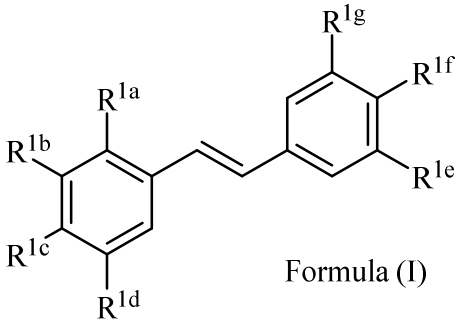
CLAIMS:

1. A process of synthesising a compound of formula (I):



Formula (I)

wherein:

R^{1a} is independently allyl, crotyl, prenyl, geranyl, farnesyl, benzyl, 2-alkenyl or 2-alkynyl;

R^{1b} is independently CF_3, OH, OR^2, NO_2, NHR^3, $NMeR^3$, $NHC{=}NH(NH_2)$ or $COOR^2$;

R^{1c} is independently H, alkyl, alkenyl, alkynyl, alkanedienyl, prenyl, geranyl, farnesyl, or benzyl;

R^{1d} is independently CF_3, OH, OR^2, NHR^3, NO_2, $NMeR^3$, $NHC{=}NH(NH_2)$ or $COOR^2$;

R^{1b} and R^{1d} are not the same;

R^{1e} is independently C_1-C_6 alkyl, OH, OR^2, NO_2, NHR^3, $NMeR^3$ or SR^2;

R^{1f} is independently H, OH, OR^2, NO_2, NHR^3, $N(OH)(CO)CH_3$, $NHC{=}NH(NH_2)$, $COOR^2$ or COOH;

R^{1g} is independently H, C_1-C_6 alkyl, CF_3, OH or OR^2;

and no more than one of R^{1f} or R^{1g} can be H;

or R^{1e} and R^{1f} form a five or six-membered heterocyclic ring containing a carbonyl group or $(CO)CH_2$ group when R^{1e} is independently OH, NH_2 or NHMe and R^{1f} is NH_2, such that the nitrogen of R^{1f} is bridged with the carbonyl group or $(CO)CH_2$ group to the oxygen or nitrogen of R^{1e}, and R^{1g} is H;

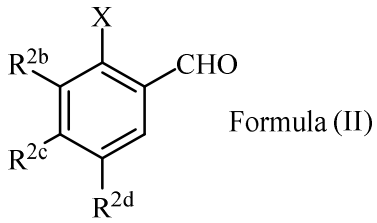
R^2 is independently methyl, ethyl, propyl, isopropyl, butyl, isobutyl, t-butyl, trifluoromethyl, $COCOOR^4$ or an O-protecting group when R^2 is attached to an O;

R^3 is independently H, CH_3, OH, (CO)H, (CO)Me, SO_2Me, CH_2COOH, CH_2COOR^2, $CO(CH_2)_nNH_2$, $CONH_2$, $CO(CH_2)_nCOOH$ or $COCOOR^4$, where n is 0, 1 or 2; and

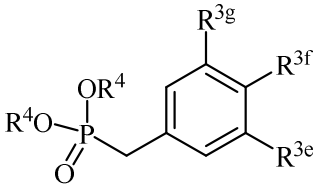
R^4 is C_1-C_6 alkyl;

the process comprising:

i) a step of coupling a compound of formula (II) (Module A) with a compound of formula (III) (Module B) to afford a compound of formula (IV) (Module C):

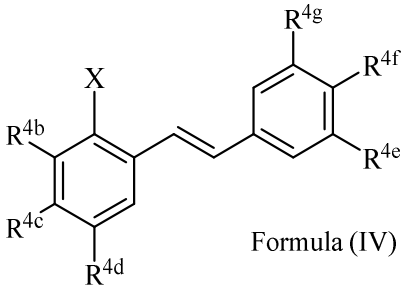


Formula (II)



Formula (III)

Module A **Module B**



Formula (IV)

Module C

wherein,

in Formula II (Module A):

R^{2b} is independently CF_3, OH, OR^2, NO_2, NHR^3 or $NMeR^3$;

R^{2c} is independently H, alkyl, alkenyl, alkynyl, alkanedienyl, prenyl, geranyl, farnesyl, or benzyl;

R^{2d} is independently CF_3, OH, OR^2, NO_2, NHR^3, $NMeR^3$, $NHC{=}NH(NH_2)$ or $COOR^2$;

X is a halide or a hydroxyl group, wherein the halide is selected from the group consisting of F, Cl, Br, I, and At; and

R^2 is independently methyl, ethyl, propyl, isopropyl, butyl, isobutyl, t-butyl, trifluoromethyl, or O-protecting group when R^2 is attached to an O; and

R^3 is independently H, OH, CH_3, (CO)H, COMe, SO_2Me, $COCH_2NH_2$, or CH_2COOR^2;

in Formula III (Module B):

R^{3e} is independently C_1-C_6 alkyl, OH, OR^2, NO_2, NHR^3, $NMeR^3$ or SR^2;

R^{3f} is independently H, OH, OR^2, NO_2, NHR^3, $NHC{=}NH(NH_2)$, COOH or $COOR^2$;

R^{3g} is independently H, C_1-C_6 alkyl, CF_3, OH or OR^2;

and no more than one of R^{3f} or R^{3g} can be H;

or R^{3e} and R^{3f} form a five or six-membered heterocyclic ring containing a carbonyl group or $(CO)CH_2$ group when R^{3e} is OH, NH_2 or NHMe and R^{3f} is NH_2, such that the nitrogen of R^{3f} is bridged with the carbonyl group or $(CO)CH_2$ group to the oxygen or nitrogen of R^{3e};

R^2 is independently methyl, ethyl, propyl, isopropyl, butyl, isobutyl, t-butyl, trifluoromethyl or O-protecting group when R^2 is attached to an O,

R^3 is independently H, CH_3, OH, (CO)H, COMe, SO_2Me, $COCH_2NH_2$, CH_2COOH or CH_2COOR^2; and

R^4 is C_1-C_6 alkyl;

in Formula IV (Module C):

R^{4b} is independently CF_3, OH or OR^2, NO_2, NHR^3 or $NMeR^3$;

R^{4c} is independently H, alkyl, alkenyl, alkynyl, alkanedienyl, prenyl, geranyl, farnesyl or benzyl;

R^{4d} is independently CF_3, OH, OR^2, NO_2,NHR^3, $NMeR^3$, $NHC{=}NH(NH_2)$ or $COOR^2$;

R^{4e} is independently C_1-C_6 alkyl, OH, OR^2, NO_2, NHR^3, $NMeR^3$, NHC(O)H or SR^2;

R^{4f} is independently H, OH, OR^2, NO_2, NHR^3, NHC=NH(NH_2), COOH or $COOR^2$;

R^{4g} is independently H, C_1-C_6 alkyl, CF_3, OH or OR^2;

and no more than one of R^{4f} or R^{4g} can be H;

or R^{4e} and R^{4f} form a five or six-membered heterocyclic ring containing a carbonyl group or (CO)CH_2 group when R^{4e} is OH, NH_2 or NHMe and R^{4f} is NH_2, such that the nitrogen of R^{4f} is bridged with the carbonyl group or (CO)CH_2 group to the oxygen or nitrogen of R^{4e};

R^2 is independently methyl, ethyl, propyl, isopropyl, butyl, isobutyl, t-butyl, trifluoromethyl or O-protecting group when R^2 is attached to an O;

R^3 is independently H, CH_3, OH, (CO)H, COMe, SO_2Me, $COCH_2NH_2$, CH_2COOH or CH_2COOR^2; and

X is a halide or a hydroxyl group, wherein the halide is selected from the group consisting of F, Cl, Br, I, and At;

wherein the O-protecting group is selected from the group consisting of COMe, *t*-BuSi(CH_3)$_2$, 2-(trimethylsilyl)ethoxy]methyl (SEM), CH(OEt)CH_3, tetrahydropyranyl, or C(OEt)(CH_3)$_2$.

2. The process of claim 1, wherein,

in Formula (I),

R^{1a} is independently allyl, crotyl, prenyl or benzyl;

R^{1b} is independently CF_3, OR^2 or NHR^3;

R^{1c} is independently H;

R^{1d} is independently OH, OR^2, NHR^3 or NO_2;

R^{1b} and R^{1d} are not the same;

R^{1e} is independently C_1-C_6 alkyl, OH, OR^2, NO_2, NHR^3, $NMeR^3$ or SR^2;

R^{1f} is independently H, OH, NO_2, NHR^3, N(OH)(CO)CH_3, NHC=NH(NH_2) or COOH;

R^{1g} is independently H, C_1-C_6 alkyl, OH or OR^2;

no more than one of R^{1f} or R^{1g} can be H;

or R^{1e} and R^{1f} form a five or six-membered heterocyclic ring containing a carbonyl group or $(CO)CH_2$ group when R^{1e} is independently OH, NH_2 or NHMe and R^{1f} is NH_2, such that the nitrogen of R^{1f} is bridged with the carbonyl group or $(CO)CH_2$ group to the oxygen or nitrogen of R^{1e}, and R^{1g} is H;

R^2 is independently methyl, ethyl, propyl, isopropyl, butyl, isobutyl, t-butyl, trifluoromethyl, or an O-protecting group when R^2 is attached to an O; and

R^3 is independently H, CH_3, OH, (CO)H, (CO)Me, SO_2Me, CH_2COOR^2, $CO(CH_2)_nNH_2$ or $CO(CH_2)_nCOOH$ where n is 0, 1 or 2;

in Formula II:

R^{2b} is independently CF_3, OR^2 or NHR^3;

R^{2c} is H;

R^{2d} is independently OR^2 or NO_2;

X is a halide or a hydroxyl group, wherein the halide is selected from the group consisting of F, Cl, Br, I and At;

R^2 is independently methyl, ethyl, propyl, isopropyl, butyl, isobutyl, t-butyl, trifluoromethyl, or O-protecting group when R^2 is attached to an O; and

R^3 is independently H, (CO)H or COMe;

in Formula III:

R^{3e} is independently C_1-C_6 alkyl, OR^2, NO_2 or SR^2;

R^{3f} is independently H, OR^2, NO_2 or $COOR^2$;

R^{3g} is independently H, C_1-C_6 alkyl or OR^2;

and no more than one of R^{3f} or R^{3g} can be H;

or R^{3e} and R^{3f} form a five or six-membered heterocyclic ring containing a carbonyl group or $(CO)CH_2$ group when R^{3e} is OH, NH_2 or NHMe and R^{3f} is NH_2, such that the nitrogen of R^{3f} is bridged with the carbonyl group or $(CO)CH_2$ group to the oxygen or nitrogen of R^{3e}, and R^{1g} is H;

R^2 is independently methyl, ethyl, propyl, isopropyl, butyl, isobutyl, t-butyl, trifluoromethyl or O-protecting group when R^2 is attached to an O; and

R^4 is C_1-C_6 alkyl;

in Formula IV:

R^{4b} is independently CF_3, OR^2 or NHR^3;

R^{4c} is independently H;

R^{4d} is independently OR^2 or NO_2;

R^{4e} is independently C_1-C_6 alkyl, OR^2, NO_2 or SR^2;

R^{4f} is independently H, OR^2, NO_2 or COOH;

R^{4g} is independently H, C_1-C_6 alkyl or OR^2;

and no more than one of R^{4f} or R^{4g} can be H;

or R^{4e} and R^{4f} form a five or six-membered heterocyclic ring containing a carbonyl group or $(CO)CH_2$ group when R^{4e} is OH, NH_2 or NHMe and R^{4f} is NH_2, such that the nitrogen of R^{4f} is bridged with the carbonyl group or $(CO)CH_2$ group to the oxygen or nitrogen of R^{4e}, and R^{1g} is H;

R^2 is independently methyl, ethyl, propyl, isopropyl, butyl, isobutyl, t-butyl, trifluoromethyl or O-protecting group when R^2 is attached to an O;

R^3 is independently H, (CO)H or COMe; and

X is a halide or a hydroxyl group, wherein the halide is selected from the group consisting of F, Cl, Br, I, and At;

wherein the O-protecting group is selected from the group consisting of COMe, *t*-$BuSi(CH_3)_2$, 2-(trimethylsilyl)ethoxy]methyl (SEM), $CH(OEt)CH_3$, tetrahydropyranyl, or $C(OEt)(CH_3)_2$.

3. The process of claim 1 or 2, wherein"

i) X in formula (II) and (IV) is a halide and wherein the halide of formula (IV) undergoes a coupling reaction with one of the following:

a) a R^{1a}-substituted boronic acid compound or ester;

b) a R^{1a}-substituted trifluoroborate compound; or

c) a R^{1a}-substituted organostannane compound;

to form the compound of formula (I),

wherein R^{1a} is selected from the group consisting of allyl, crotyl, prenyl, geranyl, farnesyl, benzyl, 2-alkenyl or 2-alkynyl;

or

ii) X in formula (II) and (IV) is hydroxyl and wherein the hydroxyl group is converted to a triflate (trifluoromethylsulfonate) group to form a triflate of formula

(IV), and the triflate of formula (IV) undergoes a coupling reaction with one of the following:

a) a R^{1a}-substituted boronic acid compound or ester;

b) a R^{1a}-substituted trifluoroborate compound; or

c) a R^{1a}-substituted organostannane compound;

to form the compound of formula (I),

wherein R^{1a} is selected from the group consisting of allyl, crotyl, prenyl, geranyl, farnesyl, benzyl, 2-alkenyl or 2-alkynyl.

4. The process of claim 3, wherein the R^{1a}-substituted boronic acid compound or ester is a R^{1a}-substituted boronic acid pinacol ester.

5. The process of claim 3, wherein the R^{1a}-substituted trifluoroborate compound is a potassium R^{1a}-substituted trifluoroborate.

6. The process of claim 3, wherein the R^{1a}-substituted organostannane compound is a R^{1a}-substituted tributylstannane.

7. The process of any one of claims 3 to 6, wherein the coupling reaction is catalysed by a palladium compound, including tetrakis(triphenylphosphine)palladium(0) and 1,1′-bis(diphenylphosphino) ferrocene]dichloropalladium(II), optionally in the presence of a base selected from alkali metal carbonates including potassium carbonate (K_2CO_3); hydrogen carbonates; calcium carbonate; magnesium carbonate; and alkylamines including triethylamine.

8. The process of any one of claims 1-7, wherein

in Formula (I):

R^{1a} is independently allyl, crotyl, prenyl or benzyl;

R^{1b} is independently CF_3, OR^2, NH_2, NHC(O)H or NHC(O)Me;

R^{1c} is H;

R^{1d} is independently OH, OR^2, NH_2, NHC(O)H, NHC(O)Me or NO_2;

R^{1b} and R^{1d} are not the same;

R^{1e} is independently C_1-C_6 alkyl, OH, OR^2, NO_2, NMe_2, NHC(O)Me, NMeH, NHC(O)H or SMe_2;

R^{1f} is independently H, OH, NO_2, NH_2, $N(OH)(CO)CH_3$, $NHSO_2Me$, $NHC(O)H$, $NHC(O)Me$, $NHCO(CH_2)_nNH_2$, $NHCO(CH_2)_n,COOH$, $NHCH_2COOR^2$, $NHC=NH(NH_2)$ or COOH where n is 0, 1 or 2;

R^{1g} is independently H, C_1-C_6alkyl, OH or OR^2;

and no more than one of R^{1f} or R^{1g} can be H;

or R^{1e} and R^{1f} form a five or six-membered heterocyclic ring containing a carbonyl group when R^{1e} is OH, NH_2 or NHMe and R^{1f} is NH_2, such that the nitrogen of R^{1f} is bridged with the carbonyl group to the oxygen or nitrogen of R^{1e}, and R^{1g} is H;

R^2 is independently methyl, ethyl, propyl, isopropyl, butyl, isobutyl, t-butyl or an O-protecting group when R^2 is attached to an O;

in Formula II (Module A):

R^{2b} is CF_3, OR^2 or NH_2;

R^{2c} is H;

R^{2d} is independently OR^2or NO_2;

X is a halide or a hydroxyl group, wherein the halide is selected from the group consisting of F, Cl, Br, I, and At; and

R^2 is independently methyl, ethyl, propyl, isopropyl, butyl, isobutyl, t-butyl, trifluoromethyl, or an O-protecting group when R^2 is attached to an O;

in Formula III (Module B):

R^{3e} is independently C_1-C_6 alkyl, OR^2, NO_2 or SMe_2;

R^{3f} is independently H, OR^2, NO_2 or $COOR^2$;

R^{3g} is independently H, C_1-C_6 alkyl or OR^2;

and no more than one of R^{3f} or R^{3g} can be H;

or R^{3e} and R^{3f} form a five or six-membered heterocyclic ring containing a carbonyl group or $(CO)CH_2$ group when R^{3e} is OH, NH_2 or NHMe and R^{3f} is NH_2, such that the nitrogen of R^{3f} is bridged with the carbonyl group or $(CO)CH_2$ group to the oxygen or nitrogen of R^{3e}, and R^{1g} is H;

R^2 is independently methyl, ethyl, propyl, isopropyl, butyl, isobutyl, t-butyl, trifluoromethyl or an O-protecting group when R^2 is attached to an O; and

R^4 is C_1-C_6 alkyl;

in Formula IV (Module C):

R^{4b} is CF_3, OR^2 or NH_2;

R^{4c} is H;

R^{4d} is independently OR^2 or NO_2;

R^{4e} is independently C_1-C_6 alkyl, OR^2, NO_2 or SMe_2;

R^{4f} is independently H, OR^2, NO_2 or COOH;

R^{4g} is independently H, C_1-C_6 alkyl or OR^2;

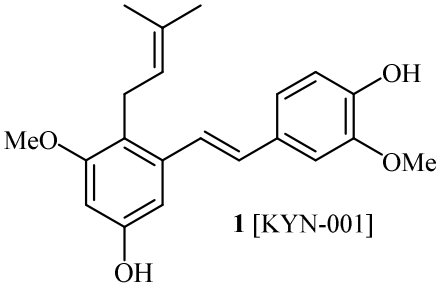
and no more than one of R^{4f} or R^{4g} can be H;

or R^{4e} and R^{4f} form a five or six-membered heterocyclic ring containing a carbonyl group or $(CO)CH_2$ group when R^{4e} is OH, NH_2 or NHMe and R^{4f} is NH_2, such that the nitrogen of R^{4f} is bridged with the carbonyl group or $(CO)CH_2$ group to the oxygen or nitrogen of R^{4e}, and R^{1g} is H;

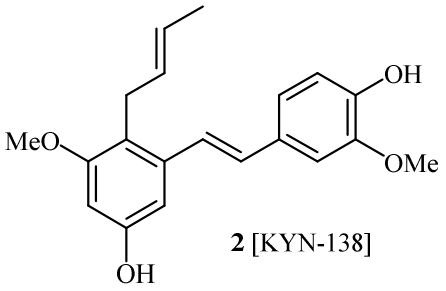
R^2 is independently methyl, ethyl, propyl, isopropyl, butyl, isobutyl, t-butyl, trifluoromethyl or an O-protecting group when R^2 is attached to an O;

X is a halide or a hydroxyl group, wherein the halide is selected from the group consisting of F, Cl, Br, I, and At;wherein the O-protecting group is selected from the group consisting of COMe, *t*-BuSi$(CH_3)_2$, 2-(trimethylsilyl)ethoxy]methyl (SEM), $CH(OEt)CH_3$, tetrahydropyranyl, or $C(OEt)(CH_3)_2$.

