

PRODUCTION, PURIFICATION AND CHARACTERIZATION OF AN ANTIBACTERIAL COMPOUND FROM *STREPTOMYCES GRISEUS* TBG19NRA1 ISOLATED FROM THE FOREST SOILS OF THE WESTERN GHATS OF KERALA, INDIA

Shiburaj Sugathan*, Gayathri Valsala and Jeeshma Nambidi Parambath

Address(es): Dr. Shiburaj Sugathan,

Jawaharlal Nehru Tropical Botanic Garden and Research Institute, Palode, Thiruvananthapuram, Kerala, India, Pin-695 562, Ph. No. +919495826669.

*Corresponding author: d	https://doi.org/10.15414/jmbfs.590
ARTICLE INFO	ABSTRACT
Received 7. 8. 2018 Revised 28. 3. 2020 Accepted 3. 3. 2021 Published 1. 8. 2021	A new actinomycete strain designated TBG19NRA1, exhibiting antimicrobial activities against Gram-positive and Gram-negative bacteria, was isolated from forest soil of Neyyar Wild Life Sanctuary, Thiruvananthapuram, Kerala. Cultural characteristics strongly suggested that this isolate belongs to the genus <i>Streptomyces</i> . Polyphasic taxonomic studies including phylogenetic analysis based on 16S rDNA sequence suggests that the isolate is a strain of <i>S. griseus</i> . Studies on the effect of different nutritional compounds on antibiotic activity revealed that the highest antibacterial activity was obtained when 1% starch (w/v) was used as the sole carbon source
	along with mineral trace elements. Extraction and purification of TBG19NRA1 culture supernatant led to the isolation of a pure molecule with good antibacterial activity. The compound has been identified as the cyclic polyether lasalocid A on the basis IR, MS and ¹³ C NMR data interpretation and comparison with reference data from literature.
	Keywords: Actinomycetes; antimicrobial activities; Streptomyces griseus; 16s rDNA; lasalocid

INTRODUCTION

The actinomycetes form an important part of the microbial community inhabiting many natural environments, and are responsible for various geochemical cycles. The actinomycete genus *Streptomyces* is an industrially important group as the members of this group produce a wide array of bioactive molecules ranging from antibiotics, enzymes, enzyme inhibitors, inducers of eukaryotic cellular differentiation, inducers and inhibitors of apoptosis, protein kinase inhibitors with antitumor activity and other pharmacologically active agents (Jeong *et al.*, 2010; Olano *et al.*, 2009; Yoshimoto *et al.*, 2000)). Indeed, actinomycetes produce two-thirds of the known antibiotics that are produced by microorganisms; of these about 80% are made by the members of the genus *Streptomyces* (Kieser *et al.*, 2000; Lucas *et al.*, 2013). The fast emerging threat of bacterial resistance to the existing antibiotics demands the search for novel antibacterial metabolites, and several research studies are currently oriented towards the isolation of new *Streptomyces* species from exotic environmental samples (Fair and Tor, 2014).

The genus *Streptomyces* contains aerobic spore forming actinomycetes which have a high guanine-plus-cytosine (G+C mol %) containing genomic DNA. They differentiate to produce branching substrate and aerial mycelia with long conidial chains. Several taxonomic tools have so far been used to classify *Streptomyces* species, which include culturing and physiological methods, chemo-taxonomic and numerical taxonomic tools and their combinations (**Anderson and Wellington, 2001**). Application of genotypic approach to *Streptomyces* classification has contributed considerably to the extension of our knowledge of the phylogenetic relationships between strains of this genus. Of the several genetic approaches, 16S rDNA sequence analysis has proven to be a powerful tool in *Streptomyces* taxonomy (**Patel et al., 2004**).

Antibiotic biosynthesis is a characteristic of certain microorganisms, and this property is often influenced by primary metabolism. Optimization of nutrient conditions is necessary for the maximum accumulation of antibiotic compounds, since the intermediate metabolites from primary metabolisms serves as precursors for the biosynthesis of antibiotics (**Mellouli** *et al.* **2003**). Isolation and characterization of active secondary metabolites from fermented broth involve several steps like solvent extraction, precipitation, chromatography and spectroscopic analysis.

In the present study, we describe the isolation of a new *Streptomyces* strain TBG19NRA1 from the forest soil of Neyyar wild life sanctuary, South India, producing antibacterial activity. Identification of this strain using polyphasic approach as well as the study of the influence of different nutritional compounds

on antibiotic biosynthesis is reported. The extraction, purification and structure elucidation of the active molecule from the strain TBG19NRA1 is carried out and its biological activity is described.

MATERIAL AND METHODS

Microorganisms Used

The strain TBG19NRA1, isolated from forest soil of Neyyar Wild Life Sanctuary, Trivandrum, Kerala was analyzed for the production of potent antimicrobial molecules. The microorganisms used for antimicrobial assays were *Escherichia coli* (MTCC 739), *Staphylococcus aureus* (MTCC 740) and *Candida albicans* (MTCC 221). They were procured from Microbial Type Culture collection and gene bank (MTCC), Institute of Microbial Technology (IMTECH), Chandigarh, India. The minimum inhibitory concentration (MIC) of the purified antibiotic was determined against above strains as well as other bacterial strains like *Arthrobacter protophormiae* (MTCC 2682), *Bacillus cereus* (MTCC 430), *B. subtilis* (MTCC 441), *E. coli* (MTCC 443), *Klebsiella pneumoniae* subsp. *pneumoniae* (MTCC 109), *Proteus vulgaris* (MTCC 426), *Pseudomonas fluorescens* (MTCC 103), *P. aeruginosa* (MTCC 741), *Salmonella typhi* (MTCC 733), *S. aureus* subsp. *aureus* (MTCC 737) and yeast strain Saccharomyces cerevisiae (MTCC 36).

Culture Conditions

For antimicrobial assay, an inoculum of *Steptomyces* TBG19NRA1 was prepared in 20 ml Tryptone-Yeast extract broth (ISP-1 media) in 100 ml Erlenmeyer flasks and inoculated to 100 ml Antibiotic Sensitivity broth containing 1.5% glucose, 1% calcium carbonate, 1.5% soya meal, 0.25% glycerol, 0.5% NaCl and 0.1% yeast extract (**Atlus and Perks, 1993**) in 250 ml Erlenmeyer flasks. The flasks were incubated at room temperature ($28 \pm 1^{\circ}$ C) on a rotary shaker at 120 rpm for 5 days. The test bacterial strains were grown overnight in LB broth at 37^oC, while the *Candida* strain was grown overnight in Sabouraud's Dextrose Broth (SDB) at 30^oC, to be used as inoculum for antimicrobial assays.

To investigate the influence of culture medium on antibiotics production, spores at 10^7 /ml were used to inoculate 500 ml Erlenmeyer flasks containing 200 mL each Antibiotic Sensitivity broth (without glucose), each supplemented with one of the five carbon sources (starch, fructose, galactose, lactose, sucrose) in 1% (w/v) concentration. Each culture was done in triplicate. After incubation at 28±

 1° C for 120h in an orbital incubator with shaking at 200 rpm, antibacterial activities were assayed for each culture supernatant. After determination of the best carbon source, the influence of varying concentrations of trace mineral oligoelements and phosphate on antibiotic production was investigated under the same culture conditions described above. Pridham and Gottlieb trace salt solution (**Shirling and Gottlieb**, **1966**) containing CuSO₄.5H₂O (6.4 mg/ml), FeSO₄.7H₂O (1.1 mg/ml), MnCl₂.4H₂O (7.9 mg/ml) and ZnSO₄.7H₂O (1.5 mg/ml) was used at 0.02 to 0.2% (v/v) and Phosphate (K₂HPO₄) at 0.05 to 0.4% (w/v) in the liquid culture medium

Cultural characteristics of strain TBG19NRA1 were observed after 7, 14 and 21 days of incubation on nutrient agar, Sabouraud's Dextrose Agar (SDA), Yeast Malt Agar media and on different ISP media as per ISP methods (**Shirling and Gottlieb**, **1966**). Cell mass for all chemotaxonomic tests was obtained by growing cultures in shake flasks for 5 days at 30^oC in Yeast Extract Malt Extract broth (ISP-2), followed by freeze-drying.

Microscopy, Physiology and Biochemistry of study organism

Micro-morphology and sporulation were determined by phase contrast microscopy (Nikon Optiphot-II) and scanning electron microscopy (Hitachi S-2400). The samples used for scanning electron microscopy were from 14-day slide cultures prepared on ISP-2 media that had been fixed with modified Karnovsky's fixative and followed by 1 h in 1% osmium tetroxide, dehydrated through a graded acetone series, critical point dried from liquid CO₂, and sputter coated with gold-palladium (**Chakrbarti, 1998**).

Standard physiological tests were performed after growth at 30°C (unless otherwise stated) for the recommended incubation periods as described (Williams and Sharpe, 1989). Antibiotic resistance was determined by addition of the antibiotics into Bennett's Medium agar plates at the recommended concentrations (Williams and Sharpe, 1989). All carbon sources for carbon-utilization tests were ether sterilized and tested at the concentrations and conditions recommended by ISP (Shirling and Gottlieb, 1966). The cell wall Diaminopimelic acid (DAP) analysis was carried out by TLC method (Staneck and Roberts, 1974).

DNA isolation and 16S rDNA sequence analysis

Total DNA preparation from strain TBG19NRA1 was carried out according to Murray and Thompson (**Murray and Thompson, 1980**). The base composition (G+C mol %) was determined in 0.1 M standard saline citrate (SSC) by the method of Mandel and Marmur (**1968**).

PCR amplification of approximately 1.5 kb of 16S ribosomal DNA (rDNA) of TBG19NRA1 was performed using the eubacterial primers 8-27F, 5' AGAGTTTGATCCTGGCTCAG 3' (*Escherichia coli* positions 8 to 27), and 1495R 5'-CTACGGCTACCTTGTTACGA -3' (*E. coli* positions 1495 to 1476) were modified from primers fD1 and rP2, respectively, of **Weisburg** *et al.* (**1991**). Amplification of the 16S rRNA was performed using a BioRad S1000 Thermal Cycler, with a reaction mix composed of 30–50 ng template DNA, 0.4 μ M each of both primers, 12.5 μ l EmeraldAmp GT PCR Master Mix (Takara Bio Inc, Japan) in a final volume of 25 μ l. PCR was performed under the following conditions: 1 min at 98°C, followed by 35 cycles of 10 sec at 98°C, 30 sec at 58°C, 1.5 min at 72°C and a final extension of 72°C for 10 min. The amplified PCR product was analyzed by agarose gel electrophoresis and the DNA of the expected size was purified by electro-elution.

The purified PCR amplified 16S rRNA gene was sequenced using the dideoxy chain-termination method (Sanger et al., 1977) at Scigenom Labs, Cochin, Kerala, India. Sequencing was done using an ABI Prism 310 Genetic Analyzer (Applied Biosystems) using the amplification primers (8-27F and1495R) and two internal primers 338F, 5'-ACTCCTACGGGAGGCAGC-3'; 798R, 5'-AGGGTATCTAATCCT-3', hybridizing respectively at positions 338-355 and 798-784, according to the E. coli 16s rRNA numbering. The sequences obtained were aligned using Contig Assembly Program of BioEdit software, to obtain almost complete (1495 bp) 16S rDNA gene sequence, which was submitted to GenBank with accession number KX269853. The obtained rDNA sequence was used for homology search using BLAST search algorithm and similar sequences retrieved from GenBank were aligned using ClustalW tool of BioEdit (Thompson et al., 1997). The MEGAX software was used for the construction of a phylogenetic tree using the ClustalW aligned sequences (Kumar et al., 2018) and the evolutionary history was inferred using the Neighbor-Joining method (Saitou and Nei, 1987). Computation of evolutionary distances was carried out using the Jukes-Cantor method (Jukes and Cantor, 1969), and is in the units of number of base substitutions per site. A bootstrap confidence analysis was performed for 1000 replicates to determine the reliability of the distance tree topologies obtained (Felsenstein, 1985).

Biological assay of antimicrobial activities

The culture filtrates collected from 5 days old culture in Antibiotic Sensitivity broth (Atlus and Perks, 1993) were analysed for antimicrobial activity following Agar-Cup-Plate method and disc diffusion method against selected bacterial strains and *Candida albicans*. Seventy five micro-litres of different culture filtrates of TBG19NRA1 were applied to the 5 mm diameter wells on agar plates spread with test organisms. Whatman paper discs (No.3) of 5 mm diameter impregnated with purified antibiotic compound of different dilutions were used for determination of MIC values. Plates were incubated at 37°C for overnight growth of bacteria and at 30°C for 24 h for *Candida*. Plates were examined for antimicrobial activities, represented by a zone of inhibition of bacterial/fungal growth around the well or the paper disk.

Extraction, purification and spectroscopic analysis of active compound

TBG19NRA1 cultured at $28\pm1^{\circ}$ C for 120h was harvested to remove the biomass, and the cell-free supernatant was mixed with equal volume of *n*-butanol and shaken vigorously at room temperature for 2 h in a separating funnel. The butanol layer was checked for antibiotic activity and concentrated *in vacuo*. This was further extracted with ethyl acetate (250 ml x 3) and the ethyl acetate phase evaporated *in vacuo* and the residue was dissolved in 5 ml chloroform. The chloroform fraction was passed through a silica gel (60~120 mesh) column. Solvent systems of chloroform-methanol (99.5:0.5), followed by chloroform-methanol (9:1) was used for fractionation. Fractions of 10 ml each were collected and checked for antimicrobial activity by disc diffusion method. The active fractions were concentrated under reduced pressure. The resultant oily residue was dissolved in 20 ml diethyl ether and filtered. Filtrate was evaporated in room temperature to form an amorphous solid, which was crystallized by adding absolute ethanol.

Silica gel thin layer chromatography (TLC) using solvent system benzene:methanol (19:1) showed single spot under ultraviolet light (365nm).

Melting point was determined by capillary method and is uncorrected. UV spectrum was measured on a Shimadzu UV-2100 spectrophotometer using methanol as solvent. IR spectrum was recorded on a Bruker IFS 66V FT- IR spectrophotometer following KBr pellet method. ¹³C NMR spectra (75MHz) was taken using Jeol GSX NB 400 MHz NMR spectrophotometer with TMS as internal standard. Mass spectra was taken on a Finnigan MAT 8230 mass spectrometer.

RESULTS AND DISCUSSION

Isolation and characterization of strain TBG19NRA1

The actinomycete strain TBG19NRA1 isolated from the forest soil of Neyyar Wild Life Sanctury of South India exhibited antimicrobial activities against Gram-positive and Gram-negative bacteria and fungi. Permissive temperature range for growth of the strain TBG19NRA1 was 10 to 36°C, with 30°C and pH 6.5 as optimum conditions. According to cultural characteristics (Table 1), strain TBG19NRA1 grew well with elevated and spreading colonies. The colours of the aerial and vegetative mycelia were white to light grey and yellowish brown respectively. The vegetative hyphae produced branched mycelia that rarely fragmented. Aerial mycelia forms well developed Rectus-flexibilis type spore chains bearing more than 20 spores of size 0.86-1.03 x 0.6 µm (Fig.1A). Electron micrograph of the aerial mycelia shows that the spore surface is smooth and without any ornamentation (Fig.1B). The cell wall peptidoglycan of the organism contains LL-diaminopimelic acid. The isolate did not produce melanin or other soluble pigments. The isolate shows resistance to the antibiotics like penicillin G and rifampicin. The strain was found to utilize carbon sources like dextran, Dfructose, D-galactose, D-lactose, mannitol, D-mannose, L-ramnose and trehalose. The G+C content of DNA was 73.44 mol%.

The morphological and chemotaxonomic characteristics of strain TBG19NRA1 were compared with those of the known species of actinomycetes described in Bergey's manual of systematic bacteriology (Williams and Sharpe, 1989). The culture characteristics strongly suggest that strain TBG19NRA1 belongs to the genus *Streptomyces*. Taxonomic characterization of strain TBG19NRA1 with ISP strains according to the classification key of Nonomura (Nonomura, 1974) and the ISP descriptions (Shirling and Gottlieb, 1969) revealed the isolate to be closely related to *Streptomyces setonii*, which was now considered as heterotypic synonym of *S. griseus* (Liu *et al.*, 2005).

In order to confirm the identification, 16S rRNA gene of TBG19NRA1 strain was amplified using primers designed based on the conserved regions of eubacterial 16s rDNA (Weisburg et al., 1991) and sequenced. The almost complete 16S rDNA sequence of 1495 bp (NCBI accession number KX269853) was compared with those of similar sequences deposited in public databases. Analysis of this sequence shows high similarity to *S. griseus* 16S rRNA genes. A phylogenetic analysis, of this strain and 23 reference strains whose sequences were available, is shown in Fig. 2. In the phylogenetic tree, the strain TBG19NRA1 clusters with *S. griseus* and allied species. Based on genotypic and phenotypic characters, the strain was identified as *Streptomyces griseus* (Millard & Burr, 1926; Waksman, 1953) and deposited in Microbial Type Culture Collection and Gene Bank, Chandigarh, India with an accession number MTCC 3756.

 Table 1 Cultural characters of TBG19NRA1 strain on Different growth media

		Cultura	1 characteristics	
Medium	Growth	Substrate mycelium	Soluble pigments	
ISP 2 ISP 3 ISP 4 ISP 5 SDA Nutrient agar	Good Good Good Good Poor	Yellow Brown Yellow Brown Yellow Brown Yellow Brown Yellow Brown	Good, White Good, White/grey Good, White Good, White Good, White/grey	None None None None

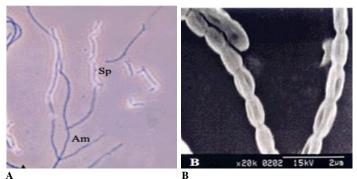
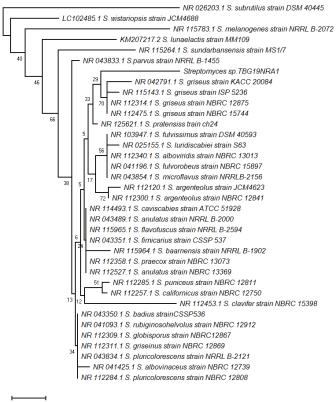


Figure 1 Microphotographs showing the morphology of TBG19NRA1 **A:** Phase contrast microphotograph (Nikon Optiphot-II) of strain TBG19NRA1 taken after 14 days of growth on ISP-2 media as slide cultures, showing aerial mycelium (Am) and *Rectus-flexibilis* type spore chain (Sp). **B:** Scanning Electron microphotograph of strain TBG19NRA1. The strain was grown for 14 days as slide cultures prepared on ISP-2 media and was fixed with modified Karnovsky's fixative and 1% osmium tetroxide, dehydrated through a graded acetone series, critical point dried using liquid CO₂, and sputter coated with goldpalladium. The scanning electron microphotograph (Hitachi S-2400) showing spore chain with smooth walled spores (scale 4 cm= 2µm).



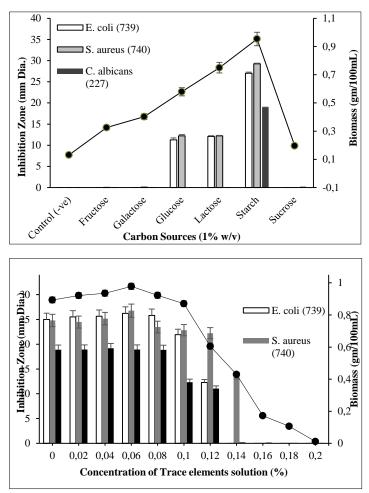
0.0020

Figure 2 Phylogenetic tree constructed from a multiple sequence alignment of the 16S rRNA of *Streptomyces* spp.

