FENASAN
XXIII Feira Nacional de Saneamento e Meio Ambiente

XXIII Encontro Técnico
AESABESP
Congresso Nacional de Saneamento e Meio Ambiente

Avaliação da remoção de contaminantes emergentes pelas ETA convencionais do estado de São Paulo: uma nova abordagem relacionada à avaliação de risco

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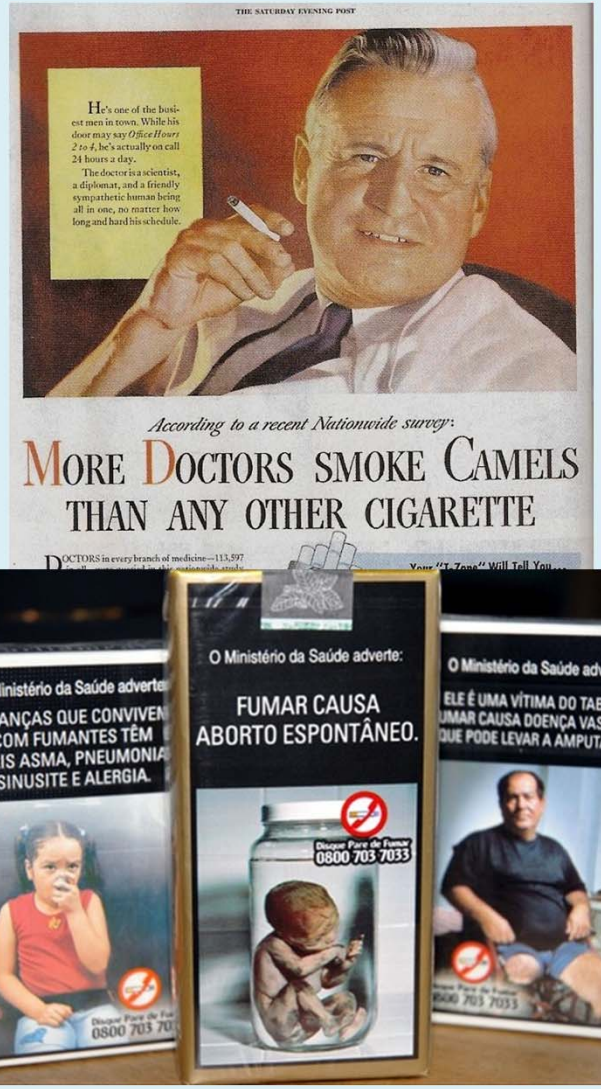
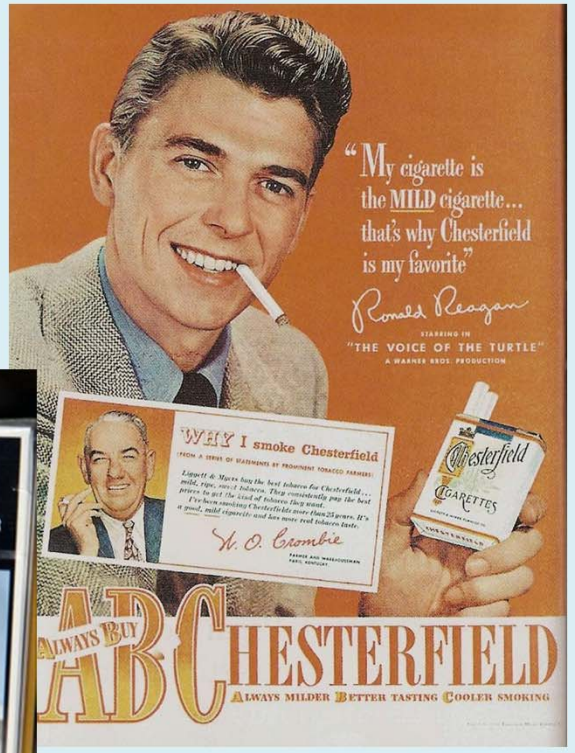
08 de agosto de 2012

