Study of the Use of Cucurbita moschata's (Green Pumpkin) and Malus domestica's (Green Apple) Waste as a Natural Filter Capable of Removing Toxic Heavy Metals from Water

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The world faces pollution in many of its resources, most commonly in water, ground, and air. Water pollution is a form of biodegradation when pollutants are discharged into water bodies. One of the most dangerous ways of pollution is the presence of heavy metals in water. This research aims to find a way of eliminating these pollutants from water using a sustainable, environmental friendly and cost effective process. The research consisted of preparing 18 solutions polluted with copper and nickel at different concentrations to simulate water pollution by presence of heavy metals. Green apples and pumpkins were used (fresh and dehydrated) and added to the solutions to absorb the metals. Once the absorption was complete, six filters were prepared with recycled water bottles and empty filter cartridges to filter the solutions. The solutions were heated for 30 minutes at 90ºC and later left to cool down. Once this was complete, the solutions were digested and underwent inductively coupled plasma optical emission spectrometry to detect traces of heavy metals. The results showed that dried and fresh pumpkin and dried and fresh apple were able to lower the levels of Cu and Ni in the solutions. The dried pumpkin proved to be more effective lowering Cu levels while the green apple was more effective lowering Ni levels. Once all results were analyzed it was determined that all fruits were able to reduce the levels of heavy metal, however, the most effective in doing so during the filtration process was the fresh pumpkin.

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