generation-sequencing drastically expands our understanding on virosphere in temperate forest ecosystems. *Microorganisms* 9(8), 1730; doi: 10.3390/microorganisms9081730
54. Poimala A, Parikka P, Hantula J, Vainio E. (2021) Viral diversity in *Phytophthora cactorum* population infecting strawberry. *Environmental Microbiology*, 23(9), 5200–5221. DOI: 10.1111/1462-2920.15519
53. Linnakoski R, Sutela S, Coetzee MPA, Duong TA, Pavlov IN, Litovka YA, Hantula J, Wingfield BD, Vainio EJ (2021). *Armillaria* root rot fungi host single-stranded RNA viruses. *Sci Rep* 11, 7336, doi: 10.1038/s41598-021-86343-7
52. Sutela S, Forgia M, Vainio EJ, Chiapello M, Daghighi S, Vallino M, Martino E, Girlanda, Perotto S, Turina M. (2020). The virome from a collection of endomycorrhizal fungi reveals new viral taxa with unprecedented genome organization. *Virus Evolution*, 6(2) veaa076, doi: 10.1093/ve/veaa076

51. [Vainio EJ, Sutela S. \(2020\).](#) Mixed infection by a partitivirus and a negative-sense RNA virus related to mymonaviruses in the polypore fungus *Bondarzewia berkeleyi*. *Virus Research* 286, 198079. doi: [10.1016/j.virusres.2020.198079](#)
50. Sutela S, Vainio EJ. (2020) Virus population structure in the ectomycorrhizal fungi *Lactarius rufus* and *L. tabidus* at two forest sites in Southern Finland. *Virus Research* [285, 197993](#). doi: [10.1016/j.virusres.2020.197993](#)
49. Poimala A, Vainio EJ. (2020) Complete genome sequence of a novel toti-like virus from the plant pathogenic oomycete *Phytophthora cactorum*. *Archives of Virology*, 165, 1679–1682. doi: 10.1007/s00705-020-04642-2
48. Hantula J, Mäkelä S, Xu, P, Brusila V, Nuorteva H, Kashif M, Hyder R, Vainio EJ. (2020) Multiple virus infections of *Heterobasidion* sp. *Fungal Biology*, 124: 102-109. doi: 10.1016/j.funbio.2019.12.004
47. Vainio EJ, Bezos D, Bragança H, Cleary M, Fourie G, Georgieva M, Ghelardini L, Hannunen S, Ioos R, Martín-García J, Martínez-Álvarez P, Mullett M, Oszako T, Papazova-Anakieva I, Piškur B, Romeralo C, Sanz-Ros AV, Steenkamp ET, Tubby K, Wingfield MJ, Diez JJ. (2019) Sampling and detection strategies for the Pine Pitch Canker (PPC) disease pathogen *Fusarium circinatum* in Europe. *Forests* 10, 723; doi:10.3390/f10090723
46. Vainio EJ. (2019). Mitoviruses in the conifer root rot pathogens *Heterobasidion annosum* and *H. parviporum*. *Virus Research* 271, Article 197681 doi: 10.1016/j.virusres.2019.197681
45. Sutela S, Poimala A, Vainio EJ. (2019) Viruses of fungi and oomycetes in the soil environment. *FEMS Microbiology Ecology* 95 (9), f1119. doi: [10.1093/femsec/f1119](#)
44. Kashif M, Jurvansuu J, Vainio EJ & Hantula J. (2019) Alphapartitiviruses of *Heterobasidion* wood decay fungi affect each others transmission and host growth. *Frontiers in Cellular and Infection Microbiology*, 9:64. doi: 10.3389/fcimb.2019.00064
43. Martín-García J, Zas R, Solla A, Woodward S, Hantula J, Vainio EJ, Mullett M, Morales-Rodríguez C, Vannini A, Martínez-Álvarez P, Pinto G, Alves A, Amaral J., Wingfield MJ, Fourie G, Steenkamp ET, Ahumada R, Šerá B, Sanz-Ros, AV, Raposo, R, Elvira-Recuenco M, Iturriza E, Gordon TR, Diez JJ (2019). Environmentally-friendly methods for controlling pine pitch canker. *Plant Pathology*, 68: 843-860. doi: [10.1111/ppa.13009](#)
42. Massart S, Chiumenti M, De Jonghe K, Glover R, Haegeman A, Koloniuk I, Kominek P, Kreuze J, Kutnjak D, Lotos L, Maclot F, Maglioka V, Maree HJ, Molnar J, Olivier T, Olmos A, Pooggin MM, Reynard J-S, Ruiz-García AB, Safarova D, Schneeberger PHH, Sela N, Turco S, Vainio EJ, Varallyay E, Verdin E, Westenberg M, Brostaux Y and Candresse T (2019). Virus detection by high-throughput sequencing of small RNAs: large scale performance testing of sequence analysis strategies. *Phytopathology* 109:488-497. doi: [10.1094/PHYTO-02-18-0067-R](#)
41. Zhen Zeng, Sun, Eeva Vainio, Tommaso Raffaello, Andriy Kovalchuk, Emmanuelle Morin, Sebastien Duplessis, Fred O. Asiegbu (2018). Intraspecific comparative genomics of isolates of the Norway spruce pathogen (*Heterobasidion parviporum*) and identification of its potential virulence factors. *BMC Genomics* 19:220. doi: 10.1186/s12864-018-4610-4