Evolução do conhecimento

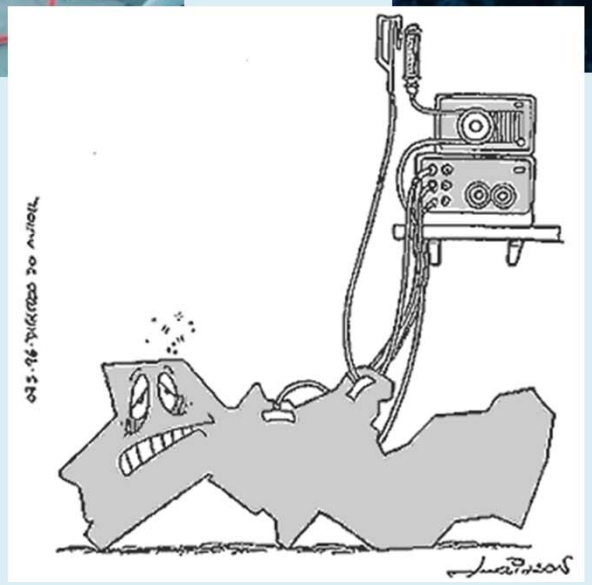




Pesticida DDT

Caso de Caruaru - PE

Cianobactérias



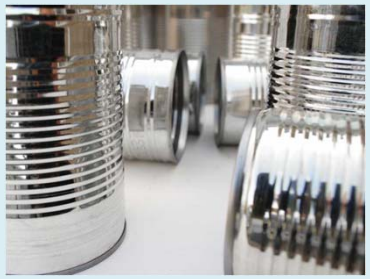
51 óbitos de pacientes

Bisfenol A


NEW MATERIAL
BPA Free
Does Not Contain Bisphenol-A or Phthalates


BPA


Playtex
Born free
DANO




POPEYE THE SAILOR:
A LIFETIME OF BPA-LINED SPINACH CANS
I WAS WHAT I WAS BUT NO LONGER, BECAUSE OF A BISPHENOL-A LINED CAN.
TOOT! TOOT!
NEGATIVE EFFECTS ON MEMORY, LEARNING AND MOOD
BPA LINING
SPINACH
ADVERSE EFFECTS ON THYROID FUNCTION
HEART DISEASE
FOREARM SHRINKAGE
INCREASED RISK FOR BREAST CANCER
KIDNEY PROBLEMS (NOT FROM BPA BUT FROM E. COLI CONTAMINATED SPINACH. POPEYE CANNOT CATCH A BREAK!)
KNOBBY ELBOWS AND KNEES
DIABETES
SEXUAL DYSFUNCTION
PROSTATE PROBLEMS
GRADE A-F MEAT FROM OVER 100 COWS (OH WAIT, DISREGARD THAT ONE. THAT'S FROM AN OLD GROUND BEEF CARTOON. WORTH REVISITING THOUGH. LINK BELOW.)
"POPEYE--A LIFETIME OF BPA EXPOSURE"
(C) JOE MOHR
JOEMOHRTOONS.COM

IP1

IP2

Contaminantes Emergentes

São compostos que têm sido detectados nos diferentes compartimentos ambientais, tanto os de origem antrópica como aqueles de ocorrência natural, que podem apresentar algum risco ao ecossistema e a saúde humana e que não estão incluídos nos programas de monitoramento de rotina, ou seja, ainda não são legislados.

Exemplos:

Fármacos;
Hormônios;
Compostos perfluorados;
Éteres de difenila polibromados (PBDE);
Bifenil policlorado (PCB),
Pesticidas;
Alquilfenóis; e etc.

Petrovic, M.; Barceló, D.; *Anal. Bioanal. Chem.*; **2006**, *385*, 422

Slide 6

IP1 These are often generally referred to as “contaminants of emerging concern” (CECs) because the risk to human health and the environment associated with their presence, frequency of occurrence, or source may not be known.
Igor Pescara; 06/08/2012

