Microplastics in shrimp, laundry water and atmosphere

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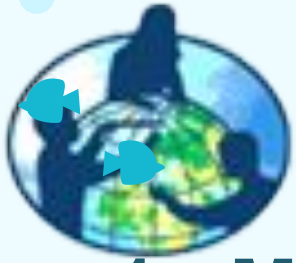

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Motivation

Since plastic was made, traces of plastic have been found in the living environment. but these are visible to the naked eyes, there are still some invisible plastic around us, that is, "microplastics", we do not know where it come from,and what is the environmental impact? And will it harm the creature or not? In the face of all these doubts, we began to study microplastics.

Research question

One

Is there any microplastics in shrimp intestines?

Second

Is there any microplastics in water cycle?

Third

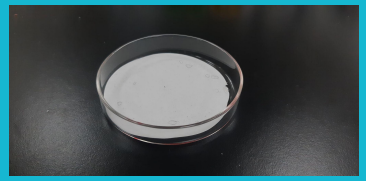
Is there any microplastics in the atmosphere?

(Is there any relationship between the number of microplastics and PM2.5?)

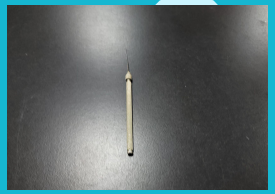
Materials

1.cassette leaf

2.petri dish

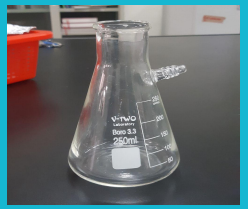


3.feeler pin



4.biological dissection microscope

5. filter flask



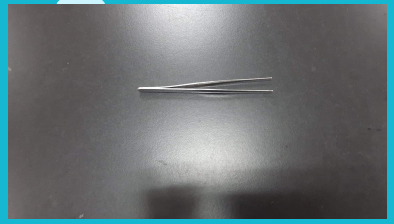
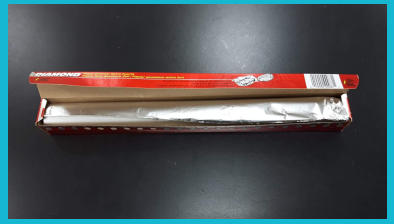
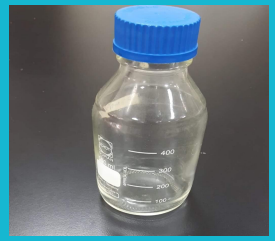
6.water-flow pump

7. porcelain funnel

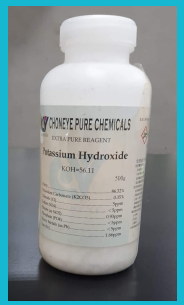
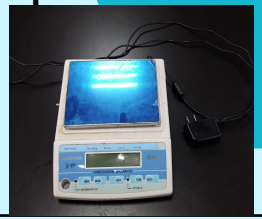
8.dehumidifie

9. detector of air quality

Materials

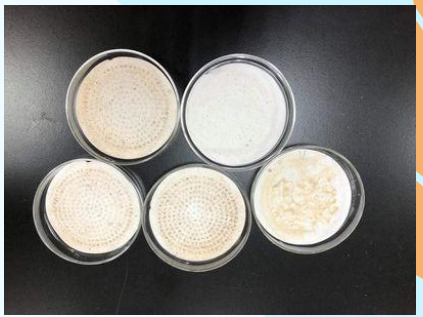
10. pincers 	11. aluminized paper 	12.wild-mouth bottle 
11.elongation 	12.dissecting tray 	13.zippo 
14.gloves 	15.dissecting scissors 	16.dissecting knife 

Materials

17.water pruifier 	18.KOH 	19.NACL 
20.electronic precision scale 	21.dry oven 	22.pH/thermal meter 

How to measure the globe value

Method



shrimp sample preparation(Litopenaeus vannamei*)*

1. The shrimp intestines were cut into small pieces and were taken into a serum bottle.
2. Then we poured 100 ml of 10% potassium hydroxide in the bottle and placed it in a 60-degree oven for more than 24 hours (digestive fluid).
3. When the digestion was completed, we added 400ml saturated NaCl solution and kept for 2 hours.
4. The sample was filtered through a filter paper (20 microns diameter) and dried at 60 °C for 1 hours.
5. Afterwards microplastics were observed under microscope. Examinations of number, color of the microplastics using hot needle test.

