BASIC INFORMATION ON SUB-PROJECT

NAME OF PROGRAMME/FUND	Scholarship Fund - Sciex NMS^{ch}
RESEARCH FIELD AND OTHER RESEARCH FIELDS INVOLVED (if applicable)	Environmental Sciences, Basic Biological Research
TITLE OF THE SUB-PROJECT	Role of functional components of biodiversity in understanding soil processes in stressed ecosystems (TELL-US)
REGION OF THE CZECH REPUBLIC (according to the location of the home institution)	Prague
GRANT AMOUNT SPENT	94 726,75 CHF
INTERMEDIATE BODY	Swissuniversities
HOME INSTITUTION	Czech Academy of Sciences Institute of Systems Biology and Ecology
HOST INSTITUTION	WSL Ecosystem Boundaries Research Unite
NAME OF THE FELLOW	Karolína Černá

ABSTRACT OF THE SUB-PROJECT	1. If and especially how biodiversity affects ecosystem functioning is currently hotly debated. The functional component of biodiversity (community trait composition) has been identified as the key factor driving the functioning of the ecosystems. Two chief components of community trait composition are hypothesized to exert a major effects on ecosystems: (i) the dominant trait values in a community (measured by community trait means, CTM), and (ii) the degree of functional trait differences among species (measured by functional trait dissimilitarity, FTD). 2. The aim of this project is to assess the relative role of CTM and FTD on the stability of ekosystém processes. We are among the first to the test the response of different soil functions to changes in CTM and FTD before and after perturbation of the ecosystem, i.e. an invading species. We will determine which component of community traits make ecosystem functions more resistant against species invasion. 3. We will use isopods as a model species because they perform key functional roles in soil ecosystem processes. We use a orthogonal experimenal design of different levels of CMT and FTD, obtained from 16 species combination x 12 replicates = 216 microcosms. We will quantify levels of soil respiration, leaf litter mass loss, leaf litter fragmentation, and leaching of nitrogen as a function of CMT and FTD values, before and after invasion of species. 4. We expect that the results of our study contribute to opening-up a new area of research at the interface landscape ecology (land use change) and community ecology (community functioning). Moreover, we expected to significantly contribute to the understanding of biodiversity effects on ecosystem functioning, fill the gap between ecological theories and functioning of communities and, finally paving the road for a more functionally focussed management of ecosystem services.

MAIN RESULTS	Our experiment disentangled the unique contributions of CWM and FTD in effect traits on a key ecosystem process and proved that CWM of litter consumption is the most important functional community component in the litter-macrodetritivore model system. We recommended applying the used methodological approach to future biodiversity–ecosystem functioning experiments, enabling to detect causal relationships between these two community components. Future research should be directed at assessing whether the generality of our finding that CWM predominates over FD holds under specific conditions, at different spatial and temporal scales, for specific ecosystem processes or simultaneously for multiple processes. Detecting general rules of community functioning might elucidate future scenarios of biodiversity threats due to global changes as increasing climatic extremes or biological invasions and thus help us to prevent further ecosystems' impoverishment. Bílá, K. et al. 2014. Disentangling community functional components in a litter–macrodetritivore model system reveals the predominance of the mass ratio hypothesis. Ecol. Evol. 4:408–416. Dias, A. T. C., M. P. Berg, F. Bello, A. R. Oosten, K. Bílá, and M. Moretti. 2013. An experimental framework to identify community functional components driving ecosystem processes and services delivery. J. Ecol. 101:29–37.
DATE OF REALISATION OF THE FELLOWSHIP	1.3.2012 - 28.2.2013
MORE INFORMATION ON THE PROGRAMME	**www.sciex.ch**