Eevi Rintamäki
17.02.2025

LIST OF PUBLICATIONS

A Peer-reviewed scientific articles:

1. Valanne, N., Aro, E-M. **& Rintamäki, E**. 1982: Leaf and chloroplast structure of two aquatic Ranunculus species. - Aquatic Botany 12:13-22. (A1)

2. **Rintamäki, E.**, Aro, E-M. 1984: Stable, high activity ribulose-1,5-bisphosphate carboxylase oxygenase from the moss Ceratodon purpureus. - Photosynthetica 18(3): 357-364. (A1)

3. **Rintamäki, E**., Aro, E-M. 1985: Photosynthetic and photorespiratory enzymes in widely divergent plant species with special reference to the moss Ceratodon purpureus. Properties of ribulose bisphosphate carboxylase/oxygenase, phosphoenolpyruvate carboxylase and glycolate oxidase. - Journal of Experimental Botany 36:1677-1684. (A1)

4. Aro, E-M., Korhonen, P., **Rintamäki, E.**, Mäenpää, P. 1985: Diel and seasonal changes in the chloroplast ultrastructure of Deschampsia flexuosa (L.) Trin. - New Phytology 100:537-548. (A1)

5. **Rintamäki, E.** 1986: RuBP-karboksylaasi-oksygenaasi: teoreettisen ja soveltavan fotosynteesi-tutkimuksen kohde / RuBP carboxylase-oxygenase: a target of theoretical and applied research of photosynthesis. - Luonnon Tutkija 90:91-99. (In Finnish) (A2)

6. Aro, E-M., **Rintamäki, E**., Korhonen, P., Mäenpää, P. 1986: Relationship between chloroplast structure and O2 evolution rate of leaf discs in plants from different biotopes in South Finland. - Plant Cell Environment 9:87-94. (A1)

7. Phillips A., Kettleborough K, Parry M. and **Rintamäki E.**1986: Expression and mutagenesis of genes for Ribulose-1,5-bisphospahte carboxylase. Biochemical Soc. Trans. 14: 1223-1224 (A1)

8. **Rintamäki, E.**, Keys, A.J. & Parry, M.A.J. 1988: Comparison of specific activity of ribulose-1,5-bisphosphate carboxylase-oxygenase from C_3 and C_4 plants. - Physiologia Plantarum 74:326-331. (A1)

9. **Rintamäki, E.** 1988: Fotosynteettinen hiilen yhteytys: avainentsyymin molekyylibiologisesta tutkimuksesta / Prospects for the genetic manipulation of the key enzyme in photosynthetic carbon fixation. - Luonnon Tutkija 92:120-122. (In Finnish) (A2)

10. **Rintamäki, E.** 1989: Formation of disulphide cross-linked aggregates of large subunit from higher plant ribulose-1,5-bisphosphate carboxylase-oxygenase. - Journal of Experimental Botany 40:1305-1313. (A1)

11. **Rintamäki, E.** 1990: In vitro studies on the tendency of large subunits from plant Rubisco to form incorrect aggregations. - In Current Research in Photosynthesis (M. Baltscheffsky, ed.), Vol. III, pp.367-370, Kluwer Academic Publishers, Dordrecht. (A4)

12. **Rintamäki, E.** 1991: Rubisco subunit binding protein increases the solubility of Rubisco subunit in vitro. - Plant Physiology and Biochemistry 29:1-8. (A1)

13. **Rintamäki, E**., Salo, R. and Aro, E.-M. 1992: Turnover of D1 protein during photoinhibition and recovery in a moss Ceratodon purpureus. - In: Murata, N. (ed.) Research in Photosynthesis, Vol IV. Kluwer Academic Publishers, Dordrecht, pp. 431-434. (A4)

14. Ovaska, J., Ruuska, S., **Rintamäki, E**. and Elina Vapaavuori 1993: Combined effects of partial defoliation and nutrient availability on cloned *Betula pendula* saplings. II. Changes in leaf gas exchange and related biochemical properties. - Journal of Experimental Botany 44:1395-1402 (A1)

15. **Rintamäki, E.**, Salo, R. & Aro, E.-M. 1994: Rapid turnover of the D1 reaction center protein of photosystem II as a protection mechanism against photoinhibition in a moss, *Ceratodon purpureus*. - Planta 193:520-529. (A1)

