

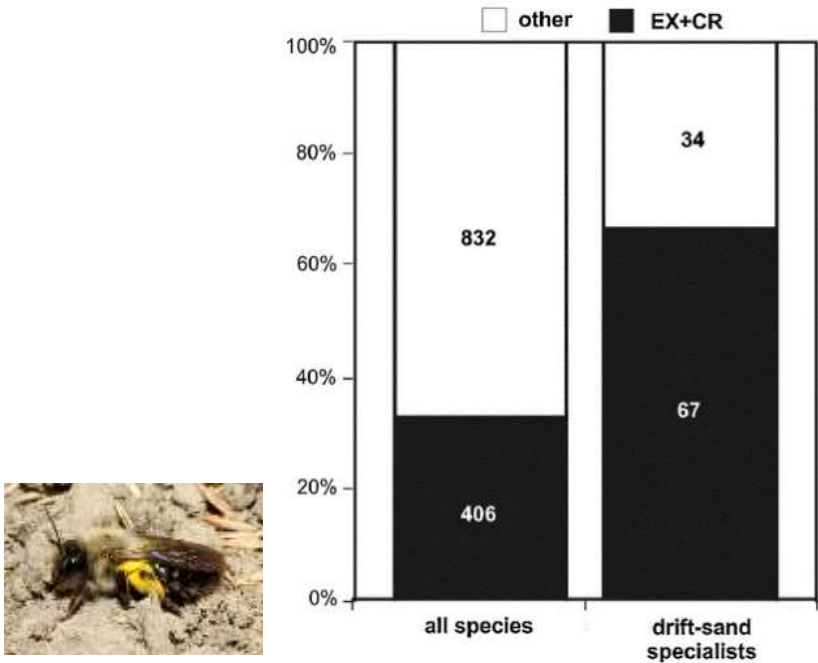
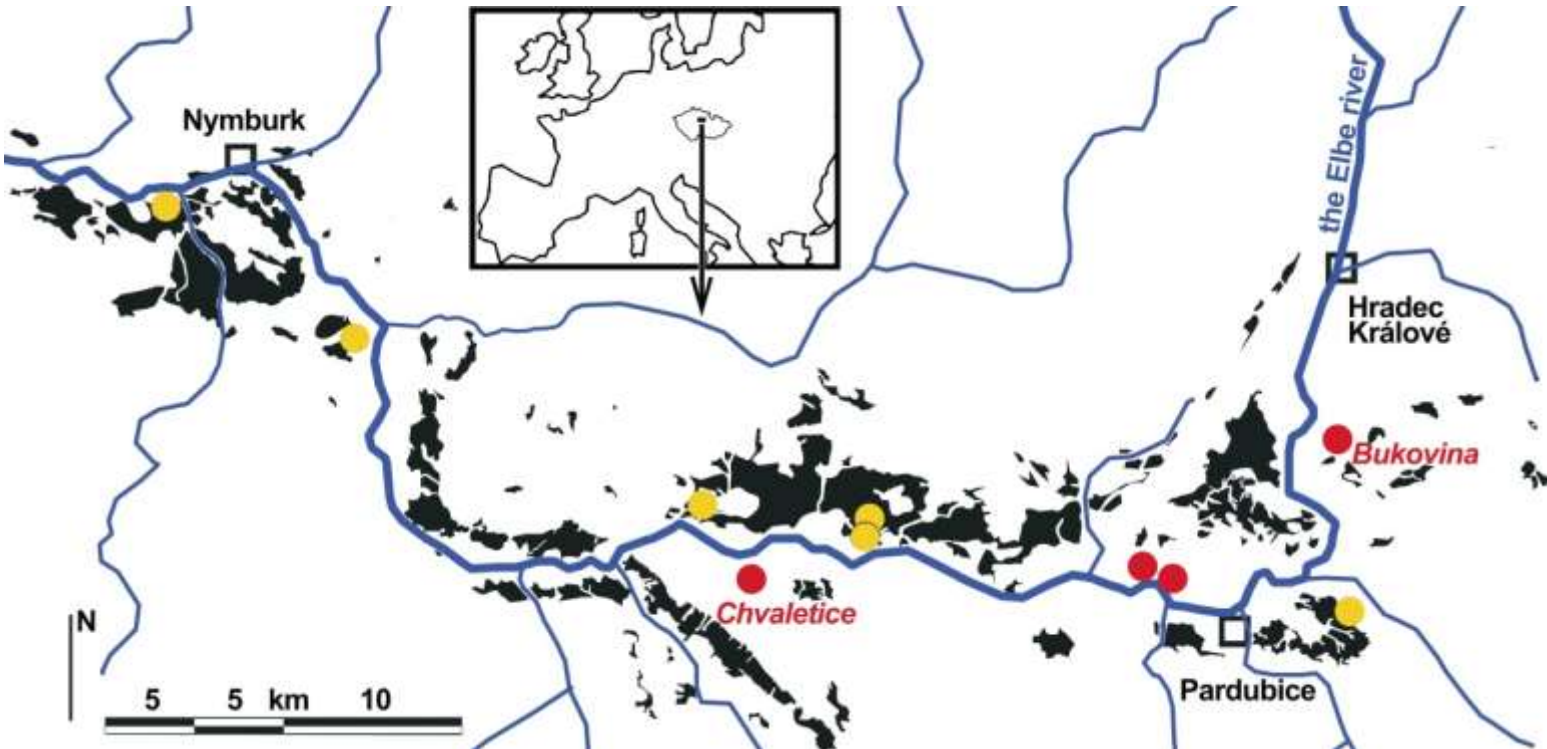


