

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference PCT116890	FOR FURTHER ACTION		See Form PCT/IPEA/416
International application No. PCT/IB2022/053387	International filing date (day/month/year) 11.04.2022	Priority date (day/month/year) 12.04.2021	
International Patent Classification (IPC) or national classification and IPC INV. C12N1/16			
Applicant AGROVENTURES S.R.L.			
1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36. 2. This REPORT consists of a total of <u>6</u> sheets, including this cover sheet. 3. This report is also accompanied by ANNEXES, comprising: a. ☒ (sent to the applicant and to the International Bureau) a total of <u>14</u> sheets, as follows: ☒ sheets of the description, claims and/or drawings which have been amended and/or sheets containing rectifications authorized by this Authority, unless those sheets were superseded or cancelled, and any accompanying letters (see Rules 46.5, 66.8, 70.16, 91.2, and Section 607 of the Administrative Instructions). ☐ sheets containing rectifications, where the decision was made by this Authority not to take them into account because they were not authorized by or notified to this Authority at the time when this Authority began to draw up this report, and any accompanying letters (Rules 66.4bis, 70.2(e), 70.16 and 91.2). ☐ superseded sheets and any accompanying letters, where this Authority either considers that the superseding sheets contain an amendment that goes beyond the disclosure in the international application as filed, or the superseding sheets were not accompanied by a letter indicating the basis for the amendments in the application as filed, as indicated in item 4 of Box No. I and the Supplemental Box (see Rule 70.16(b)). b. ☐ (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing, in the form of an Annex C/ST.25 text file, as indicated in the Supplemental Box Relating to Sequence Listing (see paragraph 3ter of Annex C of the Administrative Instructions).			
4. This report contains indications relating to the following items: ☒ Box No. I Basis of the report ☐ Box No. II Priority ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability ☐ Box No. IV Lack of unity of invention ☒ Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement ☐ Box No. VI Certain documents cited ☐ Box No. VII Certain defects in the international application ☐ Box No. VIII Certain observations on the international application			
Date of submission of the demand 30.12.2022		Date of completion of this report 15.06.2023	
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Fax: +49 89 2399 - 4465		Authorized officer Roscoe, Richard Telephone No. +49 89 2399-2554	



Note: Present claims are essentially identical, except for restriction of certain features, to those of the priority document and are thus entitled to priority from 12.04.2021

1 Item V

Reasoned statement on Novelty, Inventive Step and Industrial Applicability -

The documents mentioned in the present written opinion / International Preliminary Examination Report are numbered as in the search report, i.e. D1 corresponds to the first document of the search report etc.

1.1 Novelty (Art.33(2) PCT)

Based on the fact that applicants specific deposited strain is an environmental isolate, and that none of the 4 sequences provided to characterize it are 100% identical to sequences in the prior art. All claims now specifically relate to this strain and are thus novel.

1.2 Inventive Step (Art.33(3) PCT)

Applicants specific deposited strain is inventive and consequently the claims as a whole which all relate thereto:

Addressing this strain, and starting from e.g. any of D1-D4 as closest prior art, all of which disclose biocontrol *P. terrestris* LS28, applicant appears to be addressing the problem of the provision of a further biocontrol-capable isolate of *P. terrestris*. Given that *P. terrestris* has established biocontrol credentials, the question is thus whether the provision of an alternative isolate can be considered to constitute an inventive act.

The yeast strain LS28, previously described as *Papiliotrema laurentii* (ex *Cryptococcus laurentii*) and recently reclassified as *Papiliotrema terrestris* (Miccoli et al. 2020 (D5)), is a biocontrol agent isolated from the apple fruit epiphytic microbiota and selected for its ability to counteract fungal pathogens of plants and fruits, both in-field and in the postharvest stage (summary from postpublished doc. Palmieri et al. 2021 (not cited)).

LS28 has been in use for the protection of crops, in particular post-harvest for at least 20 years (see e.g. Lima et al. 1998 (D1)), and was tested alone or in combination with other fungicides (Table 1 (p.260)). Tolaini et al. 2010 (D2) also uses LS28 for protection of apples post-harvest from *P. expansum*. The effect is attributed at least in part to catalase, superoxide dismutase and glutathione peroxidase activities which allow the *P. terrestris* to survive despite the oxidative

stress at wound sites in the apple (see abstract; col.2, p.243). The organism was administered together with extracts from another biocontrol organism (*L. edodes* (LF23)). Lima et al. 2010 (D3) tested the compatibility of the biocontrol yeasts (*Rhodosporidium kratochvilovae* LS11 and *Cryptococcus laurentii* LS28) with the recently developed fungicides boscalid (BOSC), cyprodinil (CYPR) and fenhexamid (FENH) to create an efficient integrated approach to control blue mould on apples. The fungicide thiabendazole (TBZ), which is presently allowed for postharvest treatment of pome fruit in different countries, was also used as the control. Both the biocontrol agents (BCAs) LS11 and LS28 were compatible with BOSC and CYPR.

The patent literature also discloses use of LS28 for pre- and post-harvest treatment of crops, optionally in combination with other fungicidal agents (e.g. WO2008114304 (D4), p.7, 9-11, claims).

Applicant has provided experimental data showing broad-spectrum antimicrobial activity for his isolate and has also shown it to be safe (this has of course also been shown for LS28 in the prior art, so it is not surprising that this species has such capability).

Further, applicant has shown comparative data for his isolate and the known LS-28 isolates. Here, one can view Table 6 of the application. Therein, it is shown that both in field trials and in post-harvested crops, using identical concentrations, PT22AV (i.e. applicants CBS147138 deposit) shows improved performance at controlling a variety of fungal pathogens on stone-fruit, grape and strawberry. This broad-spectrum improved behaviour compared to a well-established prior art strain of the same species is unexpected and leads to a finding of inventive step for all claims since they relate to the strain per se or uses thereof. In addition, the tolerance of the strain to various stresses is also improved, as shown in Table 7. This again, is surprising, and contributes to a finding of inventive step.

1.3 Industrial Applicability (Art.33(4) PCT)

Present claims appear to be industrially applicable.

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.
PCT/IB2022/053387

Box No. I Basis of the report

1. With regard to the **language**, this report is based on
- ☒ the international application in the language in which it was filed
 - ☐ a translation of the international application into , which is the language of a translation furnished for the purposes of:
 - ☐ international search (under Rules 12.3(a) and 23.1(b))
 - ☐ publication of the international application (under Rule 12.4(a))
 - ☐ international preliminary examination (under Rules 55.2(a) and/or 55.3(a) and (b))
2. With regard to the **elements*** of the international application, this report is based on (*replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report*):

Description, Pages

1-83 as originally filed

Sequence listings, SEQ ID NO

1-4 as originally filed

Claims, Numbers

1-27 filed in electronic form on 24-03-2023

Drawings, Sheets

1/3-3/3 as originally filed

- ☒ a sequence listing - see Supplemental Box Relating to Sequence Listing.
3. ☐ The amendments have resulted in the cancellation of:
- ☐ the description, pages
 - ☐ the claims, Nos.
 - ☐ the drawings, sheets/figs
 - ☐ the sequence listing (*specify*):
4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since either they are considered to go beyond the disclosure as filed, or they were not accompanied by a letter indicating the basis for the amendments in the application as filed, as indicated in the Supplemental Box (Rules 70.2(c) and (c-bis)):
- ☐ the description, pages
 - ☐ the claims, Nos.
 - ☐ the drawings, sheets/figs
 - ☐ the sequence listing (*specify*):

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5. ☐ This report has been established:
- ☐ taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rules 66.1(d-bis) and 70.2(e)).
 - ☐ without taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91(Rules 66.4bis and 70.2(e)).
6. ☒ With regard to top-up searches (Rules 66.1ter and 70.2(f)):
- ☒ A top-up search was carried out by this Authority on 19.01.2023 (all discovered documents are listed in the Supplemental Box Relating to Top-up Search).
 - ☐ Additional relevant documents have been discovered during the top-up search.
 - ☐ No top-up search was carried out by this Authority because it would serve no useful purpose.
7. ☐ Supplementary international search report(s) from Authority(ies) has/have been received and taken into account in establishing this report (Rule 45bis.8(b) and (c)).

* If item 4 applies, some or all of those sheets may be marked "superseded".