The evolutionary history was inferred using the Neighbor-Joining method. The optimal tree with the sum of branch length = 0.05719313 is shown. The percentage of replicate trees in which the associated taxa clustered together in the bootstrap test (1000 replicates) are shown next to the branches. The tree is drawn to scale, with branch lengths in the same units as those of the evolutionary distances used to infer the phylogenetic tree. The evolutionary distances were computed using the Jukes-Cantor method and are in the units of the number of base substitutions per site. The analysis involved 36 nucleotide sequences. All positions containing gaps and missing data were eliminated. There were a total of 1407 positions in the final dataset. Evolutionary analyses were conducted in MEGA X.

Optimization of culture conditions and quantification of antimicrobial activities in liquid media

To investigate the effect of various carbon sources on antibiotic biosynthesis by S. griseus TBG19NRA1 strain, different carbohydrates (Starch, Fructose, Galactose, Lactose, and Sucrose) were tested as sole carbon source at 1% (w/v) concentration in antibiotic assay broth (Atlus and Perks, 1993). After incubation at $28\pm1^{\circ}$ C as described earlier, antibacterial activities were assayed for each culture supernatant using the bioassay test against indicator test bacteria (E. coli MTCC 739, S. aureus MTCC 740) and C. albicans (MTCC 227). An increase in antibiotic production was observed only when starch was used as carbon source, and the antibiotic produced was found to have antimicrobial activity against the three indicator microorganisms (Fig. 3). In order to further optimize the culture conditions, we studied the influence of Phosphorus and trace mineral elements at different concentrations. After 120 h incubation in the same conditions described above, it was found that inorganic phosphate (K₂HPO₄) inhibited antibiotic production (Fig. 3). It should be noted that the haloes of inhibition of indicator microorganism growth were higher in starch plus 0.06% (v/v) of trace element solution grown culture than in starch only. According to these results, antibiotic production by this isolate was negatively affected by fructose, galactose, lactose, sucrose and phosphate, whereas starch and trace mineral elements (up to 0.06%) increased antibiotic yield. It has been shown that the nature of carbon and nitrogen sources, phosphorus, potassium, magnesium and trace mineral oligoelements, strongly affects antibiotic production in different organisms in different ways (Holmalahti et al., 1998).



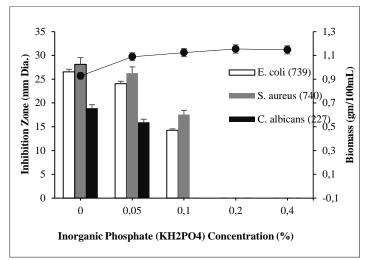


Figure 3 Effect of different nutrient conditions on antibiotic accumulation and growth

The indicator organisms used were *E. coli* (MTCC 739), *S. aureus* (MTCC 740) and *C. albicans* (MTCC 227). Cell free culture filtrates (75 μ l) of strain TBG19NRA1 were used for bio-activity assay following Agar-Cup-Plate (5mm) method.

Isolation, purification and spectroscopic analysis of the active compound

Cell-free supernatant of one litre shake flask culture of the *Streptomyces* sp. TBG19NRA1 grown in antibiotic assay medium in the presence of 1% (w/v) starch and 0.06% (v/v) of trace mineral salt solution was used for the isolation of the antibiotic as described under materials and methods. The purified antibiotic compound TBGA-1 is a white amorphous powder with melting point 132-135°C. The compound is readily soluble in many of the organic solvent but insoluble or sparingly in ethanol and water.

The compound has been identified as lasalocid A (Fig. 4) based on comparison of the spectral data of the compound with the published data for lasalocid A. The results of spectral analysis are given as supplementary data. The Thin Layer Chromatography (TLC) of the compound on pre-coated Silica gel 60 F₂₅₄ plate (Merck) using the solvent system benzene: methanol (19:1) gave single spot (R_f value 0.44). The compound gave positive colour test with FeCl₃, indicating phenolic nature. The ultraviolet spectrum in methanol (Fig.S1) exhibited absorption maxima at 315nm (ɛ 2865) and 250nm (ɛ 2800) indicating the presence of aromatic ring, substituted with a hydroxyl and carboxyl group (Berger et al., 1951, Patel and Shen, 1976). Infrared spectrum of the compound (Fig. S2) indicated the presence of two carbonyl absorptions at 1710 cm⁻¹ (aromatic COO⁻) and 1651 cm⁻¹ (ketone), and a broad hydroxyl absorption at 3452 cm⁻¹ (Berger et al., 1951 and Patel and Shen, 1976). Electron impact mass spectrum of the compound (Fig. S3) failed to give the molecular ion peak, but showed peak at m/e 572 (M⁺-H₂O), and also the characteristic fragmentation peaks corresponding to lasalocid A. McLafferty rearrangement following cleavage at C_{11} - C_{12} and the subsequent loss of tetrahydropyranyl ring yielded the prominent peak at m/e 211, which on further rearrangement yielded the peak at m/e 155. The base peak at m/e 57 results by the α -fission at carbonyl group. Other characteristic fragmentation peaks were also as reported for the pyrolytic cleavage for lasalocid A (Westley, 1974). The ¹³C NMR spectrum of the compound (Fig. S4) in CDCl3 (TMS as internal standard) along with the offresonance spectrum clearly indicated the presence of 34 carbon atoms, belonging to 8 methyls, 8 methylenes, 4 oxymethines, 6 methines, and 8 quarternary carbons including a carboxylate and a ketone. The complete assignment of the ³C NMR spectra of the compound was carried out by comparison with the published ¹³C data for lasalocid A and shown in Table S1 (Seto et al., 1978). The numbering system for the compound follows Westley (1976). The genus Streptomyces generally produce polyether antibiotics, characterized by several cyclic ether systems, a single carboxylic acid function at one end of the molecule and the prevalence of C-alkyl groups (Westley, 1976, 1981).

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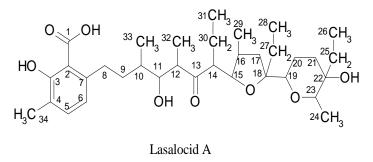


Figure 4 The predicted structure of compound TBGA-1 based on spectral analysis

The purified compound TBGA-1 is active *in vitro* primarily against grampositive bacteria (Table-2). However it shows activity against some of the gramnegative bacteria like *E. coli*, *P. fluorescens* and *S. typhi* and also against nonfilamentous fungi like *C. albicans*. In addition to major antibiotics such as streptomycin, produced by *S. griseus*, it has also been reported to produce many other antibiotics (**Iwamoto** *et al.*, **1990**; **Larsen** *et al.*, **1988**, **Larsen** *et al.*, **1989**). This is the first report on the production of lasalocid A, a polyether ionophore complex antibiotic from a strain of *S. griseus*. However, another polyether ionophore compound, 16-Deethylindanomycin (A83094A) was reported earlier (**Larsen** *et al.*, **1988**).

 Table 2 Minimum Inhibitory Concentration (MIC) of purified compound against different bacterial strains and non-filamentous fungi

ABacteria1Arthrobacter protophormiae2Bacillus cereus3B. subtilis4Escherichia coli5E. coli6Klebsiella pneumoniae subsp.7Proteus vulgaris8Pseudomonas aeruginosa9P. fluorescens10Salmonella typhi11Serratia marcescens12Staphylococcus aureus13S. aureus subsp. aureusBNon-filamentous fungi	2682 430 441	12
 2 Bacillus cereus 3 B. subtilis 4 Escherichia coli 5 E. coli 6 Klebsiella pneumoniae subsp. pneumoniae 7 Proteus vulgaris 8 Pseudomonas aeruginosa 9 P. fluorescens 10 Salmonella typhi 11 Serratia marcescens 12 Staphylococcus aureus 13 S. aureus subsp. aureus 	430	
 B. subtilis Escherichia coli E. coli Klebsiella pneumoniae subsp. pneumoniae Proteus vulgaris Pseudomonas aeruginosa P. fluorescens Salmonella typhi Serratia marcescens Staphylococcus aureus S. aureus subsp. aureus 		2
 4 Escherichia coli 5 E. coli 6 Klebsiella pneumoniae subsp. pneumoniae 7 Proteus vulgaris 8 Pseudomonas aeruginosa 9 P. fluorescens 10 Salmonella typhi 11 Serratia marcescens 12 Staphylococcus aureus 13 S. aureus subsp. aureus 	441	3
 5 E. coli 6 Klebsiella pneumoniae subsp. pneumoniae 7 Proteus vulgaris 8 Pseudomonas aeruginosa 9 P. fluorescens 10 Salmonella typhi 11 Serratia marcescens 12 Staphylococcus aureus 13 S. aureus subsp. aureus 	111	2
 Klebsiella pneumoniae subsp. pneumoniae Proteus vulgaris Pseudomonas aeruginosa P. fluorescens Salmonella typhi Serratia marcescens Staphylococcus aureus S. aureus subsp. aureus 	739	28
0pneumoniae7Proteus vulgaris8Pseudomonas aeruginosa9P. fluorescens10Salmonella typhi11Serratia marcescens12Staphylococcus aureus13S. aureus subsp. aureus	443	24
 8 Pseudomonas aeruginosa 9 P. fluorescens 10 Salmonella typhi 11 Serratia marcescens 12 Staphylococcus aureus 13 S. aureus subsp. aureus 	109	45
9P. fluorescens10Salmonella typhi11Serratia marcescens12Staphylococcus aureus13S. aureus subsp. aureus	426	>100
10Salmonella typhi11Serratia marcescens12Staphylococcus aureus13S. aureus subsp. aureus	741	>100
11Serratia marcescens12Staphylococcus aureus13S. aureus subsp. aureus	103	26
12Staphylococcus aureus13S. aureus subsp. aureus	733	34
13 S. aureus subsp. aureus	97	>100
	740	2
R Non-filamentous fungi	737	3
D Hon-manientous rungi		
1 Candida albicans	227	28
2 Saccharomyces cerevisiae	36	>100

MIC: minimum inhibitory concentration, MTCC No.: Accession code identifying strains held within the Microbial Type Culture Collection and Gene Bank, CSIR-IMTech, Chandigarh, India.

CONCLUSION

It can be concluded that the forest soils of Neyyar wild life sanctuary are abundant in Actinomycetes, and are rich sources of microorganisms producing potential antibiotics and other metabolites. TBG19NRA1 isolated from this area is identified as *Streptomyces griseus* (synonym *S. setonii*) based on morphological, physico-chemical and molecular phylogenetic analysis based on 16s rDNA sequences. The antibiotic compound TBGA-1 produced by TBG19NRA1 has been identified as lasalocid A and this is the first report of lasalocid A from *S. griseus* strain.

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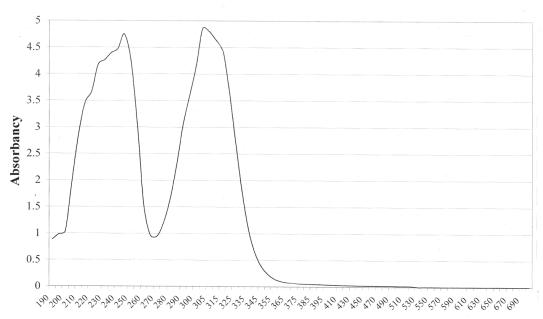
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Supplementary Data

Table S1. ¹³C NMR data of lasalocid A

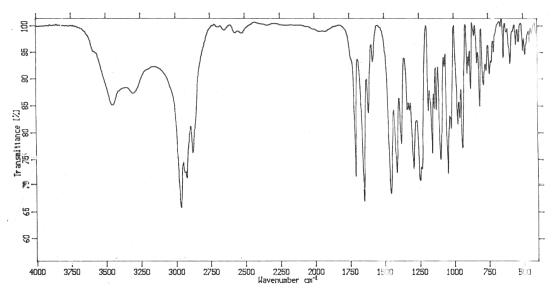
Carbon number	Multiplicity*	¹³ C shift (ppm)	¹³ C shift lit*	Carbon number	Multiplicity	¹³ C shift (ppm)	¹³ C shift lit*
1	s	173.2	173.6	18	s	86.2	86.7
2	s	110.9	111.2	19	d	70.5	70.9
3	s	161.6	161.6	20	t	19.5	20.0
4	s	123.9	124.1	21	t	29.7	30.2
5	d	134.8	135.1	22	s	72.3	72.4
6	d	121.2	121.6	23	d	75.9	76.6
7	s	144.0	144.4	24	q	13.7	14.0
8	t	34.3	34.8	25	t	30.3	30.7
9	t	36.6	37.0	26	q	6.2	6.6
10	d	34.5	34.9	27	t	30.2	30.6
11	d	72.2	72.8	28	q	8.9	9.2
12	d	48.7	48.9	29	q	15.7	15.9
13	8	214.6	214.1	30	t	16.4	16.7
14	d	55.1	55.4	31	q	12.6	12.9
15	d	83.6	84.2	32	q	12.9	13.2
16	d	34.5	34.8	33	q	13.1	13.4
17	t	38.4	38.7	34	q	15.5	15.7

*Multiplicity as indicated from off-resonance spectrum (s=singlet, d=doublet, t=triplet, q=quartet); * Seto et al., 1978

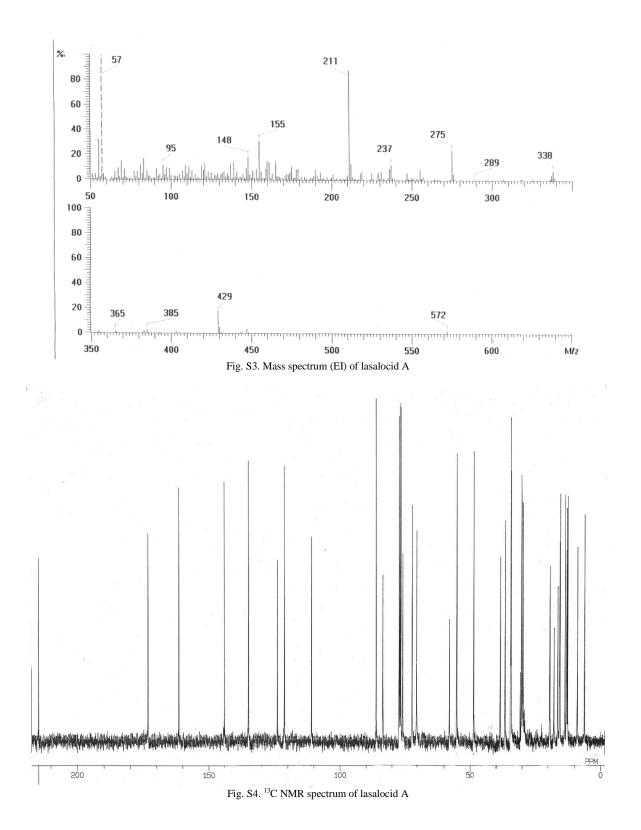


Wavelength (nm)

