Crux (Numbered) Problem

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4863. In a parallelogram ABCD, let E be the point where the diagonal BD is tangent to the incircle of $\triangle$ ABD. If r_1 and r_2 are the inradii of the triangles DEC and BEC, prove that $\frac{r_1}{r_2}=\frac{DE}{EB}$.

Solution: