MIRKKA LAHDENPERÄ, PHD

DATE

11.3.2018

PERSONAL DETAILS

- ORCID 0000-0003-0062-6284
- Born 1977
- Finnish
- Email: mirkka.lahdenpera@utu.fi

CURRENT POSITION

- Principal Investigator
- Department of Biology University of Turku, Finland
- Funded by Kone Foundation,
- 2015- 2018 Project "*Evolution of longevity: Mothers, aunties and milk in Asian elephants*".
- Research group includes 2 MSc Students, 1 PhD student and 2 Post-docs.

SCIENTIFIC INTERESTS

My research focuses on evolutionary ecology and conservation related topics in Asian elephants and humans. I'm especially interested in evolution of (post-reproductive)longevity and co-operative breeding in elephants, humans and other long-lived species.

WEBPAGES

- http://elephant-project.science/;
- http://human-life-history.science/;
- https://www.researchgate.net/profile/Mirkka_Lahdenperae

EDUCATION AND DEGREES COMPLETED

- PhD, 18.02.2010, University of Turku, Department of Biology, PhD thesis: *Evolution of prolonged longevity in humans.* Accepted with Honours and including published 1st author articles in Nature, Proc R Soc B, Ecology Letters, J. Evol Biol and Climacteric.
- MSc, 11.09.2003, University of Turku, Department of Biology, MSc thesis: *Fitness consequences of grandmothering in pre-industrial Finnish people.* Accepted with Laudatur.

PREVIOUS WORK EXPERIENCE

- Post-doctoral research fellow, independent 01/09/2012-31/08/2015
  University of Turku, Department of Biology, Section of Ecology, Finland.
  Funded by Finnish Academy.
- Post-doctoral research fellow, independent 01/01/2012-31/08/2012
  University of Turku, Department of Biology, Section of Ecology, Finland.
  Funded by personal grant from the Kone Foundation.
- Post-doctoral research fellow 01/04/2011-31/12/2011
  University of Turku, Department of Biology, Section of Ecology, Finland.
  Funded by Human Life-history project.
- Post-doctoral research fellow, independent 01/04/2010-31/03/2011
  University of Turku, Department of Biology, Section of Ecology, Finland
  Funded by a personal grant from the Finnish Cultural Foundation
- PhD student, independent 01/11/2003-29/01/2010
  Funded by personal grants from the Jenny and Antti Wihuri Foundation (3 years) and the Alfred Kordelin Foundation (1 year), 2 years on maternity leave.
- Research assistant 01/06/2003 – 30/08/2003
  University of Turku, Department of Biology, Section of Ecology.
  Project: "*Life-history strategies in pre-industrial human populations*" funded by the Finnish Academy.
- Research assistant 06/05/2002 – 31/07/2002
  University of Turku, Department of Biology, Section of Ecology.
  Project: "*Life-history strategies in pre-industrial human populations*" funded by the Finnish Academy.
- Research assistant 04/06/2001-20/08/2001
  University of Turku, Faculty of Medicine, Institute of Biomedicine.
  Project: "*Mechanisms of estrogen actions in bone*" funded by Leiras.

PERSONAL RESEARCH FUNDING AND GRANTS AS PRINCIPAL INVESTIGATOR

I have maintained continuous funding for my projects through personal grants since start of PhD:

- 2016 Kone Foundation, award of 3rd year research project, 92 000 €, PI
- 2015 Kone Foundation, award of 2nd year research project, 86 420 €, PI
- 2014 Kone Foundation, award of 1st year year research project, 95 000 €, PI
- 2012 Finnish Academy, 3 years, 244 892 €
- 2012 Marie Curie Intra-European Fellowship (IEF)(from which I declined due to family reasons)
- 2011 Kone Foundation, 27 600 €
- 2009 Finnish Cultural Foundation, 21 000 €
- 2008 Alfred Kordelin Foundation, 18 000 €
- 2006 Jenny and Antti Wihuri Foundation, 16 000 €
- 2004 Jenny and Antti Wihuri Foundation, 16 000 €
- 2003 Jenny and Antti Wihuri Foundation, 14 000 €

LEADERSHIP AND SUPERVISION EXPERIENCE

I have led 6 funded projects including Academy of Finland and Kone grants, and supervise/d an international team of researchers (mix of FIN, GB, GER, US nationals):

MSC STUDENTS

- Matleena Tuomisto, Univ. of Turku. Co-supervised by Martin Seltmann.

