

**“The net trapping effect”: is riparian
vegetation affecting riverine
macrolitter distribution?**

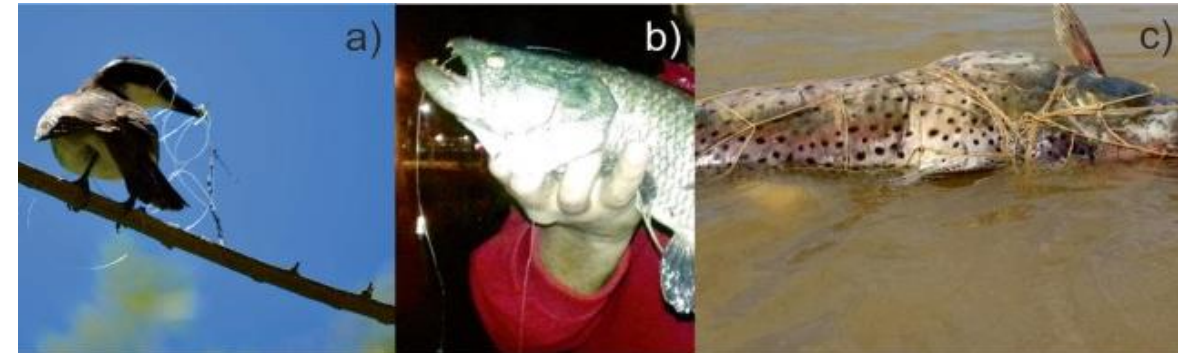
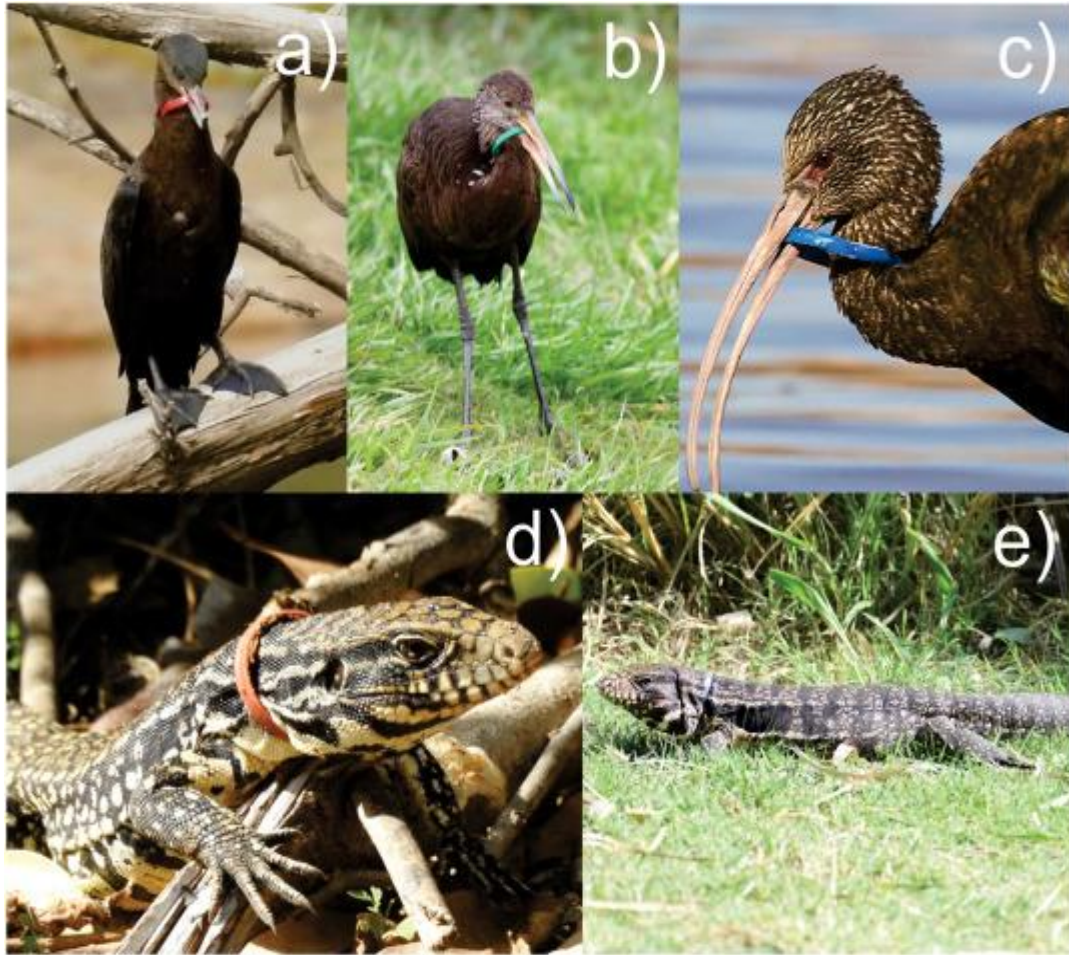
Gallitelli L.^{1*}, Cutini M.¹, Scalici M.¹