Kontroverzní příležitost pro psamofilní hmyz: **Proč a jak podpořit biodiverzitu složišť popílků?**

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katedra ekologie PŘF UK
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Continental sand dunes – threatened habitats

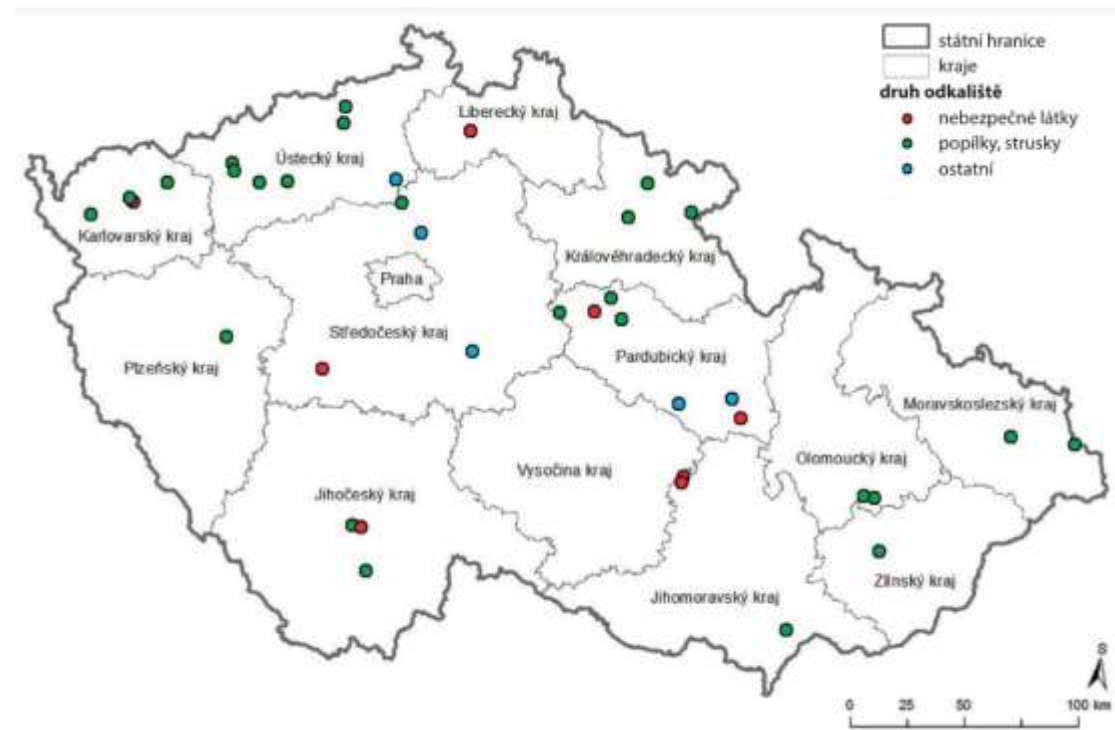


Tropek et al. 2013,
Biol. Conserv.