16. **Rintamäki, E.** & Aro, E.-M. 1995: Dephosphorylation of D1 reaction centre protein is modulated by photoinhibition of PSII. - In: P. Mathis (ed.), Photosynthesis: from Light to Biosphere, Kluwer Academic Publisher, Dordrecht, Vol. IV, pp. 335-338. (A4)

17. **Rintamäki, E.**, Salo, R. Lehtonen, E. & Aro, E.-M. 1995: Regulation of D1 protein degradation during photoinhibition *in vivo*: Phosphorylation of the D1 protein in various plant groups. - Planta 195:379-386. (A1)

18. **Rintamäki, E**., Kettunen, R., Tyystjärvi, E. and Aro, E.-M. 1995. Light-dependent phosphorylation of D1 reaction centre protein of Photosystem II: hypothesis for the functional role *in vivo*. - Physiologia Plantarum 93:191-195. (A1)

19. **Rintamäki, E.**, Salo, R., Koivuniemi, A. and Aro, E.-M. 1996. Protein phosphorylation and magnesium status regulate the degradation of D1 reaction centre protein of Photosystem II. - Plant Science, 115:175-182. (A1)

20. **Rintamäki, E.**, Kettunen, R. and Aro, E.-M. 1996. Differential D1 dephosphorylation in functional and photodamaged Photosystem II centres. Dephosphorylation is a prerequisite for degradation of damaged D1*. - J. Biol. Chem., 271:14870-14875. (A1)

21. Kettunen, R., Pursiheimo S., **Rintamäki, E**., Wijk, K.-J. & Aro, E.-M. 1997:Transcriptional and translational adjustment of *psbA* gene expression in mature chloroplasts during photoinhibition and subsequent repair of photosystem II. - Eur. J. Biochem. 247:441-448. (A1)

22. Hagman, Å., Shi, L.-X., **Rintamäki, E**., Andersson, B. & Schröder, W.P. 1997: The nuclear-encoded *PsbW* protein subunit of photosystem II undergoes light-induced proteolysis. - Biochemistry 36:12666-12671. (A1)

23. **Rintamäki, E.**, Salonen, M., Suoranta, U.-M., Carlberg, I., Andersson, B., & Aro, E.-M. 1997: Phosphorylation of light-harvesting complex II and Photosystem II core proteins shows different irradiance-dependent regulation *in vivo.*Application of phosphothreonine antibodies to analysis of thylakoid phosphoproteins. - J. Biol. Chem. 272:30476-30482. (A1)

24. Pursiheimo S., **Rintamäki E**., Baena-Gonzalez, E. and Aro, E.-M. 1998: Thylakoid protein phosphorylation in evolutionally divergent species with oxygenic photosynthesis. FEBS Lett. 423:178-182. (A1)

25. **Rintamäki, E**., Carlberg, I., Andersson, B., & Aro, E.-M. 1998: Irradiance-dependent regulation of thylakoid protein phosphorylation *in vivo* - The role of the thiol redox state. In: Garab G (ed) Photosynthesis: Mechanism and Effects, Vol III, pp. 1899–1902, Kluwer Academic Publisher, Dordrecht. (A4)

26. Salonen, M., Aro, E.-M. & **Rintamäki, E**. 1998: Reversible phosphorylation and turnover of the D1 protein under various redox states of Photosystem II induced by low temperature photoinhibition. - Photosynthesis Research 58: 143-151 (A1)

27. Pursiheimo, S., **Rintamäki, E.** & Aro, E.-M. 1998: Reversible phosphorylation of LHCII proteins in rye leaves - Redox control and physiological significance. In: Garab G (ed) Photosynthesis: Mechanism and Effects, Vol III, pp. 1903–1906, Kluwer Academic Publisher, Dordrecht. (A4)

28. Carlberg I., **Rintamäki E.**, Aro E.-M. and Andersson, B. 1999: Thylakoid protein phosphorylation and the thiol redox state. - Biochemistry 38:3197-3204. (A1)

29. **Rintamäki, E.**, Martinsuo, P., Pursiheimo, S. & Aro, E.-M. 2000: Cooperative regulation of light-harvesting complex II phosphorylation via plastoquinol and ferredoxin-thioredoxin system in chloroplast. - Proc. Natl. Acad. Sci. USA, 97: 11644-11649. (A1)

