**Supporting Information**

# Mycelia promote active transport and spatial dispersion of polycyclic aromatic hydrocarbons

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**Table S1**. Selected physico-chemical properties and amounts of PAH added to the agar test track for spatiotemporal quantification of transport of PAH-mixtures.

| ***Name of PAH*** | ***Abbreviation*** | ***Molar Mass*** *(g)* | ***No. of rings*** | ***Log*** $K_{OW}$ *(-)* | ***Amount added*** *(nmol)* | ***Log*** $P_i$ *(Pa)* |
|---|---|---|---|---|---|---|
| Naphthalene | *NAH* | 128.2 | 2 | 3.33 | 1.95 | 1.05 |
| Acenaphthylene | *ACN* | 152.2 | 3 | 4.00 | 1.64 | -0.05 |
| Acenaphthene | *ACA* | 154.2 | 3 | 4.20 | 1.62 | -0.51 |
| Fluorene | *FLU* | 166.2 | 3 | 4.32 | 1.50 | -1.02 |
| Phenanthrene | *PHE* | 178.2 | 3 | 4.57 | 1.40 | -1.66 |
| Anthracene | *ANT* | 178.2 | 3 | 4.68 | 1.40 | -3.01 |
| Fluoranthene | *FLA* | 202.3 | 4 | 5.23 | 1.24 | -2.91 |
| Pyrene | *PYR* | 202.3 | 4 | 5.13 | 1.24 | -3.09 |
| Chrysene | *CHR* | 228.3 | 4 | 5.81 | 1.10 | -6.22 |
| Benzo[a]anthracene | *B[a]A* | 228.3 | 4 | 5.91 | 1.10 | -4.60 |
| Benzo[b]fluoranthene | *B[b]F* | 252.3 | 5 | 6.11 | 0.99 | -6.15 |
| Benzo[k]fluoranthene | *B[k]F* | 252.3 | 5 | 6.11 | 0.99 | -6.20 |
| Benzo[a]pyrene | *B[a]P* | 252.3 | 5 | 6.13 | 0.99 | -6.15 |
| Indeno[1.2.3-cd]pyrene | *I[123-cd]PY* | 276.3 | 6 | 6.70 | 0.90 | -7.28 |
| Dibenz(a.h)anthracene | *DB[ah]A* | 278.4 | 5 | 6.70 | 0.90 | -7.40 |
| Benzo[ghi]perylene | *B[ghi]P* | 276.3 | 6 | 6.79 | 0.90 | -7.80 |

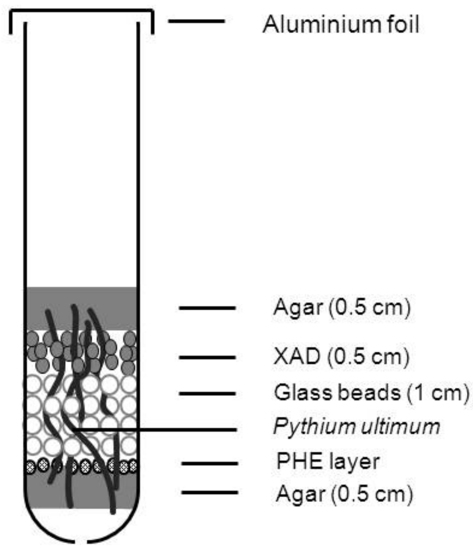



**Figure S1.** Schematic diagram of the column test track mimicking porous air-filled soil habitats for quantification of PHE transport. A circular piece of PDA inoculated with *P. ultimum* and sprinkled with 20 mg of solid PHE was placed at the bottom of a sterile glass test tube and overlaid with a 1 cm layer of glass beads and 0.5 cm of cleaned XAD4 resin to effectively entrap PHE transported. Another circular piece of PDA was placed on the top to promote growth of *P. ultimum*. The test tube was loosely covered with aluminium foil.