Fly ash deposits

- wastes after coal combustion
 - power stations, heating plants, some factories
 - in some industrial regions very common landscape components
- characteristic finely-grained substrate
 - mainly very fine fly ash
 - **strong health risks**
 - mainly dustiness
 - contamination by toxins



Ukládání popílku

- dříve výhradně jako hydrická směs
 - popílek smísený s vodou – sedimentační nádrže



- po zavedení odsíření – změna technologie
 - mísení s energosádrovcem – stabilizát
 - suché ukládání
- odpad je i dále využitelný
 - stavební materiál, náspy apod.
 - přesto nadbytek



Biodiversity of fly ash deposits

- generally unknown
- overwhelming majority of studies focused on health risks and/or fast technical reclamation
- **vascular plants**
 - most detailed data from the Czech Republic (Kovář a kol. 2004)
 - almost no species of conservation interest grows directly from fly ash
- **arthropods**
 - until recently, only a few accidental records published



Myricaria germanica - CR



Cylindera arenaria viennensis - EN

East Bohemian fly ash deposits

- Chvaletice, Opatovice, Semtín
- data from three seasons
- „bees and wasps“
 - absolutely crucial
 - 6 „extinct“ species, >20 critically endangered,
 - 59 EN and VU, + 33 specialist of sand dunes
- spiders
 - 3 CR, other 21 „less threatened“ species
 - also species of wetlands and steppes
- beetles
 - 5 red-listed spp., and/or several psammophilous specialist
- leafhoppers
 - new country record – *Paralimnus rotundiceps*
 - 1 EN, 2 VU, 1 NT
- moths, hoverflies, ants, neuropterans, true bugs
 - almost no important species
 - low species richness and abundancies



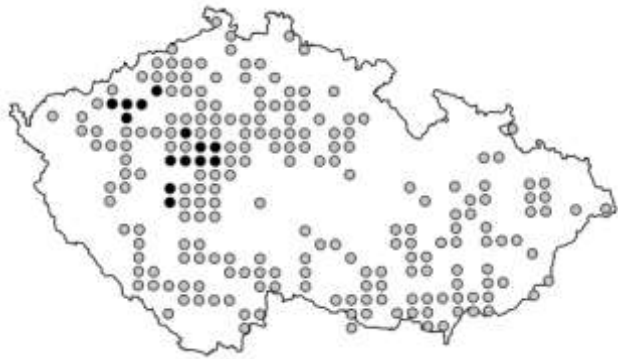
West Bohemian fly ash deposits

- Tušimice, Prunéřov, Počerady
- „bees & wasps“
 - again crucial
 - 7 „extinct“ and 23 CR
- orthopterans
 - cricket *Modicogryllus frontalis*
 - in Bohemia considered extinct (Tropek & Kočárek 2013)
 - earwig *Labidura riparia*
 - in Bohemia very rare, specialist of natural sands
- leafhoppers
 - *Pinumius areatus*
 - RE, specialised for sand dunes
 - 11 „less threatened“ **psammophilous, halofilous and steppe species**