IP2

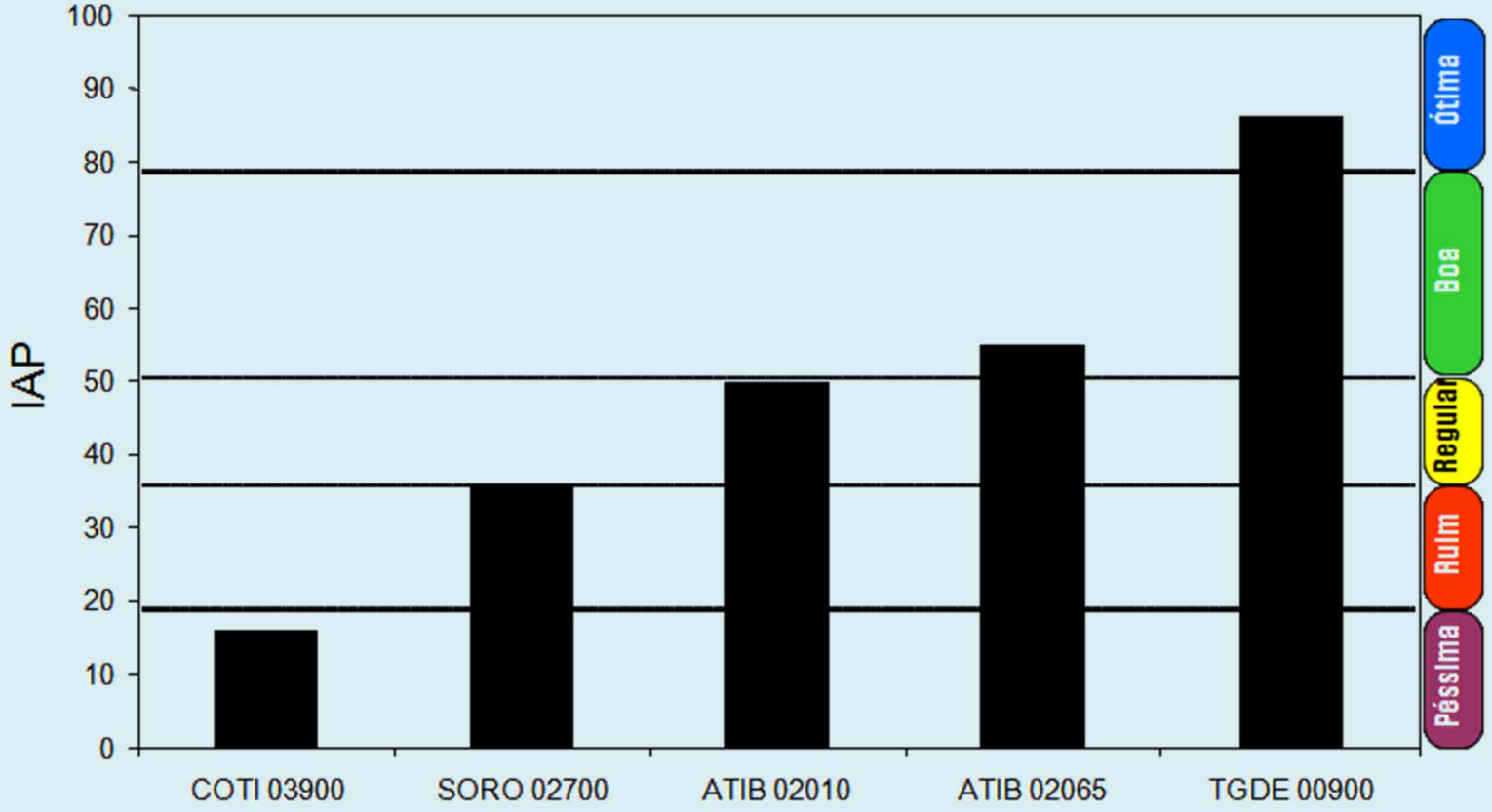
Emerging contaminants" can be broadly defined as any synthetic or naturally occurring chemical or any microorganism that is not commonly monitored in the environment but has the potential to enter the environment and cause known or suspected adverse ecological and(or) human health effects. In some cases, release of emerging chemical or microbial contaminants to the environment has likely occurred for a long time, but may not have been recognized until new detection methods were developed. In other cases, synthesis of new chemicals or changes in use and disposal of existing chemicals can create new sources of emerging contaminants.

USGS
Igor Pescara; 08/08/2012

Objetivo

Investigar 16 contaminantes emergentes em água bruta e de abastecimento público proveniente de diferentes ETA, as quais empregam tratamentos convencionais e que lançam mão de diferentes mananciais do Estado de São Paulo.

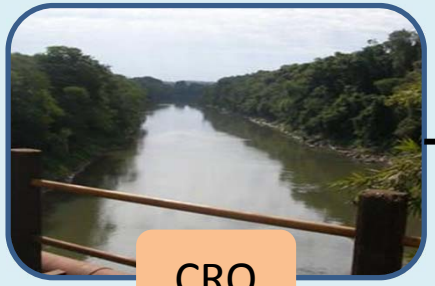
Índice de Qualidade IAP



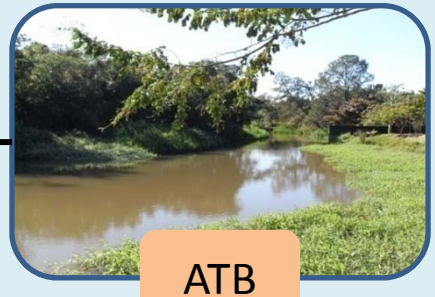
CETESB **(2007)** *Relatório de qualidade das águas interiores do Estado de São Paulo*

Pontos Amostrais

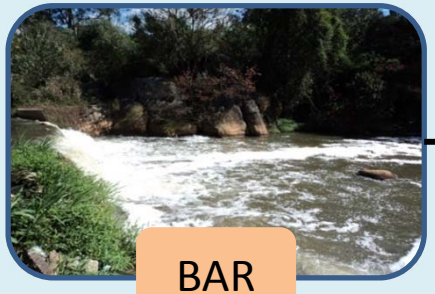
GRU



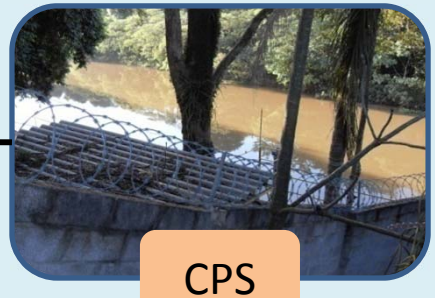
CRQ



ATB



BAR

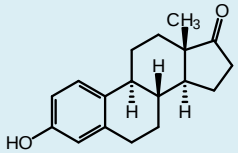


CPS

BAR

Compostos Alvo

Hormônios Endógenos



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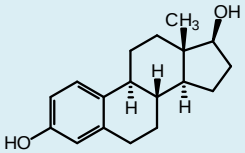

