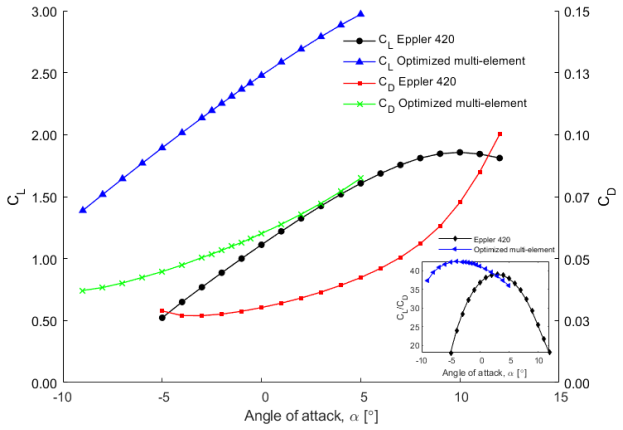

Fig. 6. C_L/C_D ratio as a function of α for a traditional hydrofoil and for an optimized multi-element hydrofoil using the Eppler 420 profile.

4. Conclusion

The design of a multi-element hydrofoil based on SM was presented in this study. The use of SM refers to an approach that can be employed for the design of hydrokinetic turbines, allowing the correction of a multi-element hydrofoil shape, aiming at preventing cavitation. In this study, the objective was to maximize C_L and minimize C_D subjected to $C_{pre} < 4$ constraint**.** The results showed that the improvement of C_L/C_D is significant compared to the conventional hydrofoil. The multi-element hydrofoil had a C_L/C_D of 8.87 % larger than that of the traditional hydrofoil.

The design of the optimal hydrofoil for hydrokinetic appliances always requires an amount of time experiments and computational analysis in order to achieve the planned goals. In this work, the SM allowed reducing the time of multi-element hydrofoil design process involved in the blade manufacture of a horizontal axis hydrokinetic turbine due to the reduction iterations number and the CFD analysis within the optimization procedure.

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