West Bohemian fly ash deposits

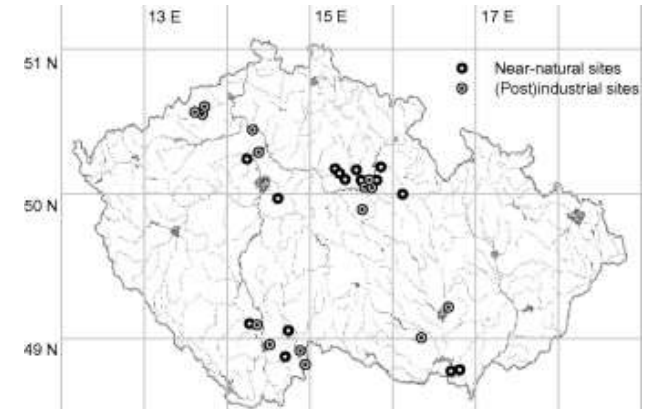
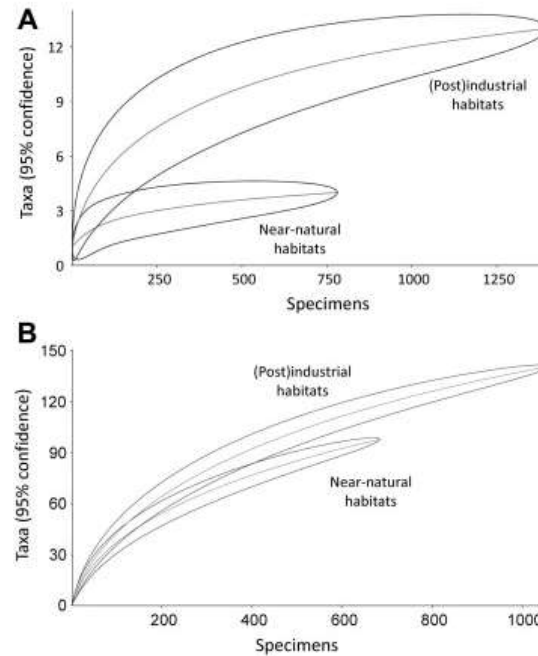
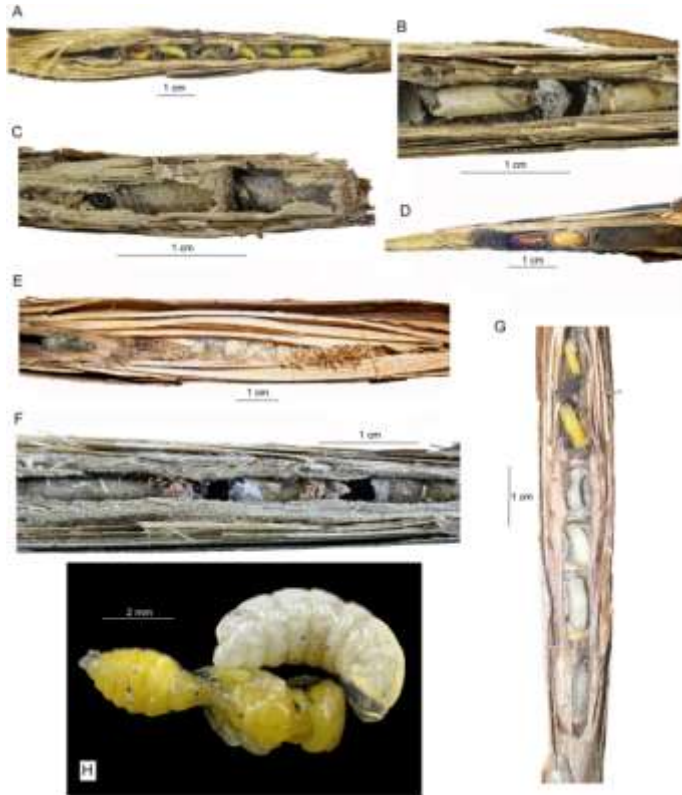
- butterflies
 - grayling (*H. semele*)
 - critically endangered
 - crucial refugium
 - VU *Hesperia comma* and others



Tropek *et al.* 2017, *Polish J Ecol*

Reedbeds

- 2012 – „bees and wasps“ in *Phragmites* growths
- communities of abandoned galls of *Lipara* flies
- 29 threatened species in post-industrials vs. 18 in natural sites