Method

water body sample preparation

1.The sample collected from tap water, distilled water and laundry water.

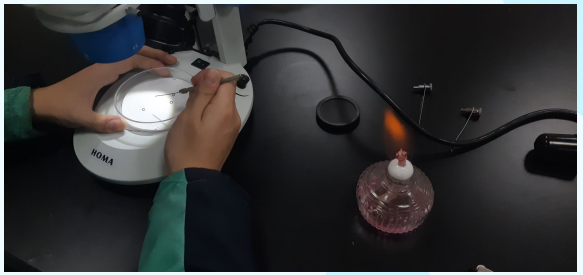
2.The sample was filtered through a filter paper (20 microns diameter) and dried at 60 °C for 1 hour.

3.Afterwards microplastics were observed under microscope. Examinations of number and color of the microplastics using hot needle test.

Method

Thermal touch test under microscope (hot touch method)

1. Move the glass petri dish containing the round filter paper under the microscope,and the round filter paper should be tiled.
2. Test the fibers, particles or fragments below 5 mm on the round filter paper under a microscope.



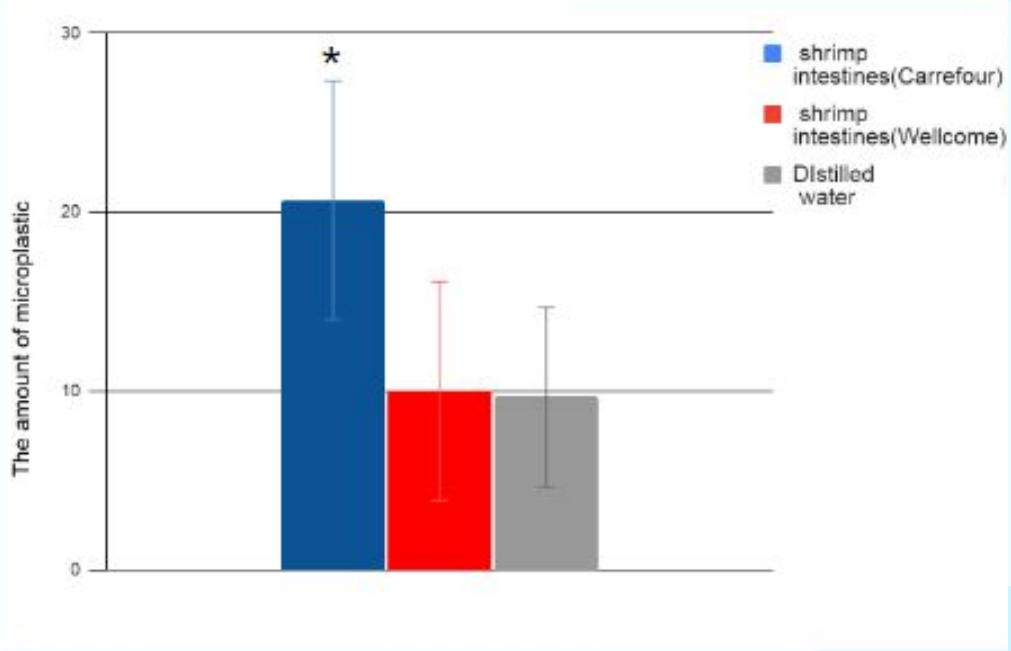
3. By heating the metal probe with an alcohol lamp and touching the fibrous, particulate or fragments on the membrane, the plastic material may melt and distort by the heated metal probe to determine whether it is a microplastics.

Dehumidifier sample preparation

1.The sample collected from dehumidifier
2.The sample was filtered through a filter paper (20 microns diameter) and dried at 60 °C for 1 hour.
3.Afterwards microplastics were observed under microscope. Examinations of number and color of the microplastics using hot needle test.
4.We also make dehumidifier with filter as a control experiment, to make sure that microplastics are not from machine.
5.The number of microplastics, water temperature, water pH, and PM2.5 are also measured.

