



Fig. S1. Probability distribution functions (PDF) of leg parameters. PDF of (A) duty factor (DF), (B) stride frequency (ω_{stride}), (C) step length (L_{step}), and (D) stride length (L_{stride}), for both (i) *S. polymorpha* and (ii) *S. sexspinosus*. For *S. polymorpha*, light green, medium green, and dark green, correspond to flat ($R_g = 0$), less rugose ($R_g = 0.17$), and more rugose ($R_g = 0.44$) terrain, respectively. For *S. sexspinosus*, light orange, medium red, and dark red, correspond to flat ($R_g = 0$), less rugose ($R_g = 0.17$), and more rugose ($R_g = 0.44$) terrain, respectively.



Movie 1. *S. polymorpha* and *S. sexspinosus* locomoting on flat, less rugose, and more rugose terrain. *S. polymorpha* locomoting on (A) flat ($R_g = 0$), (B) less rugose ($R_g = 0.17$), and (C) more rugose ($R_g = 0.44$) terrain. *S. sexspinosus* locomoting on (A) flat ($R_g = 0$), (B-D) less rugose ($R_g = 0.17$), and (E) more rugose ($R_g = 0.44$) terrain. All videos playback at real-time and 0.1x speed.



Movie 2. Passive limb behavior in *S. polymorpha* and *S. sexspinosus*. Passive limb behavior observed in *S. polymorpha* on (A) less rugose ($R_g = 0.17$) and (B) more rugose ($R_g = 0.44$) terrain. Passive limb behavior observed in *S. sexspinosus* on (A) less rugose ($R_g = 0.17$) and (B) more rugose ($R_g = 0.44$) terrain. All videos playback at 0.1x speed.



Movie 3. Vertical body lifting. (A) Side view of *S. polymorpha* locomoting on flat terrain. (B) Side view of *S. polymorpha* locomoting on less rugose ($R_g = 0.17$) terrain. All videos playback at real-time and 0.1x speed.