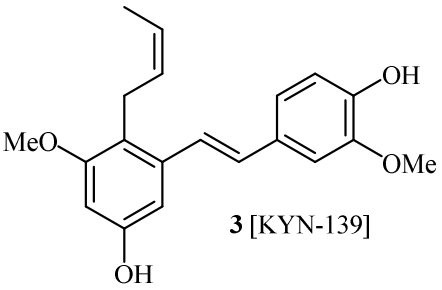
9. The process of any one of claims 1-7 wherein the compound according to formula (I) is selected from the group consisting of:



1 [KYN-001]



2 [KYN-138]



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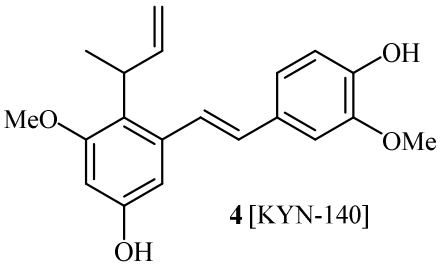

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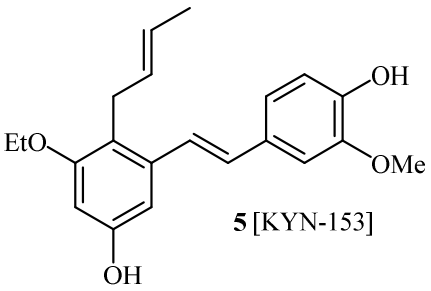

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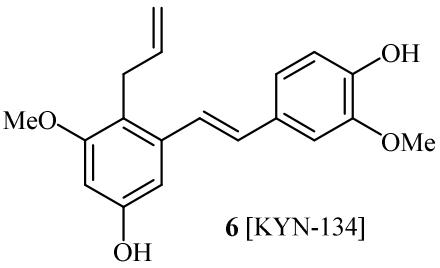

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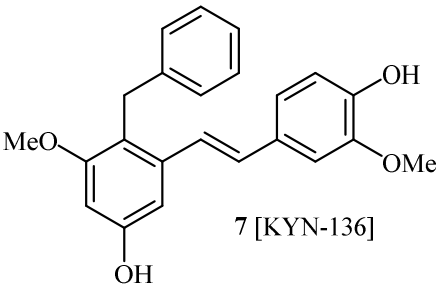
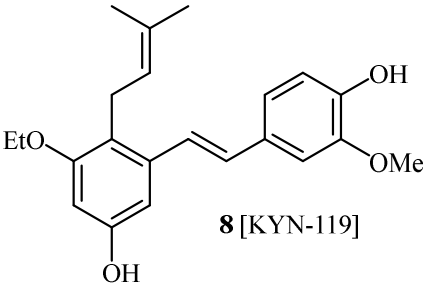
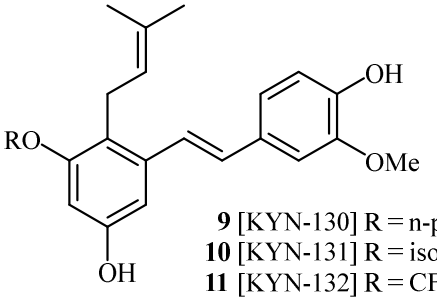


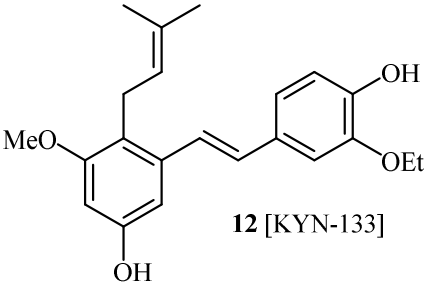
7 [KYN-136]



8 [KYN-119]



9 [KYN-130] R = n-propyl
10 [KYN-131] R = iso-propyl
11 [KYN-132] R = CF_3



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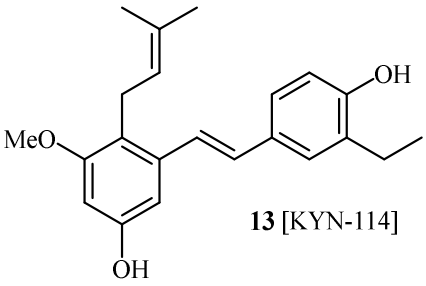
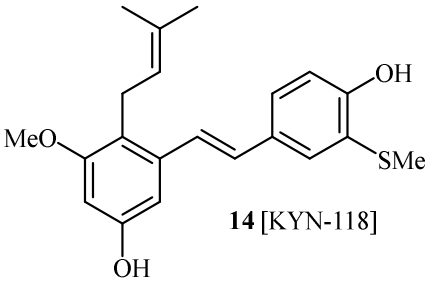
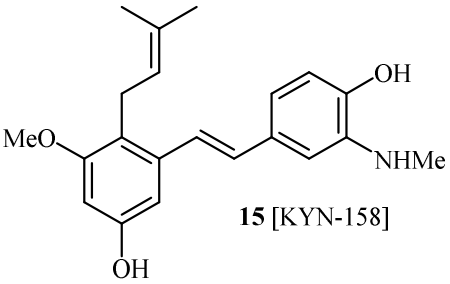


13 [KYN-114]



14 [KYN-118]



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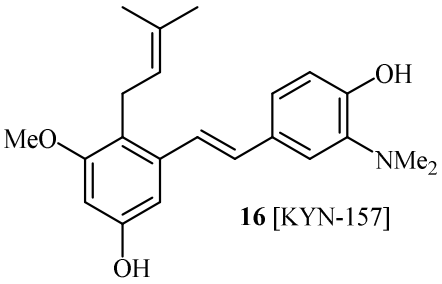
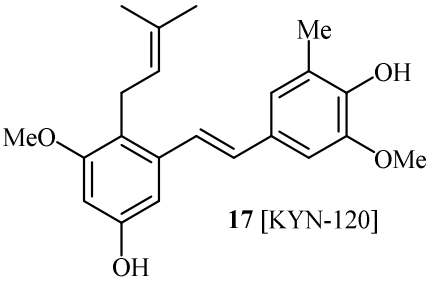
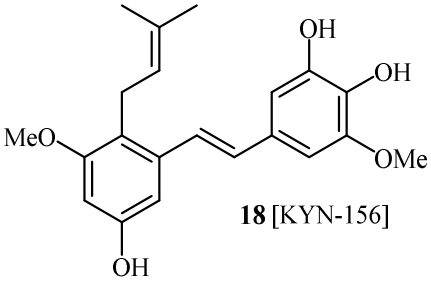


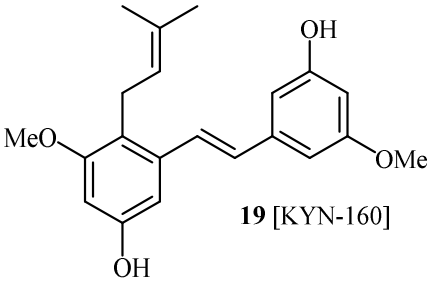
16 [KYN-157]



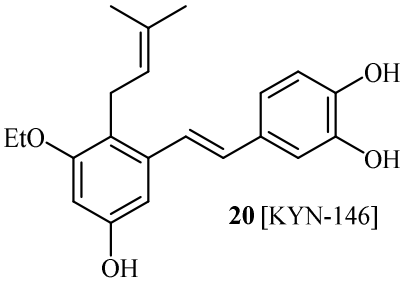
17 [KYN-120]



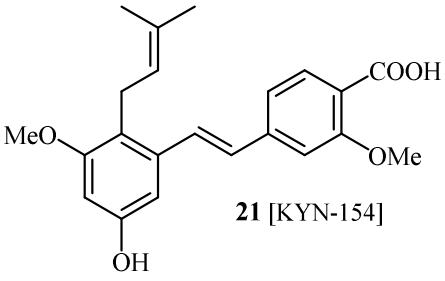
18 [KYN-156]



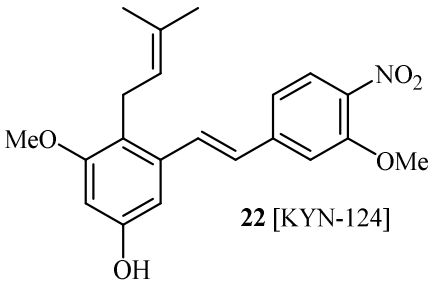
19 [KYN-160]



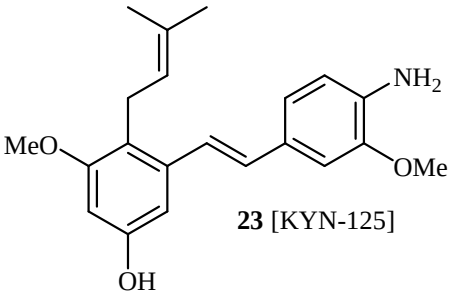
20 [KYN-146]



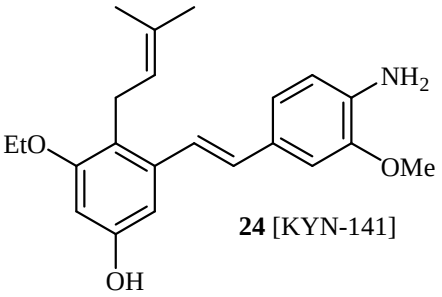
21 [KYN-154]



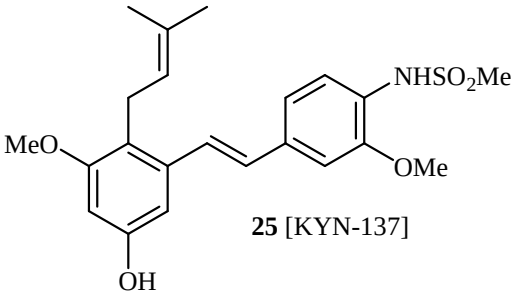
22 [KYN-124]



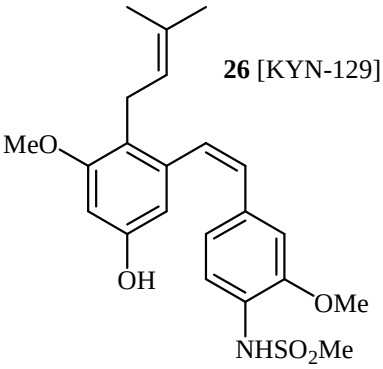
23 [KYN-125]



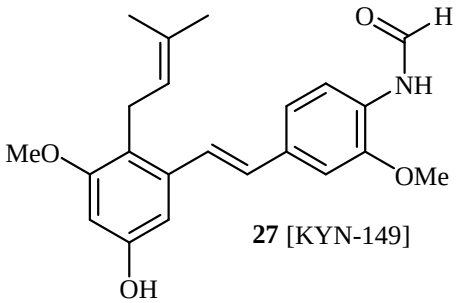
24 [KYN-141]



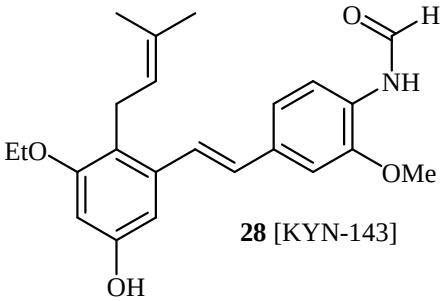
25 [KYN-137]



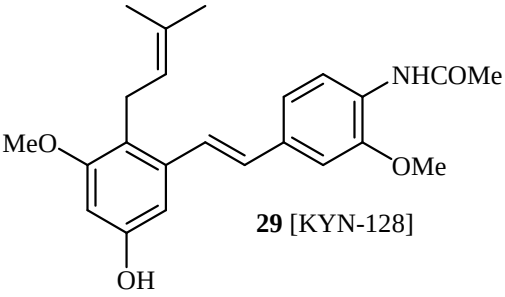
26 [KYN-129]



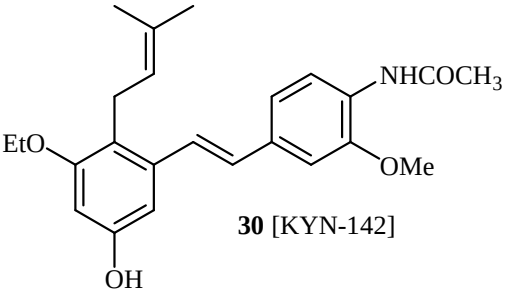
27 [KYN-149]



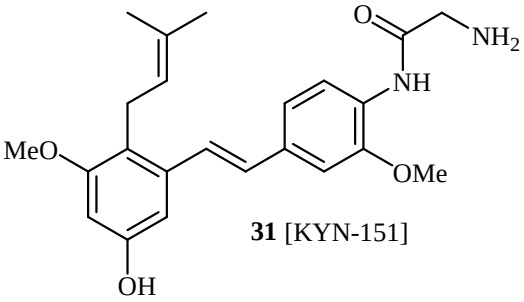
28 [KYN-143]



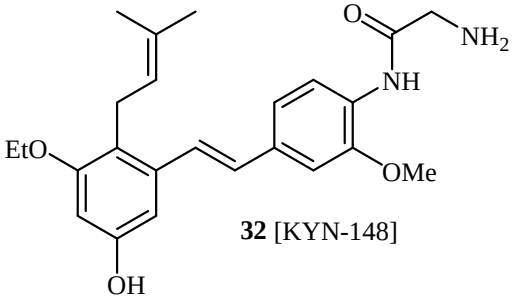
29 [KYN-128]



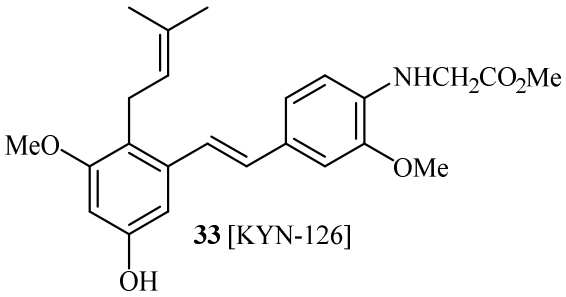
30 [KYN-142]



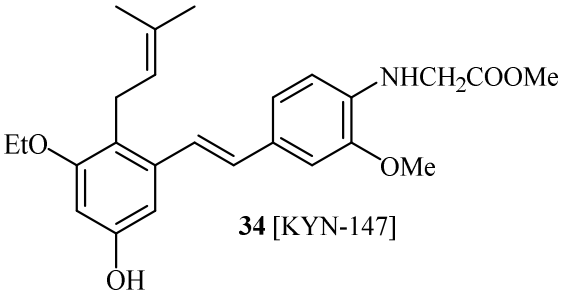
31 [KYN-151]



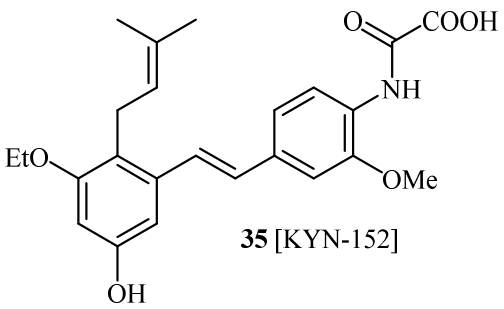
32 [KYN-148]