Results

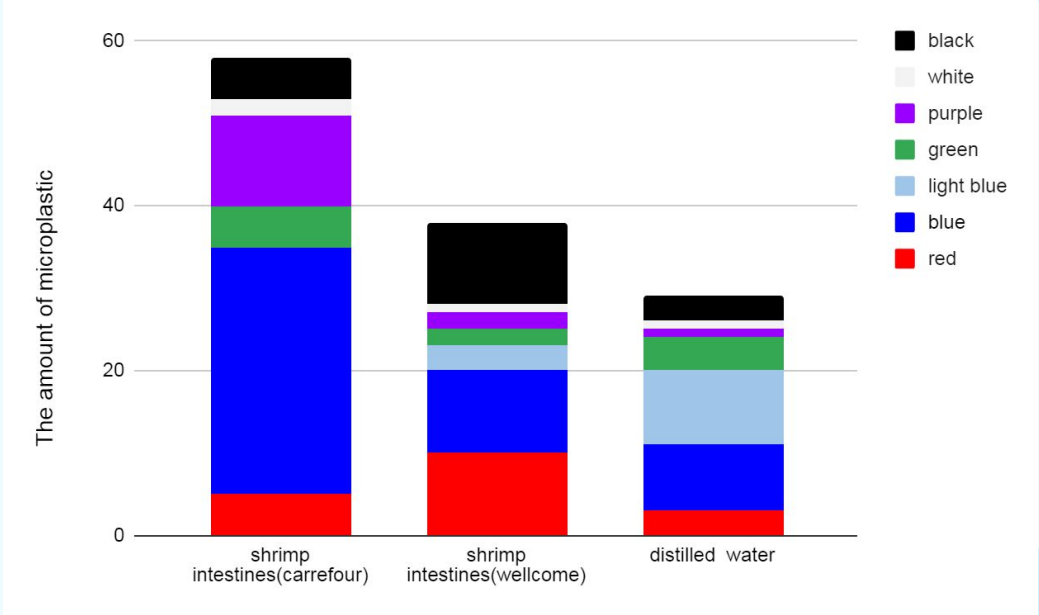
1. The amount of microplastics in Carrefour's shrimp intestines is more than Wellcome's shrimp,distilled water and tap water(Figure1).



(Figure1)

Results

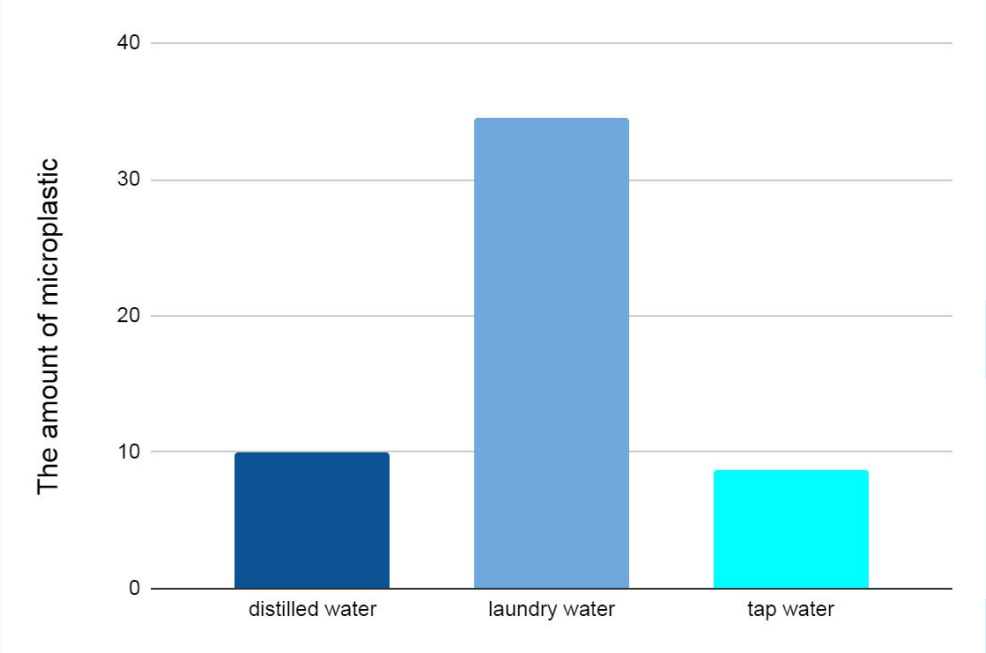
1. Blue,purple and red coloured microplastics were higher in numbers than white,green and black coloured microplastics(Figure2).



(Figure2)

Results

The amount of microplastics in laundry water is more than distilled water and tap water(Figure3).

