Supporting methods

The pH of sediment/biochar was determined by pH 400 meter (Spectrum Technologies, Inc., Aurora, Illinois, USA) at a soil/deionized water ratio of 1:2.5(w/v); the electric conductivity of sediment and biochar was measured using a WET Sensor (WET-2, Delta-T Devices Ltd., Cambridge); the C, N and H contents of sediment/corn stalks/biochar were measured with a C/H/N elemental analyser (EuroVector S.P.A EA3000, Milan, Italy) and the O content of corn biochar was calculated by the law of conservation of mass; the $\text{NO}_3^-$ and $\text{NH}_4^+$ of sediment were extracted using $\text{CaCl}_2$ solution before determined with AA3 Continuous Flow Analytical System (AA3, Bran+Luebbe, German).

For biochar, the ash content was measured according to the stand method outlined by the American Society for Testing and Materials (ASTM) (ASTM, 2007); the surface physical properties were measured using an ASAP-2020 surface area analyzer (Micromeritics Instrument Corporation, US), then the surface area was calculated using the Brunauere Emmett eTeller (BET) equation, the total porous volume was calculated by the density functional theory approach, and the micropore volume was calculated using the t-plot method (Puziy et al., 2003).

Reference:


Fig. S1. The growth status of *Calamagrostis angustifolia* during the incubation period.