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	<u>1-27</u>
	No: Claims	
Inventive step (IS)	Yes: Claims	<u>1-27</u>
	No: Claims	
Industrial applicability (IA)	Yes: Claims	<u>1-27</u>
	No: Claims	

2. Citations and explanations (Rule 70.7):

see separate sheet

Supplemental Box relating to Sequence Listing

Continuation of Box I, item 2:

1. With regard to any nucleotide and/or amino acid sequence disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of a sequence listing:
 - a. ☒ forming part of the international application as filed:
 - ☒ in the form of an Annex C/ST.25 text file.
 - ☐ on paper or in the form of an image file.
 - b. ☐ furnished together with the international application under PCT Rule 13~~ter~~.1(a) for the purposes of international search only in the form of an Annex C/ST.25 text file.
 - c. ☐ furnished subsequent to the international filing date for the purposes of international search and/or examination:
 - ☐ in the form of an Annex C/ST.25 text file (Rule 13~~ter~~.1(a)).
 - ☐ on paper or in the form of an image file (Rule 13~~ter~~.1(b) and Administrative Instructions, Section 713).
 - d. ☐ furnished to this Authority as an amendment* under PCT Article 34 on :
 - ☐ in the form of an Annex C/ST.25 text file, and preferably identified as "Amended" at the first line of text.
 - ☐ on paper or in the form of an image file.
2. ☐ In addition, in the case that more than one version or copy of a sequence listing has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that forming part of the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

3. Additional comments:

* *If item 4 in Box No. I applies, the sequence listing, which forms part of the basis of the report, may be marked "superseded."*

CLAIMS

1) Yeast strain belonging to *Papiliotrema terrestris* species, said strain being deposited at the Westerdijk Fungal Biodiversity Institute with deposit number CBS147138.

2) Yeast strain according to claim 1, wherein said yeast strain is in a form selected from fresh cells, dried cells, dehydrated cells, devitalized cells, inactivated cells, frozen cells or cells in aqueous suspension.

3) Yeast strain according to claim 2, wherein said yeast strain is in the form of cells in an aqueous suspension that includes extracellular polysaccharides of the cell biomass production process.

4) Composition comprising the yeast strain of the *Papiliotrema terrestris* species, as defined in any one of claims 1-2, as active principle, together with one or more phytopharmacologically acceptable excipients or adjuvants.

5) Composition according to claim 4, wherein said composition is in liquid or solid form.

6) Composition according to any one of claims 4-5, wherein the concentration of said yeast strain within the composition ranges from 10^3 CFU to 10^{13} CFU per gram of solid composition or from 10^2 CFU to 10^{12} CFU per mL of liquid composition.

7) Composition according to any one of claims 4-6, wherein said composition is in the form of tablets, capsules, granules, pellets, powder, such as dry powder or wettable powder, fluid, dry fluid, emulsion, suspension, solution, dispersion.

8) Composition according to any one of claims 4-7, said composition further comprising one or more chemical compounds and/or one or more biological agents selected from fungicides, insecticides, fertilizers, plant biostimulants, macronutrients, micronutrients, pathogen-resistance inducers, plant growth regulators, foliar nutrients, antibiotics, herbicides, acaricides, food additives, microorganisms.

9) Composition according to claim 8, wherein said fungicides are selected from 2-methoxyethylmercury chloride, 2-phenylphenol, 3-ethoxypropyl mercury bromide, 8-hydroxyquinoline sulfate, 8-phenylmercurioxyquinoline, acibenzolar, acibenzolar-S-methyl, acylamino acid fungicides, acypetacs, Adavelt, *Agrobacterium radiobacter* K84, aldimorph, allyl alcohol, ametoctradin, aminopyrifen, amisulbrom, ampropylfos, anilazine, aureofungin, azaconazole, azithiram, azoxystrobin, *Bacillus amyloliquefaciens* (formerly *subtilis*) strain QST713, *Bacillus amyloliquefaciens* strain AH2, strain IT-45, strain FZB24, strain MBI600, strain D747, *Bacillus mycoides* isolate J, *Bacillus nakamurai* strain F727, *Bacillus pumilus* strain QST 2808, *Bacillus subtilis* var. *amyloliquefaciens* strain FZB24, *Bacillus subtilis* strain AFS032321, strain GB03, strain IAB/BS03, barium polysulfide, benalaxyl-M (=kiralaxyl), benodanil, benomyl, benquinox, bentazon, benthialdicarb, Benthialdicarb-isopropyl, benzalkonium chloride, benzamacril, benzamide fungicides, benzamorf, benzohydroxamic acid, benzovindiflupyr, bethoxazin, binapacryl, biphenyl, bitertanol, bithionol, bixafen, blastidyn-S, Bordeaux mixture, boric acid, boscalid, bromuconazole, bupirimate, Burgundy mixture, buthiobate, calcium polysulfide, captan, carbamorph, carbendazim, carboxin, carpropamid, carvone, cell walls of *Saccharomyces cerevisiae* strain LAS117, Cheshunt mixture, chinomethionat, chlobenthiazole, chloranil, chloranil, chlorfenazole, chlorodinitronaphthalene, chloroneb, chloropicrin, Chlorothalonil, chlorquinox, chlozolinate, ciclopirox, climbazole, *Clonostachys rosea* strain CR-7, *Coniothyrium minitans*, copper hydroxide, copper naphthenate, copper oleate, copper oxychloride, copper soap, copper sulfate, basic, copper zinc chromate, copper(II) acetate, copper(II) carbonate, basic, copper(II) sulfate, coumoxystrobin, cufraneb, cuproban, cuprous oxide, cyazofamid, cyclafuramid, cyclobutirfluram, cycloheximide, cyflufenamid, cymoxanil, cypendazole, cyproconazole, cyprodinil, Cyprofuram, dazomet,

DBCP, debacarb, decafentin, dehydroacetic acid, dichlobentiazox, dichlofluanid, dichlone, dichlorophen, dichlorophenyl, dichlozoline, diclobutrazol, diclocymet, diclomezine, dicloran, diethofencarb, diethyl pyrocarbonate, difenoconazole, diflumetorim, dimethachlone, dimethirimol, dimethomorph, dimoxystrobin, diniconazole, diniconazole-M, dinobuton, dinocap, dinocap-4, dinocap-6, dinoceton, dinopenton, dinosulfon, dinoterbon, diphenylamine, Dipymetitrone, dipyrithione, disulfiram, ditalimfos, dithianon, DNOC, dodemorph, dodicin, dodine, donatodine, drazoxolon, edifenphos, enestrobin, enestroburin, enoxastrobin, epoxiconazole, etaconazole, etem, ethaboxam, ethirimol, ethoxyquin, ethylene oxide, ethylmercury 2,3-dihydroxypropyl mercaptide, ethylmercury acetate, ethylmercury bromide, ethylmercury chloride, ethylmercury phosphate, etridiazole, extract from *Melaleuca alternifolia* (tea tree), extract from *Reynoutria sachalinensis* (giant knotweed), extract from the cotyledons of lupine plantlets ("BLAD"), extract of *Swinglea glutinosa*, F500, famoxadone, fenamidone, fenaminosulf, fenaminstrobin, fenamistrobin, fenapanil, fenarimol, fenazaquin, fenbuconazole, fenfuram, fenhexamid, fenitropan, fenoxanil, fencpiclonil, fencpicoxamid, fenpropidin, fenpropimorph, fenpyrazamine, fentin, fentin acetate, fentin chloride, fentin hydroxide, ferbam, ferimzone, Florylpicoxamid, fluazaindolizine, fluazinam, fludioxonil, flufenoxystrobin, fluindapyr, flumorph, fluopicolide, fluopimomide, fluopyram, fluoroimide, fluotrimazole, fluoxapiprolin, fluoxastrobin, fluquinconazole, flurozlamide, flusilazole, flusulfamide, Flutianil, flutolanil, flutriafol, fluxapyroxad, folpet, fosetyl, fosetyl-Al, fthalide (phthalide), fuberidazole, furalaxyl, furametpyr, furcarbanil, furfural, furmecyclox, furophanate, *Gliocladium catenulatum* J1446, *Gliocladium virens* GL-21, glyodin, griseofulvin, guazatine, halacrinat, hexachlorobenzene, hexachlorophene, hexaconazole, hexylthiofos, hymexazol, imazalil, imibenconazole, iminoctadine, Inatreq (fencpicoxamid), inorganic oils, inpyrfluxam, iodocarb, ipconazole, Ipflufenquin, iprobenfos, iprodione,