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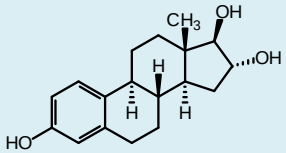

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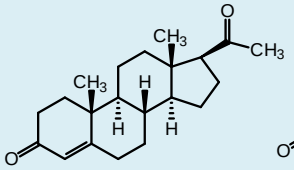
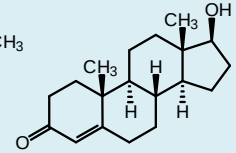
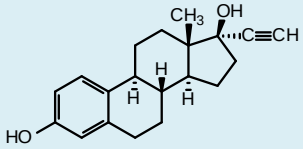


PROG

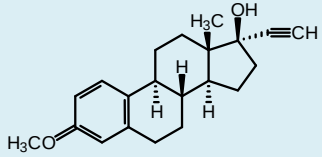


TTN

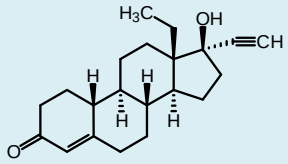
Hormônios Sintéticos



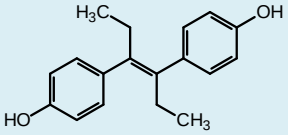
EE2



MEE

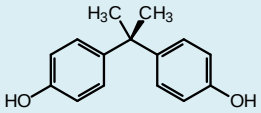


NGT

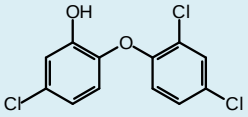


DES

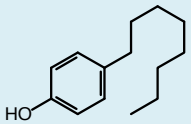
Xenoestrogênios



BPA



TCS



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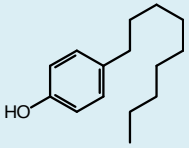

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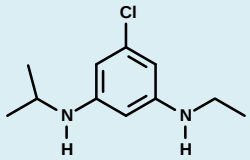
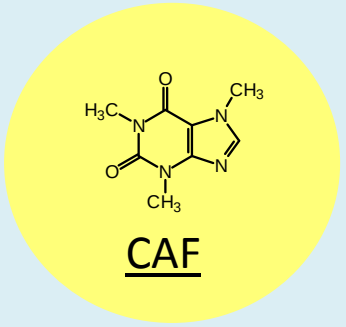


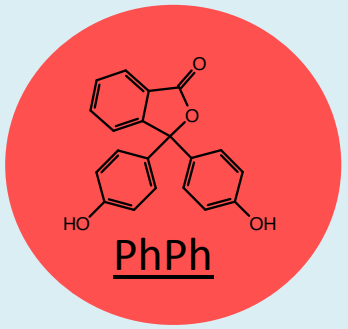
ATZ

Traçador Químico



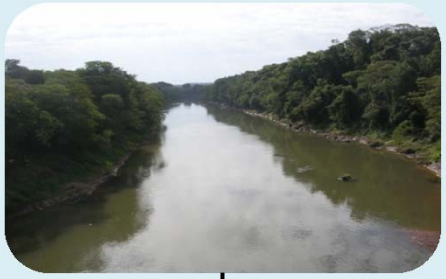
CAF

?



