

Julkaisut vuonna 2021 – Publications in 2021

Pro gradu -tutkielmat/Master's theses

Kuusisto, I., 2021: Tunturikasvillisuus lumigradientilla – lumenviipymästä niukkalumiseen tunturikankaaseen. – M. Sc. thesis, Department of Biology, University of Turku. 56 pp. + 5 app.

Kandidaatin tutkielmat/Bachelor's theses

Koistinen, M. 2021: Utsjoen (Skállovárri, InL) päivällä lentävien suurperhosten (Macrolepidoptera) lajistollinen monimuotoisuus viidessä erilaisessa luontotyyppissä. – B. Sc. thesis, Department of Biology, University of Turku. 37 pp. + 2 app.

Koski, V. 2021: Poron (*Rangifer tarandus tarandus*) laidunnuksen vaikutus maaperän lämpötilaan. – B. Sc. thesis, Department of Biology, University of Turku. 14 pp. + 1 app.

Muut julkaisut/Other publications

Culina, A., Adriaensen, F., Bailey, L.D., Burgess, M.D., Charmantier, E.F.C., Eeva, T., Matthysen, E., Nater, C.R., Sheldon, B.C., Sæther, B.-E., Vriend, S.J.G., Zajkova, Z., Adamík, P., Aplin, L.M., Angulo, E., Artemyev, A., Barba, E., Barišić, S., Belda, E., Can Bilgin, C., Bleu, J., Both, C., Bouwhuis, S., Branston, C., Broggi, J., Burke, T., Bushuev, A., Camacho, C., Campobello, D., Canal, D., Cantarero, A., Caro, S.P., Cauchoix, M., Chaine, A., Cichoń, M., Ćiković, D., Cusimano, C.A., Deimel, C., Dhondt, A.A., Dingemanse, N.J., Doligez, B., Dominoni, D.M., Doutrelant, C., Drobniak, S.M., Dubiec, A., Eens, M., Erikstadt, K.E., Espín, S., Farine, D.R., Figuerola, J., Gülbeyaz, P.K., Grégoire, A., Hartley, I.R., Hau, M., Hegyi, G., Hille, S., Hinde, C.A., Holtmann, B., Ilyina, T., Isaksson, C., Iserbyt, A., Ivankina, E., Kania, W., Kempenaers, B., Kerimov, A., Komdeur, J., Korsten, P., Král, M., Krist, M., Lambrechts, M., Lara, C.E., Leivits, A., Liker, A., Lodjak, J., Mägi, M., Mainwaring, M.C., Mänd, R., Massa, B., Massemin, S., Martinez-Padilla, J., Mazgajski, T.D., Mennerat, A., Moreno, J., Mouchet, A., Nakagawa, S., Nilsson, J.-Å., Nilsson, J., Norte, A.C., van Oers, K., Orell, M., Potti, J., Quinn, J.L., Réale, D., Reiertsen, T.K., Rosivall, B., Russell, A.F., Rytönen, S., Sánchez-Virosta, P., Santos, E.S.A., Schroeder, J., Senar, J.C., Seress, G., Slagsvold, T., Szulkin, M., Teplitsky, C., Tilgar, V., Tolstoguzov, A., Török, J., Valcu, M., Vátka, E., Verhulst, S., Watson, H., Yuta, T., Zamora-Martin, J.M. & Visser, M.E. 2021: Connecting the data landscape of long-term ecological studies: the SPI-Birds data hub. – *Journal of Animal Ecology* 90: 2147-2160. doi.org/10.1111/1365-2656.13388

Culverwell, C.L., Uusitalo, R.J., Korhonen, E.M., Vapalahti, O.P., Huhtamo, E. & Harbach, R.E. 2021: The mosquitoes of Finland: updated distributions and bionomics. – *Medical and Veterinary Entomology* 35: 1-29. doi.org/10.1111/mve.12475