iprovalicarb, isofetamid, isoflucypram, isopropanol azole, isoprothiolane, isopyrazam, isotianil, isovaledione, Jun Si Qi, kasugamycin, kresoxim-methyl, laminarin, Lime sulfur (lime sulphur), mancopper, mancozeb, mandestrobin, mandipropamid, maneb, mebenil, mecarbinzid, mefenoxam, mefentrifluconazole, mepanipirim, mepronil, meptyldinocap, metalaxyl, metalaxyl-M (=mefenoxam), metam, metazoxolon, metconazole, methasulfocarb, methfuroxam, methyl bromide, methyl isothiocyanate, methylmercury benzoate, methylmercury dicyandiamide, methylmercury pentachlorophenoxide, metiram, metominostrobin, metrafenone, metsulfovax, metyltetraprole, milneb, myclobutanil, myclozolin, N-(ethylmercury)-p-toluenesulfonanilide, nabam, naftifine, natamycin, neem oil, nitrothal-isopropyl, nuarimol, octhilinone, ofurace, organic oils, orthophenyl phenol, orysastrobin, oxadixyl, oxathiapiprolin, oxazosulfyl, oxine copper, oxolinic acid, oxpoconazole, oxycarboxin, oxytetracycline, PCNB, pefurazoate, penconazole, pencycuron, penflufen, pentachlorophenol, penthiopyrad, phenamacril, phenylmercuriurea, phenylmercury acetate, phenylmercury chloride, phenylmercury nitrate, phosdiphen, Phosphite, phosphorous acid and salts, phosphorus acid, phthalide, picarbutrazox, picolinamides, picoxystrobin, piperalin, plant oils (mixtures): eugenol, geraniol, thymol, polycarbamate, polyoxin-D, potassium azide, potassium bicarbonate, potassium polysulfide, potassium thiocyanate, probenazole, prochloraz, procymidone, propamocarb, propiconazole, propineb, proquinazid, prothiocarb, prothioconazole, Pseudomonas chlororaphis strain AFS009, Pseudomonas syringae ESC-10, pydiflumetofen, pyracarbolid, pyraclostrobin, pyrametostrobin, pyraoxystrobin, pyrapropoyne, pyraziflumid, pyrazophos, pyribencarb, pyributicarb, pyridachlometyl, pyridinitril, pyrifenox, pyrimethanil, pyrimorph, pyriofenone, pyrisoxazole, pyroquilon, pyroxychlor, pyroxyfur, quinacetol, quinazamid, quinconazole, quinofumelin, quinomethionate, quinoxifen, quintozone, rabenzazole, Reynoutria sachalinensis, salicylanilide, sec-

butylamine, sedaxane, sesame oil, silthiofam, silver, simeconazole, SJC17, sodium azide, sodium bicarbonate, sodium hypochlorite, sodium orthophenylphenoxide, sodium pentachlorophenoxide, sodium polysulfide, spiroxamine, *Streptomyces griseovirides* strain K61, *Streptomyces lydicus* strain WYEC108, streptomycin, sulfur, sulfuryl fluoride, sultropen, tea tree oil, tebuconazole, tebufloquin, tecloftalam, tecnazene, tecoram, tetraconazole, thiabendazole, thiadifluor, thicyofen, thifluzamide, thiochlorfenphim, thiophanate, thiophanate-methyl, thioquinox, thiram, THQ25, tiadinil, tioxyimid, tolclofos-methyl, tolfenpyrad, tolprocarb, tolylfluorid, tolylmercury acetate, triadimefon, triadimenol, triamiphos, triarimol, triazbutil, triazoxide, trichlamide, *Trichoderma afroharzianum* (formerly *harzianum*) strain T-22, *Trichoderma asperellum* (formerly *harzianum*) strain ICC012, strain T25, strain TV1, *Trichoderma asperellum* strain T34, *Trichoderma atrobrunneum* (formerly *harzianum*) strain ITEM908, *Trichoderma atroviride* (formerly *harzianum*) strain IMI206040, strain T11, *Trichoderma atroviride* strain I-1237, *Trichoderma atroviride* strain LU132, *Trichoderma atroviride* strain SC1, *Trichoderma gamsii* (formerly *viride*) strain ICC080, triclopyricarb, tricyclazole, tridemorph, trifloxystrobin, triflumizole, triforine, triticonazole, UCQ09, *Ulocladium oudemansii* strain U3, uniconazole-P, urea, validamycin, valifenalate, vinclozolin, voriconazole, WLR08, zarilamid, zinc naphthenate, zinc thiazole, zineb, ziram, zoxamide, preferably azoxystrobin, trifloxystrobin, benomyl, carbendazim, thiabendazole, tebuconazole, imazalil, penconazole, procymidone, vinclozolin, mancozeb, ziram, copper oxychloride, sulfur, fludioxonil and/or iprovalicarb.

10) Kit comprising

- a) the yeast strain of *Papiliotrema terrestris* species as defined in any one of claims 1-2, or a composition as defined in any one of claims 4-9, and
- b) one or more chemical compounds and/or one or more biological agents or compositions including them, selected from fungicides,

insecticides, fertilizers, biostimulants, macronutrients, micronutrients, pathogen-resistance inducers, plant growth regulators, foliar nutrients, antibiotics, herbicides, acaricides, food additives, antioxidants, microorganisms.

11) Kit according to claim 10, wherein said fungicides are selected from 2-methoxyethylmercury chloride, 2-phenylphenol, 3-ethoxypropyl mercury bromide, 8-hydroxyquinoline sulfate, 8-phenylmercurioxyquinoline, acibenzolar, acibenzolar-S-methyl, acylamino acid fungicides, acypetacs, Adavelt, *Agrobacterium radiobacter* K84, aldimorph, allyl alcohol, ametocradin, aminopyrifin, amisulbrom, ampropylfos, anilazine, aureofungin, azaconazole, azithiram, azoxystrobin, *Bacillus amyloliquefaciens* (formerly *subtilis*) strain QST713, *Bacillus amyloliquefaciens* strain AH2, strain IT-45, strain FZB24, strain MBI600, strain D747, *Bacillus mycoides* isolate J, *Bacillus nakamurai* strain F727, *Bacillus pumilus* strain QST 2808, *Bacillus subtilis* var. *amyloliquefaciens* strain FZB24, *Bacillus subtilis* strain AFS032321, strain GB03, strain IAB/BS03, barium polysulfide, benalaxyl-M (=kiralaxyl), benodanil, benomyl, benquinox, bentazon, benthialdicarb, Benthialdicarb-isopropyl, benzalkonium chloride, benzamacril, benzamide fungicides, benzamorf, benzohydroxamic acid, benzovindiflupyr, bethoxazin, binapacryl, biphenyl, bitertanol, bithionol, bixafen, blastidicid-S, Bordeaux mixture, boric acid, boscalid, bromuconazole, bupirimate, Burgundy mixture, buthiobate, calcium polysulfide, captafol, captan, carbamorph, carbendazim, carboxin, carpropamid, carvone, cell walls of *Saccharomyces cerevisiae* strain LAS117, Cheshunt mixture, chinomethionat, chlobenthiazole, chloranilformetan, chloranil, chlorfenazole, chlorodinitronaphthalene, chloroneb, chloropicrin, Chlorothalonil, chlorquinox, chlozolinate, ciclopirox, climbazole, *Clonostachys rosea* strain CR-7, *Coniothyrium minitans*, copper hydroxide, copper naphthenate, copper oleate, copper oxychloride, copper soap, copper sulfate, basic,