Fig.S1. UV spectrum of lasalocid A in MeOH







	10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200 210
eptomyces sp.TBG19NRA1	AGAGTITIGATECT66CTCAST6AC6AC6CT66C6ACCCT66CAAC6CG6CGTCTAACACAT6CAAGTC6AAC6CGGAT6AACACCCT66CAAC6GGGTCAAAACACCT66CCAAC6GGGTCAAAAC6GGGTCTAACAC6GGTCAAAACACTCT6TCC6CAT66GAAC6GGGTCAAAACACCT66CAAC6GGGTCAAAACACCT66CAAC6GGGTCAAAACACCT66CAAC6GGTCAAAC6GGTCAAAAC6GTCAAAC6GTCAAAC6GGTCAAAAC6GGTCAAAAC6GGTCAAAC6GTCAAC6GTCAAAC6GGTCAAAAC6GGTCAAAC6GGTCAAAAC6GGTCAAAC6GGTCAAAC6GGTCAAAC6GGTCAAAC6GGTCAAAC6GGTCAAAC6GGTCAAAC6GGTCAAAAC6GGTCAAAC6GGTCAAAC6GGTCAAAC6GGTCAAAC6GGTCAAAC6GGTCAAAC6GGTCAAC6GGTCAAAC6GGTCAAAC6GGTCAAAC6GGTCAAAC6GGTCAAAAC6GGTCAAAC6GGTCAAAC6GGTCAAAC6GGTCAAAC6GGTCAAAC6GGTCAAAC6GGTCAAAC6GGTCAAAC6GGTCAAAC6GGTCAAAC6GGTCAAAC6GGTCAAAC6GGTCAAAC6GGTCAAAC6GGTCAAAC6GGTCAAAC6GGTCAAC6GGTCAAAC6GGTCAAAC6GGTCAAAC6GGTCAAAC6GGTCAAAC6GGTCAAC6GGTCAAAC6GGTCAAAC6GGTCAAAC6GGTCAAAC6GGTCAAAC6GGTCAAAC6GGTCAAAC6GGTCAAAC6GGTCAAC6GGTCAAAC6GGTCAAAC6GGTCAAAC6GGTCAAAC6GGTCAAAC6GGTCAAC6GGTCAAAC6GGTCAAC6AC6GGTCAAC6AC6GG
103947.1 S. fulvissimus DSM	
025155.1 S. luridiscabiei S	
14493.1 S. caviscabies ATC	
25621.1 S. pratensis ch24	TGATCCTGGCTCAG-GACGAACGCGGCGTGCCTTAACACATGCAAGTCGAACGATGAAGCC-CTTCGG-GGTGAGTAACACGGGGCAATCGGGCCATCTGGCCAAGCCCTGGAAACGGGGCCTAATACCCGGATAACACTCTGCCCGCATGGACGGGCTAAAAAGCTCCGGCGGTGAGTAACACTCTGGCCAATGCGGGCGACGGGCTAATACCCGGATGAGCCCTGGAAACGGGGCCTGGAAACGGGGCCTGGAAACGGGGCCTGGAAACGGGGCCTGGAAACGGGGCGACGGGCTGAGTAAAAGCTCCGGGGCAATGAGCCCTGGAAACGGGGCCTGGAAACGGGGCCTGGAAACGGGGCCTGGAAACGGGGCCTGAGAACGGGGCCTGGAAACGGGGCGACGGGCGACGGGCCGGGCGGCGACGGGCGGC
43854.1 S. microflavus NRR	CTGGCTCAG-GACGAACGCGGCGTGCTGACACATGCAAGTCGAACGATGAAGCC-TTTCGG-GGTGGATTAGTGGCGAACGGGGTGAACACGTGGGCAATCTGCCCTCGACGGGACGGGGTCTAAAACCTCGGCCAACGGGGTCTAAACACCTCGCCCGACGGGGTCAAAAACCTCCGCCGGGGTCAACACGCGGTCGAACGGGGTCTAACACCTCGCCCGGACGGGGGTCAACACGCGGTCGAACGGGGTCGAACGGGGTCTAACACCTCGCCCGGACGGGGTCAACACGCCCTGGACGGGGTCAACACGCGGTCGAACGGGGTCGAACGGGGTCTAACACCTCGCCCTCGACGGGTCGAACGGGGTCTAACACCTCGCCCGGGTCGAACGGGGTCGAACGGGGTCGAACGGGGTCGAACGGGGTCGACGGGTCGAACGGGGTCGACGGGTCGACGGGTCGAACGGGGTCGACGGGTCGACGGGTCGACGGGGTCGACGGGTCGACGGGGTCGACGGGTCGACGGGTCGACGGGGTCGACGGTCGACGGGTCGACGGGTCGACGGGTCGACGGGTCGACGGTCGACGGTCGACGGTCGACGGTCGACGGTCGACGGTCGACGGTCGACGGTCGACGGTCGACGGTCGACGGTCGACGGTCGACGGTCGACGGTCGACGGTCGACGGTCGACGGTCGACGGTCGACGACGGTCGACGGTCACGGGTCGACGGTCGACGTCGGGTCGACGACGACGACGACGACGACGACGACGACGACGACGAC
43489.1 S. anulatus NRRL B	
3350.1 S. badius CSSP536	CTGGCTCAG-GACGAACGCTGGCGGCGTGCTTAACACATGCAAGCCGCTTCGGTGGGGTGGAGGGGGGGG
1093.1 S. rubiginosohelvo	
5965.1 S. flavofuscus NRR	
2309.1 S. globisporus NBR	
2311.1 S. griseinus NBRC	
3834.1 S. pluricolorescen	
3351.1 S. fimicarius CSSP	CTGGCTCAG-GACGAACGCTGGCGGCGTGCTTAACACCATGCAAGTCGAACGATGAACGGCGGTTCGGTGGGATTAGTGGCGAACGGGGTAACACGGGGCAACGGGGTCTAAAGCCCTGGAACGGGGTCTAAAGCCCCGGCAGGGGCAACGGGGTCTAAAGCCCCGGCGGGCG
7217.2 S. lunaelactis MM1	-AGAGTTTGATCCTGGCTCAG -GACGAAGGCTGGCGGGGGGGGGGGGGAAGGGGAGGAAGGGGGGGG
5964.1 S. baarnensis NRRL	
1425.1 S. albovinaceus NB	
2120.1 S. argenteolus JCM	GCTCAG-GACGAACGCTGGCGGCGTGCTTAACACATGCAAGTCGAACGATGAAGCC-TTTCGG-GGTGGGAACGGGGTGAGTAACACGTGGGCCATCTGCCCTTCACTCTGGG-ACAAGCCCTGGAAACGGGGTCTAATACCCGGATAACACTCTGCCCGCATGGACGGGCTAAAAACCCCGGATGAGCCCTGGACGGGCTAACACGGGGCCAACGGGCGACGGGCTAACACGCGGCCAACGGGCCAACGGGCCTCCACGGCGACGGGCCTAATACCCGGATAACACCTCTGCCCGCACGGCCAACGGGCCAACGGCGCCTCCACGGCGACGGGCCAACGGGCGACGGGCCAACGGCGCCTCCACGGCGACGGGCCTAATACCCGGATAACACCTCTGCCCGCACGGCCGGC
3833.1 S. parvus NRRL B-1	CTGGCTCAG-GACGGACGGCGTGCTTAACACCATGCAAGCGATGAAACCGCTTCGGTGGACGGGGTGGAATAGCGCGGTGGACGGGGTGGAACGGCGTCGAACGCCCTCGCCCGGGACGGGGTCGAAACGCCCCGGCAGGGCGTGGAACGCCCTCGCCCGGCAGGGCGTGGAACGCCCCGGCGGGCTGGAAACGCCCCGGCGGGCTGGAACGCCCCGGCGGGCG
2527.1 S. anulatus NBRC 1	ACGAAGGCTGCGCGCGCGTGCTTAACACATGCAAGCGAGGAGGAGCGCGCGGGGGGAGGAACAGGGGGGAGGA
1196.1 S. fulvorobeus NBR	CGARCGCTGGCGGCGTGCTTARCRCATGCRAGCGATGCAGCGCGTGACGACGGGGTARACGCGGGGGGGGGG
2358.1 S. praecox NBRC 13	
2340.1 S. alboviridis NBR	
2300.1 S. argenteolus NBR	ACGAACGCTGGCGGCGTGCTTAACACATGCAAGTCGAACGATGAAGCC TTTCGG GGTGGATTAGTGGCGAACGGGGTGAGTAACACTGGGCCAATGCCCTTCACTCTGG ACGGGGTCTAATACGGATAGCACCGGGTGATAAAAGCTCCGGCGGGCAACGGGGTCAATACGCCTGGAACGGGGTCAATACGGATGGGACGGGTTAAAAGCTCCGGCGGGGTGACGGGTTAACACTCTGCCCTCCGCAAGCCCTGGAACGGGGTCTAATACGGATGGGCGGGTTAAAAGCTCCGGCGGGTGACGACGGGTGAACACGGGTGAACACGTGGGCAACGGGGTGAACGCCTGGAACGGGGTCAATACGGATGGGCGAGGACGGGTTAACACTCGGCGGGTGACGGGTGACGGGTGAACGCCGGGACGGGTGACGGGTGAACGCCGGGTGACGACGGGTGACGGGTGAGTACCCTCGGCAGGGGTGACGGGTGAGTACCCGGACGGGGTGAACGCCGGGGTGACGGCGAGGACGGGGTGACGGGGTGACGGGGTGAGTACCCCGGAGGGGGGGG
2285.1 S. puniceus NBRC 1	ACGAACGCTGGCCGCGCGTCTTAACACATGCAACGATGAACGC-TTTCGG-GGTGGATTAGTGGCGAACGGGTGAGTAACACGTGGGCAATCTGCCCTTCACTCTGGG-ACAGGCGTTGAACACGGGGTCTAATACCGGAAACGGGGTCTGACGACGGGTTGAACACTCTGCCCGCGGG
2284.1 S. pluricolorescen	- ACCCTCGCCGCCGCGTGCTTAACACAAGTCGAACGCAGTGAAGCC-CTTCGG-GGTGGATTACTGCCGGTGAGTAACACGTGGGCAATCTGCCCTTCACTCTGGG-ACAAGCCCTGGAAACGGGGTCTAATACCCGGATACACCGCATGGGACGGGTGAAAGCGCGGGTGGAAACGGGGTGAAAGCGCGGGTGAAAGCGCGGGTGAAAGCGCGGGTGAAAGCGCGGGTGAAAGCGCGGGTGAAAGCGCGGGTGAAAGCGCTGGAAACGGGGTGAAAGCGCGGGTGAAAGCGCTGGAAACGGGGTGAAAGCGCGGGTGAAAGCGCTGGAAACGGGGTGAAAGCGCTGGAAACGGGGTGAAAGCGCTGGAAACGGGGTGAAAGCGCGGGTGAAAGCGCGGGTGAAAGCGCTGGAAACGGGGTGAAAGCGCGGGTGAACGGGTGAACGGGGTGAACGGCGGGTGAACGGCGGGTGAAAGCGCCTGGGAAGCGGGGGTGAAAGCGCGGGTGAAGCGCTGAAACGGGGTGAAAGCGCTGGGACGGGTGAACGGGGTGAAAGCGCCGGAAGCGGGTGAAACGGGGGTGAACGGCGGTGAACGGGTGAACGGCTGGGCGAATGGGCGAAGCGGGGTGAACGGCGGGTGAACGGCGGGTGAACGGCTGGGCGAAGCGGGGTGAACGGCGGGTGAACGGCGGGTGAACGGCGGGGTGAACGGCGGGGTGAAAGCGCCTGGGACGGGTGAGTAACGGGGTGAGTAACGGGGTGACGGGTGAGTAACGGCGGGTGGGCGAATGGGCGAAGCGCTGGGGGTGAACGGCGGGTGAACGGGGTGAGTAACGGCGGGGTGAGTAACGGCGGGTGGGCGAAGCGGGTGGGCGAAGCGCGGTGGGCGAAGCGGGTGGGCGAGGGGTGAACGGCGGGTGGGCGAAGCGCGGGTGGGCGAAGCGGGGGGGG
2257.1 S. californicus NB	
2791.1 S. griseus KACC 20	
5264.1 S. sundarbansensis	
2453.1 S. clavifer NBRC 1	
2485.1 S. wistariopsis JC	- AGACTITGATCCTGGCTCAG-GACGAACGGCGCGCGCGTCACAACGCCGCGCGACGGCGGCGACGGGCGAACGGGGCGACGGGCGACGGGCGACGGGCGACGGGCGACGGGCGACGGGCGCGCGCGCGCGCGCGCGCGCGCGCGCGCGCGGCG
5143.1 S. griseus ISP 523	
5783.1 S. melanogenes NRR	GAGTTTGATCCTGGCTCAG-GACGGACGCGCGCGTGCTTAACACCATGCAAGCGATGAAGCC-CTTCGG-GGGGGATTAGTGGCGAACGGGGGCAATCTGCCCTTCAGCCCTGGAAACGGCGGTCTAATACCGGGATCAGCACCGGAAGCGCCATGCTTCTGGG-GGGGGAAAGCGCCGGAGCAGCGCCAGCTTCAGGGGGGAAAGCGCCGGAGCAGCGCCAGCGCGGGGGAGCGGCG
6203.1 S. subrutilus DSM	AGASTITIGATECTOGETCAS GACGAACGETGEGEGEGEGETTAACACGEGATGAAGECGETGEGAGAGAGGEGEGEGEGEGEGEGEGEGEGEGEGEGE
12475.1 S. griseus NBRC 15	GAACGCTGGCGCGTGCTTAACACATGCAAGTCGAACGATGAACCC-TTTCGG-GGTGGATAACACGTGGGCAATCTGCCCTTCACTCTGGG-ACAAGGCCGTGAAAACGGGGTCTAAAACCGGATAACACTCTGTCCCCCATGGGACGGTTAAAAAGCTCCGGCGGT
12314.1 S. griseus NBRC 12	230 240 250 260 270 280 290 300 310 320 330 340 350 360 370 380 390 400 410 420 430
ptomyces sp.TBG19NRA1	
otomyces sp.TBG19NRA1	
- btomyces sp.TBG19NRA1 13947.1 S. fulvissimus DSM	
- tomyces sp.TBG19NRA1 3947.1 S. fulvissimus DSM 5155.1 S. luridiscabiei S	
tomyces sp.TBG19NRA1 3947.1 S. fulvissimus DSM 5155.1 S. luridiscabiei S 4493.1 S. caviscabies ATC	
tomyces sp.TBG19NRA1 3947.1 S. fulvissimus DSM 5155.1 S. luridiscabies ATC 5429.1 S. caviscabies ATC 552.1 S. pratensis ch24	
tomyces sp.TBG19NRA1 3947.1 S. fulvissimus DSM 5155.1 S. luridiscabies APC 562.1 S. caviscabies APC 562.1 S. pratensis ch24	
tomyces sp.TBG19NRA1 3947.1 S. fulvissimus DSM 5155.1 S. luridiscabiei S 4493.1 S. caviscabies APC 5621.1 S. pratensis ch24 3554.1 S. microflavus NRR	
tomyces sp.TBG19NRA1 3947.1 S. fulvissimus DSM 5155.1 S. luridiscabiei S 4493.1 S. caviscabies APC 5621.1 S. pratensis ch24 3854.1 S. microflavus NRR 3489.1 S. anulatus NRRL B	
tomyces sp. TBG19NRA1 3947.1 S. fulvissimus DSM 5155.1 S. luridiscabiei S 4493.1 S. caviscabies ATC 5621.1 S. pratensis ch24 3854.1 S. mircoflavus NRR 3489.1 S. anulatus NRRL B 3350.1 S. badius CSSP536	
tomyces sp.TBG19NRA1 3947.1 S. fulvissimus DSM 5155.1 S. luridiscabiei S. 4493.1 S. caviscabies ARC 5621.1 S. pratensis ch24 3854.1 S. microflavus NRR 4499.1 S. anulatus NRRL B 3350.1 S. badius CSSP536 1093.1 S. rubiginoschelvo	
tomyces sp. TBG19NRA1 3947.1 S. fulvissimus DGM 5155.1 S. luridiscabiei S 4493.1 S. caviscabies ATC 5621.1 S. pratensis ch24 354.1 S. microflavus NRR 3489.1 S. anulatus NRRL B 3350.1 S. badius CSSP536 1093.1 S. rubiginoschelvo 5965.1 S. flavofuscus NRR	
tomyces sp.TBG19NRA1 3947.1 S. fulvissimus DSM 5155.1 S. luridiscabiei S. 4793.1 S. caviscabies ATC 5621.1 S. pratensis ch24 3854.1 S. microflavus NRR 3489.1 S. anulatus NRRL B 3350.1 S. badius CSSP536 1093.1 S. rubiginoschelvo 5965.1 S. flavofuscus NRR 5905.1 S. globisporus NRR	
tomyces sp.TBG19NRA1 3947.1 S. fulvissimus DSM 5155.1 S. luridiscabiei S. 4793.1 S. caviscabies ATC 5621.1 S. pratensis ch24 3854.1 S. microflavus NRR 3489.1 S. anulatus NRRL B 3350.1 S. badius CSSP536 1093.1 S. rubiginoschelvo 5965.1 S. flavofuscus NRR 5905.1 S. globisporus NRR	
tomyces sp. TBG19NRA1 3947.1 S. fulvissimus DGM 5155.1 S. luridiscabiei S 4493.1 S. caviscabies ATC 5621.1 S. pratensis ch24 3489.1 S. anulatus NRAL B 3489.1 S. anulatus NRAL B 350.1 S. badius CSSP536 1093.1 S. rubiginoschelvo 9565.1 S. flavofuscus NRR 2309.1 S. globisporus NRR 2311.1 S. griseinus NBRC	
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sp.TBG19NRA1	GGAAGAAGCGAGAGTGACGGTA																	
. fulvissimus DSM	GGAAGAAGCGAAAGTGACGGTA																	
. luridiscabiei S																		
. caviscabies ATC																		
. pratensis ch24	GGAAGAAGCGAGAGTGACGGTA																	
. microflavus NRR																		
. anulatus NRRL B	GGAAGAAGCGAAAGTGACGGTA	CCTGCAGAAGAAGC	GCCGGCTAACTACGT	GCCAGCAGCC	GCGGTAATACGTAG	GGGCGCAAGCGTTGT	-CCGGAATTATTGGGG	CGTAAAGAGCT	CGTAGGCGGCT	TGTCACGTCGGAT	GTGAAAGCC	CGGGGGCTTAA-	CCCCGGGTCT	GCATTCGATACGGGC	FAGCTAGAGTG	GGTAGGGGAG	ATCGGAATTCCT	2GG
. badius CSSP536	GGAAGAAGCGAAAGTGACGGTA																	
 rubiginosohelvo 																		
. flavofuscus NRR																		
. globisporus NBR																		
. griseinus NBRC . pluricolorescen	GGAAGAAGCGAAAGTGACGGTA																	
. fimicarius CSSP																		
. lunaelactis MM1	GGAAGAAGCGAAAGTGACGGTA																	
. baarnensis NRRL	GGAAGAAGCGAAAGTGACGGTA																	
. albovinaceus NB	GGAAGAAGCGAAAGTGACGGTA																	
. argenteolus JCM																		
. parvus NRRL B-1	GGAAGAAGCGAAAGTGACGGTA																	
. anulatus NBRC 1																		
. fulvorobeus NBR																		
. praecox NBRC 13	GGAAGAAGCGAAAGTGACGGTA																	
 alboviridis NBR argenteolus NBR 	GGAAGAAGCGAAAGTGACGGTA GGAAGAAGCGAAAGTGACGGTA																	
. argenteolus NBR . puniceus NBRC 1																		
. pluricolorescen																		
. californicus NB																		
. griseus KACC 20																		
. sundarbansensis	G-AAGAAGCGCAAGTGACGGTA	CCTGCAAAGAGC	GCCGGCTAACTACGT	GCCAGCAGCC	GCGGTAATACGTAG	GG-CGCAAGCGTTGT	TCCGGAATTATTGGGG	CGTAAAGAGCT	CGTAG-CGGCT	TGTCACGTCGGAT	GTGAAAGCC	CGGGGGCTTAA-	CCCCGGGTCT	GCATTCGATACGGGC	FAGCTAGAGTG	GGTAGGGGAG	ATCGGAATTCCT	2GG
. clavifer NBRC 1	GGAAGAAGCGCAAGTGACGGTA																	
. wistariopsis JC																		
. griseus ISP 523																		
. melanogenes NRR . subrutilus DSM	GGAAGAAGCGAAAGTGACGGTA GGAAGAAGCGAAAGTGACGGTA																	
. griseus NBRC 15																		
	GGAAGAAGCGAGAGTGACGGTA																	
·																		
	670 680	690	700 710				50 760	770	780				820 83	30 840	850	860	870	880
sp.TBG19NRA1	TGTAGCGGTGAAATGCGCAGATA		.								1				.			-1
. fulvissimus DSM																		
. luridiscabiei S																		
. caviscabies ATC																		
. pratensis ch24	TGTAGCGGTGAAATGCGCAGATA																	
. microflavus NRR	TGTAGCGGTGAAATGCGCAGATA																	
. anulatus NRRL B																		
. badius CSSP536	TGTAGCGGTGAAATGCGCAGATA																	
. rubiginosohelvo																		
. flavofuscus NRR . globisporus NBR	TGTAGCGGTGAAATGCGCAGATA TGTAGCGGTGAAATGCGCAGATA																	
. griseinus NBRC	TGTAGCGGTGAAATGCGCAGAT/ TGTAGCGGTGAAATGCGCAGAT/																	
. pluricolorescen																		
. fimicarius CSSP																		
. lunaelactis MM1	TGTAGCGGTGAAATGCGCAGAT	ATCAGGAGGAACACO	CGGTGGCGAAGGCGG	ATCTCTGGGC	CATTACTGACGCT	GAGGAGCGAAAGCGT	GGGGAGCGAACAGGA	TTAGATACCCT	GGTAGTCCACG	CCGTAAACGTTGG	GAACTAGGT	GTTGGCGACAT	TCCACGTCGT	CGGTGCCGCAGCTAA	CGCATTAAGTTO	CCCGCCTGGG	GAGTACGGCCGC	CAA
. baarnensis NRRL	TGTAGCGGTGAAATGCGCAGATA	ATCAGGAGGAACAC(CGGTGGCGAAGGCGG	ATCTCTGGGC	CATTACTGACGCT	GAGGAGCGAAAGCGT	GGGGAGCGAACAGGA	TTAGATACCCT	GGTAGTCCACG	CCGTAAACGTTGG	GAACTAGGT	GTTGGCGACA1	TCCACGTCGT	CGGTGCCGCAGCTAA	CGCATTAAGTT	CCCGCCTGGG	GAGTACGGCCGC	:AA
. albovinaceus NB																		
. argenteolus JCM																		
. parvus NRRL B-1	TGTAGCGGTGAAATGCGCAGATA																	
. anulatus NBRC 1	TGTAGCGGTGAAATGCGCAGATA																	
. fulvorobeus NBR . praecox NBRC 13	TGTAGCGGTGAAATGCGCAGATA TGTAGCGGTGAAATGCGCAGATA																	
. praecox NBRC 13 . alboviridis NBR	TGTAGCGGTGAAATGCGCAGATA																	
. argenteolus NBR																		
. californicus NB	TGTAGCGGTGAAATGCGCAGAT	ATCAGGAGGAACAC	CGGTGGCGAAGGCGG	ATCTCTGGGC	CATTACTGACGCT	GAGGAGCGAAAGCGT	GGGGAGCGAACAGGA	TTAGATACCCT	GGTAGTCCACG	CCGTAAACGTTGG	GAACTAGGT	GTTGGCGACAT	TCCACGTCGT	CGGTGCCGCAGCTAA	CGCATTAAGTTO	CCCGCCTGGG	GAGTACGGCCGC	CAA
. griseus KACC 20																ccccc_mccc	GAGTNCGGGCGC	CAA
and the second																		
	TGTAGCGGTGAAATGCGCAGATA	ATCAGGAGGAACAC	CGGTGGCGAAGGCGG	ATCTCTGGGC	CATTACTGACGCT	GAGGAGCGAAAGCGT	GGGGAGCGAACAGGA	TTAGATACCCT	GGTAGTCCACG	CCGTAAACGTTGG	GAACTAGGT	GTTGGCGACAT	TCCACGTCGT	CGGTGCCGCAGCTAA	CGCATTAAGTT	CCCGCCTGGG	GAGTACGGCCGC	
. clavifer NBRC 1		ATCAGGAGGAACACO ATCAGGAGGAACACO	CGGTGGCGAAGGCGG CGGTGGCGAAGGCGG	ATCTCTGGGC	CATTACTGACGCTC CATTACTGACGCTC	GAGGAGCGAAAG <mark>CGT</mark> GAGGAGCGAAAG <mark>CGT</mark>	GGGGAGCGAACAGGA GGGGAGCGAACAGGA	TTAGATACCCT TTAGATACCCT	GGTAGTCCACG	CCGTAAACGTTGG CCGTAAACGTTGG	GAACTAGGT GGAACTAGGT	GTTGGCGACAI GTTGGCGACAI	TCCACGTCGT(CGGTGCCGCAGCTAA CGGTGCCGCAGCTAA	CGCATTAAGTTC CGCATTAAGTTC	CCCGCCTGGG	GAGTACGGCCGC GAGTACGGCCGC	CAA

