Supplementary Materials

Fluorescence excitation spectra of the fungal samples without normalization

The Figure S1 shows the same spectra as in Figure 2a, 2b, but without normalization to the fluorescence band maximum. Comparison of Figures S1(a,b) and 2 (a,b) explains why the spectral curve in Figure 2a (At) strongly differs from the others shown on the same Figure (low fluorescence intensity does not allow one to reveal the band maximum).

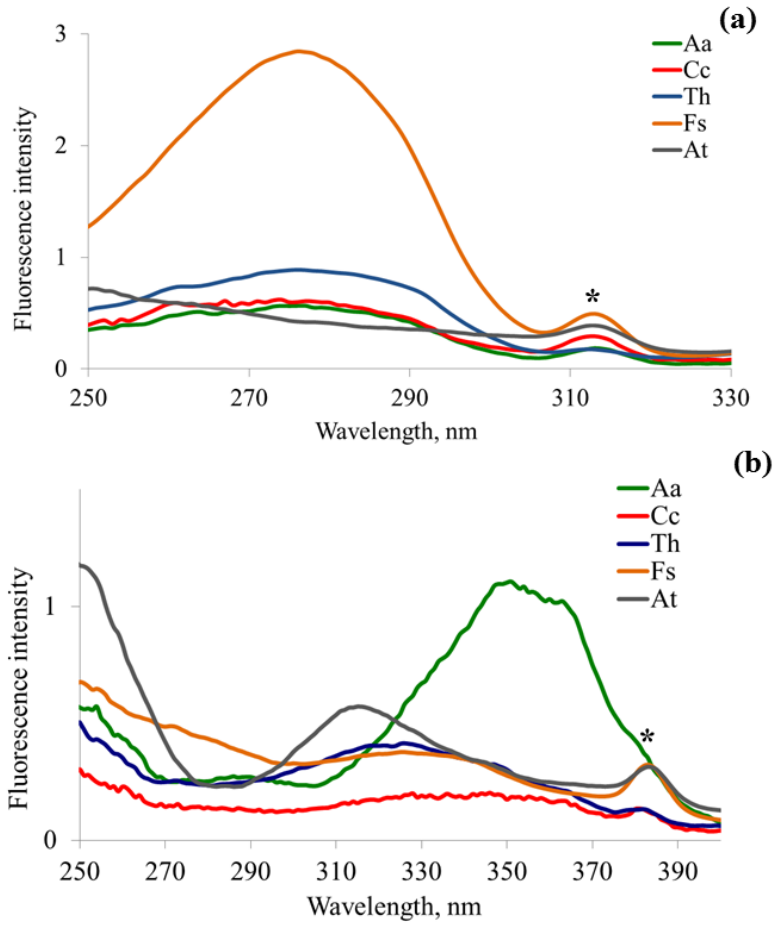

Figure S1. Fluorescence spectra (without normalization) of the fungal samples grown on agar medium: a – excitation spectra with emission at 350 nm for *Alternaria alternata* (Aa), *Cladosporium cladosporioides* (Cc), *Trichoderma harzianum* (Th), *Fusarium solani* (Fs), and *Aspergillus terreus* (At); b – excitation spectra with emission at 440 nm for Aa, Cc, Th, Fs, At; c – emission spectra for Aa; d – emission spectra for Cc; e – emission spectra for Th; f – emission spectra for Fs, g – emission spectra for At.

Comparison of the normalized fluorescence emission spectra for the same fungal culture grown on agar medium (AM) and liquid medium (LM).