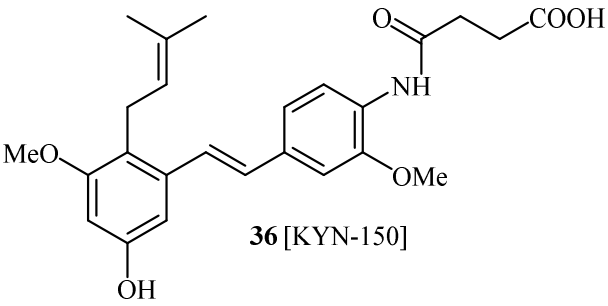
33 [KYN-126]



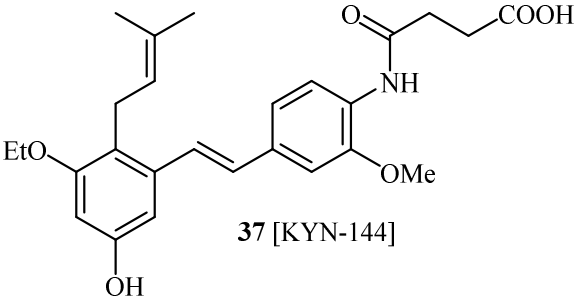
34 [KYN-147]



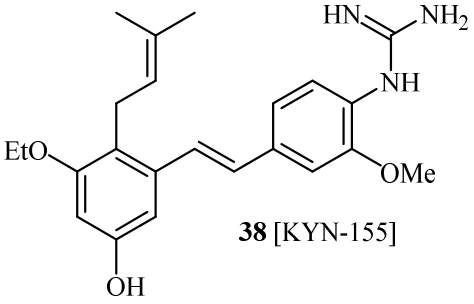
35 [KYN-152]



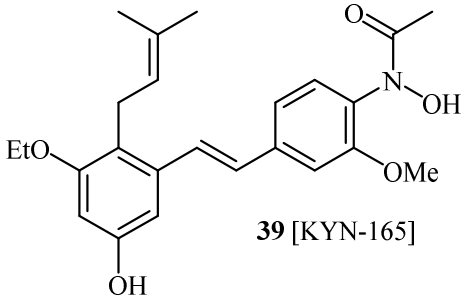
36 [KYN-150]



37 [KYN-144]



38 [KYN-155]



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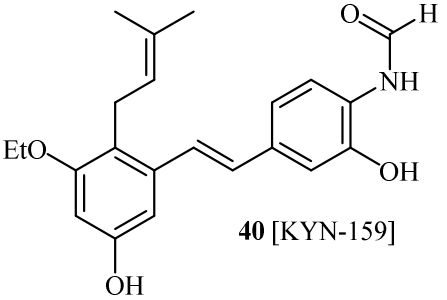
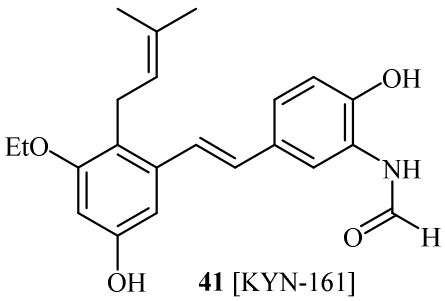
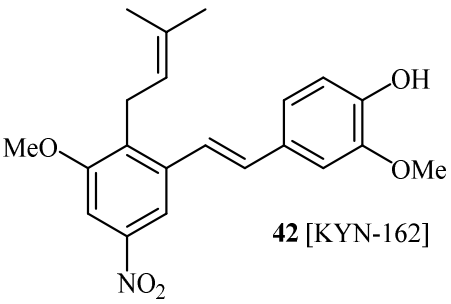


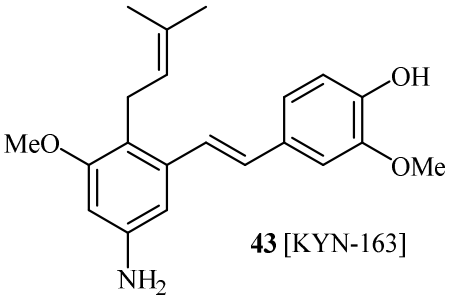
40 [KYN-159]



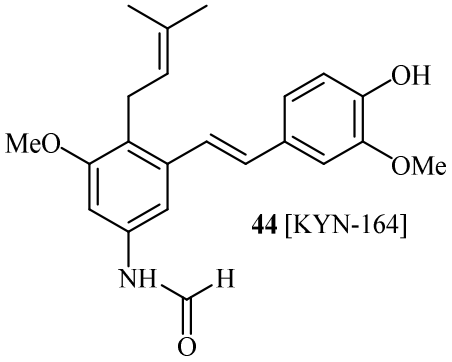
41 [KYN-161]



42 [KYN-162]



43 [KYN-163]



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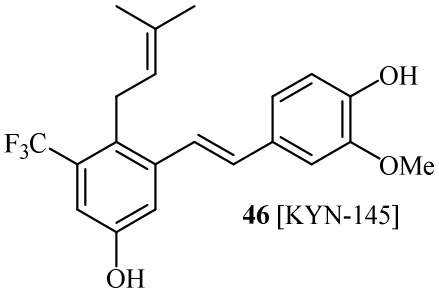
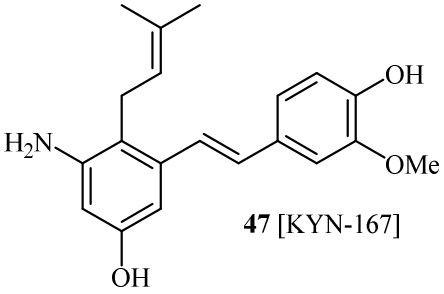
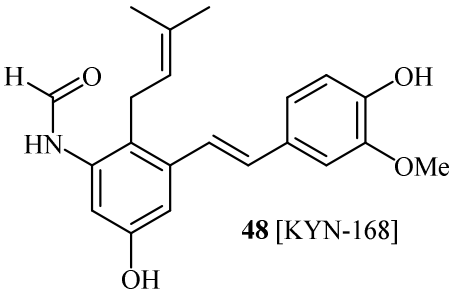


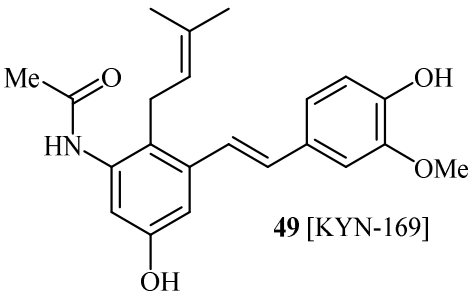
46 [KYN-145]



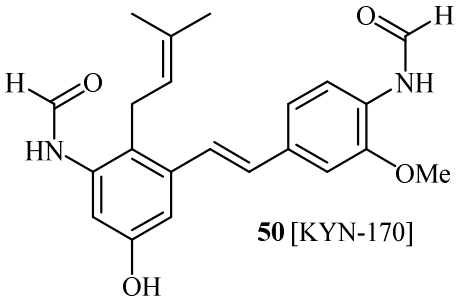
47 [KYN-167]



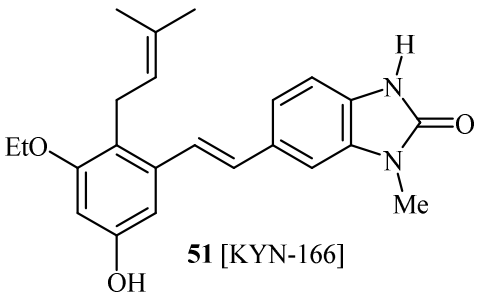
48 [KYN-168]



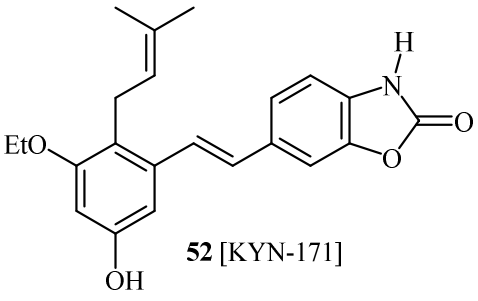
49 [KYN-169]



50 [KYN-170]



51 [KYN-166]



52 [KYN-171]

10. The process of any one of claims 1-7,

wherein in formula (I):

R^{1a} is allyl, crotyl, prenyl or benzyl;

R^{1b} is OR^2, NHC(O)Me or NHC(O)H,

R^{1c} is H;

R^{1d} is OH;

R^{1e} is OH or OR^2;

R^{1f} is NO_2, NHR^3 or NHC=NH(NH_2);

R^{1g} is H;

R^2 is methyl, ethyl, propyl, isopropyl, butyl, isobutyl or t-butyl;

R^3 is H, (CO)H, (CO)Me, SO_2Me, CH_2COOR^2, $COCH_2NH_2$ or $CO(CH_2)_nCOOH$ (where n = 0, 1 or 2);

in Formula (II):

R^{2b} is NH_2 or OR^2;

R^{2c} is H,

R^{2d} is OR^2;

X is a halide selected from the group consisting of F, Cl, Br, I, and At; and

R^2 is methyl, ethyl, propyl, isopropyl, butyl, isobutyl, t-butyl, trifluoromethyl or O-protecting group when R^2 is attached to an O,

wherein the O-protecting group is selected from the group consisting of COMe, *t*-$BuSi(CH_3)_2$, 2-(trimethylsilyl)ethoxymethyl (SEM), $CH(OEt)CH_3$, tetrahydropyranyl, or $C(OEt)(CH_3)_2$;

in Formula (III):

R^{3e} is OH or OR^2;

R^{3f} is NO_2, NHR^3 or NHC=NH(NH_2);

R^{3g} is H;

R^2 is methyl, ethyl, propyl, isopropyl, butyl, isobutyl or t-butyl; and

R^3 is H, (CO)H, COMe, SO_2Me or CH_2COOR^2 , $COCH_2NH_2$ or $CO(CH_2)_nCOOH$ (where n = 0, 1 or 2); and

R^4 is C_1-C_6 alkyl;

in Formula (IV):

R^{4b} is, OR^2 or NH_2;

R^{4c} is H;

R^{4d} is OR^2;

R^{4e} is OH or OR^2;

R^{4f} is, NO_2, NHR^3 or $NHC=NH(NH_2)$;

R^{4g} is H;

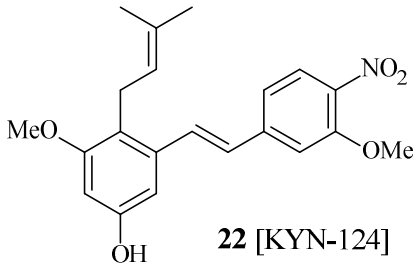
R^2 is methyl, ethyl, propyl, isopropyl, butyl, isobutyl or t-butyl;

R^3 is H, (CO)H, COMe, SO_2Me, CH_2COOR^2, $COCH_2NH_2$ or $CO(CH_2)_nCOOH$ (where n = 0, 1 or 2); and

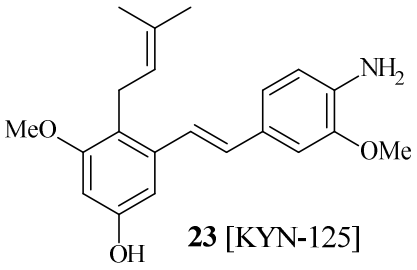
X is a halide selected from the group consisting of F, Cl, Br, I, and At;

wherein formula IV is coupled with a R^{1a} boronic pinacol ester selected from the group consisting of 3-methylbut-2-enylboronic acid pinacol ester, crotylboronic acid pinacol ester, allylboronic acid pinacol ester and benzylboronic acid pinacol ester, catalysed by a palladium catalyst in the presence of a base, to produce the compound of formula (I).

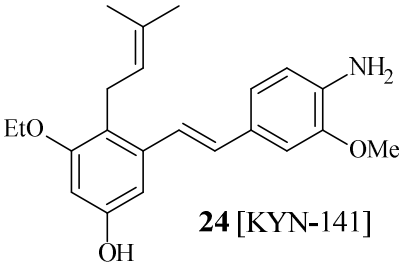
11. The process of any one of claims 1-7, wherein the compound according to formula (I) is selected from the group consisting of:



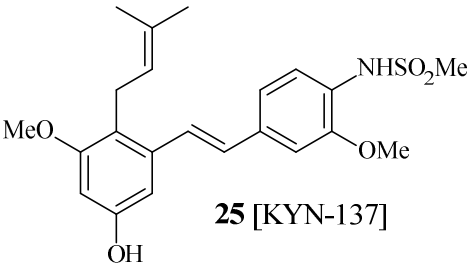
22 [KYN-124]



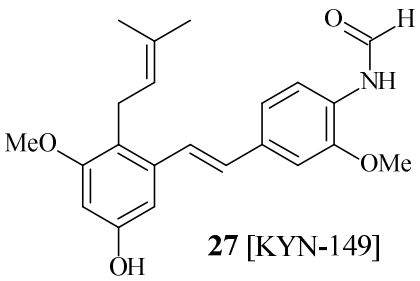
23 [KYN-125]



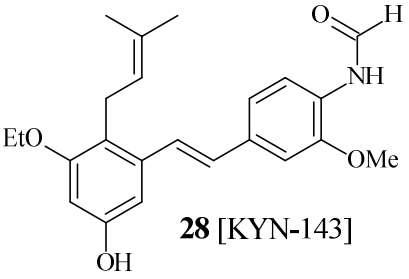
24 [KYN-141]



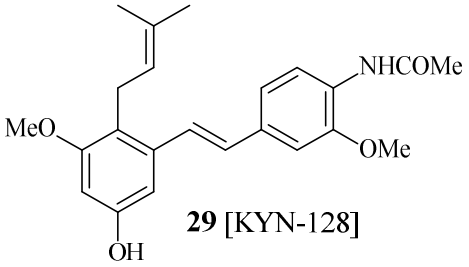
25 [KYN-137]



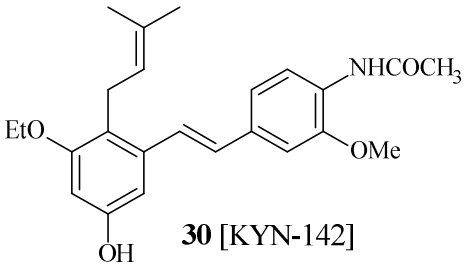
27 [KYN-149]



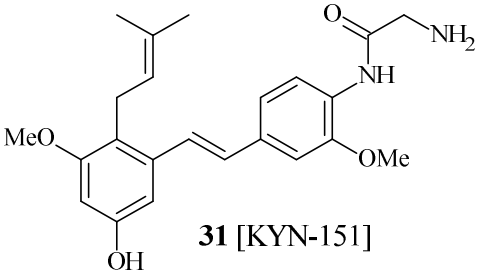
28 [KYN-143]



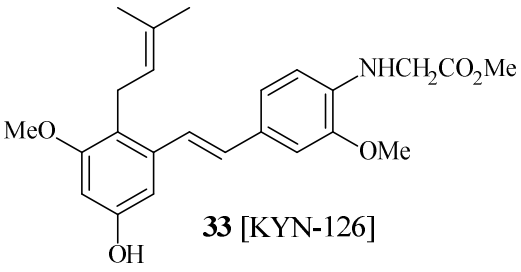
29 [KYN-128]



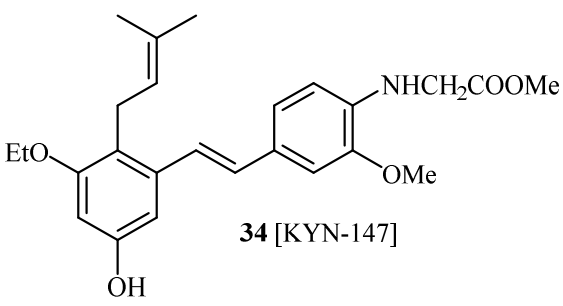
30 [KYN-142]



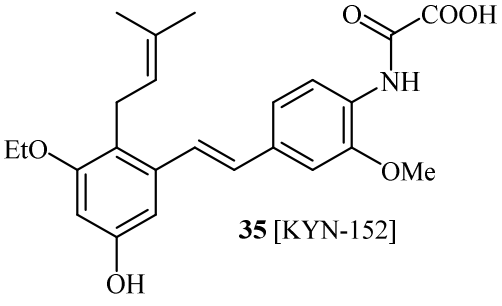
31 [KYN-151]



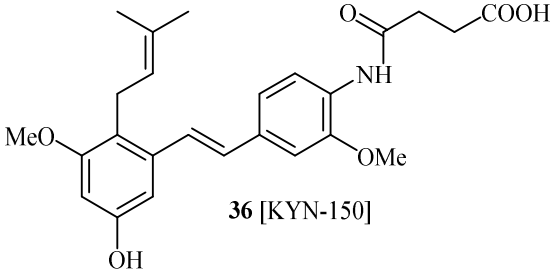
33 [KYN-126]



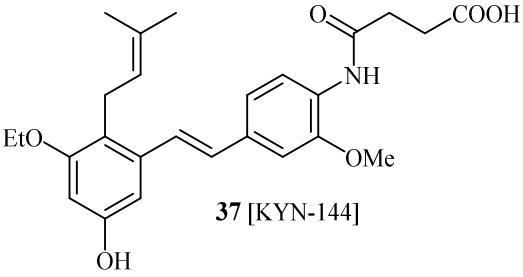
34 [KYN-147]