copper zinc chromate, copper(II) acetate, copper(II) carbonate, basic, copper(II) sulfate, coumoxystrobin, cufraneb, cuprobam, cuprous oxide, cyazofamid, cyclafuramid, cyclobutrifluram, cycloheximide, cyflufenamid, cymoxanil, cypendazole, cyproconazole, cyprodinil, Cyprofuram, dazomet, DBCP, debacarb, decafentin, dehydroacetic acid, dichlobentiazox, dichlofluanid, dichlone, dichlorophen, dichlorophenyl, dichlozoline, diclobutrazol, diclocymet, diclomezine, dicloran, diethofencarb, diethyl pyrocarbonate, difenoconazole, diflumetorim, dimethachlone, dimethirimol, dimethomorph, dimoxystrobin, diniconazole, diniconazole-M, dinobuton, dinocap, dinocap-4, dinocap-6, dinoceton, dinopenton, dinosulfon, dinoterbon, diphenylamine, Dipymetitron, dipyrithione, disulfiram, ditalimfos, dithianon, DNOC, dodemorph, dodicin, dodine, donatodine, drazoxolon, edifenphos, enestrobin, enestroburin, enoxastrobin, epoxiconazole, etaconazole, etem, ethaboxam, ethirimol, ethoxyquin, ethylene oxide, ethylmercury 2,3-dihydroxypropyl mercaptide, ethylmercury acetate, ethylmercury bromide, ethylmercury chloride, ethylmercury phosphate, etridiazole, extract from *Melaleuca alternifolia* (tea tree), extract from *Reynoutria sachalinensis* (giant knotweed), extract from the cotyledons of lupine plantlets ("BLAD"), extract of *Swinglea glutinosa*, F500, famoxadone, fenamidone, fenaminosulf, fenaminstrobin, fenamistrobin, fenapanil, fenarimol, fenazaquin, fenbuconazole, fenfuram, fenhexamid, fenitropan, fenoxanil, fenciclonil, fencicoxamid, fenpropidin, fenpropimorph, fenpyrazamine, fentin, fentin acetate, fentin chloride, fentin hydroxide, ferbam, ferimzone, Florylpicoxamid, fluazaindolizine, fluazinam, fludioxonil, flufenoxystrobin, fluindapyr, flumorph, fluopicolide, fluopimomide, fluopyram, fluoroimide, fluotrimazole, fluoxapiprolin, fluoxastrobin, fluquinconazole, flurozolamide, flusilazole, flusulfamide, Flutianil, flutolanil, flutriafol, fluxapyroxad, folpet, fosetyl, fosetyl-Al, fthalide (phthalide), fuberidazole, furalaxyl, furametpyr, furcarbanil, furfural, furmecyclox, furophanate, *Gliocladium catenulatum* J1446, *Gliocladium virens* GL-21,

glyodin, griseofulvin, guazatine, halacrinat, hexachlorobenzene, hexachlorophene, hexaconazole, hexylthiofos, hymexazol, imazalil, imibenconazole, iminoctadine, Inatreq (fenpicoxamid), inorganic oils, inpyrfluxam, iodocarb, ipconazole, Ipflufenquin, iprobenfos, iprodione, iprovalicarb, isofetamid, isoflucypram, isopropanol azole, isoprothiolane, isopyrazam, isotianil, isovaledione, Jun Si Qi, kasugamycin, kresoxim-methyl, laminarin, Lime sulfur (lime sulphur), mancopper, mancozeb, mandestrobin, mandipropamid, maneb, mebenil, mecarbinzid, mefenoxam, mefentrifluconazole, mepanipirim, mepronil, meptyldinocap, metalaxyl, metalaxyl-M (=mefenoxam), metam, metazoxolon, metconazole, methasulfocarb, methfuroxam, methyl bromide, methyl isothiocyanate, methylmercury benzoate, methylmercury dicyandiamide, methylmercury pentachlorophenoxide, metiram, metominostrobin, metrafenone, metsulfovax, metyltetraprole, milneb, myclobutanil, myclozolin, N-(ethylmercury)-p-toluenesulfonanilide, nabam, naftifine, natamycin, neem oil, nitrothal-isopropyl, nuarimol, othilinone, ofurace, organic oils, orthophenyl phenol, orysastrobin, oxadixyl, oxathiapiprolin, oxazosulfyl, oxine copper, oxolinic acid, oxpoconazole, oxycarboxin, oxytetracycline, PCNB, pefurazoate, penconazole, pencycuron, penflufen, pentachlorophenol, penthiopyrad, phenamacril, phenylmercuriurea, phenylmercury acetate, phenylmercury chloride, phenylmercury nitrate, phosdiphen, Phosphite, phosphorous acid and salts, phosphorus acid, phthalide, picarbutrazox, picolinamides, picoxystrobin, piperalin, plant oils (mixtures): eugenol, geraniol, thymol, polycarbamate, polyoxin-D, potassium azide, potassium bicarbonate, potassium polysulfide, potassium thiocyanate, probenazole, prochloraz, procymidone, propamocarb, propiconazole, propineb, proquinazid, prothiocarb, prothioconazole, Pseudomonas chlororaphis strain AFS009, Pseudomonas syringae ESC-10, pydiflumetofen, pyracarbolid, pyraclostrobin, pyrametostrobin, pyraoxystrobin, pyrapropoyne, pyraziflumid, pyrazophos, pyribencarb,

pyributicarb, pyridachlometyl, pyridinitril, pyrifenox, pyrimethanil, pyrimorph, pyriofenone, pyrisoxazole, pyroquilon, pyroxychlor, pyroxyfur, quinacetol, quinazamid, quinconazole, quinofumelin, quinomethionate, quinoxifen, quintozone, rabenzazole, Reynoutria sachalinensis, salicylanilide, sec-butylamine, sedaxane, sesame oil, silthiofam, silver, simeconazole, SJC17, sodium azide, sodium bicarbonate, sodium hypochlorite, sodium orthophenylphenoxide, sodium pentachlorophenoxide, sodium polysulfide, spiroxamine, *Streptomyces griseovirides* strain K61, *Streptomyces lydicus* strain WYEC108, streptomycin, sulfur, sulfuryl fluoride, sultropen, tea tree oil, tebuconazole, tebufloquin, tecloftalam, tecnazene, tecoram, tetraconazole, thiabendazole, thiadifluor, thicyofen, thifluzamide, thiochlorfenphim, thiophanate, thiophanate-methyl, thioquinox, thiram, THQ25, tiadinil, tioxyimid, tolclofos-methyl, tolfenpyrad, tolprocarb, tolylfluorid, tolylmercury acetate, triadimefon, triadimenol, triamiphos, triarimol, triazbutil, triazoxide, trichlamide, *Trichoderma afroharzianum* (formerly *harzianum*) strain T-22, *Trichoderma asperellum* (formerly *harzianum*) strain ICC012, strain T25, strain TV1, *Trichoderma asperellum* strain T34, *Trichoderma atroviride* (formerly *harzianum*) strain ITEM908, *Trichoderma atroviride* (formerly *harzianum*) strain IMI206040, strain T11, *Trichoderma atroviride* strain I-1237, *Trichoderma atroviride* strain LU132, *Trichoderma atroviride* strain SC1, *Trichoderma gamsii* (formerly *viride*) strain ICC080, triclopyricarb, tricyclazole, tridemorph, trifloxystrobin, triflumizole, triforine, triticonazole, UCQ09, *Ulocladium oudemansii* strain U3, uniconazole-P, urea, validamycin, valifenalate, vinclozolin, voriconazole, WLR08, zarilamid, zinc naphthenate, zinc thiazole, zineb, ziram, zoxamide, preferably azoxystrobin, trifloxystrobin, benomyl, carbendazim, thiabendazole, tebuconazole, imazalil, penconazole, procymidone, vinclozolin, mancozeb, ziram, copper oxychloride, sulfur, fludioxonil and/or iprovalicarb.

12) Use of the yeast strain belonging to the yeast species *Papiliotrema terrestris* as defined in any one of claims 1-2, of a composition as defined in any of the claims 4-9, or of a kit as defined in any one of claims 10-11, against phytopathogens of one or more plants or crops, in particular before sowing, pre-harvest or post-harvest.

13) Use according to claim 12, wherein said one or more plants or crops are selected from cereals, such as wheat, barley, rye, oats, rice, corn, sorghum; fruit trees, such as olive, apple, pear trees, apricot, nashi, plum, peach, almond, cherry, persimmon, banana, grape, strawberry, raspberry, blackberry; citrus fruits, such as oranges, lemons, mandarins, clementines, grapefruits; legumes, such as beans, peas, lentils, soy; horticultural crops, such as spinach, lettuce, asparagus, artichokes, cabbage, carrots, onions, garlic, tomatoes, potatoes, aubergines, peppers, fennel; cucurbits, such as squashes, zucchini, watermelons, melons; oil plants, such as soy, sunflower, canola, peanut, castor, coconut; tobacco; coffee; you; cocoa; sugar beet; sugar cane; cotton.

14) Use according to any one of claims 12-13, wherein said phytopathogens are fungi, such as for example Basidiomycetes, Ascomycetes, Deuteromycetes, Oomycetes, fungi with sexual or asexual reproduction, fungi with biotrophic or necrotrophic activity, protists or Chromista.

