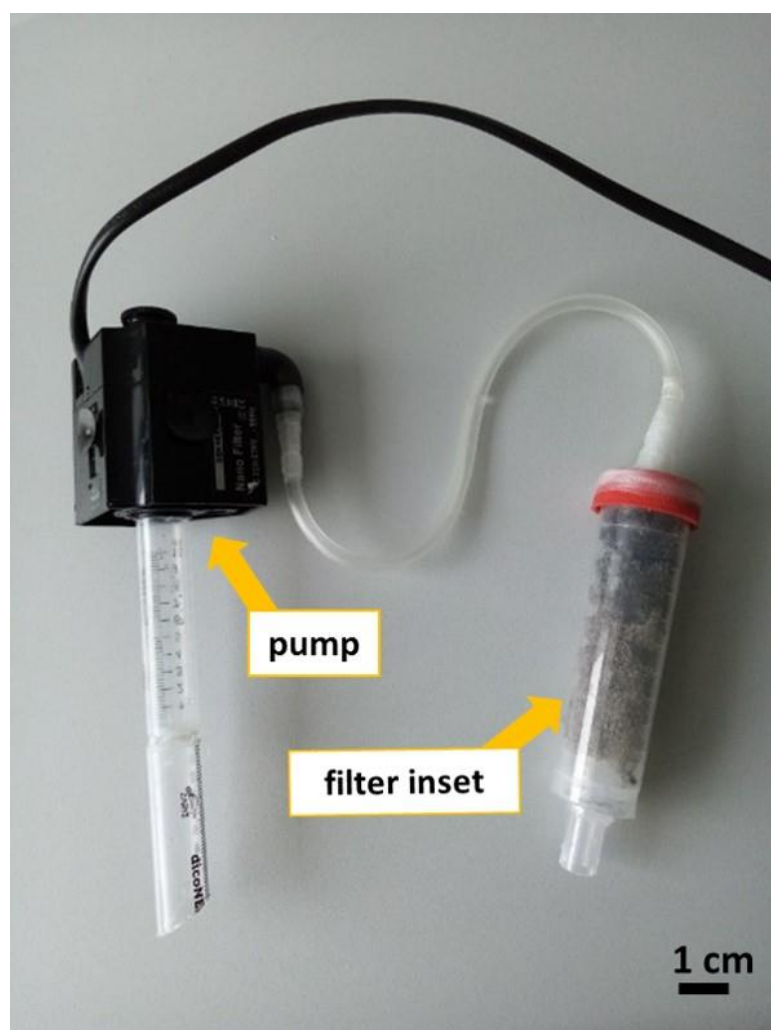


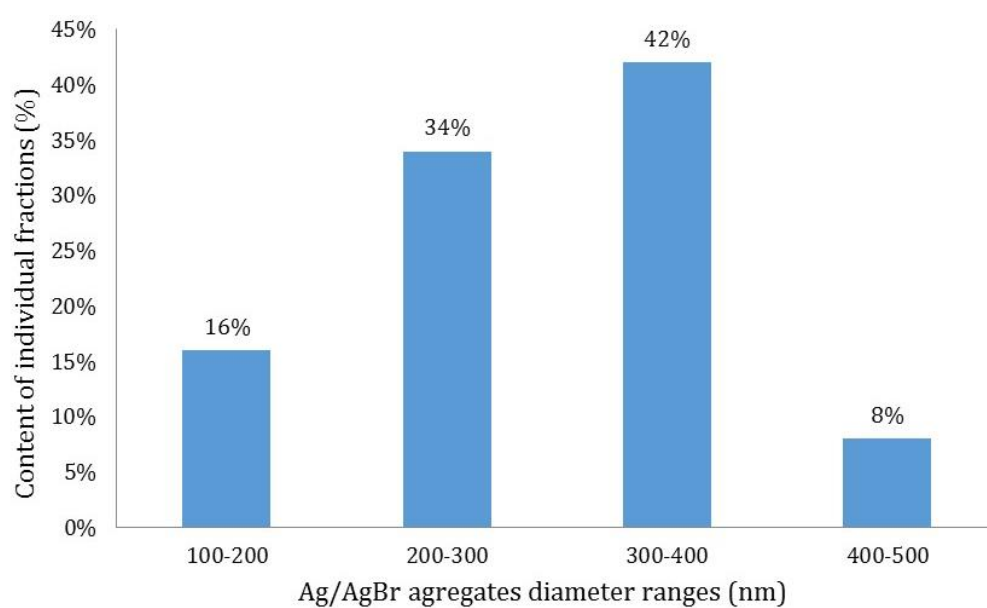
# Functionalization of 3D Chitinous Skeletal Scaffolds of Sponge Origin Using Silver Nanoparticles and Their Antibacterial Properties