. wistariopsis JC . griseus LSP 523 . melangenes NRC 15 . griseus NRC 15 . griseus NRC 12 . grise

	890 900 910	920 930	940 950	960 970	980 990 10				060 1070 1080 1090 1
Streptomyces sp.TBG19NRA1									I · · · · I · · · · I · · · · I · · · ·
NR 103947.1 S. fulvissimus DSM									TGTTGGGTTAAGTCCCGCAACGAGCGCAACCCTTGTTCTG
NR_025155.1 S. luridiscabiei S	GGCTAAAACTCAAAGGAATTGACGGGGGGCCCG								
NR_114493.1 S. caviscabies ATC									
NR_125621.1 S. pratensis ch24 NR 043854.1 S. microflavus NRR									TGTTGGGTTAAGTCCCGCAACGAGCGCAACCCTTGTTCTC TGTTGGGTTAAGTCCCGCAACGAGCGCAACCCTTGTTCTC
NR_043854.1 S. microflavus NRK NR 043489.1 S. anulatus NRRL B									TGTTGGGTTAAGTCCCGCAACGAGCGCAACCCTTGTTCTC TGTTGGGTTAAGTCCCGCAACGAGCGCAACCCTTGTTCTC
NR 043350.1 S. badius CSSP536									TGTTGGGTTAAGTCCCGCAACGAGCGCAACCCTTGTTCTG
NR 041093.1 S. rubiginosohelvo									TGTTGGGTTAAGTCCCGCAACGAGCGCAACCCTTGTTCTC
NR_115965.1 S. flavofuscus NRR		CACAAGCAGCGGAGCATGTGG	CTTAATTCGACGCAACGCGAAGAA	CCTTACCAAGGCTTGACATA	TACCGGAAAGCATCAGAGATGGT	GCCCCCTTGTGGTCGGTATAC	CAGGTGGTGCATGGCTG	TCGTCAGCTCGTGTCGTGAGA	TGTTGGGTTAAGTCCCGCAACGAGCGCAACCCTTGTTCTC
NR_112309.1 S. globisporus NBR									TGTTGGGTTAAGTCCCGCAACGAGCGCAACCCTTGTTCTC
NR_112311.1 S. griseinus NBRC									TGTTGGGTTAAGTCCCGCAACGAGCGCAACCCTTGTTCTG
NR_043834.1 S. pluricolorescen NR 043351.1 S. fimicarius CSSP									TGTTGGGTTAAGTCCCGCAACGAGCGCAACCCTTGTTCTC TGTTGGGTTAAGTCCCGCAACGAGCGCAACCCTTGTTCTC
KM 207217.2 S. lunaelactis MM1									TGTTGGGTTAAGTCCCGCAACGAGCGCAACCCTTGTTCTC
NR 115964.1 S. baarnensis NRRL	GGCTAAAACTCAAAGGAATTGACGGGGGGCCCG								
NR_041425.1 S. albovinaceus NB	GGCTAAAACTCAAAGGAATTGACGGGGGGCCCG	CACAAGCAGCGGAGCATGTGGG	CTTAATTCGACGCAACGCGAAGAA	CCTTACCAAGGCTTGACATA	TACCGGAAAGCATCAGAGATGGT	GCCCCCTTGTGGTCGGTATA	AGGTGGTGCATGGCTG	TCGTCAGCTCGTGTCGTGAGA	TGTTGGGTTAAGTCCCGCAACGAGCGCAACCCTTGTTCTG
NR_112120.1 S. argenteolus JCM									TGTTGGGTTAAGTCCCGCAACGAGCGCAACCCTTGTTCTC
NR_043833.1 S. parvus NRRL B-1									TGTTGGGTTAAGTCCCGCAACGAGCGCAACCCTTGTTCTG
NR_112527.1 S. anulatus NBRC 1									TGTTGGGTTAAGTCCCGCAACGAGCGCAACCCTTGTTCTC TGTTGGGTTAAGTCCCCGCAACGAGCGCAACCCTTGTTCTC
NR_041196.1 S. fulvorobeus NBR NR 112358.1 S. praecox NBRC 13									TGTTGGGTTAAGTCCCGCAACGAGCGCAACCCTTGTTCTC
NR 112340.1 S. alboviridis NBR									TGTTGGGTTAAGTCCCGCAACGAGCGCAACCCTTGTTCTG
NR 112300.1 S. argenteolus NBR									TGTTGGGTTAAGTCCCGCAACGAGCGCAACCCTTGTTCTC
NR_112285.1 S. puniceus NBRC 1	GGCTAAAACTCAAAGGAATTGACGGGGGGCCCG								TGTTGGGTTAAGTCCCGCAACGAGCGCAACCCTTGTTCTG
NR_112284.1 S. pluricolorescen									TGTTGGGTTAAGTCCCGCAACGAGCGCAACCCTTGTTCTC
NR_112257.1 S. californicus NB									TGTTGGGTTAAGTCCCGCAACGAGCGCAACCCTTGTTCTG
NR_042791.1 S. griseus KACC 20									TGTTGGGTTAAGTCCCGCAACGAGCGCAACCCTTGTTCTC TGTTGGGTTAAGTCCCGCAACGAGCGCAACCCTTGTTCTC
NR_115264.1 S. sundarbansensis NR 112453.1 S. clavifer NBRC 1									TGTTGGGTTAAGTCCCGCAACGAGCGCAACCCTTGTTCTC
LC 102485.1 S. wistariopsis JC									TGTTGGGTTAAGTCCCGCAACGAGCGCAACCCTTGTTCTC
NR 115143.1 S. griseus ISP 523									TGTTGGGTTAAGTCCCGCAACGAGCGCAACCCTTGTTCTC
NR_115783.1 S. melanogenes NRR		CACAAGCAGCGGAGCATGTGG	CTTAATTCGACGCAACGCGAAGAA	CCTTACCAAGGCTTGACATA	TACCGGAAACGGCCAGAGATGGT	CGCCCCCTTGTGGTCGGTATA	AGGTGGTGCATGGCTG	TCGTCAGCTCGTGTCGTGAGA	TGTTGGGTTAAGTCCCGCAACGAGCGCAACCCTTGTTCTG
NR_026203.1 S. subrutilus DSM									TGTTGGGTTAAGTCCCGCAACGAGCGCAACCCTTGTCCTG
	GGCTAAAACTCAAAGGAATTGACGGGGGGCCCG								TGTTGGGTTAAGTCCCGCAACGAGCGCAACCCTTGTTCTC TGTTGGGTTAAGTCCCGCAACGAGCGCAACCCTTGTTCTC
Streptomyces sp.TBG19NRA1									280 1290 1300 1310 1
Streptomyces sp.TBG19NRA1 NR 103947.1 S. fulvissimus DSM	GTTGCCAGCATGCCTTTCGGGGTGATGGGGGAC	TCACAGGAGACTGCCGGGGTC	AACTCGGAGGAAGGTGGGGACGAC	GTCAAGTCATCATGCCCCTT.	ATGTCTTGGGCTGCACACGTGCT	ACAATGGCCGGTACAATGAGC	GCGATGCCGTGAGGCG	GAGCGAATCTCAAAAAGCCGG	
NR_103947.1 S. fulvissimus DSM NR_025155.1 S. luridiscabiei S	GTTGCCAGCATGCCTTTCGGGGTGATGGGGAC GTTGCCAGCATGCCTTCGGGGTGATGGGGAC GTTGCCAGCATGCCCTTCGGGGTGATGGGGAC	TCACAGGAGACTGCCGGGGTC2 TCACAGGAGACTGCCGGGGTC2 TCACAGGAGACTGCCGGGGTC2	AACTCGGAGGAAGGTGGGGACGAC AACTCGGAGGAAGGTGGGGACGAC AACTCGGAGGAAGGTGGGGACGAC	GTCAAGTCATCATGCCCCTT. GTCAAGTCATCATGCCCCTT. GTCAAGTCATCATGCCCCTT.	ATGTCTTGGGCTGCACACGTGCT ATGTCTTGGGCTGCACACGTGCT ATGTCTTGGGCTGCACACGTGCT	ACAATGGCCGGTACAATGAGC ACAATGGCCGGTACAATGAGC ACAATGGCCGGTACAATGAGC	CCGATGCCGTGAGGCG	GAGCGAATCTCAAAAAGCCGG GAGCGAATCTCAAAAAGCCGG GAGCGAATCTCAAAAAGCCGG GAGCGAATCTCAAAAAGCCGG	TCTCAGTTCGGATTGGGGTCTGCAACTCGACCCCATGAAC TCTCAGTTCGGATTGGGGTCTGCAACTCGACCCCATGAAC TCTCAGTTCGGATTGGGGTCTGCAACTCGACCCCATGAAC
NR 103947.1 S. fulvissimus DSM NR 025155.1 S. luridiscabiei S NR 114493.1 S. caviscabies ATC	GTTGCCAGCATGCCTTTCGGGGTGATGGGGAC GTTGCCAGCATGCCCTTCGGGGTGATGGGGAC GTTGCCAGCATGCCCTTCGGGGTGATGGGGC GTTGCCAGCATGCCCTTCGGGGTGATGGGGAC	TCACAGGAGACTGCCGGGGTCI TCACAGGAGACTGCCGGGGTCI TCACAGGAGACTGCCGGGGTCI TCACAGGAGACTGCCGGGGTCI	AACTCGGAGGAAGGTGGGGACGAC AACTCGGAGGAAGGTGGGGACGAC AACTCGGAGGAAGGTGGGGACGAC AACTCGGAGGAAGGTGGGGACGAC	GTCAAGTCATCATGCCCCTT. GTCAAGTCATCATGCCCCTT. GTCAAGTCATCATGCCCCTT. GTCAAGTCATCATGCCCCCTT.	ATGTCTTGGGCTGCACACGTGCT ATGTCTTGGGCTGCACACGTGCT ATGTCTTGGGCTGCACACGTGCT ATGTCTTGGGCTGCACACGTGCT	ACAATGGCCGGTACAATGAGC ACAATGGCCGGTACAATGAGC ACAATGGCCGGTACAATGAGC ACAATGGCCGGTACAATGAGC	CCGATGCCGTGAGGCG CCGATGCCGCGAGGCG CCGATGCCGCGAGGCG CCGATGCCGCGAGGCG	GAGCGAATCTCAAAAAGCCGG GAGCGAATCTCAAAAAGCCGG GAGCGAATCTCAAAAAGCCGG GAGCGAATCTCAAAAAGCCGG	TCTCAGTCGGATTGGGGTCTGCAACTCGACCCCATGAA TCTCAGTCGGATTGGGGTCTGCAACTCGACCCCATGAAC TCTCAGTCGGATTGGGGTCTGCAACTCGACCCCATGAAC TCTCAGTCGGATTGGGGTCTGCAACTCGACCCCATGAAC
NR_103947.1 S. fulvissimus DSM NR_025155.1 S. luridiscabiei S NR_114493.1 S. caviscabies ATC NR_125621.1 S. pratensis ch24	GTTGCCAGCATGCCTTCGGGGTGATGGGAC GTTGCCAGCATGCCCTTCGGGGTGATGGGGAC GTTGCCAGCATGCCCTTCGGGGTGATGGGGAC GTTGCCAGCATGCCCTTCGGGGTGATGGGGAC GTTGCCAGCATGCCCTTCGGGGTGATGGGGAC	TCACAGGAGACTGCCGGGGTCI TCACAGGAGACTGCCGGGGTCI TCACAGGAGACTGCCGGGGTCI TCACAGGAGACTGCCGGGGTCI TCACAGGAGACTGCCGGGGTCI	ACTCGGAGGAAGGTGGGACGAC AACTCGGAGGAAGGTGGGGACGAC AACTCGGAGGAAGGTGGGGACGAC AACTCGGAGGAAGGTGGGGACGAC AACTCGGAGGAAGGTGGGGACGAC	GTCAAGTCATCATGCCCCTT. GTCAAGTCATCATGCCCCTT. GTCAAGTCATCATGCCCCTT. GTCAAGTCATCATGCCCCTT. GTCAAGTCATCATGCCCCTT.	ATGTCTTGGGCTGCACACGTGCT ATGTCTTGGGCTGCACACGTGCT ATGTCTTGGGCTGCACACGTGCT ATGTCTTGGGCTGCACACGTGCT ATGTCTTGGGCTGCACACGTGCT	ACAATGGCCGGTACAATGAGC ACAATGGCCGGTACAATGAGC ACAATGGCCGGTACAATGAGC ACAATGGCCGGTACAATGAGC ACAATGGCCGGTACAATGAGC	CCGATGCCGTGAGGCG CCGATGCCGCGAGGCG CCGATGCCGCGAGGCG CCGATGCCGCGAGGCG CCGATGCCGCGAGGCG	GAGCGAATCTCAAAAAAGCCGG GAGCGAATCTCAAAAAAGCCGG GAGCGAATCTCAAAAAGCCGG GAGCGAATCTCAAAAAGCCGG GAGCGAATCTCAAAAAGCCGG	TCTAGTTCGATTGGGTCTGCAACTCGACCCATGAAC TCTAGTTCGGATTGGGTCTGCAACTCGACCCATGAAC TCTAGTTCGGATTGGGTCTGCAACTCGACCCATGAAC TCTAGTTCGGATTGGGGTCTGCAACTCGACCCCATGAAC
NR_103947.1 S. fulvissimus DSM NR_025155.1 S. luridiscabiei S NR_114493.1 S. caviscabies ATC NR_125621.1 S. pratensis ch24 NR_043854.1 S. microflavus NRR	CTTECCACATECOTTCGGGTCATGGGACT GTTECCAGCATCCOCTTCGGGTCATGGGACT GTTECCAGCATGCOCTTCGGGTGATGGGACT GTTECCAGCATGCOCTTCGGGTGATGGGACT GTTECCAGCATGCOCTTCGGGTGATGGGGACT GTTECCAGCATGCOCTTCGGGTGATGGGGACT	TCACAGGAGACTGCCGGGGTC TCACAGGAGACTGCCGGGGTC TCACAGGAGACTGCCGGGGTC TCACAGGAGACTGCCGGGGTC TCACAGGAGACTGCCGGGGTC TCACAGGAGACTGCCGGGGTC	ACTCGGAGGAAGGTGGGGACGAC AACTCGGAGGAAGGTGGGGACGAC AACTCGGAGGAAGGTGGGGACGAC AACTCGGAGGAAGGTGGGACGAC AACTCGGAGGAAGGTGGGACGAC AACTCGGAGGAAGGTGGGGACGAC	GTCAAGTCATCATGCCCCTT. GTCAAGTCATCATGCCCCTT. GTCAAGTCATCATGCCCCTT. GTCAAGTCATCATGCCCCTT. GTCAAGTCATCATGCCCCTT. GTCAAGTCATCATGCCCCTT.	ATGTCTTGGGCTGCACACGTGCT ATGTCTTGGGCTGCACACGTGCT ATGTCTTGGGCTGCACACGTGCT ATGTCTTGGGCTGCACACGTGCT ATGTCTTGGGCTGCACACGTGCT ATGTCTTGGGCTGCACACGTGCT	ACAATGGCCGGTACAATGAGC ACAATGGCCGGTACAATGAGC ACAATGGCCGGTACAATGAGC ACAATGGCCGGTACAATGAGC ACAATGGCCGGTACAATGAGC ACAATGGCCGGTACAATGAGC	GCGATGCCGTGAGCG GCGATGCCGCGAGCGG GCGATGCCGCGAGGCG GCGATGCCGCGAGGCG GCGATGCCGCGAGGCG GCGATGCCGCGAGGCG	GAGCGAATCTCAAAAAAGCCGG GAGCGAATCTCAAAAAGCCGG GAGCGAATCTCAAAAAGCCGG GAGCGAATCTCAAAAAGCCGG GAGCGAATCTCAAAAAGCCGG GAGCGAATCTCAAAAAGCCGG	TETCASTICGATTEGGGTCTSCAACTCGACCCATGAA TETCASTICGATTEGGGTCTSCAACTCGACCCATGAA TETCASTICGATTEGGGTCTSCAACTCGACCCATGAA TETCASTICGGATTEGGGTCTSCAACTCGACCCATGAA TETCASTICGGATTEGGGTCTSCAACTCGACCCCATGAA
NR 103947.1 S. fulvissimus DSM NR_025155.1 S. luridiscablei S NR_114493.1 S. caviscables ATC NR_125621.1 S. pratensis ch24 NR_043854.1 S. microflavus NRR NR_043459.1 S. anulatus NRRL B	GTTCCAGCATCCGGGGGGGGGGGGGGGGGGGGGGGGGGG	TCACAGAGACTGCCGGGGTCI TCACAGAGACTGCCGGGGTCI TCACAGGAGACTGCCGGGGTCI TCACAGGAGACTGCCGGGGTCI TCACAGGAGACTGCCGGGGTCI TCACAGGAGACTGCCGGGGTCI	AACTCGGAGGAAGGTGGGGACGAC AACTCGGAGGAAGGTGGGGACGAC AACTCGGAGGAAGGTGGGGACGAC AACTCGGAGGAAGGTGGGGACGAC AACTCGGAGAAGGTGGGGACGAC AACTCGGAGGAAGGTGGGGACGAC	GTCAAGTCATCATGCCCCTT. GTCAAGTCATCATGCCCCTT. GTCAAGTCATCATGCCCCTT. GTCAAGTCATCATGCCCCTT. GTCAAGTCATCATGCCCCTT. GTCAAGTCATCATGCCCCTT. GTCAAGTCATCATGCCCCTT.	ATTCTTGGGCTGCACACGTGCT ATGTCTTGGGCTGCACACGTGCT ATGTCTTGGGCTGCACACGTGCT ATGTCTTGGGCTGCACACGTGCT ATGTCTTGGGCTGCACACGTGCT ATGTCTTGGGCTGCACACGTGCT ATGTCTTGGGCTGCACACGTGCT	ACAATGCCGGTACAATGAGC ACAATGCCCGTACAATGAGC ACAATGCCCGTACAATGAGC ACAATGCCCGTACAATGAGC ACAATGCCCGTACAATGAGC ACAATGCCCGTACAATGAGC ACAATGCCCGTACAATGAGC	CCGATCCCGTGAGCCG CGCGATGCCGCGAGCG CGCGATGCCGCGAGCG CGCGATGCCGCGAGCG CGCGATGCCGCGAGCG CGCGATGCCGCGAGCG CGCGATGCCGCGAGGCG	GAGCGAATCTCAAAAAGCCGG GAGCGAATCTCAAAAAGCCGG GAGCGAATCTCAAAAAGCCGG GAGCGAATCTCAAAAAGCCGG GAGCGAATCTCAAAAAGCCGG GAGCGAATCTCAAAAAGCCGG GAGCGAATCTCAAAAAGCCGG	TTCTAGTTCGGATTGGGTCTGCAACTCGACCCCATGAAC TCTCAGTTCGGATTGGGTCTGCAACTCGACCCCATGAAC TCTCAGTTCGGATTGGGGTCTGCAACTCGACCCCATGAAC TCTCAGTTCGGATTGGGGTCTGCAACTCGACCCCATGAAC TCTCAGTTCGGATTGGGGTCTGCAACTCGACCCCATGAAC TCTCAGTTCGGATTGGGGTCTGCAACTCGACCCCATGAAC
