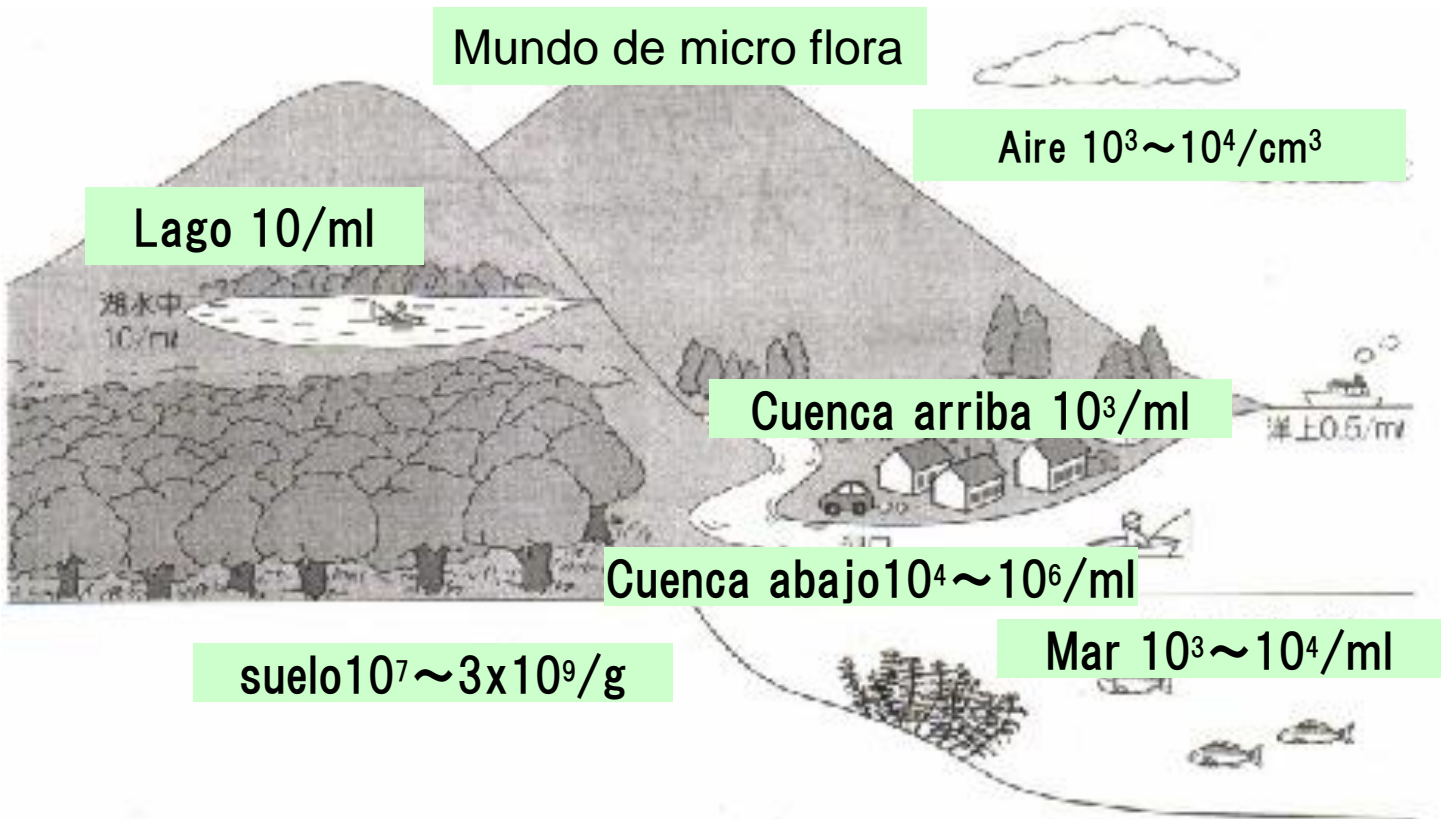


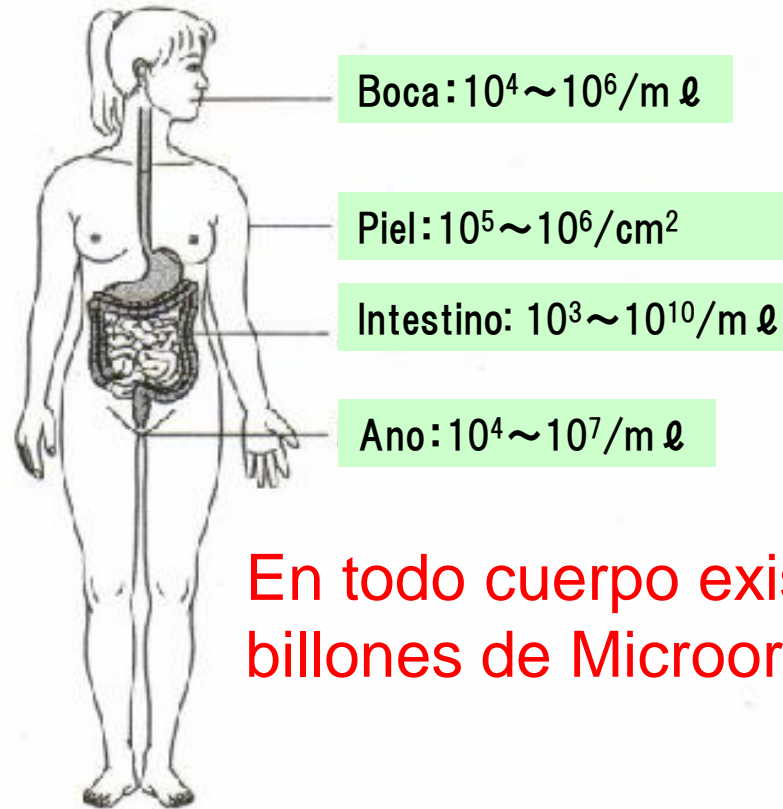
Microorganismos alrededor de nuestra vida



Fuente: El mundo de Microorganismos

Cuantos microorganismos existe en cuerpo?

Mundo de micro flora en el cuerpo



**En todo cuerpo existe 40
billones de Microorganismos**

Types & Functions of Microbes

Beneficial



Soy Sauce, Sake



Cheese, Yogurt



Bread

Good Microbes



Aspergillus Oryzae



Lactic Acid Bacteria



Yeast