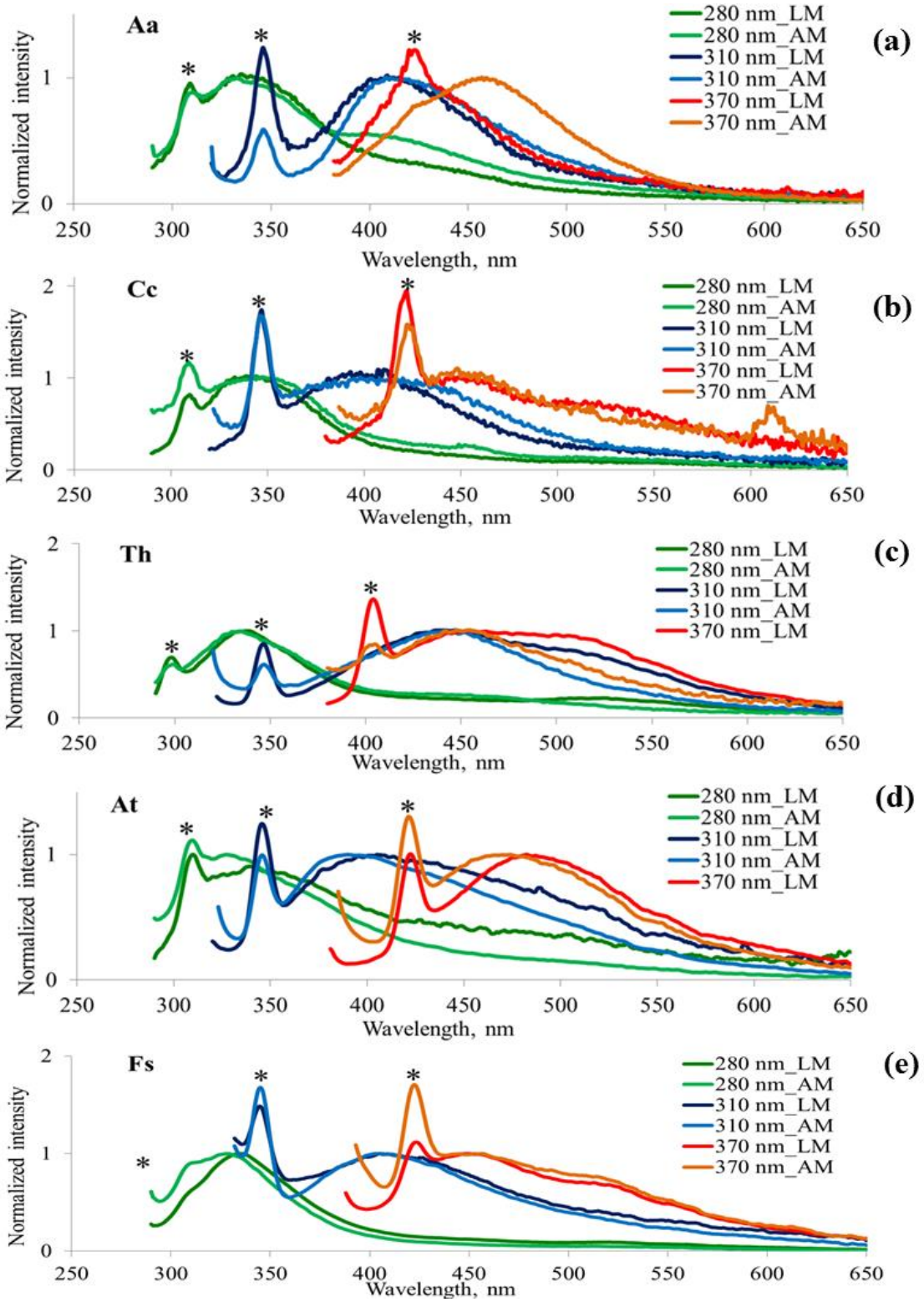

Figure S2. Fluorescence spectra of the fungal samples grown on agar medium (AM) and liquid medium (LM): a – excitation spectra for *Alternaria alternata* (Aa), b - *Cladosporium cladosporioides* (Cc), c - *Trichoderma harzianum* (Th), d - *Aspergillus terreus* (At), and *e* - *Fusarium solani* (Fs). The fluorescence emission spectra were measured with excitation at 280, 310, or 370 nm, and then normalized by emission intensity at maximum of the fluorescence band.

Comparison of the normalized fluorescence emission spectra for fungal cultures excited with the same excitation wavelength (280, 310 or 370 nm).

