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Investigation of gliding flight by flying fish HYUNGMIN PARK, WOO-PYUNG JEON, HAECHEON CHOI, Seoul National University — The most successful flight capability of fish is observed in the flying fish. Furthermore, despite the difference between two medium (air and water), the flying fish is well evolved to have an excellent gliding performance as well as fast swimming capability. In this study, flying fish's morphological adaptation to gliding flight is experimentally investigated using dry-mounted darkedged-wing flying fish, *Cypselurus Hiraii*. Specifically, we examine the effects of the pectoral and pelvic fins on the aerodynamic performance considering (i) both pectoral and pelvic fins, (ii) pectoral fins only, and (iii) body only with both fins folded. Varying the attack angle, we measure the lift, drag and pitching moment at the free-stream velocity of 12m/s for each case. Case (i) has higher lift-to-drag ratio (i.e. longer gliding distance) and more enhanced longitudinal static stability than case (ii). However, the lift coefficient is smaller for case (i) than for case (ii), indicating that the pelvic fins are not so beneficial for wing loading. The gliding performance of flying fish is compared with those of other fliers and is found to be similar to those of insects such as the butterfly and fruitfly.

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