Impact des traitements de l'eau potable sur le microbiome de l'eau

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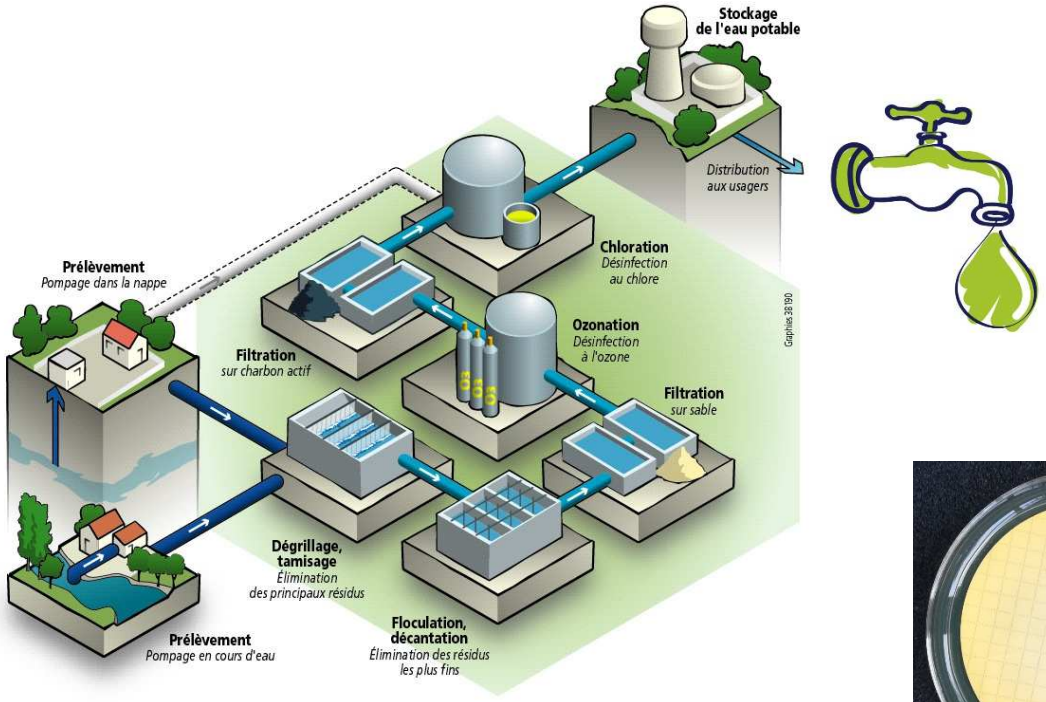
prêts pour la révolution de la ressource

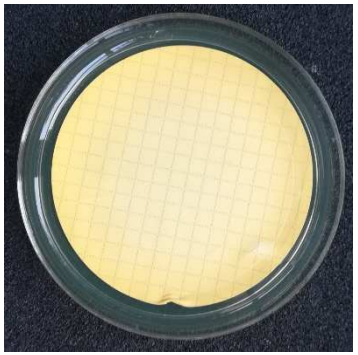
SUEZ

Sommaire

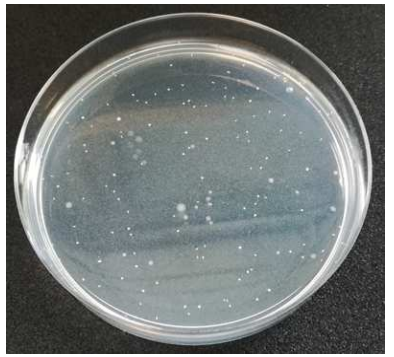
- **Application des méthodes de métagénomique : une nouvelle vision de la diversité bactérienne de l'eau potable**
- **Impact des traitements de la filière de production d'eau potable sur la diversité bactérienne**
- **Impact des traitements de la filière de production d'eau potable sur le résistome de l'eau**

L’eau potable, enjeu majeur de santé publique





E. coli
Absence /100 mL



Flore hétérotrophe cultivable
<100 cfu/ml

Eau = Aliment le plus contrôlé

Vers une nouvelle vision de la diversité bactérienne de l'eau

Environmental Science & Technology

Environ. Sci. Technol. 2012, 46, 8851–8859

Article

pubs.acs.org/est

Bacterial Community Structure in the Drinking Water Microbiome Is Governed by Filtration Processes

