

### **Popular abstract**

In recent years, there has been a growing tendency to avoid the use of artificial colorants and additives in food products, especially after some studies linked their consumption with behavioural changes in children. However, the incorporation of natural colorants remains a challenge, as these are typically less vivid and less stable than their synthetic alternatives. The case of natural blue colorants is more complicated, as they are relatively scarce in nature.

In this PhD thesis, a process for production of a natural blue colorant from *Arthrospira* genus algae is presented. First, a model for purifications of proteins from the algae is presented, and combined with a mathematical model to predict the process behaviour. The protein was used as starting material for the development of a production process of colorant. The method presented resulted in better performance than the conventional method in terms of yield, purity and time consumption. Although the new colorant was in general terms less stable than the raw material, some insights into the stabilization are provided.