

## Research Article

### The Effectiveness in Detoxification and Deodorization of Water with Small molecular mass in Turtle Study

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## Abstract

Turtle, known as a medicine of health protection, is senior delicious taste. In order to raise the production, many farms add drugs to the feed, which not only induces the decrease of immune ability of broilers, but also increases drug residue in turtle meat, creates many potential food safety problems for consumers. In this paper, a new simple method of water with small molecular mass breeding to reach the goal in detoxification and deodorization of turtle is put forward. By this way, we have successfully been harvested a batch of turtles that has excellent safety guarantee.

**Keywords:** Turtle; Breeding; Water with Small Molecular Mass; Detoxification and Deodorization

## Introduction

Turtle is senior delicious taste with rich nutrients. The flavor of the turtle enjoys a good reputation all over the world, some research shows that turtle contains rich protein, trace elements, some vitamin and kinds of amino acids, which benefit our health.

In the process of breeding, many farms add drugs, malachite green and crystal violet used most, to the feed to prevent the turtle biting each other and to raise the production. Malachite Green (MG) and Crystal Violet (CV) will be converted to Leuco Malachite Green (LMG) and Leuco Crystal Violet (LCV) in the turtle for the whole time, and they would threaten human health seriously by high poison and other harmful substances [1,2]. Meanwhile, Turtle body has a strong stench which is hard to remove out. In this paper, we use water with small molecular mass to breed turtle to reach the goal in detoxification and deodorization of turtle.

## Methods

In the paper, we breed turtle in a freshwater pond with circulating water system. The water circulates a device which contains tourmaline before entering into the freshwater pond. It can produce a large of number water with small molecular mass and then form a negative ion environment, which benefit turtle in detoxification and deodorization.

Water with small molecular mass is provided with large kinetic energy, high moving speed and strong ability of infiltrating and dissolving. Water with small molecular mass has been the best transportation carrier [5].

Many studies have shown that water with small molecular mass has the following advantages:

Strong solution: it can stimulate the decomposition of nutrients and dissolve harmful substances persisting in cell and vessel wall to deodorization; at the same time it also can re-

duce the level of alcohol and improve the ability of the body's detoxification.

High emulsification: it can emulsify and eliminate excess cholesterol and triglycerides in the blood through the metabolism.

Fast metabolism: metabolism is very important for the health of creatures. Only in this way to remove toxins out of body can they enjoy good health.

Excellent cleaning performance: it can remove acidic waste to balance the acid and alkali of the body fluids and improve the ability of detoxification and deodorization to promote a healthy metabolism.

Strong activating ability: it can enter everywhere of the body with large kinetic energy, high moving speed to promote the blood circulation and activate the cell to make body more dynamic.

Tourmaline is a natural biochemical ceramic formed after the eruption, is a valuable mineral resource, whose chemical composition is more complicated. It is a kind of boron-based rock-forming minerals, also containing aluminum, sodium, iron, magnesium, lithium and other elements. the advantage is its abilities to release negative ions and far infrared emission, which is benefit to environment and health.

Tourmaline [3] with polar asymmetry structure has its particular electric characteristics-spontaneous polar electricity, which can adjust the pH of water to weakly alkaline, improve the interfacial activity of water, and enhance the penetration and solvency of water. Tourmaline particles can release negative ions and emit far-infrared light, which causes hydrogen bond fracture among H<sub>2</sub>O and generates excessive negative oxygen ions, thus generating water with small molecular mass and bringing into useful physiological action for turtle.

**Testing and results**

**The test of air anion concentration**

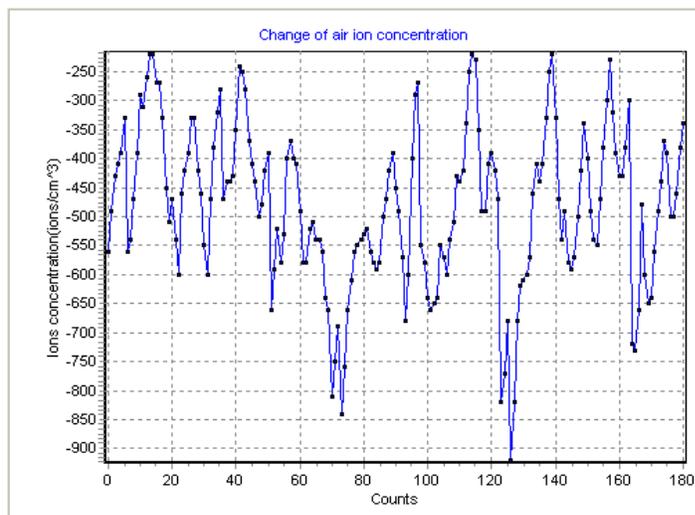
By testing the air anions concentration, we evaluate the anion releasing rate of water. Test conditions and results are as follows:

Testing instrument: DLY-6A-232 type air anion concentration testing instrument;

Testing environment: air temperature is 20°C,the air humidity is 37%;

The analysis of testing results: As showed in Fig.1, the average releasing concentration of anions of water is about -481/cm<sup>3</sup>, and the maximum releasing concentration of anions can obtain -920/cm<sup>3</sup>. This indicates that anion releasing rate of water

with small molecular mass is good and stable, it could benefit turtle health.



**Figure 1.** The anion concentration data graph.

**The test of turtle**

We use the method of molecularly imprinted solid-phase extraction and high-performance liquid chromatography (HPLC) [4] to test. Test result is shown in the table.1:

**Table 1.** The experiment results.

Name	Number	Item	Unit	Result
Turtle	SL140053	Malachite green	µg / kg	Not detected (<0.5)
		Leucomalachite green		Not detected (<0.5)
		Crystal Violet		Not detected (<0.5)
		Leucocrystal Violet		Not detected (<0.5)
		Nitrofurazone		Not detected (<0.5)
		Macroclantin		Not detected (<0.5)
		Furazolidone		Not detected (<0.5)
		Furaltadone		Not detected (<0.5)

From the table, we can see that Leucomalachite Green and other drug residues in turtles have been cleaned outside, we can taste it safely. At the same time, the stinking smell of turtle has disappeared because of trimethylamine and others by oxida-

tion, we can taste it delicious without stinking smell.

## Conclusions

This research is an extending based on the previous work of our team, it proves the potential applications of water with small molecular mass. We use water with small molecular mass to breed turtle and reach the goal in detoxification and deodorization of turtle. With the development of society, we believe that the demand for turtle of detoxification and deodorization will be greatly increased.

In the future work, we will continue to look for new methods of seafood aquaculture. We still take efforts to use new methods, in order to make sure that turtle of detoxification and deodorization has a better performance.

## References

1. Srivastava S, Sinha R, Roy D. Toxicological effects of malachite green [J]. *Aquatic Toxicology*. 2004, 66(3): 319-329.
2. 李宁. 孔雀石绿对健康的影响[J]. *国外医学(卫生学分册)*. 2005, 5: 262-264.
3. Liang J S, Wang L J. Synthesis of Composite Materials and Their Application on Aquaculture Water Treatment [J]. *Advanced Materials Research*. 2010, 96: 165-170.
4. Xie J, Peng T, Chen DD, Zhang QJ, Wang GM et al. Determination of malachite green, crystal violet and their leuco-metabolites in fish by HPLC-VIS detection after immunoaffinity column clean-up [J]. *J Chromatogr B Analyt Technol Biomed Life Sci*. 2013, 15: 123-128.
5. 丁永良. 纳米材料与水产养殖 [J], *中国渔业经济*, 2003(2): 43-44.