

Movement of chronic wasting disease prions in prairie, boreal and alpine soils

Alsu Kuznetsova^{1,2}, Debbie McKenzie^{2,3}, Bjørnar Ytrehus^{5,6}, Kjersti Selstad Utaaker^{5,7} and Judd M. Aiken^{2,4*}

¹ Department of Renewable Resources, University of Alberta, Edmonton, AB T6G 2G8, Canada

² Centre for Prions and Protein Folding Diseases, University of Alberta, Edmonton, AB T6G 2M8, Canada

³ Department of Biological Sciences, University of Alberta, Edmonton, Alberta, Canada

⁴ Department of Agricultural, Food and Nutritional Sciences, University of Alberta, Edmonton, Alberta, Canada

⁵ Norwegian Institute for Nature Research (NINA), Trondheim, Norway

⁶ Department of Biomedicine and Veterinary Public Health Sciences, Swedish University of Agricultural Sciences, Uppsala, Sweden

⁷ Faculty of Biosciences and Aquaculture, Nord University, Bodø, Norway

* Correspondence: to: Judd Aiken, e-mail: judd.aiken@ualberta.ca

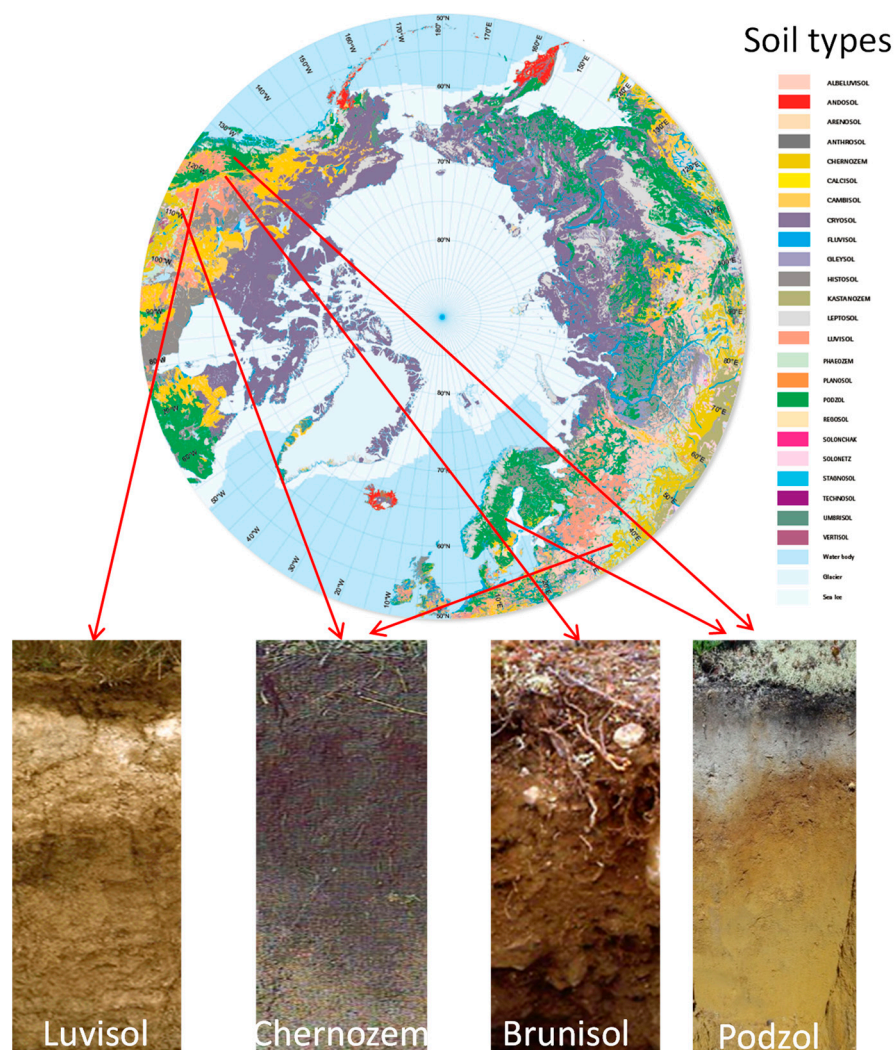
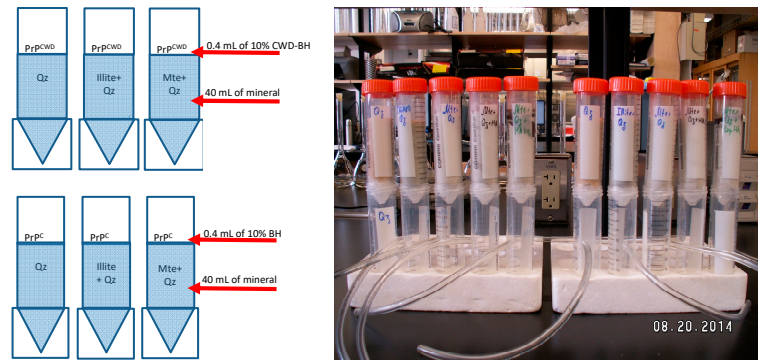


