ABSTRACT

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Copper is present as a trace element in all tissues and is essential in cellular respiration, in the biosynthesis of neurotransmitters, for the scavening of reactive oxygen species, and is also a cofactor for various enzymes. Disruption of homeostasis can lead to liver and CNS damage, and tumor formation. Typical examples of an imbalance in copper homeostasis represents Wilson and Menkes disease.

Xanthene derivatives are biologically active compounds with a possible broad therapeutic spectrum. Some of these derivatives have antitumor, antipyretic, immunomodulatory, antioxidant and other positive biological activities.

The aim of this work was to determine whether 2,6,7-trihydroxyxanthen-3-one derivatives have the ability to reduce cupric ions and possibly to detect the effect of various substituents on this ability. As a methodology, a spectrophotometric method based on bathocuproindisulfonic acid as an indicator was used. Ten compounds were tested at different pH values. All tested compounds have been shown to have the ability to reduce copper ions and most of them even at a ratio of less than 1: 1 (xanthene: copper) at all pH. The highest copper reduction ability was observed in the case of the 4'-trifluoromethyl derivative. The influence of other substituents was variable and also dependent at pH of the environment.

In conclusion, all 2,6,7-trihydroxyxanthen-3-one derivatives reduced copper. This ability was modified to some extent by substituents on the benzene ring in position 9.