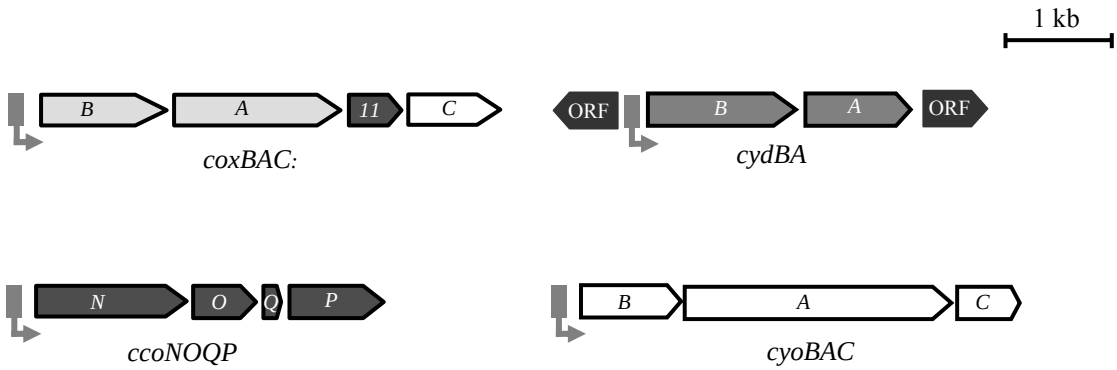
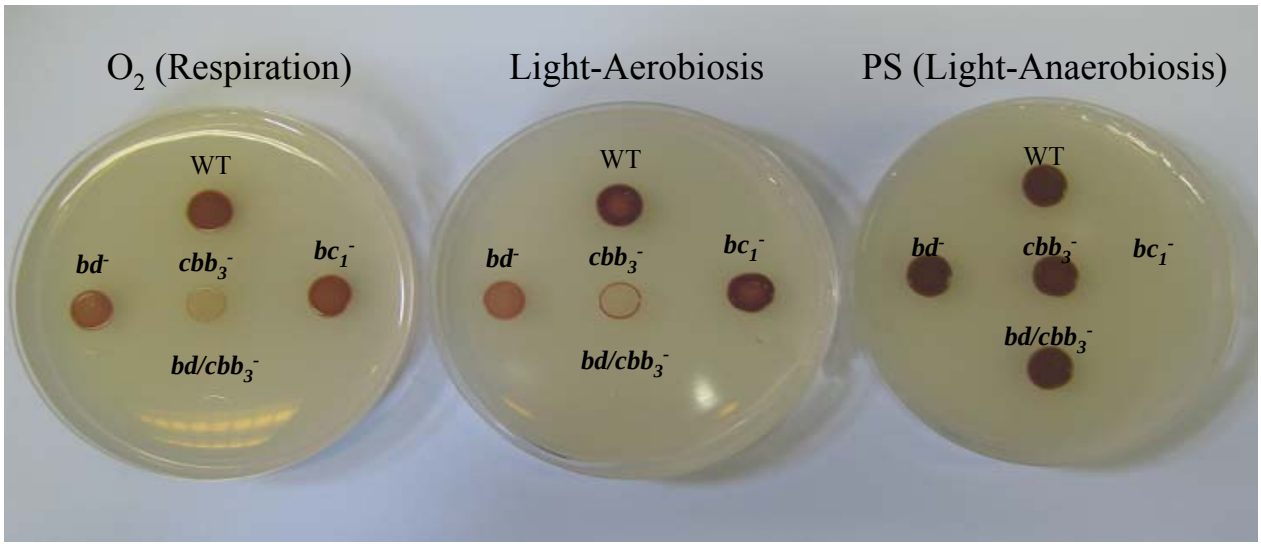
Khalfaoui_ Fig. S1




**Supplemental figure S1**

Organisation of terminal oxidase operons identified in *R. gelatinosus*. The *coxBAC* and *ccoNOQP* operons encode $caa_3$ and $cbb_3$ cytochrome *c* oxidases respectively. *cox11* encodes an assembly factor. The *cydBA* and *cyoBAC* encode *bd* and *bo* quinol oxidases. ORF are open reading frames with unknown function.