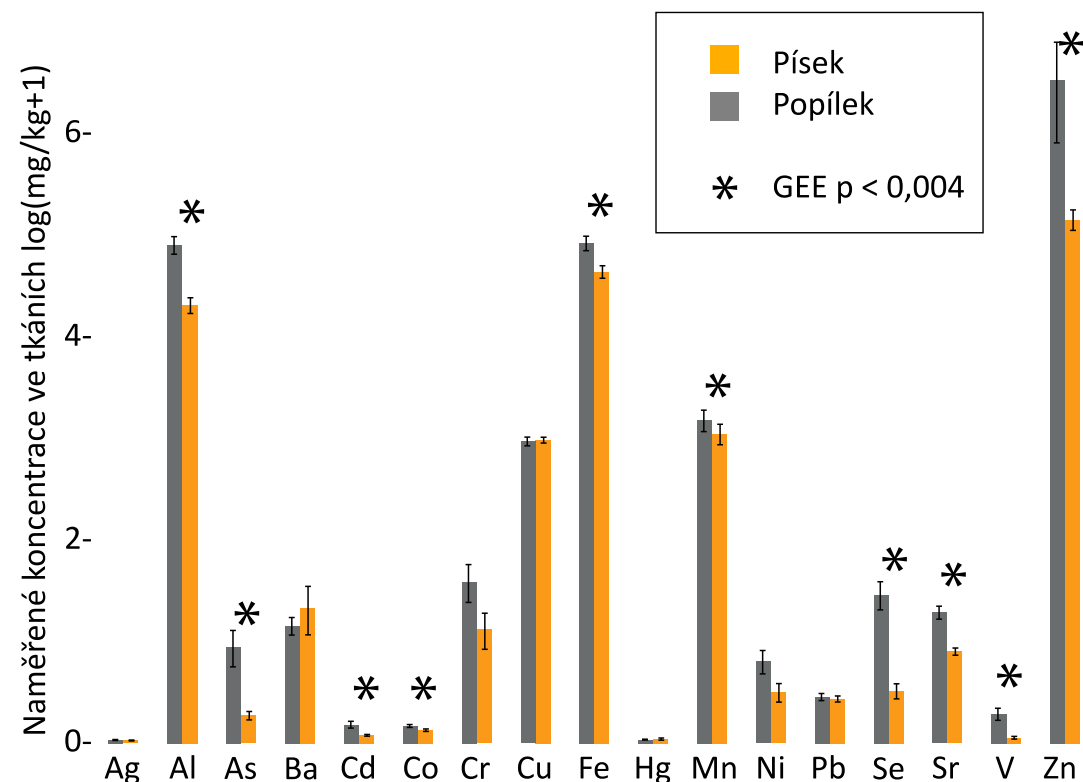
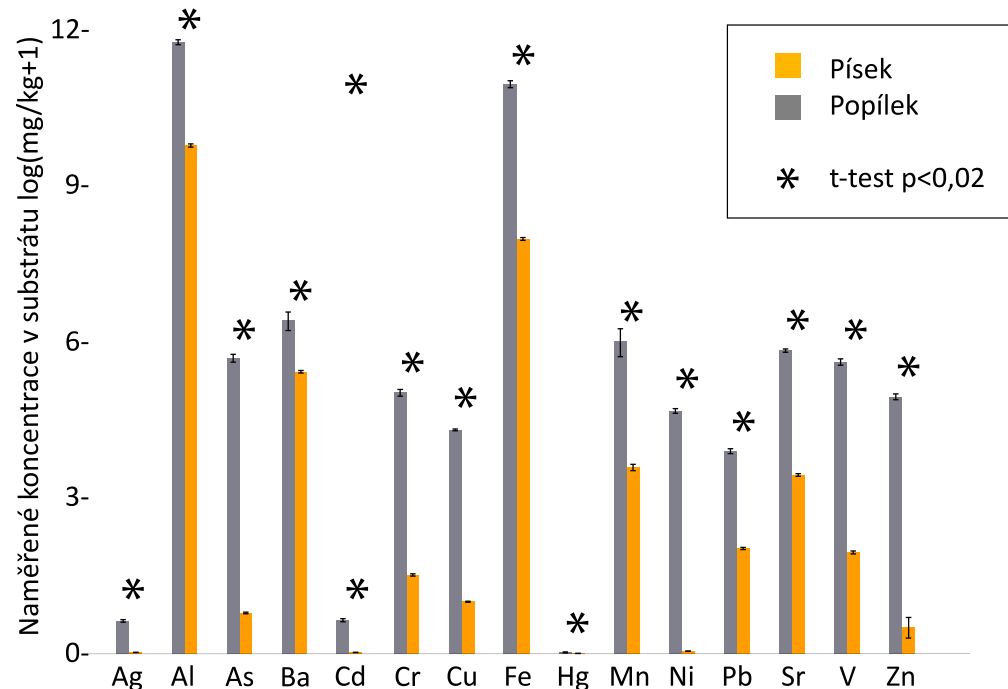
Biodiversity of fly ash deposits

- >20 species considered as extinct
- several tens of critically endangered spp.
- **surely not suitable for all potential species**



