**Supplementary Material**

**Supplementary 1**

**Precursor classifications**

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| --- | --- | --- | --- | --- | --- | --- |
| Amino Acids | Sterols (Steroids and Steroid Precursors) | Phenolic Compounds (Phenylpropanoids) | Shikimate Pathway Compounds | Intermediates in Metabolic Pathways | Other Nitrogenous Compounds | Other Organic Acids |
| L-isoleucine, L-threonine, L-valine – Branched-chain amino acids (BCAAs) | Cholesterol | Cinnamic acid | Shikimic acid | α-keto glutaric acid and pyruvic acid – Citric acid cycle intermediates | Tryptamine – Derived from tryptophan, involved in neurotransmitter biosynthesis | Benzoic acid |
| L-phenylalanine, Phenylalanine – Aromatic amino acids | 7-dehydrocholesterol | Ferulic acid | Phenylalanine | Squalene and pyruvic acid – Pyruvic acid is a glycolysis intermediate, squalene is a cholesterol precursor | Tyramine – Derived from tyrosine, a monoamine involved in blood pressure regulation | Vanadyl sulfate – Not an organic acid, but a vanadium-containing compound often grouped with trace elements |
| L-alanine – Non-essential amino acid | Stigmasterol | Sinapic acid | L-tyrosine | Sodium acetate – Acetate ion, precursor in fatty acid synthesis | Glutathione – Tripeptide antioxidant |  |
| L-tyrosine, Tyrosine – Aromatic amino acid | Progesterone – Steroid hormone | Cinnamyl alcohol | Tryptophan | Loganin, Secologanin – Iridoid glycosides involved in alkaloid biosynthesis | Casein hydrolysate – Protein breakdown product (peptides and amino acids) |  |
| Tryptophan, L-tryptophan – Aromatic amino acid | Squalene – Precursor to cholesterol and other sterols | Cinnamaldehyde | Tryptamine |  |  |  |
| L-glutamine – Non-essential amino acid | Mevalonic acid, Mevalonic acid lactone – Precursors in cholesterol biosynthesis pathway | Caffeic acid |  |  |  |  |
| L-asparagine – Non-essential amino acid |  | p-Coumaric acid |  |  |  |  |
| L-cystine – Sulfur-containing amino acid |  | Tyrosol |  |  |  |  |
| L-arginine – Conditionally essential amino acid |  | Umbelliferone |  |  |  |  |

**Supplementary 2**

Plant Classification based on usage

|  |  |  |
| --- | --- | --- |
| Medicinal | Industry | Ornamental |
| *Withania somnifera* | *Vitis vinifera* | *Solenostemon scutellarioides* |
| *Achyranthes aspera* | *Isatis tinctoria* | *Dionaea muscipula,Drosera capensis* |
| *Hypericum perforatum* | *Papaver somniferum* | *Aronia melanocarpa (Michx.) Elliott, Aronia arbutifolia (L.) Pers.* |
| *Digitalis purpurea L.* | *Argania spinosa* | *Dendrobium fimbriatum* |
| *Vitex agnus castus L.* |  |  |
| *Citrullus colocynthis* |  |  |
| *Artemisia annua* |  |  |
| *Sphagneticola calendulacea* |  |  |
| *Larrea divaricata* |  |  |
| *Bacopa monnieri* |  |  |
| *Rhodiola rosea* |  |  |
| *Morus alba L.* |  |  |
| *Psoralea corylifolia* |  |  |
| *Mucuna pruriens* |  |  |
| *Solanum lyratum* |  |  |
| *Drosera burmannii Vahl and Drosera indica L.* |  |  |
| *Rauwolfia serpentina* |  |  |
| *Silybum marianum* |  |  |
| *Centella asiatica* |  |  |
| *Rauwolfia tetraphylla L.* |  |  |
| *Papaver bracteatum* |  |  |
| *Decalepis hamiltonii* |  |  |
| *Panax sikkimensis* |  |  |
| *Psoralea corylifolia L.* |  |  |
| *Mitragyna speciosa* |  |  |
| *Cassia angustifolia Vahl* |  |  |
| *Bacopa monnieri* |  |  |
| *Rhodiola imbricata* |  |  |
| *Spilanthes acmella Murr.* |  |  |
| *Hybanthus enneaspermus (L.)* |  |  |
| *Silybum marianum* |  |  |
| *Morus alba L.* |  |  |
| *Picrorhiza kurroa* |  |  |
| *Cassia occidentalis L.* |  |  |
| *Bacopa floribunda* |  |  |
| *Arnebia euchroma* |  |  |
| *Catharanthus roseus* |  |  |
| *Mucuna pruriens* |  |  |
| *Rauwolfiatetraphylla L.* |  |  |
| *Rhodiola rosea L.* |  |  |
| *Moringa oleifera* |  |  |
| *Nasturtium officinale* |  |  |
| *Allium sativum L.* |  |  |
| *Catharanthus roseus L.* |  |  |
| *Mitragyna speciosa* |  |  |
| *Mucuna prurita* |  |  |
| *Vinca minor* |  |  |
| *Corylus avellana L.* |  |  |