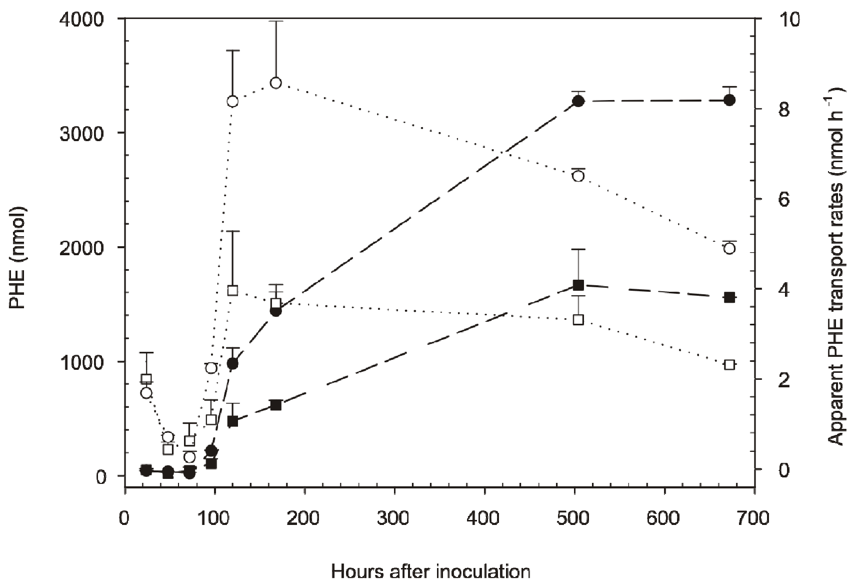



**Figure S2.** Time course of the amount of PHE extracted from XAD4 resins after inoculation of *P. ultimum* at the bottom of the column test track for the quantification of PHE transport (Fig. S1) in presence (filled circles) and absence (control, filled squares) of mycelia of *P. ultimum*. Data are the means and standard errors of n ≥ 3 replicates. *P. ultimum* needed approximately 72 h to reach the XAD4 resin. The open symbols represent the apparent calculated transport rates of PHE in presence (circles) and absence of mycelia (control, squares) and refer to the right y-axis.

