WASTEWATER AND BIOLOGICAL FANGES TREATMENT: REDUCTION OF PHOSPHORUS WITH CHEMICAL AND BIOLOGICAL PRODUCTS.

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INTRODUCTION

Wastewater treatment is both an important and difficult topic nowadays due to the negative effects it can cause on the environment and people's health. One of these problems is he presenc of organic nutrients such as nitrates, nitrites and phosphates.
In our project we have studied the possibility of combining some of the already used chemical coagulants with natural and biodegradable coagulants to remove phosphorus in wastewater by alternative cogualation-flocculation processes.

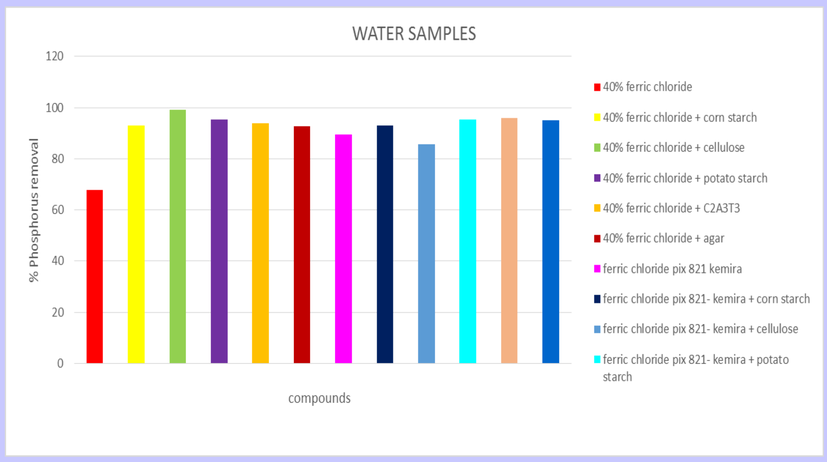
RESULTS AND CONCLUSIONS

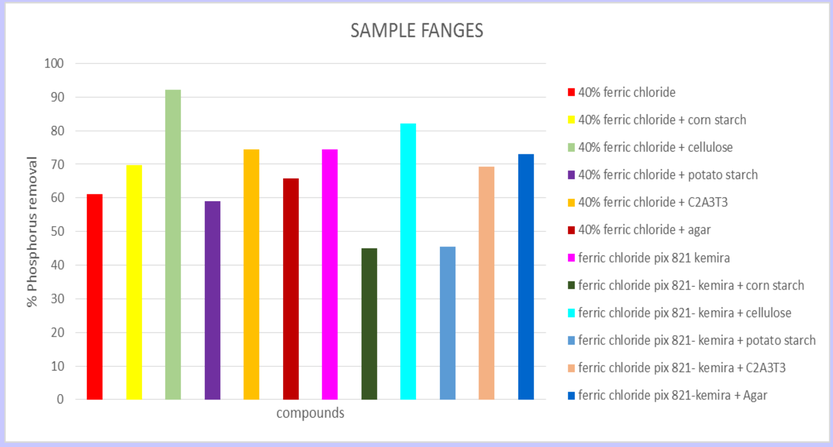
WATER RESULTS

COMPOUNDS	OPTIMAL DOSE µL	% PH DECREASE	% TURBIDITY VARIATION	% DISPOSAL OF PHOSPHORUS
40% FERRIC CHLORIDE	0.2	18.19	96.08	67.94
40% FERRIC CHLORIDE + CORN STARCH	0.15 + 25	1.78	-18.70	92.96
40% FERRIC CHLORIDE + CELLULOSE	0.15 + 0.1	1.51	18.11	99.07
40% FERRIC CHLORIDE + POTATO STARCH	0.15 + 0.05	2.94	18.26	95.48
40% FERRIC CHLORIDE + C2A3T3	0.15 + 0.5	-1.82	-92.7	93.82
40% FERRIC CHLORIDE + AGAR	0.15 + 0.025	0	-10.43	92.76
FERRIC CHLORIDE PIX 821 KEMIRA	0.2	13.62	74.8	89.51
FERRIC CHLORIDE PIX 821- KEMIRA + CORN STARCH	0.2 + 0.075	1.66	-51.75	93.09
FERRIC CHLORIDE PIX 821- KEMIRA + CELLULOSE	0.1 + 0.1	2.89	10.36	85.57
FERRIC CHLORIDE PIX 821- KEMIRA + POTATO STARCH	0.15 + 0.05	0	-1.40	95.33
FERRIC CHLORIDE PIX 821- KEMIRA + C2A3T3	0.15 + 1	1.31	-30.84	95.89
FERRIC CHLORIDE PIX 821-KEMIRA + AGAR	0.15 + 1	-1.14	14.70	94.94