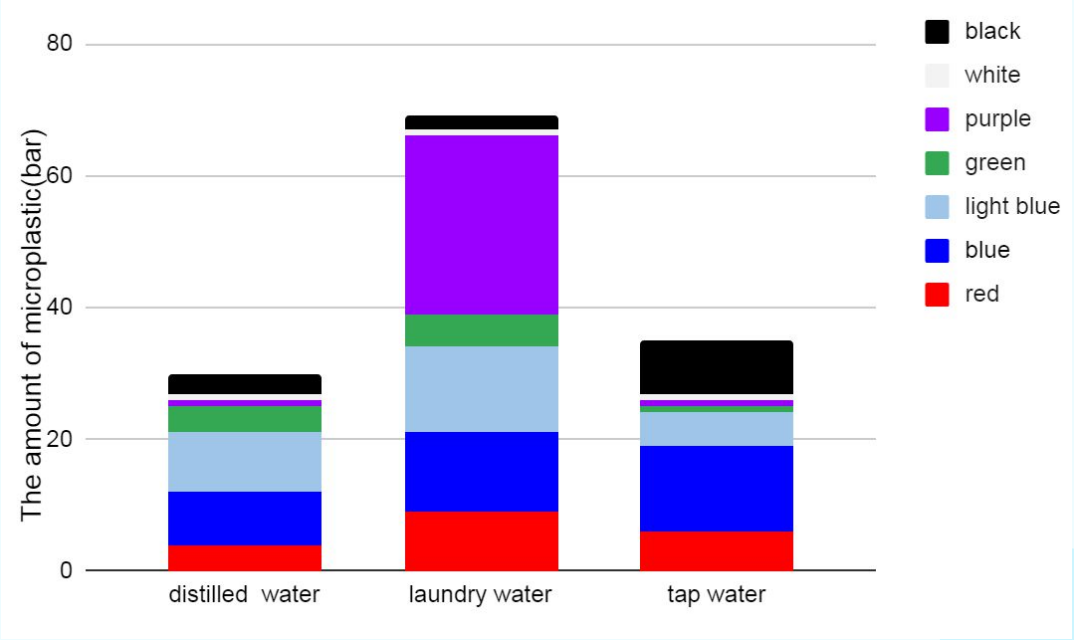


(Figure3)

Results

1. Light blue,blue and purple coloured microplastics were higher in numbers than white,green and black coloured microplastics(Figure4).

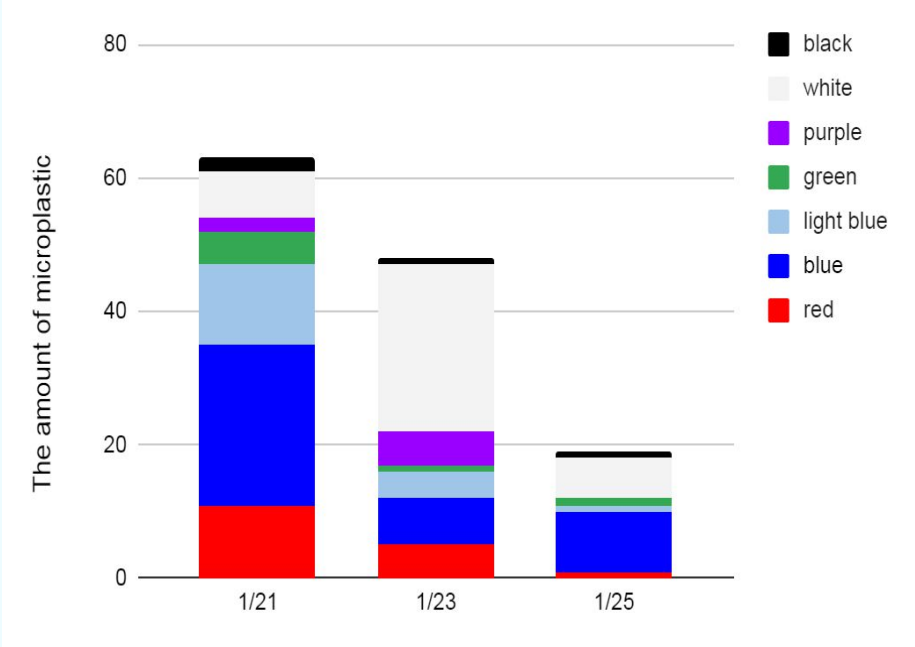
2. From Figure4 and Figure 2, it can be seen that most of the plastic products manufactured by man-made are blue.