PHD STUDENTS

- Simon Chapman, University of Turku, started 8/2016
  Title: "*Context-dependence of kin effects on family success in humans*". Co-supervised by Prof. Virpi Lummaa and Dr. Jenni Pettay.
- Jennifer Crawley, University of Turku, started 8/2016.
  Title: "*The impact of human interaction on elephant well-being in semi-captive Asian elephants*". Co-supervised by Prof. Virpi Lummaa.

SUPERVISED POST-DOCS

- Martin Seltmann, University of Turku, Funded by Kone. 10/2015-11/2018.
- Emily Lynch, University of Turku, Funded by Ehrnrooth Foundation. 01/2018-

TEACHING EXPERIENCE (EXAMPLES)

- University of Helsinki, Lectures for a course titled Quantitative History Research (2016)
- University of Turku, Lectures for a course titled Human evolution (2016)
- Åbo Akademi, Lectures for a course titled Behavioural evolutionary ecology (2016)
- University of Turku, Lectures for a course titled Research in Ecology section (2015)

PRESENTATIONS IN INTERNATIONAL CONGRESSES

- Nordic Demographic Symposium, Turku, Finland (2017)(oral)

- The Nordic Evolutionary Psychology Meeting, Lammi, Finland (2014)(invited speaker)
- Congress of the European Society for Evolutionary Biology, Lissabon, Portugal (2013)(oral)
- 13th Congress of the European Society for Evolutionary Biology, Tüebingen, Germany (2011) (poster)
- 5th European Human Behaviour and Evolution Association Meeting, Wroclaw, Poland (2010) (oral)
- Annual Meeting of the European Students on Evolutionary Biology, St Andrews, Scotland (2006) (oral)
- 11th International Behavioral Ecology Congress, Tours, France (2006)(poster)
- 10th International Behavioral Ecology Conference, Jyväskylä, Finland (2004)(oral)
- Finnish Evolutionary Ecology Graduate School Meeting, Jyvaskylä, Finland (2004)(oral)
- Human Behaviour: An Evolutionary Perspective Meeting, Montpellier, France (2004)(oral)
- Annual Meeting of the European Students on Evolutionary Biology, Switzerland (2003)(oral)

OTHER ORAL PRESENTATIONS (EXAMPLES RANGING FROM SCHOOLS TO GENEALOGICAL SOCIETIES)

- Invited speaker in a seminar by Summer Universities: Thursday Academy. Rauma, Finland (2011)
- Invited speaker in a seminar by Finnish Genealogical Society: 350 years of genealogical research in Finland. Helsinki, Finland (2010)
- Invited speaker in a seminar by folk high school: Presentations of human evolution. Luopioinen, Finland (2009)
- Invited speaker in a meeting of Genealogical Society of Turku. Turku, Finland (2004)
- Invited speaker in a meeting of Zoological and Botanical Society. Turku, Finland (2004).

REVIEWS TO INTERNATIONAL JOURNALS/GRANT PROGRAMS

Reviewed papers e.g. to Biology Letters, Current Biology, Frontiers in Zoology, PeerJ, American Journal of Human Biology, Human Biology, Current Anthropology, Evolutionary Psychology, Plos One, Evolution, Journal of Theoretical Biology, Philosophical Transactions B.
Also acted as a referee in National Geographic Grant Program.

PUBLICATIONS

Since my PhD I have worked on longitudinal datasets resulting in joint publications with teams compiling these datasets, but I have also established myself as senior or leading author. I have 29 papers in publication/press in peer-reviewed journals. I also have manuscripts in peer-review and several in preparation. These papers have been cited 801 times with an h-index of 11 (Google Scholar, Sep 2018).