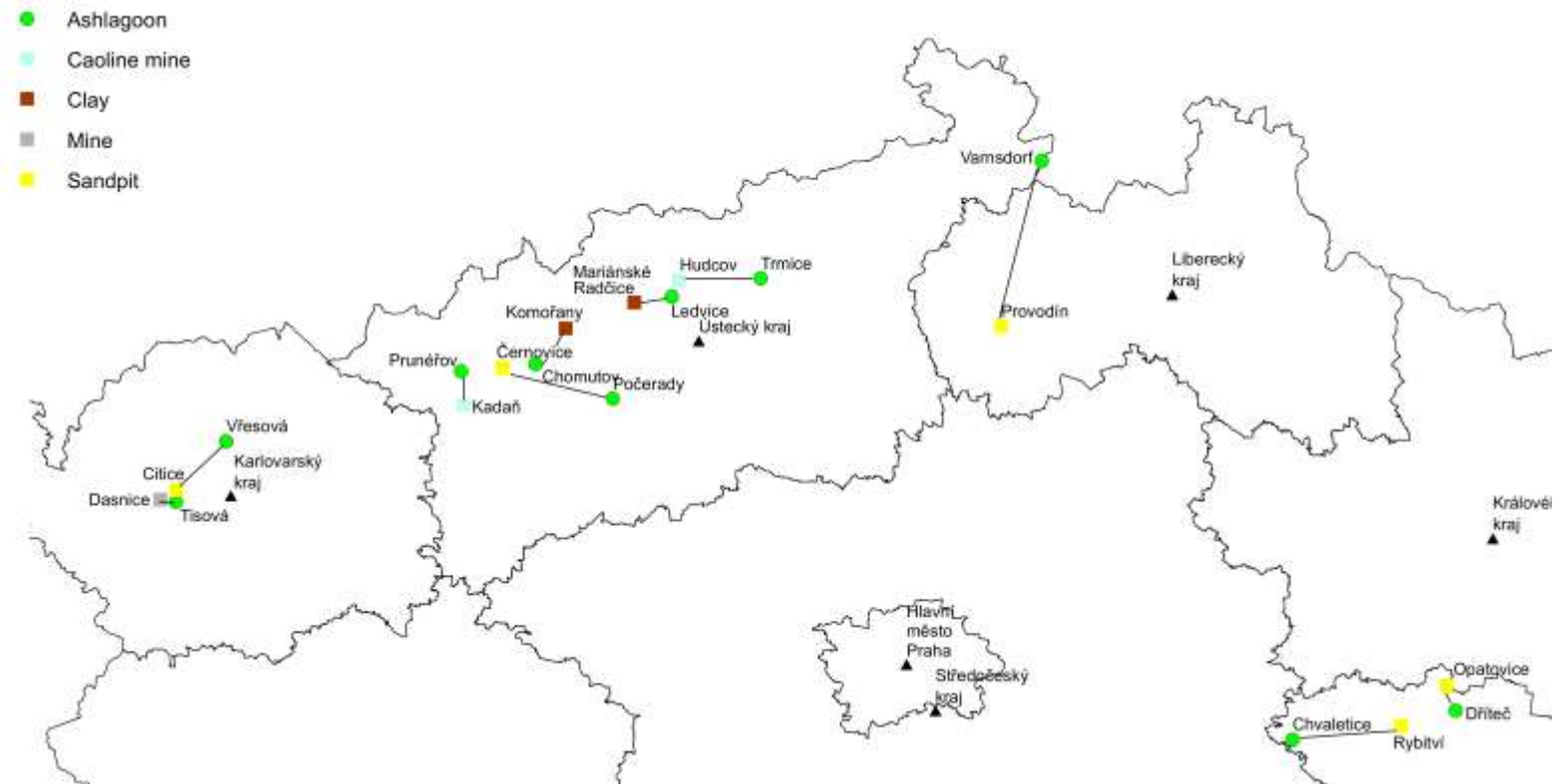
Fly ash deposits – ecological traps?

- toxic substrate?
- **invertebrates**
 - much better mechanisms of decontamination
 - almost no studies



Fly ash deposits – ecological traps?

- new project (GACR) – together with Dr. David Boukal
- **freshwater communities** – comparing with unpolluted artificial localities
 - community composition and structure
 - heavy metals bioaccumulation
 - transplant experiments
 - laboratory experiments
 - ...