(Figure4)

Results

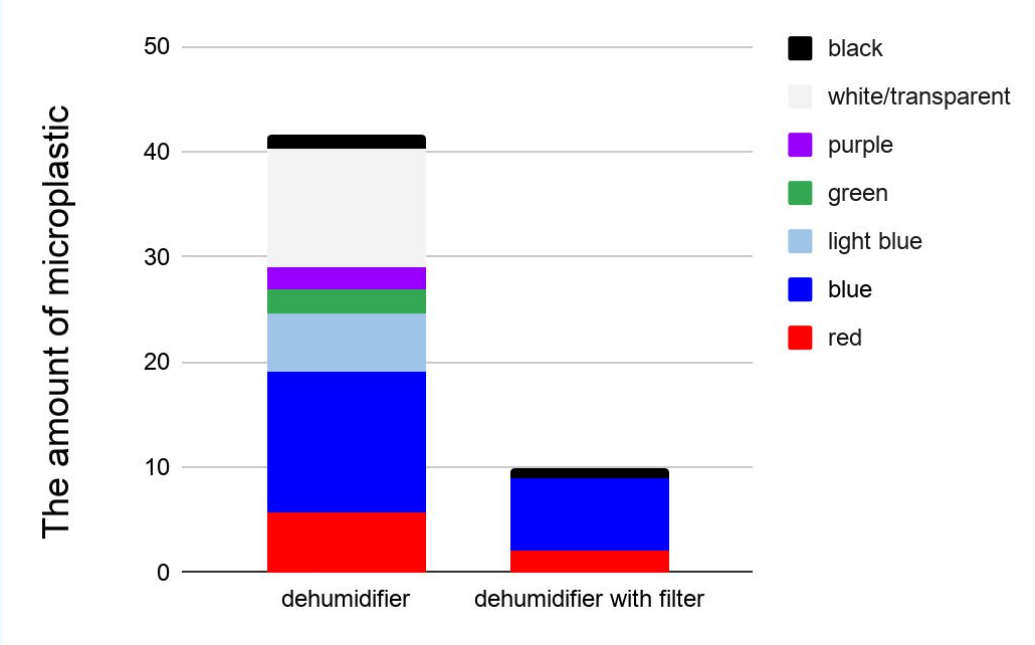
1. The amount of microplastics detected on different days are different. Among different coloured microplastics there are more blue,red,and white coloured(Figure5).
2. From Figure 5 and Figure 2, it can be seen that most of the plastic products manufactured by man-made are blue.



(Figure5)

Results

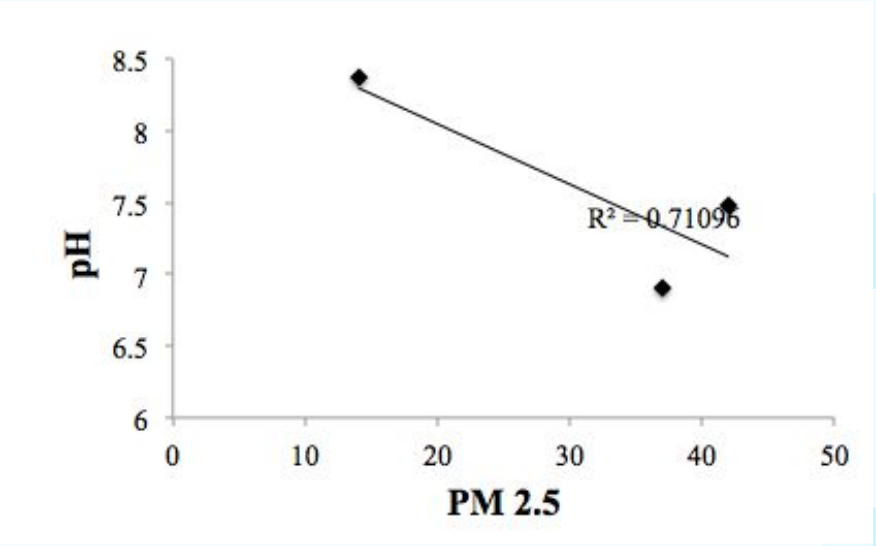
The dehumidifier with filter receive less amount of microplastics in the water (Figure 6).It can be said that the amount of microplastics in the dehumidifier has little impact.