¹Department of Sciences, Roma Tre University, Rome (Italy)

 luca.gallitelli@uniroma3.it
 @LucaGallitelli



State of the Art



*Blettler and Wantzen 2019;
van Emmerik and Schwarz 2020;
Blettler and Mitchell 2021*



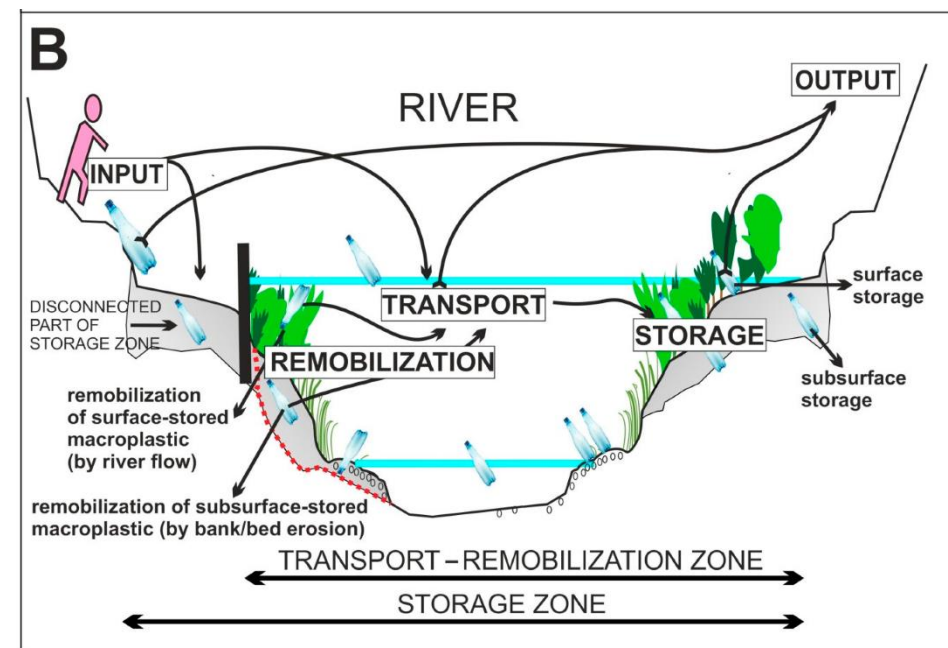
Rivers as carriers of macroplastics (MA) to the sea.



MA in *rivers* are «poorly» investigated.



Riverine MA transport affected by *abiotic factors*.



