

## Fly rod deflection and rotation

Looking through fly fishing forums I often see a statement like this: „we rotate the fly rod and as the inevitable consequence it deflects“ (and again recently: “rod bend is a consequence of our main purpose to rotate the rod”).

This statement left me unsatisfied. On the one hand I totally agree that the rotation of the fly rod is vital to generate a proper line speed to get the fly into the target. But on the other hand I was missing something. To me this statement felt incomplete somehow, since in this view the meaning of the deflection tends to be a kind of byproduct of the rotation reduced to some geometrical advantages - basically to carry the tip of the fly rod on a straight path.

Since my „[Experimental investigation on the fly rod deflection](#)“ I can explain what I was missing: the meaning the deflection could have in terms of efficiency (ratio of output / input energy) !

As one conclusion of my investigations there is no doubt that the deflection of the fly rod enables a significant better energy transfer from the grip towards the tip. In comparison to a totally rigid fly rod - which provides basically leverage resulting from the translatory and rotary motion - the flexible one provides two further transfer properties: 1.) the storage of energy (spring energy, the „load“) as well as 2.) the redistribution of angular momentum, consisting the pirouette and the whip effect (together with the modification of the moment of inertia - see section F1 and annex 2 of my investigations). Both further energy transfer properties interrelate and enable the caster to generate a proper line speed with less effort, if he deflects the fly rod in a proper manner ! Even if the rigid as well as the flexible fly rod could be massless - as investigated in my work - the flexible one has a significant better ability in energy transfer than the rigid one.

What is the insight ? Beside some other impacts – like e.g. the minimization of the false casts - the rotation in combination with the controlled deflection as well as the controlled counter deflection (reduced counterflex) is the key of an efficient fly cast ! In terms of efficiency a closer look on HOW the fly rod is deflected is important instead of THAT it just deflects as a consequence of rotation. The rotation is vital to achieve this and it is always effective ("the aim is all") somehow – but without a proper deflection the rotation alone is not efficient<sup>1</sup>.

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P.S. I have created some [videos](#) to explain what I'm talking about.

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<sup>1</sup> Scientists would say, that for efficiency the rotation is a **necessary**, but solely **not a sufficient condition** ! Both conditions are only met if the optimal deflection joins the casting stroke !