Rice, Wheat, Soybean



Milk



Dough

Bad Microbes



Bad Microbes



Bad Microbes



Bad Microbes

Harmful



Putrefied



Putrefied



Putrefied

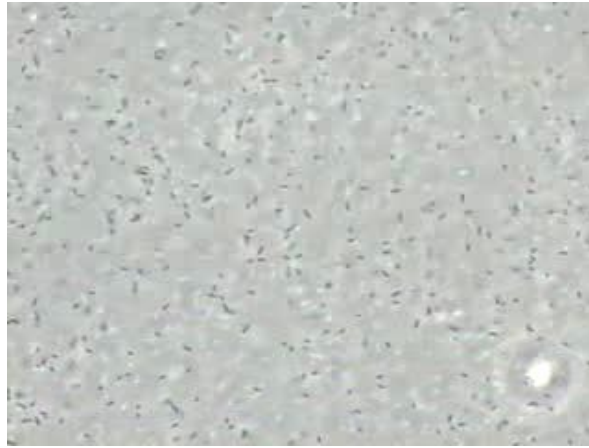
¿Que es EM®?

EM® es una abreviación de
“**Effective Microorganisms™**”

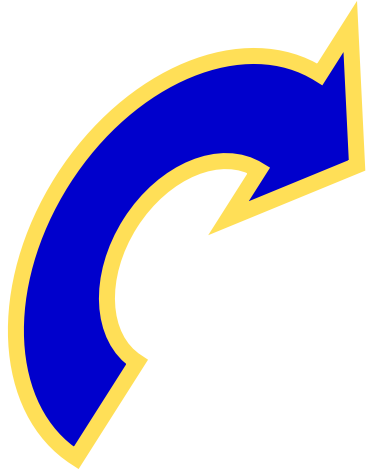
es producto biológico que tiene una mezcla de varios tipos de microorganismos benéficos que son seguros, naturales y sin manipulación genética (NON GMO).