NR_103947.1 S. fulvissimus DSM NR_025155.1 S. luridiscabiei S NR_114493.1 S. caviscabies ATC NR_125621.1 S. pratensis ch24 NR_043854.1 S. microflavus NRR	CTTECCACATECCTTCCGGGTCATGGGACT CTTECCACATECCCTTCGGGTCATGGGACT CTTECCACATECCCTTCGGGTCATGGGACT CTTECCACATECCCTTCGGGTCATGGGACT CTTECCACATECCCTTCGGGTCATGGGACT CTTECCACATECCCTTCCGGGTCATGGGACT CTTECCACATECCCTTCCGGGTCATGGGACT	TCACAGAGACTGCCGGGGTCI TCACAGAGACTGCCGGGGTCI TCACAGAGACTGCCGGGGTCI TCACAGAGACTGCCGGGGTCI TCACAGAGACTGCCGGGGTCI TCACAGAGACTGCCGGGGTCI TCACAGAGACTGCCGGGGTCI TCACAGAGACTGCCGGGGTCI	A ACTOGRAGAAGTGGGGACGAC AACTOGGAGAAGTGGGGACGAC AACTOGGAGAAGTGGGGACGAC AACTOGGAGAAGGTGGGACGAC AACTOGGAGGAAGGTGGGACGAC AACTOGGAGGAAGGTGGGAACGAC AACTOGGAGGAAGGTGGGGACGAC	GTCAAGTCATCATGCCCCTT. GTCAAGTCATCATGCCCCTT. GTCAAGTCATCATGCCCCTT. GTCAAGTCATCATGCCCCTT. GTCAAGTCATCATGCCCCCTT. GTCAAGTCATCATGCCCCCTT. GTCAAGTCATCATGCCCCCTT. GTCAAGTCATCATGCCCCCTT.	ALGORITAGE	ACAATGGCCGGTACAATGACC ACAATGGCCGGTACAATGACC ACAATGGCCGGTACAATGACC ACAATGGCCGGTACAATGACC ACAATGGCCGGTACAATGACC ACAATGGCCGGTACAATGACC ACAATGGCCGGTACAATGACC	CCCATCCCCCCACCCCCCCCCCCCCCCCCCCCCCCCCC	GAGCGAATCTCAAAAAGCCGG GAGCGAATCTCAAAAAGCCGG GAGCGAATCTCAAAAAGCCGG GAGCGAATCTCAAAAAGCCGG GAGCGAATCTCAAAAAGCCGG GAGCGAATCTCAAAAAGCCGG GAGCGAATCTCAAAAAGCCGG	TETCASTICGATTEGGGTCTSCAACTCGACCCATGAA TETCASTICGATTEGGGTCTSCAACTCGACCCATGAA TETCASTICGATTEGGGTCTSCAACTCGACCCATGAA TETCASTICGGATTEGGGTCTSCAACTCGACCCATGAA TETCASTICGGATTEGGGTCTSCAACTCGACCCCATGAA
NR_103947.1 S. fulvissimus DRM NR_025155.1 s. luridiscabiei S NR_114493.1 S. caviscabies ATC NR_125621.1 S. pratensis ch24 NR_043654.1 S. microflavus NRR NR_043650.1 s. badius CSSP536 NR_041093.1 S. rubiginoschelvo NR_115965.1 S. flavofuscus NRR	CTTCCAGCATCCCTTCGGGTCATGGGACT GTTGCCAGCATCCCTTCGGGTCATGGGACT GTTGCCAGCATGCCCTTCGGGTCATGGGGACT GTTGCCAGCATGCCCTTCGGGTCATGGGGACT GTTGCCAGCATGCCTTCGGGTGATGGGGACT GTTGCCAGCATGCCCTTCGGGTCATGGGGACT GTTGCCAGCATGCCCTTCCGGGTCATGGGGACT GTTGCCAGCATGCCCTTCCGGGTCATGGGGACT	TACAGAGAATECCGGGTCI TCACAGAATECCGGGTCI TCACAGAACTECCGGGTCI TCACAGAACTECCGGGTCI TCACAGAGACTECCGGGTCI TCACAGAGACTECCGGGTCI TCACAGAGACTECCGGGTCI TCACAGAGACTECCGGGTCI TCACAGAGACTECCGGGTCI	Antrocalegatoria and a construction of the con	GTCAAGTCATCATGCCCCTT GTCAAGTCATCATGCCCCTT GTCAAGTCATCATGCCCCTT GTCAAGTCATCATGCCCCTT GTCAAGTCATCATGCCCCTT GTCAAGTCATCATGCCCCTT GTCAAGTCATCATGCCCCTT GTCAAGTCATCATGCCCCTT GTCAAGTCATCATGCCCCTT	ARGITTGGGCTGCACAGGTGC ARGITTGGGCTGCACAGGTGC ARGITTGGGCTGCACAGGTGC ARGITTGGGCTGCACAGGTGC ARGITTGGGCTGCACAGGTGC ARGITTGGGCTGCACAGGTGC ARGITTGGGCTGCACAGGTGC ARGITTGGGCTGCACAGGTGC ARGITTGGGCTGCACAGGTGC	ACARTGC/GGTACARTGAC' ACARTGC/GGTACARTGAC' ACARTGC/GGTACARTGAC' ACARTGC/GGTACARTGAC' ACARTGC/GGTACARTGAC' ACARTGC/GGTACARTGAC' ACARTGC/GGTACARTGAC' ACARTGC/GGTACARTGAC'	GCGATCCCCCAGCCG CCATCCCCCAGCCG CCATCCCCCAGCCG CCCATCCCCCAGCCG CCCATCCCCCAGCCG CCCATCCCCCCAGCCG CCCATCCCCCCAGCCG CCCATCCCCCCAGCCG CCCATCCCCCCAGCCG CCCATCCCCCCAGCCG	AGGEGAATCTCAAAAAGCCEG GAGCGAATCTCAAAAAGCCEG GAGCGAATCTCAAAAAGCCEG GAGCGAATCTCAAAAAGCCEG GAGCGAATCTCAAAAAGCCEG GAGCGAATCTCAAAAAGCCEG GAGCGAATCTCAAAAAGCCEG GAGCGAATCTCAAAAAGCCEG GAGCGAATCTCAAAAAGCCEG	TETCAGTTCGATTCGGGTTGCAACTCGACCCATGAA TETCAGTTCGATTCGGGTTGCAACTCGACCCATGAA TETCAGTTCGGATTGGGGTCTGCAACTCGACCCATGAA TETCAGTTCGGATTGGGGTCTGCAACTCGACCCATGAA TCTAGTTCGGATTGGGGTCTGCAACTCGACCCATGAA TCTAGTTCGGATTGGGGTCTGCAACTCGACCCCATGAA TCTAGTTCGGATTGGGGTCTGCAACTCGACCCCATGAA TCTAGTTCGGATTGGGGTCTGCAACTCGACCCCATGAA TCTAGTTCGGATTGGGGTCTGCAACTCGACCCCATGAA
<pre>NR_103947.1 S_fulvissimus DEM NR_025155.1 S. luridiscabiei S NR_114493.1 S. caviscabies ATC NR_0243654.1 S. microflavus NRR NR_043469.1 S. anulatus NRRL B NR_043350.1 s. badius CSP536 NR_041093.1 S. rubiginoschelvo NR_115965.1 S. flavofuscus NRR NR_11209.1 S. globisporus NBR</pre>	CTTGCCAGCATCCCTTCGGGTGATGGGAC GTTGCCAGCATGCCTTCGGGTGATGGGAC GTTGCCAGCATGCCCTTCGGGTGATGGGAC GTTGCCAGCATGCCTTCGGGTGATGGGGAC GTTGCCAGCATGCCTTCGGGTGATGGGGAC GTTGCCAGCATGCCTTCGGGTGATGGGGAC GTTGCCAGCATGCCCTTCGGGTGATGGGGAC GTTGCCAGCATGCCCTTCGGGTGATGGGGAC GTTGCCAGCATGCCCTTCGGGTGATGGGGAC	TCACAGAGACTECCGGGGTCI TCACAGGAGACTECCGGGGTCI TCACAGGAGACTECCGGGGTCI TCACAGGAGACTECCGGGGTCI TCACAGGAGACTECCGGGGTCI TCACAGGAGACTECCGGGGTCI TCACAGGAGACTECCGGGGTCI TCACAGGAGACTECCGGGGTCI TCACAGGAGACTECCGGGGTCI	I AACTOGAGAGAAGGTGGGACGAC AACTOGGAGAAGGTGGGGACGAC AACTOGGAGAAGGTGGGGACGAC AACTOGGAGAAGGTGGGGACGAC AACTOGGAGGAAGGTGGGGACGAC AACTOGGAGGAAGGTGGGACGAC AACTOGGAGGAAGGTGGGACGAC AACTOGGAGGAAGGTGGGGACGAC	Greatercartextere Steastere Steastere S	Ansortregecteckackerser Ansortregecteckackerser Ansortregecteckackerser Ansortregecteckackerser Ansortregecteckackerser Ansortregecteckackerser Ansortregecteckackerser Ansortregecteckackerser Ansortregecteckackerser Ansortregecteckackerser Ansortregecteckackerser	ACAATGCCGGTACAATGACC ACAATGCCGGTACAATGACC ACAATGGCCGGTACAATGACC ACAATGGCCGGTACAATGACC ACAATGGCCGGTACAATGACC ACAATGGCCGGTACAATGACC ACAATGGCCGGTACAATGACC ACAATGGCCGGTACAATGACC ACAATGGCCGGTACAATGACC	CLATECCOTAAGCO CCATECCOTAAGCO CCATECCOCAAGCO CCATECCCCAAGCO CCATECCCCCAGCO CCATECCCCCAGCO CCATECCCCCACAGCO CCATECCCCCACAGCO CCATECCCCCAAGCO CCATECCCCCAAGCO	Спосование с с с с с с с с с с с с с с с с с с с	TTCAGTTCGATTGGGTTGCAACTCGACCCATGAA TCTCAGTTCGATTGGGTCTGCAACTCGACCCATGAA TCTCAGTTCGATTGGGTCTGCAACTCGACCCCATGAA TCTCAGTTCGGATTGGGTCTGCAACTCGACCCCATGAA TCTCAGTTCGGATTGGGTCTGCAACTCGACCCCATGAA TCTCAGTTCGGATTGGGTCTGCAACTCGACCCCATGAA TCTCAGTTCGGATTGGGTCTGCAACTCGACCCCATGAA TCTCAGTTCGGATTGGGGTCTGCAACTCGACCCCATGAA TCTCAGTTCGGATTGGGGTCTGCAACTCGACCCCATGAA
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NR_103947.1 S. fulvissimus DBM NR_025155.1 s. luridiscabiei S NR_114493.1 S. caviscabies ATC NR_043054.1 S. microflavus NRR NR_043055.1 S. anulatus NRRL B NR_043055.1 s. badius CSSP536 NR_041093.1 S. rubiginoschelvo NR_115565.1 s. flavofuscus NRR NR_112309.1 S. globieporus NRR NR_112309.1 S. globieporus NRR NR_112309.1 S. globieporus NRR NR_112305.1 S. bairceinus NERC NR_043031.1 S. juricolorescen NR_043031.1 S. baarnensis NRRL NR_041425.1 S. albovinaceus NB NR_112120.1 S. argenteolus JCM NR_04333.1 S. parvus NRRL B-1	CTTECCAGCATECCTTCGGGTGATGGGGAC GTTECCAGATGCCTTCGGGTGATGGGGAC GTTECCAGATGCCTTCGGGTGATGGGGAC GTTECCAGATGCCTTCGGGTGATGGGGAC GTTECCAGATGCCTTCGGGTGATGGGGAC GTTECCAGATGCCTTCGGGTGATGGGGAC GTTECCAGATGCCTTCGGGTGATGGGGAC GTTECCAGATGCCTTCGGGTGATGGGGAC GTTECCAGCATGCCTTCGGGTGATGGGGAC GTTECCAGCATGCCTTCGGGTGATGGGGAC GTTECCAGCATGCCTTCGGGTGATGGGGAC GTTECCAGCATGCCTTCGGGTGATGGGGAC GTTECCAGCATGCCTTCGGGTGATGGGGAC GTTECCAGCATGCCTTCGGGTGATGGGGAC GTTECCAGCATGCCTTCGGGTGATGGGGAC GTTECCAGCATGCCTTCGGGTGATGGGGAC GTTECCAGCATGCCTTCGGGGTGATGGGGAC GTTECCAGCATGCCTTCGGGTGATGGGGAC GTTECCAGCATGCCTTCGGGTGATGGGGAC GTTECCAGCATGCCTTCGGGTGATGGGGAC GTTECCAGCATGCCTTCGGGTGATGGGGAC GTTECCAGCATGCCTTCGGGTGATGGGGAC GTTECCAGCATGCCTTCGGGTGATGGGGAC	TCACAGAGACTECCGGGGTCI TCACAGAGACTECCGGGGTCI TCACAGAGACTECCGGGGTCI TCACAGAGACTECCGGGGTCI TCACAGAGACTECCGGGGTCI TCACAGAGACTECCGGGGTCI TCACAGAGACTECCGGGGTCI TCACAGAGACTECCGGGGTCI TCACAGAGACTECCGGGGTCI TCACAGAGACTECCGGGGTCI TCACAGAGACTECCGGGGTCI TCACAGAGACTECCGGGGTCI TCACAGGAGACTECCGGGGTCI TCACAGGAGACTECCGGGGTCI TCACAGGAGACTECCGGGGTCI TCACAGGAGACTECCGGGGTCI TCACAGGAGACTECCGGGGTCI TCACAGGAGACTECCGGGGTCI TCACAGGAGACTECCGGGGTCI TCACAGGAGACTECCGGGGTCI		GICAAGTORATICATIGCCCCTT GICAAGTORTCATGCCCCTT GICAAGTORTCATGCCCCTT GICAAGTORTCATGCCCCTT GICAAGTORTCATGCCCCTT GICAAGTORTCATGCCCCTT GICAAGTORTCATGCCCCTT GICAAGTORTCATGCCCCTT GICAAGTORTCATGCCCCCTT GICAAGTORTCATGCCCCCTT GICAAGTORTCATGCCCCCTT GICAAGTORTCATGCCCCCTT GICAAGTORTCATGCCCCCTT GICAAGTORTCATGCCCCCTT GICAAGTORTCATGCCCCCTT GICAAGTORTCATGCCCCCTT GICAAGTORTCATGCCCCCTT GICAAGTORTCATGCCCCCTT GICAAGTORTCATGCCCCCTT GICAAGTORTCATGCCCCCTT	A LACOTTOGGCTGCACAGGTGC ANGTOTTOGGCTGCACAGGTGC ANGTOTTOGGCTGCACAGGTGC ANGTOTTGGCTGCACAGGTGC ANGTOTTGGCTGCACAGGTGC ANGTOTTGGCTGCACAGGTGC ANGTOTTGGCTGCACAGGTGC ANGTOTTGGCTGCACAGGTGC ANGTOTTGGCTGCACAGGTGC ANGTOTTGGCTGCACAGGTGCT ANGTOTTGGCTGCACAGGTGCT ANGTOTTGGCTGCACAGGTGCT ANGTOTTGGCTGCACAGGTGCT ANGTOTTGGCTGCACAGGTGCT ANGTOTTGGCTGCACAGGTGCT ANGTOTTGGCTGCACAGGTGCT ANGTOTTGGCTGCACAGGTGCT	ACARTGC/CGTA/CARTGAC' A/CARTGC/CGTA/CARTGAC' A/CARTGC/CGGTA/CARTGAC' A/CARTGC/CGGTA/CARTGAC' A/CARTGC/CGGTA/CARTGAC' A/CARTGC/CGGTA/CARTGAC' A/CARTGC/CGGTA/CARTGAC' A/CARTGC/CGGTA/CARTGAC' A/CARTGC/CGGTA/CARTGAC' A/CARTGC/CGGTA/CARTGAC' A/CARTGC/CGGTA/CARTGAC' A/CARTGC/CGGTA/CARTGAC' A/CARTGC/CGGTA/CARTGAC' A/CARTGC/CGGTA/CARTGAC' A/CARTGC/CGGTA/CARTGAC' A/CARTGC/CGGTA/CARTGAC' A/CARTGC/CGGTA/CARTGAC'		Спосовалистса на насосов спосовалистса на насосов спосовалистся на насосов спосовалистся на насосов спосовалистся на насосов спосовалистся на насосов спосовалистся на насосов спосова на на насосов спосова на насосов спосова на насосов спосова на насосов спосова на насосов спосова на насосова на насосов спосова на на на насосов спосова на на на на на на насосов спосова на на на насосов спосова на на на насосова на на на на на насосова спосова на	TCTCAGTTCGATTCGGGTCTGCAACTCGACCCATGAA TCTCAGTTCGATTCGGGTCTGCAACTCGACCCATGAA TCTCAGTTCGGATTGGGGTCTGCAACTCGACCCATGAA TCTCAGTTCGGATTGGGGTCTGCAACTCGACCCATGAA TCTCAGTTCGGATTGGGGTCTGCAACTCGACCCCATGAA TCTCAGTTCGGATTGGGGTCTGCAACTCGACCCCATGAA TCTCAGTTCGGATTGGGGTCTGCAACTCGACCCCATGAA TCTCAGTTCGGATTGGGGTCTGCAACTCGACCCCATGAA TCTCAGTTCGGATTGGGGTCTGCAACTCGACCCCATGAA TCTCAGTTCGGATTGGGGTCTGCAACTCGACCCCATGAA TCTCAGTTCGGATTGGGGTCTGCAACTCGACCCCATGAA TCTCAGTTCGGATTGGGGTCTGCAACTCGACCCCATGAA TCTCAGTTCGGATTGGGGTCTGCAACTCGACCCCATGAA TCTCAGTTCGGATTGGGGTCTGCAACTCGACCCCATGAA TCTCAGTTCGGATTGGGGTCTGCAACTCGACCCCATGAA TCTCAGTCGGATTGGGGTCTGCAACTCGACCCCATGAA TCTCAGTCGGATTGGGGTCTGCAACTCGACCCCATGAA TCTCAGTCGGATTGGGGTCTGCAACTCGACCCCATGAA