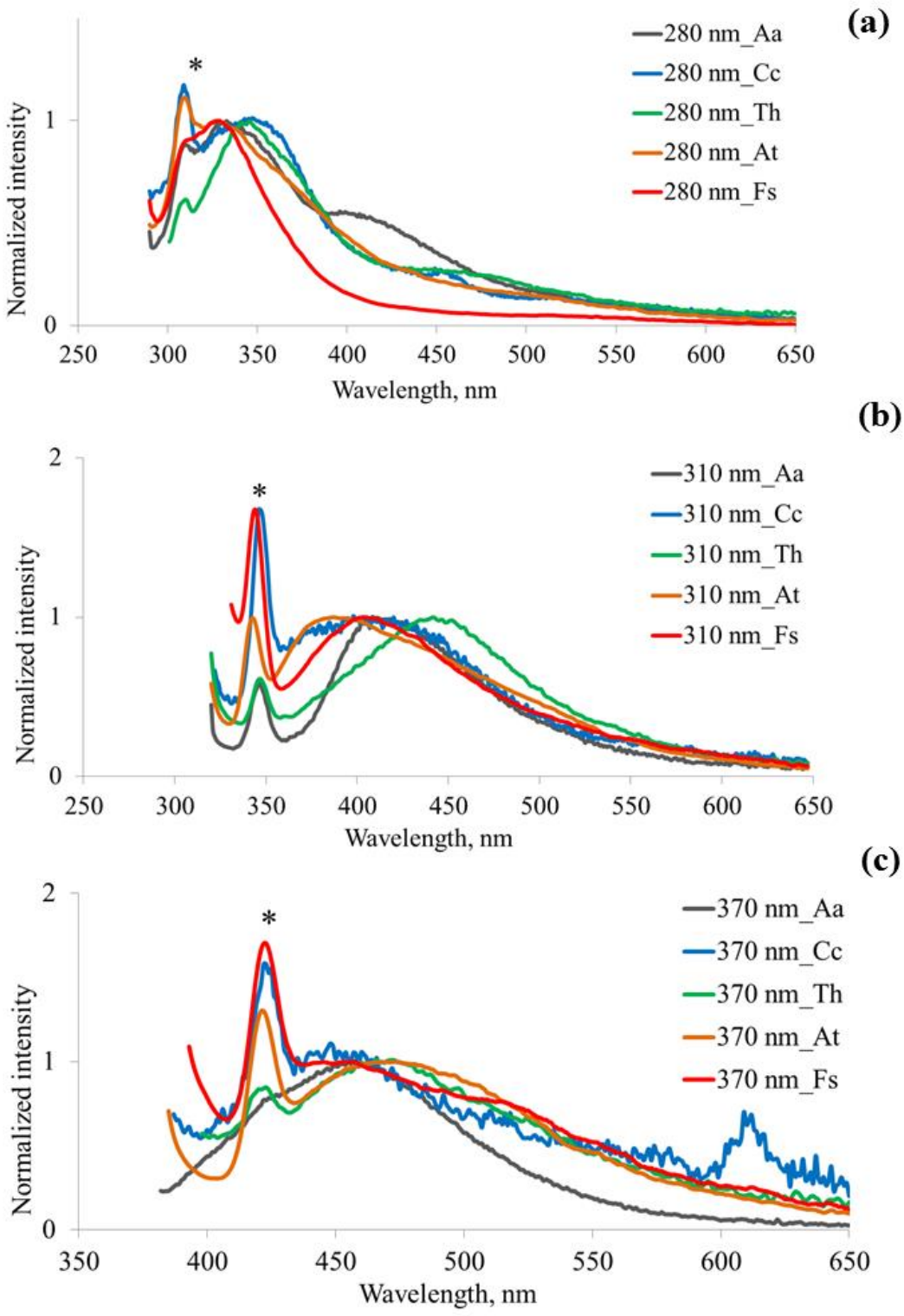

Figure S3. Fluorescence emission spectra of the fungal samples grown on agar medium: emission spectra with excitation at 280 (a), 310 (b), or 370 (c) nm for *Alternaria alternata* (Aa); *Cladosporium cladosporioides* (Cc); *Trichoderma harzianum* (Th); *Fusarium solani* (Fs), and *Aspergillus terreus* (At). The fluorescence emission spectra were normalized by emission intensity at maximum of the fluorescence band. The star indicates the position of water Raman scattering band.

