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Skim before you fly

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How does gradual evolutionary change come up with a complex trait such as flying? One possible intermediate state for insects is surface-skimming, in which the insect's weight is borne by water, meaning that the wings must deal only with generating forward motion. A limited analysis suggested, however, that present-day surface skimmers were evolutionary latecomers, and had lost their previous ability to fly. In the November 21 [Proceedings of the National Academy of Sciences](#), Thomas *et al.* analyze skimming behaviors and rRNA gene sequences of 34 stonefly species and come to the opposite conclusion (*Proc. Natl. Acad. Sci. USA* 2000, **97**:13178-13183). This more extensive analysis reveals that the number of costal cross veins in the wings has increased during species radiation, allowing skimming to expand to flying. This evolutionary trajectory may or may not hold for insects as a whole. It is at least consistent with a growing body of anatomical and molecular evidence that wings evolved from the [moveable gills](#) of aquatic ancestors.

References

1. *Proceedings of the National Academy of Sciences*, [<http://www.pnas.org/>]
2. Movie of gill flapping, [<http://www.bio.psu.edu/people/faculty/marden/movies/gillflap.mov>]