

Abstract Submitted
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Recent Observations on Shortfin Mako Scale Flexibility as a Mechanism for Separation Control¹ AMY LANG, University of Alabama, PHILIP MOTTA, MARIA HABEGGER, University of South Florida, EMILY JONES, University of Alabama, ROBERT HUETER, Mote Marine Laboratory — Recent results obtained from examining the skin of the shortfin mako (*Isurus oxyrinchus*) suggest that scale flexibility may provide a passive, flow actuated mechanism for controlling flow separation. The shortfin mako is considered to be one of the fastest and most agile marine predators. High contragility, or the ability to change direction while already in a turn, requires minimal form drag and thus control of flow separation on body regions aft of the point of maximum girth. Recent biological observations have found that the shortfin mako has highly flexible scales, or denticles, particularly on the sides of the body downstream of the gills; in these regions scale crowns can be easily manipulated to angles in excess of 60 degrees. Histological data of the skin provides preliminary evidence that this flexibility is achieved due, in part, to a reduction in the size of the base of the scale where it is anchored into the skin. Experimental measurements of maximum angle of denticle bristling observed as a function of body location will be presented and a probable mechanism leading to separation control will be discussed.

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