A) PEER-REVIEWED SCIENTIFIC ARTICLES

1. Seltmann, M.W., Helle, S., Htut, W. & **Lahdenperä M.** 2019. Males have more aggressive and less sociable personalities than females in semi-captive Asian elephants. ***Scientific Reports***. 9:2668.
2. Chapman, S.N., Pettay, J.E., Lummaa, V. & **Lahdenperä, M.** 2019. Limits to Fitness Benefits of Prolonged Post-reproductive Lifespan in Women. ***Current Biology*.** 29(4):645-650. *This study shows to show that post-reproductive grandmothers were important for the family's success and improved the survival of grandchildren. However, the opportunity and ability to provide help to young grandchildren declines with grandmother age and deteriorated health, and the benefits from grandmothering to families have selected women to survive beyond menopause only up to a point.*
3. Crawley, J.A.H., **Lahdenperä, M.**, Seltmann, M.W., Htut, W., Aung, H.H., Nyein, K., et al. 2019. Investigating changes within the handling system of the largest semi-captive population of Asian elephants. ***PLoS ONE*** 14(1): e0209701.
4. Chapman, S.N., Pettay, J.E., **Lahdenperä, M.** & Lummaa, V. 2018. Grandmotherhood across the demographic transition. ***PLoS ONE.***
5. Chapman, S.N., Pettay, J.E., Lummaa, V. & **Lahdenperä, M.** 2018. Limited support for the X-linked grandmother hypothesis in pre-industrial Finland. ***Biology Letters*.** 14(1).
6. Han, Y.A.M., Dierenfeld, E.S., Mar, K.U., **Lahdenperä, M.**, Lummaa, V. & Aung, A. 2018. A Simple, practical method for measurement of fat in milk, applied to mid- to late-lactating working elephants in Myanmar. ***Novel Tech. Nutr. Food Sci.*** *2(4).*
7. **Lahdenperä, M.**, Mar, K.U., Courtiol, A. & Lummaa, V. 2018. Differences in age-specific mortality between wild-caught and captive-born Asian elephants. ***Nature Communications*** 9:3023. (published in Aug 2018, journal impact factor 12.4). *This study shows the adverse long-term effects of capturing elephants from the wild, with implications to numerous sectors. Extensive media coverage, ALT score 220.*
8. **Lahdenperä, M.**, Tanskanen, A. & Danielsbacka, M. 2018. Grandmother Hypothesis, The. In: Shackelford T., Weekes-Shackelford V. (eds) ***Encyclopedia of Evolutionary Psychological Science.*** Springer, Cham. (reviewed, invited contribution).
9. Laisk, T., Tšuiko, O., Jatsenko, T., Hõrak, P., Otala, M., **Lahdenperä, M.**, Lummaa, V., Tuuri, T., Salumets, A. & Tapanainen, J.S. 2018. Demographic and evolutionary trends in ovarian function and aging. ***Human Reproduction Update*** (Journal impact factor 11.9). dmy031. *Key review by a cross-discipline team on reproductive medicine, integrating molecular mechanisms of ovarian function and aging with short-term demographic and long-term evolutionary trends.*
10. Lynch, E., Lummaa, V., Htut, W. & **Lahdenperä, M.** 2019. Evolutionary significance of maternal kinship in a long-lived mammal. Invited contribution to ***Philos Trans R Soc Lond B Biol Sci.*** *In press. We show that living near a sister increased the likelihood of annual female elephant reproduction among young individuals, providing novel evidence that fitness benefits gained from relationships with kin are age-specific and highlighting the adaptive importance of matriliny in a long-lived mammal.*
11. Seltmann M.W., Helle S., Adams M.J., Mar K.U. & **Lahdenperä, M. 2018.** Evaluating the personality structure of semi-captive Asian elephants living in their natural habitat. ***Royal Society Open Science*.** 5:172026.
12. Chapman, S.N., **Lahdenperä, M.**, Pettay, J.E. & Lummaa V. 2017. Changes in length of grandparenthood in Finland 1790-1959. ***Finnish Yearbook of Population Research***. 52:3-13.

13. Pettay, J., **Lahdenperä, M.**, Rotkirch, A., Lummaa, V. 2017. Effects of female reproductive competition on birth rate and reproductive scheduling in a historical human population. ***Behavioral Ecology.*** arx168.

14. Crawley, J.A.H., Mumby, H.S., Chapman, S.N., **Lahdenperä, M.**, Mar, K.U., Htut, W., Thura Soe, A., Aung, H.H. & Lummaa, V. 2017. Is bigger better? The relationship between size and reproduction in female Asian elephants. ***Journal of Evolutionary Biology.*** 30(10):1836-1845.

15. **Lahdenperä, M.,** Mar, K.U., Lummaa, V. 2016: Nearby grandmothers enhances calf survival and reproduction in Asian elephants. ***Scientific Reports.*** 6:27213. (13 citations) *We show first time that Asian elephants grandmothers are important in ensuring their grand-calf survival. The results suggest that beneficial grandmother effects are insufficient alone to lead to evolution of menopause. High media coverage.*

16. **Lahdenperä, M.,** Mar, K.U., Lummaa, V. 2016: Short-term and delayed effects of mother death on calf mortality in Asian elephants. ***Behavioral Ecology.*** 27(1):166-174.

