

Darwinian Agriculture

A new Current Themes Symposium

April 13, 2007

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Darwinian agriculture: the evolutionary ecology of agricultural symbiosis

Charles Darwin started *The origin of species* with a chapter about artificial selection, practiced by man, upon domesticated organisms. This is still the popular view of domestication, and agriculture in general: as a human 'invention', beneficial to the farmer. However, this opinion can be challenged for several reasons. First, not only humans profit from agriculture, but also the domesticated organisms themselves as they reach far higher population densities than their free-living ancestors (which have in some cases even gone extinct). Therefore, from a biological perspective, agriculture fulfills the definition of mutualistic symbiosis: a mutually beneficial association between different species. Second, genetic adaptations to the agricultural lifestyle are not limited to the domesticated organisms but have also occurred in humans. For example, lactose tolerance in adult humans has evolved independently in several human populations after the domestication of cattle. Finally, agriculture is not restricted to humans: other species, such as some social insect species, have independently evolved forms of agriculture.



This symposium will provide a broad overview of the evolution of agricultural symbiosis along three lines: i) the (co-)evolutionary history and future of human agriculture; ii) the (co-)evolutionary history of non-human forms of agriculture and iii) applied aspects of evolutionary insights for human agriculture. The speakers include Ford Denison (opportunities of artificial selection for future agricultural innovations), Albano Beja-Pereira (coevolution between cattle milk protein genes and human lactase genes), Dan Bradley (Documenting domestication - the intersection of genetics and archaeology), and Koos Boomsma (evolution of agriculture in fungus-growing ants).



Organisation

Organisation:

[Dr. Duur K. Aanen, Wageningen University](#) ,
[Prof. Rolf F. Hoekstra, Wageningen University](#) ,
[Prof. Thom. W. Kuyper, Wageningen University](#) , The Netherlands.

Advice and overview:

[Prof. Hans de Kroon, Experimental Plant Ecology](#), Radboud University Nijmegen, The Netherlands.

Logistics: [Els Kakisina, Netherlands Institute of Ecology](#) .

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For practical questions:

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Location of the Ecological implications of adaptive behavior Symposium

Date: April 13, 2007

Venue: WICC, Wageningen The Netherlands

Admission, including lunch: €22,50 (Students & PhDs: €12,50)

Starting time: 10.00 hrs.

Registration: [Click here to register](#)

[Address and route](#) to the Wageningen International Conference Centre (WICC).

Programme

[Print version](#)

10.00-10.30	Registration and coffee
10.25-10.30	Introduction by the organisers.
10.30-11.05	Dan Bradley , Institute of Genetics, Trinity College, Dublin, Ireland. Genetic hoofprints: molecular deciphering of animal domestication.
11.05-11.40	Albano Beja-Pereira , CIBIO/UP - Research Center in Biodiversity and Genetic Resources, University of Porto, Portugal. Milk Drinkers: When the domesticator becomes domesticated.
11.40-12.15	Mike Jeger and Frank van den Bosch , Imperial College London, U.K. The role of agricultural practice in the co-evolution of pathogens and crop plants.
12.15-13.35	Lunch
13.35-14.10	Koos Boomsma , Center for Social Evolution, University of Copenhagen, Denmark. Host-symbiont conflicts in fungus-growing ants.
14:10-14:45	Toby Kiers , Institute of Ecological Sciences, Vrije Universiteit, Amsterdam, The Netherlands. Managing mutualisms: Farming practices and evolution in symbiotic communities.
14.45-15.15	Tea
15.15-15.50	Duur Aanen , Laboratory of Genetics, Wageningen University and Research Center, The Netherlands. Monoculture or mixed crop? The evolutionary stability of the termite-fungus mutualism.
15.50-16.30	R. Ford Denison , Ecology Evolution and Behavior, University of Minnesota, USA. Artificial Selection versus the Tragedy of the Commons.
16.30	End