(Figure6)

Results

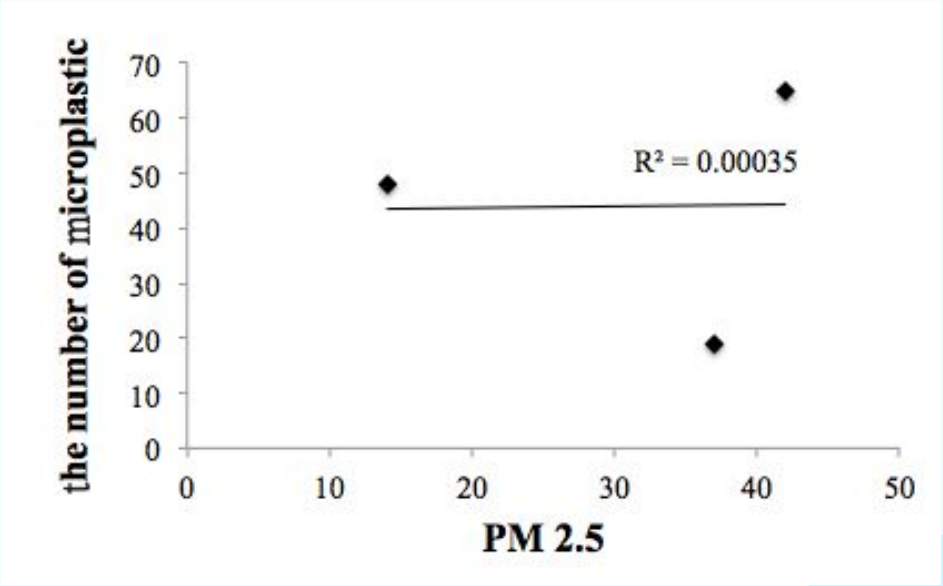
1.The figure above shows that PM2.5 has a correlation with pH values (Figure7).



(Figure7)

Results

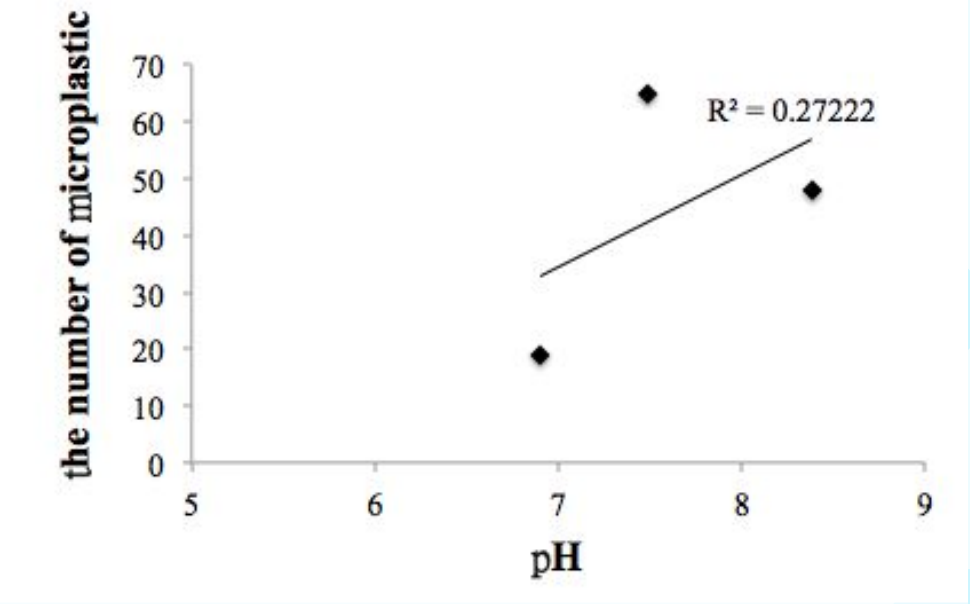
1.The figure above shows that pm2.5 has no correlation with microplastics (Figure8).