Y certificado equivalencia para producción Organica por Eco Logica





Bacterias Fototróficas



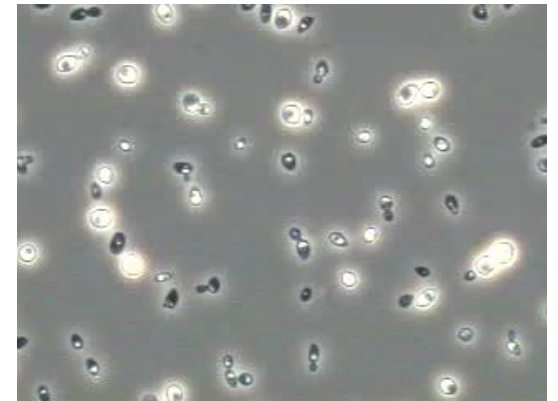
Co



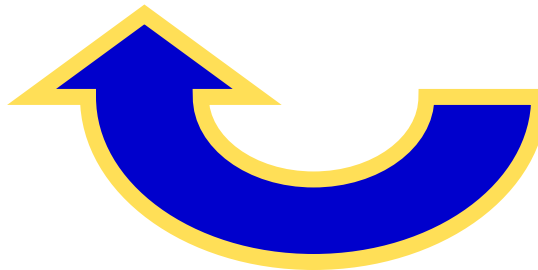
Existencia



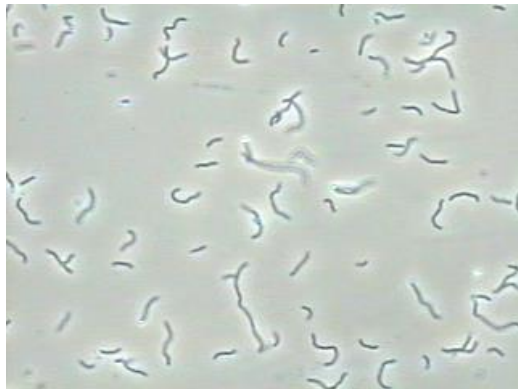
Prosperidad



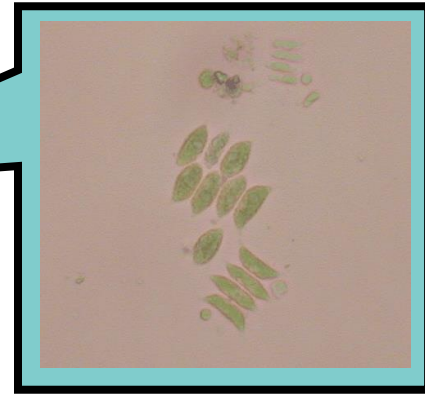
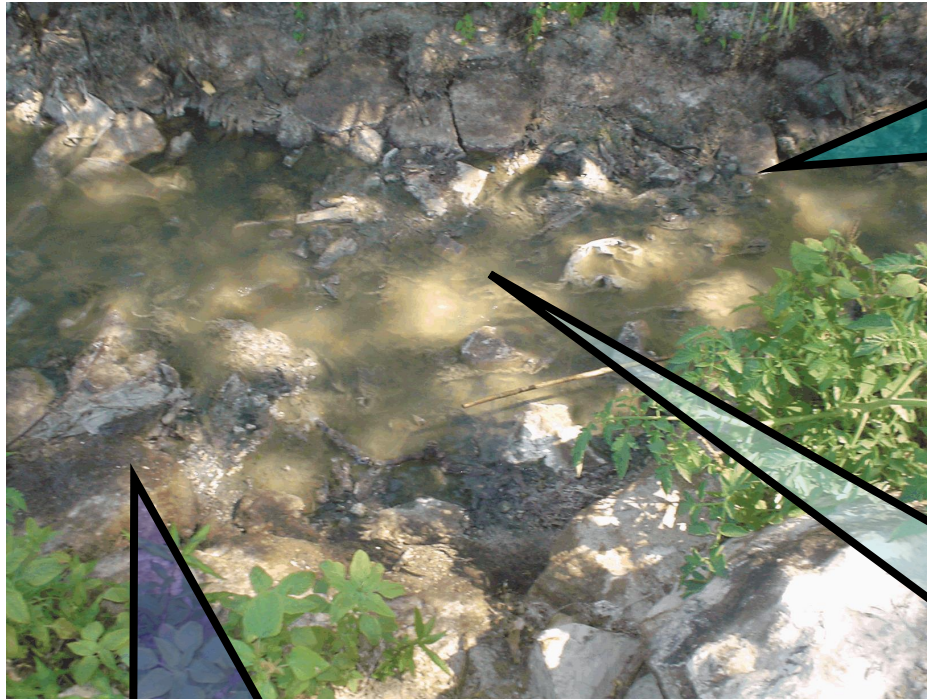
Levaduras