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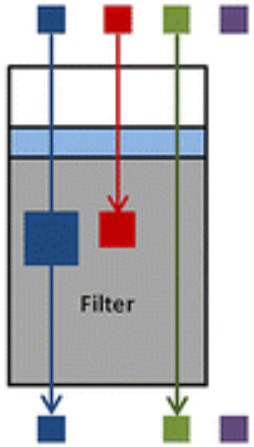
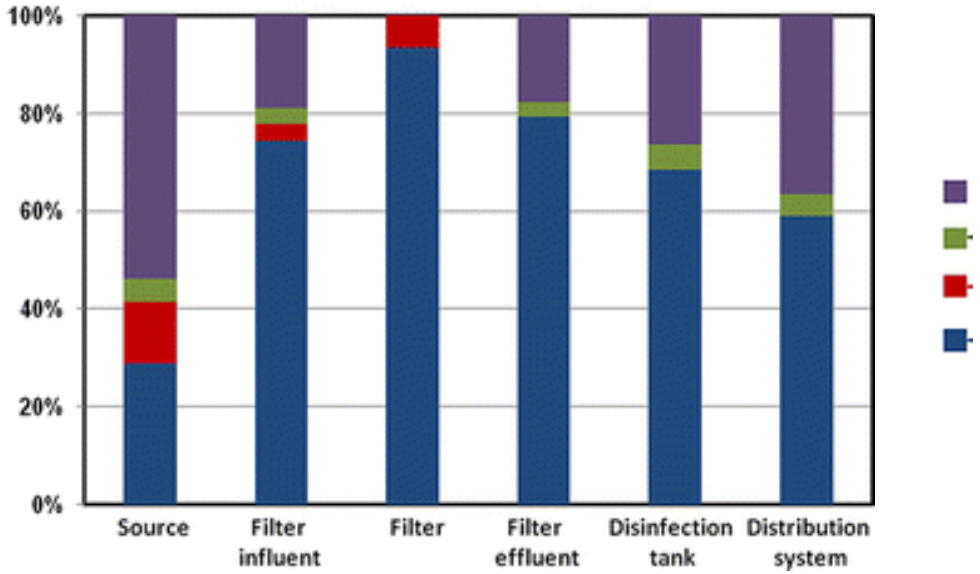
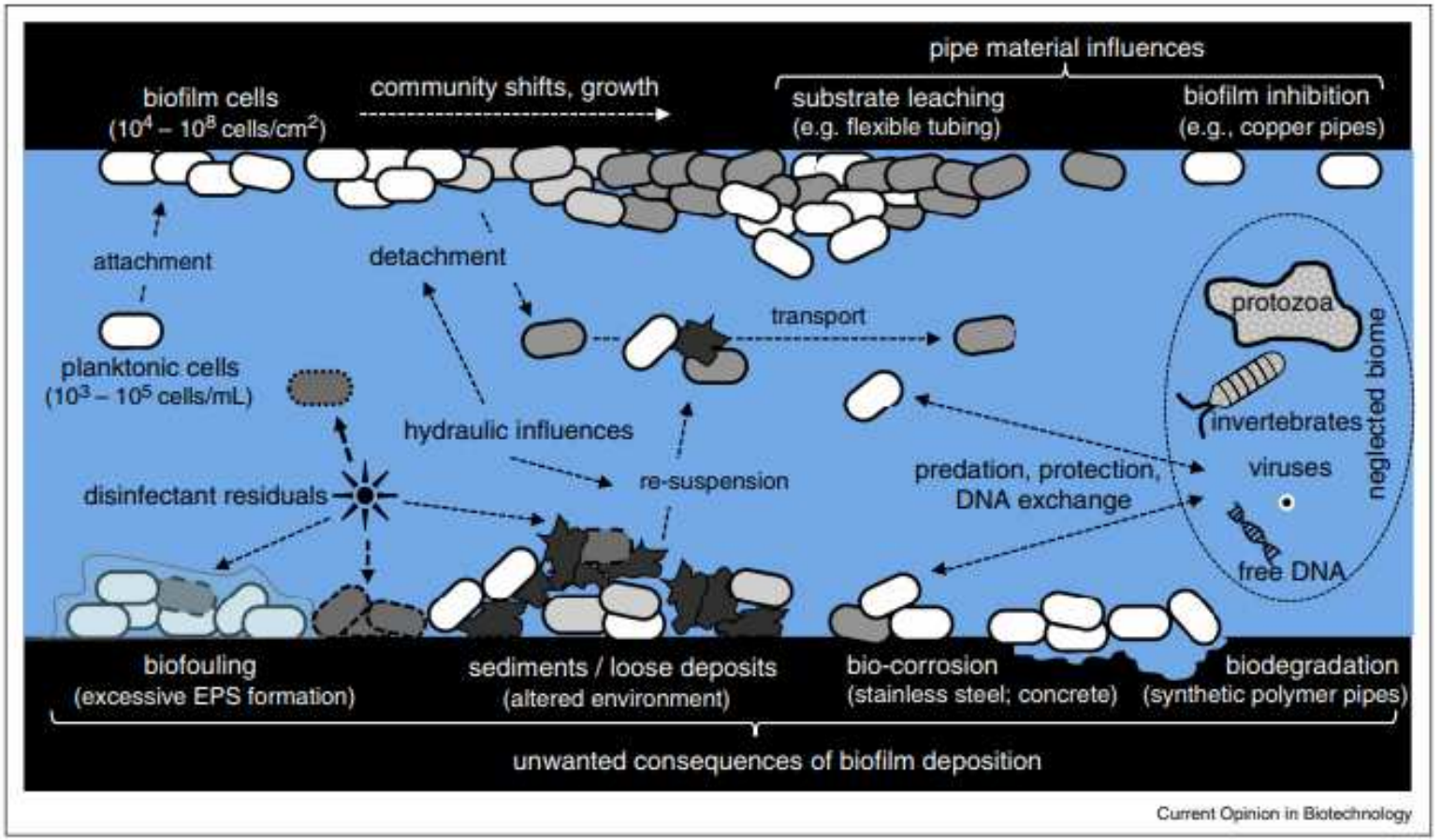
Defining bacterial groups



