Acacia xanthophloea Characterization and Preservation Techniques of Sapwood (Plant Xylem) as a Low Cost Membrane Filtration Device for Arid and Semi-Arid Areas in Kenya

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This project explores the water purification properties of the sapwood of Acacia Xanthophloea to provide safe and clean water to arid and semi arid areas in Kenya that is cheaper and easily accessible. Samples of the species were collected and stored in buckets of water so as to maintain the freshness of their xylem. Several tests were then carried out on the branches of the species after building a basic xylem filter, using the sapwood of the species, some plastic tubing and hose clamps. Firstly, a test was carried out to test the best direction of the flow and the rejection rate of water so as to obtain the best results of purification. Secondly, the rejection rate was measured using different lengths of sapwood so as to determine the best length of the sapwood for purification and the effect that it had on the rejection rate of the sapwood. Thirdly, because we want to implement this method of purification in arid and semi arid areas where people would collect water from a river or lake, it was important for us to test a sample of water from a naturally contaminated source so as to determine whether the sapwood would be useful to purify water from such sources. In addition to that a test was carried out to observe for how long a piece of sapwood can purify impure water until it loses its permeability. Lastly an experiment was carried out to determine how the sapwood can be preserved for longer so as to increase its productivity as a water purifier. In conclusion we realized that the sapwood from Acacia Xanthophloea can be a cheaper way of purifying water in a way that it is perfectly suitable to be used in semi arid and arid areas for the benefit of the people considering its availability in those areas.

Awards Won:
Third Award of $1,000