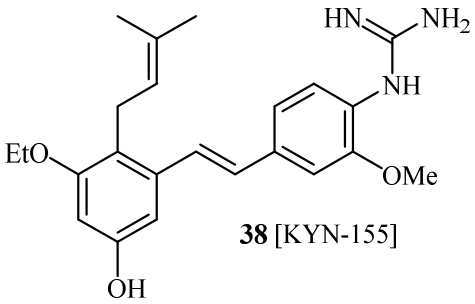
35 [KYN-152]



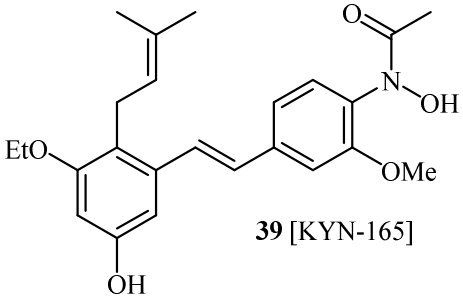
36 [KYN-150]



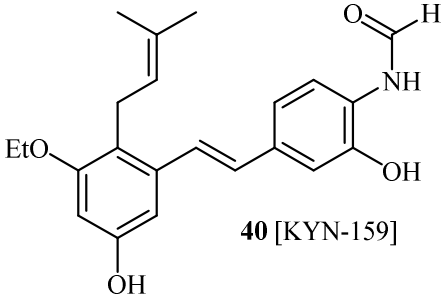
37 [KYN-144]



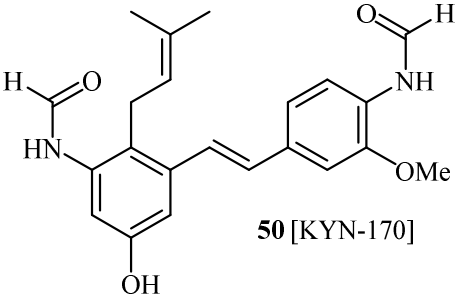
38 [KYN-155]



39 [KYN-165]



40 [KYN-159]



50 [KYN-170]

12. The process of any one of claims 1-7 wherein the compound of formula (IV) or (I) undergo one or more further reactions, selected form one or more of the following:

-reaction with one or more $–NH_2$, NO_2 and/or -OH substituents on formula (IV) or formula (I);

-conversion of an $–NH_2$ substituents to methoxyoxoacetamido (-$NHC(O)C(O)OCH_3$) substituents by reaction of the compound containing the NH_2substituent with methyl chlorooxoacetate in the presence of a base;

-conversion of one or more –OH substituents to methyl oxalate substituents by reaction of the compound containing the –OH substituent with methyl chlorooxoacetate in the presence of a base;

-Hydrolysis of one or more methoxyoxoacetamido substituents to a -NHC(O)C(O)OH substituents by reaction of the compound containing the N methoxyoxoacetamido substituent with a base;

-Hydrolysis of one or more methyl oxalate substituents to - OH substituents by reaction of the compound containing the methyl oxalate substituent with a base;

-Conversion of one or more $–NH_2$ substituents to guanidine (-NHC(NH)NH_2) substituents by reaction of the compound containing the NH_2 substituent with cyanamide in the presence of an acid;

-Conversion of one or more $–NH_2$ substituents to formamide (-NHC(O)H) substituents by reaction of the compound containing the NH_2 substituent with ethyl formate;

-Conversion of one or more $–NH_2$ substituents to an acetamido (-NHC(O)CH_3) substituents by reaction of the compound containing the NH_2 substituent with acetic anhydride in the presence of a base;

-Conversion of one or more $–NH_2$ substituents to an amide derivative (-NHC(O)CH_2CH_2C(O)OH) substituents by reaction of the compound containing the NH_2 substituent with succinic anhydride in the presence of a base;

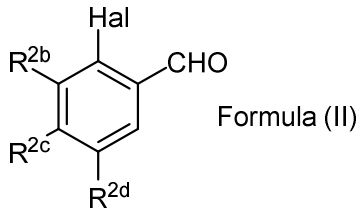
-Conversion of one or more $–NH_2$ substituents to methyl amine substituents (-NHMe) by reaction of the compound containing the NH_2 substituent with formaldehyde in the presence of triacetoxyborohydride;

-Conversion of one or more –OH substituents to acetate (-OC(O)CH_3) substituents by reaction of the compound containing the -OH substituent with acetic anhydride in the presence of a base;

-Hydrolysis of one or more acetate substituents may to form - OH substituents by reaction of the compound containing the acetate substituent with a base;

-Reduction of one or more –NO_2 substituents to amine substituents by, for example, reaction of the compound containing the NO_2 substituent with Zn in the presence of ammonium chloride.

13. The process according to any one of claims 1-7 wherein the compound according to formula (II) is



Formula (II)

A

wherein

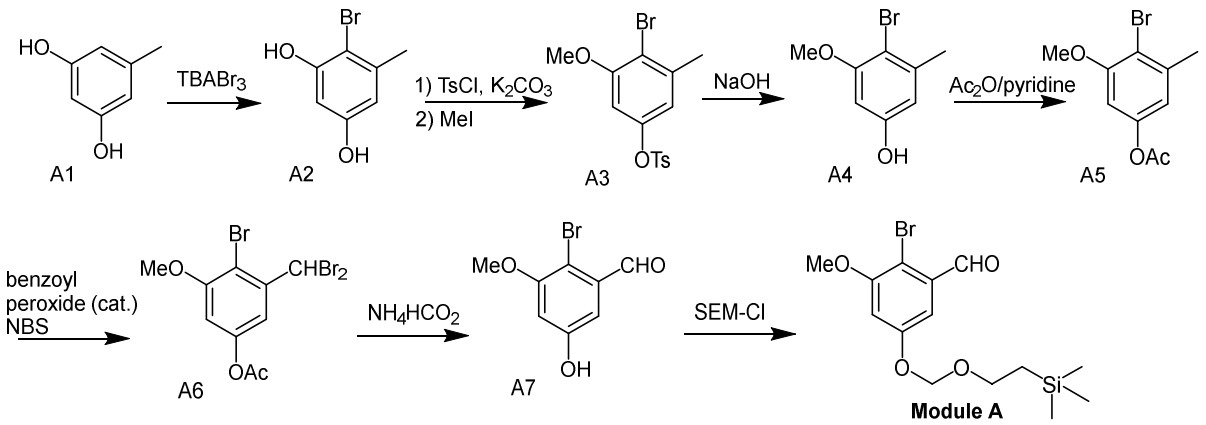
R^{2b}= OMe;

R^{2d}=OH or OSEM;

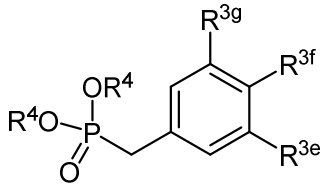
R^{2c}=H; and

Hal is Br.

14. The process according to claim 13 wherein the compound according to formula (II) is Module A and is prepared according to the following process:



15. The process according to any one of claims 1-7 wherein the compound according to formula (III) is



Formula (III)

B

wherein

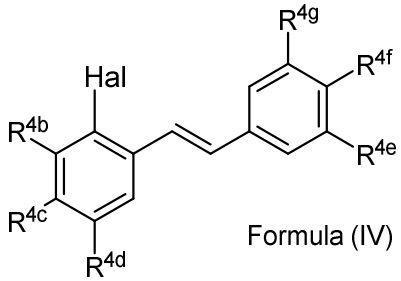
R^{3g}=H;

R^{3f}=OSEM;

R^{3e}=OMe; and

R^4=Et.

16. The process according to any one of claims 1-7 wherein the compound according to formula (IV) is



Formula (IV)

wherein

R^{4b}=OMe;

R^{4c}=H;

R^{4d}=OSEM or OH;

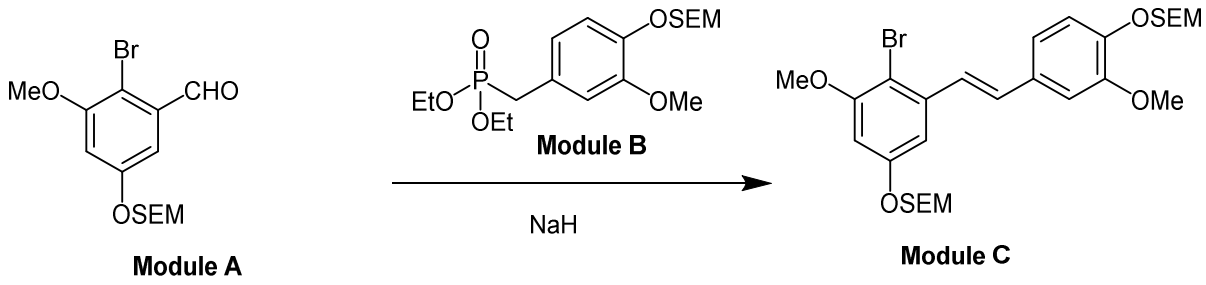
R^{4g}=H;

R^{4e}=OMe;

R^{4f}=OSEM; and

Hal =Br.

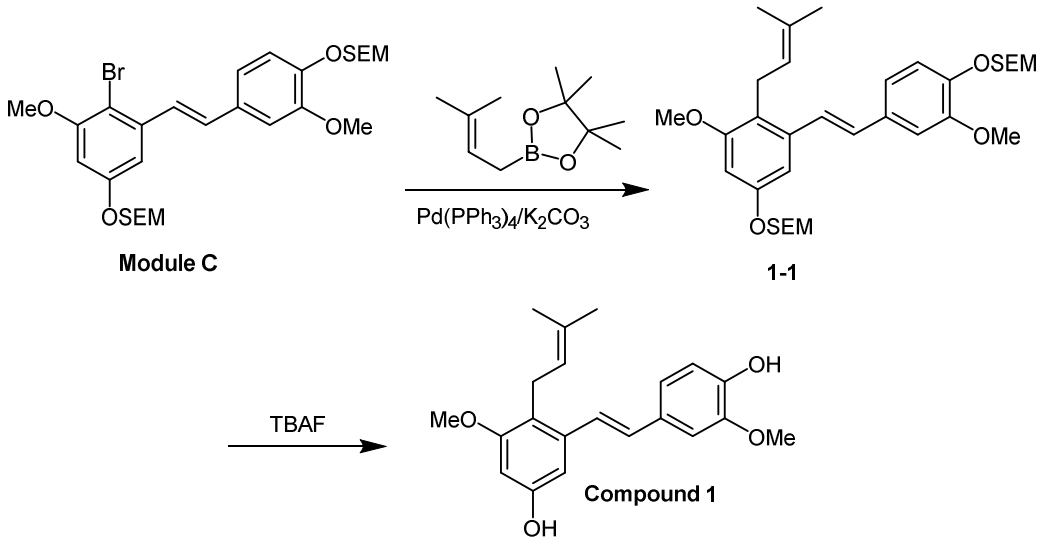
17. The process of claim 16 wherein formula(II) is Module A, formula (III) is Module B and formula (IV) is Module C according to the following:



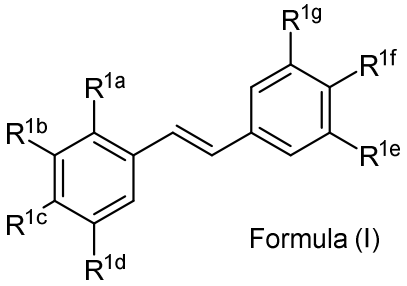
wherein:

i) Module C is coupled with 3-methylbut-2-enylboronic acid pinacol ester in the presence of tetrakis(triphenylphosphine)palladium(0) and potassium carbonate to afford compound 1.1; and

ii) compound 1.1 is treated with tetrabutylammonium fluoride to afford compound 1, according to the following:



18. A compound according to formula (I)



wherein:

R^{1a} is allyl, crotyl, prenyl, or benzyl;

R^{1b} is CF_3, OR^2, NO_2, NHR^3, $NMeR^3$, $NHC{=}NH(NH_2)$ or $COOR^2$;

R^{1c} is H;

R^{1d} is CF_3, OH,, NO_2, NHR^3, $NMeR^3$, $NHC{=}NH(NH_2)$ or $COOR^2$;

R^{1e} is C_1-C_6 alkyl, OR^2, NO_2, NHR^3, $NMeR^3$ or SR_2

R^{1f} is H, OH, NO_2, NHR^3, $NHC{=}NH(NH_2)$, $COOR^2$, COOH or $N(OH)(CO)CH_3$;

R^{1g} is H, C_1-C_6 alkyl, CF_3, OH or OR^2;

R^2 is methyl, ethyl, propyl, isopropyl, butyl, isobutyl, t-butyl, trifluoromethyl, $COCOOR^4$or O-protecting group, wherein the O-protecting group is selected from the group consisting of COMe, *t*-$BuSi(CH_3)_2$, 2-(trimethylsilyl)ethoxymethyl (SEM), $CH(OEt)CH_3$, tetrahydropyranyl, or $C(OEt)(CH_3)_2$;

R^3 is H, CH_3, OH, (CO)H, (CO)Me, SO_2Me, CH_2COOH, CH_2COOR^2, $CO(CH_2)_nNH_2$, $CONH_2$, $CO(CH_2)_nCOOH$ or $COCOOR^4$ (where n = 0, 1 or 2);

R^4 is C_1-C_6 alkyl; and

only one of R^{1f} or R^{1g} can be H;

or R^{1e} and R^{1f} are joined to form a five or six-membered heterocyclic ring containing a carbonyl or $(CO)CH_2$ group when R^{1e} is OH, NH_2 or NHMe and R^{1f} is NH_2, such that the nitrogen of R^{1f} is bridged via the carbonyl or $(CO)CH_2$ group to the oxygen or nitrogen of R^{1e}, and R^{1g} is H;

provided that:

i) when R^{1a} or R^{1c} is prenyl, R^{1d} is OH, R^{1f} is OH, R^{1g} is H and R^{1e} is OH or OR^2, then R^{1b} cannot be OR^2 where R^2 =methyl, ethyl, propyl, isopropyl, butyl, isobutyl or *t*-butyl; and

ii) R^{1b} and R^{1d} are not the same;

19. A compound of formula (I) according to claim 18,

wherein:

R^{1a} is allyl, crotyl, prenyl or benzyl;

R^{1b} is CF_3, OR^2 or NHR^3;

R^{1c} is H;

R^{1d} is OH, NO_2 or NHR^3;

R^{1e} is C_1-C_6 alkyl, OH, OR^2, NO_2, NHR^3, $NMeR^3$or SR^2;

R^{1f} is H, OH, NO_2, NHR^3, $NHC{=}NH(NH_2)$, COOH or $N(OH)(CO)CH_3$;

R^{1g} is H, C_1-C_6 alkyl, OH or OR^2;

R^2 is methyl, ethyl, propyl, isopropyl, butyl, isobutyl, t-butyl, trifluoromethyl, $COCOOR^4$or O-protecting group, wherein the O-protecting group is selected from the group consisting of COMe, *t*-$BuSi(CH_3)_2$, 2-

(trimethylsilyl)ethoxymethyl (SEM) acetal, $CH(OEt)CH_3$, tetrahydropyranyl, or $C(OEt)(CH_3)_2$;

R^3 is H, CH_3, OH, (CO)H, (CO)Me, SO_2Me, CH_2COOH, CH_2COOR^2, $CO(CH_2)_nNH_2$, $CONH_2$, $CO(CH_2)_nCOOH$ or $COCOOR^4$ (where n = 0, 1 or 2);

R^4 is C_1-C_6 alkyl; and

only one of R^{1e}, R^{1f} or R^{1g} can be H;

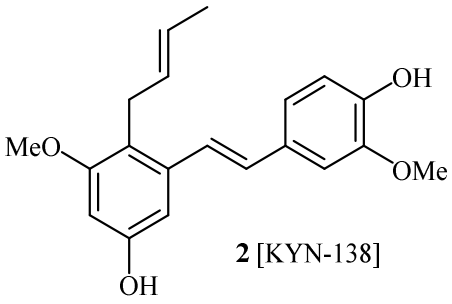
or R^{1e} and R^{1f} are joined to form a five or six-membered heterocyclic ring containing a carbonyl or $(CO)CH_2$ group when R^{1e} is OH, NH_2 or NHMe and R^{1f} is NH_2, such that the nitrogen of R^{1f} is bridged via the carbonyl or $(CO)CH_2$ group to the oxygen or nitrogen of R^{1e}, and R^{1g} is H;

provided that:

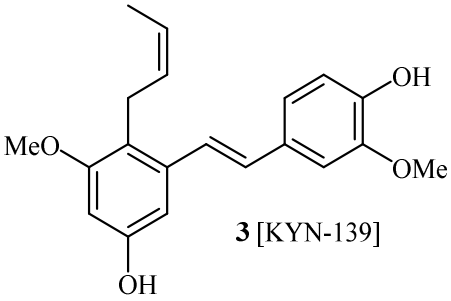
i) when R^{1a} is prenyl, R^{1d} is OH, R^{1f} is OH, R^{1g} is H and R^{1e} is OH or OR^2, then R^{1b} cannot be OR^2 where R^2 =methyl, ethyl, propyl, isopropyl, butyl, isobutyl or *t*-butyl; and

ii) R^{1b} and R^{1d} are not the same.