30. Pursiheimo, S., Mulo, P., **Rintamäki, E.** & Aro, E.-M. 2001: Coregulation of light-harvesting complex II phosphorylation and *lhcb* mRNA accumulation in winter rye. - Plant J. 26: 317-327. (A1)

31. **Rintamäki, E.** & Aro, E.-M. 2001: Phosphorylation of Photosystem II proteins. In: Aro M,Andersson B (eds.*)* Regulation of Photosynthesis. Kluwer Academic Publishers, Dordrecht, *Advances in Photosynthesis and Respiration* **11,** 395-418. (A3)

32. Pursiheimo, S., Hou, C.H. **Rintamäki, E.** and Aro, E.-M. 2001: Light-harvesting complex II kinase and chloroplast redox signaling. – In 'PS2001 Proceedings: 12th International Congress on Photosynthesis'. (CSIRO Publishing: Melbourne, Australia). CD-ROM. (A4)

33. Martinsuo, P., Pursiheimo, S., Aro, E.-M. and **Rintamäki, E.** 2001: Complex regulation of Potosystem II protein phosphorylation via redox state of chloroplast. . – In 'PS2001 Proceedings: 12th International Congress on Photosynthesis'. (CSIRO Publishing: Melbourne, Australia). CD-ROM. (A4)

34. Mamedov F, **Rintamäki E**, Aro EM, Andersson B and Styring S 2002: Influence of protein phosphorylation on the electron-transport properties of Photosystem II. Photosynt. Res. 74: 61-72. (A1)

35. Hou, C-.X , Pursiheimo, S., **Rintamäki, E.** and Aro, E.-M. 2002: Environmental and metaboliccontrol of LHCII protein phosphorylation: Revealing the mechanisms for dual regulation of the LHCII kinase. - Plant Cell Environm. 25: 1515-1525 (A1)

36. Hou, C-.X, **Rintamäki, E**. and Aro, E.-M. 2003: Ascorbate-mediated LHCII protein phosphorylation - LHCII kinase regulation in light and in darkness. Biochemistry 42: 5828-5836. (A1)

37. Martinsuo, P., Pursiheimo, S., Aro, E.-M. and **Rintamäki, E.** 2003**:** Dithiol oxidant and disulfide reductant dynamically regulate the phosphorylation of light harvesting complex II proteins in thylakoid membranes. - Plant Physiol. 133: 37-46 (A1)

38. Pursiheimo, S., Martinsuo P., **Rintamäki, E.** & Aro, E.-M. 2003: Photosystem II protein phosphorylation follows four distinctly different regulatory patterns induced by environmental cues. - Plant Cell Environm., 26: 1995-2003. (A1)

39. **Rintamäki, E.** 2004: Plant response to stress: Modification of the photosynthetic apparatus. In: Goodman R.M. (ed.) Encyclopedia of Plant and Crop Science. Marcel Dekker, Inc., New York. pp. 990-994. (A3)

40. Aro, E.-M, Suorsa, M., Rokka, A., Allahverdiyeva, Y., Paakkarinen, V., Saleem, A., Battchikova, N. & **Rintamäki E.** 2005: Dynamics of photosystem II: a proteomic approach to thylakoid protein complexes. - J. Exp. Bot. 56:347-356. (A2)

41. Breitholtz H.-L., Srivastava, R., Tyystjärvi, E. & **Rintamäki, E**. 2005: LHCII protein phosphorylation in leaves of *Arabidopsis thaliana* mutants deficient in non-photochemical quenching. - Photosynth. Res., 84: 217-223. (A1)

42. Lintala M, Allahverdiyeva Y, Kidron H, Piippo M, Battchikova N, Suorsa M, **Rintamäki E**, SalminenTA, Aro E-M, Mulo P 2007: Structural and functional characterization of ferredoxin-NADP+-oxidoreductase using knock-out mutants of Arabidopsis. The Plant Journal 49:1041-1052. (A1)

43. Kangasjärvi S, Lepistö A, Hännikäinen K, Piippo M, Luomala, EM, Aro EM & **Rintamäki E** (2008): Diverse roles for chloroplast stromal and thylakoid-bound ascorbate peroxidases in plant stress responses. Biochem. J. 412: 275-285. (A1)