15) Use according to claim 14, wherein said fungi are selected from the *Albugo* spp.; *Alternaria* spp.; Anthracnose; *Armillaria* spp.; *Ascochyta* spp.; *Aspergillus* spp.; *Blumeria graminis*; *Botrytis cinerea*; *Botrytis* spp.; *Bremia lactucae*; *Cercospora kikuchii*; *Cercospora soja*; *Cercospora* spp.; *Cercospora herpotrichoides*; *Cladosporium* spp.; *Claviceps purpurea*; *Colletotrichum* spp.; *Corynespora cassiicola*; *Diaporthe* spp.; *Erysiphe* spp.; *Fusarium graminearum*; *Fusarium oxysporum*; *Fusarium* spp.; *Helminthosporium* spp.; *Leveillula Taurica*; *Macrophomina phaseolina*; *Magnaporthe oryzae*; *Magnaporthe* spp.; *Melampsora lini*; *Monilinia* spp.;

Mucor spp.; *Mycosphaerella graminicola*; *Mycosphaerella* spp.; *Oidium* spp.; *Penicillium* spp.; *Downy mildew manshurica*; *Downy mildew* spp.; *Phaeosphaeria* spp.; *Phakopsora pachyrhizi*; *Phakopsora* spp.; *Phoma* spp.; *Phytophthora* spp.; *Plasmopara viticola*; *Podosphaera* spp.; *Pseudoperonospora cubensis*; *Puccinia* spp.; *Pyrenochaeta lycopersici*; *Pyrenophora* spp.; *Pyricularia oryzae*; *Pythium* spp.; *Ramularia* spp.; *Rhizoctonia solani*; *Rhizoctonia* spp.; *Rhizopus* spp.; *Rhynchosporium* spp.; *Sclerotinia sclerotiorum*; *Sclerotinia* spp.; *Sclerotium cepivorum*; *Sclerotium rolfsii*; *Sclerotium* spp.; *Septoria glycines*; *Septoria* spp.; *Sphaerotheca* spp.; *Stemphylium* spp.; *Stenocarpella maydis*; *Thielaviopsis basicola*; *Thielaviopsis* spp.; *Tilletia* spp.; *Uncinula* spp.; *Uromyces* spp.; *Ustilago maydis*; *Ustilago* spp.; *Venturia* spp.; *Verticillium* spp.

16) Use according to any one of claims 12-13, wherein said phytopathogens are bacteria, viruses or nematodes.

17) Use according to claim 16, wherein the bacteria are selected from the species *Pseudomonas* spp., *Xanthomonas* spp., *Clavibacter* spp., *Ralstonia* spp., *Erwinia* spp.

18) Use according to claim 16, wherein the nematodes are selected from the species *Meloidogyne* spp., *Heterodera* spp., *Globodera* spp., *Belonolaimus* spp., *Pratylenchus* spp., *Rotylenchulus* spp., *Trichodorus* spp., *Paratylenchus* spp.

19) Use according to any one of claims 12-18, wherein said yeast strain or said composition or said kit are applied on one or more parts, intact or wounded, of the plant selected from seeds, aerial parts, leaves, stems, trunks, buds, gems, branches, stems, flowers, fruits, roots.

20) Use according to any one of claims 12-19, wherein the quantity of live cells of said yeast strain distributed per unit of culture surface ranges from 10^8 to 10^{15} CFU per hectare.

21) Use according to any one of claims 12-19, wherein said yeast strain or said composition or said kit are applied to a solid growth substrate,

such as soil, preferably at a concentration of live cells of yeast strain ranging from 10^2 to 10^{12} CFU per gram of solid growth substrate.

22) Use according to any one of claims 12-21, wherein said phytopathogen is selected between *Botrytis cinerea* and *Plasmopara viticola* of vine; *Botrytis cinerea* of strawberry, *Botrytis cinerea* and *Phytophthora infestans* of tomato, *Venturia inequalis* and *Stemphylium* spp. of apple and/or pear tree, *Monilia* spp. of stone fruit and/or *Phytophthora* spp. of potato.

23) Use according to any one of claims 12-22, wherein when the kit as defined in any one of claims 10-11 is used, said a) and b) are used separately or sequentially.

24) Use of the yeast strain belonging to the yeast species *Papiliotrema terrestris* as defined in claim 3 as plant protection agent.

25) Method for the control of phytopathogens in agricultural crops comprising or consisting in applying the yeast strain belonging to *Papiliotrema terrestris* species as defined in any one of claims 1-2, a composition as defined in any of the claims 4-9 or a kit as defined in any one of claims 10-11 on said crops or on the soil in which the crop grows, before sowing, pre-harvest or post-harvest.

26) Method, according to claim 25, characterized in that said application takes place on one or more parts, intact or wounded, of the plant selected from seeds, aerial parts, leaves, stems, trunks, buds, shoots, branches, stems, flowers, fruits, roots.

27) Method according to any one of claims 24-26, wherein the dose of said composition ranges from 10^8 CFU to 10^{15} CFU per hectare.

CLAIMS

1) Yeast strain belonging to *Papiliotrema terrestris* species, said strain being deposited at the Westerdijk Fungal Biodiversity Institute with deposit number CBS147138.

2) Yeast strain according to claim 1, wherein said yeast strain is in a form selected from fresh cells, dried cells, dehydrated cells, devitalized cells, inactivated cells, frozen cells or cells in aqueous suspension.

3) Yeast strain according to claim 2, wherein said yeast strain is in the form of cells in an aqueous suspension that includes extracellular polysaccharides of the cell biomass production process.

34) Composition comprising the yeast strain of the *Papiliotrema terrestris* species, as defined in any one of claims 1-2, as active principle, together with one or more phytopharmacologically acceptable excipients or adjuvants.

45) Composition according to claim 34, wherein said composition is in liquid or solid form.

56) Composition according to any one of claims 34-54, wherein the concentration of said yeast strain within the composition ranges from 10^3 CFU to 10^{13} CFU per gram of solid composition or from 10^2 CFU to 10^{12} CFU per mL of liquid composition.

67) Composition according to any one of claims 34-65, wherein said composition is in the form of tablets, capsules, granules, pellets, powder, such as dry powder or wettable powder, fluid, dry fluid, emulsion, suspension, solution, dispersion.

78) Composition according to any one of claims 34-67, said composition further comprising one or more chemical compounds and/or one or more biological agents selected from fungicides, insecticides, fertilizers, plant biostimulants, macronutrients, micronutrients, pathogen-resistance inducers, plant growth regulators, foliar nutrients, antibiotics, herbicides, acaricides, food additives, microorganisms.

89) Composition according to claim 78, wherein said fungicides are selected from 2-methoxyethylmercury chloride, 2-phenylphenol, 3-ethoxypropyl mercury bromide, 8-hydroxyquinoline sulfate, 8-phenylmercurioxyquinoline, acibenzolar, acibenzolar-S-methyl, acylamino acid fungicides, acypetacs, Adavelt, *Agrobacterium radiobacter* K84, aldimorph, allyl alcohol, ametoctradin, aminopyrifen, amisulbrom, ampropylfos, anilazine, aureofungin, azaconazole, azithiram, azoxystrobin, *Bacillus amyloliquefaciens* (formerly *subtilis*) strain QST713, *Bacillus amyloliquefaciens* strain AH2, strain IT-45, strain FZB24, strain MBI600, strain D747, *Bacillus mycoides* isolate J, *Bacillus nakamurai* strain F727, *Bacillus pumilus* strain QST 2808, *Bacillus subtilis* var. *amyloliquefaciens* strain FZB24, *Bacillus subtilis* strain AFS032321, strain GB03, strain IAB/BS03, barium polysulfide, benalaxyl-M (=kiralaxyl), benodanil, benomyl, benquinox, bentaluron, benthiavalicarb, Benthiavalicarb-isopropyl, benzalkonium chloride, benzamacril, benzamide fungicides, benzamorf, benzohydroxamic acid, benzovindiflupyr, bethoxazin, binapacryl, biphenyl, bitertanol, bithionol, bixafen, blasticidin-S, Bordeaux mixture, boric acid, boscalid, bromuconazole, bupirimate, Burgundy mixture, buthiobate, calcium polysulfide, captafol, captan, carbamorph, carbendazim, carboxin, carpropamid, carvone, cell walls of *Saccharomyces cerevisiae* strain LAS117, Cheshunt mixture, chinomethionat, chlobenthiazole, chloraniformethan, chloranil, chlorfenazole, chlorodinitronaphthalene, chloroneb, chloropicrin, Chlorothalonil, chlorquinox, chlozolate, ciclopirox, climbazole, *Clonostachys rosea* strain CR-7, *Coniothyrium minitans*, copper hydroxide, copper naphthenate, copper oleate, copper oxychloride, copper soap, copper sulfate, basic, copper zinc chromate, copper(II) acetate, copper(II) carbonate, basic, copper(II) sulfate, coumoxystrobin, cufraneb, cuprobam, cuprous oxide, cyazofamid, cyclafuramid, cyclobutrifluram, cycloheximide, cyflufenamid, cymoxanil, cypendazole, cyproconazole, cyprodinil, Cyprofuram, dazomet,

