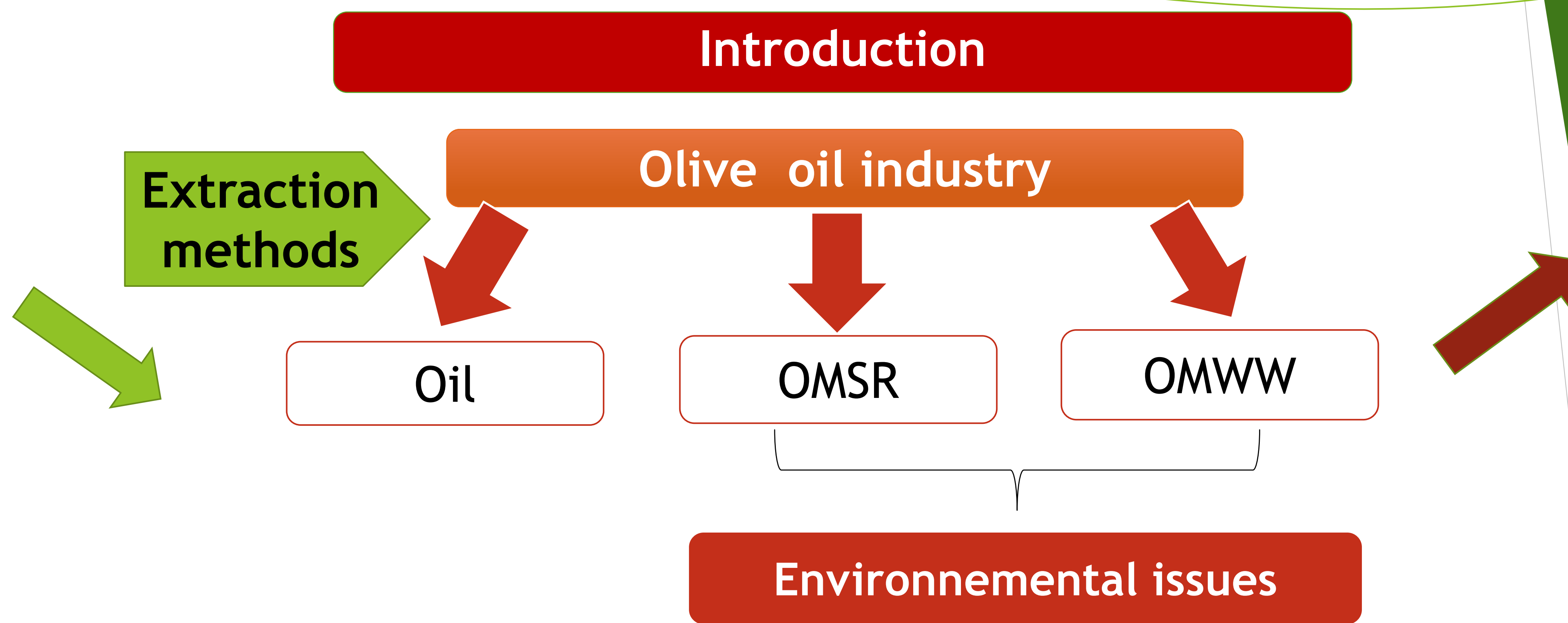


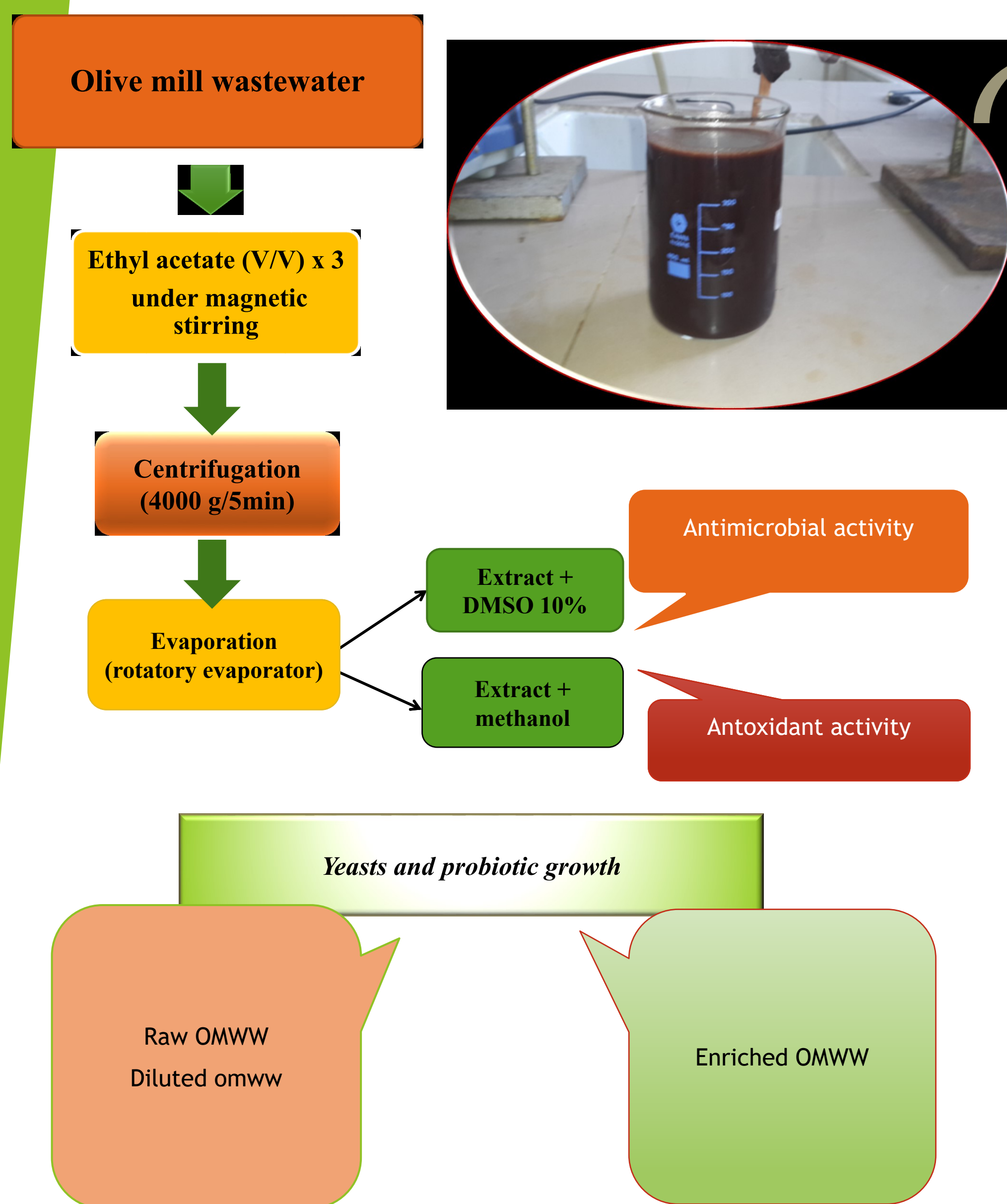
## Toward biotechnological conversion of olive oil mill by-products into valuable biomolecules and microbial biomass

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## Material and methods



## Results and discussion

Table 3. Cell growth (CFU/ml) assessment on OMWW1 and OMWW2 (\*) for lactobacilli.

Culture medium	Initial pH	Strain	Produced biomass yield	Final pH
M-Glu	4.91	Y	0	4.1
		CR	0	4.2
M-Gly	4.85	Y	0	4.11
		CR	0	4.2
DM	4.9	Y	5.6 × 10 <sup>4</sup>	4.79
		CR	5.3 × 10 <sup>5</sup>	4.77
DM-Glu	4.77	Y	1.1 × 10 <sup>5</sup>	4.01
		CR	8.9 × 10 <sup>5</sup>	4.3
DM-Gly	5.77	Y	5.3 × 10 <sup>5</sup>	4.05
		CR	5.2 × 10 <sup>5</sup>	4.09
M-MRS	5.22	LB <sub>4</sub>	6.5 × 10 <sup>7</sup>	4.02
		LB <sub>5</sub>	2.6 × 10 <sup>8</sup>	4
		LB <sub>6</sub>	6.7 × 10 <sup>7</sup>	5.1
DM	5.17	LB <sub>4</sub>	0	5.1
		LB <sub>5</sub>	0	5.01

Table 4. Produced biomass (CFU/ml) of *Yarrowia lipolytica* on OMWW1.

