

ISRAEL

WATER FERNS USED TO DETOXIFY WATER

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[Text]

Rehovot - A very promising process for the detoxification of sewage is in an advanced stage of development at the Hebrew University's Faculty of Agriculture here. Based on the cultivation of a water fern, accomodating a blue green alga, it has been found capable of extracting heavy metals from an effluent.

A team of botanists, headed by Dr. Elisha Tel-Or, took its departure from a study of azolla, a water fern found mainly in the Far East. The investigators believed that this plant, grown in marginal quality water, could provide significant quantities of biomass and livestock feed.

However, their attention soon came to focus on the ability of azolla plants to extract significant quantities of heavy metal, such as copper, zinc, nickel, chromium, cadmium and uranium, from the sewage. Those materials, common in many industrial and municipal sewage systems, can be highly toxic to man, animal life and the flora. However, purifying the effluent of these pollutants often is prohibitively expensive.

The Hebrew University team has now developed a practical process, based on the introduction of azolla plants to sewage treatment ponds. The symbiotic blue green algae, capable of extracting nitrogen from the air, provide the nutrient on which azolla will flourish; the traditional alternative - application of commercial fertilizer - would make the system grossly uneconomical.

Provided with an ample supply of nutrient, azolla plants flourish in the pond. The fern acts as a magnet for heavy metals, taking their ions out of solution and leaving the water much purer. Used in conjunction with other processes, aimed at the removal of toxic microorganisms, this produces

water clean enough for a broad spectrum of possible uses, including some agricultural applications.

After large quantities of metal have come to be concentrated in the azolla, the ferns are also killed by those toxic substances. Harvested and dried, they can be burned to recover various costly metals, such as silver or uranium, for reuse.

A related process, also developed at the Hebrew University, passes the effluent of certain industrial installations — photographic laboratories, metal plating lines and so forth — through dried and powdered azolla leaves, which act as a highly selective filter: they extract metal ions from the flow, usually improving it to the point where it can be allowed to enter municipal sewage systems.

Yissum Research Development Company, the firm in charge of commercializing research carried out at the Hebrew University, holds two patents on the use of azolla for sewage treatment. The company is anxious to cooperate with qualified firms, in Israel and abroad, toward the commercial application of these processes.

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