**Bacterias Ácido
Lácticas**



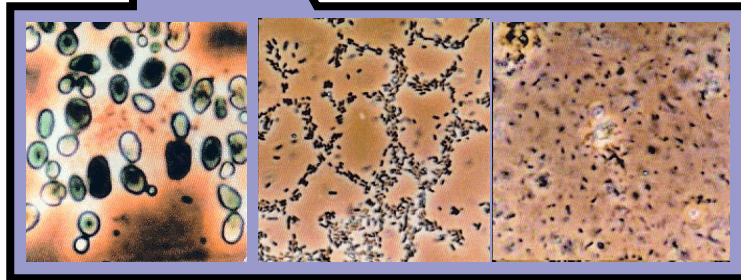
Prificacion por microorganismos



Scenedesmus sp.



Cymbella sp.



Bacteria

Rios contaminados del mundo



Y los rios de Costa Rica ?



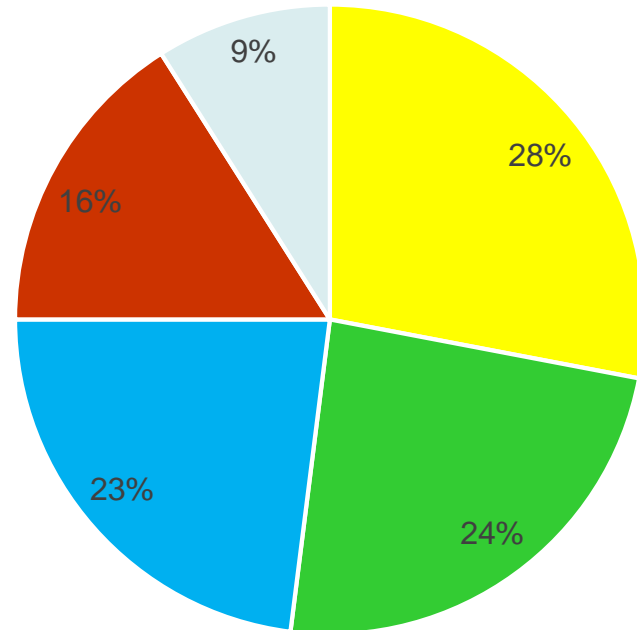
En Costa Rica se depositan cerca de 110 toneladas de basura en las playas y ríos cada día. (Foto AFP)

Cuántos litros de agua consumes ?



186 Litros / p / día
Consumo de agua
promedio mundial

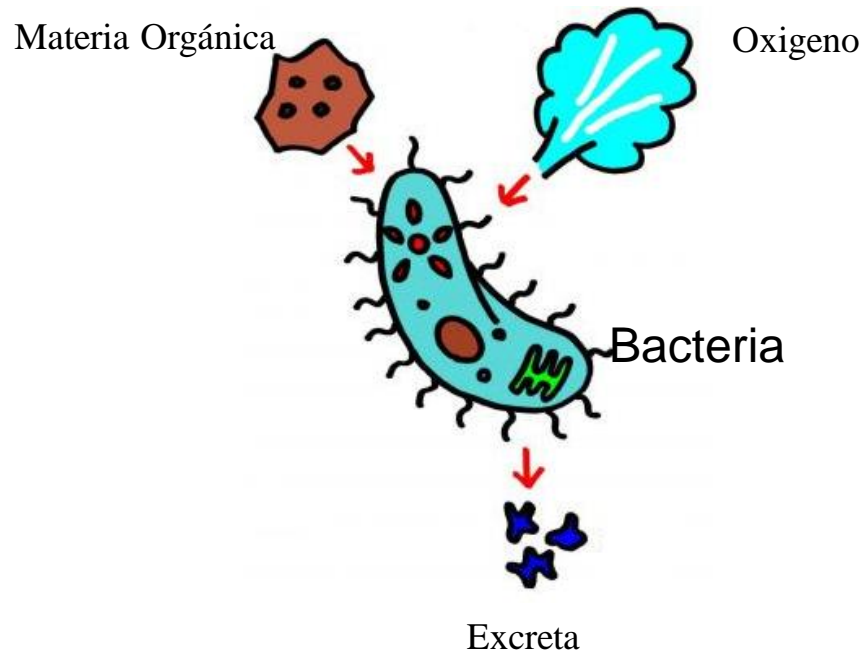
CONSUMO DE AGUA



- BANO SANITARIO
- BANO
- COCINA
- LAVANDERIA

Que es DBO(Demanda Biológica de Oxígeno)?