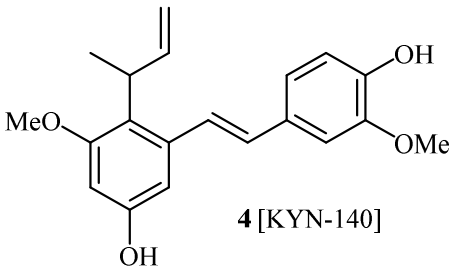
20. A compound according to claim 18 or 19 wherein formula (I) is a compound selected from the group consisting of:



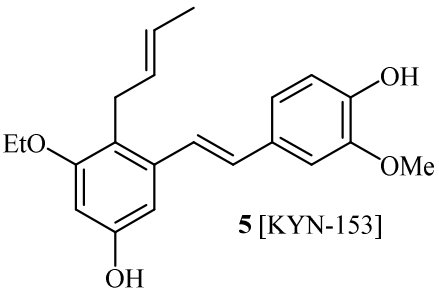
2 [KYN-138]



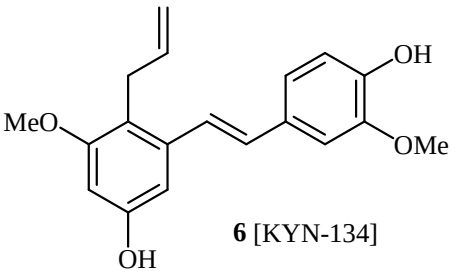
3 [KYN-139]



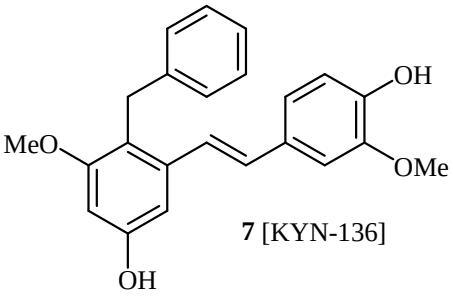
4 [KYN-140]



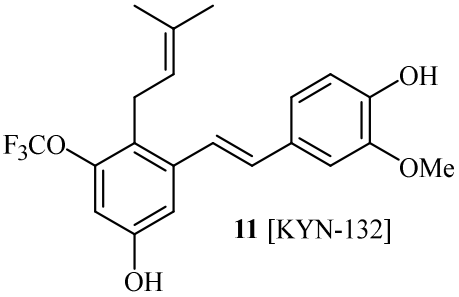
5 [KYN-153]



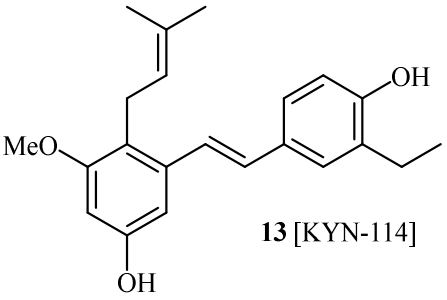
6 [KYN-134]



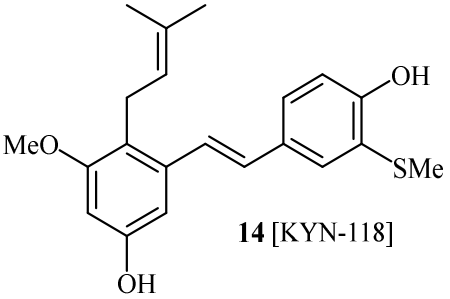
7 [KYN-136]



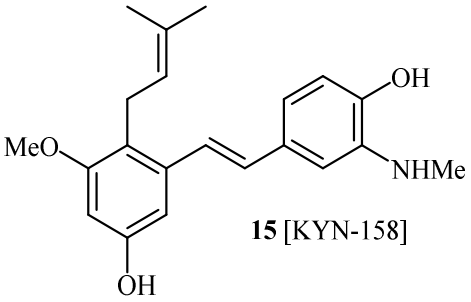
11 [KYN-132]



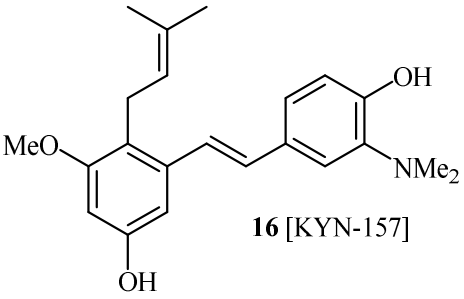
13 [KYN-114]



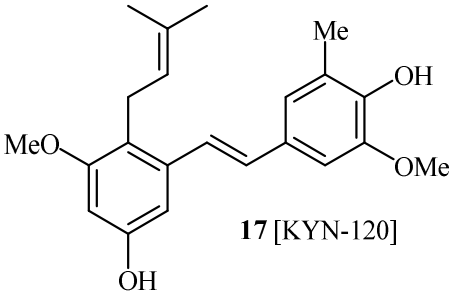
14 [KYN-118]



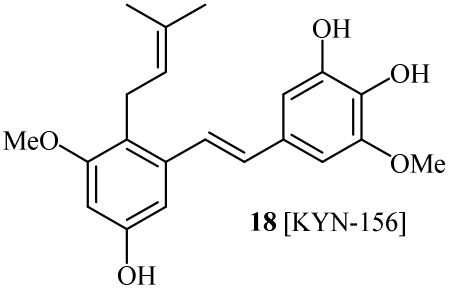
15 [KYN-158]



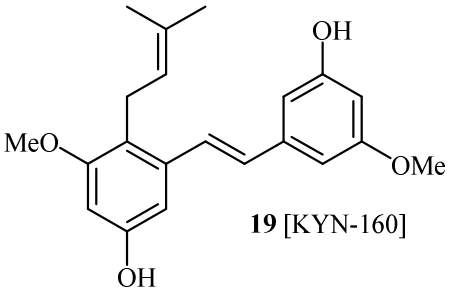
16 [KYN-157]



17 [KYN-120]



18 [KYN-156]



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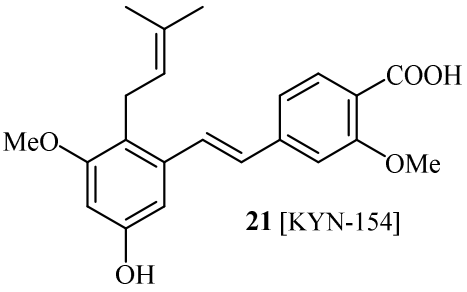
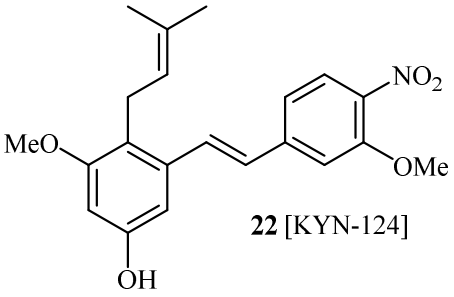


21 [KYN-154]



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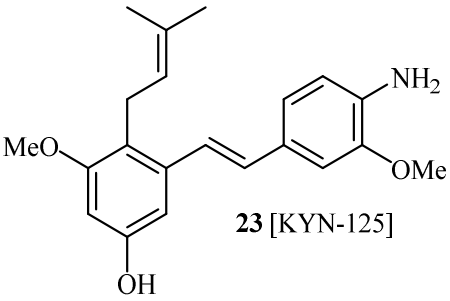

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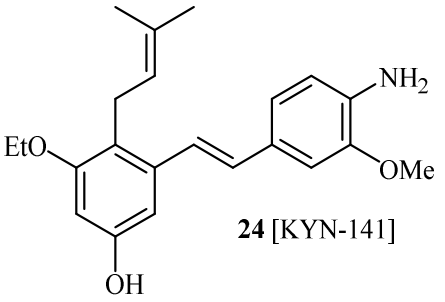
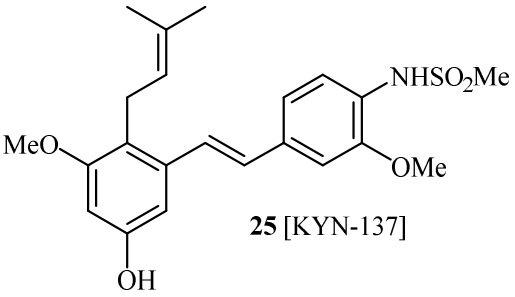
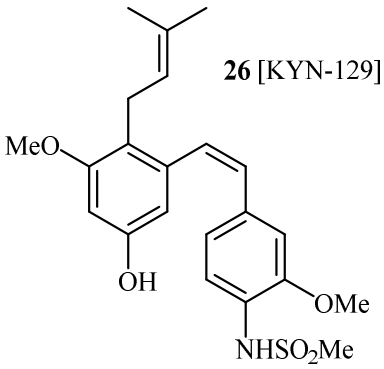


24 [KYN-141]



25 [KYN-137]



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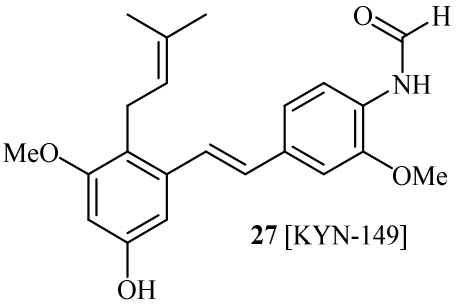
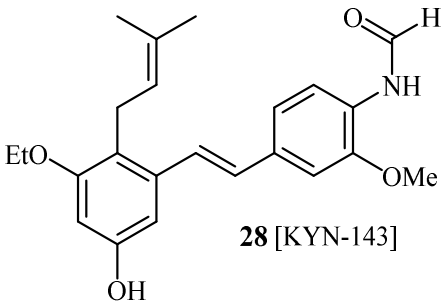
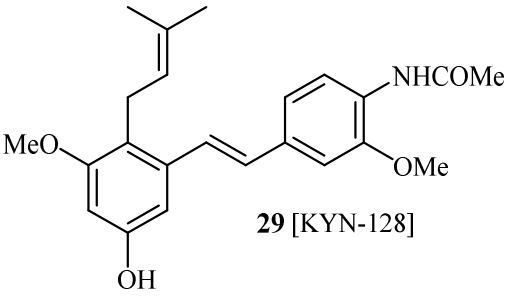


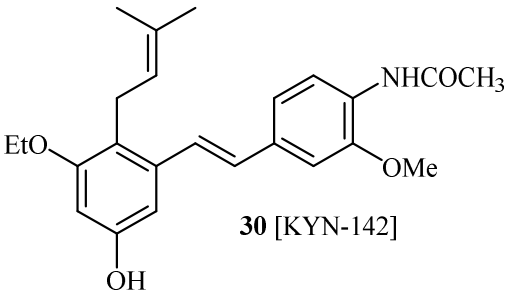
27 [KYN-149]



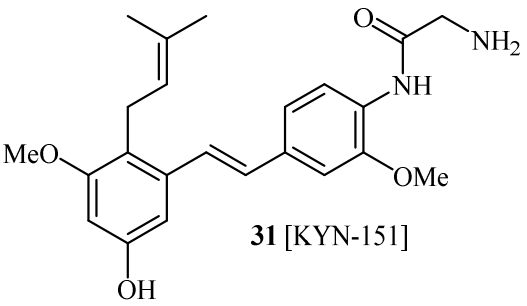
28 [KYN-143]



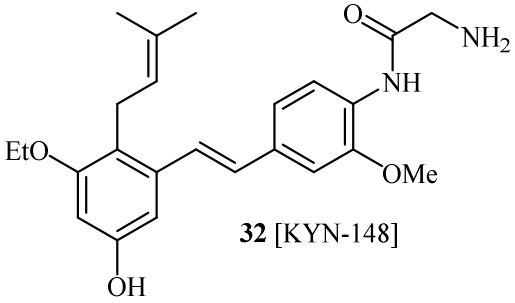
29 [KYN-128]



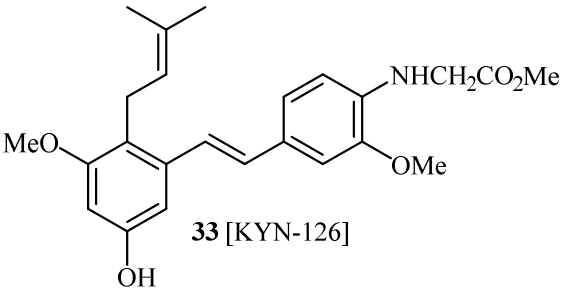
30 [KYN-142]



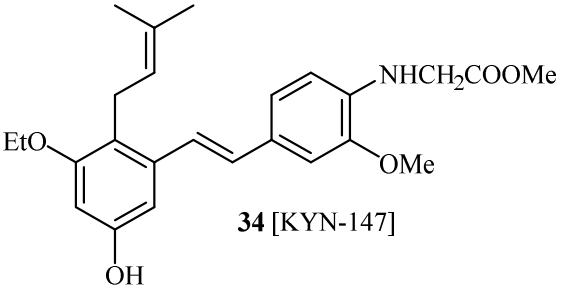
31 [KYN-151]



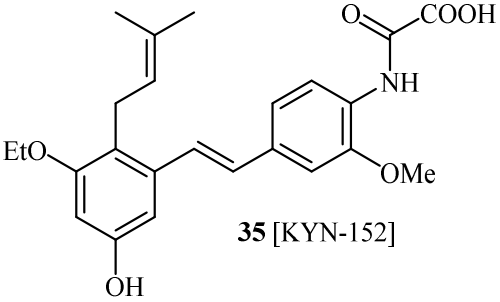
32 [KYN-148]



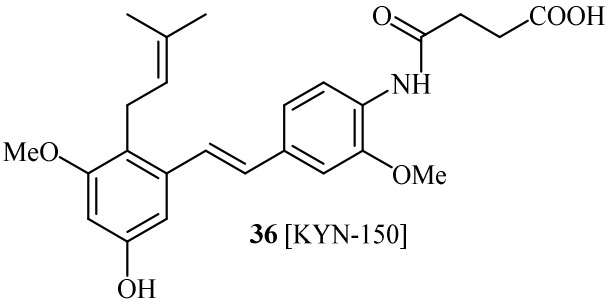
33 [KYN-126]



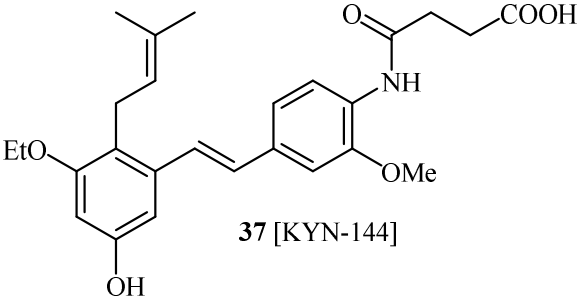
34 [KYN-147]



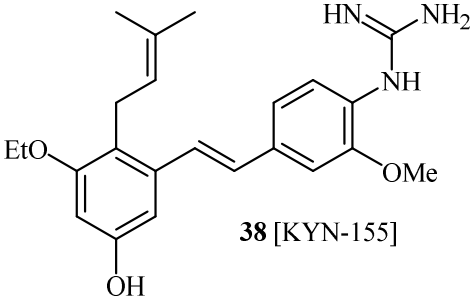
35 [KYN-152]



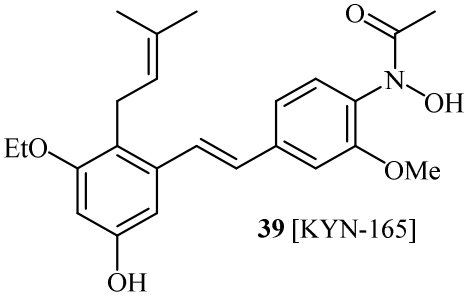
36 [KYN-150]



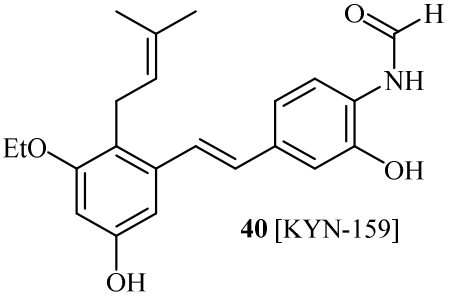
37 [KYN-144]



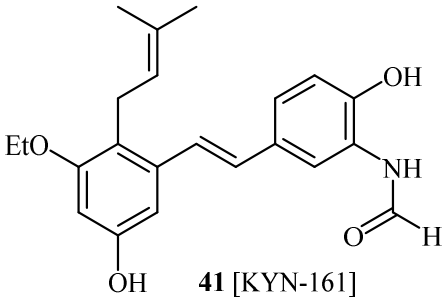
38 [KYN-155]



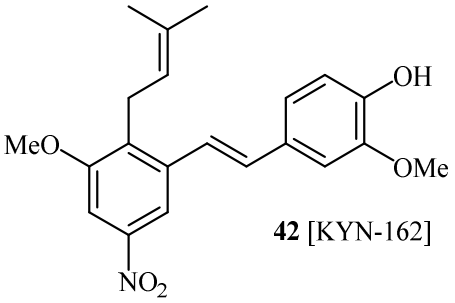
39 [KYN-165]



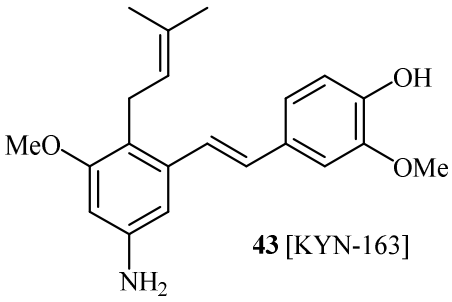
40 [KYN-159]