Liro et al. 2020;

González-Fernández et al. 2021;

Meijer et al. 2021;

van Emmerik et al. 2022

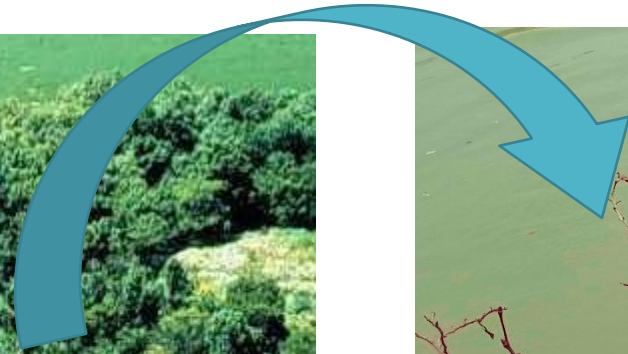
Aims



investigating the distribution of **MA** and their *accumulation areas* in rivers;



assessing the *trapping effects* of the **riparian vegetation structure** on MA.



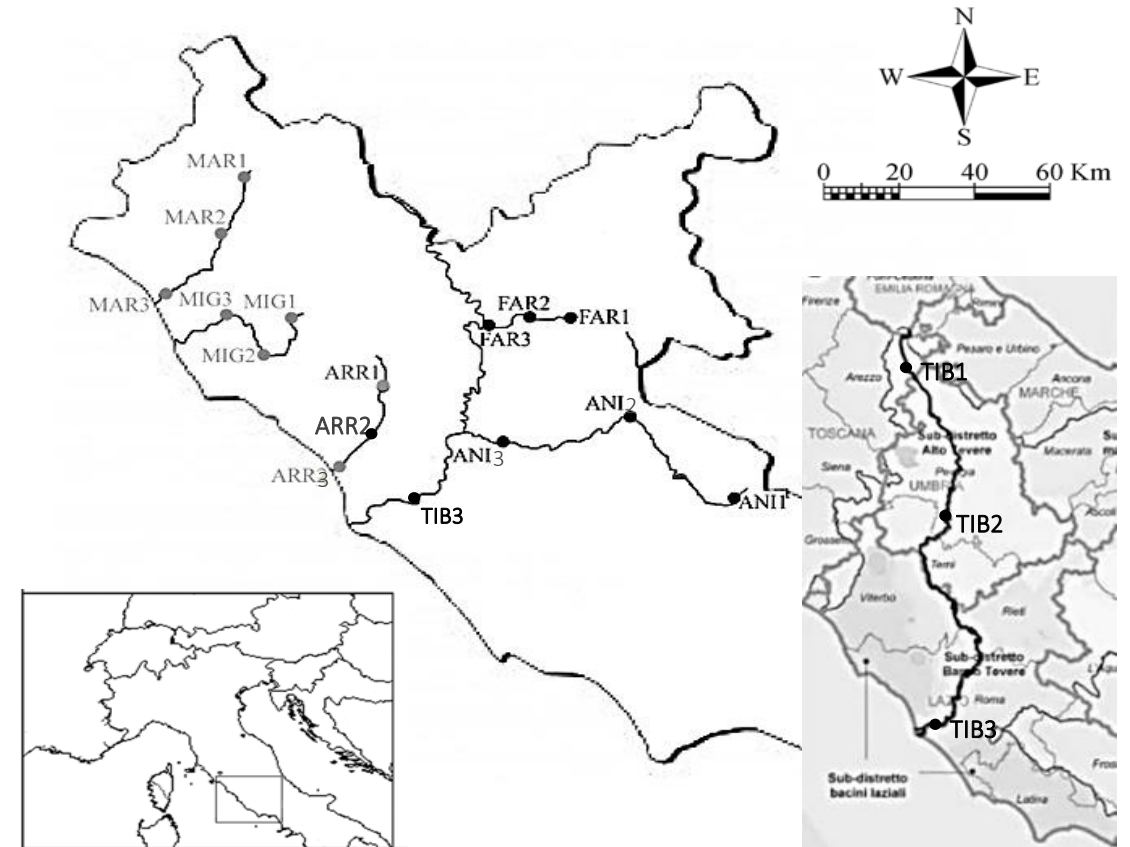
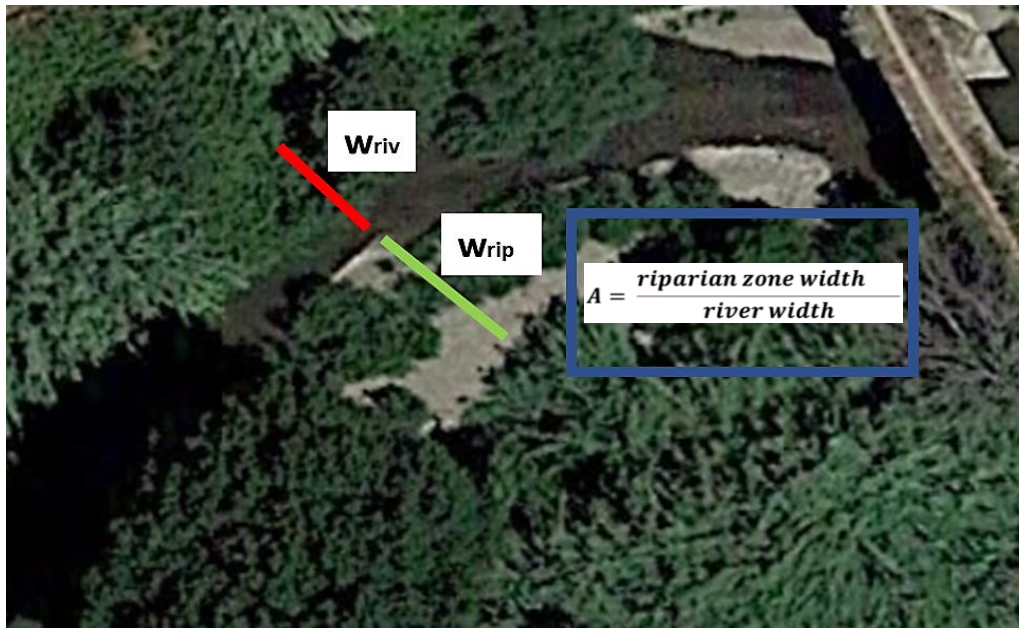
Methods



