

世界一のろい魚 ニシオンデンザメの泳ぐ速さと尾びれの振りの速さ

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The slowest fish: swim speed and tailbeat frequency of Greenland sharks

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Locomotory muscle function of ectothermic fishes is generally depressed in cold waters, making them vulnerable to avian and mammalian predators whose body temperature remains high. Paradoxically, Greenland sharks *Somniosus microcephalus* exhibit the reverse of this usual predator-prey thermal pattern by apparently hunting seals in Arctic waters. To examine whether this species possesses cold-adaptations that enhance its swimming performance, we used data-logging tags to measure swim speed and tail-beat frequency (which reflects muscle-shortening speed) of six free-swimming sharks (204–343 kg). For comparison, we compiled these parameters for wild fishes from the literature over a wide body mass range (0.2–3900 kg) and examined the scaling relationships using phylogenetically informed statistics. The sharks cruised at $0.34\text{m}\cdot\text{s}^{-1}$ with a tail-beat frequency of 0.15 Hz, both of which were the lowest values for their size across fish species. The mean and maximum speed ($0.74\text{m}\cdot\text{s}^{-1}$) and acceleration during burst swimming ($0.008\text{m}\cdot\text{s}^{-2}$) were much lower than those of seals. Our results indicate that the swimming performance of Greenland sharks is limited by cold waters ($\sim 2\text{ }^{\circ}\text{C}$) and insufficient to catch swimming seals. However, Arctic seals sleep in water to avoid predation by polar bears *Ursus maritimus*, which may leave them vulnerable to this cryptic slow-swimming predator.