40. Muñoz-Adalia EJ, Diez JJ, Fernández M, Hantula J, Vainio EJ (2018). Characterization of small RNAs originating from mitoviruses infecting the conifer pathogen *Fusarium circinatum*. Archives of Virology, 163 (4), 1009–1018. doi: [10.1007/s00705-018-3712-2](https://doi.org/10.1007/s00705-018-3712-2)
39. Vainio EJ. (2018) Complete genome sequence of HetPV20-an1, an alphapartitivirus infecting the conifer pathogenic fungus *Heterobasidion annosum*. Archives of Virology, 163(4), 1113–1116. doi: [10.1007/s00705-018-3707-z](https://doi.org/10.1007/s00705-018-3707-z)
38. Vainio EJ, Jurvansuu J, Hyder R, Kashif M, Piri T, Tuomivirta T, Poimala A, Xu P, Mäkelä S, Nitisa D, Hantula J. (2018) The partitivirus HetPV13-an1 mediates growth debilitation and major alterations in the gene expression of a fungal forest pathogen. Journal of Virology 92(5) e01744-17. doi: 10.1128/JVI.01744-17
37. Vainio EJ, Chiba S, Ghabrial SA, Maiss E, Roossinck M, Sabanadzovic S, Suzuki N, Xie J, Nibert M, ICTV Consortium (2018) ICTV Virus Taxonomy Profile: *Partitiviridae*. J Gen Virol 99:17–18. doi: 10.1099/jgv.0.000985
36. Hyder R, Piri T, Hantula J, Nuorteva H, Vainio EJ. (2018) Distribution of viruses inhabiting *Heterobasidion annosum* in a pine-dominated forest plot in southern Finland. Microbial Ecology 75:622–630. doi: 10.1007/s00248-017-1027-6.
35. Vainio EJ, Velmala S, Salo P, Huhtinen S and Müller MM. (2017). Defoliation of small-leaved lime trees (*Tilia cordata*) associated with *Apiognomonina errabunda* infection in Finland. Silva Fennica 51 (4): 7749. doi: 10.14214/sf.7749.
34. Muñoz-Adalia EJ, Sanz-Ros AV, Flores-Pacheco JA, Bezos D, Hantula J, Diez JJ, Vainio EJ, Fernández M. (2017). *Sydowia polyspora* dominates fungal community carried by two species of bark beetles in pine plantations threatened by *Fusarium circinatum*. Forests 8(4): 127. doi: [10.3390/f8040127](https://doi.org/10.3390/f8040127).
33. Vainio EJ, Pennanen T, Rajala T, Hantula J. (2017) Occurrence of similar mycoviruses in pathogenic, saprotrophic and mycorrhizal fungi inhabiting the same forest stand. FEMS Microbiology Ecology 93(3): fix003. doi: [10.1093/femsec/fix003](https://doi.org/10.1093/femsec/fix003)
32. Massart S, Candresse T, Gil J, Lacomme C, Predajna L, Ravnikaar M, Reynard J-S, Rumbou A, Saldarelli P, Škorić D, Vainio EJ, Valkonen JPT, Vanderschuren H, Varveri C, Wetzel T. (2017). A framework for the evaluation of biosecurity, commercial, regulatory and scientific impacts of plant viruses and viroids identified by NGS technologies. Frontiers in Microbiology 8:45. doi: 10.3389/fmicb.2017.00045.
31. Vainio EJ, Hantula J. (2016). Taxonomy, biogeography and importance of *Heterobasidion* viruses. Virus Research, 219:2-10.
30. Drenkhan T, Kasanen R, Vainio EJ. (2016). *Phlebiopsis gigantea* and associated viruses survive passing through the digestive tract of *Hylobius abietis*. Biocontrol Science and Technology, 26:320-330.
29. Vainio EJ, Martínez-Álvarez P, Bezos D, Hantula J, Diez J. (2015). *Fusarium circinatum* isolates from northern Spain are commonly infected by three distinct mitoviruses. Archives of Virology, 160:2093–2098.
28. Botella L, Vainio EJ, Hantula J, Diez J, Jankovsky L. (2015). Description and prevalence of