<pre>NR_103947.1 S. fulvissimus DEM NR_025155.1 S. luridiscables ATC NR_126221.1 S. pratensis ch24 NR_043854.1 S. microflavus NRRL B NR_043869.1 S. anulatus NRRL B NR_043809.1 S. rubiginoschelvo NR_115965.1 S. flavofuscus NRR NR_112309.1 S. globisporus NBR NR_112311.1 S. griseinus NBRC NR_043034.1 S. pluricolorescen NR_043034.1 S. pluricolorescen NR_043034.1 S. aluriacarius CSSP KM 207217.2 S. lunaelactis MNR NR_1041425.1 S. albovinaceus NB NR_043033.1 S. parves NRRL NR_04333.1 S. parvus NRRL B-1 NR_04333.1 S. parvus NRRL B-1 NR_11220.1 S. argenteolus JCM NR_04333.1 S. parvus NRRL B-1 NR_11227.1 S. anulatus NRRL B-1</pre>	CTTCCAGATCCCTTCGGGTCATGGGACT GTTCCAGATCCCTTCGGGTCATGGGACT GTTCCACATCCCTTCGGGTCATGGGACT GTTCCACATCCCTTCGGGTCATGGGACT GTTCCAGATCCCTTCGGGTCATGGGACT GTTCCAGATCCCTTCGGGTCATGGGACT GTTCCAGATCCCTTCGGGTCATGGGACT GTTCCAGATCCCTTCGGGTCATGGGACT GTTCCAGATGCCTTCGGGTCATGGGACT GTTCCAGCATGCCTTCGGGTCATGGGACT GTTCCAGCATGCCTTCGGGTCATGGGACT GTTCCAGCATGCCTTCGGGTCATGGGACT GTTCCAGCATGCCTTCGGGTCATGGGACT GTTCCAGCATGCCTTCGGGTCATGGGACT GTTCCAGCATGCCTTCGGGTCATGGGACT GTTCCAGCATGCCTTCGGGTCATGGGACT GTTCCAGCATGCCCTTCGGGTCATGGGACT GTTCCCAGCATGCCCTTCGGGTCATGGGACT GTTCCCAGCATGCCCTTCGGGTCATGGGACT GTTCCCAGCATGCCCTTCGGGTCATGGGACT GTTCCCAGCATGCCCTTCGGGTCATGGGACT GTTCCCAGCATGCCCTTCGGGTCATGGGGACT GTTCCCAGCATGCCCTTCGGGTCATGGGGACT	TCACAGAGACTECCGGGGTCI TCACAGAGACTECCGGGGTCI TCACAGAGACTECCGGGGTCI TCACAGAGACTECCGGGGTCI TCACAGAGACTECCGGGGTCI TCACAGAGACTECCGGGGTCI TCACAGAGACTECCGGGGTCI TCACAGAGACTECCGGGGTCI TCACAGAGACTECCGGGGTCI TCACAGAGACTECCGGGGTCI TCACAGAGACTECCGGGGTCI TCACAGAGACTECCGGGGTCI TCACAGAGACTECCGGGGTCI TCACAGAGACTECCGGGGTCI TCACAGAGACTECCGGGGTCI TCACAGAGACTECCGGGGTCI TCACAGAGACTECCCGGGTCI TCACAGAGACTECCCGGGTCI TCACAGAGACTECCCGGGTCI TCACAGAGACTECCCGGGTCI		GRAAFCARCATCS GRCAAFCARCATCS GRCAAFCARCATCARCCCCCT GRCAAFCARCARCCCCCCT GRCAAFCARCARCCCCCCCT GRCAAFCARCARCCARCCCCCT GRCAAFCARCARCCARCCCCCT GRCAAFCARCARCCARCCCCCT GRCAAFCARCARCCARCCCCCT GRCAAFCARCARCCARCCCCT GRCAAFCARCARCCCCCCT GRCAAFCARCARCCCCCCT GRCAAFCARCARCCCCCCT GRCAAFCARCARCCCCCCT GRCAAFCARCARCCCCCCT GRCAAFCARCARCCCCCCT GRCAAFCARCARCCCCCCT GRCAAFCARCARCCCCCCT GRCAAFCARCARCCCCCCT GRCAAFCARCARCCCCCCT GRCAAFCARCARCCCCCCT	Ansortregectico.cacacersor Ansortregectico.cacacersor	ACATEGCOGTACANTGACC ACATEGCOGGTACANTGACC ACATEGCOGGTACANTGACC ACATEGCOGGTACANTGACC ACATEGCOGGTACANTGACC ACATEGCOGGTACANTGACC ACATEGCOGGTACANTGACC ACATEGCOGGTACANTGACC ACATEGCOGGTACANTGACC ACATEGCOGGTACANTGACC ACATEGCOGGTACANTGACC ACATEGCOGGTACANTGACC ACATEGCOGGTACANTGACC ACATEGCOGGTACANTGACC ACATEGCOGGTACANTGACC ACATEGCOGGTACANTGACC ACATEGCOGGTACANTGACC ACATEGCOGGTACANTGACC ACATEGCOGGTACANTGACC ACATEGCOGGTACANTGACC		CAGOGANTCTCAAAAAGCOG GAGOGAATCTCAAAAAGCOG GAGOGANTCTCAAAAAGCOG GAGOGANTCTCAAAAAGCOG	TCTCAGTTCGATTCGGGTTGCAACTCGACCCATGAA TCTCAGTTCGATTCGGGTCTGCAACTCGACCCATGAA TCTCAGTTCGATTCGGGTCTGCAACTCGACCCATGAA TCTCAGTTCGATTCGGGTCTGCAACTCGACCCATGAA TCTCAGTTCGGATTGGGGTCTGCAACTCGACCCATGAA TCTCAGTTCGGATTGGGGTCTGCAACTCGACCCATGAA TCTCAGTTCGGATTGGGGTCTGCAACTCGACCCATGAA TCTCAGTTCGGATTGGGGTCTGCAACTCGACCCATGAA TCTCAGTTCGGATTGGGGTCTGCAACTCGACCCATGAA TCTCAGTTCGGATTGGGGTCTGCAACTCGACCCATGAA TCTCAGTTCGGATTGGGGTCTGCAACTCGACCCATGAA TCTCAGTTCGGATTGGGGTCTGCAACTCGACCCATGAA TCTCAGTTCGGATTGGGGTCTGCAACTCGACCCATGAA TCTCAGTTCGGATTGGGGTCTGCAACTCGACCCCATGAA TCTCAGTTCGGATTGGGGTCTGCAACTCGACCCCATGAA TCTCAGTTCGGATTGGGGTCTGCAACTCGACCCCATGAA TCTCAGTTCGGATGGGGTCTGCAACTCGACCCCATGAA TCTCAGTTCGGATGGGGTCTGCAACTCGACCCCATGAA TCTCAGTTCGGATGGGGTCTGCAACTCGACCCCATGAA TCTCAGTTCGGATGGGGTCTGCAACTCGACCCCATGAA TCTCAGTTCGGATGGGGTCTGCAACTCGACCCCATGAA TCTCAGTTCGGATGGGGTCTGCAACTCGACCCCATGAA
NR_103947.1 S. fulvissimus DEM NR_025155.1 s. luridiscabies ATC NR_12493.1 s. caviscabies ATC NR_043054.1 s. microflavus NRR NR_043055.1 s. baius CSSP536 NR_041093.1 S. rubiginoschelvo NR_115965.1 s. flavofuscus NRR NR_112309.1 S. globisporus NBR NR_112309.1 S. globisporus NBR NR_112309.1 S. globisporus NBR NR_112305.1.8 s. pluricolorescen NR_043033.1 S. pluricolorescen NR_043035.1 S. slavensis NRRL NR_041425.1 S. albovinaceus MB NR_11210.1 S. argenteolus JCM NR_04333.1 S. parvus NRRL B-1 NR_04333.1 S. parvus NRRL B-1 NR_112527.1 S. anulatus NBRC I NR_04163.1 S. parvus NRRL B-1 NR_04196.1 S. fulvorobeus NBR	CTTCCACAGCATCCCTTCGGGTCATGGGACT GTTGCCAGCATGCCTTCGGGTCATGGGACT GTTGCCAGCATGCCTTCGGGTCATGGGGACT GTTGCCAGCATGCCTTCGGGTCATGGGGACT GTTGCCAGCATGCCTTCGGGTCATGGGGACT GTTGCCAGCATGCCTTCGGGTCATGGGGACT GTTGCCAGCATGCCTTCGGGTCATGGGGACT GTTGCCAGCATGCCTTCGGGTCATGGGGACT GTTGCCAGCATGCCTTCGGGTCATGGGGACT GTTGCCAGCATGCCTTCGGGTCATGGGGACT GTTGCCAGCATGCCTTCGGGTCATGGGGACT GTTGCCAGCATGCCTTCGGGTCATGGGGACT GTTGCCAGCATGCCTTCGGGTCATGGGGACT GTTGCCAGCATGCCTTCGGGTCATGGGGACT GTTGCCAGCATGCCTTCGGGTCATGGGGACT GTTGCCAGCATGCCTTCGGGTCATGGGGACT GTTGCCAGCATGCCTTCGGGTCATGGGGACT GTTGCCAGCATGCCTTCGGGTCATGGGGACT GTTGCCAGCATGCCTTCGGGTCATGGGGACT GTTGCCAGCAGCCCTTCGGGTCATGGGGACT GTTGCCAGCATGCCTTCGGGTCATGGGGACT GTTGCCAGCATGCCTTCGGGTCATGGGGACT GTTGCCAGCATGCCTTCGGGTCATGGGGACT GTTGCCAGCATGCCCTTCGGGTCATGGGGACT GTTGCCAGCATGCCCTTCGGGTCATGGGGACT	TACACAGAACTECCGGGGTCI TCACAGAACTECCGGGGTCI TCACAGAACTECCGGGGTCI TCACAGAACTECCGGGGTCI TCACAGAACTECCGGGGTCI TCACAGAACTECCGGGGTCI TCACAGAACTECCGGGGTCI TCACAGAACTECCGGGTCI TCACAGAACTECCGGGTCI TCACAGAACTECCGGGTCI TCACAGAACTECCGGGTCI TCACAGAACTECCGGGTCI TCACAGAACTECCGGGTCI TCACAGAACTECCGGGTCI TCACAGAACTECCGGGTCI TCACAGAACTECCGGGTCI TCACAGAACTECCGGGTCI TCACAGAACTECCGGGTCI TCACAGAACTECCGGGTCI TCACAGAACTECCGGGTCI TCACAGAACTECCGGGTCI TCACAGAACTECCGGGTCI TCACAGAACTECCGGGTCI TCACAGAACTECCGGGTCI		GRAAFGATCATGCCCCTT GRCAAFGATCATGCCCCTT GRCAAFGATCATGCCCCCTT GRCAAFGATCATGCCCCCTT GRCAAFGATCATGCCCCCTT GRCAAFGATCATGCCCCCTT GRCAAFGCATCATGCCCCCTT GRCAAFGCATCATGCCCCCTT GRCAAFGCATCATGCCCCCTT GRCAAFGCATCATGCCCCCTT GRCAAFGCATCATGCCCCCTT GRCAAFGCATCATGCCCCCTT GRCAAFGCATCATGCCCCCTT GRCAAFGCATCATGCCCCCTT GRCAAFGCATCATGCCCCCTT GRCAAFGCATCATGCCCCCTT GRCAAFGCATCATGCCCCCTT GRCAAFGCATCATGCCCCCTT GRCAAFGCATCATGCCCCCTT GRCAAFGCATCATGCCCCCTT GRCAAFGCATCATGCCCCCTT GRCAAFGCATCATGCCCCCTT GRCAAFGCATCATGCCCCCTT	A LANGTOTIGGGCTGCACAGGTGCT ANGTOTTIGGGCTGCACAGGTGCT	ACARTGC/GGTACARTGAC' ACARTGC/GGTACARTGAC'		LA CARL CARACTER CARACTER CARCER CARCERANTETCAAAAAGCCGG GAGCGAATCTCAAAAAGCCGG	TCTCAGTTCGATTGGGTTGCAACTCGACCCATGAA TCTCAGTTCGATTGGGTTGCAACTCGACCCATGAA TCTCAGTTCGATTGGGTTGCAACTCGACCCATGAA TCTCAGTTCGATTGGGTTGCAACTCGACCCATGAA TCTCAGTTCGGATTGGGTTGCAACTCGACCCATGAA TCTCAGTTCGGATTGGGTTGCAACTCGACCCATGAA TCTCAGTTCGGATTGGGTTGCAACTCGACCCATGAA TCTCAGTTCGGATTGGGTTGCAACTCGACCCATGAA TCTCAGTTCGGATTGGGTTGCAACTCGACCCATGAA TCTCAGTTCGGATTGGGTTGCAACTCGACCCATGAA TCTCAGTTCGGATTGGGTTGCAACTCGACCCATGAA TCTCAGTTCGGATTGGGGTTGCAACTCGACCCATGAA TCTCAGTTCGGATTGGGGTTGCAACTCGACCCATGAA TCTCAGTTCGGATTGGGGTTGCAACTCGACCCATGAA TCTCAGTTCGGATTGGGGTTGCAACTCGACCCATGAA TCTCAGTTCGGATTGGGGTTGCAACTCGACCCATGAA TCTCAGTTCGGATTGGGGTTGCAACTCGACCCATGAA TCTCAGTTCGGATTGGGGTTGCAACTCGACCCATGAA TCTCAGTTCGGATTGGGGTTGCAACTCGACCCATGAA TCTCAGTTCGGATTGGGGTTGCAACTCGACCCATGAA TCTCAGTTCGGATTGGGGTTGCAACTCGACCCATGAA TCTCAGTTCGGATTGGGGTTGCAACTCGACCCATGAA TCTCAGTTCGGATGGGGTTGCAACTCGACCCATGAA
<pre>NR_103947.1 S. fulvissimus DEM NR_025155.1 S. luridiscables ATC NR_126221.1 S. pratensis ch24 NR_043854.1 S. microflavus NRRL B NR_043869.1 S. anulatus NRRL B NR_043809.1 S. rubiginoschelvo NR_115965.1 S. flavofuscus NRR NR_112309.1 S. globisporus NBR NR_112311.1 S. griseinus NBRC NR_043034.1 S. pluricolorescen NR_043034.1 S. pluricolorescen NR_043034.1 S. aluriacarius CSSP KM 207217.2 S. lunaelactis MNR NR_1041425.1 S. albovinaceus NB NR_043033.1 S. parves NRRL NR_04333.1 S. parvus NRRL B-1 NR_04333.1 S. parvus NRRL B-1 NR_11220.1 S. argenteolus JCM NR_04333.1 S. parvus NRRL B-1 NR_11227.1 S. anulatus NRRL B-1</pre>	CTTCCAGATCCCTTCGGGTGATGGGGACT GTTGCCAGATCCCTTCGGGTGATGGGGACT GTTGCCAGATCCCTTCGGGTGATGGGGACT GTTGCCAGATCCCTTCGGGTGATGGGGACT GTTGCCAGATCCCTTCGGGTGATGGGGACT GTTGCCAGATCCCTTCGGGTGATGGGGACT GTTGCCAGATGCCTTCGGGTGATGGGGACT GTTGCCAGCATGCCTTCGGGTGATGGGGACT GTTGCCAGCATGCCTTCGGGTGATGGGGACT GTTGCCAGCATGCCTTCGGGTGATGGGGACT GTTGCCAGCATGCCTTCGGGTGATGGGGACT GTTGCCAGCATGCCTTCGGGTGATGGGGACT GTTGCCAGCATGCCTTCGGGTGATGGGGACT GTTGCCAGCATGCCTTCGGGTGATGGGGACT GTTGCCAGCATGCCTTCGGGTGATGGGGACT GTTGCCAGCATGCCCTTCGGGTGATGGGGACT GTTGCCAGCATGCCCTTCGGGTGATGGGGACT GTTGCCAGCATGCCCTTCGGGTGATGGGGACT GTTGCCAGCATGCCCTTCGGGTGATGGGGACT GTTGCCAGCATGCCCTTCGGGTGATGGGGACT GTTGCCAGCATGCCCTTCGGGTGATGGGGACT GTTGCCAGCATGCCCTTCGGGTGATGGGGACT GTTGCCAGCATGCCCTTCGGGTGATGGGGACT GTTGCCAGCATGCCCTTCGGGTGATGGGGACT	TCACAGAGACTECCGGGTCI TCACAGAGACTECCGGGTCI		CICANCIANCATCATCCCCCT GRCAAGCATCATCATCCCCCT GRCAAGCATCATCATCCCCCCT GRCAAGCATCATCATCCCCCCT GRCAAGCATCATCATCCCCCCT GRCAAGCATCATCCATCCCCCT GRCAAGCATCATCCATCCCCCT GRCAAGCATCATCCATCCCCCT GRCAAGCATCATCCCCCCT GRCAAGCATCATCCCCCCT GRCAAGCATCATCCCCCTT GRCAAGCATCATCCCCCCT GRCAAGCATCATCCCCCCT GRCAAGCATCATCCCCCCT GRCAAGCATCATCCCCCCT GRCAAGCATCATCCCCCCT GRCAAGCATCATCCCCCCT GRCAAGCATCATCCCCCCT GRCAAGCATCATCCCCCCT GRCAAGCATCATCCCCCCT GRCAAGCATCATCCCCCCT	ARGITTGGGCTGCACAGGTGCA ARGICTTGGCTGCACAGGTGCA ARGICTTGGCTGCACAGGTGCA ARGICTTGGCTGCACAGGTGCA ARGICTTGGCTGCACAGGTGCA ARGICTTGGGCTGCACAGGTGCA ARGICTTGGGCTGCACAGGTGCA ARGICTTGGGCTGCACAGGTGCA ARGICTTGGGCTGCACAGGTGCA ARGICTTGGGCTGCACAGGTGCA ARGICTTGGGCTGCACAGGTGCA ARGICTTGGGCTGCACAGGTGCA ARGICTTGGGCTGCACAGGTGCA ARGICTTGGGCTGCACAGGTGCA ARGICTTGGGCTGCACAGGTGCA ARGICTTGGGCTGCACAGGTGCA ARGICTTGGGCTGCACAGGTGCA	ACATEGCEGTACANTGACE ACANTGGCEGTACANTGACE		CAGOGANTCTCAAAAAGCOG GAGOGAATCTCAAAAAGCOG GAGOGANTCTCAAAAAGCOG GAGOGANTCTCAAAAAGCOG GAGOGANTCTCAAAAAGCOG GAGOGANTCTCAAAAAGCOG	TCTCAGTTCGATTCGGGTTGCAACTCGACCCATGAA TCTCAGTTCGATTCGGGTCTGCAACTCGACCCATGAA TCTCAGTTCGATTCGGGTCTGCAACTCGACCCATGAA TCTCAGTTCGATTCGGGTCTGCAACTCGACCCATGAA TCTCAGTTCGGATTGGGGTCTGCAACTCGACCCATGAA TCTCAGTTCGGATTGGGGTCTGCAACTCGACCCATGAA TCTCAGTTCGGATTGGGGTCTGCAACTCGACCCATGAA TCTCAGTTCGGATTGGGGTCTGCAACTCGACCCATGAA TCTCAGTTCGGATTGGGGTCTGCAACTCGACCCATGAA TCTCAGTTCGGATTGGGGTCTGCAACTCGACCCATGAA TCTCAGTTCGGATTGGGGTCTGCAACTCGACCCATGAA TCTCAGTTCGGATTGGGGTCTGCAACTCGACCCATGAA TCTCAGTTCGGATTGGGGTCTGCAACTCGACCCATGAA TCTCAGTTCGGATTGGGGTCTGCAACTCGACCCCATGAA TCTCAGTTCGGATTGGGGTCTGCAACTCGACCCCATGAA TCTCAGTTCGGATTGGGGTCTGCAACTCGACCCCATGAA TCTCAGTTCGGATGGGGTCTGCAACTCGACCCCATGAA TCTCAGTTCGGATGGGGTCTGCAACTCGACCCCATGAA TCTCAGTTCGGATGGGGTCTGCAACTCGACCCCATGAA TCTCAGTTCGGATGGGGTCTGCAACTCGACCCCATGAA TCTCAGTTCGGATGGGGTCTGCAACTCGACCCCATGAA TCTCAGTTCGGATGGGGTCTGCAACTCGACCCCATGAA