Restoration of fly ash deposits

- **aim:** prevention of wind erosion
 - substrate stabilisation
 - covering by topsoil and sowing/planting
- **result:** complete eradication from landscape

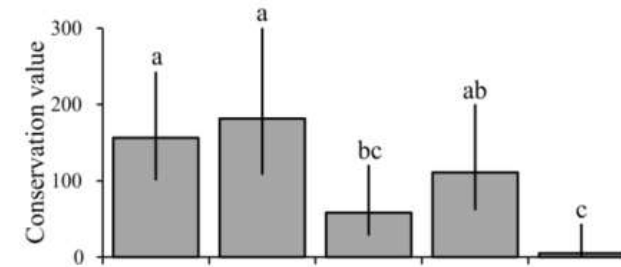


Technical reclamation vs. Succession

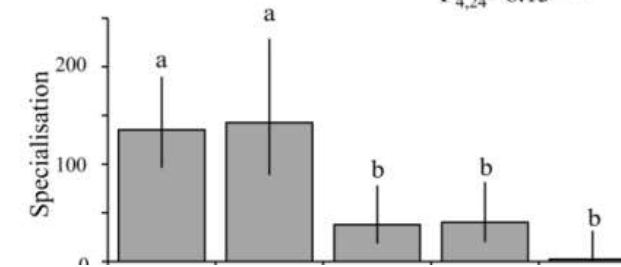
- Polabí – 3 deposit
- 5 types of biotopes
 - 3 spontaneous, 2 reclaimed



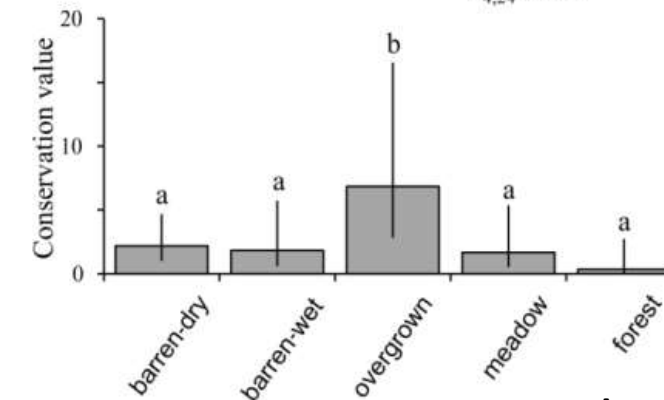
(f) Bees & wasps - *conservation value*
 $F_{4,24}=5.01^{**}$



(h) Bees & wasps - *psammophilous species*
 $F_{4,24}=8.13^{***}$

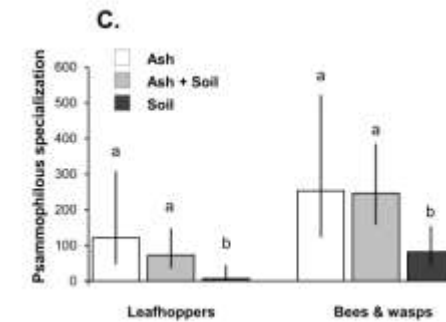
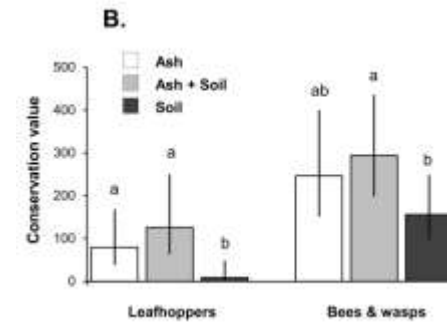
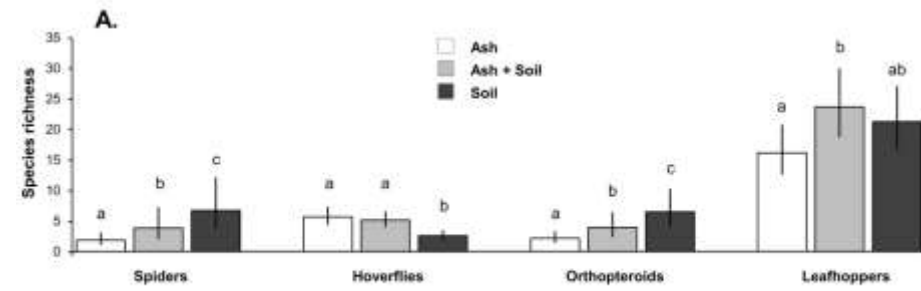