a putative novel mycovirus within the conifer pathogen *Gremmeniella abietina*. Archives of Virology, 160:1967-1975.

27. Vainio EJ, Jurvansuu J, Streng J, Rajamäki M, Jarkko Hantula J, Valkonen JPT. (2015). Diagnosis and discovery of fungal viruses by deep sequencing of small RNAs. Journal of General Virology 96:714–725.
26. Vainio EJ, Müller MM, Korhonen K, Piri T, Hantula J. (2015). Viruses accumulate in aging infection centers of a fungal forest pathogen. The ISME Journal 9, 497–507.
25. Kashif M, Hyder R, De Vega Perez D, Hantula J, Vainio EJ (2015). Heterobasidion wood decay fungi host diverse and globally distributed viruses related to Helicobasidium mompa partitivirus V70. Virus Research 195:119–123.
24. Martínez-Álvarez P, Vainio EJ, Botella L, Hantula J, Diez JJ. (2014). Three mitovirus strains infecting a single isolate of *Fusarium circinatum* comprise the first putative members of *Narnaviridae* among species of *Fusarium*. Archives of Virology, 159:2153–2155.
23. Jurvansuu J, Kashif M, Vaario L, Vainio EJ, Hantula J. (2014). Partitiviruses of a fungal forest pathogen have species-specific quantities of genome segments and transcripts. Virology 462-463:25-33
22. Nibert ML, Ghabrial SA, Maiss E, Lesker T, Vainio EJ, Jiang D, Suzuki N. (2014). Taxonomic reorganization of family *Partitiviridae* and other recent progress in partitivirus research. Virus Research 188:128-141
21. Hyder R, Pennanen T, Hamberg, L Vainio EJ, Piri T, Jarkko Hantula J. (2013). Two viruses of *Heterobasidion* confer beneficial, cryptic or detrimental effects to their hosts in different situations. Fungal Ecology, 6:387-396
20. Drenkhan T, Sibul I, Kasanen R, Vainio E. (2013). Viruses of the conifer pathogenic fungus *Heterobasidion parviporum* resist passing through the alimentary tract of the large pine weevil. Forest Pathology 43:317-323
19. Vainio EJ, Capretti P, Motta E, Hantula J. (2013). Molecular characterization of HetRV8-ir1, a partitivirus of the invasive conifer pathogenic fungus *H. irregulare*. Archives of Virology, 158:1613-1615
18. Vainio EJ, Piri T, Hantula J. (2013). Virus community dynamics in the conifer pathogenic fungus *Heterobasidion parviporum* following an artificial introduction of a partitivirus. Microbial Ecology, 65:28-38
17. Vainio EJ, Hyder R, Aday G, Hansen E, Piri T, Dogmus-Lehtijärvi T, Lehtijärvi A, Korhonen K, Hantula J. (2012) Population structure of a novel putative mycovirus infecting the conifer root-rot fungus *Heterobasidion annosum* sensu lato. Virology 422:366–376
16. Vainio EJ, Hakanpää J, Dai Y-C, Hansen E, Hantula J (2011). Species of *Heterobasidion* host a diverse pool of partitiviruses with global distribution and interspecies transmission. Fungal Biology 115:1234-1243
15. Vainio EJ, Keriö S, Hantula J (2011). Description of a new putative virus infecting the conifer pathogenic fungus *Heterobasidion parviporum* with resemblance to Heterobasidion