44. **Rintamäki E**., Lepistö A., Kangasjärvi S., Ruokamo R., Sipari N. & Keinänen M. 2008: Chloroplast NADPHthioredoxin reductase A novel modulator of plastidial amino acid and hormone metabolism. In:Allen JF, Gantt E, Golbeck JH, Osmond B(eds.), Photosynthesis. Energy from the Sun: 14th International Congress on Photosynthesis. Springer, Berlin Heidelberg New York, pp. 977-980. (A4)

45. Lepistö A, Kangasjärvi S, Luomala EM, Hännikäinen K, Brader G, & **Rintamäki** E. 2008: Chloroplastic NADPH thioredoxin reductase mediates photoperiod-dependent development of leaves in *Arabidopsis.* In: Allen JF, Gantt E, Golbeck JH, Osmond B(eds.), Photosynthesis. Energy from the Sun: 14th International Congress on Photosynthesis. Springer, Berlin Heidelberg New York, pp. 1303-1306. (A4)

46. Lintala, M., Allahverdiyeva, Y., Kangasjärvi, S., Lehtimäki, N., Keränen, M**., Rintamäki, E**., Aro, EM & Mulo, P. 2009: Comparative analysis of leaf-type ferredoxin-NADP$^+$-oxidoreductase isoforms in *Arabidopsis thaliana*. Plant J. 57:1103-1115. (A1)

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48. Lepistö A, **Rintamäki E** 2012: Coordination of plastid and light signalling pathways upon development of *Arabidopsis* leaves under various photoperiods. Mol Plant 5: 799-816 (A2)

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51. Lepistö A, Pakula E, Toivola J, Krieger-Liszkay A, Vignols F, & **Rintamäki E** (2013): Deletion of chloroplast NADPH-dependent thioredoxin reductase results in inability to regulate starch synthesis and causes stunted growth under short-day photoperiods. J. Exp. Bot., 12:3843-3854. (A1)

52. Toivola J, Nikkanen L, Dahlström KM, Salminen TA, Lepistö A, Vignols F & **Rintamäki E** (2013): Overexpression of chloroplast NADPH-dependent thioredoxin reductase in Arabidopsis enhances leaf growth and elucidates *in-vivo* function of reductase and thioredoxin domains. Front. Plant Sci., 08 October 2013, doi: 10.3389/fpls.2013.00389 (A1)

53. Nikkanen L & **Rintamäki E** (2014) Thioredoxin-dependent regulatory networks in chloroplast under fluctuating light conditions. Philosophical Transactions of the Royal Society B 369 20130224 http://dx.doi.org/10.1098/rstb.2013.0224. (A2)

54. Nikkanen, L.; Toivola, J. & **Rintamäki, E.** (2016) Crosstalk between chloroplast thioredoxin systems in regulation of photosynthesis. Plant Cell Environment 39:1691-705 http://dx.doi.org/10.1111/pce.12 718 (A1)

55. Nikkanen L, Toivola J, Diaz MG, **Rintamäki E** (2017) Chloroplast thioredoxin systems: prospects for improving photosynthesis. Philos Trans R Soc Lond B Biol Sci. 372, 20160474 DOI:10.1098/rstb.2016.0474 (A2)

56. Nikkanen L, Toivola J, Trotta A, Guinea Diaz, M, Tikkanen M, Aro E, **Rintamäki E** (2018) Regulation of cyclic electron flow by chloroplast NADPH-dependent thioredoxin system. *Plant Direct* 2:1–24. https://doi.org/10.1002/pld3.93 (A1)

57. Nikkanen, L., Guinea Diaz, M., Toivola, J., Tiwari, A. and **Rintamäki, E**. (2019) Multilevel regulation of non-photochemical quenching and state transitions by chloroplast NADPH-dependent thioredoxin reductase. *Physiol Plant 166: 211-225*, https://doi.org/10.1111/ppl.12914 (A1)

58. Alexey Shapiguzov, Julia P Vainonen, Kerri Hunter, Helena Tossavainen, Arjun Tiwari, Sari Järvi, Maarit Hellman, Fayezeh Aarabi, Saleh Alseekh, Brecht Wybouw, Katrien Van Der Kelen, Lauri Nikkanen, Julia Krasensky-Wrzaczek, Nina Sipari, Markku Keinänen, Esa Tyystjärvi, **Eevi Rintamäki**, Bert De Rybel, Jarkko Salojärvi, Frank van Breusegem, Alisdair R Fernie, Mikael Brosché, Perttu Permi, Eva-Mari Aro, Michael Wrzaczek, Jaakko Kangasjarvi (2019) Arabidopsis RCD1 coordinates chloroplast and mitochondrial functions through interaction with ANAC transcription factors. *eLife* 2019;8:e43284, DOI: 10.7554/eLife.43284 (A1)

