EUROPEAN EXPERTISE IN RESEARCH ON THERMAL ADAPTATION

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General scope of the group's research: We are trying to understand the evolution and genetics of various ecologically important traits and the relative importance of natural selection and genetic drift in phenotypic evolution in general. We also seek to combine physiology to evolutionary problems (see: www.coe.fi).

Topics & Questions: Evolution and genetics of body size, sexual size dimorphism; life histories; phenotypic plasticity; clinal patterns (e.g. Bergmann's rule); relationship between molecular (F_{ST}) and quantitative genetic (Q_{ST}) differentiation among populations; QTL-mapping ecologically important genes; thermoregulation strategies. We are also developing new statistical approaches (in Bayesian framework) to many of the problems in focus.

Organisms: Primarily vertebrates, in particular birds (Siberian Jay *Perisoreus infaustus*, Red-billed gull *Larus novahollandiea*), fish (three- and nine-spined sticklebacks), amphibians (e.g. the common frog, *Rana temporaria*) and reptiles (the common lizard *Lacerta vivipara* and the adder *Vipera berus*).

Methods & Expertise we use: Genetic analysis of coding and non-coding parts of DNA for population genetic, phylogeographic and paternity analyses; gene-expression studies; ecological and behavioural laboratory and field experiments; digitizing equipment for morphometrics; quantitative genetic and statistical methods; anlyses of long-term data-sets.

Methods & Expertise sought: Methods for assessing physiological parameters accurately and efficiently from very large number of individuals.

3-5 Sample publications:

Palo, J., R. O'Hara, A.T. Laugen, A. Laurila, C.P. Primmer & J. Merilä 2003. Latitudinal divergence of common frog (Rana temporaria) life history traits by natural selection: evidence from a comparison of molecular and quantitative genetic data. Molecular Ecology 12:1963-1978.

O'Hara, R. & J. Merilä 2005. Bias and precision in Q_{ST} estimates: Problems and some solutions. Genetics 171: 1331-1339.

Timenes Laugen, A., I. Jönsson, A. Laurila, F. Söderman & J. Merilä 2005. Do common frogs (Rana temporaria) follow Bermann's rule? Evolutionary Ecology Research 7:717-731

Herczeg, G. T. AA. Gonda, J. Saarikivi & J. Merilä 2006. Experimental support for the cost-benefit model of lizard thermoregulation. Behavioural Ecology and Sociobiology 60: 405-414.

Cano J. M., C. Matsuba, H. Mäkinen & J. Merilä 2006. Eda sequence polymorphisms and plate-morphs in threespine sticklebacks - another look. Molecular Ecology, in press.