17. Pettay, J., **Lahdenperä, M.,** Rotkirch, A., Lummaa, V. 2016: Costly reproductive competition between co-resident females in humans. ***Behavioral Ecology.*** 27(6):1601-1608.

18. Berg, V., Lummaa, V., **Lahdenperä, M.,** Rotkirch, A. & Jokela, M. 2014: Personality and long-term reproductive success measured by the number of grandchildren. ***Evolution & Human Behavior*** 35(6):533-539.

19. Hayward, A.D., Mar, K.U., **Lahdenperä, M.** & Lummaa, V. 2014: Early reproductive investment, senescence and lifetime reproductive success in female Asian elephants. ***Journal of Evolutionary Biology.*** 27(4):772-783.

20. **Lahdenperä, M.,** Mar, K.U. & Lummaa, V. 2014: Reproductive cessation and post-reproductive lifespan in Asian elephants and pre-industrial humans. ***Frontiers in Zoology.*** 11:54. (32 citations). *Our results show that the reproductive and survival patterns of Asian elephants differ from other long-lived animals exhibiting menopause, such as humans, and longevity alone does not promote the evolution of menopause/post-reproductive lifespan.*

21. **Lahdenperä, M.** 2013. Miksi biologeja kiinnostaa historiallinen kirkonkirja-aineisto? (Why biologists are interested in church records?) ***Historiallinen Aikakausikirja (Historical Journal).***

22. **Lahdenperä, M.,** Lummaa, V. Gillespie, D.O.S & Russell, A.F. 2012: Severe intergenerational reproductive conflict and the evolution of menopause. ***Ecology letters.*** 15(11):1283-90. (73 citations) *First empirical demonstration in humans that between-generation reproductive conflict among unrelated women (mother-in-law/daughter-in-law) promotes the evolution of menopause. Extensive media coverage.*

23. Mar, K.U., **Lahdenperä, M.** & Lummaa, V. 2012: Causes and correlates of calf mortality in captive Asian elephants (Elephas maximus). ***PloS One.*** 7(3):e32335. (29 citations). *The results show that calf mortality is lower in this semi-captive elephant population than in zoo settings and clarify the specific factors affecting calf and still-birth mortality. The results have implications for improving captive working elephant management systems in range countries.*

24. **Lahdenperä, M.,** Russell, A.F. & Lummaa, V. 2011: Selection on male longevity in a monogamous human population: late-life survival brings no additional grandchildren. ***Journal of Evolutionary Biology.*** 24:1053-1063.

25. **Lahdenperä, M.**, Tremblay, M., Russell, A.F. & Lummaa, V. 2011: Selection on menopause in two pre-modern human populations: No evidence for the Mother Hypothesis. ***Evolution.*** 65:476-489. (29 citations) *First comprehensive empirical demonstration that need for maternal care alone cannot explain the markedly extended post-reproductive lifespan in human females.*

26. Gillespie, D.O.S., **Lahdenperä, M.,** Russell, A.F. & Lummaa, V. 2010: Pair-bonding modifies the age-specific intensity of natural selection on human female fecundity. ***American Naturalist.*** 176:159-69.

27. **Lahdenperä, M.,** Russell, A.F. & Lummaa, V. 2007: Selection for long lifespan in men: benefits of grandfathering? ***Proc. R. Soc. Lond. B.*** 274(1624):2437-2444. (43 citations). *These results show that in contrast to our results for women in the same population, men do not gain extra fitness (i.e. more grandchildren) through grandfathering.*

28. **Lahdenperä, M.,** Lummaa, V., Helle, S., Tremblay, M. & Russell, A.F. 2004: Fitness benefits of prolonged post-reproductive lifespan in women. ***Nature.*** 428:178-181. (465 citations) *First study to show that human women can accrue fitness after menopause by helping their offspring to reproduce more successfully, casting light on the evolution of prolonged post-reproductive lifespan. Extensive media coverage e.g., BBC, Reuters, Scientific American, New Scientist, New York Times, Telegraph, Times, Washington Post and Nature.*

29. **Lahdenperä, M.,** Lummaa, V. & Russell, A.F. 2004: Menopause: why does fertility end before life? ***Climacteric.*** 7:327-332.

G) THESES

30. **Lahdenperä, M**., 2010: *Evolution of prolonged longevity in humans*. PhD thesis, Department of Biology, University of Turku.

31. **Lahdenperä, M.**, 2003: *Fitness consequences of grandmothering in pre-industrial Finnish people.* MSc thesis, Department of Biology, University of Turku.