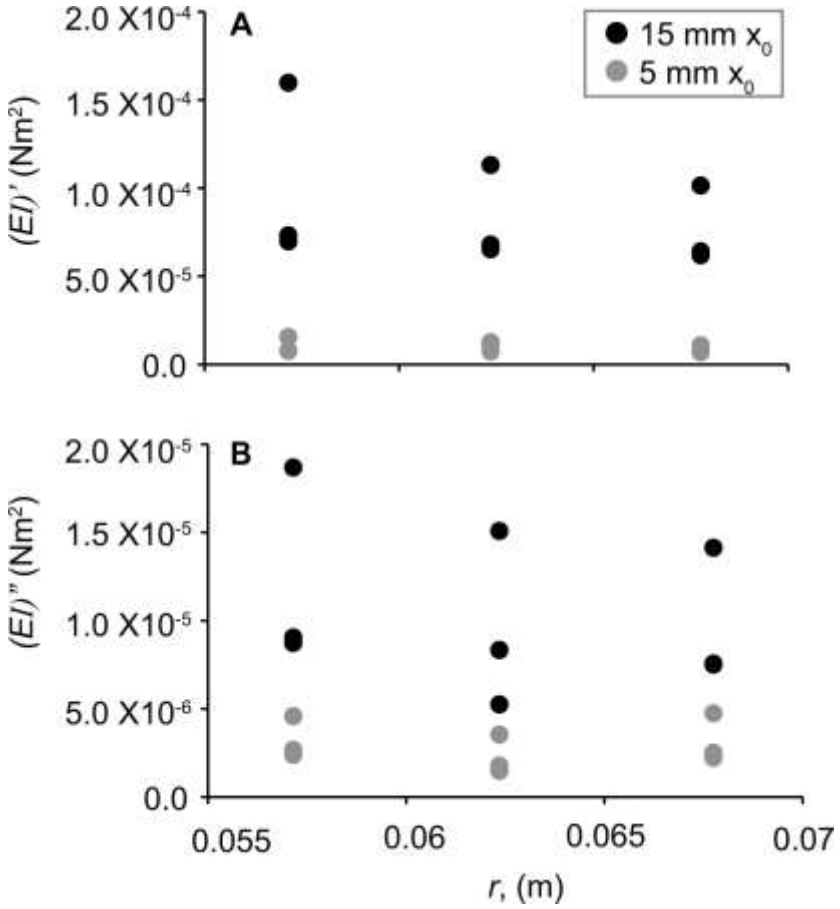

Fig. S1. Moduli are constant with respect to changes in compressive load superimposed during bending. As a consequence of bending rig geometry (see Fig. 1), when the moment arm *r* is shortened, the compressive load superimposed on the bending load increases. This compressive load was not independently measured, but the effect on the moduli was determined to be negligible by a mixed model ANCOVA, where *r* and linear actuator amplitude, x_0, are the main effects. The ANCOVA model is significant for the elastic stiffness, $(EI)_1'$ ($F_{3,14}$ = 44.61; $p < 0.0001$), and the loss stiffness, $(EI)_1''$ ($F_{3,14}$ = 26.87; $p < 0.0001$), but this is due to amplitude-dependent viscoelastic nonlinearity. (A) Effects test: $(EI)_1'$ was greater at x_0 = 15 mm compared to x_0 = 5 mm ($p < 0.0001$), also *r* and *r* * x_0 were not significant effects. (B) Effects test: $(EI)_1''$ was greater at x_0 = 15 mm compared to x_0 = 5 mm ($p < 0.0001$), also *r* and *r* * x_0 were not significant effects. Each data point represents the mechanical test performed on each of the three specimens at *f* = 1Hz, at a given *r* and a given x_0.

Table S1. Linear and non-linear viscoelastic properties of vertebral column segments from *Squalus acanthias* using mixed model ANCOVA.

Click here to Download Table S1