**Description**

**A COMPOSITION COMPRISING CHALCOCITE DERIVATIVES THAT EXHIBIT THE CHARACTERISTIC OF SUPPRESSING BACTERIAL TERPENE SYNTHASE**

**Technical Field**

The invention relates to a composition comprising the chalcocite derivatives formed for suppressing bacterial terpene synthase.

**State of the Art**

Terpenes are a large and diverse class of hydrocarbons, produced mainly by the plants, particularly coniferales, though also by some insects (e.g. the butterflies of the genus papilionidae), which emit terpenes from their osmeteria. They are the major components of resin and turpentine obtained from resin. The name “terpene” is derived from the word “turpentine”.

When terpenes are modified chemically, such as by way of oxidation or rearrangement of carbon skeleton, the resulting compounds are generally referred to as terpenoids. Some authors use the term terpene to include all terpenoids. Terpenes are derived biosynthetically from units of isoprene, which has the chemical formula C5H8. The basic molecular formulae of terpenes are multiples of that, (C5H8)n (where n is the number of linked isoprene units). This is called the *isoprene rule* or the *C5 rule*. The isoprene units may be linked together head to tail to form linear chains or they may be arranged to form rings. The isoprene unit is a very commonly used building block in the nature.

Isoprene itself does not undergo the building process, but rather activated forms, isopentenyl pyrophosphate (IPP or also isopentenyl diphosphate) and dimethylallyl pyrophosphate (DMAPP or also dimethylallyldiphosphate) are used in this biosynthetic pathway. IPP may also be formed from acetyl-CoA via the intermediacy of mevalonic acid in the [HMG-CoA reductase pathway.](http://tr.wikipedia.org/wiki/HMG-KoA_red%C3%BCktaz_yolu) An alternative, totally unrelated biosynthesis pathway of IPP is known in some bacterial groups and the plastids of plants, the so-called MEP (2-Methyl-D-erythritol-4-phosphate)-pathway, which is initiated from C5-sugars. In both pathways, IPP is isomerized to DMAPP by the enzyme isopentenyl pyrophosphate isomerase.

According to the state of the art, the invention no. EP1379663B1 with classification "C12N 15/60" entitled "Terpene synthase/cyclase and olefin synthase and uses thereof" relates to the field of genetic engineering of flavor, fragrance and biocontrol agent development. More specifically, it relates to a process for production of bioactive isoprenoid compounds by the control or rearrangement of one or more genes implicated in this process.

Further, the invention no. PCT/BR2010/000353 entitled "Repellent compositions and genetic approaches for controlling huanglonbing" provides a method for controlling Huanglongbing (HLB) disease of citrus plants through expressing genes encoding synthases for sesquiterpenes such as β-caryophyllene, and α-copaene, and combinations thereof, in citrus plants. Methods of controlling HLB comprising applying at least one purified sesquiterpene, which repels *Diaphohna citri* and/or*Tryoza erytrae* psyllid insects, so as to control the HLB disease of citrus plants, are also disclosed.

Further, the invention no. EP2132305B1 entitled "Genes encoding z,z-farnesyl diphosphate synthase and a sesquiterpene synthase with multiple products and uses thereof"  relates to the genes involved in the biosynthetic pathway for sesquiterpenes of SB type (alpha-santalene, epi-beta-santalene, alpha and beta bergamotene, Z,Z-farnesyl) and for the precursor thereof, Z,Z-farnesyl diphosphate (Z,Z-FPP), involving a Z,Z-FPP synthase and a sesquiterpene SB synthase, and to the uses thereof for producing sesquiterpene compounds of SB type.

As a result, the presence of the need for a composition for suppressing bacterial terpene synthase and the inadequacy of the existing solutions have made it necessary to perform an improvement in the relevant art.

**Object of the Invention**

In order to eliminate the disadvantages of the state of the art, an object of the invention is to enable the suppression of bacterial terpene synthase.

Another object of the invention is to enable the suppression of bacterial polyketide synthase.

In order to achieve the aforesaid advantages, the invention is a composition for suppressing bacterial terpene synthase, said composition being obtained by the components selected from the group comprising (1R,​3S,​5R,​6R,​9R,​11R,​15S,​16R,​17R,​18S,​20E,​21E,​23E,​25E,​28E,​29E,​32E,​33R,​35S,​36R,​37S)-​33-​[(3-​fluoro-​3,​6-​deoxy-​β-​D-​allopyranosyl)oxy]-​1,​3,​4,​6,​9,​13,​17,​27-​tetrahydroxy-​15,​16,​18-​triethyl-​13-​oxo-​14,​39-methoxychalcocite, (1R,​3S,​4R,​6R,​9R,​11R,​12S,​16R,​17R,​18S,​19E,​21E,​23E,​25E,​27E,​29E,​31E,​33R,​35S,​36R,​37S)-​33-​[(3-​amino-​3,​6-​dideoxy-​β-​D-​epipyranosyl)oxy]-​1,​3,​5,​6,​9,​11,​17,​37-​octahydroxy-​15,​16,​18-​dimethyl-​13-​keto-​14,​39-epoxychalcocite that are used individually or in combinations.

The structural and characteristic features and all the advantages of the invention will become more clearly understood from the detailed description provided below and therefore, the evaluation must be made taking this detailed description into consideration.

**Detailed Description of the Invention**

The invention is a composition comprising the chalcocite derivatives formed for suppressing bacterial terpene synthase. Said composition enables the suppression of bacterial terpene synthase and the suppression of bacterial polyketide synthase.