DBCP, debacarb, decafentin, dehydroacetic acid, dichlobentiazox, dichlofluanid, dichlone, dichlorophen, dichlorophenyl, dichlozoline, diclobutrazol, diclocymet, diclomezine, dicloran, diethofencarb, diethyl pyrocarbonate, difenoconazole, diflumetorim, dimethachlone, dimethirimol, dimethomorph, dimoxystrobin, diniconazole, diniconazole-M, dinobuton, dinocap, dinocap-4, dinocap-6, dinoceton, dinopenton, dinosulfon, dinoterbon, diphenylamine, Dipymetitron, dipyrithione, disulfiram, ditalimfos, dithianon, DNOC, dodemorph, dodicin, dodine, donatodine, drazoxolon, edifenphos, enestrobin, enestroburin, enoxastrobin, epoxiconazole, etaconazole, etem, ethaboxam, ethirimol, ethoxyquin, ethylene oxide, ethylmercury 2,3-dihydroxypropyl mercaptide, ethylmercury acetate, ethylmercury bromide, ethylmercury chloride, ethylmercury phosphate, etridiazole, extract from *Melaleuca alternifolia* (tea tree), extract from *Reynoutria sachalinensis* (giant knotweed), extract from the cotyledons of lupine plantlets ("BLAD"), extract of *Swinglea glutinosa*, F500, famoxadone, fenamidone, fenaminosulf, fenaminstrobin, fenamistrobin, fenapanil, fenarimol, fenazaquin, fenbuconazole, fenfuram, fenhexamid, fenitropan, fenoxanil, fencpiclonil, fencpicoxamid, fenpropidin, fenpropimorph, fenpyrazamine, fentin, fentin acetate, fentin chloride, fentin hydroxide, ferbam, ferimzone, Florylpicoxamid, fluazaindolizine, fluazinam, fludioxonil, flufenoxystrobin, fluindapyr, flumorph, fluopicolide, fluopimomide, fluopyram, fluoroimide, fluotrimazole, fluoxapiprolin, fluoxastrobin, fluquinconazole, flurozlamide, flusilazole, flusulfamide, Flutianil, flutolanil, flutriafol, fluxapyroxad, folpet, fosetyl, fosetyl-Al, fthalide (phthalide), fuberidazole, furalaxyl, furametpyr, furcarbanil, furfural, furmecyclox, furophanate, *Gliocladium catenulatum* J1446, *Gliocladium virens* GL-21, glyodin, griseofulvin, guazatine, halacrinat, hexachlorobenzene, hexachlorophene, hexaconazole, hexylthiofos, hymexazol, imazalil, imibenconazole, iminoctadine, Inatreq (fencpicoxamid), inorganic oils, inpyrfluxam, iodocarb, ipconazole, Ipflufenquin, iprobenfos, iprodione,

iprovalicarb, isofetamid, isoflucypram, isopropanol azole, isoprothiolane, isopyrazam, isotianil, isovaledione, Jun Si Qi, kasugamycin, kresoxim-methyl, laminarin, Lime sulfur (lime sulphur), mancopper, mancozeb, mandestrobin, mandipropamid, maneb, mebenil, mecarbinzid, mefenoxam, mefentrifluconazole, mepanipirim, mepronil, meptyldinocap, metalaxyl, metalaxyl-M (=mefenoxam), metam, metazoxolon, metconazole, methasulfocarb, methfuroxam, methyl bromide, methyl isothiocyanate, methylmercury benzoate, methylmercury dicyandiamide, methylmercury pentachlorophenoxide, metiram, metominostrobin, metrafenone, metsulfovax, metyltetraprole, milneb, myclobutanil, myclozolin, N-(ethylmercury)-p-toluenesulfonanilide, nabam, naftifine, natamycin, neem oil, nitrothal-isopropyl, nuarimol, octhilinone, ofurace, organic oils, orthophenyl phenol, orysastrobin, oxadixyl, oxathiapiprolin, oxazosulfyl, oxine copper, oxolinic acid, oxpoconazole, oxycarboxin, oxytetracycline, PCNB, pefurazoate, penconazole, pencycuron, penflufen, pentachlorophenol, penthiopyrad, phenamacril, phenylmercuriurea, phenylmercury acetate, phenylmercury chloride, phenylmercury nitrate, phosdiphen, Phosphite, phosphorous acid and salts, phosphorus acid, phthalide, picarbutrazox, picolinamides, picoxystrobin, piperalin, plant oils (mixtures): eugenol, geraniol, thymol, polycarbamate, polyoxin-D, potassium azide, potassium bicarbonate, potassium polysulfide, potassium thiocyanate, probenazole, prochloraz, procymidone, propamocarb, propiconazole, propineb, proquinazid, prothiocarb, prothioconazole, *Pseudomonas chlororaphis* strain AFS009, *Pseudomonas syringae* ESC-10, pydiflumetofen, pyracarbolid, pyraclostrobin, pyrametostrobin, pyraoxystrobin, pyrapropoyne, pyraziflumid, pyrazophos, pyribencarb, pyributicarb, pyridachlometyl, pyridinitril, pyrifenox, pyrimethanil, pyrimorph, pyriofenone, pyrisoxazole, pyroquilon, pyroxychlor, pyroxyfur, quinacetol, quinazamid, quinconazole, quinofumelin, quinomethionate, quinoxifen, quintozone, rabenzazole, *Reynoutria sachalinensis*, salicylanilide, sec-

butylamine, sedaxane, sesame oil, silthiofam, silver, simeconazole, SJC17, sodium azide, sodium bicarbonate, sodium hypochlorite, sodium orthophenylphenoxide, sodium pentachlorophenoxide, sodium polysulfide, spiroxamine, *Streptomyces griseovirides* strain K61, *Streptomyces lydicus* strain WYEC108, streptomycin, sulfur, sulfuryl fluoride, sultropen, tea tree oil, tebuconazole, tebufloquin, tecloftalam, tecnazene, tecoram, tetraconazole, thiabendazole, thiadifluor, thicyofen, thifluzamide, thiochlorfenphim, thiophanate, thiophanate-methyl, thioquinox, thiram, THQ25, tiadinil, tioxyimid, tolclofos-methyl, tolfenpyrad, tolprocarb, tolylfluorid, tolylmercury acetate, triadimefon, triadimenol, triamiphos, triarimol, triazbutil, triazoxide, trichlamide, *Trichoderma afroharzianum* (formerly *harzianum*) strain T-22, *Trichoderma asperellum* (formerly *harzianum*) strain ICC012, strain T25, strain TV1, *Trichoderma asperellum* strain T34, *Trichoderma atrobrunneum* (formerly *harzianum*) strain ITEM908, *Trichoderma atroviride* (formerly *harzianum*) strain IMI206040, strain T11, *Trichoderma atroviride* strain I-1237, *Trichoderma atroviride* strain LU132, *Trichoderma atroviride* strain SC1, *Trichoderma gamsii* (formerly *viride*) strain ICC080, triclopyricarb, tricyclazole, tridemorph, trifloxystrobin, triflumizole, triforine, triticonazole, UCQ09, *Ulocladium oudemansii* strain U3, uniconazole-P, urea, validamycin, valifenalate, vinclozolin, voriconazole, WLR08, zarilamid, zinc naphthenate, zinc thiazole, zineb, ziram, zoxamide, preferably azoxystrobin, trifloxystrobin, benomyl, carbendazim, thiabendazole, tebuconazole, imazalil, penconazole, procymidone, vinclozolin, mancozeb, ziram, copper oxychloride, sulfur, fludioxonil and/or iprovalicarb.

910) Kit comprising

a) the yeast strain of *Papiliotrema terrestris* species as defined in any one of claims 1-2, or a composition as defined in any one of claims 34-89, and

b) one or more chemical compounds and/or one or more biological agents or compositions including them, selected from fungicides, insecticides, fertilizers, biostimulants, macronutrients, micronutrients, pathogen-resistance inducers, plant growth regulators, foliar nutrients, antibiotics, herbicides, acaricides, food additives, antioxidants, microorganisms.