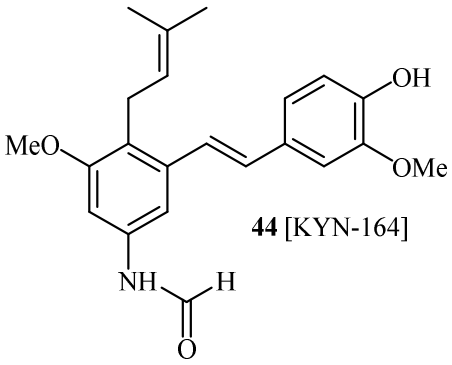
41 [KYN-161]



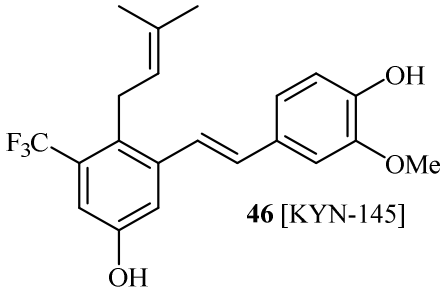
42 [KYN-162]



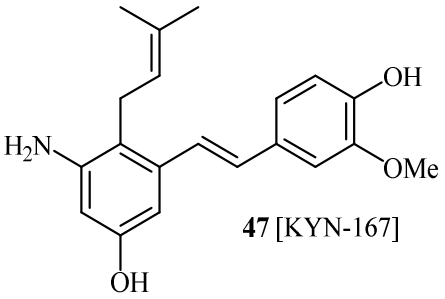
43 [KYN-163]



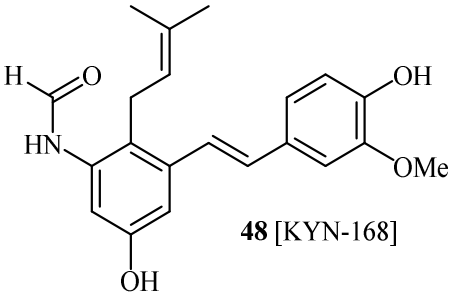
44 [KYN-164]



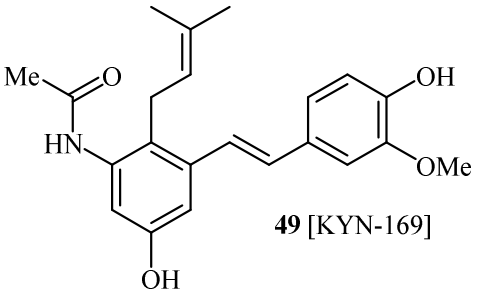
46 [KYN-145]



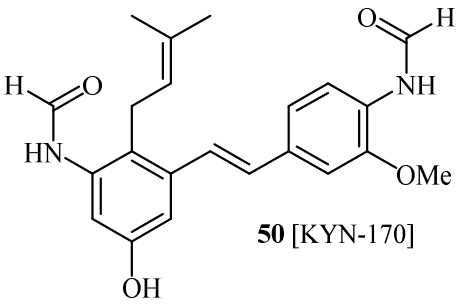
47 [KYN-167]



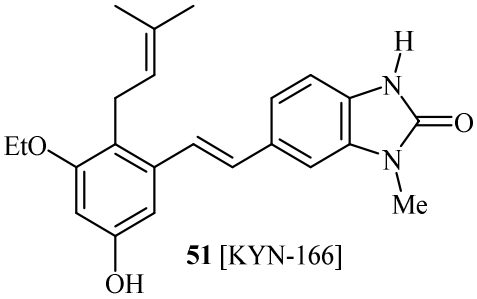
48 [KYN-168]



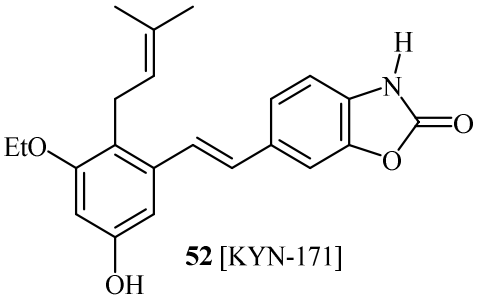
49 [KYN-169]



50 [KYN-170]



51 [KYN-166]

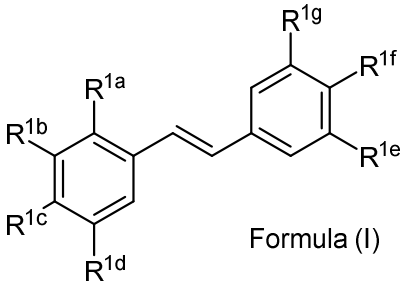


52 [KYN-171]

.

5

21 A compound of formula (I)according to claim 18,



Formula (I)

wherein:

R^{1a} is allyl, crotyl, prenyl, or benzyl;

R^{1b} is CF_3, OR^2, NO_2, NHR^3, $NMeR^3$, $NHC{=}NH(NH_2)$ or $COOR^2$;

R^{1c} is H;

R^{1d} is CF_3, OH, , NHR^3, NO_2, $NHC{=}NH(NH_2)$ or $COOR^2$;

R^{1b} and R^{1d} are not the same;

R^{1e} is OH or OR^2;

R^{1f} is NO_2, NHR^3, $NHC{=}NH(NH_2)$, $COOR^2$, COOH, $NHSO_2Me$, $NHC(O)(CH_2)COOH$, $NHC(O)COOH$, $NHC(O)(CH_2)NNH_2$, $NHC(O)CH_2NH_2$, $NHCH_2COOMe$, $NHC(O)H$, $NHC(O)CH_3$, $NHC(O)(CH_2)_2COOH$ or $NHC(NH)NH_2$;

R^{1g} is H;

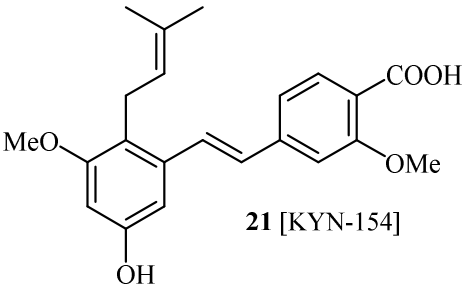
R^2 is methyl, ethyl, propyl, isopropyl, butyl, isobutyl, t-butyl, trifluoromethyl or O-protecting group, wherein the O-protecting group is selected from the group consisting of COMe, *t*-$BuSi(CH_3)_2$, 2-(trimethylsilyl)ethoxymethyl (SEM), $CH(OEt)CH_3$, tetrahydropyranyl, or $C(OEt)(CH_3)_2$;

R^3 is H, CH_3, OH, (CO)H, (CO)Me, SO_2Me, CH_2COOH, CH_2COOR^2, $COCH_2NH_2$, $CONH_2$, $CO(CH_2)_nCOOH$ or $CO(CH_2)_nCOOR^4$ (where n = 0, 1 or 2); and

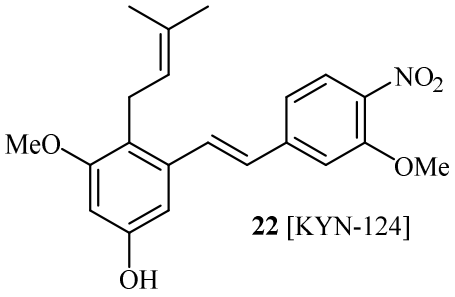
R^4 is C_1-C_6 alkyl;

or R^{1e} and R^{1f} are joined to form a five or six-membered heterocyclic ring containing a carbonyl or $(CO)CH_2$ group when R^{1e} is OH, NH_2 or NHMe and R^{1f} is NH_2, such that the nitrogen of R^{1f} is bridged via the carbonyl or $(CO)CH_2$ group to the oxygen or nitrogen of R^{1e}, and R^{1g} is H.

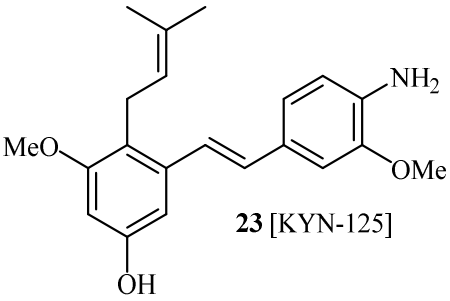
22. A compound according to claim 21 wherein formula (I) is a compound selected from the group consisting of:



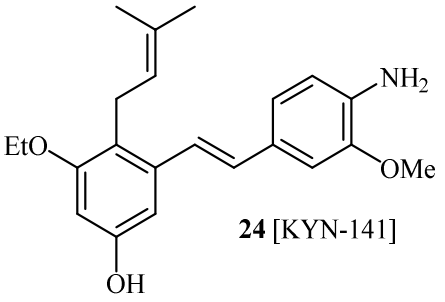
21 [KYN-154]



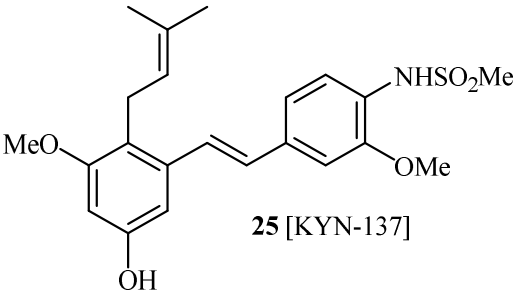
22 [KYN-124]



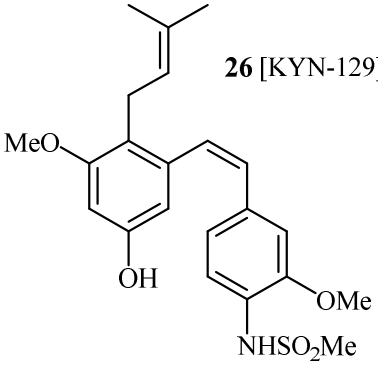
23 [KYN-125]



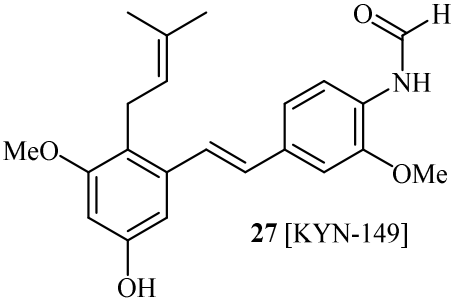
24 [KYN-141]



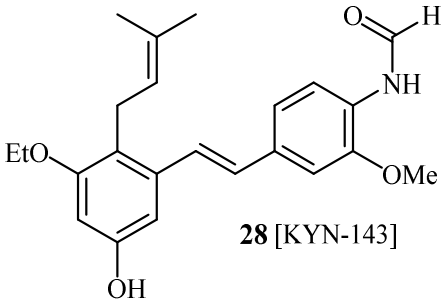
25 [KYN-137]



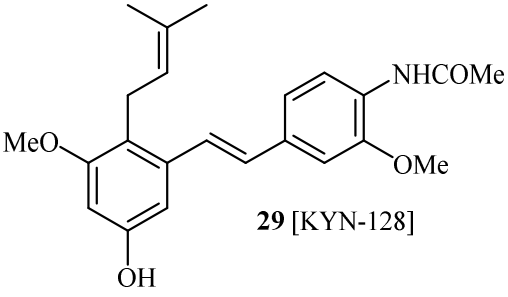
26 [KYN-129]



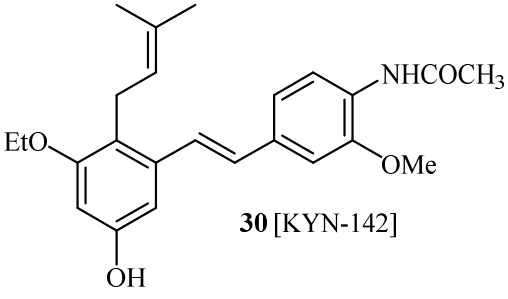
27 [KYN-149]



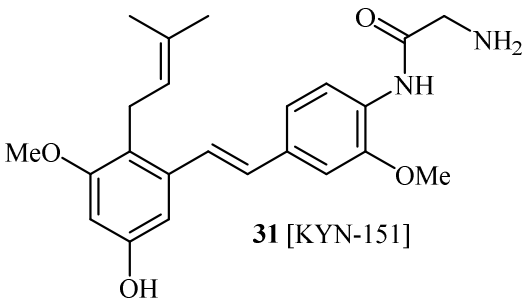
28 [KYN-143]



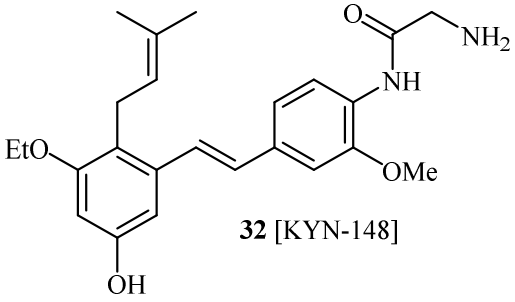
29 [KYN-128]



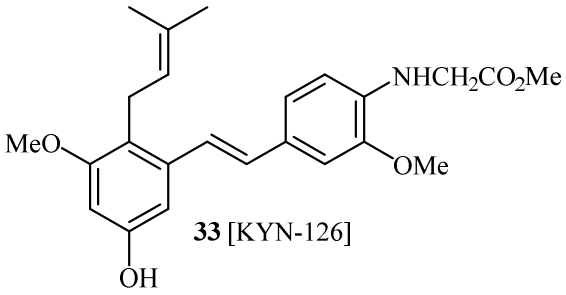
30 [KYN-142]



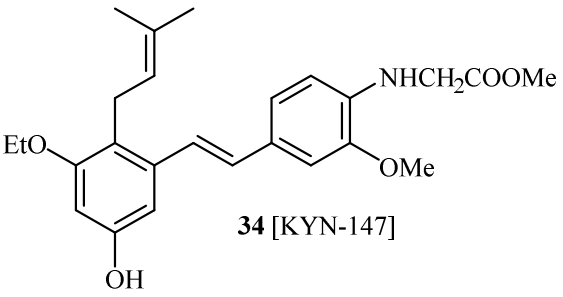
31 [KYN-151]



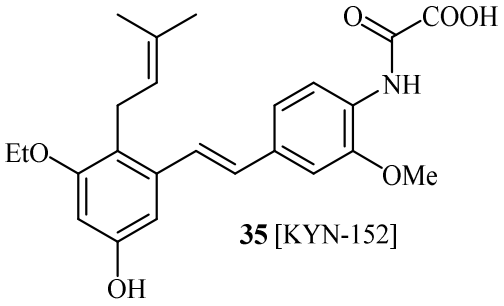
32 [KYN-148]



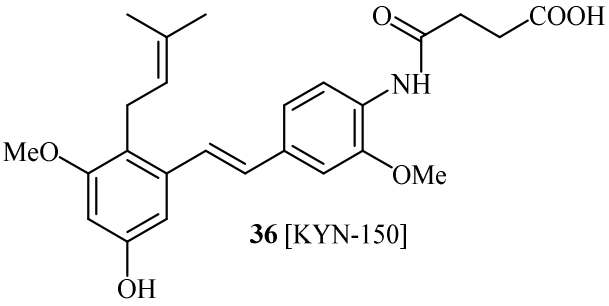
33 [KYN-126]



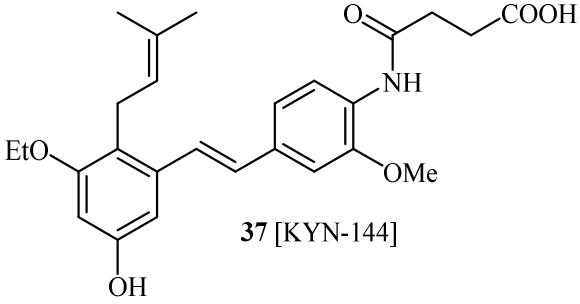
34 [KYN-147]



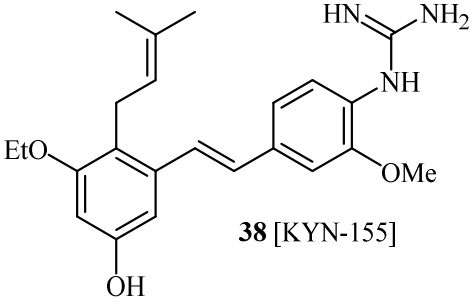
35 [KYN-152]



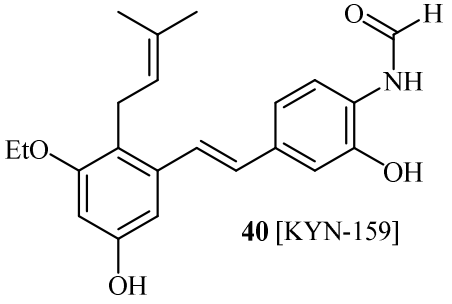
36 [KYN-150]



37 [KYN-144]

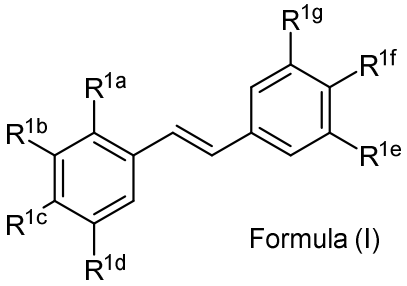


38 [KYN-155]



40 [KYN-159]

23. A compound of formula (I) according to claim 18,



Formula (I)

wherein:

R^{1a} is allyl, crotyl, prenyl or benzyl;

R^{1b} is CF_3, OR^2, NO_2, NHR^3, $NMeR^3$, NHC=NH(NH_2) or $COOR^2$;

R^{1c} is H;

R^{1d} is CF_3, OH, NHR^3, NO_2, NHC=NH(NH_2) or $COOR^2$;

R^{1b} and R^{1d} are not the same

R^{1e} is C_1-C_6 alkyl, NO_2, NHR^3, $NMeR^3$ or SR_2;

R^{1f} is OH

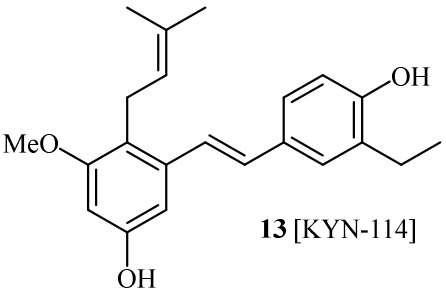
R^{1g} is H;

R^2 is methyl, ethyl, propyl, isopropyl, butyl, isobutyl, t-butyl, trifluoromethyl or O-protecting group, wherein the O-protecting group is selected from the group consisting of COMe, *t*-BuSi(CH_3)$_2$, 2-(trimethylsilyl)ethoxymethyl (SEM), $CH(OEt)CH_3$, tetrahydropyranyl, or C(OEt)(CH_3)$_2$;

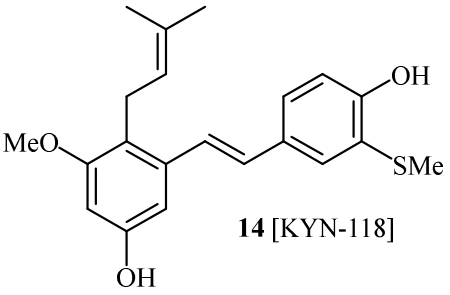
R^3 is H, CH_3, OH, (CO)H, (CO)Me, SO_2Me, CH_2COOH, CH_2COOR^2, $COCH_2NH_2$, $CONH_2$ or $CO(CH_2)_nCOOH$ (where n = 0, 1 or 2); and only one of R^{1f} or R^{1g} can be H,

or R^{1e} and R^{1f} are joined to form a five or six-membered heterocyclic ring containing a carbonyl or (CO)CH_2 group when R^{1e} is OH, NH_2 or NHMe and R^{1f} is NH_2, such that the nitrogen of R^{1f} is bridged via the carbonyl or (CO)CH_2 group to the oxygen or nitrogen of R^{1e}, and R^{1g} is H.