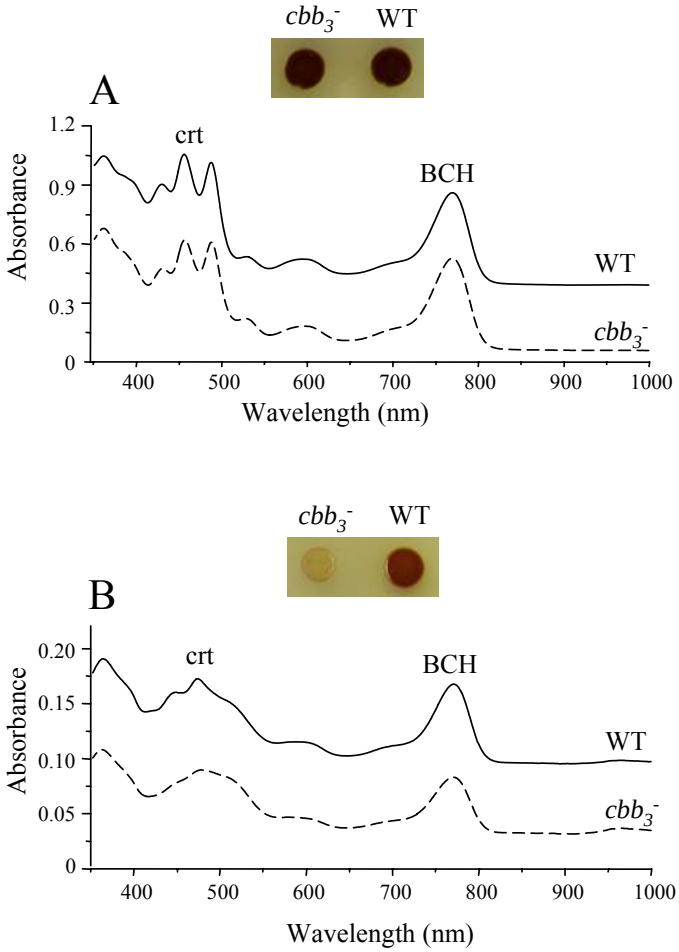
Khalfaoui_Fig. S2




**Supplemental figure S2**

Growth of different strains (wild type, *bd*$^-$, *cbb*$_3^-$, *bc*$_1^-$ and *cbb*$_3^-$-*bd*$^-$) on plates under respiration (dark, oxygen), under light with oxygen and under strict anaerobic photosynthetic conditions (light without oxygen). The double mutant *cbb*$_3^-$-*bd*$^-$ can grow only by strict anaerobic photosynthesis, in this condition the *bc*$_1^-$ mutant is photosynthesis deficient.