<pre>NR_103947.1 S. fulvissimus DBM NR_025155.1 S. luridiscables ATC NR_125621.1 S. pratensis ch24 NR_043854.1 S. microflavus NRRL B NR_043869.1 S. anulatus NRRL B NR_043809.1 S. anulatus NRRL B NR_04390.1 S. badium CSSP536 NR_012561.1 S. flavofuscus NRR NR_112569.1 S. globipsorus NBR NR_112311.1 S. griseinus NBRC NR_043034.1 S. pluricolorescen NR_043034.1 S. aluricatis MRL NR_041631.1 S. funcarius CSSP NM_207217.2 S. lunaelactis MNR NR_11220.1 S. argenteolus JCM NR_04333.1 S. parvus NRRL B-1 NR_04333.1 S. parvus NRRL B-1 NR_11220.1 S. argenteolus JCM NR_04333.1 S. parvus NRRL B-1 NR_11225.1 S. pluvids NRRL NR_041365.1 S. fulvorobeus NRR NR_11235.1 S. fulvorobeus NRR NR_ NR_11235.1 S. fulvorobeus NRR NR_1135.1 S. fulvorobeus NRR NR_11355.1 S. fulvorobeus NRR_11355.1 S. fulvorobeus NRR_11355.1 S. fulvorobeus NRR_113555.1 S. fulvorobeus NRR_1135555.1 S. fu</pre>	CTTCCAGARCCTTCGGGTCATGGGACT GTTGCCAGARCCCTTCGGGTCATGGGACT GTTGCCAGARCCCTTCGGGTCATGGGACT GTTGCCAGCARCCCTTCGGGTCATGGGACT GTTGCCCAGCARCCCTTCGGGTCATGGGACT			CRAAFCARCATCRECCCT GRCAAFCARCATCARCCCCCT GRCAAFCARCARCCARCCCCCT GRCAAFCARCARCCARCCCCT GRCAAFCARCARCCARCCCCT GRCAAFCARCARCCACCCCT GRCAAFCARCARCCCCCT GRCAAFCARCARCCCCCT GRCAAFCARCARCCCCCT GRCAAFCARCARCCCCCCT GRCAAFCARCARCCCCCCT GRCAAFCARCARCCCCCCT GRCAAFCARCARCCCCCCT GRCAAFCARCARCCCCCCT GRCAAFCARCARCCCCCCT GRCAAFCARCARCCCCCT GRCAAFCARCARCCCCCT GRCAAFCARCARCCCCCT GRCAAFCARCARCCCCCT GRCAAFCARCARCCCCCT GRCAAFCARCARCCCCCT GRCAAFCARCARCCCCCT GRCAAFCARCARCCCCCT GRCAAFCARCARCCCCCT GRCAAFCARCARCCCCCT GRCAAFCARCARCCCCCT GRCAAFCARCARCCCCCT GRCAAFCARCARCCCCCT GRCAAFCARCARCCCCCT GRCAAFCARCARCCCCCT	A LANGTOTIGGGOTGCACAGOGOT ANGTOTTIGGGOTGCACAGOGOT	ACARTGC/CGTA/CARTGAC' ACARTGC/CGTA/CARTGAC' ACARTGC/CGTA/CARTGAC' ACARTGC/CGTA/CARTGAC' ACARTGC/CGTA/CARTGAC' ACARTGC/CGTA/CARTGAC' ACARTGC/CGTA/CARTGAC' ACARTGC/CGTA/CARTGAC' ACARTGC/CGTA/CARTGAC' ACARTGC/CGTA/CARTGAC' ACARTGC/CGTA/CARTGAC' ACARTGC/CGGTA/CARTGAC' ACARTGC/CGGTA/CARTGAC' ACARTGC/CGGTA/CARTGAC' ACARTGC/CGGTA/CARTGAC' ACARTGC/CGGTA/CARTGAC' ACARTGC/CGGTA/CARTGAC' ACARTGC/CGGTA/CARTGAC' ACARTGC/CGGTA/CARTGAC' ACARTGC/CGGTA/CARTGAC' ACARTGC/CGGTA/CARTGACC' ACARTGC/CGGTA/CARTGACC' ACARTGC/CGGTA/CARTGACC' ACARTGC/CGGTA/CARTGACC' ACARTGC/CGGTA/CARTGACC' ACARTGC/CGGTA/CARTGACC'		GACGAATCTCAAAAAGCCG GACGAATCTCAAAAAGCCG GACGAATCTCAAAAAGCCG GACGAATCTCAAAAAGCCG GACGAATCTCAAAAAGCCG GACGAATCTCAAAAAGCCG GACGAATCTCAAAAAGCCG GACGAATCTCAAAAAGCCG GACGAATCTCAAAAGCCG GACGAATCTCAAAAGCCG GACGAATCTCAAAAGCCG GACGAATCTCAAAAGCCG GACGAATCTCAAAAAGCCG GACGAATCTCAAAAAGCCG GACGAATCTCAAAAAGCCG GACGAATCTCAAAAAGCCG GACGAATCTCAAAAAGCCG GACGAATCTCAAAAAGCCG GACGAATCTCAAAAAGCCG GACGAATCTCAAAAAGCCG GACGAATCTCAAAAAGCCG GACGAATCTCAAAAAGCCG GACGAATCTCAAAAAGCCG GACGAATCTCAAAAAGCCG GACGAATCTCAAAAAGCCG GACGAATCTCAAAAAGCCG GACGAATCTCAAAAAGCCG GACGAATCTCAAAAAGCCG GACGAATCTCAAAAAGCCG GACGAATCTCAAAAAGCCG GACGAATCTCAAAAAGCCG	TCTCAGTTCGATTCGGGTCTGCAACTCGACCCATGAA TCTCAGTTCGATTCGGGTCTGCAACTCGACCCATGAA TCTCAGTTCGGATTGGGGTCTGCAACTCGACCCATGAA TCTCAGTTCGGATTGGGGTCTGCAACTCGACCCATGAA TCTCAGTTCGGATTGGGGTCTGCAACTCGACCCATGAA TCTCAGTTCGGATGGGGTCTGCAACTCGACCCCATGAA TCTCAGTTCGGATGGGGTCTGCAACTCGACCCCATGAA TCTCAGTTCGGATGGGGTCTGCAACTCGACCCCATGAA TCTCAGTTCGGATGGGGTCTGCAACTCGACCCCATGAA TCTCAGTTCGGATGGGGTCTGCAACTCGACCCCATGAA TCTCAGTTCGGATGGGGTCTGCAACTCGACCCCATGAA TCTCAGTTCGGATGGGGTCTGCAACTCGACCCCATGAA TCTCAGTTCGGATGGGGTCTGCAACTCGACCCCATGAA TCTCAGTCGGATGGGGTCTGCAACTCGACCCCATGAA TCTCAGTTCGGATGGGGTCTGCAACTCGACCCCATGAA TCTCAGTTCGGATGGGGTCTGCAACTCGACCCCATGAA TCTCAGTCGGATGGGGTCTGCAACTCGACCCCATGAA TCTCAGTCGGATGGGGTCTGCAACTCGACCCCATGAA TCTCAGTCGGATGGGGTCTGCAACTCGACCCCATGAA TCTCAGTCGGATGGGGTCTGCAACTCGACCCCATGAA TCTCAGTCGGATGGGGTCTGCAACTCGACCCCATGAA TCTCAGTCGGATGGGGTCTGCAACTCGACCCCATGAA TCTCAGTCGGATGGGGTCTGCAACTCGACCCCATGAA TCTCAGTCGGATGGGGTCTGCAACTCGACCCCATGAA TCTCAGTCGGATGGGGTCCCAACTCGACCCCATGAA TCTCAGTCGGATGGGGTCCCAACTCGACCCCATGAA TCTCAGTCGGATGGGGTCCCAACTCGACCCCATGAA TCTCAGTCGGATGGGGTCTGCAACTCGACCCCATGAAC TCTCAGTCGGATGGGGTCTGCAACTCGACCCCATGAAC TCTCAGTCGGATGGGGTCTGCAACTCGACCCCATGAAC TCTCAGTCGGATGGGGTCTGCAACTCGACCCCATGAAC TCTCAGTCGGATGGGGTCTGCAACTCGACCCCATGAAC TCTCAGTCGGATGGGGTCTGCAACTCGACCCCATGAAC TCTCAGTCGGATGGGGTCTGCAACTCGACCCCATGAAC
<pre>NR_103947.1 S. fulvissimus DEM NR_025155.1 s. luridiscables ATC NR_12493.1 s. caviscables ATC NR_125621.1 S. pratensis ch24 NR_043854.1 S. anulatus NRRL B NR_043055.1 s. badius CSSP536 NR_041093.1 S. rubiginoschelvo NR_115965.1 s. flavofuscus NNR NR_112309.1 S. globisporus NNR NR_112309.1 S. globisporus NNR NR_112309.1 S. globisporus NNR NR_112305.1 S. bimicarius CSSP KM_207217.2 S. lunaelactis MNH NR_0418531.1 s. fimicarius CSSP KM_207217.2 S. lunaelactis MNR NR_041825.1 S. albovinaceus NB NR_041205.1 S. parvus NRRL B-1 NR_04333.1 S. parvus NRRL B-1 NR_04333.1 S. parvus NRRL B-1 NR_112527.1 S. anulatus NBRC 1 NR_112340.1 S. albovinis NBR NR_112340.1 S. argenteolus NBR NR_112340.1 S. argenteolus NBR NR_112340.1 S. argenteolus NBR NR_112320.1 S. argenteolus NBR NR_112305.1 S. puriceus NBRC 1</pre>	CTTCCAGATCCTTCGGGTCATGGGGAC GTTCCAGATCCCTTCGGGTCATGGGAC GTTCCAGATCCCTTCGGGTCATGGGAC GTTCCAGATCCCTTCGGGTCATGGGAC GTTCCAGCATGCCTTCGGGTCATGGGAC GTTCCAGATGCCTTCGGGTCATGGGAC GTTCCAGATGCCTTCGGGTCATGGGAC GTTCCAGATGCCTTCGGGTCATGGGAC GTTCCAGATGCCTTCGGGTCATGGGAC GTTCCAGATGCCTTCGGGTCATGGGAC GTTCCAGATGCCTTCGGGTCATGGGAC GTTCCAGATGCCTTCGGGTCATGGGAC GTTCCAGATGCCTTCGGGTCATGGGAC GTTCCAGATGCCTTCGGGTCATGGGAC GTTCCAGATGCCTTCGGGTCATGGGAC GTTCCAGATGCCTTCGGGTCATGGGAC GTTCCAGATGCCTTCGGGTCATGGGAC GTTCCAGATGCCTTCGGGTCATGGGAC GTTCCAGATGCCTTCGGGTCATGGGAC GTTCCAGATGCCTTCGGGTCATGGGAC GTTCCAGATGCCTTCGGGTCATGGGAC GTTCCAGATGCCTTCGGGTCATGGGAC GTTCCAGCATGCCTTCGGGTCATGGGAC			CICATION CATEGORICOLUMNIC CONTRACTOR CONTRAC	A LANGTOTIGGGCTGCACAGGTGCT ARGTOTTIGGGCTGCACAGGTGCT	ACARTGCCGGTACARTGACT ACARTGGCCGGTACARTGACT ACARTGCCGGTACARTGACT ACARTGCCGGTACARTGACT ACARTGCCGGTACARTGACT ACARTGCCGGTACARTGACT ACARTGCCGGTACARTGACT ACARTGCCGGTACARTGACT ACARTGCCGGTACARTGACT		LA CARACTER	TCTCAGTTCGATTCGGGTCGCACTCGACCCATGAC TCTCAGTTCGATTCGGGTCGCACTCGACCCATGAC TCTCAGTTCGGATTGGGTCTGCAACTCGACCCATGAA TCTCAGTTCGGATTGGGGTCTGCAACTCGACCCATGAA TCTCAGTTCGGATTGGGGTCTGCAACTCGACCCATGAC TCTAGTTCGGATTGGGGTCTGCAACTCGACCCCATGAC TCTAGTTCGGATTGGGGTCTGCAACTCGACCCCATGAC TCTCAGTTCGGATTGGGGTCTGCAACTCGACCCCATGAC
<pre>NR_103947.1 S. fulvissimus DBM NR_025155.1 S. luridiscables ATC NR_125621.1 S. pratensis ch24 NR_043854.1 S. microflavus NRRL B NR_043869.1 S. anulatus NRRL B NR_043869.1 S. anulatus NRRL B NR_04390.1 S. tubiginoschelvo NR_04390.1 S. fulvissus NRR NR_112509.1 S. globisporus NBR NR_11230.1 S. fulvissus NBRC NR_043834.1 S. pluricolorescen NR_043834.1 S. pluricolorescen NR_04383.1 S. fulvissi NRRL NR_04383.1 S. altovinseus NBR NR_11221.1 S. altovinseus NBR NR_043833.1 S. pluricolorescen NR_043833.1 S. parvus NRRL B- NR_043833.1 S. plurus NRRL NRR_120.1 S. argenteolus JCM NR_043833.1 S. plurus NRRL B- NR_04195.1 S. fulvorobeus NBR NR_112300.1 S. argenteolus JCM NR_04195.1 S. fulvorobeus NBRC 1 NR_112300.1 S. argenteolus NBRC 1 NR_112280.1 S. puniceus NBRC 1 NR_112284.1 S. pluricolorescen</pre>	CTTCCAGATCCCTTCGGGTGATGGGGACT GTTGCCAGATCCCTTCGGGTGATGGGGACT GTTGCCAGATCCCTTCGGGTGATGGGGACT GTTGCCAGATCCCTTCGGGTGATGGGGACT GTTGCCAGATCCCTTCGGGTGATGGGGACT GTTGCCAGATCCCTTCGGGTGATGGGGACT GTTGCCAGATGCCTTCGGGTGATGGGGACT GTTGCCAGATGCCTTCGGGTGATGGGGACT GTTGCCAGATGCCTTCGGGTGATGGGGACT GTTGCCAGATGCCTTCGGGTGATGGGGACT GTTGCCAGATGCCTTCGGGTGATGGGGACT GTTGCCAGATGCCTTCGGGTGATGGGGACT GTTGCCAGATGCCTTCGGGTGATGGGGACT GTTGCCAGATGCCTTCGGGTGATGGGGACT GTTGCCAGATGCCTTCGGGTGATGGGGACT GTTGCCAGATGCCTTCGGGTGATGGGGACT GTTGCCAGCATGCCCTTCGGGTGATGGGGACT GTTGCCAGCATGCCTTCGGGTGATGGGGACT GTTGCCAGCATGCCTTCGGGTGATGGGGACT GTTGCCAGCATGCCCTTCGGGTGATGGGGACT GTTGCCAGCATGCCCTTCGGGTGATGGGGACT GTTGCCAGCATGCCCTTCGGGTGATGGGGACT GTTGCCAGCATGCCCTTCGGGTGATGGGGACT GTTGCCAGCATGCCCTTCGGGTGATGGGGACT GTTGCCAGCATGCCCTTCGGGTGATGGGGACT GTTGCCAGCATGCCCTTCGGGTGATGGGGACT GTTGCCAGCATGCCCTTCGGGTGATGGGGACT GTTGCCAGCATGCCCTTCGGGTGATGGGGACT GTTGCCAGCATGCCCTTCGGGTGATGGGGACT GTTGCCAGCATGCCCTTCGGGTGATGGGGACT GTTGCCAGCATGCCCTTCGGGTGATGGGGACT GTTGCCAGCATGCCCTTCGGGTGATGGGGACT GTTGCCAGCATGCCCTTCGGGTGATGGGGACT GTTGCCAGCATGCCCTTCGGGTGATGGGGACT GTTGCCAGCATGCCCTTCGGGTGATGGGGACT GTTGCCAGCATGCCCTTCGGGTGATGGGGACT GTTGCCAGCATGCCCTTCGGGTGATGGGGACT			CICATCATCATCATCCCCCT GTCAAGTCATCATCATCCCCCT GTCAAGTCATCATCATCCCCCT GTCAAGTCATCATCATCCCCCT GTCAAGTCATCATCATCCCCCT GTCAAGTCATCATCCCCCCT GTCAAGTCATCATCCCCCCT GTCAAGTCATCATCCCCCCT GTCAAGTCATCATCCCCCT	ARGITTGGGCTGCACAGGTGC ARGITTTGGGCTGCACAGGTGC ARGITTTGGGCTGCACAGGTGC ARGITTTGGGCTGCACAGGTGC ARGITTTGGGCTGCACAGGTGC ARGITTTGGGCTGCACAGGTGC ARGITTTGGGCTGCACAGGTGC ARGITTTGGGCTGCACAGGTGC ARGITTTGGGCTGCACAGGTGC ARGITTTGGGCTGCACAGGTGC ARGITTTGGGCTGCACAGGTGC ARGITTTGGGCTGCACAGGTGC	ACATEGCCEGTACANTGACC ACATEGCCEGTACANTGACC		LA CARGE ANTOTO ANALOCOG GAGOGANTOTO ANALOCOG GAGOGANTOTO ANALOCOG GAGOGANTOTO ANALOCOG GAGOGANTOTO ANALOCOG GAGOGANTOTO ANALOCOG GAGOGANTOTO ANALAGOOG GAGOGANTOTO ANALAGOOG	TCTCAGTTCGATTCGGGTCGCATCGACCCATGAA TCTCAGTCCGATTCGGGTCGCATCGACCCATGAC TCTCAGTCCGATTCGGGTCGCATCGACCCATGAC TCTCAGTCCGATTCGGGTCGCACTGACCCATGAC TCTCAGTCCGATTCGGGTCGCACTGACCCATGAC TCTCAGTCCGATTCGGGTCGCACTGACCCATGAC TCTCAGTCCGATTGGGTCGCACTGACCCATGAC TCTCAGTCGGATTGGGTCGCACTGACCCATGAC TCTCAGTCGGATTGGGGTCGCACTGACCCATGAC TCTCAGTCGGATTGGGGTCGCACTGACCCATGAC TCTCAGTCGGATTGGGGTCGCACTGACCCATGAC TCTCAGTCGGATTGGGGTCGCACTGACCCATGAC TCTCAGTCGGATTGGGGTCGCACTGACCCATGAC TCTCAGTCGGATTGGGGTCGCACTGACCCATGAC TCTCAGTCGGATTGGGGTCGCACTGACCCATGAC TCTCAGTCGGATTGGGGTCGCACTGACCCATGAC TCTCAGTCGGATGGGGTCGCACTGACCCATGAC TCTCAGTCGGATGGGGTCGCACTGACCCATGAC TCTCAGTCGGATGGGGTCGCACTGCACCCATGAC TCTCAGTCGGATGGGGTCGCACTGCACCCATGAC TCTCAGTCGGATGGGGTCGCACTGCACCCATGAC TCTCAGTCGGATGGGGTCGCACTGCACCCCATGAC TCTCAGTCGGATGGGGTCGCACTGCACCCCATGAC TCTCAGTCGGATGGGGTCGCACTGCACCCCATGAC TCTCAGTCGGATGGGGTCGCACTGCACCCCATGAC TCTCAGTCGGATGGGGTCGCACTGCACCCCATGAC TCTCAGTCGGATGGGGTCGCACTGCACCCCATGAC TCTCAGTCGGATGGGGTCGCACTGCACCCCATGAC TCTCAGTCGGATGGGGTCGCACTGCACCCCATGAC TCTCAGTCGGATGGGGTCGCACTGCACCCCATGAC TCTCAGTCGGATGGGGTCGCACTGCACCCCATGAC TCTCAGTCGGATGGGGTCGCACTGCACCCCATGAC TCTCAGTCGGATGGGGTCGCACTGCACCCCATGAC TCTCAGTCGGATGGGGTCGCACTGCACCCCATGAC TCTCAGTCGGATGGGGTCGCACTGCACCCCATGAC TCTCAGTCGGATGGGGTCGCACTGCACCCCATGAC
