

# Microplastic in Mediterranean Sea Salt: Types and Prevalence

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## BACKGROUND

The Mediterranean sea is a closed basin with limited water exchange. It is surrounded by 22 countries producing 10% of all plastic goods, making it the world's 4<sup>th</sup> largest plastic producer (WWF, 2019). Among those countries, 3 of them account for 2/3 of plastic leaked into nature including Egypt (42.5%), Turkey(18.9%), and Italy (7.5%).



Sites along its shores show the greatest densities of marine debris in the world. Evidences showed that plastic littered in the Mediterranean would float all around. Plastics in Western Mediterranean come from Spain and in Eastern Mediterranean from Turkey (European Parliament, 2019).

Shores in Cyprus represented the highest amount of microplastics after Hong Kong (Duncan, et al., 2018).

Knowing that the basin is a source of sea salt and salt is produced by the sole evaporation of sea water, growing evidence indicated that it is contaminated with microplastics.



## OBJECTIVE

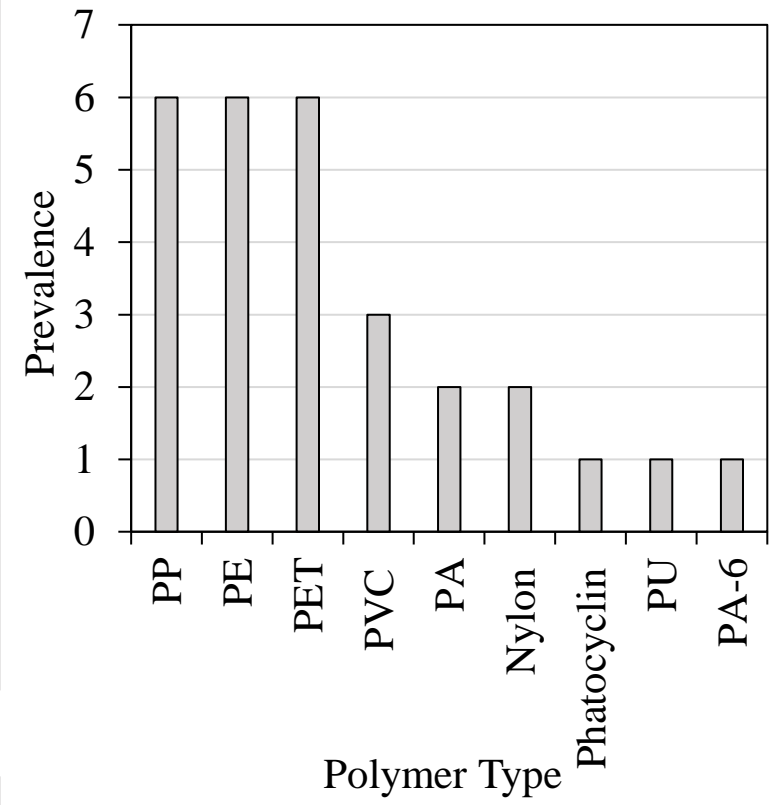
-  To conduct an assessment of microplastics in sea salt across the Mediterranean countries.
-  To identify missing data and estimate the exposure via the consumption of sea salt.

## METHODS

Published papers were collected from online databases.

In total, 7 published papers and 7 countries were assessed.

Origin	Salt brands (n)	Filter Pore size (µm)	Abundances (item·kg <sup>-1</sup> )	Polymer Type	Size (µm)	Shapes	Reference
Croatia	5	0.45	13500-19800	PP, PE	15-4628	80% fiber, knots, fragments films, granules	Renzi & Blaskovic. (2018)
	5	0.2	70-200	PA, PP, Nylon, PET, PVC	10-150	Most abundant: Fiber	Renzi <i>et al.</i> (2019)
	1	2.7	1-100	PP (most abundant), PE, PET, Nylon	100-5000	Fragments (most abundant), fiber	Kim <i>et al.</i> (2018)
France	6	149	0.2	Phthalocyanine, PE, PET, PP	160-980	Fragments, filaments, films	Karami <i>et al.</i> (2017)
	1	2.7	0	-	-	-	Kim <i>et al.</i> (2018)
Italy	6	0.45	22-594	PE, PP	4-2100	Fragments, fiber, films, foam, granules, tubular, unrecognized shape	Renzi & Blaskovic (2018)
	2	2.7	1-100	Nylon, PE, PP, PET, PVC	75-5000	Fragments (most abundant), fiber	Kim. <i>et al.</i> (2018)
	6	0.2	170-320	PVC (most abundant), PET	10-150	Most abundant fiber	Renzi <i>et al.</i> (2019)
Spain	21	9	50-280	PET, PE, PP, unknown particles	30-3500	-	Iniguez <i>et al.</i> (2017)
Turkey	5	0.2	16-84	PE, PET, PU, PP, PA-6, PVC	20-5000	Most abundant fiber, Fragments, films	Gundogdu (2018)
Silician Sea	2	11	220	PE, PET, PP	40-5000	Fibers (99.3%), fragments	Kosuth <i>et al.</i> (2018)
Med. Sea	5	11	266	Fibers and Particles	40-5000	Fibers (99.3%), fragments	Kosuth <i>et al.</i> (2018)



PP: Polypropylene, PE: Polyethylene, PET: Polyethylene terephthalate, PVC: Polyvinylchloride, PA-6: Polyamide-6, PU: Polyurethane, PA: Polyacrylate, PS: Polystyrene

## CONCLUSION

All (100%) the assessed sea salt samples obtained across the Mediterranean sea contained plastic fragments including propylene, polyethylene and polyethylene terephthalate. Data from 16 countries on the basin is still missing and further assessments are recommended.

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