annosum P-type partitivirus. Archives of Virology 156(1): 79-86

14. Vainio EJ, Korhonen K, Tuomivirta TT, Hantula J (2010). A novel putative partitivirus of the saprotrophic fungus *Heterobasidion ecrustosum* infects pathogenic species of the *Heterobasidion annosum* complex. Fungal Biology 114: 955-965.
13. Lilja AT, Parikka PK, Pääskynkivi EA, Hantula JI, Vainio EJ, Vartiamaäki HA, Lemmetty AH, Vestberg MV (2006). *Phytophthora cactorum* and *Colletotrichum acutatum*: survival and detection. Agriculturae Conspectus Scientificus 71:121-128
12. Kauhanen M, Vainio EJ, Hantula J, Eyjolfssdottir GG, Niemelä P (2006). Endophytic fungi in Siberian larch (*Larix sibirica*) needles. Forest Pathology 36: 434-446
11. Vainio EJ, Hallaksela A-M, Lipponen K, Hantula J (2005). Direct analysis of ribosomal DNA in denaturing gradients: application on the effects of *Phlebiopsis gigantea* treatment on fungal communities of conifer stumps. Mycological Research 109:103-114
10. Hantula J, Vainio E (2003). Specific primers for the differentiation of *Heterobasidion annosum* (s.str.) and *H. parviporum* infected stumps in northern Europe. Silva Fennica 37:181-187
9. Dai Y-C, Vainio EJ, Hantula J, Niemelä T, Korhonen K (2003). Investigations on *Heterobasidion annosum* s. lat. In central and eastern Asia with the aid of mating tests and DNA fingerprinting. Forest Pathology 33:269-286
8. Dai Y-C, Vainio EJ, Hantula J, Niemelä T, Korhonen K (2002). Sexuality and intersterility within the *Heterobasidion insulare* complex. Mycological Research 106:1435-1448
7. Vainio EJ, Lipponen K, Hantula J (2001). Persistence of a biocontrol strain of *Phlebiopsis gigantea* in conifer stumps and its effects on within-species genetic diversity. Forest Pathology 31:285-295
6. Vainio EJ, Hantula J (2000). Direct analysis of wood-inhabiting fungi using denaturing gradient gel electrophoresis of amplified ribosomal DNA. Mycological Research 104:927-936
5. Vainio EJ, Hantula J (2000). Genetic differentiation between European and North American populations of *Phlebiopsis gigantea*. Mycologia 92:436-446
4. Vainio EJ, Hantula J (1999). Variation of RAMS markers within the intersterility groups of *Heterobasidion annosum* in Europe. European Journal of Forest Pathology 29:231-246
3. Vainio EJ, Korhonen K, Hantula J (1998). Genetic variation in *Phlebiopsis gigantea* as detected with random amplified microsatellite (RAMS) markers. Mycological Research 102:187-192
2. Lyra C, Hantula J, Vainio E, Rapala J, Rouhiainen L, Sivonen K (1997). Characterization of cyanobacteria by SDS-PAGE of whole-cell proteins and PCR/RFLP of the 16S rRNA gene. Archives of Microbiology 168:176-184
1. Vainio EJ, Moilanen A, Koivula TT, Bamford DH, Hantula J (1997). Comparison of partial 16S rRNA gene sequences obtained from activated sludge bacteria. Applied Microbiology and Biotechnology 48:73-79

B Non-refereed scientific articles

4. Jarkko Hantula, J; Vainio, E. J. Chapter 20 - Viruses as components of forest microbiome, Editor(s): Fred O. Asiegbu, Andriy Kovalchuk. In: Forest Microbiology, Academic Press, 2021, Pages 371-382, ISBN 9780128225424, <https://doi.org/10.1016/B978-0-12-822542-4.00008-5>
3. Vainio, E. J. (2021) Partitiviruses (*Partitiviridae*) – Fungal. *Encyclopedia of Virology* (Elsevier). Academic Press, ISBN: 9780128145159.
2. Vainio, E. J. & Hantula, J. (2018). Fungal viruses. In: Viruses of Microorganisms (eds. Paul Hyman & Stephen T. Abedon) Caister Academic Press, Norfolk, UK. ISBN: 978-1-910190-85-2
1. Vainio E, Korhonen K, Lipponen K, Hantula J (2001). Juurikäävän torjunnan vaikutukset harmaaorvakan perinnölliseen monimuotoisuuteen sekä havupuun kantojen lahoittajasienilajistoon. Julkaisussa: Siitonen, J. (toim.). Monimuotoinen metsä. Metsäluonnon monimuotoisuuden tutkimusohjelman loppuraportti. Metsätutkimuslaitoksen tiedonantoja 812: 167-172. [In Finnish]

