**Table S1. Temporal trends of DWs, SRP and AJM production**

| Variables | T0 | T1 | Percentage variation |
|---|---|---|---|
| Leaf DW | 0.9 ± 0.1 | 3.8 ± 0.2 | +322.2% |
| Root DW | 1.0 ± 0.04 | 2.7 ± 0.14 | +170.0% |
| Total DW | 1.9 ± 0.1 | 6.4 ± 0.2 | +236.8% |
| Leaf SRP concentration | 19.9 ± 1.4 | 12.3 ± 0.6 | -39.2% |
| Root SRP concentration | 113.9 ± 7.0 | 325.0 ± 12.7 | +185.3% |
| Leaf SRP yield | 18.2 ± 2.5 | 47.6 ± 3.7 | +161.5% |
| Root SRP yield | 21.4 ± 3.8 | 896.0 ± 66.5 | +4086.9% |
| Total SRP yield | 39.7 ± 5.5 | 943.7 ± 66.2 | +2277.1% |
| AJM concentration | 50.9 ± 4.3 | 153.0 ± 9.9 | +202.4% |
| AJM yield | 51.3 ± 4.5 | 418.6 ± 35.9 | +716.0% |

Values are means ± standard error (n = 5 for T0, n=61 for T1).

## AJM and SRP biosynthetic pathway

In *C. roseus*, TIAs biosynthesis integrates intermediates from both the shikimate/indole pathway, originating from amino acids, and the methylerythritol pathway (MEP)/iridoid pathway, which involves monoterpenoids[1]. The amino acid tryptophan and the monoterpenoid geraniol serve as crucial precursors in this process. Tryptophan is converted into tryptamine by tryptophan decarboxylase (*TDC*), an upstream enzyme in the TIA pathway. In parallel, geraniol undergoes hydroxylation to 10-hydroxygeraniol catalyzed by geraniol 10-hydroxylase (*G10H*), another upstream enzyme, and is subsequently transformed into secologanin through a series of enzymatic steps. Tryptamine and secologanin are the key intermediates required for the formation of strictosidine, the central precursor for a diverse array of TIAs, such as SRP and AJM. Strictosidine is deglycosylated by strictosidine β-D-glucosidase (*SGD*), a midstream enzyme, yielding the strictosidine aglycone, a highly reactive intermediate that feeds into multiple midstream and downstream biosynthetic routes. One such route leads to the formation of AJM through the reduction of cathenamine, catalyzed by heteroyohimbine synthase (*HYS*), another key midstream enzyme. AJM can subsequently undergo enzymatic oxidation to produce SRP[1,2].