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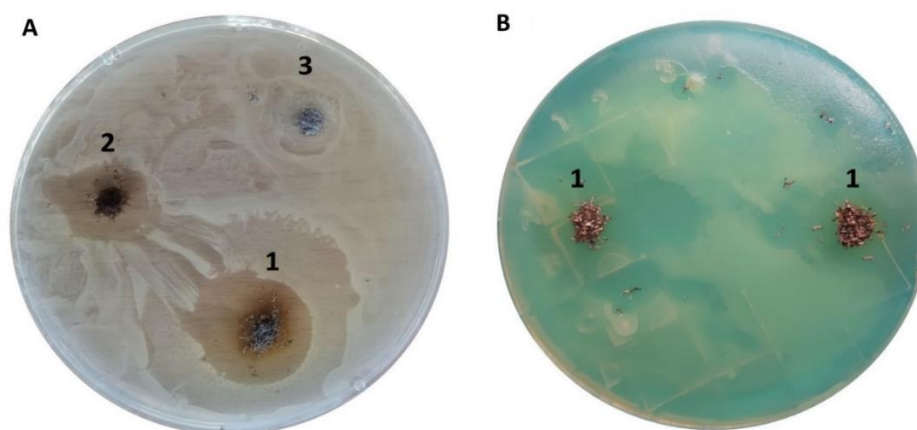
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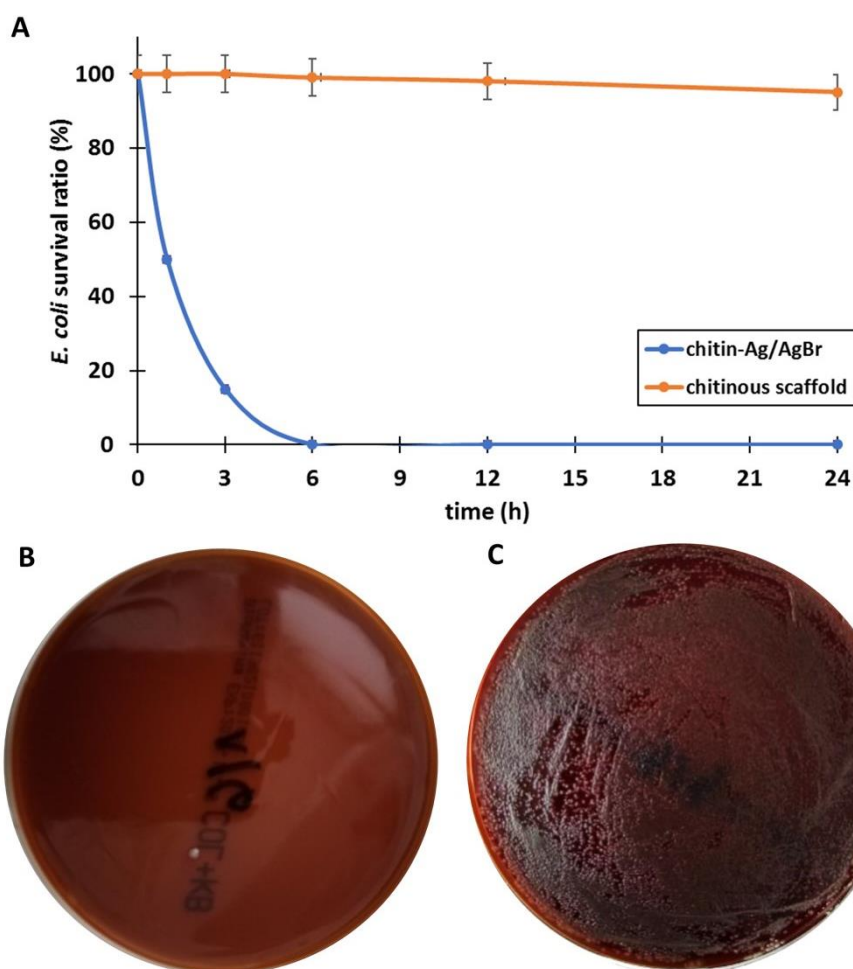
**Figure S1.** The prototype of the filtration set used in this study.



**Figure S2.** Percentage of Ag/AgBr nano-aggregates in individual fractions as a function of diameter ranges.



**Figure S3.** Results obtained with the agar diffusion method. (A) Antimicrobial activity of 3D chitin-Ag/AgBr scaffold (1), chitinous scaffold before metallization (2) against *E. coli*. Lack of antimicrobial activity has been observed by using of “Suprasorb® A + Ag” material (3). (B). The antimicrobial activity of 3D chitin-Ag/AgBr scaffold (1) against *B. subtilis*.



**Figure S4.** Dynamics of the degradation of live bacteria colonies as a function of time of filtration with 5% error bars (A). Filtration clearly indicate that 3D chitin-Ag/AgBr scaffold possess antibacterial properties against *E. coli* (ATCC® 25922) strain (blue line). Br-containing chitinous scaffold before AgNPs coating did not reflect any antibacterial effect. The number of survived bacteria’s colony was uncountable, even after 24 h (orange line). Only one colony of *E. coli* survived after 24 h of filtration using chitin-Ag/AgBr scaffold (B). Br-containing chitinous scaffold without silver coating did not show antibacterial activity against *E. coli* even after 24 h (C).

**Table S1.** Results of 3D quantitative analysis (Micro-CT).

| Material                    | Porosity | Average pore size ( $\pm$ SD)                  | Average fiber size ( $\pm$ SD)              |
|-----------------------------|----------|------------------------------------------------|---------------------------------------------|
| chitinous scaffold (2)      | 98.5%    | 1350 $\mu\text{m}$ ( $\pm$ 400 $\mu\text{m}$ ) | 72 $\mu\text{m}$ ( $\pm$ 17 $\mu\text{m}$ ) |
| chitin-Ag/AgBr scaffold (3) | 98.2%    | 1300 $\mu\text{m}$ ( $\pm$ 300 $\mu\text{m}$ ) | 71 $\mu\text{m}$ ( $\pm$ 18 $\mu\text{m}$ ) |

**Table S2.** Results of local chemical analyses (SEM-EDX) of selected areas of the *A. aerophoba* chitinous scaffold after metallization.

| Element | At % |
|---------|------|
| C       | 28.1 |
| O       | 26.3 |
| Mg      | 1.8  |
| Si      | 2.3  |
| S       | 0.5  |
| Cl      | 0.8  |
| Ag      | 32.9 |
| Br      | 7.1  |