**Appendix 1:** Sample collection and processing methods of the individual datasets

**Alpine (Italy):** Doretto et al., 2017;2018

 Colonisation devices consisted of a parallelepiped trap built with a metal net (180 mm long, 60 mm wide and 60 mm high, mesh aperture 8 mm, total volume = 0.65 dm3). Traps were filled with pea pebbles (average size 14-20mm) and sand (range size 500-1000 µm) and were assigned to either control conditions (free from sand) or clogged (66% sand and 33% pebbles). All traps were installed flush with the substrate surface. Upon retrieval samples were preserved in 75% alcohol and identified to genus and family level.

**Lowland (UK):** Mathers et al., 2017

Colonisation devices consisted of a PVC cylinders (diameter 65 mm, height 200 mm, total volume 0.66 dm3) perforated with twelve horizontal holes (diameter 6mm). Cylinders were filled with pre-washed gravels from each respective site (River Chater and River Gwash) truncated at 8 mm and sand (range size 63-2000 µm) and were assigned to either control conditions (free from sand) or clogged (250g of sand). For the clogged columns, a circular disk (64 mm diameter) was attached to the mesh bag to reduce the los of fine sediment vertically into the riverbed. All traps were installed flush with the substrate surface. Upon retrieval samples were preserved in 10% formaldehyde and identified to genus and species level in most instances with the exception of Diptera (family), Sphaeriidae (family) and Oligochaeta (order).

**References**

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