(g) Spiders - *conservation value*
 $F_{4,24}=5.27^{**}$

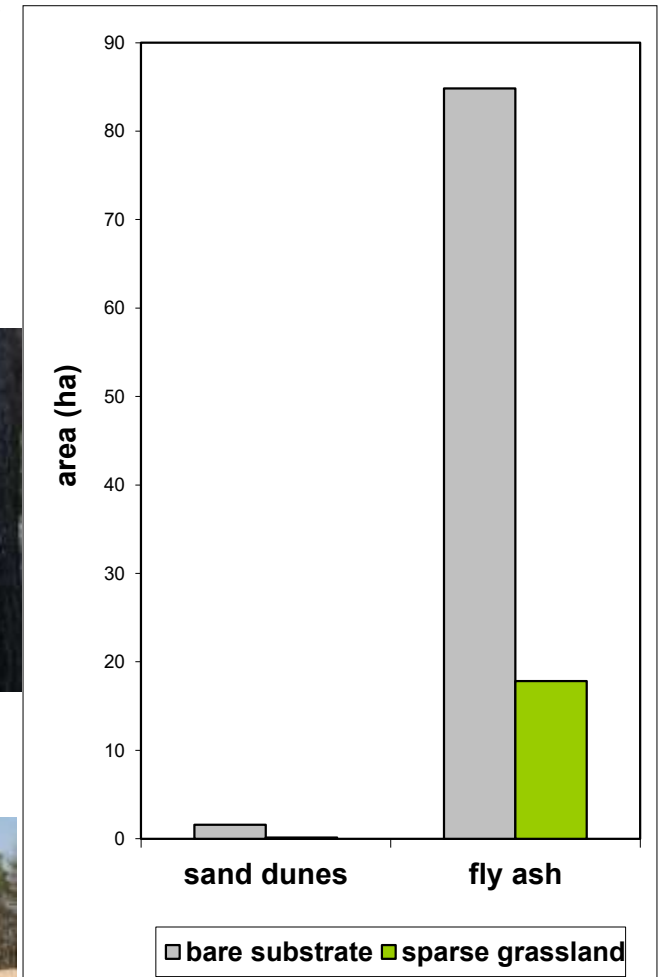
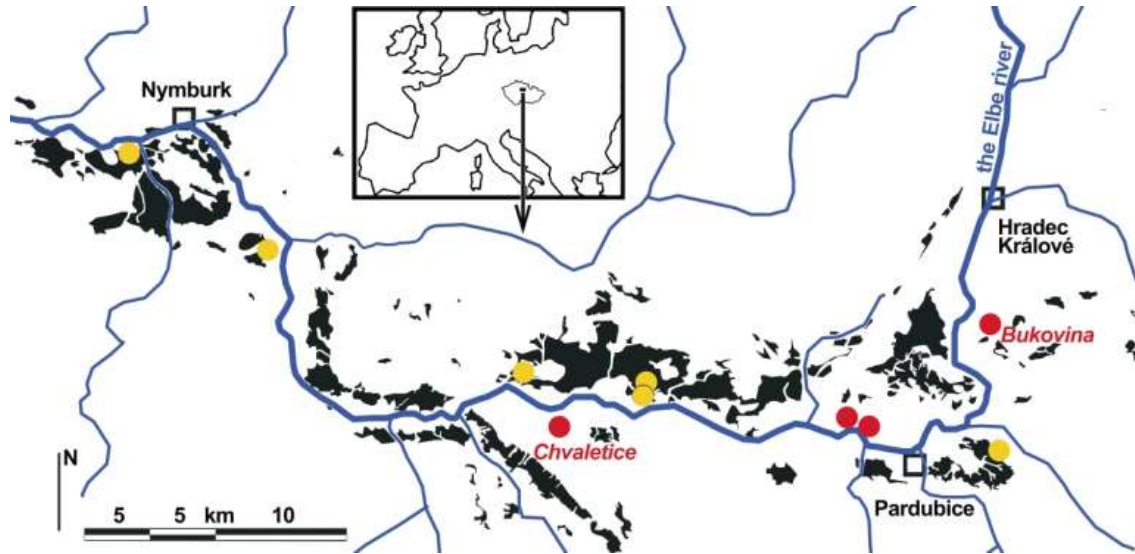


Restoration of fly ash deposits

- Western Bohemia
- 3 habitat types



Can we ignore fly ash deposits?





Thank you for your attention!

Interested? We are looking for students...