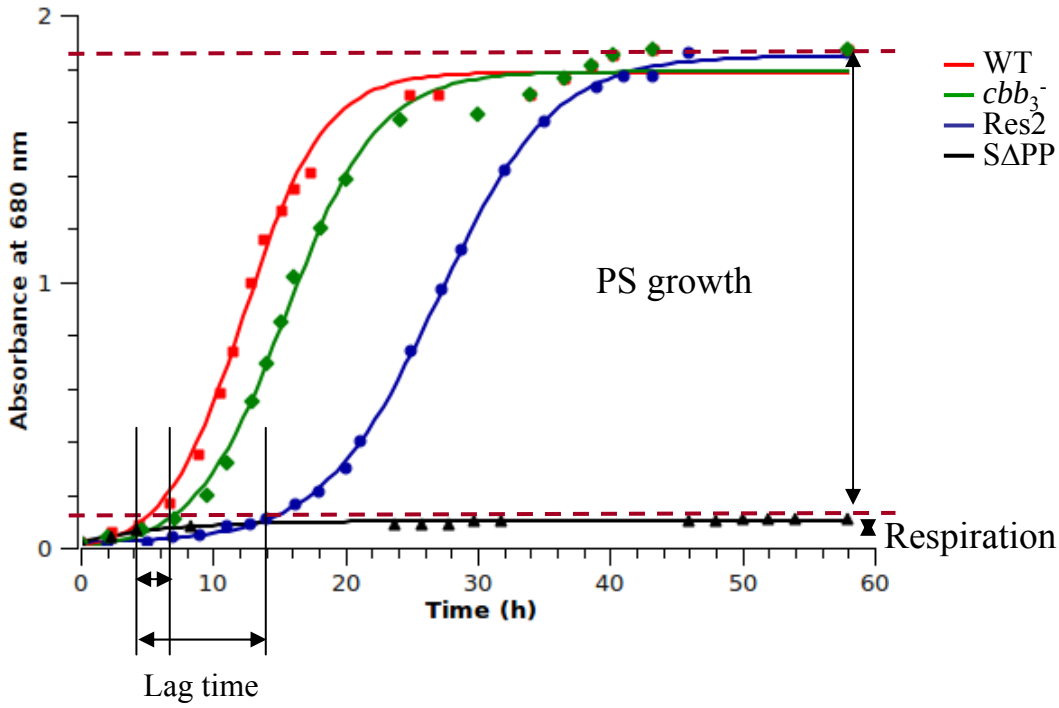
Khalfaoui_ Fig. S3




**Supplemental figure S3**

Absorption spectra of pigment extracts from the wild type (solid line) and *cbb*$_3$$^-$mutant (dashed line) cells grown under photosynthetic (**A**) and semi-aerobic (**B**) conditions. BCH and crt are bacteriochlorophyll and carotenoids respectively. The zero level of the upper spectra was shifted for better viewing.

Khalfaoui_ Fig. S4

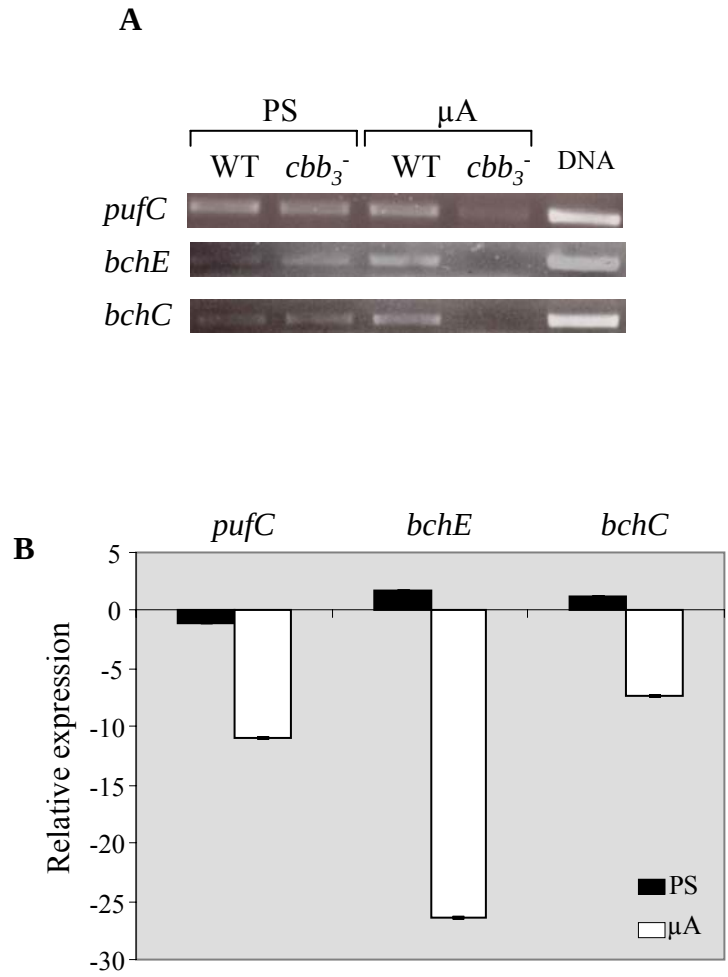



**Supplemental figure S4**

Growth curves of the wild type, the *cbb*$_3^-$ mutant, the Res2 suppressor, and the photosynthesis deficient strain SΔPP. Filled tubes were inoculated with semi-aerobic grown cells and shifted into photosynthesis growth conditions. The photosynthesis deficient strain SΔPP grew by respiration up to 0.12 $OD_{680}$. The WT resumed photosynthetic growth after a lag phase of 4 hours, the *cbb*$_3^-$ strain exhibited a lag phase of 7 hours, whereas the Res2 mutant started photosynthetic growth after 14 hours post inoculation.

Once photosynthetic growth started, the doubling time were comparable for the three strains.