Ercan, F.E.Z., Mikola, J., Silfver, T., Myller, K., Vainio, E., Słowińska, S., Słowiński, M., Lamentowicz, M., Blok, D. & Wagner-Cremer, F. 2021: Effects of experimental warming on *Betula nana* epidermal cell growth tested over its maximum climatological growth range. – *PloS ONE* 16(5): e0251625. doi.org/10.1371/journal.pone.0251625

Ghimire, R.P., Silfver, T., Myller, K., Oksanen, E., Holopainen, J.K. & Mikola, J. 2021: BVOC emissions from subarctic ecosystem, as controlled by insect herbivore pressure and temperature. - *Ecosystems* (early access 17 August 2021). doi.org/10.1007/s10021-021-00690-0

Huuskonen, S., Domisch, T., Finér, L., Hantula, J., Hynynen, J., Matala, J., Miina, J., Neuvonen, S., Nevalainen, S., Niemistö, P., Nikula, A., Piri, T., Siitonen, J., Smolander, A., Tonteri, T., Uotila, K. & Viiri, H. 2021: What is the potential for replacing monocultures with mixed-species stands to enhance ecosystem services in boreal forests in Fennoscandia? – *Forest Ecology and Management* 479: 118558. doi.org/10.1016/j.foreco.2020.118558

Mellat, M., Bailey, H., Mustonen, K.-R., Marttila, H., Klein, E.S., Gribanov, K., Bret-Harte, M.S., Chupakov, A.V., Divine, D.V., Else, B., Filippov, I., Hyöky, V., Jones, S., Kirpotin, S.N., Kroon, A., Markussen, H.T., Nielsen, M., Olsen, M., Paavola, R., Pokrovsky, O.S., Prokushin, A., Rasch, M., Raundrup, K., Suominen, O., Syvänperä, I., Vignissou, S.R., Zarov, E. & Welker, J.M. 2021: Hydroclimatic controls on the isotopic ($\delta^{18}\text{O}$, $\delta^2\text{H}$, d-excess) traits of pan-arctic summer rainfall events – *Frontiers in Earth Science* 9: 651731. doi: 10.3389/feart.2021.651731

Meyer, N., Xu, Y., Karjalainen, K., Adamczyk, S., Biasi, C., van Delden, L., Martin, A., Mganga, K., Myller, K., Sietiö, O.-M., Suominen, O. & Karhu, K. 2021: Living, dead, and absent trees – How do moth outbreaks shape small-scale patterns of soil organic matter stocks and dynamics at the Subarctic mountain birch treeline? – *Global Change Biology* (early view 21 October 2021). doi.org/10.1111/gcb.15951

Sánchez-Hernández, J., Hayden, B., Harrod, C. & Kahilainen, K.K. 2021: Population niche breadth and individual specialization of fish along a climate-productivity gradient. – *Reviews in Fish Biology and Fisheries* 31: 1025-1043. doi.org/10.1007/s11160-021-09687-3

Julkaisut vuonna 2022 – Publications in 2022

Väitöskirjat/Doctoral Dissertations

Ercan, F.E.Z. 2022: Growing season changes over the past millennium in northern high latitudes. – Doc. thesis, Universiteit Utrecht. 154 pp.

Lindén, E. 2022: Circumpolar impacts of herbivores on Arctic tundra vegetation. – Doc. thesis, Umeå University, Faculty of Science and Technology, Department of Ecology and Environment. 22 pp. + 4 articles. ORCID iD: 0000-0002-4060-0110

Pro gradu -tutkielmat/Master's theses

Marjamäki, B. 2022: Yöperhosten lukumäärän ja biomassan ajalliset muutokset subarktisen alueen muuttuvassa ilmastossa sekä yhteydet kirjosiepon pesimämenestykseen. – M. Sc. thesis, Department of Biology, University of Turku. 54 pp.

