**Supplementary data**

**Ammonium/nitrate ratio affects the growth and shikonin accumulation in Arnebia euchroma**

**Table S1.** The information of standards used for quantification

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Abbreviation** | **Purity** | **Company** |
| Shikonin | SH | ≥98% | Zhongke Yiyou Chemical Technology Research Institute ,Beijing. |
| Acetylshikonin | AS | ≥98% |
| β-Hydroxyisovalerylshikonin | HIVS | >98% |
| β-Acetoxyisovalerylalkannin | AOIVA | ≥98% |
| β,β’-Dimethacrylicalkannin | DAA | ≥98% |
| Deoxyshikonin | DS | >98% | Tokyo Chemical Industry |
| Isobutyrylshikonin | IBS | ≥98% | Yuanye Biotechnology,Shanghai |
| Indole-3-Acetic Acid | IAA | ≥99.5% | Sigma |
| Zeatin | ZT | ≥99.0% |
| Trans-Zeatin-Riboside | TZR | 98.0% |
| Abscisic Acid | ABA | ≥98.5% |
| Methyl Jasmonate | MeJA | ≥95% |
| Salicylic Acid | SA | ≥98.9% |
| Gibberellins4 | GA4 | ≥90.0% |
| Isopentenyladenosine | IPA | ≥96.0% | TRC. |

**Table S2.** Primers for qRT-PCR

|  |  |  |
| --- | --- | --- |
| Gene | Forward-primer（5’-3’） | Reverse-primer（5’-3’） |
| AeHMGR | GGCTACTACCGAAGGGTGC | GGTGCCAAACCTCACGACA |
| AePAL | TGGCTCGGTCCTCTTATTGA | AATAGGCGTGCCCTGGAA |
| AePGT | GTCCAAGCAAGCACAGCAG | CCAAACTGCCCACCATCC |
| CYP76B74 | CAACATCGGATTCTTCTAAAC | ATTGCTGGGACTGATACAACT |
| 18S | TGTTGGATGTGGTGGATTGTG | AACGAACGAGTTGGAAAGCA |

**Table S3.** Mass element formulation of different NH4+ concentration mediums (mM）

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Varieties | 0% NH4+ | 10% NH4+ | 20% NH4+ | 30% NH4+ |
| NH4+ | 0 | 2 | 4 | 6 |
| NO3- | 20 | 18 | 16 | 14 |
| Cl- | 2 | 3 | 4 | 5 |
| SO42- | 3 | 3.25 | 4.5 | 4.75 |
| H2PO4- | 2.5 | 2.5 | 3 | 3.5 |
| K+ | 19.5 | 19.5 | 19.5 | 19 |
| Ca+ | 3 | 2.75 | 2.75 | 2.5 |
| Na+ | 2 | 0 | 0 | 0 |
| Mg2+ | 1.5 | 1.5 | 1.5 | 1.25 |