D Publications intended for professional communities: Conference proceedings and poster presentations

35. Possibilities of using mycoviruses for the control of fungal and oomycete plant pathogens with a focus on boreal forest fungi. International Symposium on Plant Biotic Interactions and Plant Health, Huazhong Agricultural University, Nov 18-19, 2021 [Invited online presentation]
34. Fungal and oomycete viruses with persistent lifestyles and unprecedented genome organizations. iVoM2 #4: Endless virus diversity most beautiful, Viruses of microbes webinar series, 22.2.2022 [Invited webinar talk]
33. Eeva J. Vainio, Anna Poimala, Päivi Parikka, Jarkko Hantula, María Ángeles Ayllón, Massimo Turina (2018). VIROPLANT: Virome NGS analysis of pests and pathogens for plant protection (poster). Final Meeting of COST-DIVAS Action: HTS Technologies for the study and diagnostic of plant viruses. **26-30 November 2018, Liège – Belgium**
32. Eeva J. Vainio (2018). Mitochondrial viruses revealed by HTS in conifer pathogenic fungi of genus *Heterobasidion* (poster). Final Meeting of COST-DIVAS Action: HTS Technologies for the study and diagnostic of plant viruses. **26-30 November 2018, Liège – Belgium**
31. Eeva Johanna Vainio, Anna Poimala, Tuula Piri, Muhammad Kashif, Jarkko Hantula (2018). Partitiviruses and related unclassified viruses in plant pathogenic fungi and oomycetes. 13th International dsRNA Virus Symposium. 24-28 September 2018, Houffalize, Belgium. [Invited oral presentation]
30. Jarkko Hantula, Tuula Piri, Eeva J. Vainio, Muhammad Kashif (2018). New biocontrol applications against *Heterobasidion* spp. 3rd Conference on **Ecology of Soil Microorganisms 2018. 17-21 June 2018, Helsinki, Finland**
29. Eeva Vainio, Tuula Piri, Rafiqul Hyder, Taina Pennanen, Jarkko Hantula (2018). Virus communities of forest fungi inhabiting decomposing wood and tree roots. 3rd Conference on **Ecology of Soil Microorganisms 2018. 17-21 June 2018, Helsinki, Finland** [Invited oral presentation]

presentation]

28. Eeva Vainio. Viruses of *Heterobasidion* wood decay fungi may switch hosts into saprotrophic and mutualistic fungal species of the same habitat. LYNET 3rd Winter Classic Microbial Ecology Seminar. 16th February, 2016, Vantaa, Finland.
27. Hyder R, Vainio EJ, Piri T, Hantula J. Diversity and transmission of *Heterobasidion annosum* viruses in a pathogen-affected pine forest in Finland. Root and Butt Rot of Forest Trees. 14th International Conference of IUFRO Working Party 7.02.01. 12th-18th October 2015. Antalya – Fethiye –Bodrum, Turkey.
26. Vainio EJ, Pennanen T, Müller MM, Piri T, Korhonen K, Rajala T, Hantula J. Viruses accumulate in aging *Heterobasidion* clones and may switch hosts into other fungal species of the same habitat. Root and Butt Rot of Forest Trees. 14th International Conference of IUFRO Working Party 7.02.01. 12th-18th October 2015. Antalya – Fethiye –Bodrum, Turkey.
25. Hantula J, Kashif M, Mäkelä S, Xu P, Vainio EJ. New insights into the transmission of *Heterobasidion* viruses. Root and Butt Rot of Forest Trees. 14th International Conference of IUFRO Working Party 7.02.01. 12th-18th October 2015. Antalya – Fethiye –Bodrum, Turkey.
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H Patents and invention disclosures

Patent: Method for Preventing Wood Decay, Related Biocontrol Agent and Uses, accepted in Finland 2021