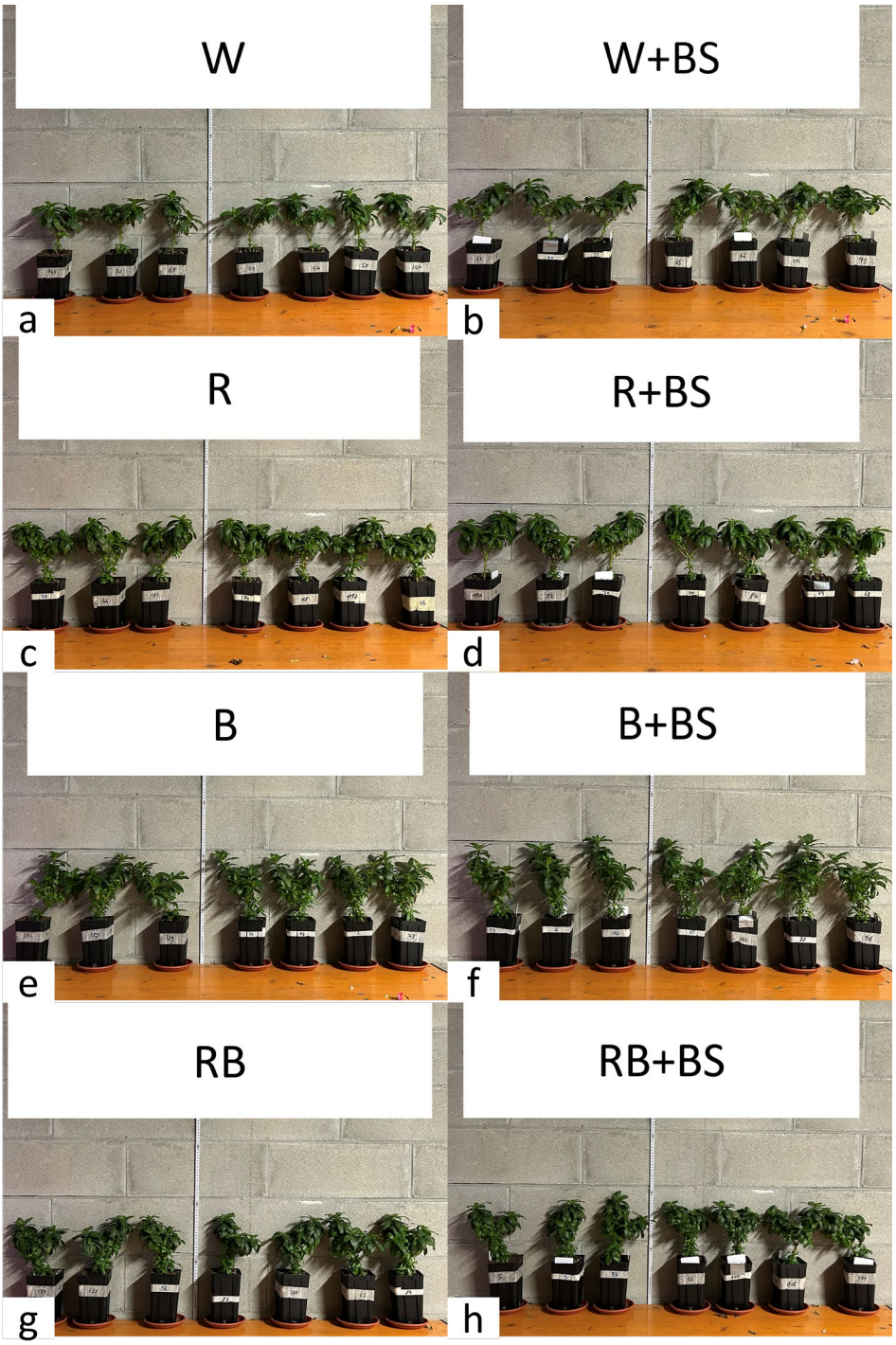


**Figure S1. Growth differences under different LED light spectra and AMF-containing biostimulant (BS) treatments**. (a) White light (W), (b) W + BS, (c) red light (R), (d) R + BS, (e) blue light (B), (f) B + BS, (g) red-blue light (RB), (h) RB + BS.

.