DBO	MATERIA ORGANICA	CONSUMO DE OXIGENO	CONTAMINACION
ALTO	MUCHO	MUCHO	MUY CONTAMINADO
BAJO	POCO	POCO	MENOS CONTAMINACION



Usted sabia esto?

**DBO de un Rio limpio (viven los peses)
:5mg/l**

DBO: Demanda Biológica de Oxígeno

Nombre de producto	DBO(mg/l)
CAFE	5,400
LECHE	140,000
ACEITE VEGETAL	1,800,000
AZUCAL	690,000
SALSA TOMATE	220,000
CERVEZA	96,000
JABON PARA ROPA	140,000
EXCREMENTO	12,000

Cuantos litros de agua limpia necesita para diluir la contaminación hasta que pueda vivir los peses?

Nombre de producto	cantidad	cantidad de agua
CAFE	una taza(180ml)	180litros (9 biones)
LECHE	una taza(180ml)	5,040litros (252 bidones)
ACEITE VEGETAL	una cuchala(15ml)	5,000litros (250bidones)
AZUCAL	una cuchala(10g)	1,380litros (69bidones)
SALSA TOMATE	una cuchala(15ml)	660litros (33bidones)
CERVEZA	una taza(180ml)	3,450litros (173bidones)

Fuente: Asociación de consumidores,Tokio,Japon

**DBO que generamos 40g/l/p/d:
200 Bidones**



1 bidon=20litros

Tratamiento con EM en la planta de tratamiento de aguas residuales (PTAR) en El Roble, Puntarenas 11 de Julio de 2012 - 2017



La aplicación de EM



Biorremediación

Lago de Tiscapa, Managua, Nicaragua

Resultados:

- Reducción 70% de materia fecales**
- Eliminación de coliformes totales**
- 70% de disminución de DQO y DBO**
- Reducción de H₂S (mal olor)**
- Disminución 60% de SST (Sólido suspendido t.)**
- Mantenimiento del ph 6.5 al 7.5**