Muut julkaisut/Other publications

Baylei, L.D., van de Pol, M., Adriaensen, F., Arct, A., Barba, E., Bellamy, P.E., Bonamour, S., Bouvier, J.-C., Burgess, M.D., Charmantier, A., Cusimano, C., Doligez, B., Drobniak, S.M., Dubiec, A., Eens, M., Eeva, T., Ferns, P.N., Goodenough, A.E., Hartley, I.R., Hinsley, S.A., Ivankina, E., Juškaitis, R., Kempenaers, B., Kerimov, A.B., Lavigne, C., Leivits, A., Mainwaring, M.C., Matthysen, E., Nilsson, J.-Å., Orell, M., Rytkönen, S., Senar, J.C., Sheldon, B.C., Sorace, A., Stenning, M.J., Török, J., van Oers, K., Vatka, E., Vriend, S.J.G. & Visser, M.E. 2022: Bird populations most exposed to climate change are less sensitive to climatic variation. – *Nature Communications* 13: 2112. doi: 10.1038/s41467-022-29635-4

Bhattarai, H.R., Marushchak, M.E., Ronkainen, J., Lamprecht, R.E., Siljanen, H.M.P., Martikainen, P.J., Biasi, C. & Maljanen, M. 2022: Emissions of atmospherically reactive gases nitrous acid and nitric oxide from Arctic permafrost peatlands. – *Environmental Research Letters* 17: 024034. doi.org/10.1088/1748-93267ac4f8e

Laihonon, M., Saikkonen, K., Helander, M., Vasquez de Aldana, B.R., Zabalgoeazcoa, I. & Fuchs, B. 2022: *Epichloë* endophyte-promoted seed pathogen increases host grass resistance against insect herbivory. – *Frontiers in Microbiology* 12: 786619. doi: 10.3389/fmicb.2021.786619

Meyer, N., Xu, Y., Karjalainen, K., Adamczyk, S., Biasi, C., van Delden, L., Martin, A., Mganga, K., Myller, K., Sietiö, O.-M., Suominen, O. & Karhu, K. 2022: Living, dead, and absent trees – How do moth outbreaks shape small-scale patterns of soil organic matter stocks and dynamics at the Subarctic mountain birch treeline? – *Global Change Biology* 28(2): 441-462. doi.org/10.1111/gcb.15951

Nyman, T., Wutke, S., Koivisto, E., Klemola, T., Shaw, M.R., Andersson, T., Haraldseide, H., Hagen, S.B., Nakadai, R. & Ruohomäki, K. 2022: A curated DNA barcode reference library for parasitoids of northern European cyclically outbreaking geometrid moths. – *Ecology and Evolution* 12 (11): e9525. doi.org/10.1002/ece3.9525

Plączkowska, E., Wasak-Sęk, K., Żelazny, M., Jelonkiewicz, Ł., Syvänperä, I., Paavola, R., Sippola, K., Partanen, R. & Leuchner, M. 2022. Headwater chemistry in subarctic areas with different plant communities (Finnish Lapland). – *Episodes* (published online September 1, 2022). doi.org/10.18814/epiiugs/2022/022026

Schmale, J., Sharma, S., Decesari, S., Pernov, J., Massling, A., Hansson, H.-C., von Salzen, K., Skov, H., Andrews, E., Quinn, P.K., Upchurch, L.M., Eleftheriadis, K., Traversi, R., Gilardoni, S., Mazzola, M., Laing, J. & Hopke, P. 2022: Pan-Arctic seasonal cycle and long-term trends of aerosol properties from 10 observatories. – *Atmospheric Chemistry and Physics* 22(5): 3067-3099. doi.org/10.5194/acp-22-3067-2022