Cultivation medium	Final biomass	Produced biomass yield
M-Glu-Y	2.31 × 10 <sup>8</sup> ± 31*	0
M-Gly-Y	2 × 10 <sup>8</sup> ± 0*	0
DM-Y	1.47 × 10 <sup>8</sup> ± 32	0.56 × 10 <sup>8</sup>
DM-Glu-Y	2.05 × 10 <sup>8</sup> ± 10	1.1 × 10 <sup>8</sup>
DM-Gly-Y	6.5 × 10 <sup>8</sup> ± 7	5.3 × 10 <sup>8</sup>

(\*) Cell survival

Table 7. Produced biomass (CFU/ml) of *Lactobacillus rhamnosus* on OMWW1.

Medium	Final biomass	Produced biomass
M-MRS	6.7 × 10 <sup>8</sup> ± 2	6.5 × 10 <sup>8</sup>
DM	ND	0

Table 8. Produced biomass (CFU/ml) of *Lactobacillus casei* on OMWW1.

Medium	Final biomass	Produced biomass
M-MRS	2.75 × 10 <sup>8</sup> ± 7	2.6 × 10 <sup>8</sup>
DM	1.55 × 10 <sup>8</sup> ± 49.5*	0

(\*) Cell survival

Table 9(a). Inhibition zones diameters exhibited by OMWW1 polyphenolic extracts against the food spoiling and pathogenic bacterial strains (means ± SD)

	<i>Staphylococcus aureus</i>	<i>Bacillus cereus</i>	<i>Enterococcus faecalis</i>	<i>Bacillus megaterium</i>
M	12 ± 0	10 ± 0	9 ± 0.5	9 ± 0.5
M-Glu	8.5 ± 0.5	9.5 ± 0.5	9 ± 0	-
M-Gly	10 ± 0	10 ± 0	9.5 ± 0.5	6.5 ± 0.5
DM	11 ± 1	9.5 ± 0.5	8.5 ± 0.6	-
CR	8.5 ± 0.5	7 ± 0	9 ± 0	7.5 ± 0.5
M-Gly	8.5 ± 0.5	8.5 ± 0.5	7 ± 0	7 ± 0.5
DM	7.5 ± 0.5	8 ± 0	-	-
CR	7.5 ± 0.5	9 ± 1	-	-
DM	7.5 ± 0.5	8 ± 0	-	-
CR	7.5 ± 0.5	8 ± 0	-	-
DM	9.5 ± 0.5	8.5 ± 0.5	-	7.75 ± 0.25
DM	8 ± 0	8.5 ± 0.5	-	7 ± 0
DM	9 ± 0	9 ± 0	9 ± 0	7.75 ± 0.25
CR	7 ± 0.5	9.5 ± 0.5	8 ± 0	9 ± 0
M-MRS	8.5 ± 0.5	8.5 ± 0.5	8 ± 0	10 ± 0.5
LB <sub>4</sub>				
M-MRS				
LB <sub>5</sub>				

DM	9.5 ± 0.5	9.5 ± 0.5	8 ± 0	6.5 ± 0.5
LB	9 ± 0	9 ± 1	8 ± 0	7 ± 0.5
DM	8.5 ± 0.5	8.5 ± 1.5	7.5 ± 0.5	6.75 ± 0.5
LB	7.5 ± 0.6	9 ± 0	7 ± 0	8.5 ± 0.5
DM	10 ± 0	9.5 ± 0.5	7.5 ± 0.5	8.25 ± 0.75
Y	9.5 ± 0.5	9 ± 1	7.5 ± 0.5	7.5 ± 0.5
CR				

**Results:** The results reveals that raw OMWW exert a strong inhibition against yeasts and bacteria while substrate pretreatment led to cell growth and polyphenol biodegradation by yeasts. Moreover, polyphenolic extracts provide a wide antimicrobial spectrum against pathogenic and food spoiling bacteria

## Conclusion

OMWW could be considered as valuable substrate for microbial biomass production and bioactive compounds recovery