Fuente: Agro Eco Serv. Nicaragua 2008

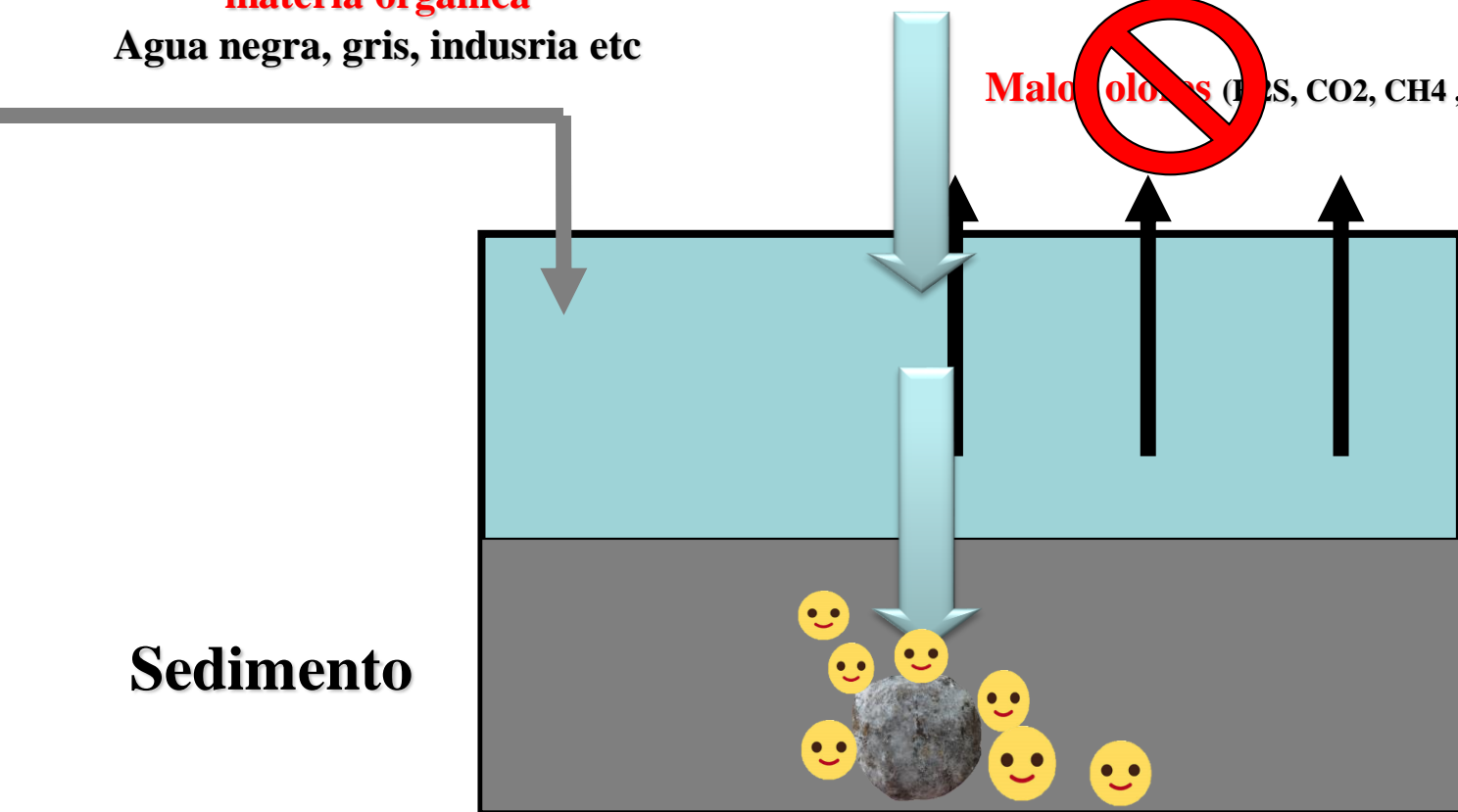




Esfera de barro con EM

Alta concentración de materia orgánica
Agua negra, gris, industria etc

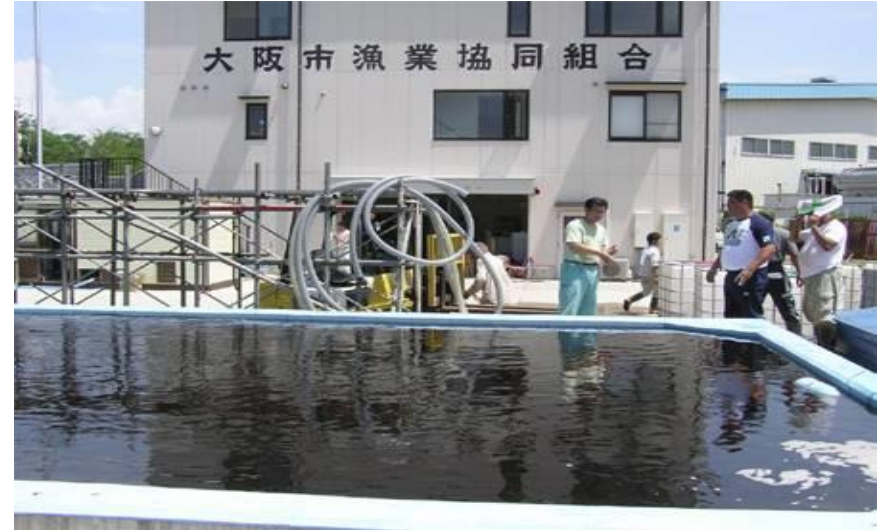
Malololores (H₂S, CO₂, CH₄, NH₃, CH₃SH)



Sedimento

Como funciona la esfera ?