(Figure8)

Results

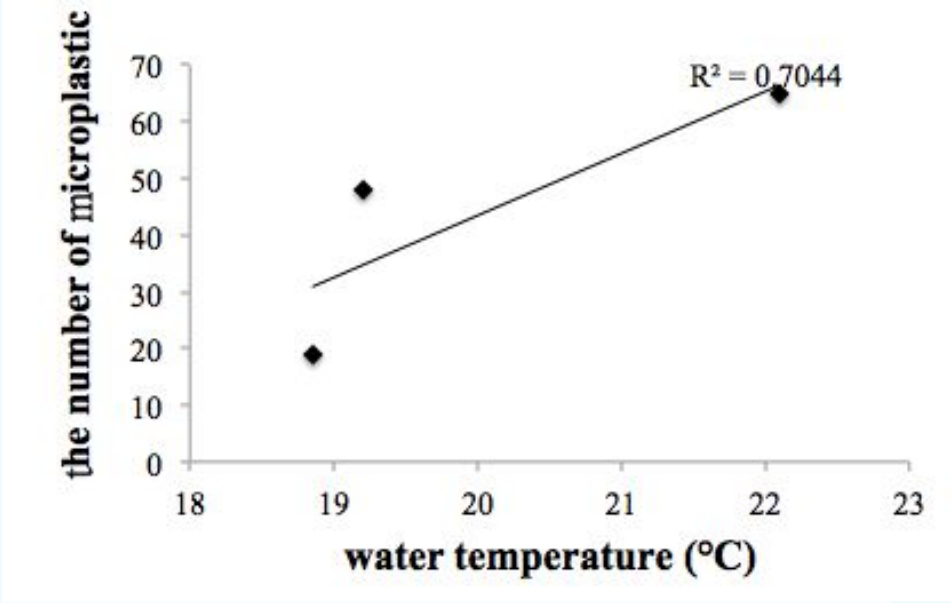
1.There are no correlation between pH value and the amount of microplastics (Figure9).



(Figure9)

Results

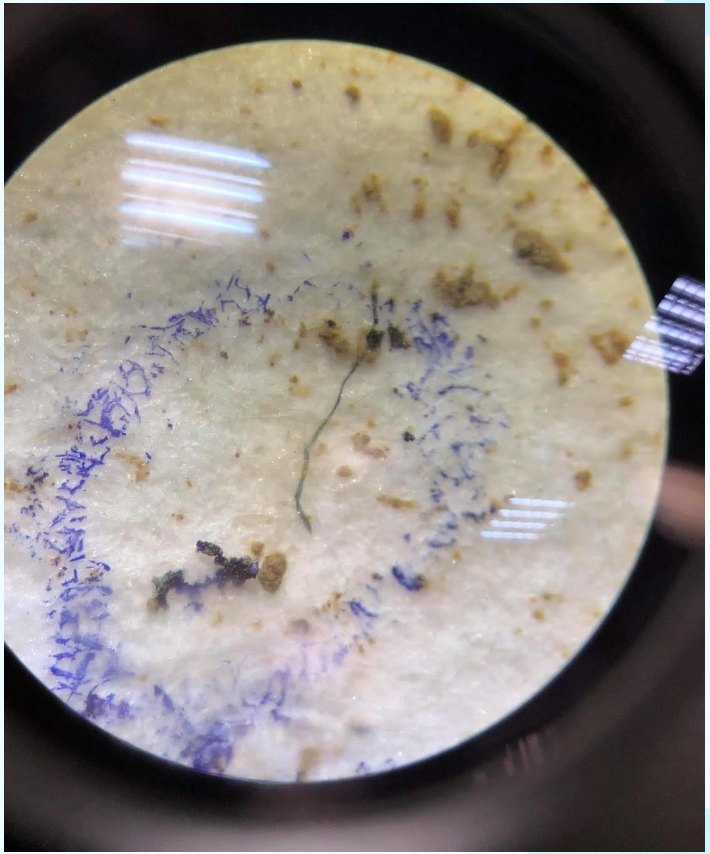
1.**According to the figure, the amount of microplastics is slightly related to the water temperature(Figure10).**



(Figure10)

The microplastics in shrimp

From:shrimp
Size:0.1~0.5cm



The microplastics in dehumidifiers

From:dehumidifier
Size:0.1~0.5cm

Conclusion

1.There are more blue, red microplastics in white shrimp than black, white and green.

2.We found more microplastics in laundry water than tap water and distilled water.

3.There are microplastics in the atmosphere and water pH and PM2.5 in the atmosphere are related.