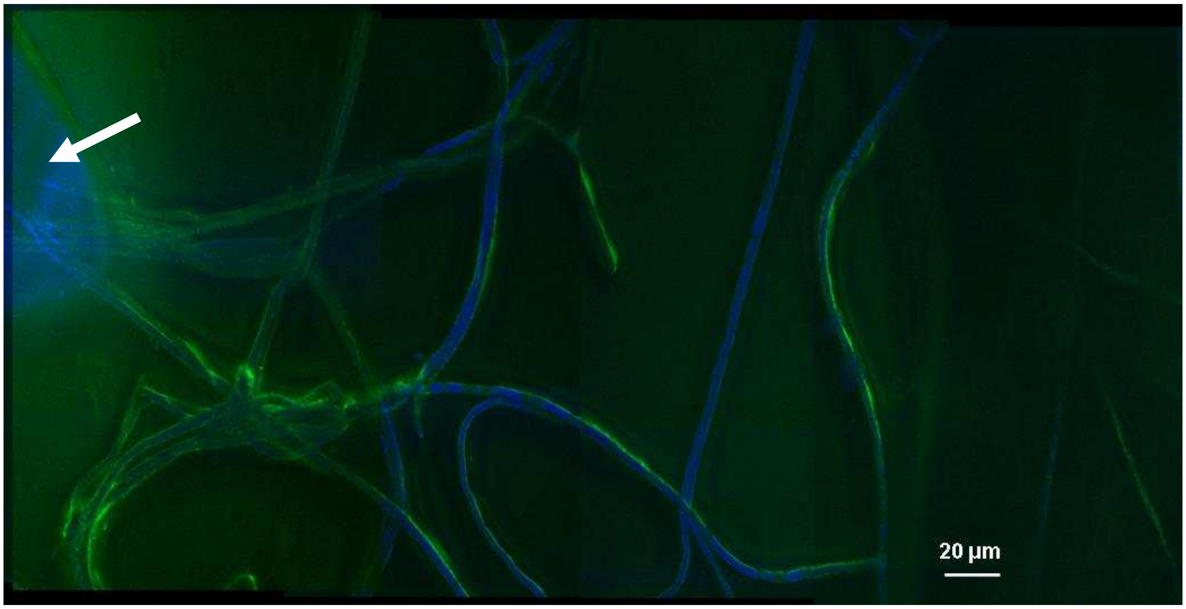
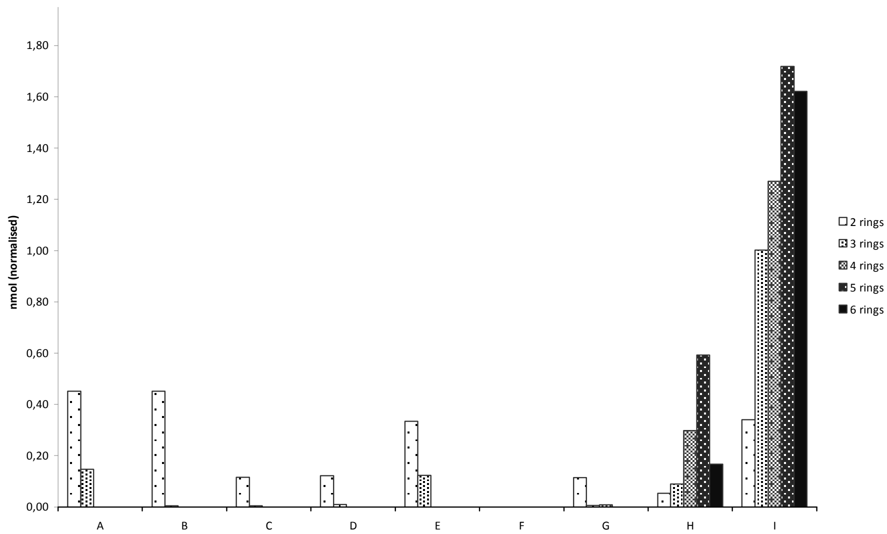
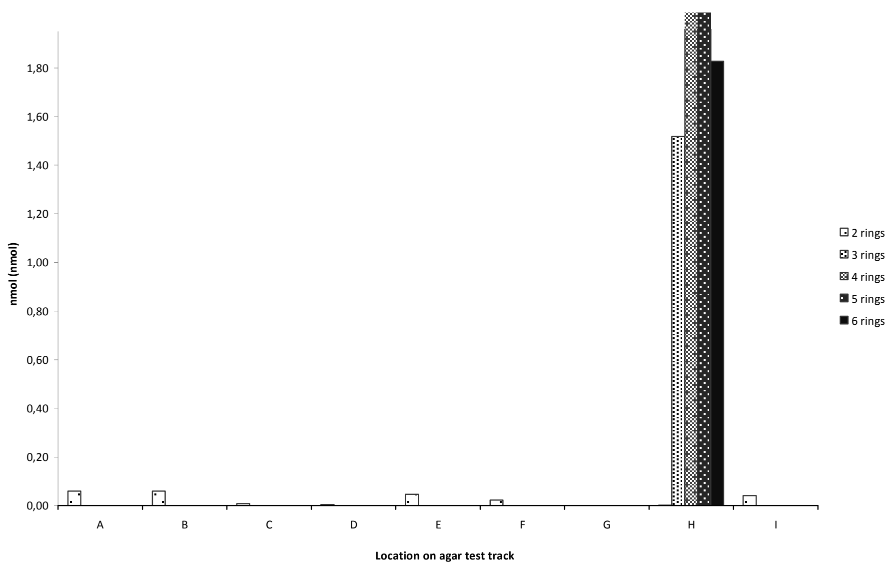



**Figure S3.** Sequence of two-photon excitation micrographs visualizing the accumulation and spatial dispersion of PHE (in blue) inside the hyphae of *P. ultimum* (in green) after 24 h. PHE was added by depositing a drop of an aqueous PHE solution onto the mycelium. The PHE source is indicated by the arrow.




**A**




**B**

**Figure S4. D**istribution of 2-ring (white), three-ring (shaded grey), four-ring (solid grey), five-ring (shaded black) and six-ring (solid black) PAH 24 h after the addition of the artificial oil to PosH in presence (Fig. S4A) and in the absence of *P. ultimum* (Fig. S4B). Data are the means of n = 3 replicates. As equal weight concentrations (0.25 µg per 10 µL) instead of equal molarities of the PAH were added, transport rates of individual PAH were normalised to the mol amount of NAH (1.95 nmol) for better readability of the values. Letters on the x-axis refer to Fig. 1.