ACTIVACION DE 160 TONELADAS DE EM – OSAKA JAPON

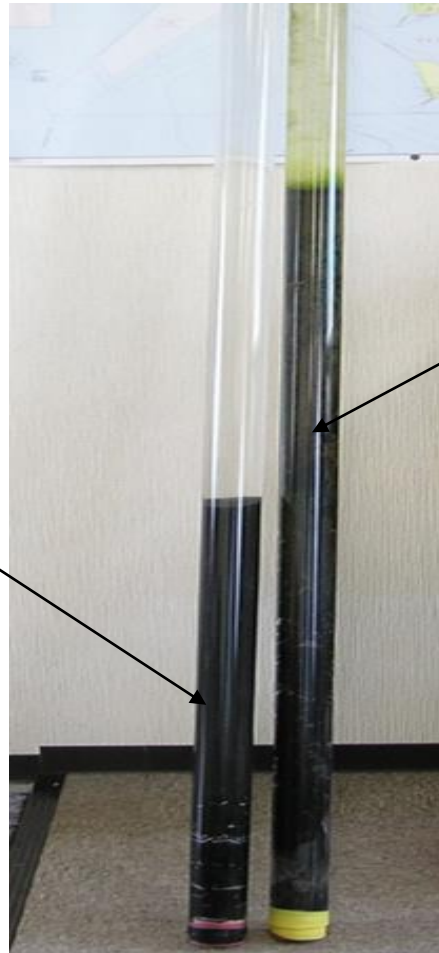


APLICACIÓN DE 160 TON. DE EM Activado AL RIO DOUTONBORI – OSAKA JAPON



REDUCCION DE LODOS DEL RIO DOUTONBORI – OSAKA JAPON

**DESPUES DE
APLICACIÓN DE EM,
AGOSTO DE 2004**



**ANTES DE APLICACIÓN
DE EM ENERO DE 2004**



EM World Mudball Movement in 2012



EM Mudball Movement in Japan



MALAYSIA
 Site: Sutera Mall, Johor Bahru
 Date: August
 Participants: School students
 Event: Competition within schools making EM Mudballs during the EM & ME Event
<http://www.emrojan.com/em-news/content/487.html>

CROATIA
 Site: Pag town, sea coast
 Date: November 2th
 EM Application: 11000 mudballs
 Participants: 100 people
 Other: Published in major Croatian newspapers and broadcasted on national television TV NOVA
<http://dnevnik.hr/vijesti/hrvatsk-a/vo-kako-japanske-kugle-ciste-jadransko-more.html#video>



THAILAND
 Site: Sampran Riverside
 Date: 30 June
 Participants: APNAN members
 Event: During the on site visit APNAN members pumped EM Mudballs to the pond
<http://www.emrojan.com/em-news/content/481.html>



TURKEY
 Site: Sadabat Lake, Istanbul
 Date: June - August
 Participants: 400 people
 Event: 20000 mudballs and 4500 L Activated EM-1* thrown by Kagithane District Governor and relevant authorities along with school students and residents
<https://www.facebook.com/photo.php?v=409810125741410>



GREECE
 Site: AXIOS River, Thessaloniki
 Date: August 8th
 Event: 100 mudballs and Activated EM-1* were pumped into the river by neighboring residents



BELGIUM
 Site: Ieper town
 Date: August 8th
 Participants: 100 people
 Event: NPO EM-B, local authorities and Agriton prepared 2000L of Activated EM-1* and 2000 mudballs to pump into ponds
<http://www.focus-wtv.tv/video/modderballen-voor-zuiver-water>



Call for EM Mudball Movement



NAGOYA
 Site: Nagoya City
 Date: July 16th
 Participants: 350 people
 Event: Prof. Higa took part in the 5000 EM mudballs and 10000L of Activated EM-1* applying into the river.
 10 to 15 tons of Activated EM-1* are injecting into the Horikawa river monthly



ISHIKAWA
 Site: Sea coast, Hakusan City
 Date: July 16th
 Event: Members of the Group SPC Japan gathered wishing to cleanup their beautiful sea and pumped 1500 mudballs



YAMAGATA
 Site: Nagai & Tendo City
 Date: July 16th
 Participants: 80 people
 Event: 1400 mudballs and 400L of Activated EM-1* were applied into rivers



KANAGAWA
 Site: Seacoast, Zushi City
 Date: July 16th
 Participants: 200 people
 Event: 4200 mudballs pumped by neighboring families who also collected the garbage in the beach



IBARAGI
 Site: Toride City
 Date: July 16th
 Participants: 36 people
 Event: A NPO group pumped 2000 mudballs and 1000L of Activated EM-1* into rivers. They also pumped 2000 mudballs into the Nihonbashi river in Tokyo.



YAMAGUCHI
 Site: Takeda Shrine, Kofu City
 Date: July 16th
 Event: 4000 mudballs and 1180L of Activated EM-1* were applied into the shrine moat



OKINAWA
 Site: Kitanakagusuku, Itoman & Nago City
 Date: July 16th and Dec. 1st
 Participants: 250 people
 Event: 42000 totaled the mudballs pumped into three sites; rivers and seacoast



KYOTO
 Site: Kamo River
 Date: July 20th
 Participants: 20 children and 10 adults with the NPO U-net and volunteer groups
 Event: Participants made the EM mudballs and pumped into the river on the Marin Day

EM Mudboll in Costa Rica



Gracias : Arigato