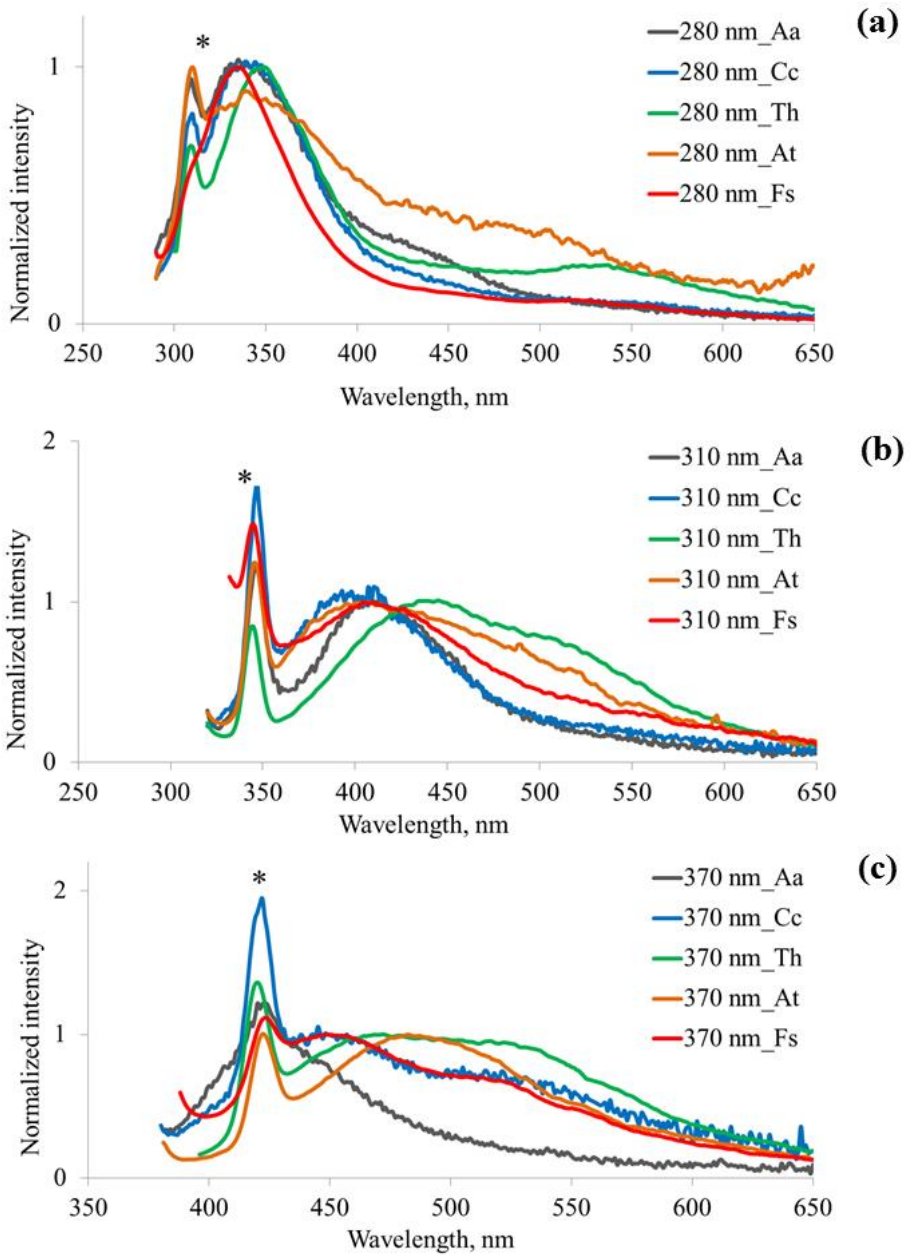

Figure S4. Fluorescence emission spectra of the fungal samples grown on liquid medium: emission spectra with excitation at 280 (a), 310 (b), or 370 (c) nm for *Alternaria alternata* (Aa); *Cladosporium cladosporioides* (Cc); *Trichoderma harzianum* (Th); *Fusarium solani* (Fs), and *Aspergillus terreus* (At). The fluorescence emission spectra were normalized by emission intensity at maximum of the fluorescence band. The star indicates the position of water Raman scattering band.

Illustration of the complex nature of the fluorescence spectrum excited at 280 nm.

