

I. INTRODUCTION

1.1 Background

The use of various food additives increases the nutritional value, quality of storage and strengthens the appeal of foods. One example of food additives that are often used to strengthen the appeal of foods is food coloring. There are two types of food coloring in the food industry, namely natural dyes and synthetic dyes. One of the popular synthetic dyes is tartrazine (Sunu, 2018). Tartrazine has also been widely used for coloring drugs such as vitamin capsules, antacids, cosmetics and hair care products. This substance also gives attractive color to the mixture of cakes, jams, jellies, chips of various flavors, chewing gum, biscuits, sauces, and ice cream (Mohamed *et al.*, 2015). In addition, tartrazine has been used as a substitute for turmeric for cooking in many developing countries (Mehedi *et al.*, 2009) The recommended dose of tartrazine according to Permenkes RI Number 722/MEN. Case. PER/IX/88 on food Additives is 70 micrograms/mL for soft drinks and liquid foods. This recommendation encourages the legal and widespread use of tartrazine at industrial and household times in Indonesia.

Although it is a popular dye legally recommended by the government, a study shows that tartrazine can negatively influence and alter some biochemical indicators in essential organs such as the liver and kidneys, either at high or low doses (Amin *et al.*, 2010). Furthermore, tartrazine also provides a riskier effect at higher doses as it can induce oxidative stress through the formation of free radicals. Previous research has found that oral administration of tartrazine to male rat cubs (700mg/kg bb) for 30 days induces a significant decrease in the neurotransmitter

gamma-aminobutyric acid, dopamine and serotonin. These three types of neurotransmitters play a crucial role in the normality of nervous system function. In addition, tartrazine causes a decrease in natural antioxidants and increases oxidative stress biomarkers in brain tissue especially in the cerebral cortex as a memory center (Mohamed *et al.*, 2015).

Usually, in the body, there are free radicals in deficient levels and harmless. However, it also has natural antioxidants that can counteract the effects of free radicals. However, excessive free radicals can cause these natural antioxidants not to cope and cause oxidative stress conditions. Therefore, the body needs an intake of antioxidants from the outside (Herdiani *et al.*, 2015).

Corn silk is one of the sources of natural antioxidants that are beneficial for the body. Research conducted by (Gomez-Cabrera *et al.*, 2015) shows that corn silk has a higher antioxidant activity than pandanus and wind plants. Some phenolic compounds are antioxidants in corn silk, especially Flavonoids. Phenolic acid is also found in corn silk, i.e., anthocyanins, p-coumaric acid, vanilla acid. The utilization of corn silk which is waste from corn cultivation is still limited to traditional medicine. It also can be used for urine decay and blood pressure lowering. Considering that corn silk waste is a source of various bioactive compounds especially potential natural antioxidants, it is strongly suspected that corn silk also has high efficacy as a neuroprotector that can be developed in the future. Based on the background that has been presented, research on the efficacy of corn silk as a neuroprotector is essential.

1.2 Problem Formulation

1. How do the effects of cornsilk ethanol extract in counteracting the decrease in cognitive intelligence, including memory cognitive, spatial, curiosity, and social interaction in tartrazine-treated mice?
2. How do the effects of the cornsilk ethanol extract on MDA levels of brain tissue in tartrazine-treated mice?
3. How do the effects of the cornsilk ethanol extract in counteracting brain tissue degeneration in tartrazine treated on mice?
4. What are the bioactive compound in silk ethanol extract that may effect the brain function?

1.3 Research Objectives

1. To Analyze the effects of cornsilk ethanol extract in counteracting the decrease in cognitive intelligence, including memory cognitive, spatial, curiosity, and social interaction in tartrazine-treated mice
2. To analyze the effects of the cornsilk ethanol extract on MDA levels of brain tissue in tartrazine-treated mice
3. To analyze the effects of the cornsilk ethanol extract in counteracting brain tissue degeneration in tartrazine-treated mice.
4. To know the bioactive compound in silk ethanol extract that may effect the brain function

1.4 Significance of The Research

1. Provide information about the efficacy of corn silk ethanol extract as an alternative in improving cognitive intelligence.
2. One of the efforts to support the government in handling organic waste.