6 rivers in the *three riverine zones* (upper, middle, lower course).



Riparian vegetation was sampled in relation to **river width** and **riparian zone width**.



3D-Structure

- i. Dominant species coverage
- ii. Tree, shrub, grass coverage
- iii. Altitude, branches, diameter species



MA samplings:

- number of items (#)
- litter type (plastic, paper, ..)
- item type (bottles, cups, ..)
- polymeric characterization (e.g. PS, PET, ..)
- size (2.5-5 cm, ..) and color (white, ..)

Results



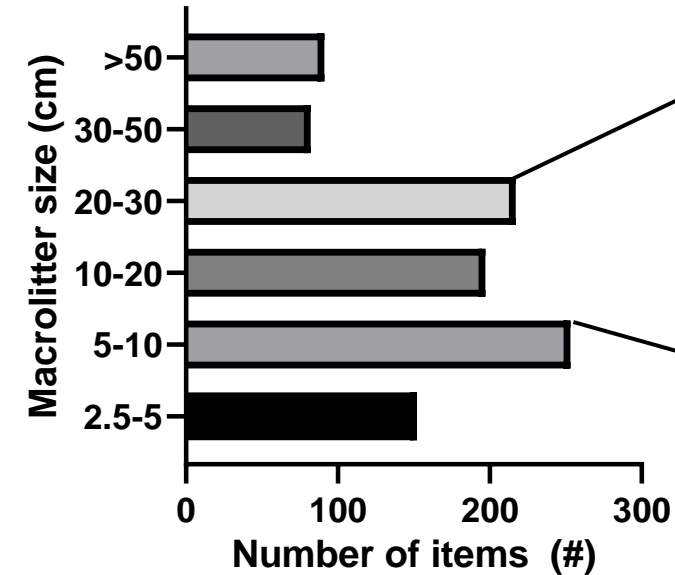
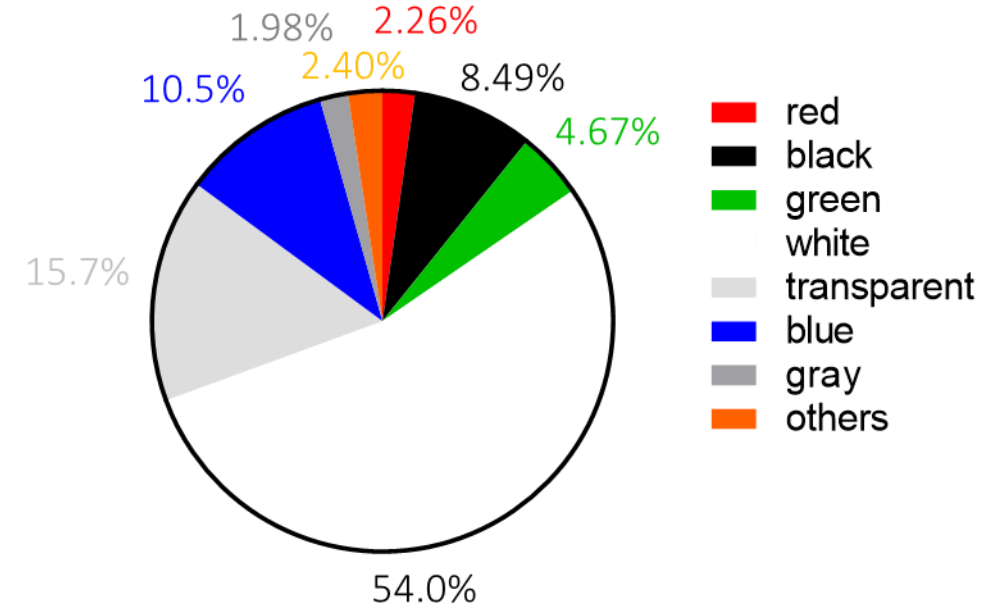
Overall, 1548 MA items on ~300 m² of sampled riparian vegetation.



Plastics represented 94.9% of total litter.