PhPh

Procedimento Experimental



1,0 Litro

4,0 Litros

Filtração em membrana de acetato de celulose 0,45 µm

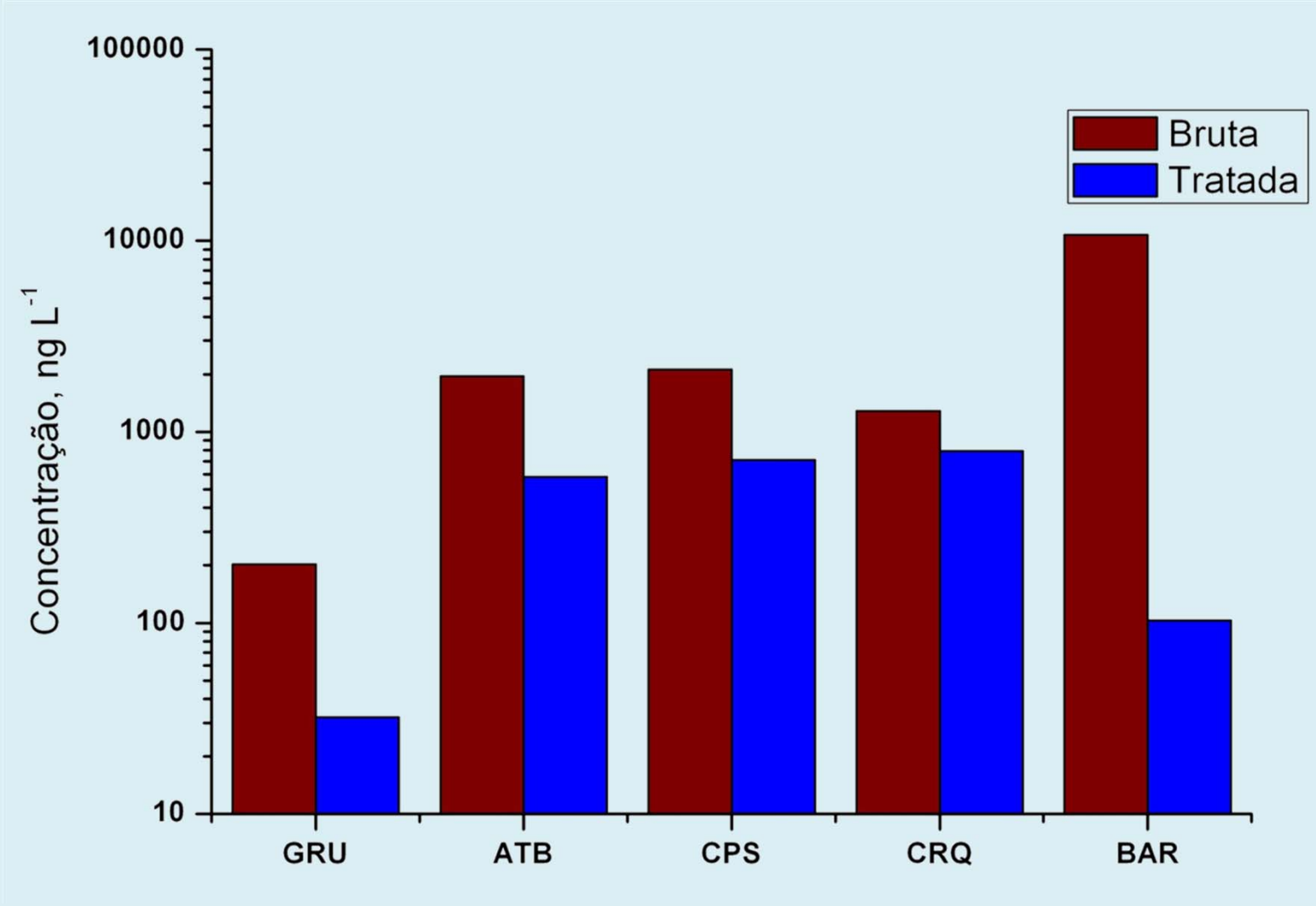
Condicionado com metanol e água desionizada

Suspenso em 400 µL Água/metanol (70:30, v/v)

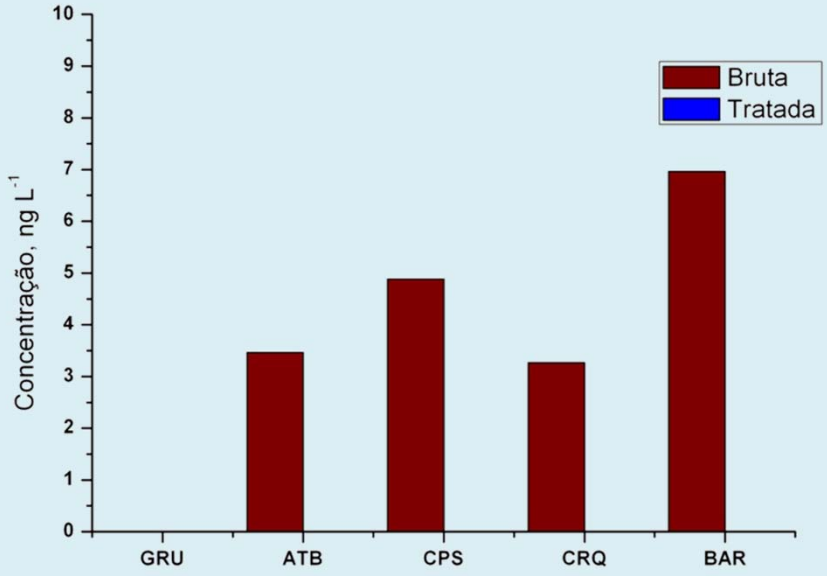
Agilent LC-MS/MS Electrospray ionization

Yeast Estrogen Screen (YES)