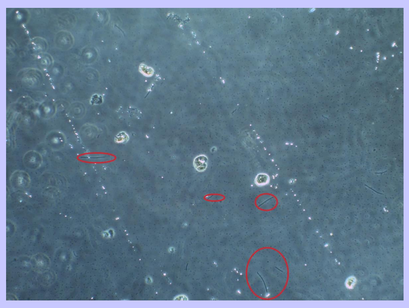
SLUDGE RESULTS

COMPOUNDS	OPTIMAL DOSE µL	% PH DECREASE	% TURBIDITY VARIATION	% DISPOSAL OF PHOSPHORUS
40% FERRIC CHLORIDE	0.075	1.40	5.35	61.08
40% FERRIC CHLORIDE + CORN STARCH	0.025 + 0.075	3.43	8.47	69.87
40% FERRIC CHLORIDE + CELLULOSE	0.025 + 0.075	1.98	10.84	92.25
40% FERRIC CHLORIDE + POTATO STARCH	0.025 + 0.5	0.28	5.26	58.97
40% FERRIC CHLORIDE + C2A3T3	0.025 + 0.075	-0.84	22.84	74.45
40% FERRIC CHLORIDE + AGAR	0.025 + 0.025	1.32	-2.48	65.87
FERRIC CHLORIDE PIX 821 KEMIRA	0.05	6.87	34.65	74.43
FERRIC CHLORIDE PIX 821- KEMIRA + CORN STARCH	0.025 + 0.025	1.31	9.65	45
FERRIC CHLORIDE PIX 821- KEMIRA + CELLULOSE	0.025 + 0.025	-1.01	32.45	82.107
FERRIC CHLORIDE PIX 821- KEMIRA + POTATO STARCH	0.025 + 0.025	-1.38	22.47	45.56
FERRIC CHLORIDE PIX 821- KEMIRA + C2A3T3	0.025 + 0.05	0.13	6.37	69.22
FERRIC CHLORIDE PIX 821-KEMIRA + AGAR	0.025 + 0.1	5.30	38.31	72.91

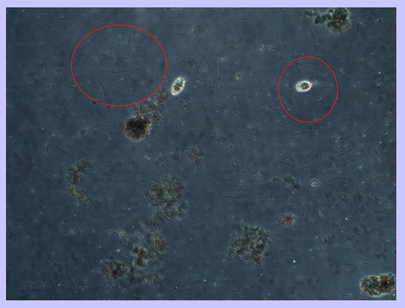




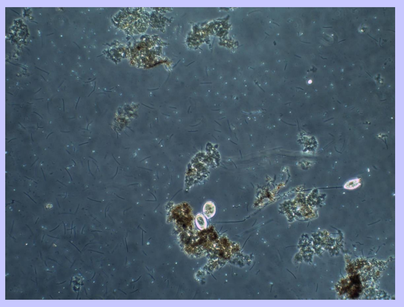
Graphics of the percentage of disposal of phosphorus by chemical coagulants conjugated with biological coagulants in water and sludge



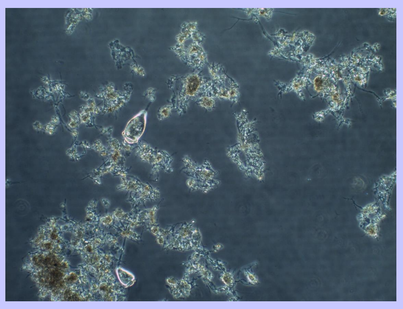
Waters, White. Ferric chloride (0.2µl). Unknown mobile thick filament



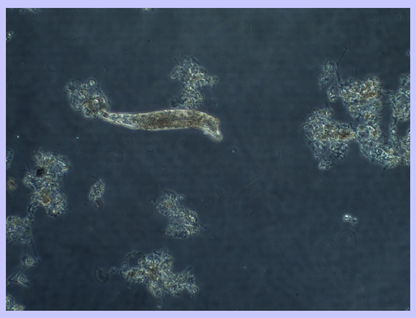
Waters, Ferric chloride pix 821- kemira + corn starch (0.2µl + 0.075µl). Unknown mobile thick filament and *Opercularia sp.*



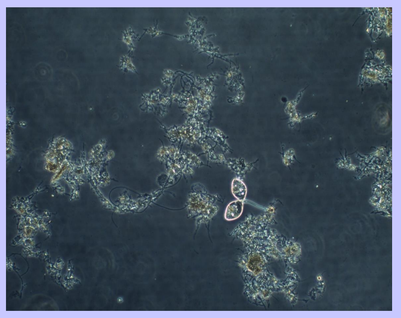
Waters, Ferric chloride + potato starch (0.15µl + 0.05µl). Unknown mobile thick filament and *Opercularia sp*.



Sludge, White. Ferric chloride (0.075µl). *Opercularia sp.*



Sludge, Ferric Chloride + Corn Starch (0.025 µl + 0.075µl). *Rotíffero.*



Sludge, Ferric chloride pix 821-kemira + agar (0.025µl + 0.1µl).*Opercularia sp*.

- Among the results, we can add roughly that the chemical caogulants already used work better in conjunction with biologic coagulants not used until now, such as agar, different types of cellulose and starches. The use of these components are also beneficial for industrial companies which work with these kind of wastes because they are cheaper and easier to obtain.
- Biological coagulants are more effective for reducing the percentage of phosphorus in water, so there are many that have not yet been studied and that could be more beneficial for the environment and for the performance of companies, so it would be interesting that research lines continue to open in order to deepen this issue.