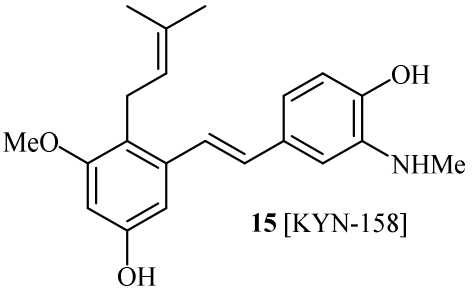
24. A compound according to claim 23wherein formula (I) is a compound selected from the group consisting of:



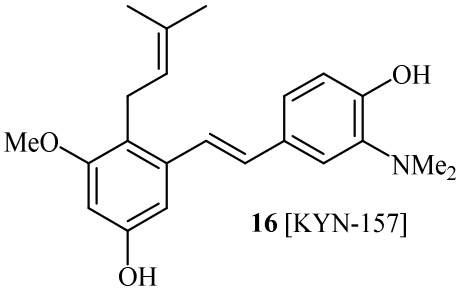
13 [KYN-114]



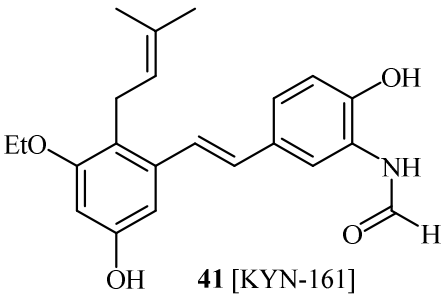
14 [KYN-118]



15 [KYN-158]

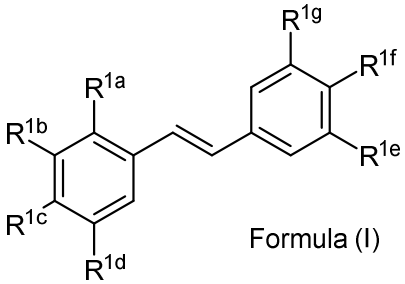


16 [KYN-157]



41 [KYN-161]

25 A compound of formula (I) according to claim 18,



Formula (I)

wherein:

R^{1a} is allyl, crotyl or benzyl;

R^{1b} is CF_3, OR^2, NO_2, NHR^3, $NMeR^3$, NHC=NH(NH_2) or $COOR^2$;

R^{1c} is H;

R^{1d} is CF_3, OH, NHR^3, NO_2, $NMeR^3$, $NHC{=}NH(NH_2)$ or $COOR^2$;R^{1e} is OH, OR^2, NO_2, NHR^3, $NMeR^3$or SR^2;

R^{1f} is H, OH, NO_2, NHR^3, $NHC{=}NH(NH_2)$, $COOR^2$ or COOH;

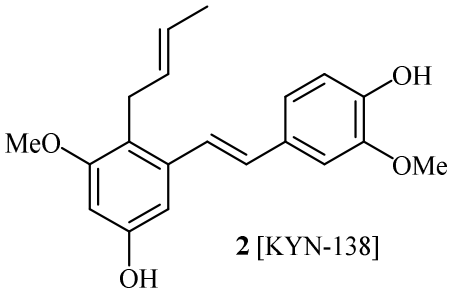
R^{1g} is H, C_1-C_6 alkyl, OH or OR^2;

R^2 is methyl, ethyl, propyl, isopropyl, butyl, isobutyl, t-butyl, trifluoromethyl, C(O)C(O)OR^4 or O-protecting group, wherein the O-protecting group is selected from the group consisting of COMe, *t*-$BuSi(CH_3)_2$, 2-(trimethylsilyl)ethoxymethyl (SEM), $CH(OEt)CH_3$, tetrahydropyranyl, or $C(OEt)(CH_3)_2$;

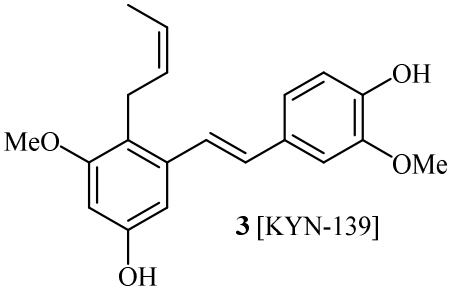
R^3 is H, CH_3, OH, (CO)H, (CO)Me, SO_2Me, CH_2COOH, CH_2COOR^2, $COCH_2NH_2$, $CONH_2$ or $CO(CH_2)_nCOOH$ (where n = 0, 1 or 2); only one of R^{1f} or R^{1g} can be H,

or R^{1e} and R^{1f} are joined to form a five or six-membered heterocyclic ring containing a carbonyl or $(CO)CH_2$ group when R^{1e} is OH, NH_2 or NHMe and R^{1f} is NH_2, such that the nitrogen of R^{1f} is bridged via the carbonyl or $(CO)CH_2$ group to the oxygen or nitrogen of R^{1e}, and R^{1g} is H.

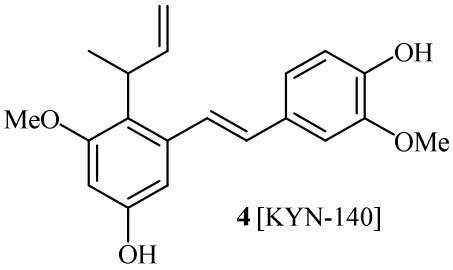
26. A compound according to claim 26 wherein formula (I) is a compound selected from the group consisting of:



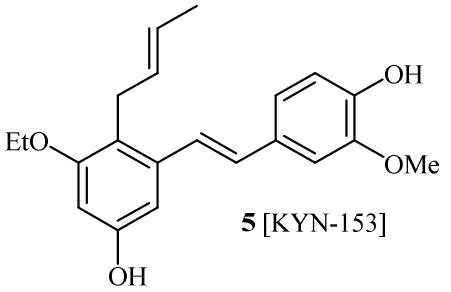
2 [KYN-138]



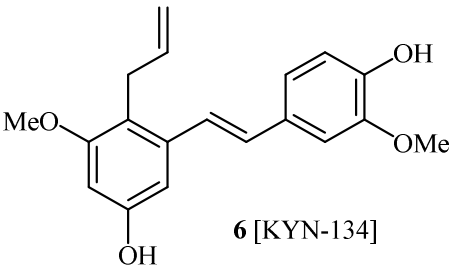
3 [KYN-139]



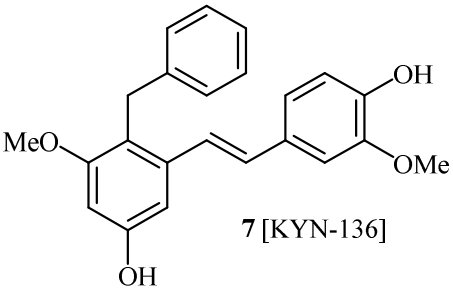
4 [KYN-140]



5 [KYN-153]

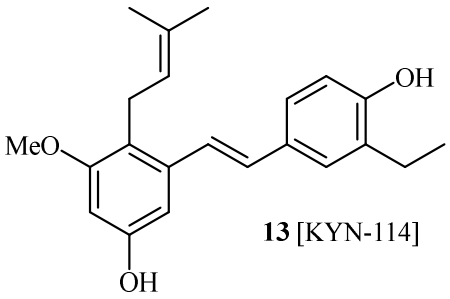


6 [KYN-134]

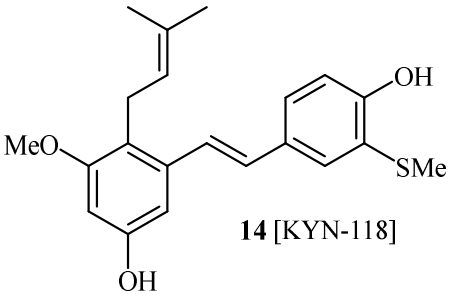


7 [KYN-136]

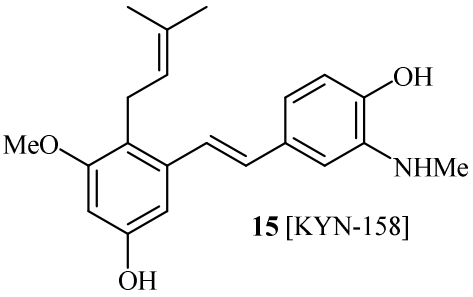
27. A compound of formula (I) according to claim 18 wherein the compound is selected from the group consisting of:



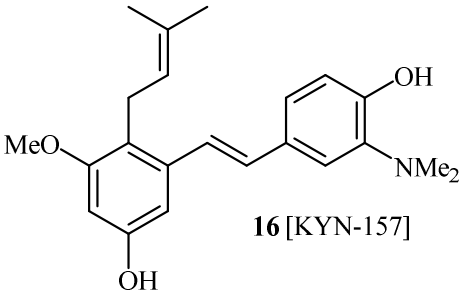
13 [KYN-114]



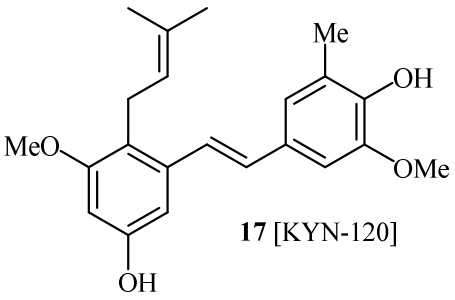
14 [KYN-118]



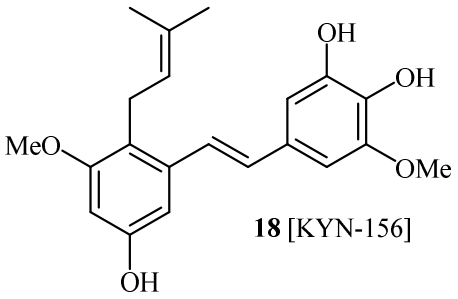
15 [KYN-158]



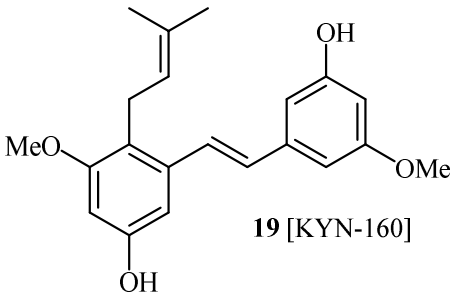
16 [KYN-157]



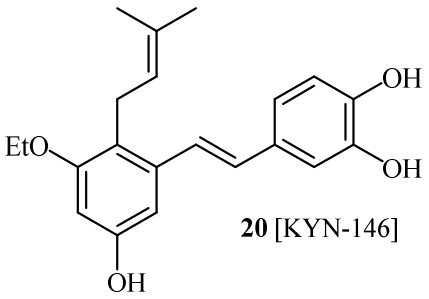
17 [KYN-120]



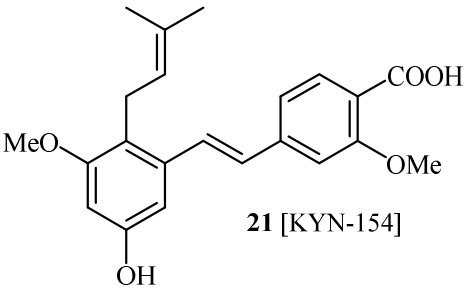
18 [KYN-156]



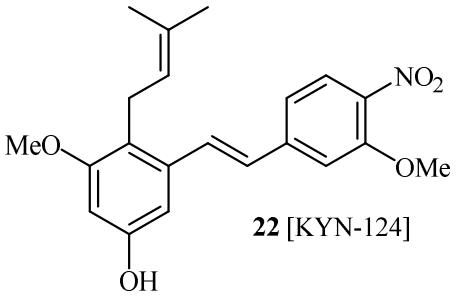
19 [KYN-160]



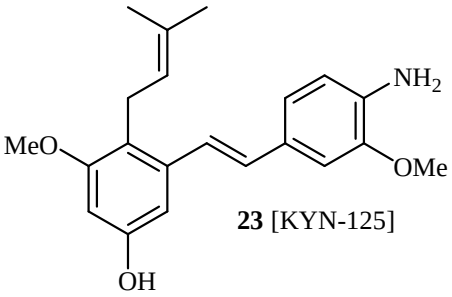
20 [KYN-146]



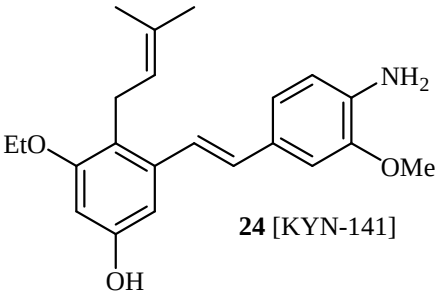
21 [KYN-154]



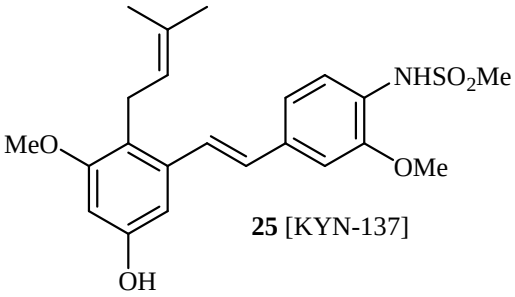
22 [KYN-124]



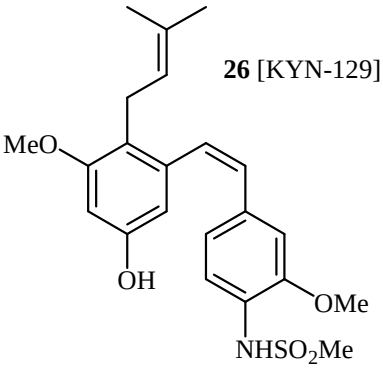
23 [KYN-125]



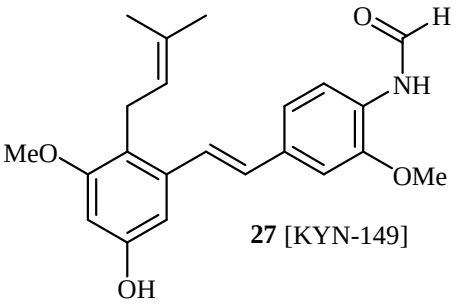
24 [KYN-141]



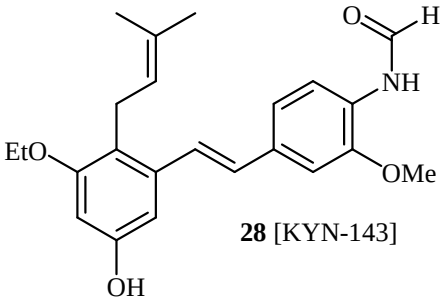
25 [KYN-137]