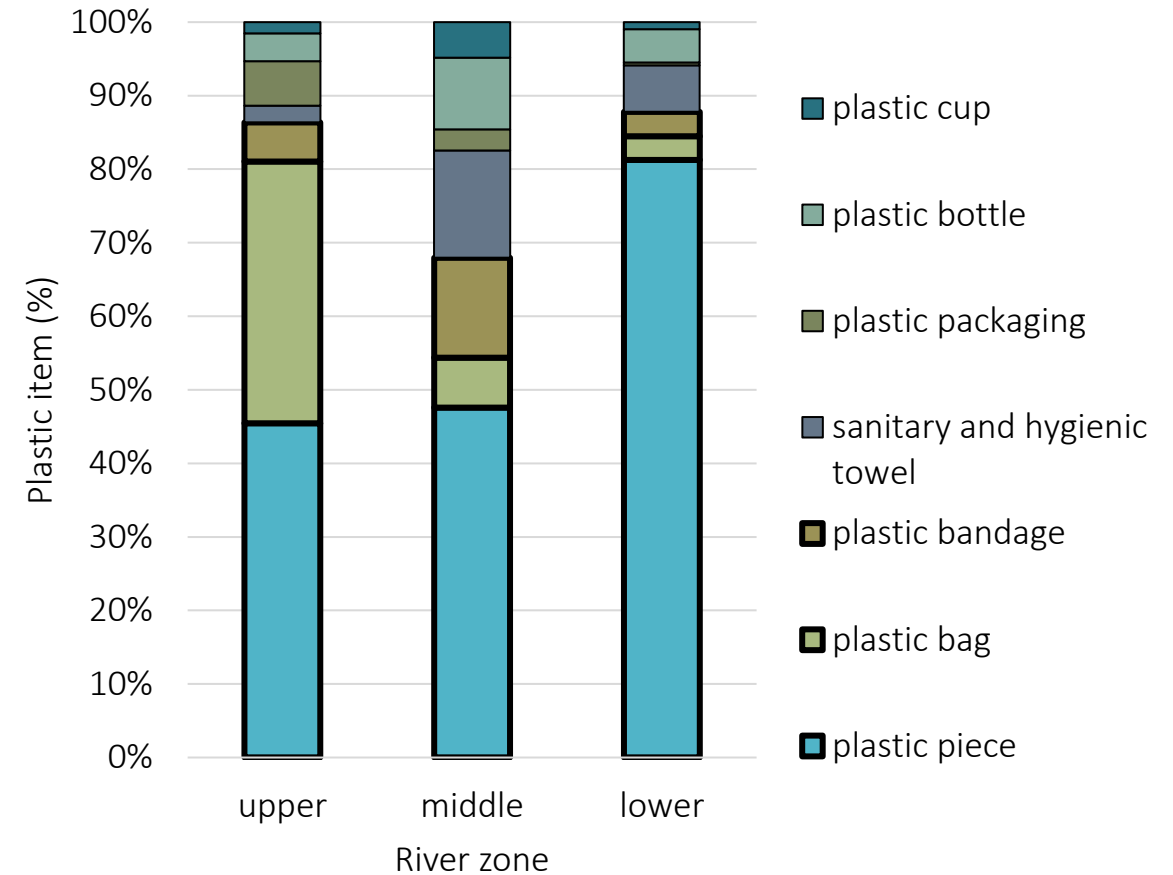
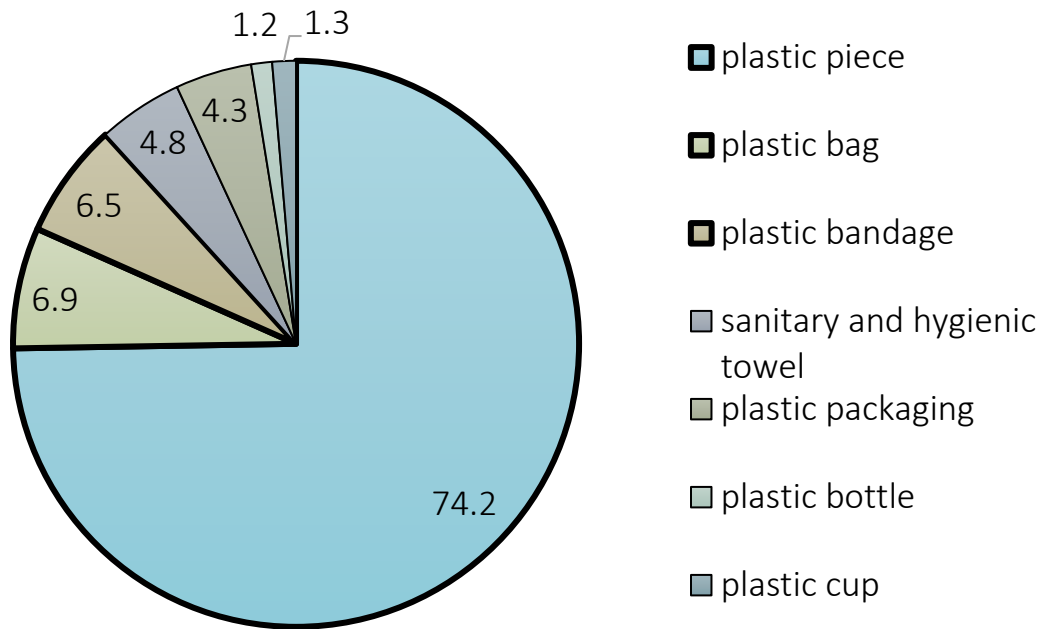


Macro litter **colours and sizes** most occurring are *white* and 5-10 cm.