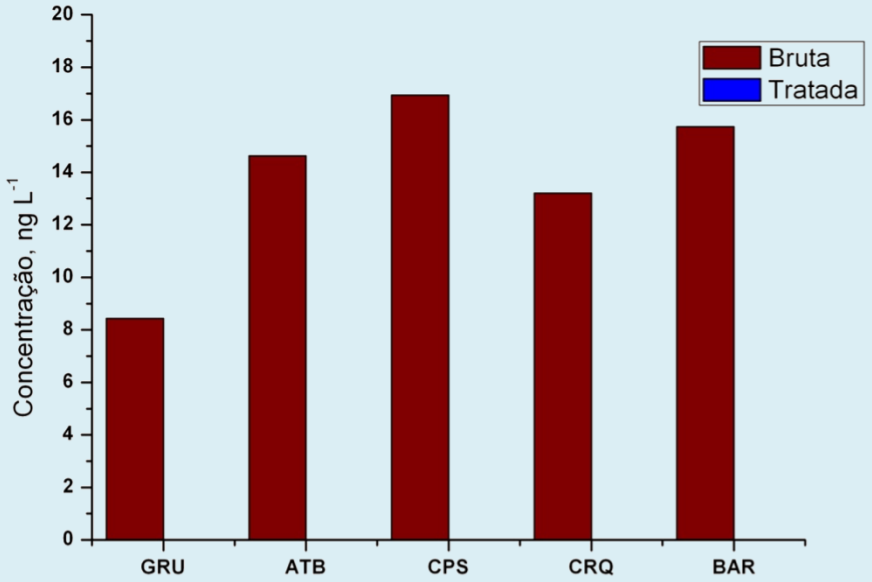
Resultados - Cafeína



Resultados – Estrona e Bisfenol A

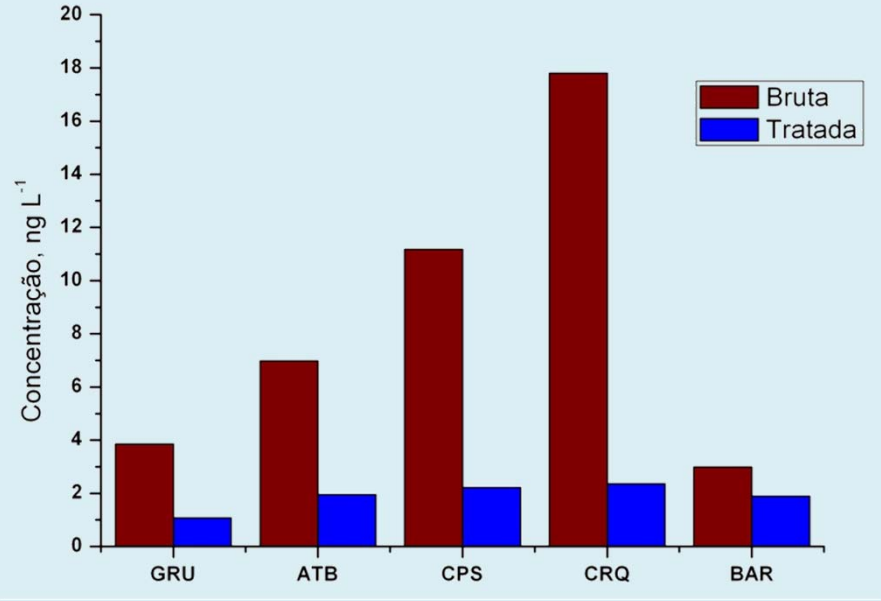


Estrona

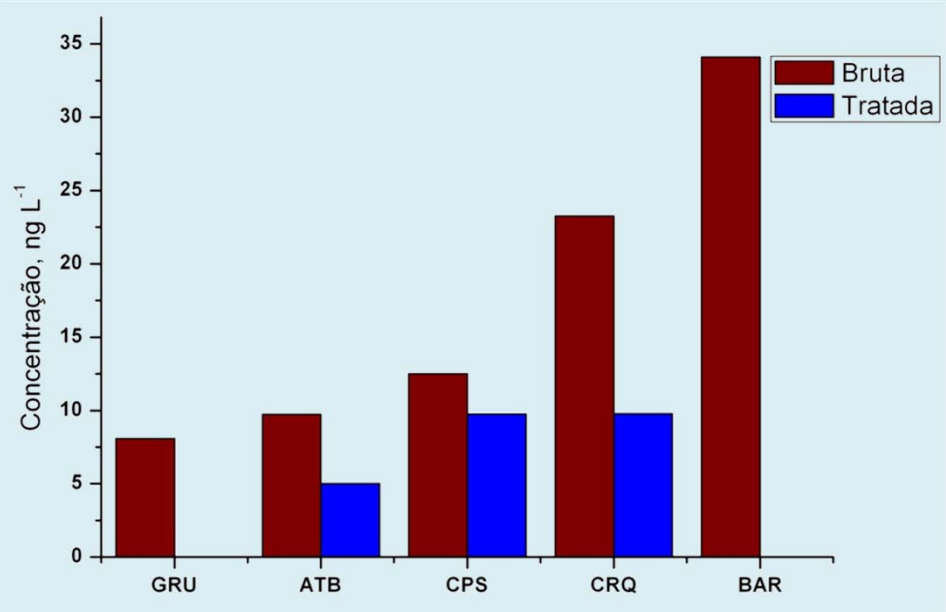


Bisfenol A

Resultados – Atrazina e Triclosan

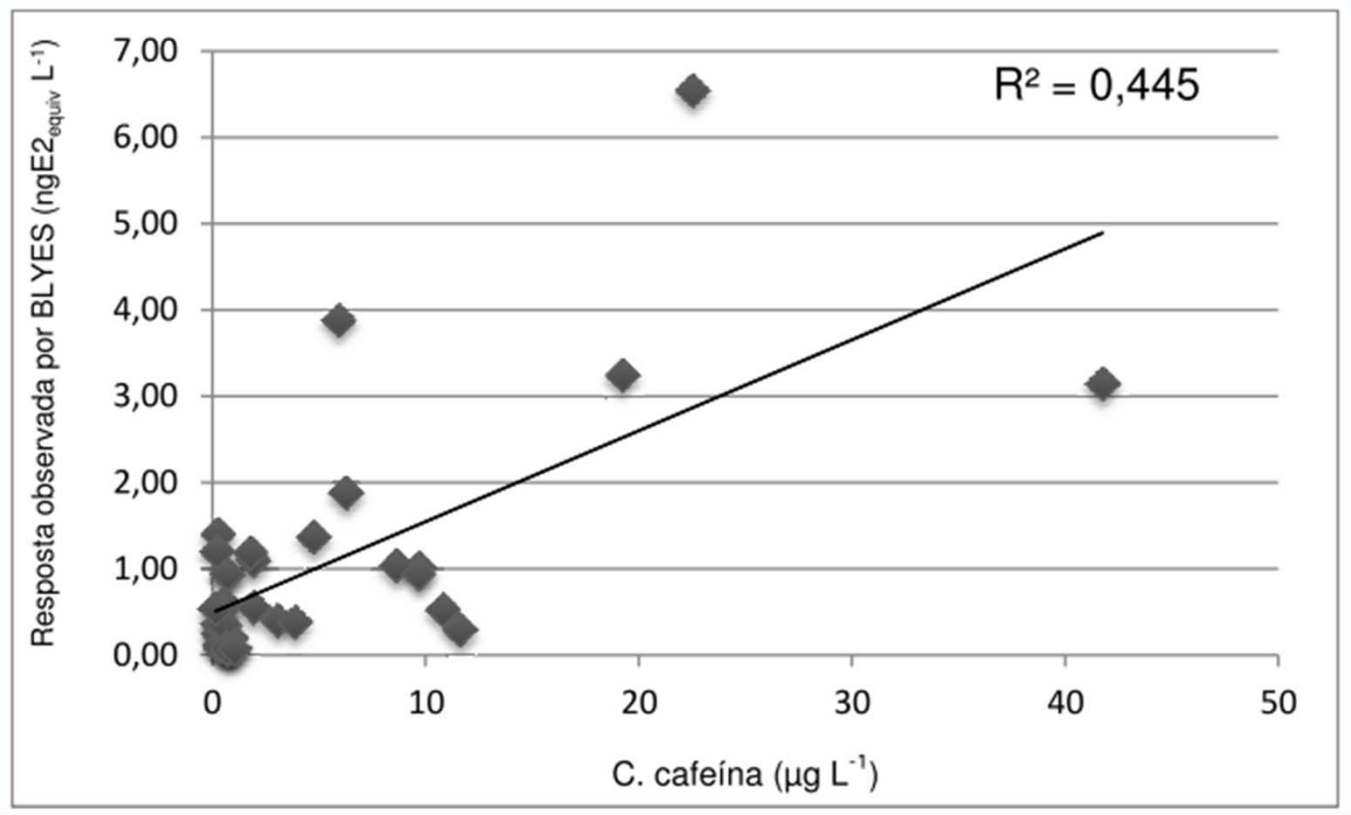


Atrazina



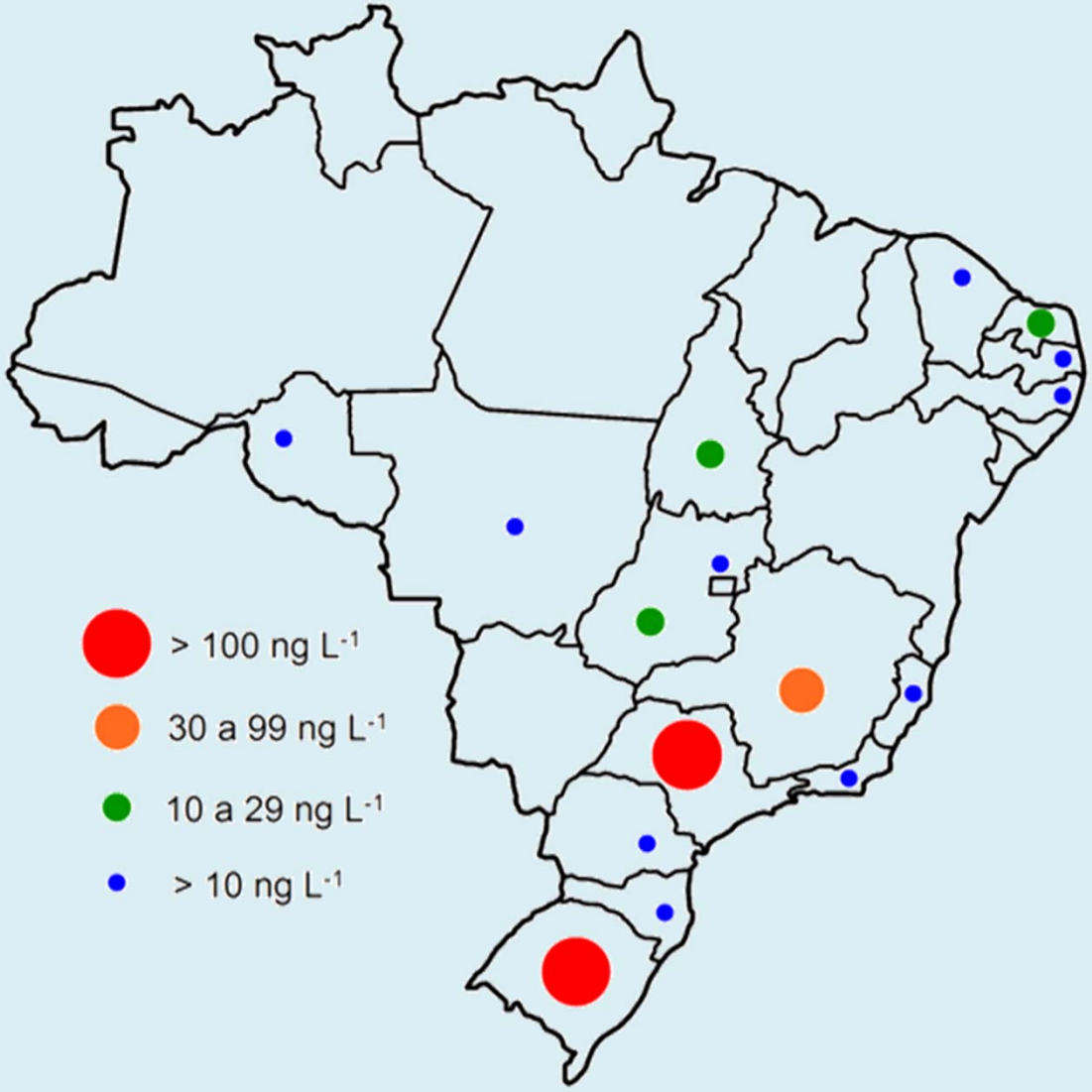
Triclosan

Cafeína e Atividade Estrogênica



Montagner, C. C.; *Contaminanes emergentes em água tratada e seus mananciais*, **2011**.

Cafeína no Brasil - INCTAA



Cafeína no oceano

Marine Pollution Bulletin 64 (2012) 1417–1424

Contents lists available at SciVerse ScienceDirect

Marine Pollution Bulletin

journal homepage: www.elsevier.com/locate/marpolbul

Occurrence and concentration of caffeine in Oregon coastal waters