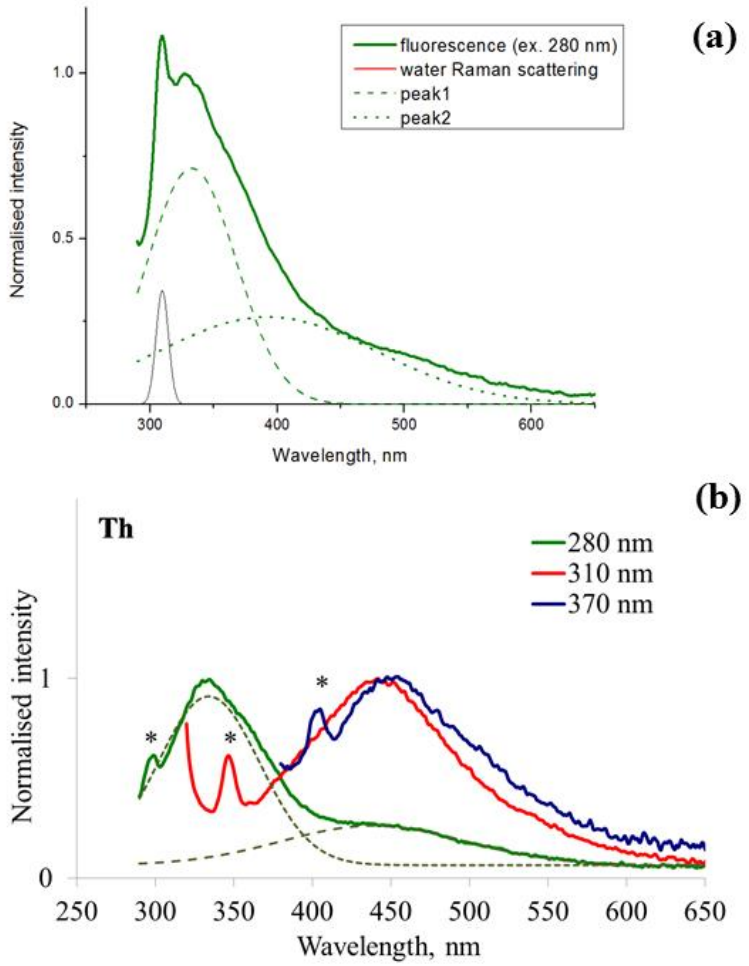

Figure S5. Illustration of decomposition of the emission band at excitation at 280 gm for *Trichoderma harzianum* grown on a liquid medium into two Gaussians (a). Normalised fluorescence emission spectra of *Trichoderma harzianum* (Th) grown on liquid medium with Gaussian decomposition.

Correlation of protein-like fluorescence and conidia formation.

Figure S6 shows the graphs with correlation and regression equations for data on conidia formation, in units of conidia per cm^3, and intensity of protein-like fluorescence with maximum at 350 nm. Typical fluorescence spectra of conidia fungal samples in an aqueous medium excited at 280 nm consisted of two emission bands: a protein-like fluorescence with a maximum at 350 nm and a blue fluorescence with a maximum at 460 nm. The intensity of protein-like fluorescence at 350 nm was found correlating with the amount of conidia number in water suspension; larger is sporulation intensity, higher is fluorescence intensity. Though the dependence of fluorescence intensity was not linear versus conidia biomass, we found a good correlation between these two values; the Pearson correlation coefficients (R at p=0.05) between data on conidia formation, in units of conidia per cm3, and maximum of fluorescence at 350 nm were 0.85 and 0.82 for *A. alternaria* and *T. harzianum*, respectively (Figure S6). These correlations were received for a quite large number of fungi samples grown on different variants of agar media saturated by sucrose (30 g L^{-1}) and with a reduced amount of sucrose (3 g L^{-1}), in the presence of humic preparations, as well as in their absence. There were also other complications, such as the dependence of protein-like fluorescence intensity on the age and physiological state of fungal cultures. During the maturation of the *T. harzianum* cultures, conidia change their colour from yellow to green, and with an equal level of conidia formation, yellow-coloured conidia are less fluorescent at 350 nm (excited at 280 nm) than green-coloured conidia. Given such difficulties, we estimate as good the correlation of conidia biomass and fluorescence intensity measured at 350 nm with 280 nm excitation.