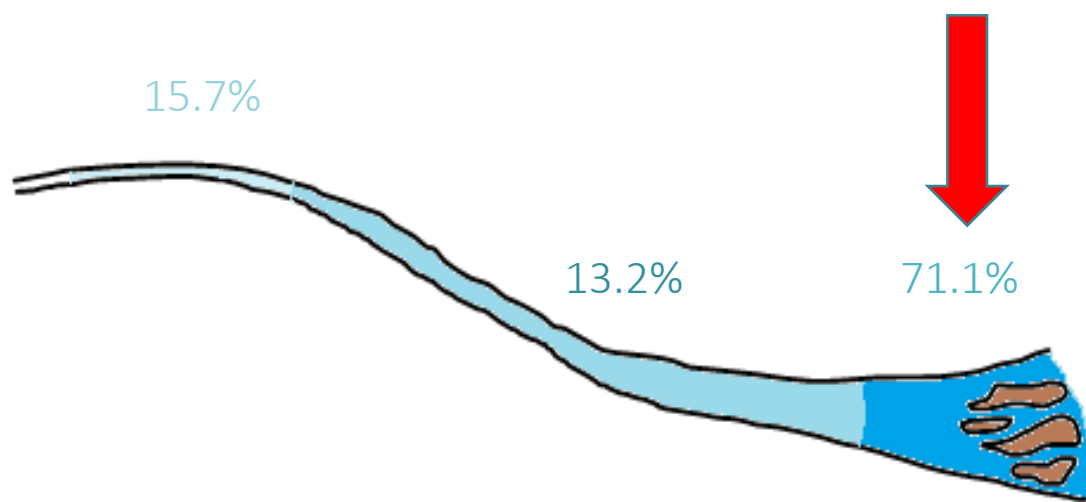


Plastic pieces, bags, and bandages are the most found items.

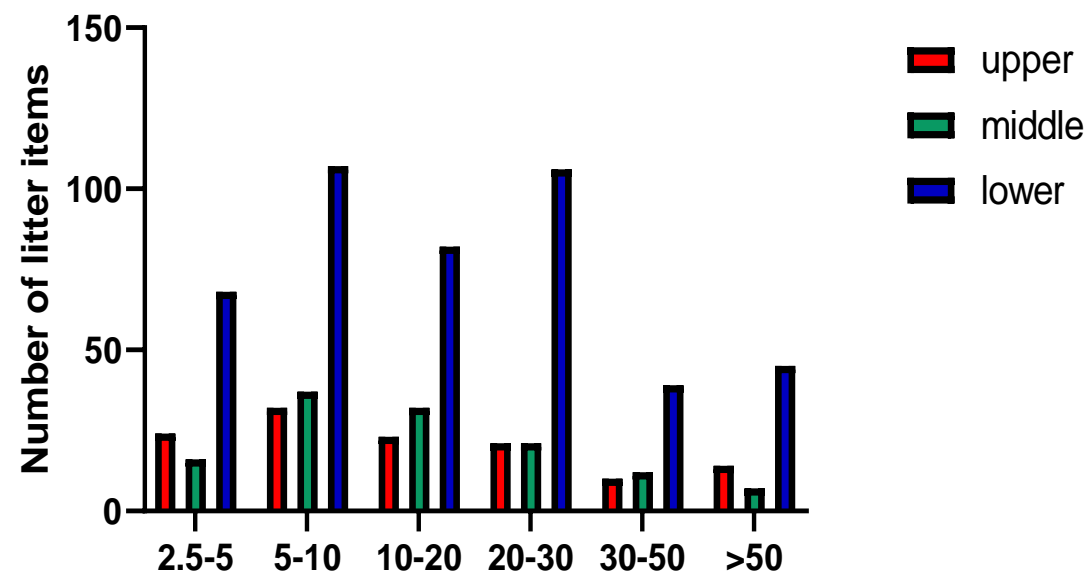




Plants in river **lower course** entrapped most MA.



$$\chi^2 (df=10) = 455.2, p < 0.05$$



$$H(df=10) = 9.478, p < 0.05$$

 The best efficient riparian plants in **entrapping** MA litter were:

1. *Populus spp.*
(51.6%)



2. *Salix spp.*
(19.0%)