Relative abundance of bacterial groups

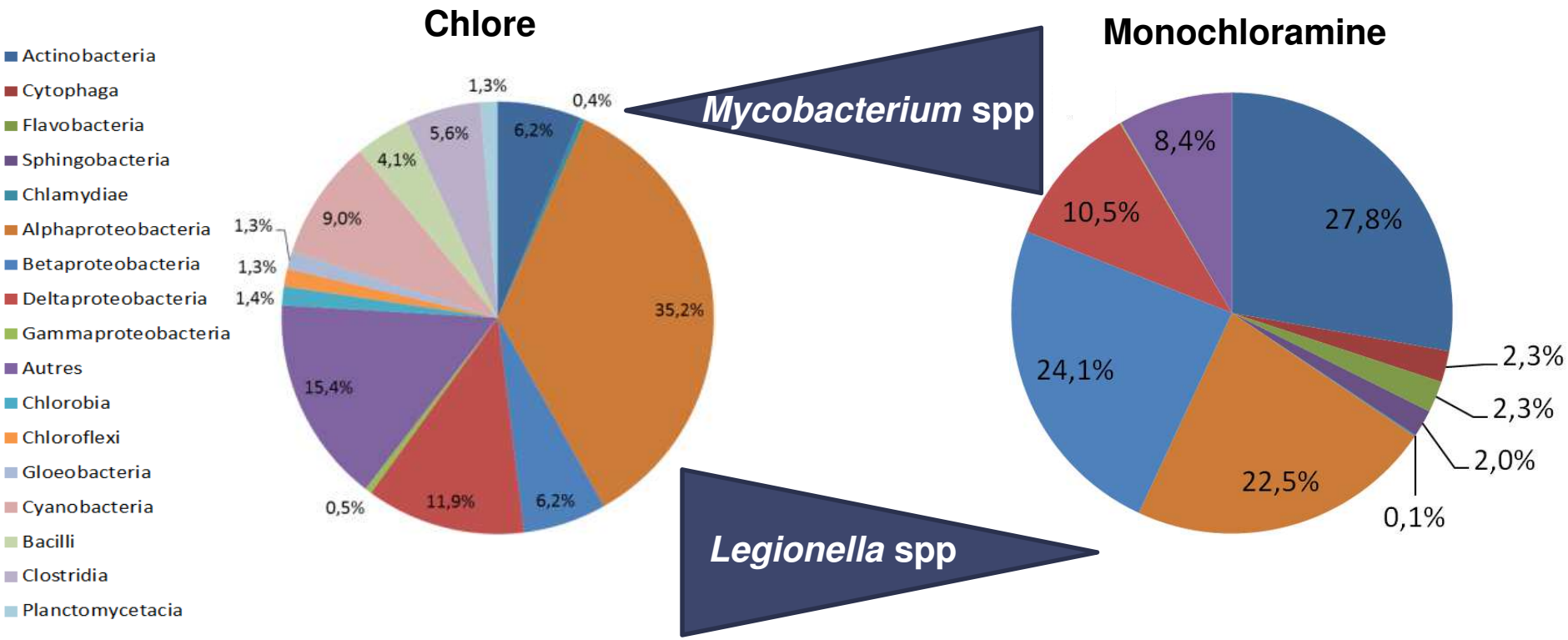


Ecologie microbienne des biofilms



Dynamique biologique du réseau de distribution d'eau potable
(d'après Proctor & Hammes, 2015)

Impact des traitements de désinfection sur les populations planctoniques



Gomez-Alvarez et al. 2012. **Metagenomic analyses of drinking water receiving different disinfection treatments**. *Applied and Environmental Microbiology* 78:6095-6102.