Vriend, S. J.G., Grøtan, V., Gamelon, M., Adriaensen, F., Ahola, M.P. Álvarez, E., Bailey, L.D., Barba, E., Bouvier, J.-C., Burgess, M.D., Camacho, C., Canal, D., Charmantier, A., Cole, E.F., Cusimano, C., Doligez, B.F., Drobniak, S.M., Dubiec, A., Eens, M., Eeva, T., Erikstad, K.E., Ferns, P.N., Goodenough, A.E., Hartley, I.R., Hinsley, S.A., Ivankina, E., Juškaitis, R., Kempenaers, B., Kerimov, A.B., Kålås, J.A., Lavigne, C., Leivits, A., Mainwaring, M.C., Martínez-Padilla, J., Matthysen, E., van Oers, K., Orell, M., Pinxten, R., Reiertsen, T.K., Rytönen, S., Senar, J.C., Sheldon, B.C., Sorace, A., Török, J., Vátka, E., Visser, M.E., Sæther, B.-E. 2022: Temperature synchronizes temporal variation in laying dates across European hole-nesting passerines. – *Ecology* 104(2): e3908. doi.org/10.1002/ecy.3908

Julkaisut vuonna 2023 – Publications in 2023

Väitöskirjat/Doctoral Dissertations

Heiskanen, L. 2023: Environmental responses of carbon dioxide and methane fluxes of subarctic ecosystems in Northern Finland. – Doc. thesis, Finnish Meteorological Institute, University of Helsinki. 66 pp. + 4 articles + 1 app. doi.org/10.35614/iisb.9789523361676

Muut julkaisut/Other publications

Donhauser, J., Briones, M.J.I., Mikola, J., Jones, D.L., Eder, R., Filser, J., Frossard, A., Krogh, P.H., Paulo, J.P., Cortet, J., Desie, E., Domene, X., Djuric, S., Hackenberger, D., Jimenez, J.J., Iamandei, M., Rissman, C., Schmidt, O., Shanskiy, M., Silfver, T., Vancampenhout, K., Vasutova, M., Velizarova, E. & Frey, B. 2023: Extracting DNA from soil or directly from isolated nematodes indicate dissimilar community structure for Europe-wide forest soils. – *Soil Biology and Biochemistry* 185: 109154. doi.org/10.1016/j.soilbio.2023.109154

Holmgren, M., Groten, F., Carracedo, M.R., Vink, S. & Limpens, J. 2023: Rewilding risks for peatland permafrost. – *Ecosystems*. doi.org/10.1007/s10021-023-00865-x

Hosokawa, K., Oyama, S.-I., Ogawa, Y., Miyoshi, Y., Kurita, S., Teramoto, M., Nozawa, S., Kawabata, T., Kawamura, Y., Tanaka, Y.-M., Miyaoka, H., Kataoka, R., Shiokawa, K., Brändström, U., Turunen, E., Raita, T., Johnsen, M.G., Hall, C., Hampton, D., Ebihara, Y., Kasahara, Y., Matsuda, S., Shinohara, I. & Fujii, R. 2023: A ground-based instrument suite for integrated high-time resolution measurement of pulsating aurora with Arase. – *Journal of Geophysical Research: Space Physics* 128: e2023JA031527. doi.org/10.1029/2023JA031527

Kemppinen, J., Niittynen, P., Rissanen, T., Tyystjärvi, V., Aalto, J. & Luoto, M. 2023: Soil moisture variations from boreal forest to the tundra. – *Water Resource Research* 59: e2022WR032719. doi.org/10.1029/2022WR032719

Kotila, M., Suominen, K., Vasko, V., Blomberg, A., Lehtiköinen, A., Andersson, T., Aspi, J., Cederberg, T., Hänninen, J., Inkinen, J., Koskinen, J., Lundberg, G., Mäkinen, K., Rontti, M., Snickars, M., Solbakken, J., Sundell, J., Syvänpää, I., Vuorenmaa, S., Ylönen, J., Vesterinen, E. & Lilley, T. 2023: Large-scale long-term passive-acoustic monitoring reveals spatio-temporal activity patterns of boreal bats. – *Ecography* (preprint). doi:10.2254/au.166826490.04895229/v1