59. Nikkanen L and **Rintamäki E** (2019) Chloroplast thioredoxin systems dynamically regulate photosynthesis in plants. *Biochemical Journal* 476:1159–1172 https://doi.org/10.1042/BCJ20180707 (A2)

60. Guinea Diaz Manuel, Nikkanen Lauri, Himanen Kristiina, Toivola Jouni, **Rintamäki Eevi** (2020) Two chloroplast thioredoxin systems differentially modulate photosynthesis in Arabidopsis depending on light intensity and leaf age. *The Plant Journal* 104:718-734 (A1) doi: 10.1111/tpj.14959

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62. Lempiäinen Tapio, **Rintamäki Eevi**, Aro Eva-Mari, Tikkanen Mikko (2022): Plants acclimate to Photosystem I photoinhibition by readjusting the photosynthetic machinery. Plant, Cell and Environment 45:2954–2971. DOI: 10.1111/pce.14400 (A1)

63. Gunell Sanna, Lempiäinen Tapio, **Rintamäki Eevi**, Aro Eva-Mari, Tikkanen Mikko (2023) Enhanced function of non-photoinhibited photosystem II complexes upon PSII photoinhibition. BBA – Bioenergetics 1864:148978. https://doi.org/10.1016/j.bbabio.2023.148978 (A1)

64. Kılıç Mehmet, Käpylä Ville, Gollan Peter J, Aro Eva-Mari, **Rintamäki Eevi** (2023) PSI Photoinhibition and Changing CO2 Levels Initiate Retrograde Signals to Modify Nuclear Gene Expression. Antioxidants 12:1902. https://doi.org/10.3390/antiox12111902 (A1)

65. Hani U, Naranjo B, Shimakawa G, Espinasse C, Vanacker H, Sétif P, **Rintamäki E**, Issakidis-Bourguet E, Krieger-Liszkay A. (2025) A complex and dynamic redox network regulates oxygen reduction at photosystem I in Arabidopsis. Plant Physiol. 197: kiae501. https://doi.org/10.1093/plphys/kiae501 (A1)

66. Kılıç Mehmet, Gollan Peter J, Aro Eva-Mari, **Rintamäki Eevi** (2025) Jasmonic acid signaling and glutathione coordinate plant recovery from high light stress. Plant Physiol. 197: kiaf143. https://doi.org/10.1093/plphys/kiaf143. (A1)

67. Tapio Lempiäinen, Dorota Muth-Pawlak, Julia P. Vainonen, **Eevi Rintamäki**, Mikko Tikkanen, Eva-Mari Aro (2025) Moderate temperature reduction changes the high-light acclimation strategy of lettuce plants. Physiologia Plant., 177:e70298. https://doi.org/10.1111/ppl.70298 (A1)

B Non-refereed scientific articles

68. **Rintamäki, E.**, Lepistö, A., and Kangasjärvi S. 2009: Implication of chlorophyll biosynthesis on chloroplast-to-nucleus retrograde signaling. Plant Signaling & Behavior 4:6, 545-547 (B1)

C Scientific books

69. Spetea C, **Rintamäki E** & Schoefs B (2014) Preface: Changing the light environment: chloroplast signalling and response mechanisms. Philosophical Transactions of the Royal Society B 369 20130220 http://dx.doi.org/10.1098/rstb.2013.0224. (C2)

70. Sarvikas P. Suorsa M, **Rintamäki E**, Vapaavuori E, Aro EM, Tyystjärvi, E (2017): Fotosynteesi. Books on Demand GmbH, Helsinki, Suomi. 301 pp. (C1)

G Thesis

71. **Rintamäki, E.** 1989: Ribulose-1,5-bisphosphate carboxylase-oxygenase. Characterization of the enzyme with reference to the CO_2 assimilation capacity in plants. - Reports from the Department of Biology 20, pp. 81. Doctoral dissertation (article) (G5)