**Introduction :**

(Diapo) The gerris is an insectivore insect of the hemipteran family which has the ability to move over water at a speed of 1 metre per second. They are more often called "water bugs" or "surface skaters" and live mainly in ponds, rivers or pools. They feed exclusively on insects that fall into the water and usually die between 6 and 8 months (the male dies after mating).

They have 6 legs, two on the head and two legs on either side of the body forming an X. They have a brown body and a conical head with two antennae and vary in size from 10 to 18 mm. Over time, we notice that these gerris disappear due to several factors, especially pollution.

(Diapo)

**Why might water pollution lead to the disappearance of gerris?**

1. **First of all, how do these insects walk on water?**

(Diapo) It is known that the microscopic hairs on the legs of the gerris secrete a hydrophobic substance, strongly resembling oil, which they produce themselves. Moreover, with their mass not exceeding one gram (90 mg maximum) they can use the physical process: surface tension.

(Diapo) Surface tension is a physical property that keeps two free surfaces in equilibrium. It is also called surface tension or surface energy. It is thanks to this surface tension that water drops on a tree leaf do not spread.

It takes place at the molecular level and at the level of any surface between two media, in our case water and air.

Example: if a drop of water is placed on a surface with low surface tension such as plastic or a leaf, the drop will tend to stay as it is and will not spread. On the contrary, if a drop of water is placed on a surface with a high surface tension such as glass, the drop will spread on the surface. In the case of an interface between liquid and air, the air will exert a force on the liquid as we can see in a test tube filled with water.

(Diapo) The surface tension opposes the weight of the different objects. In the case of gerris, being very light, it can be placed on the surface of the water without penetrating it. But if the mass of an object is too big, the surface tension is not strong enough and the surface of the liquid is pierced. In addition, the surface tension of the water pushes hydrophobic substances back to its surface, like the legs of a gerris.

It is therefore this surface tension and the help of these hydrophobic legs that the gerris can walk on water.

When we observe gerris on water, it proves that this water is not polluted but if the gerris is placed on polluted water, it sinks and unfortunately dies. So we talk about a bio-indicator.

**II. What could lead to pond water pollution?**

(Diapo)

Water pollution is a degradation of water in relation to its natural qualities, it disturbs the living conditions of animals and insects.

It could reach other scales of the ecosystem to the point of leading to the disappearance of several species.

In our case, two types of pollution mainly affect gerris :

First of all:

- Thermal pollution: this corresponds to the heating or cooling of the temperature of an environment in relation to the usual temperature. The causes of thermal pollution are mainly the discharge of water from factories and the discharge of waste water.

- And above all chemical pollution: it corresponds to the discharge of polluting or even very polluting and dangerous substances for mankind! Industries and factories reject hydrocarbons, radioactive waste, acids and metals, and domestic workers reject plastic waste, cleaning products and their urine/pee.

All these pollutants then lead to a modification of the surface tension of the water and thus a possible disappearance of the insects living on its surface.

(Diapo) ***Conclusion*** : If the surface tension of the water is reduced by adding a pollutant, the gerris is no longer carried and breaks the surface of the water. This is why the gerris normally walking on water is considered as a bio-indicator of water not polluted by a surfactant.

Water pollution affects the buoyancy of gerris because it modifies and lowers the surface tension of the water medium, making gerris unable to float and which could in the future lead to their disappearance.

So please, do not pollute the water ! Gerris are still cool

Thank you every body for your attention