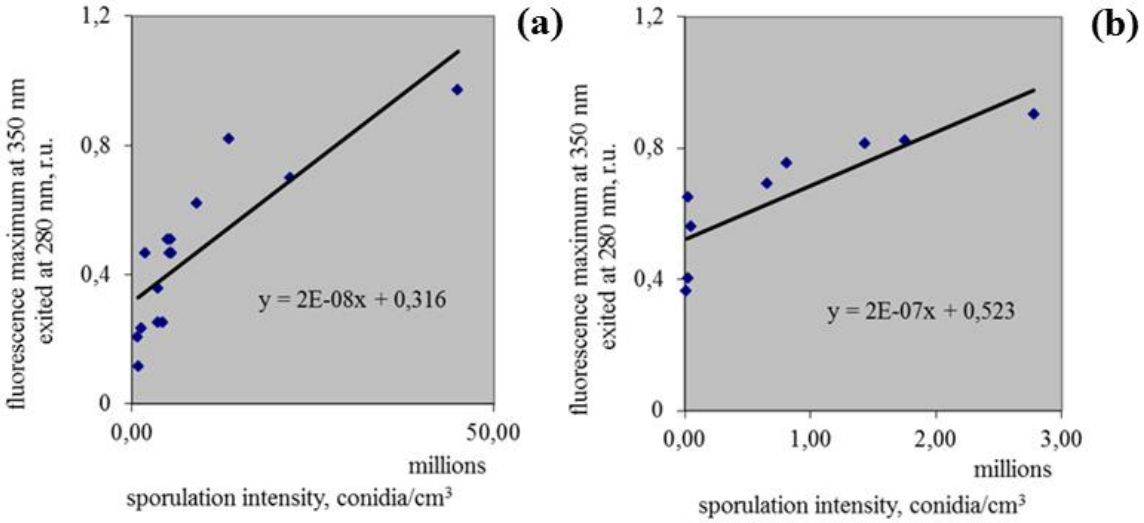

Figure S6. Regression equations for fluorescence intensity registered at 350 nm with 280 nm excitation and sporulation intensity for a *Trichoderma harzianum* (a), b *Alternaria alternata* (b). Taken from (Fedoseeva et al., 2021) and modified

Fig. 7S shows the distribution on the PCA plot for all biological replications of the experimental samples.

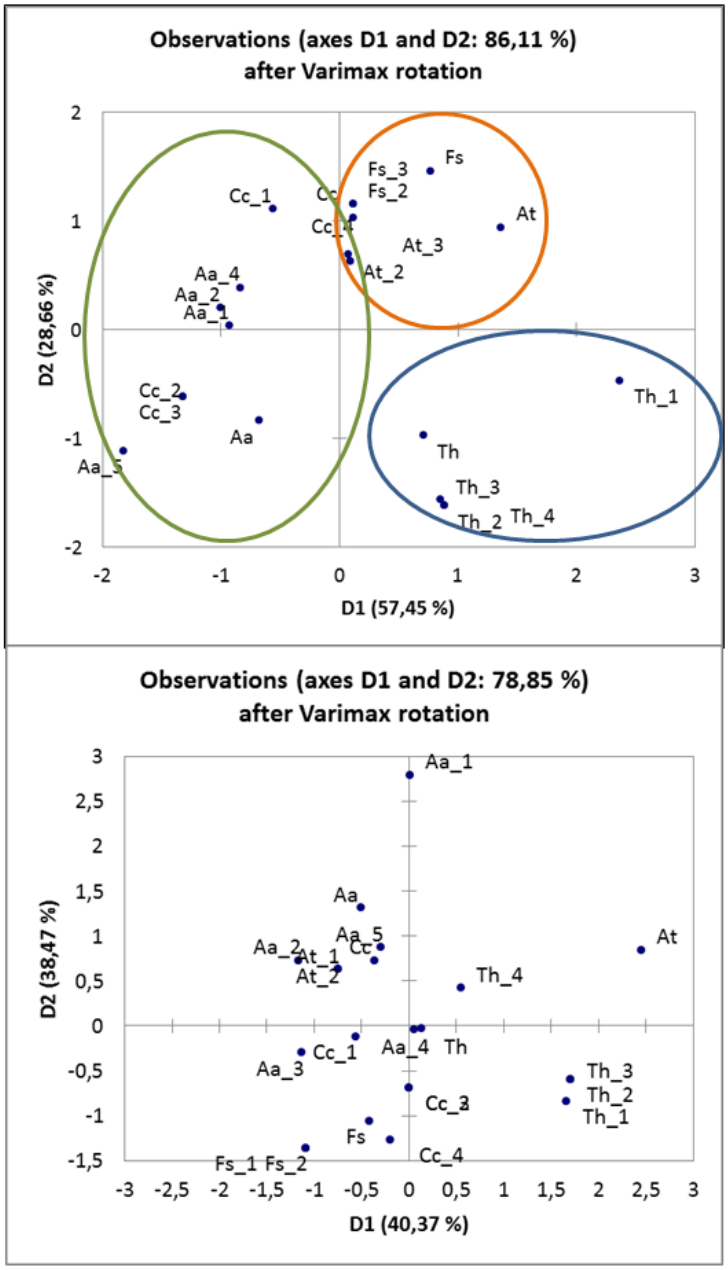

Figure 7S. Discrimination of fungal samples with PCA: fluorescence data at excitation at 280 nm (a), at 310 nm (b)