



Microplastics and urban water

Rachid Dris, Johnny Gasperi, Vincent Rocher, Mohamed Saad, Bruno Tassin

► **To cite this version:**

Rachid Dris, Johnny Gasperi, Vincent Rocher, Mohamed Saad, Bruno Tassin. Microplastics and urban water. Colloque 2016 de l'ARET :Plastiques : quels enjeux pour demain ? Pollution physico-chimique & Impacts environnementaux et sanitaires, Jun 2016, Valence TGV, France. <hal-01333692>

HAL Id: hal-01333692

<https://hal-enpc.archives-ouvertes.fr/hal-01333692>

Submitted on 18 Jun 2016

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

Materials and methods

Sampling	Atmospheric fallout	Rainwater	Washing machine	WWTP effluents	Surface water
Samples treatment	Remove natural organic fraction SDS → H ₂ O ₂ Lipase, Protéase, Amylase		Remove mineral fraction ZnCl ₂ Density = 1.6 g/cm ³		
Observation					
Characterization					

7

Materials and methods

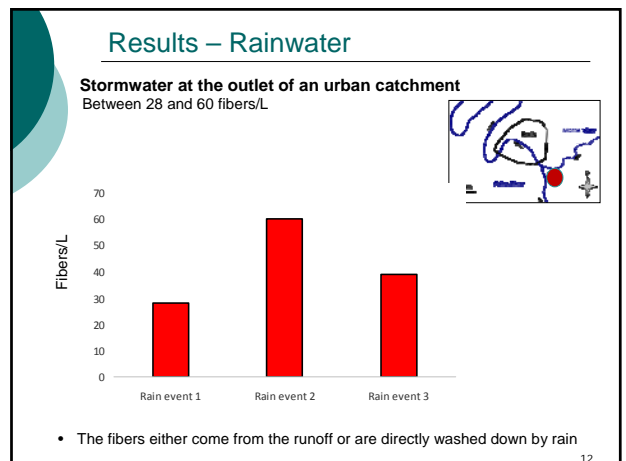
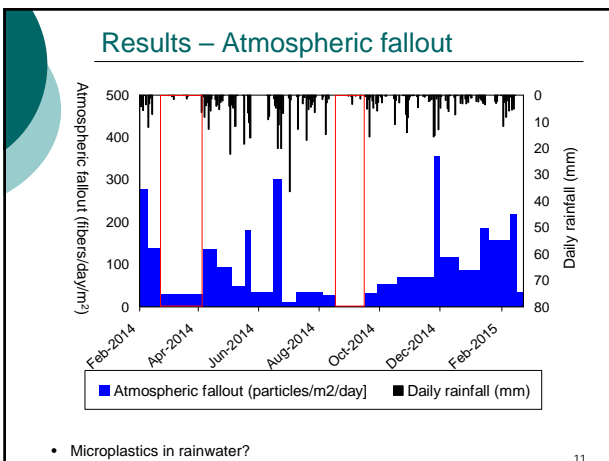
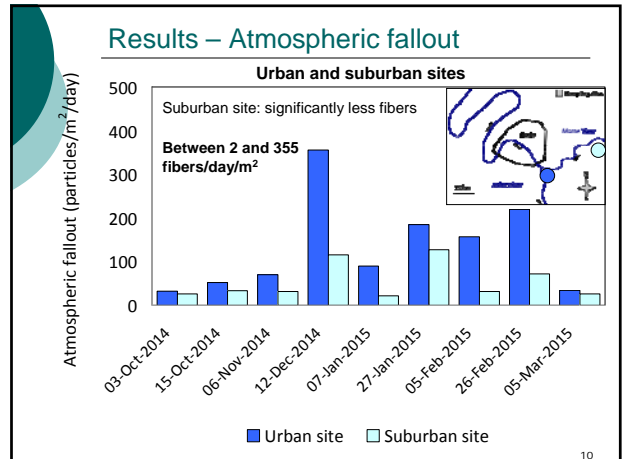
Sampling	Atmospheric fallout	Rainwater	Washing machine	WWTP effluents	Surface water
Samples treatment	Remove natural organic fraction SDS → H ₂ O ₂ Lipase, Protéase, Amylase		Remove mineral fraction ZnCl ₂ Density = 1.6 g/cm ³		
Observation					
Characterization					