Zoe Rodriguez del Rey [a], Elise F. Granek [a,*], Steve Sylvester [b]

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[b] School of Molecular Biosciences, Washington State University, Vancouver, 14204 NE Salmon Creek Avenue, Vancouver, WA 98686, United States

Faixa de concentração no oceano
< 8,5 à 44,7 ng L^{-1}

Faixa de concentração nos rios
< 8,5 à 152,2 ng L^{-1}

Considerações Finais

- ✓As concentrações encontradas nos mananciais para os diferentes compostos estudados apresentam uma correlação com o índice IAP atribuído pela CETESB;

- ✓Apesar de atenderem à portaria do Ministério da Saúde em vigência, em certos casos as ETA não foram capazes de remover completamente cafeína, atrazina e triclosan;

- ✓Cafeína foi a substância investigada que apresentou as concentrações mais elevadas tanto em água bruta quanto água tratada;

- ✓As faixas de concentrações de cafeína observadas em águas bruta e tratada possibilitam o emprego de instrumentos mais simples para o monitoramento desta substância;

Considerações Finais

- ✓Devida a correlação entre a concentração de cafeína e atividade estrogênica e, a grande quantidade de substâncias suspeitas de serem interferentes endócrinos, sugere-se o monitoramento de cafeína em água tratada para inferir uma contaminação química;

- ✓Em Barueri foram observadas as maiores diferenças entre as concentrações de cafeína encontradas na água bruta e água de abastecimento da região; e

- ✓É necessário um maior levantamento de informações a respeito do cenário brasileiro para fornecer uma base sólida para futuras tomadas de decisões.

Agradecimentos

Projeto 07/58449-2