1011) Kit —according to claim 910, wherein said fungicides are selected from 2-methoxyethylmercury chloride, 2-phenylphenol, 3-ethoxypropyl mercury bromide, 8-hydroxyquinoline sulfate, 8-phenylmercurioxyquinoline, acibenzolar, acibenzolar-S-methyl, acylamino acid fungicides, acypetacs, Adavelt, *Agrobacterium radiobacter* K84, aldimorph, allyl alcohol, ametoctradin, aminopyrifen, amisulbrom, ampropylfos, anilazine, aureofungin, azaconazole, azithiram, azoxystrobin, *Bacillus amyloliquefaciens* (formerly *subtilis*) strain QST713, *Bacillus amyloliquefaciens* strain AH2, strain IT-45, strain FZB24, strain MBI600, strain D747, *Bacillus mycoides* isolate J, *Bacillus nakamurai* strain F727, *Bacillus pumilus* strain QST 2808, *Bacillus subtilis* var. *amyloliquefaciens* strain FZB24, *Bacillus subtilis* strain AFS032321, strain GB03, strain IAB/BS03, barium polysulfide, benalaxyl-M (=kiralaxyl), benodanil, benomyl, benquinox, bentaluron, benthiavalicarb, Benthiavalicarb-isopropyl, benzalkonium chloride, benzamacril, benzamide fungicides, benzamorf, benzohydroxamic acid, benzovindiflupyr, bethoxazin, binapacryl, biphenyl, bitertanol, bithionol, bixafen, blasticidin-S, Bordeaux mixture, boric acid, boscalid, bromuconazole, bupirimate, Burgundy mixture, buthiobate, calcium polysulfide, captafol, captan, carbamorph, carbendazim, carboxin, carpropamid, carvone, cell walls of *Saccharomyces cerevisiae* strain LAS117, Cheshunt mixture, chinomethionat, chlobenthiazole, chloraniformethan, chloranil, chlorfenazole, chlorodinitronaphthalene, chloroneb, chloropicrin, Chlorothalonil, chlorquinox, chlozolate, ciclopirox, climbazole, *Clonostachys rosea* strain

CR-7, *Coniothyrium minitans*, copper hydroxide, copper naphthenate, copper oleate, copper oxychloride, copper soap, copper sulfate, basic, copper zinc chromate, copper(II) acetate, copper(II) carbonate, basic, copper(II) sulfate, coumoxystrobin, cufraneb, cuprobam, cuprous oxide, cyazofamid, cyclafuramid, cyclobutrifluram, cycloheximide, cyflufenamid, cymoxanil, cypendazole, cyproconazole, cyprodinil, Cyprofuram, dazomet, DBCP, debacarb, decafentin, dehydroacetic acid, dichlobentiazox, dichlofluanid, dichlone, dichlorophen, dichlorophenyl, dichlozoline, diclobutrazol, diclocymet, diclomezine, dicloran, diethofencarb, diethyl pyrocarbonate, difenoconazole, diflumetorim, dimethachlone, dimethirimol, dimethomorph, dimoxystrobin, diniconazole, diniconazole-M, dinobuton, dinocap, dinocap-4, dinocap-6, dinoceton, dinopenton, dinosulfon, dinoterbon, diphenylamine, Dipymetitron, dipyrithione, disulfiram, ditalimfos, dithianon, DNOC, dodemorph, dodicin, dodine, donatodine, drazoxolon, edifenphos, enestrobin, enestroburin, enoxastrobin, epoxiconazole, etaconazole, etem, ethaboxam, ethirimol, ethoxyquin, ethylene oxide, ethylmercury 2,3-dihydroxypropyl mercaptide, ethylmercury acetate, ethylmercury bromide, ethylmercury chloride, ethylmercury phosphate, etridiazole, extract from *Melaleuca alternifolia* (tea tree), extract from *Reynoutria sachalinensis* (giant knotweed), extract from the cotyledons of lupine plantlets ("BLAD"), extract of *Swinglea glutinosa*, F500, famoxadone, fenamidone, fenaminosulf, fenaminstrobin, fenamistrobin, fenapanil, fenarimol, fenazaquin, fenbuconazole, fenfuram, fenhexamid, fenitropan, fenoxanil, fempiclonil, fempicoxamid, fenpropidin, fenpropimorph, fenpyrazamine, fentin, fentin acetate, fentin chloride, fentin hydroxide, ferbam, ferimzone, Florylpicoxamid, fluazaindolizine, fluazinam, fludioxonil, flufenoxystrobin, fluindapyr, flumorph, fluopicolide, fluopimomide, fluopyram, fluoroimide, fluotrimazole, fluoxapiprolin, fluoxastrobin, fluquinconazole, flurozolamide, flusilazole, flusulfamide, Flutianil, flutolanil, flutriafol, fluxapyroxad, folpet, fosetyl, fosetyl-Al, fthalide (phthalide),

fuberidazole, furalaxyl, furametpyr, furcarbanil, furfural, furmecyclox, furophanate, *Gliocladium catenulatum* J1446, *Gliocladium virens* GL-21, glyodin, griseofulvin, guazatine, halacrinat, hexachlorobenzene, hexachlorophene, hexaconazole, hexylthiofos, hymexazol, imazalil, imibenconazole, iminoctadine, Inatreq (fenpicoxamid), inorganic oils, inpyrfluxam, iodocarb, ipconazole, Ipflufenquin, iprobenfos, iprodione, iprovalicarb, isofetamid, isoflucypram, isopropanol azole, isoprothiolane, isopyrazam, isotianil, isovaledione, Jun Si Qi, kasugamycin, kresoxim-methyl, laminarin, Lime sulfur (lime sulphur), mancopper, mancozeb, mandestrobin, mandipropamid, maneb, mebenil, mecarbinzid, mefenoxam, mefentrifluconazole, mepanipyrin, mepronil, meptyldinocap, metalaxyl, metalaxyl-M (=mefenoxam), metam, metazoxolon, metconazole, methasulfocarb, methfuroxam, methyl bromide, methyl isothiocyanate, methylmercury benzoate, methylmercury dicyandiamide, methylmercury pentachlorophenoxide, metiram, metominostrobin, metrafenone, metsulfovax, metyltetraprole, milneb, myclobutanil, myclozolin, N-(ethylmercury)-p-toluenesulfonanilide, nabam, naftifine, natamycin, neem oil, nitrothal-isopropyl, nuarimol, othilinone, ofurace, organic oils, orthophenyl phenol, orysastrobin, oxadixyl, oxathiapiprolin, oxazosulfyl, oxine copper, oxolinic acid, oxpoconazole, oxycarboxin, oxytetracycline, PCNB, pefurazoate, penconazole, pencycuron, penflufen, pentachlorophenol, penthiopyrad, phenamacril, phenylmercuriurea, phenylmercury acetate, phenylmercury chloride, phenylmercury nitrate, phosdiphen, Phosphite, phosphorous acid and salts, phosphorus acid, phthalide, picarbutrazox, picolinamides, picoxystrobin, piperalin, plant oils (mixtures): eugenol, geraniol, thymol, polycarbamate, polyoxin-D, potassium azide, potassium bicarbonate, potassium polysulfide, potassium thiocyanate, probenazole, prochloraz, procymidone, propamocarb, propiconazole, propineb, proquinazid, prothiocarb, prothioconazole, *Pseudomonas chlororaphis* strain AFS009, *Pseudomonas syringae* ESC-

10, pydiflumetofen, pyracarbolid, pyraclostrobin, pyrametostrobin, pyraoxystrobin, pyrapropoyne, pyraziflumid, pyrazophos, pyribencarb, pyributicarb, pyridachlometyl, pyridinitril, pyrifenox, pyrimethanil, pyrimorph, pyriofenone, pyrisoxazole, pyroquilon, pyroxychlor, pyroxyfur, quinacetol, quinazamid, quinconazole, quinofumelin, quinomethionate, quinoxyfen, quintozone, rabenzazole, Reynoutria sachalinensis, salicylanilide, sec-butylamine, sedaxane, sesame oil, silthiofam, silver, simeconazole, SJC17, sodium azide, sodium bicarbonate, sodium hypochlorite, sodium orthophenylphenoxide, sodium pentachlorophenoxide, sodium polysulfide, spiroxamine, *Streptomyces griseovirides* strain K61, *Streptomyces lydicus* strain WYEC108, streptomycin, sulfur, sulfuryl fluoride, sultropen, tea tree oil, tebuconazole, tebufloquin, tecloftalam, tecnazene, tecoram, tetraconazole, thiabendazole, thiadifluor, thicyofen, thifluzamide, thiochlorfenphim, thiophanate, thiophanate-methyl, thioquinox, thiram, THQ25, tiadinil, tioxyimid, tolclofos-methyl, tolfenpyrad, tolprocarb, tolylfluorid, tolylmercury acetate, triadimefon, triadimenol, triamiphos, triarimol, triazbutil, triazoxide, trichlamide, *Trichoderma afroharzianum* (formerly *harzianum*) strain T-22, *Trichoderma asperellum* (formerly *harzianum*) strain ICC012, strain T25, strain TV1, *Trichoderma asperellum* strain T34, *Trichoderma atroviride* (formerly *harzianum*) strain ITEM908, *Trichoderma atroviride* (formerly *harzianum*) strain IMI206040, strain T11, *Trichoderma atroviride* strain I-1237, *Trichoderma atroviride* strain LU132, *Trichoderma atroviride* strain SC1, *Trichoderma gamsii* (formerly *viride*) strain ICC080, triclopyricarb, tricyclazole, tridemorph, trifloxystrobin, triflumizole, triforine, triticonazole, UCQ09, *Ulocladium oudemansii* strain U3, uniconazole-P, urea, validamycin, valifenalate, vinclozolin, voriconazole, WLR08, zarilamid, zinc naphthenate, zinc thiazole, zineb, ziram, zoxamide, preferably azoxystrobin, trifloxystrobin, benomyl, carbendazim, thiabendazole, tebuconazole, imazalil,