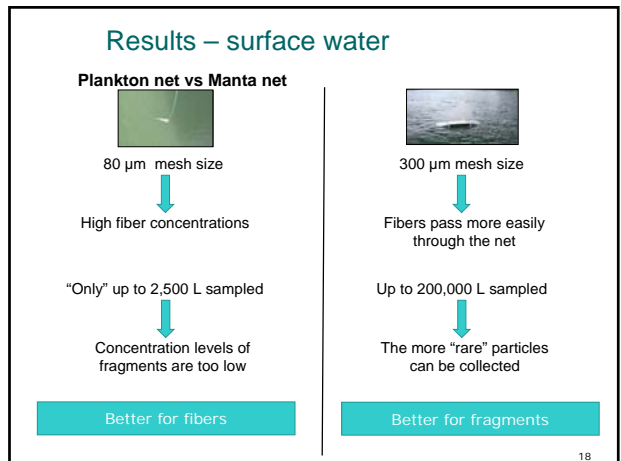
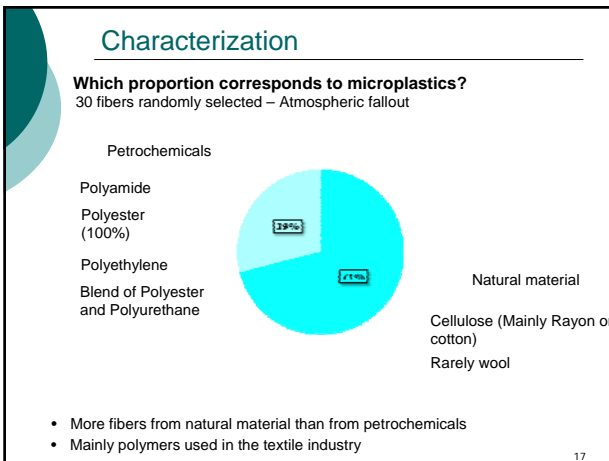
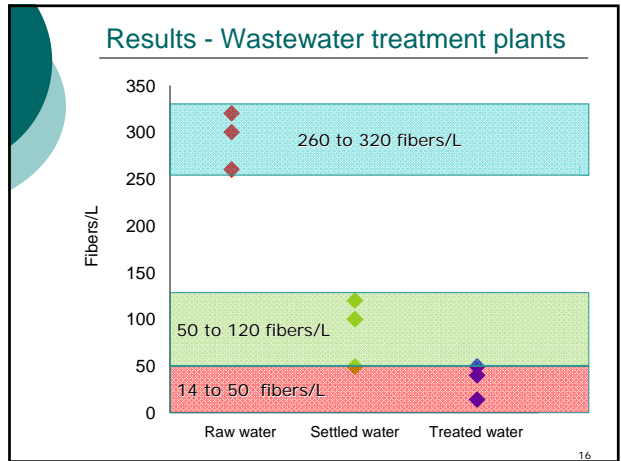
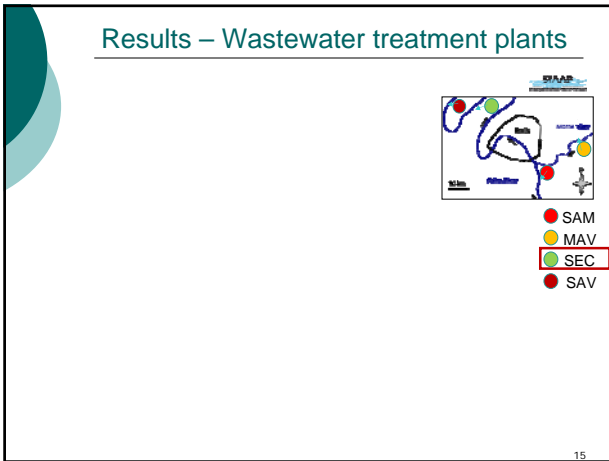
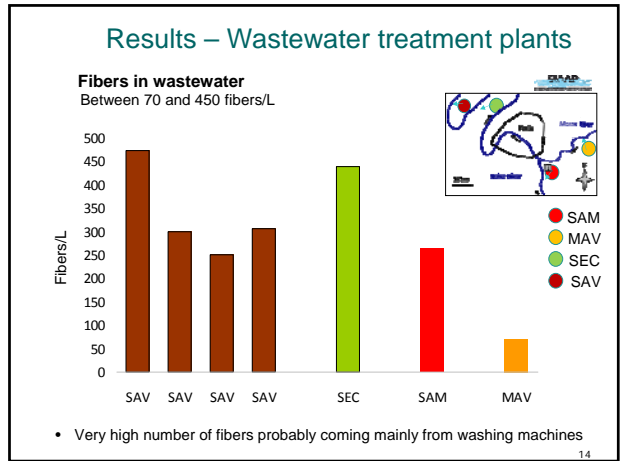
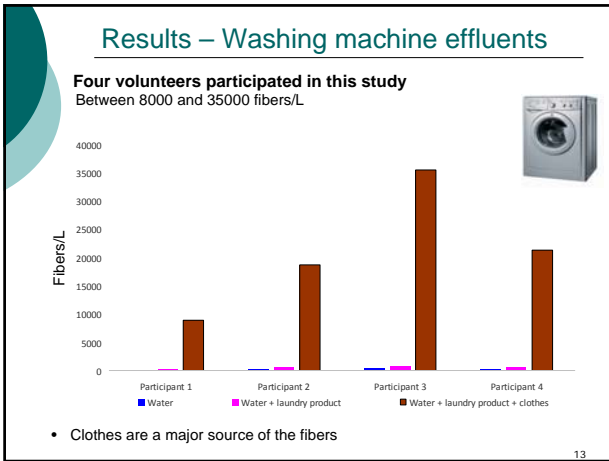
8