Figure S1. Soil map of circumpolar area with CWD-endemic region (Map source: https://esdac.jrc.ec.europa.eu/Library/Maps/Circumpolar/Documents/Circumpolar_atlas.pdf).

Experiment 1



Experiment 2

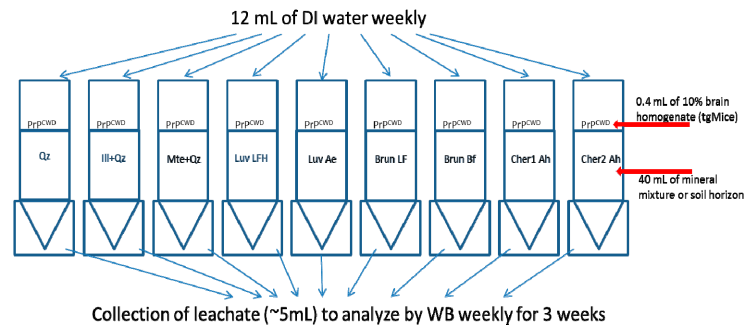


Figure S2. Experimental design of the PrPC^{WD} Transport Experiments. 24x100 mm tubes with perforated bottom were filled with 40 mL of minerals (quartz, Qz; illite, Ill; montmorillonite, Mte) or soil horizons (Luv – northern Luvisol, LFH and Ae horizons; Brun – mountain Brunisol, LFH and Bf horizons; Cher1 and Cher2 – central and southern Chernozems, Ah horizons). Ratios used - Mte:Qz 30:70 = sandy clay loam texture for columns incubated 6 weeks; Mte:Qz 50:50 = sandy loam texture for a column incubated 3 weeks. Brain homogenate (BH, 1% , tgMice) was applied on the surface. Columns were irrigated weekly with water, 12mL (simulating 90mm/month precipitation). Leachate was collected weekly to analyze presence of PrP.

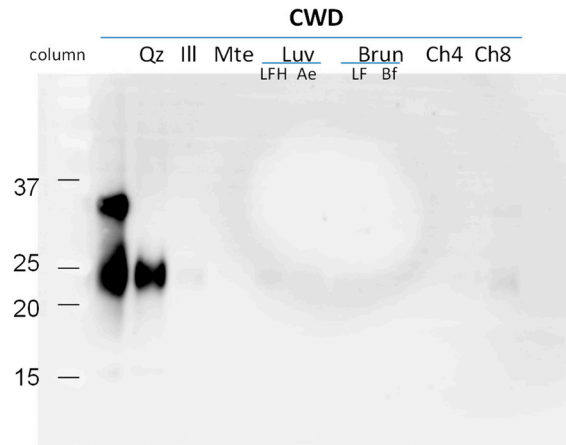


Figure S3. Leachate obtained at the third week from all 9 columns (column experiment 2): Qz – quartz, Ill – illite(50%)+quartz, Mte – montmorillonite (50%)+quartz, Luv – northern Luvisol, horizons LFH and Ae, Brun – mountain Brunisol, horizons LFH and Bf, Ch – Chernozems. ~ 5 mL of leachate was obtained from each column; 50uL of leachate were boiled at 100°C with SB and analyzed by western blot using mab Bar224.