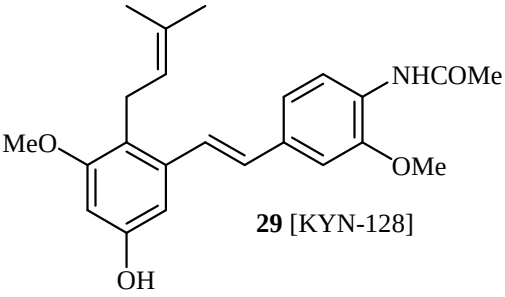
26 [KYN-129]



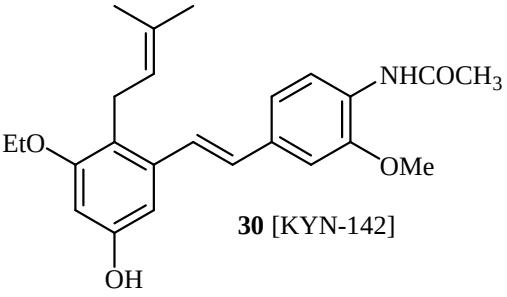
27 [KYN-149]



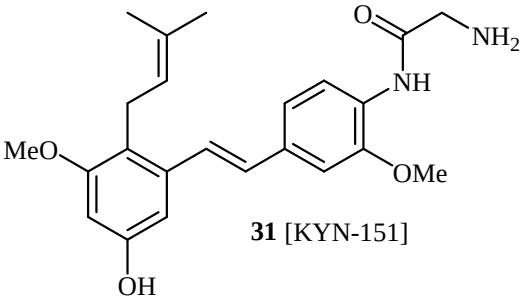
28 [KYN-143]



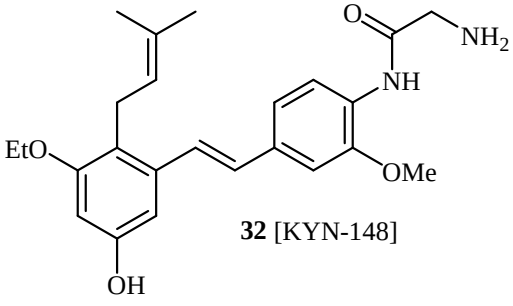
29 [KYN-128]



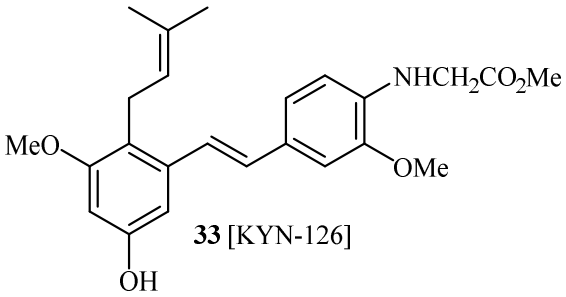
30 [KYN-142]



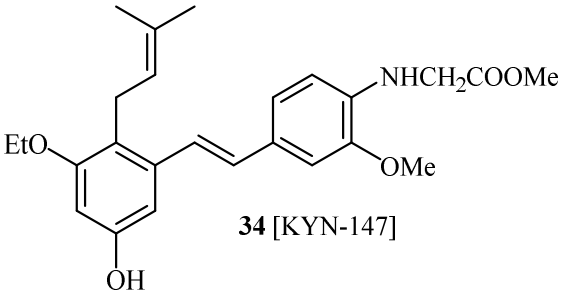
31 [KYN-151]



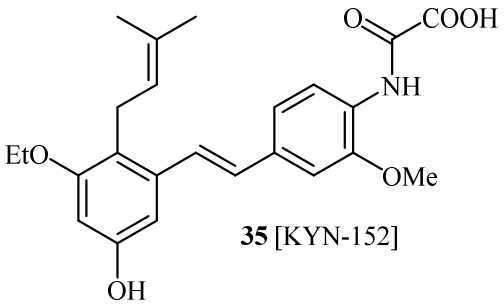
32 [KYN-148]



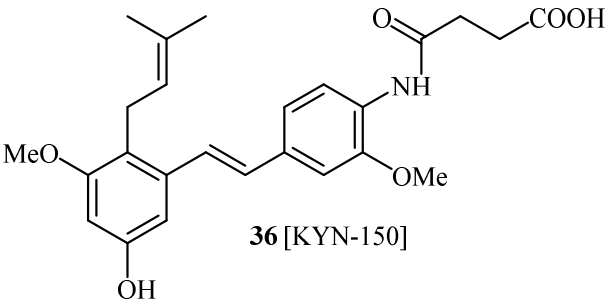
33 [KYN-126]



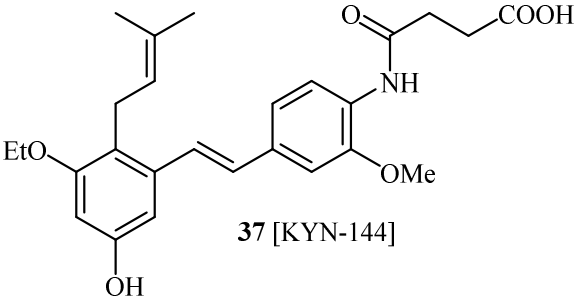
34 [KYN-147]



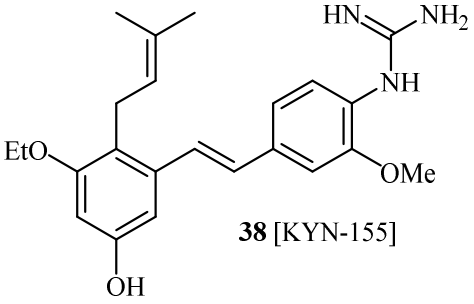
35 [KYN-152]



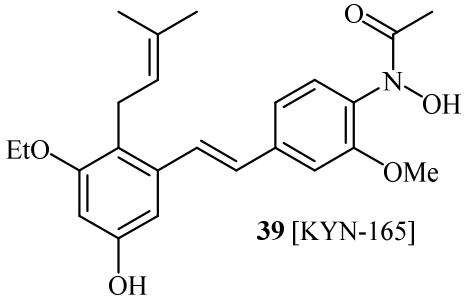
36 [KYN-150]



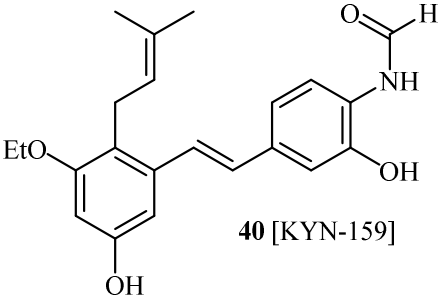
37 [KYN-144]



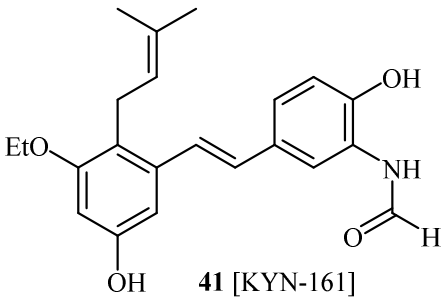
38 [KYN-155]



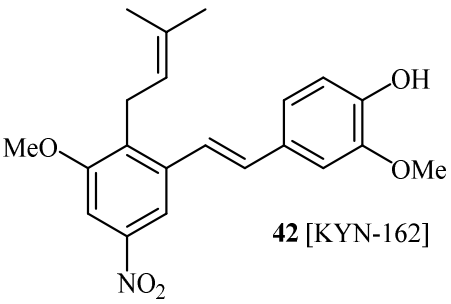
39 [KYN-165]



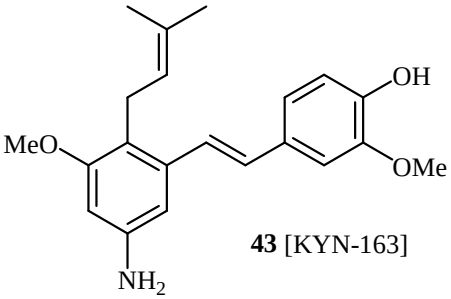
40 [KYN-159]



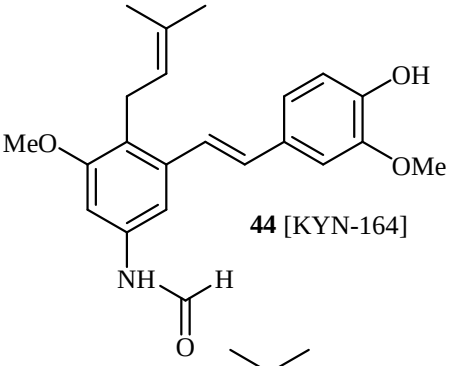
41 [KYN-161]



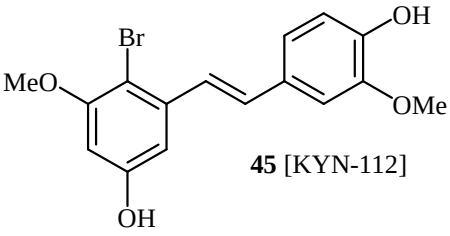
42 [KYN-162]



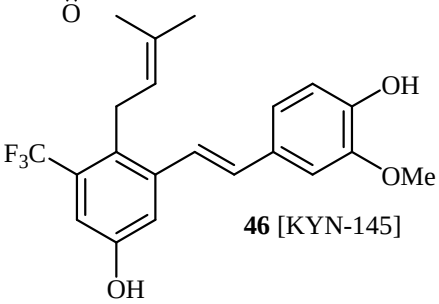
43 [KYN-163]



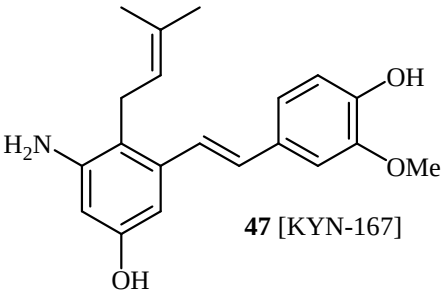
44 [KYN-164]



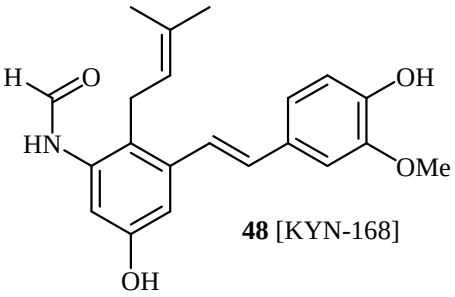
45 [KYN-112]



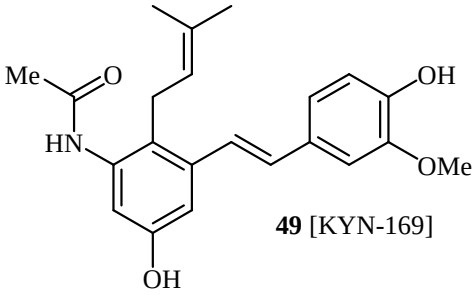
46 [KYN-145]



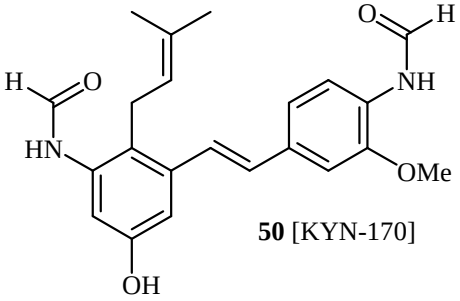
47 [KYN-167]



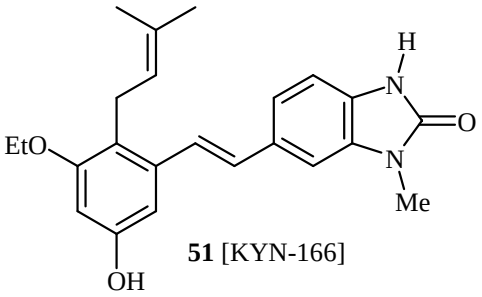
48 [KYN-168]



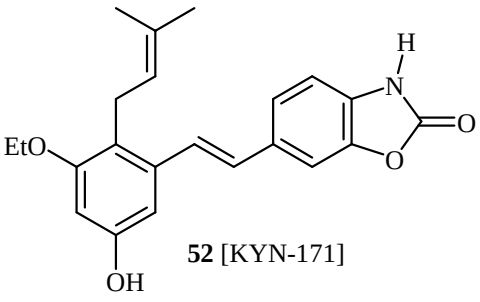
49 [KYN-169]



50 [KYN-170]



51 [KYN-166]



52 [KYN-171]

28. A compound of formula (I) according to claim 18 wherein:

R^{1a} is prenyl;

R^{1b} is OR^2;

R^{1c} is H;

R^{1d} is OH;

R^{1e} is OR^2;

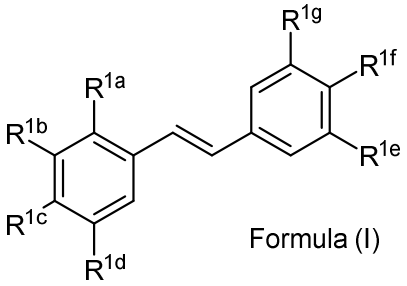
R^{1f} is NHR^3 or $NHC=NH(NH_2)$,

R^{1g} is H, C_1-C_6 alkyl or OH;

R^2 is methyl, ethyl, propyl, isopropyl, butyl, isobutyl or t-butyl; and

R^3 is H, CH_3, OH, (CO)H, (CO)Me, SO_2Me, CH_2COOR^2, $COCH_2NH_2$ or $CO(CH_2)_nCOOH$ (where n = 0, 1 or 2).

29. A compound of formula (I) according to claim 18,



Formula (I)

wherein:

R^{1a} is allyl, crotyl, prenyl or benzyl;

R^{1b} is CF_3, OH or OR^2, NO_2, NHR^3, $NMeR^3$, $NHC=NH(NH_2)$ or $COOR^2$;

R^{1c} is H;

R^{1d} is CF_3, OH, NO_2, NHR^3, $NMeR^3$, $NHC=NH(NH_2)$ or $COOR^2$;

R^{1b} and R^{1d} are not the same;

R^{1e} is C_1-C_6 alkyl, OH, OR^2, NO_2, NHR^3 or SR^2;

R^{1f} is H, OH, NO_2, NHR^3, $NHC=NH(NH_2)$ or COOH;

R^{1e} and R^{1f} are not the same;

R^{1g} is H, C_1-C_6 alkyl, OH or OR^2;

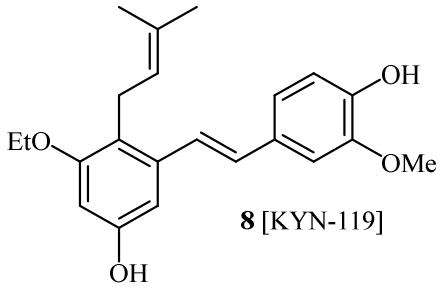
R^2 is methyl, ethyl, propyl, isopropyl, butyl, isobutyl, t-butyl, trifluoromethyl, $COCOOR^4$or O-protecting group, wherein the O-protecting group is selected from the group consisting of COMe, *t*-$BuSi(CH_3)_2$, 2-(trimethylsilyl)ethoxymethyl (SEM), $CH(OEt)CH_3$, tetrahydropyranyl, or $C(OEt)(CH_3)_2$;

R^3 is H, CH_3, OH, (CO)H, (CO)Me, SO_2Me, CH_2COOH, CH_2COOR^2, $CO(CH_2)_nNH_2$, $CONH_2$, $CO(CH_2)_nCOOH$ or $COCOOR^4$ (where n = 0, 1 or 2);

R^4 is C_1-C_6 alkyl; and only one of R^{1f} or R^{1g} can be H; and

wherein at least one of R^{1e} or R^{1f} is – NHC(O)H or NHC(O)Me.

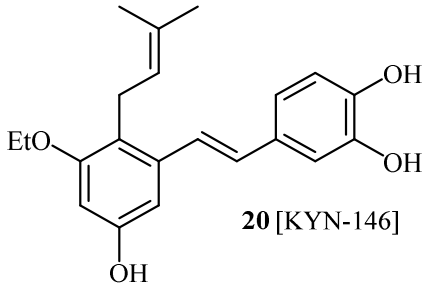
30. A compound according to:



8 [KYN-119]

.

31. A compound according to:



20 [KYN-146]

.

32. A compound according to any one of claims 18-29 or a pharmaceutically acceptable salt, solvate or pharmaceutical composition including said compound for use

in the treatment of cancer or a skin disease or disorder including atopic dermatitis and psoriasis.

33. Use of a compound according to any one of claims 18-29 or a pharmaceutically acceptable salt, solvate or pharmaceutical composition including said compound in the preparation of a medicament for treating cancer or a skin disease or disorder.

34. The compound or use of claism 32 or 33 wherein the cancer is selected from the group consisting of skin cancer, melanoma, leukemia, CNS cancer, ovarian cancer, renal cancer, prostate cancer, pancreatic cancer, bladder cancer, kidney cancer, colon cancer, breast cancer, lung cancer, liver cancer, brain cancer, glioblastoma and osteoblastic sarcoma cell cancer; Bone Ewing's sarcoma, muscle Ewing's sarcoma, fibrosarcomas, hypo-pharynx cancer, pharynx cancer, leiomyosarcoma, liposarcoma, connective tissue sarcoma, osteosarcoma, rhabdomyosarcoma, tongue cancer, squamous cell carcinoma of tongue, squamous cell carcinoma of base of tongue, squamous cell carcinoma of pharynx, squamous cell carcinoma of hypopharynx, pharyngeal cancer, and neuroblastomas.