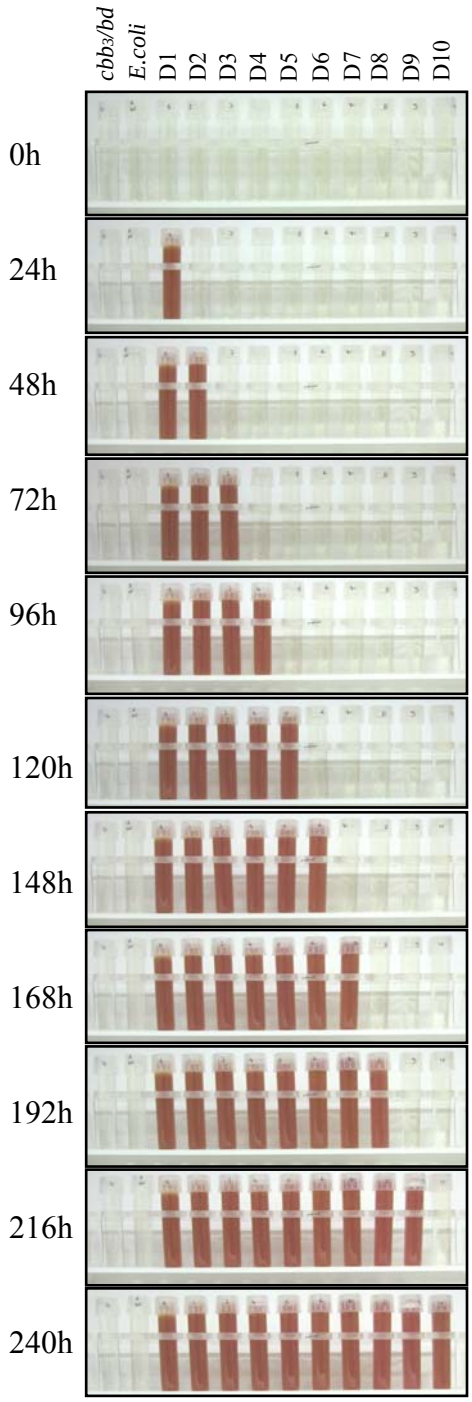
Khalfaoui_ Fig. S5




**Supplemental figure S5**

Accumulation of three photosynthesis gene transcripts in the $cbb_3^-$ mutant and the wild type of *R. gelatinosus*. (A) RT-PCR and qPCR (B) were performed with 2µg RNA isolated from the wild type (WT) and the $cbb_3^-$ mutant grown under photosynthesis (PS) or microaerobic (µA) (2 % oxygen) conditions. RT-PCR was performed to check the accumulation of *bchE*, *bchC* transcripts involved in bacteriochlorophyll biosynthesis and of *pufC* encoding the for the tetraheme subunit of the reaction centre. PCR on genomic DNA shows the bands of the expected size with the used primers.Quantification of transcript levels analyzed by RT-PCR by using qPCR. We determined the absolute level of each specific RNA. The relative expression (or the n-fold change) of the target genes was calculated by comparing the RNA in the $cbb_3^-$ with the wild type. Mean values and standard deviations of three different experiments are shown.

Khalfaoui_Fig. S6




**Supplemental figure S6**

Mixed cultures of the double mutant *$cbb_3^-bd^-$ and E. coli* grown during 10 days under photosynthetic conditions. D1-D10 tubes were inoculated with the mutant on the 1st day. *E. coli* was co-inoculated the 1st day in D1, the 2d day in D2, the 3d day in D3 and so forth. Control tubes containing respectively the double mutant alone and *E. coli* are shown on the left.

| Conditions / Genotype | Aerobic | Semi-aerobic | Micro-aerobic | Photosynthesis in non-deoxygenated medium |
|---|---|---|---|---|
| Wild type | 2 h | 2.25 h | 2.5 h | 2.5 h |
| *ccoN*::*Km* (*cbb*$_3^-$) | 3 h | 3.5h | 4 h | 2.5 h (lag of 3h) |
| *cydA*::Ω (*bd*$^-$) | 4 h | nd | 3 h | nd |
| *cbb*$_3^-$/*bd*$^-$ *ccoN* ::*Km*, *cydA*::Ω | No growth | No growth | No growth | No growth * |
| Res2, *caa*$_3^+$ *CcoN* ::Km, *cyoA*:: Ω | nd | 10 h | nd | 2.5 h (lag of 10h) |

**Table S1**

Growth characteristics of the wild type and the mutants under different oxygen conditions and under photosynthesis in non-deoxygenated medium. * The *cbb*$_3^-$/*bd*$^-$ double mutant grow photosynthetically only under strict anaerobic conditions. nd, not determined.

Aerobic: (250 ml flasks containing 20 ml medium), semi-aerobic (250 ml flasks containing 120 ml medium), micro-aerobic (50 ml flasks filled with 50 ml medium), photosynthesis: filled and sealed tubes in light.