Martin, J., Boike, J., Chadburn, S., Zwieback, S., Anselm, N., Goldau, M.P., Hammar, J., Abramova, E., Lisovski, S., Coulumbe, S., Brampton, D., Wilcox, E.J., Giamberini, M., Radar, F., Suominen, O., Rudd, D.A., Mastepanov, M. & Young, A. 2023: T-MOSAiC 2021 myThaw data set. PANGAEA. doi.org/10.1594/PANGAEA.956039

Schillings, A., Palin, L., Bower, G.E., Opgenoorth, H.J., Milan, S.E., Kauristie, K., Juusola, L., Reeves, G.D., Henderson, M.G., Paxton, L.J., Lester, M., Hamrin, M. & Van de Kamp, M. 2023: Signatures of wedgelets over Fennoscandia during the St Patrick's Day Storm 2015. – *Journal of Space Weather and Space Climate* 13:19. doi.org/10.1051/swsc/2023018

Julkaisut vuonna 2024 – Publications in 2024

Muut julkaisut/Other publications

Abrego, N., Furneaux, B., Hardwick, B., Somervuo, P., Palorinne, I., Aguilar-Trigueros, C.A., Andrew, N.R., Babiy, U.V., Bao, T., Bazzano, G., Bondarchuk, S.N., Bonebrake, T.C., Brennan, G.L., Bret-Harte, S., Bässler, C., Cagnolo, L., Cameron, E.K., Chapurlat, E., Creer, S., D'Acqui, L.P., de Vere, N., Desprez-Loustau, M.-L., Dongmo, M.A.K., Dyrholm Jacobsen, I.B., Fisher, B.L., Flores de Jesus, M., Gilbert, G.S., Griffith, G.W., Gritsuk, A.A., Gross, A., Grudd, H., Halme, P., Hanna, R., Hansen, J., Hansen, L.H., Hegbe, A.D.M.T., Hill, S., Hogg, I.D., Hultman, J., Hyde, K.D., Hynson, N.A., Ivanovna, N., Karisto, P., Kerdraon, D., Knorre, A., Krisai-Greilhuber, I., Kurhinen, J., Kuzmina, M., Lecomte, N., Lecomte, E., Loaiza, V., Lundin, E., Meire, A., Mešić, A., Miettinen, O., Monkhouse, N., Mortimer, P., Müller, J., Nilsson, R.H., Nonti, P.Y.C., Nordén, J., Nordén, B., Norros, V., Paz, C., Pellikka, P., Pereira, D., Petch, G., Pitkänen, J.-M., Popa, F., Potter, C., Purhonen, J., Pätsi, S., Rafiq, A., Raharinjanahary, D., Rakos, N., Rathnayaka, A.R., Raundrup, K., Rebriev, Y.A., Rikkinen, J., Rogers, H.M.K., Rogovsky, A., Rozhkov, Y., Runnel, K., Saarto, A., Savchenko, A., Schlegel, M., Schmidt, N.M., Seibold, S., Skjøth, C., Stengel, E., Sutyryna, S.V., Syvänperä, I., Tedersoo, L., Timm, J., Tipton, L., Toju, H., Uscka-Perzanowska, M., van der Bank, M., van der Bank, F.H., Vanderbrink, B., Ventura, S., Vignisson, S.R., Wang, X., Weisser, W.W., Wijesinghe, S.N., Wright, S.J., Yang, C., Yorou, N.S., Young, A., Yu, D.W., Zakharov, E.V., Hebert, P.D.N., Roslin, T. & Ovaskainen, O. 2024: Airborne DNA reveals predictable spatial and seasonal dynamics of fungi. *Nature* 631: 835-842. doi.org/10.1038/s41586-024-07658-9

Ahonen, S.H.K., Ruotsalainen, A.L., Wäli, P.R., Suominen, O., Vindstadt, O.P., Jepsen, J.U. & Markkola, A. 2024: Does long-term grazing cause cascading impacts on the soil microbiome in mountain birch forests? – *Fungal Ecology* 69: 101332. doi.org/10.1016/j.funeco.2024.101332