Vers une réduction du résiduel de chlore en distribution

- **G&O : 1**
  - Seu
  - Rés
- **Gestion**

The Dutch secret: how to provide safe drinking water without chlorine in the Netherlands

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Received: 26 August 2008 – Published in Drink. Water Eng. Sci. Discuss.: 27 October 2008
Revised: 11 March 2009 – Accepted: 11 March 2009 – Published: 16 March 2009

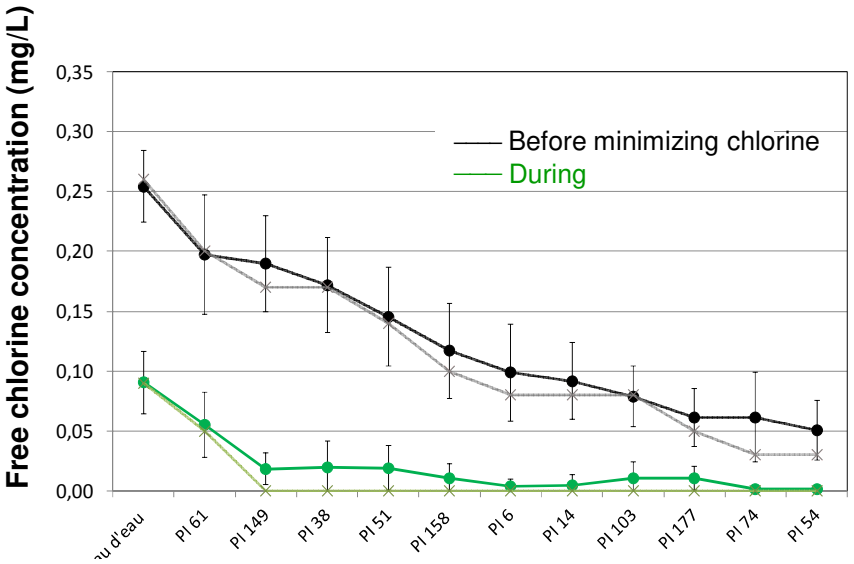
Abstract. The Netherlands is one of the few countries where chlorine is not used at all, neither for primary disinfection nor to maintain a residual disinfectant in the distribution network. The Dutch approach that allows production and distribution of drinking water without the use of chlorine while not compromising microbial safety at the tap, can be summarized as follows:

1. Use the best source available, in order of preference:
   - microbiologically safe groundwater,
   - surface water with soil passage such as artificial recharge or bank filtration,
   - direct treatment of surface water in a multiple barrier treatment;
2. Use a preferred physical process treatment such as sedimentation, filtration and UV-disinfection. If absolutely necessary, also oxidation by means of ozone or peroxide can be used, but chlorine is avoided;
3. Prevent ingress of contamination during distribution;
4. Prevent microbial growth in the distribution system by production and distribution of biologically stable (biostable) water and the use of biostable materials;
5. Monitor for timely detection of any failure of the system to prevent significant health consequences.

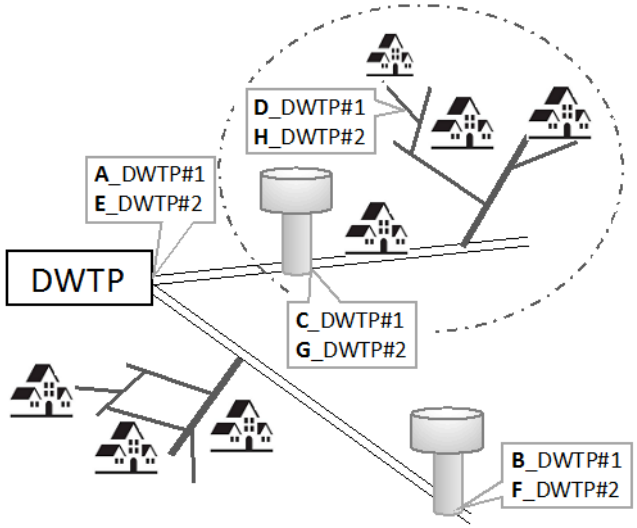
Faisabilité de la réduction du chlore résiduel en réseau de distribution

- ✓ Evaluation quantitative des risques microbiologiques :
  - Qualité de la ressource
  - Efficacité de la filière de traitement
  - Surveillance/ maintenance du réseau de distribution