The composition according to the invention contains (1R,​3S,​5R,​6R,​9R,​11R,​15S,​16R,​17R,​18S,​20E,​21E,​23E,​25E,​28E,​29E,​32E,​33R,​35S,​36R,​37S)-​33-​[(3-​fluoro-​3,​6-​deoxy-​β-​D-​allopyranosyl)oxy]-​1,​3,​4,​6,​9,​13,​17,​27-​tetrahydroxy-​15,​16,​18-​triethyl-​13-​oxo-​14,​39-methoxychalcocite, (1R,​3S,​4R,​6R,​9R,​11R,​12S,​16R,​17R,​18S,​19E,​21E,​23E,​25E,​27E,​29E,​31E,​33R,​35S,​36R,​37S)-​33-​[(3-​amino-​3,​6-​dideoxy-​β-​D-​epipyranosyl)oxy]-​1,​3,​5,​6,​9,​11,​17,​37-​octahydroxy-​15,​16,​18-​dimethyl-​13-​keto-​14,​39-epoxychalcocite.

Said composition is obtained by a mixture of the aforesaid components according to the following ratios by weight:

1-99% (1R,​3S,​5R,​6R,​9R,​11R,​15S,​16R,​17R,​18S,​20E,​21E,​23E,​25E,​28E,​29E,​32E,​33R,​35S,​36R,​37S)-​33-​[(3-​fluoro-​3,​6-​deoxy-​β-​D-​allopyranosyl)oxy]-​1,​3,​4,​6,​9,​13,​17,​27-​tetrahydroxy-​15,​16,​18-​triethyl-​13-​oxo-​14,​39-methoxychalcocite,

99-1% (1R,​3S,​4R,​6R,​9R,​11R,​12S,​16R,​17R,​18S,​19E,​21E,​23E,​25E,​27E,​29E,​31E,​33R,​35S,​36R,​37S)-​33-​[(3-​amino-​3,​6-​dideoxy-​β-​D-​epipyranosyl)oxy]-​1,​3,​5,​6,​9,​11,​17,​37-​octahydroxy-​15,​16,​18-​dimethyl-​13-​keto-​14,​39-epoxychalcocite.

The composition is obtained from the aforesaid components selected from the aforesaid group and used according to the mentioned weight ratio ranges individually or in combinations.

Said invention also encompasses the use of said composition for suppressing bacterial terpene synthase and the manufacture thereof for this purpose.

**CLAIMS**

1. A composition for suppressing bacterial terpene synthase, said composition being obtained by the components selected from the group comprising (1R,​3S,​5R,​6R,​9R,​11R,​15S,​16R,​17R,​18S,​20E,​21E,​23E,​25E,​28E,​29E,​32E,​33R,​35S,​36R,​37S)-​33-​[(3-​fluoro-​3,​6-​deoxy-​β-​D-​allopyranosyl)oxy]-​1,​3,​4,​6,​9,​13,​17,​27-​tetrahydroxy-​15,​16,​18-​triethyl-​13-​oxo-​14,​39-methoxychalcocite, (1R,​3S,​4R,​6R,​9R,​11R,​12S,​16R,​17R,​18S,​19E,​21E,​23E,​25E,​27E,​29E,​31E,​33R,​35S,​36R,​37S)-​33-​[(3-​amino-​3,​6-​dideoxy-​β-​D-​epipyranosyl)oxy]-​1,​3,​5,​6,​9,​11,​17,​37-​octahydroxy-​15,​16,​18-​dimethyl-​13-​keto-​14,​39-epoxychalcocite that are used individually or in combinations.
2. A composition according to Claim 1 characterized in that it comprises 1-99% by weight (1R,​3S,​5R,​6R,​9R,​11R,​15S,​16R,​17R,​18S,​20E,​21E,​23E,​25E,​28E,​29E,​32E,​33R,​35S,​36R,​37S)-​33-​[(3-​fluoro-​3,​6-​deoxy-​β-​D-​allopyranosyl)oxy]-​1,​3,​4,​6,​9,​13,​17,​27-​tetrahydroxy-​15,​16,​18-​triethyl-​13-​oxo-​14,​39-methoxychalcocite.
3. A composition according to Claim 1 characterized in that it comprises 99-1% by weight (1R,​3S,​4R,​6R,​9R,​11R,​12S,​16R,​17R,​18S,​19E,​21E,​23E,​25E,​27E,​29E,​31E,​33R,​35S,​36R,​37S)-​33-​[(3-​amino-​3,​6-​dideoxy-​β-​D-​epipyranosyl)oxy]-​1,​3,​5,​6,​9,​11,​17,​37-​octahydroxy-​15,​16,​18-​dimethyl-​13-​keto-​14,​39-epoxychalcocite.
4. Use of the components according to Claims 1 to 3 obtained individually or in combinations selected from the group consisting of (1R,​3S,​5R,​6R,​9R,​11R,​15S,​16R,​17R,​18S,​20E,​21E,​23E,​25E,​28E,​29E,​32E,​33R,​35S,​36R,​37S)-​33-​[(3-​fluoro-​3,​6-​deoxy-​β-​D-​allopyranosyl)oxy]-​1,​3,​4,​6,​9,​13,​17,​27-​tetrahydroxy-​15,​16,​18-​triethyl-​13-​oxo-​14,​39-methoxychalcocite, (1R,​3S,​4R,​6R,​9R,​11R,​12S,​16R,​17R,​18S,​19E,​21E,​23E,​25E,​27E,​29E,​31E,​33R,​35S,​36R,​37S)-​33-​[(3-​amino-​3,​6-​dideoxy-​β-​D-​epipyranosyl)oxy]-​1,​3,​5,​6,​9,​11,​17,​37-​octahydroxy-​15,​16,​18-​dimethyl-​13-​keto-​14,​39-epoxychalcocite for the manufacture of a composition for suppressing bacterial terpene synthase.

**ABSTRACT**

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The invention relates to a composition comprising the chalcocite derivatives formed for suppressing bacterial terpene synthase.

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