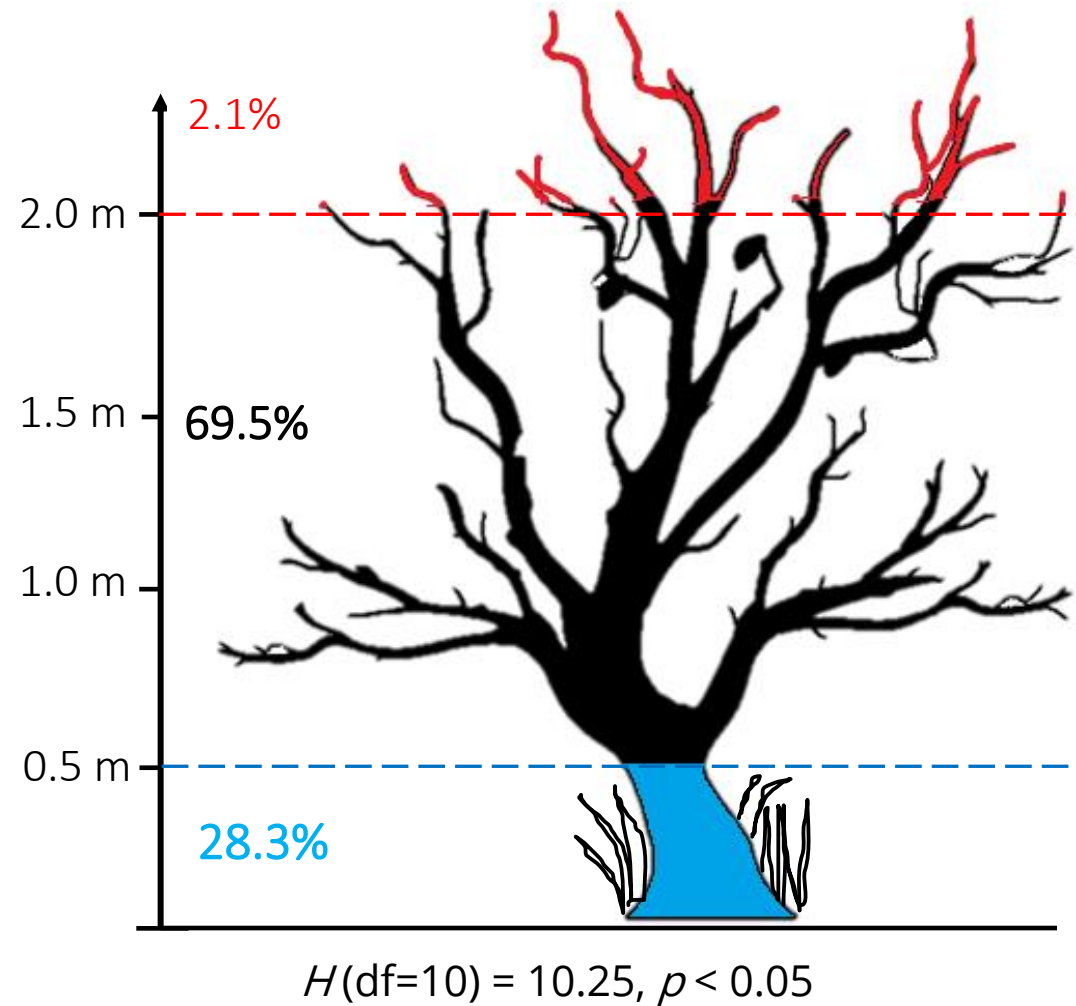


3. *Rubus ulmifolius*
(6.7%)





MA litter entrapped in **branches**.



Conclusions

plastic pollution
management

Riverine plastic
hotspot areas

Policy-making
decisions

Riverine plastic
transport

riparian vegetation
sustainable management



Thank you for
your attention!
Any questions?



Luca Gallitelli, M.Sc.



luca.gallitelli@uniroma3.it



@LucaGallitelli



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Outstanding Student & PhD
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Plastic can be used as **nesting** material and can affect animals due to **entanglement**.



Macroplastic litter might harm **riverine ecosystem services** (e.g. pollination).



Gallitelli and Scalici 2022, submitted