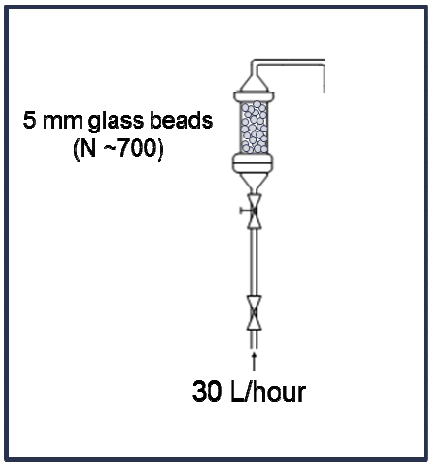
- ✓ Surveillance microbiologique (autocontrôle) par les analyses réglementaires

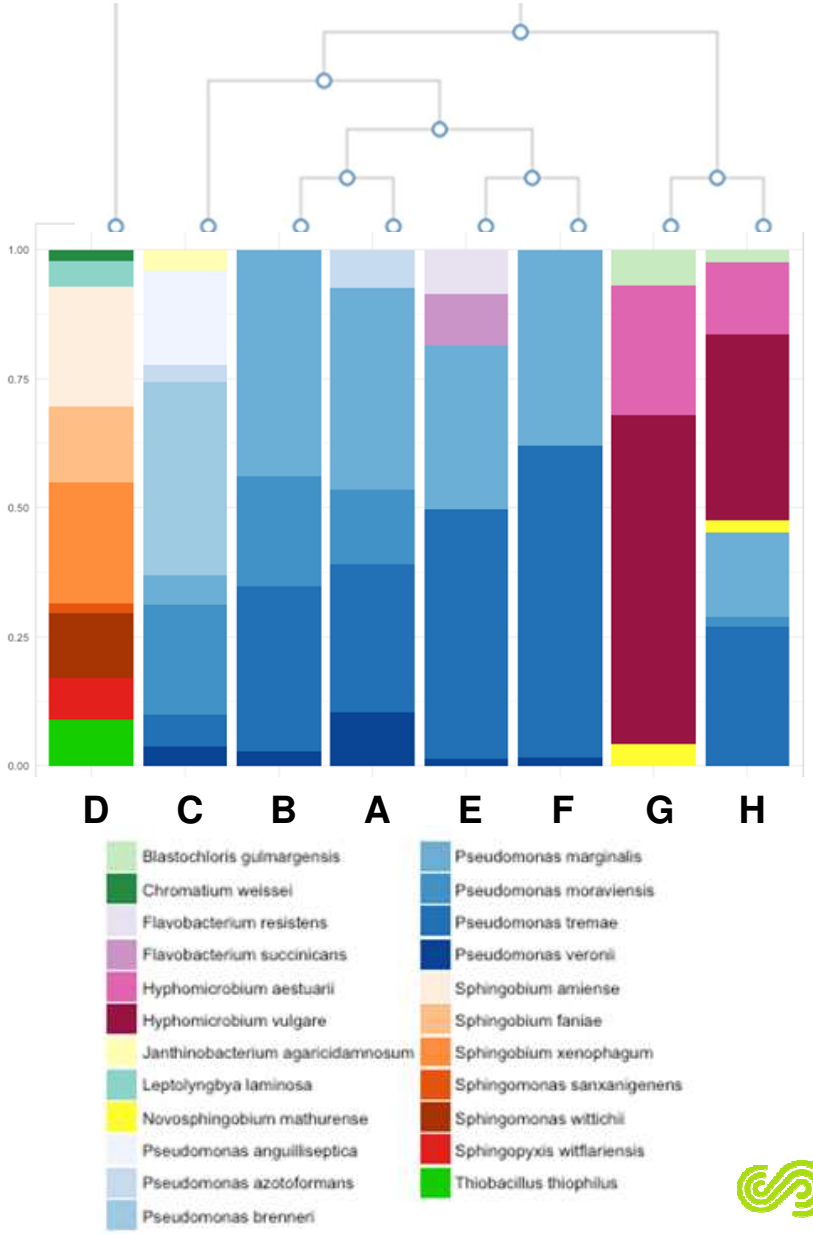


Impact de la reduction du chlore sur la diversité bactérienne des biofilms



Incubation
60 jours





Conclusion

Début de la description du microbiome de l'eau : écosystème complexe

Diversité bactéries planctoniques / biofilm / sédiments

Virus

Eucaryotes

Difficultés méthodologiques demeurent :

Prélèvements biofilms

Concentration grands volumes d'eau si faible biomasse

Identification/base de données incluant les bactéries/micro-organismes de l'environnement