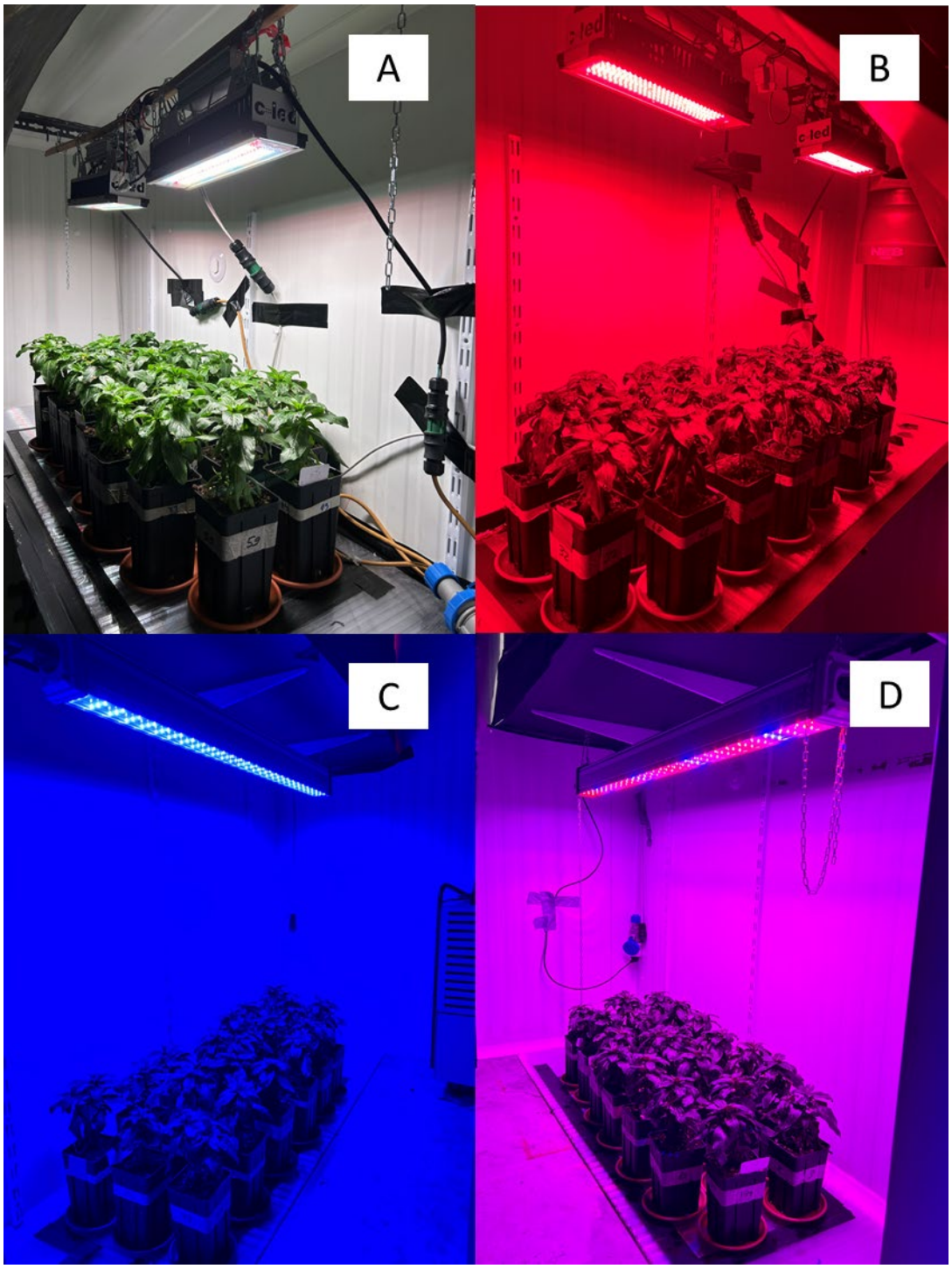


**Figure S2. Plants exposed to the experimental treatments**. The plants were placed under four different LED light sources: white LED light (A), red LED light (B), blue LED light (C), and a combination of blue and red LED light (RB, 6:1) (D). For BS-treated plants, the BS application was performed immediately before exposing the plants to the light treatments. Each pot received a 40-gram dose of the product, distributed into four 10-cm-deep cavities, with 10 grams per cavity, positioned directly beneath the transplanted seedlings.

.

## References


1. Liu, Y. *et al.* Terpenoid indole alkaloid biosynthesis in Catharanthus roseus: effects and prospects of environmental factors in metabolic engineering. *Biotechnology Letters 2021 43:11* **43**, 2085–2103 (2021).

2. Liu, J., Cai, J., Wang, R. & Yang, S. Transcriptional Regulation and Transport of Terpenoid Indole Alkaloid in Catharanthus roseus: Exploration of New Research Directions. *International Journal of Molecular Sciences 2017, Vol. 18, Page 53* **18**, 53 (2016).