penconazole, procymidone, vinclozolin, mancozeb, ziram, copper oxychloride, sulfur, fludioxonil and/or iprovalicarb.

~~412~~) Use of the yeast strain belonging to the yeast species *Papiliotrema terrestris* as defined in any one of claims 1-2, ~~of extracellular polysaccharide compounds secreted by said strain during its biomass production process~~, of a composition as defined in any of the claims ~~34-89~~, or of a kit as defined in any one of claims ~~910-1011~~, against phytopathogens of one or more plants or crops, in particular before sowing, pre-harvest or post-harvest.

~~4213~~) Use according to claim ~~412~~, wherein said one or more plants or crops are selected from cereals, such as wheat, barley, rye, oats, rice, corn, sorghum; fruit trees, such as olive, apple, pear trees, apricot, nashi, plum, peach, almond, cherry, persimmon, banana, grape, strawberry, raspberry, blackberry; citrus fruits, such as oranges, lemons, mandarins, clementines, grapefruits; legumes, such as beans, peas, lentils, soy; horticultural crops, such as spinach, lettuce, asparagus, artichokes, cabbage, carrots, onions, garlic, tomatoes, potatoes, aubergines, peppers, fennel; cucurbits, such as squashes, zucchini, watermelons, melons; oil plants, such as soy, sunflower, canola, peanut, castor, coconut; tobacco; coffee; you; cocoa; sugar beet; sugar cane; cotton.

~~4314~~) Use according to any one of claims ~~412-4213~~, wherein said phytopathogens are fungi, such as for example Basidiomycetes, Ascomycetes, Deuteromycetes, Oomycetes, fungi with sexual or asexual reproduction, fungi with biotrophic or necrotrophic activity, protists or Chromista.

~~4415~~) Use according to claim ~~4314~~, wherein said fungi are selected from the *Albugo* spp.; *Alternaria* spp.; Anthracnose; *Armillaria* spp.; *Ascochyta* spp.; *Aspergillus* spp.; *Blumeria graminis*; *Botrytis cinerea*; *Botrytis* spp.; *Bremia lactucae*; *Cercospora kikuchii*; *Cercospora soja*; *Cercospora* spp.; *Cercospora herpotrichoides*; *Cladosporium* spp.;

Claviceps purpurea; *Colletotrichum* spp.; *Corynespora cassiicola*; *Diaporthe* spp.; *Erysiphe* spp.; *Fusarium graminearum*; *Fusarium oxysporum*; *Fusarium* spp.; *Helminthosporium* spp.; *Leveillula Taurica*; *Macrophomina phaseolin*; *Magnaporthe oryzae*; *Magnaporthe* spp.; *Melampsora lini*; *Monilinia* spp.; *Mucor* spp.; *Mycosphaerella graminicola*; *Mycosphaerella* spp.; *Oidium* spp.; *Penicillium* spp.; Downy mildew *manshurica*; Downy mildew spp.; *Phaeosphaeria* spp.; *Phakopsora pachyrhizi*; *Phakopsora* spp.; *Phoma* spp.; *Phytophthora* spp.; *Plasmopara viticola*; *Podosphaera* spp.; *Pseudoperonospora cubensis*; *Puccinia* spp.; *Pyrenochaeta lycopersici*; *Pyrenophora* spp.; *Pyricularia oryzae*; *Pythium* spp.; *Ramularia* spp.; *Rhizoctonia solani*; *Rhizoctonia* spp.; *Rhizopus* spp.; *Rhynchosporium* spp.; *Sclerotinia sclerotiorum*; *Sclerotinia* spp.; *Sclerotium cepivorum*; *Sclerotium rolfsii*; *Sclerotium* spp.; *Septoria glycines*; *Septoria* spp.; *Sphaerotheca* spp.; *Stemphylium* spp.; *Stenocarpella maydis*; *Thielaviopsis basicola*; *Thielaviopsis* spp.; *Tilletia* spp.; *Uncinula* spp.; *Uromyces* spp.; *Ustilago maydis*; *Ustilago* spp.; *Venturia* spp.; *Verticillium* spp.

~~4516~~) Use according to any one of claims ~~4412-4213~~, wherein said phytopathogens are bacteria, viruses or nematodes.

~~4617~~) Use according to claim ~~4516~~, wherein the bacteria are selected from the species *Pseudomonas* spp., *Xanthomonas* spp., *Clavibacter* spp., *Ralstonia* spp., *Erwinia* spp.

~~4718~~) Use according to claim ~~4516~~, wherein the nematodes are selected from the species *Meloidogyne* spp., *Heterodera* spp., *Globodera* spp., *Belonolaimus* spp., *Pratylenchus* spp., *Rotylenchulus* spp., *Trichodorus* spp., *Paratylenchus* spp.

~~4819~~) Use according to any one of claims ~~4412-4718~~, wherein said yeast strain or ~~said extracellular polysaccharide compounds secreted by said strain during its biomass production process or said composition or said kit~~ are applied on one or more parts, intact or wounded, of the plant selected

from seeds, aerial parts, leaves, stems, trunks, buds, gems, branches, stems, flowers, fruits, roots.

~~19~~20) Use according to any one of claims ~~11~~12-18~~19~~, wherein the quantity of live cells of said yeast strain distributed per unit of culture surface ranges from 10^8 to 10^{15} CFU per hectare.

~~20~~21) Use according to any one of claims ~~11~~12-18~~19~~, wherein said yeast strain or ~~said extracellular polysaccharide compounds secreted by said strain during its biomass production process or said composition or said kit~~ are applied to a solid growth substrate, such as soil, preferably at a concentration of live cells of yeast strain ranging from 10^2 to 10^{12} CFU per gram of solid growth substrate.

~~21~~22) Use according to any one of claims ~~11~~12-20~~21~~, wherein said phytopathogen is selected between *Botrytis cinerea* and *Plasmopara viticola* of vine; *Botrytis cinerea* of strawberry, *Botrytis cinerea* and *Phytophthora infestans* of tomato, *Venturia inequalis* and *Stemphylium* spp. of apple and/or pear tree, *Monilia* spp. of stone fruit and/or *Phytophthora* spp of potato.

~~22~~23) Use according to any one of claims ~~11~~12-21~~22~~, wherein when the kit as defined in any one of claims ~~9~~10-10~~11~~ is used, said a) and b) are used separately or sequentially.

24) Use of the yeast strain belonging to the yeast species *Papiliotrema terrestris* as defined in claim 3 as plant protection agent.

~~23~~25) Method for the control of phytopathogens in agricultural crops comprising or consisting in applying the yeast strain belonging to *Papiliotrema terrestris* species as defined in any one of claims 1-2, ~~extracellular polysaccharide compounds secreted by said strain during its biomass production process secreted by said strain,~~ a composition as defined in any of the claims ~~34-8-9~~ or a kit as defined in any one of claims ~~9~~10-10~~11~~ on said crops or on the soil in which the crop grows, before sowing, pre-harvest or post-harvest.

~~2426~~) Method, according to claim ~~2325~~, characterized in that said application takes place on one or more parts, intact or wounded, of the plant selected from seeds, aerial parts, leaves, stems, trunks, buds, shoots, branches, stems, flowers, fruits, roots.

~~2527~~) Method according to any one of claims ~~2224-2426~~, wherein the dose of said composition ranges from 10^8 CFU to 10^{15} CFU per hectare.