Drobyshev, M.N., Abramov, D.V., Koneshov, V.N. & Malysheva, D.A. 2024: Estimation of the impact of storm microseism on long-term gravimetric measurements. – *Izvestiya, Physics of the Solid Earth* 60(1): 173-178. doi.org/10.1134/s1069351324700162

Espín, S., Andersson, T., Haapoja, M., Hyvönen, R., Klun, E., Kolunen, H., Laaksonen, T., Lakka, J., Leino, L., Merimaa, K., Nurmi, J., Rainio, M., Ruuskanen, S., Rönkä, K., Sánchez-Virosta, P., Suhonen, J., Suorsa, P. & Eeva, T. 2024: Fecal calcium levels of bird nestlings as a potential indicator of species-specific metal sensitivity. – *Environmental Pollution* 345: 123181. doi.org/10.1016/j.envpol.2023.123181

Fomichev, A.A. & Koponen, S. 2024: The first data on subnivean activity of spiders (Arachnida: Aranei) in Southwestern Siberia (Russia). *Acta Biologica Sibirica* 10: 1211-1228. doi: 10.5281/zenodo.13956901

Goev, A.G. 2024: Velocity structure of the Earth's crust and upper mantle in the Pechenga ore region and adjacent areas in the northwestern part of the Lapland-Kola orogen by the receiver function technique. – *Journal of Mining Institute* 266: 188-198.

Heliölä, J., Huikkonen, I.-M. & Paukkunen, J. 2024: Kimallisseurannan vuoden 2023 tulokset. – Julkaistu 17.1.2024. <https://www.ymparisto.fi/fi/luonto-vesistot-ja-meri/luonnon-monimuotoisuus/lajien-monimuotoisuus/lajien-seuranta/kimalaisseuranta>

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Huikkonen, I.-M., Pöyry, J., Korhonen, P., Leinonen, R. & Suuronen, A. 2024: Valtakunnallinen yöperhosseuranta 30 vuotta (1993-2022). – Suomen ympäristökeskuksen raportteja 26. 122 ss. Suomen ympäristökeskus (Syke), Helsinki. <http://urn.fi/URN:ISBN:978-952-11-5540-6>, <http://hdl.handle.net/10138/577595>

Hwang, B.C., Giardina, C.P., Adu-Bredu, S., Barrios-Garcia, M.N., Calvo-Alvarado, C., Dargie, G.C., Diao, H., Duboscq-Carra, V.G., Hemp, A., Hemp, C., Huaraca Huasco, W., Ivanov, A.V., Johnson, N.G., Kuijper, D.P.J., Lewis, S.L., Lobos-Catalán, P., Malhi, Y., Marshall, A.R., Mumladze, L., Ngute, A.S.K., Palma, A.C., Petritan, I.C., Rordriguez-Cabal, M.A., Zagidullina, A., Andersson, T., Galiano-Cabrera, D.F., Jiménez-Castillo, M., Churski, M.m Gage, S.A., Filippova, N., Francisco, K.S., Gaglianese-Woody, M., Iankoshvili, G., Kaswamila, M.A., Lyatuu, H., Mampouya, W., Materu, B., Mbemba, M., Moritz, R., Orang, K., Plyusnin, S., Puma Vilca, B.L., Rodríguez-Solís, M., Šamonil, P., Stepniak, K.M., Walsh, S.K., Xu, H. & Metcalfe, D.B. 2024: The impact of insect herbivory on biogeochemical cycling in broadleaved forests varies with temperature. – *Nature Communications* 15: 6011. doi.org/10.1038/s41467-024-50245-9

Koistinen, M. & Andersson, T. 2024: Change in the life history trait? – an alternative overwintering strategy of the *Macaria fusca* (Thunberg, 1792) (Lepidoptera, Geometridae, Ennominae). – *Norwegian Journal of Entomology* 71: 109-112.

Kuusisto, I. 2024: *Caloplaca phaeocarpella* new to Finland. – *Graphis Scripta* 36(5): 105-108.

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