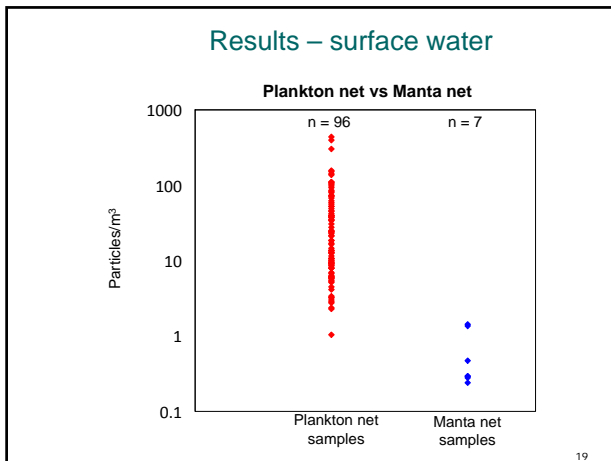
Materials and methods

Sampling	Atmospheric fallout	Rainwater	Washing machine	WWTP effluents	Surface water
Samples treatment	Remove natural organic fraction SDS → H ₂ O ₂ Lipase, Protéase, Amylase		Remove mineral fraction ZnCl ₂ Density = 1.6 g/cm ³		
Observation					
Characterization	Transform infrared (FT-IR) micro spectroscopy (Microscope LUMOS FT-IR – Bruker)				

9







Results – surface water

80 µm net samples

Chemical characterization in progress

So far:

- 2 Rayon fibers (among 19 particles)
- Polyester mainly
- Polyamide and Polypropylene

Only fibers

20

Results – surface water

300 µm net samples

Chemical characterization in progress

So far:

- Only plastic particles
- Only Polyethylene and Polypropylene

Fragments, films and spheres

21

Synthèse

Retombées atmosphériques	10 ² /m ² /jour
Eaux de ruissellement	10 ¹ /L
Lave linge	10 ⁴ /L
Station d'épuration (entrée)	10 ² /L
Station d'épuration (sortie)	10 ¹ /L
Rivière	10 ⁻² – 10 ⁰ /L

- ### Conclusions et perspectives
- Présence ubiquiste en milieu urbain
 - Bilans encore très lacunaires
 - Méthodes d'analyse non stabilisées
 - Cas des fibres
 - Difficiles à caractériser
 - Très présentes, (contamination)
 - Question de l'impact écologique

leesu laboratoire eau environnement systèmes urbains UNIVERSITÉ PARIS-EST

Microplastics in various compartments of the urban water cycle

rachid.dris@enpc.fr

©Dris, R., Gasperi, J., Saad, M., Mirande, C., Tassin, B., 2016. **Synthetic fibers in atmospheric fallout: A source of microplastics in the environment?** Mar. Pollut. Bull. doi:10.1016/j.marpolbul.2016.01.006

©Dris, R., Gasperi, J., Rocher, V., Saad, M., Renault, N., Tassin, B., 2015a. **Microplastic contamination in an urban area: a case study in Greater Paris.** Environ. Chem. 12, 592–599.

©Dris, R., Imhof, H., Sanchez, W., Gasperi, J., Galgani, F., Tassin, B., Laforsch, C., 2015b. **Beyond the ocean: Contamination of freshwater ecosystems with (micro-) plastic particles.** Environ. Chem. 12, 539–550.

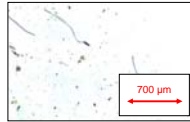
©Gasperi, J., Dris, R., Bonin, T., Rocher, V., Tassin, B., 2014 **Assessment of floating plastic debris in surface water along the Seine River.** Environ. Poll. 195, 163–166.

Introduction

Previous investigations in the Seine River



Less than 2 fragments/m³



Up to 400 fibers/m³