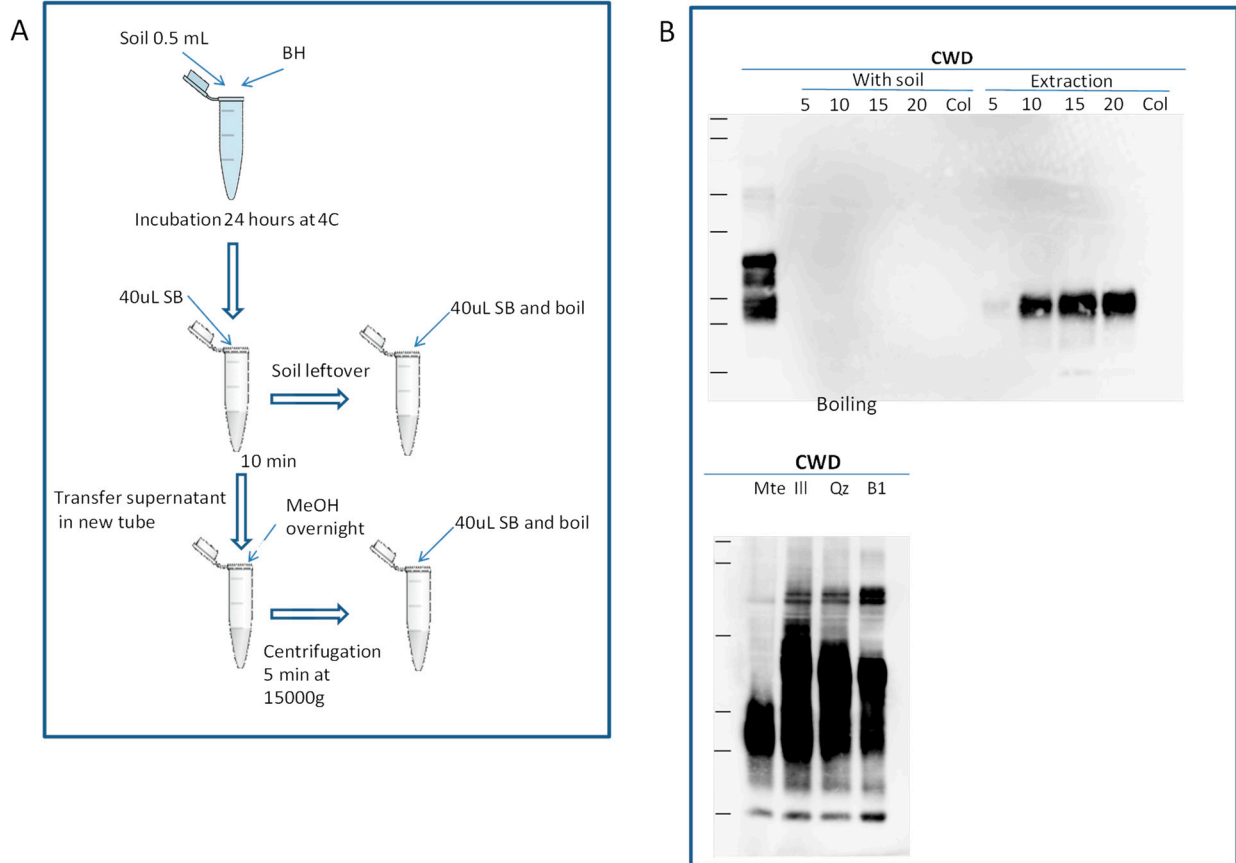


Figure S4. PrP extraction from solid phase. (A) Extraction protocol from soil. (B) Extraction 5 uL CWD from 0.5 mL of solid soil analyzed by western blot using Bar224 antibody.

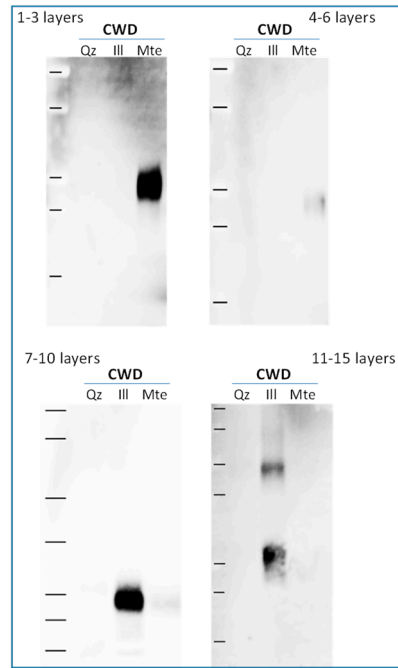


Figure S5. PrP signal extracted from solid phase of columns after 3 weeks incubation, mixed layers. Samples were boiled at 100°C with SDS and analyzed by western blot using Bar224 antibody.