<pre>NR_103947.1 S. fulvissimus DEM NR_025155.1 s. luridiscablei S NR_114493.1 s. caviscables ATC NR_125621.1 S. pratensis ch24 NR_043854.1 S. microflavus NRR NR_043850.1 S. badius CSSP536 NR_041093.1 S. tubiginoschelvo NR_115965.1 S. flavofuscus NRR NR_112309.1 S. globisporus NBR NR_112309.1 S. globisporus NBR NR_112309.1 S. pluricolorescen NR_043833.1 S. fimicarius CSSP KM 207217.2 S. lunaelactis MNI NR_11250.1 S. albovinaceus NB NR_041823.1 S. funcarius CSSP KM 207217.2 S. lunaelactis MNI NR_11220.1 S. argenteolus JCM NR_04383.1 S. parvus NRRL B- NR_04192.1 S. anulatus NBRC 1 NR_04192.1 S. praecox NBRC 1 NR_112340.1 S. alboviridis NBR NR_11230.1 S. argenteolus NBR NR NR_11230.1 S. argenteolus NBR NR NR NR N</pre>	CTTCCCAGCATCCCTTCGGGTCATGGGGAC GTTGCCAGCATCCCTTCGGGTCATGGGGAC GTTGCCAGCATGCCTTCGGGTCATGGGGAC GTTGCCAGCATGCCTTCGGGTCATGGGGAC GTTGCCAGCATGCCTTCGGGTGATGGGGAC GTTGCCAGCATGCCCTTCGGGTGATGGGGAC				Ansortrosocial conservation of the ansart of the and the ansart of the and	ACARTGCCGGTACARTGACT ACARTGCCGGTACARTGACT		AGGGAATCTCAAAAAGCCG GAGGAATCTCAAAAGCCG GAGGAATCTCAAAAGCCG GAGGAATCTCAAAAGCCG GAGGAATCTCAAAAGCCG GAGCGAATCTCAAAAGCCG GAGGAATCTCAAAAAGCCG GAGGAATCTCAAAAGCCG	TCTCAGTTCGATTCGGGTCGCAACTCGACCCATGAA TCTCAGTTCGATTCGGGTCGCAACTCGACCCATGAA TCTCAGTTCGATTGGGGTCGCAACTCGACCCATGAA TCTCAGTTCGATTGGGGTCGCAACTCGACCCATGAA TCTCAGTTCGGATTGGGGTCTGCAACTCGACCCATGAA TCTCAGTTCGGATTGGGGTCTGCAACTCGACCCCATGAA TCTCAGTCGGATTGGGGTCTGCAACTCGACCCCATGAA TCTCAGTTCGGATTGGGGTCTGCAACTCGACCCCATGAA TCTCAGTTCGGATTGGGGTCTGCAACTCGACCCCATGAA TCTCAGTTCGGATTGGGGTCTGCAACTCGACCCCATGAA TCTCAGTCGGATTGGGGTCTGCAACTCGACCCCATGAA TCTCAGTCGGATTGGGGTCTGCAACTCGACCCCATGAA TCTCAGTCGGATTGGGGTCTGCAACTCGACCCCATGAA TCTCAGTCGGATTGGGGTCTGCAACTCGACCCCATGAA TCTCAGTCGGATTGGGGTCTGCAACTCGACCCCATGAA TCTCAGTCGGATTGGGGTCTGCAACTCGACCCCATGAA TCTCAGTCGGATTGGGGTCTGCAACTCGACCCCATGAA
<pre>NR_103947.1 S. fulvissimus DBM NR_025155.1 S. luridiscables ATC NR_125621.1 S. pratensis ch24 NR_043854.1 S. microflavus NRRL B NR_043869.1 S. anulatus NRRL B NR_043869.1 S. anulatus NRRL B NR_04393.1 S. tubiginoschelvo NR_04193.1 S. tubiginoschelvo NR_04393.1 S. flavofixsus NRR NR_112309.1 S. glueinus NBRC NR_04335.1 S. fimicarius CSSP NR_04335.1 S. alpovinceus NBR NR_04335.1 S. alpovinceus NBR NR_112210.1 S. argenteolus JCM NR_04333.1 S. parvus NRRL B-1 NR_041425.1 S. alpovinceus NBR NR_112230.1 S. argenteolus JCM NR_04195.1 S. fulvorobeus MBRC 1 NR_112300.1 S. argenteolus NBRC 1 NR_112300.1 S. argenteolus NBRC 1 NR_112230.1 S. appencous NBRC 1 NR_11225.1 S. puriceus NBRC 1 NR_11225.1 S. puriceus NBRC 1 NR_11225.1 S. puriceus NBRC 1 NR_11225.1 S. puriceus NBRC 1 NR_11225.1 S. cultoring NBRC 1 NR_11255.1 S. cultoring NBRC 1 NR_11255.1 S. cultoring NBRC 1 NR_11255.1 S</pre>	CTTCCCACATCCCTTCGGGTCATGGGGACT GTTGCCAGATCCCTTCGGGTCATGGGGACT GTTGCCAGCATCCCTTCGGGTCATGGGGACT GTTGCCAGCATCCCTTCGGGTCATGGGGACT GTTGCCAGCATCCCTTCGGGTCATGGGGACT GTTGCCAGATGCCTTCGGGTCATGGGGACT GTTGCCAGATGCCTTCGGGTCATGGGGACT GTTGCCAGCATGCCTTCGGGTCATGGGGACT GTTGCCAGCATGCCTTCGGGTCATGGGGACT GTTGCCAGCATGCCTTCGGGTCATGGGGACT GTTGCCAGCATGCCTTCGGGTCATGGGGACT GTTGCCAGCATGCCTTCGGGTCATGGGGACT GTTGCCAGCATGCCTTCGGGTCATGGGGACT GTTGCCAGCATGCCTTCGGGTCATGGGGACT GTTGCCAGCATGCCTTCGGGTCATGGGGACT GTTGCCAGCATGCCTTCGGGTCATGGGGACT GTTGCCAGCATGCCTTCGGGTGATGGGGACT GTTGCCAGCATGCCTTCGGGTGATGGGGACT GTTGCCAGCATGCCTTCGGGTGATGGGGACT GTTGCCAGCATGCCTTCGGGTGATGGGGACT GTTGCCAGCATGCCTTCGGGTGATGGGGACT GTTGCCAGCATGCCTTCGGGTGATGGGGACT GTTGCCAGCATGCCTTCGGGTGATGGGGACT GTTGCCAGCATGCCCTTCGGGTGATGGGGACT GTTGCCAGCATGCCCTTCGGGTGATGGGGACT GTTGCCAGCATGCCCTTCGGGTGATGGGGACT GTTGCCAGCATGCCCTTCGGGTGATGGGGACT GTTGCCAGCATGCCCTTCGGGTGATGGGGACT GTTGCCAGCATGCCCTTCGGGTGATGGGGACT GTTGCCAGCATGCCCTTCGGGTGATGGGGACT GTTGCCAGCATGCCCTTCGGGTGATGGGGACT GTTGCCAGCATGCCCTTCGGGTGATGGGGACT GTTGCCAGCATGCCCTTCGGGTGATGGGGACT GTTGCCAGCATGCCCTTCGGGTGATGGGGACT GTTGCCAGCATGCCCTTCGGGTGATGGGGACT GTTGCCAGCATGCCCTTCGGGTGATGGGGACT GTTGCCAGCATGCCCTTCGGGTGATGGGGACT GTTGCCAGCATGCCCTTCGGGTGATGGGGACT GTTGCCAGCATGCCCTTCGGGTGATGGGGACT GTTGCCAGCATGCCCTTCGGGTGATGGGGACT				ARGITTGGGCTGCACAGGTGC ARGITTTGGGCTGCACAGGTGC ARGITTTGGGCTGCACAGGTGC ARGITTTGGGCTGCACAGGTGC ARGITTTGGGCTGCACAGGTGC ARGITTTGGGCTGCACAGGTGCT ARGITTTGGGCTGCACAGGTGCT ARGITTTGGGCTGCACAGGTGCT	ACATEGCOGTACANTGACC ACATEGCOGGTACANTGACC		CAGCGAATCTCAAAAAGCCGG GAGCGAATCTCAAAAGCCGAAAGCCGG GAGCGAATCTCAAAAAGCCGG GAGCGAATCTCAAAAAGCCGG GAGCGAATCTCAAAAAGCCGG GAGCGAATCTCAAAAAGCCGG GAGCGAATCTCAAAAAGCCGG GAGCGAATCTCAAAAAGCCGG GAGCGAATCTCAAAAAGCCGG GAGCGAATCTCAAAAAGCCGG GAGCGAATCTCAAAAAGCCGG GAGCGAATCTCAAAAGCCGG GAGCGAATCTCAAAAGCCGG GAGCGAATCTCAAAAGCCGG GAGCGAATCTCAAAAGCCGG GAGCGAATCTCAAAAGCCGG GAGCGAATCTCAAAAGCCGG GACGAATCTCAAAAGCCGG GACGAATCTCAAAAGCCGG GACGAATCTCAAAAGCCGG GACGAATCTCAAAAGCCGGACGCGACGAATCCCAAAAGCCGG GACGAATCTCAAAAGCCGGAACCGCGACGAATCCCAAAAGCCGG	TCTCAGTTCGATTCGGGTCTGCAACTCGACCCATGAA TCTCAGTTCGATTCGGGTCTGCAACTCGACCCATGAA TCTCAGTTCGATTCGGGTCTGCAACTCGACCCATGAA TCTCAGTTCGATTCGGGTCTGCAACTCGACCCATGAA TCTCAGTTCGATTGGGGTCGCAACTCGACCCATGAA TCTCAGTTCGATTGGGGTCGCAACTCGACCCATGAA TCTCAGTTCGATTGGGGTCGCAACTCGACCCATGAA TCTCAGTTCGGATTGGGGTCGCAACTCGACCCATGAA TCTCAGTTCGGATTGGGGTCGCAACTCGACCCATGAA TCTCAGTTCGGATTGGGGTCGCAACTCGACCCATGAA TCTCAGTTCGGATTGGGGTCGCAACTCGACCCATGAA TCTCAGTTCGGATTGGGGTCGCAACTCGACCCATGAA TCTCAGTTCGGATTGGGGTCGCAACTCGACCCATGAA TCTCAGTTCGGATTGGGGGTCGCAACTCGACCCATGAA TCTCAGTTCGGATTGGGGTCTGCAACTCGACCCCATGAA TCTCAGTTCGGATTGGGGTCTGCAACTCGACCCCATGAA TCTCAGTTCGGATTGGGGTCTGCAACTCGACCCCATGAA TCTCAGTTCGGATTGGGGTCTGCAACTCGACCCCATGAA TCTCAGTTCGGATTGGGGTCTGCAACTCGACCCCATGAA TCTCAGTTCGGATTGGGGTCTGCAACTCGACCCCATGAA TCTCAGTTCGGATTGGGGTCTGCAACTCGACCCCATGAA TCTCAGTTCGGATTGGGGTCTGCAACTCGACCCCATGAA TCTCAGTTCGGATTGGGGTCTGCAACTCGACCCCATGAA TCTCAGTTCGGATTGGGGTCTGCAACTCGACCCCATGAA TCTCAGTTCGGATTGGGGTCTGCAACTCGACCCCATGAA TCTCAGTTCGGATTGGGGTCTGCAACTCGACCCCATGAA TCTCAGTTCGGATTGGGGTCTGCAACTCGACCCCATGAA TCTCAGTTCGGATTGGGGTCTGCAACTCGACCCCCATGAA TCTCAGTTCGGATTGGGGTCTGCAACTCGACCCCCATGAA TCTCAGTTCGGATTGGGGTCTGCAACTCGACCCCATGAA TCTCAGTTCGGATTGGGGTCTGCAACTCGACCCCATGAA TCTCAGTTCGGATTGGGGTCTGCAACTCGACCCCATGAA TCTCAGTTCGGATTGGGGTCTGCAACTCGACCCCATGAA TCTCAGTTCGGATTGGGGTCTGCAACTCGACCCCATGAA
<pre>NR_103947.1 S. fulvissimus DEM NR_02515.1 s. luridiscablei S NR_114493.1 s. caviscables ATC NR_125621.1 S. pratensis ch24 NR_043854.1 S. microflavus NRR NR_043854.1 S. badius CSSP536 NR_043854.1 S. tubiginoschelvo NR_115965.1 S. flavofuscus NNR NR_112309.1 S. globisporus NNR NR_112309.1 S. globisporus NNR NR_112305.1 S. funcarius CSSP KM_207217.2 S. lunaelactis MNH NR_11264.1 S. barnensis NRRL NR_043833.1 S. primicarius CSSP KM_207217.2 S. lunaelactis MNR NR_11220.1 S. argenteolus JCM NR_043833.1 S. pravus NNRL B-1 NR_043833.1 S. pravus NNRL NR_112527.1 S. anulatus NNRC NR_04383.1 S. pravus NNRL MRC NR_04185.1 S. praecox NNRC 1 NR_112360.1 S. alboviridis NBR NR_11236.1 S. praecox NBRC 1 NR_112285.1 S. puniceus NBRC NR_112285.1 S. puniceus NBRC 1 NR_112285.1 S. puniceus NBRC 1 NR_12285.1 S. puniceus NBRC 1 NR_1285.1 S. puniceus NBRC 1 NR_1285.1 S. puniceus NBRC 1 NR_1285.1 S. puniceus NBRC 1 NR_1285</pre>	CTTCCAGCATCCCTTCGGGTCATGGGGAC GTTGCCAGCATCCCTTCGGGTCATGGGGAC GTTGCCAGCATCCCTTCGGGTCATGGGGAC GTTGCCAGCATGCCTTCGGGTGATGGGGAC GTTGCCAGCATGCCTTCGGGTGATGGGGAC GTTGCCAGCATGCCTTCGGGTGATGGGGAC GTTGCCAGCATGCCTTCGGGTGATGGGGAC GTTGCCAGCATGCCTTCGGGTGATGGGGAC GTTGCCAGCATGCCTTCGGGTGATGGGGAC GTTGCCAGCATGCCTTCGGGTGATGGGGAC GTTGCCAGCATGCCTTCGGGTGATGGGGAC GTTGCCAGCATGCCTTCGGGTGATGGGGAC GTTGCCAGCATGCCTTCGGGTGATGGGGAC GTTGCCAGCATGCCTTCGGGTGATGGGGAC GTTGCCAGCATGCCTTCGGGTGATGGGGAC GTTGCCAGCATGCCTTCGGGTGATGGGGAC GTTGCCAGCATGCCTTCGGGTGATGGGGAC GTTGCCAGCATGCCTTCGGGTGATGGGGAC GTTGCCAGCATGCCTTCGGGTGATGGGGAC GTTGCCAGCATGCCTTCGGGTGATGGGGAC GTTGCCAGCATGCCTTCGGGTGATGGGGAC GTTGCCAGCATGCCCTTCGGGTGATGGGGAC GTTGCCAGCATGCCCTTCGGGTGATGGGGAC GTTGCCAGCATGCCCTTCGGGTGATGGGGAC			CREATCATCATCATCCCCCT GRCAAGCATCATCATCCCCCCT GRCAAGCATCATCATCCCCCCT GRCAAGCATCATCATCCCCCCT GRCAAGCATCATCCCCCCT	Ansortrosocial conservation of the ansatz of	ACATEGCCGGTACANTGACC ACATEGCCGGTACANTGACC		GACGAATCTCAAAAAGCCG GACGAATCTCAAAAAGCCG	TCTCAGTTCGATTCGGGTCGCAACTCGACCCATGAA TCTCAGTTCGATTCGGGTCGCAACTCGACCCATGAA TCTCAGTTCGATTCGGGTCGCAACTCGACCCATGAA TCTCAGTTCGATTCGGGTCGCAACTCGACCCATGAA TCTCAGTTCGGATTGGGGTCTGCAACTCGACCCCATGAA TCTCAGTTCGGATTGGGGTCTGCAACTCGACCCCATGAA TCTCAGTTCGGATGGGGTCTGCAACTCGACCCCATGAA TCTCAGTTCGGATGGGGTCTGCAACTCGACCCCATGAA TCTCAGTTCGGATGGGGTCTGCAACTCGACCCCATGAA TCTCAGTTCGGATGGGGTCTGCAACTCGACCCCATGAA TCTCAGTTCGGATGGGGTCTGCAACTCGACCCCATGAA TCTCAGTTCGGATGGGGTCTGCAACTCGACCCCATGAA TCTCAGTTCGGATGGGGTCTGCAACTCGACCCCATGAA TCTCAGTTCGGATGGGGTCTGCAACTCGACCCCATGAA TCTCAGTTCGGATGGGGTCTGCAACTCGACCCCATGAA TCTCAGTTCGGATGGGGTCTGCAACTCGACCCCATGAA TCTCAGTTCGGATGGGGTCTGCAACTCGACCCCATGAA TCTCAGTTCGGATGGGGTCTGCAACTCGACCCCATGAA TCTCAGTTCGGATTGGGGTCTGCAACTCGACCCCATGAA TCTCAGTTCGGATTGGGGTCTGCAACTCGACCCCATGAA TCTCAGTTCGGATTGGGGTCTGCAACTCGACCCCATGAA TCTCAGTTCGGATTGGGGTCTGCAACTCGACCCCATGAA TCTCAGTTCGGATTGGGGTCTGCAACTCGACCCCATGAA TCTCAGTTCGGATTGGGGTCTGCAACTCGACCCCATGAA TCTCAGTCGGATTGGGGTCTGCAACTCGACCCCATGAA TCTCAGTCGGATTGGGGTCTGCAACTCGACCCCATGAA TCTCAGTCCGATTGGGGTCTGCAACTCGACCCCATGAA TCTCAGTCGGATTGGGGTCTGCAACTCGACCCCATGAA TCTCAGTCGGATTGGGGTCTGCAACTCGACCCCATGAA TCTCAGTCGGATTGGGGTCTGCAACTCGACCCCATGAA TCTCAGTCGGATTGGGGTCTGCAACTCGACCCCATGAA TCTCAGTCGGATTGGGGTCTGCAACTCGACCCCATGAA TCTCAGTCGGATTGGGGTCTGCAACTCGACCCCATGAA TCTCAGTCGGATTGGGGTCTGCAACTCGACCCCATGAA TCTCAGTCGGATTGGGGTCTGCAACTCGACCCCATGAA TCTCAGTCGGATTGGGGTCTGCAACTCGACCCCATGAA TCTCAGTCGGATTGGGGTCTGCAACTCGACCCCATGAA TCTCAGTCGGATTGGGGTCTGCAACTCGACCCCATGAA TCTCAGTCGGATTGGGGTCTGCAACTCGACCCCATGAA TCTCAGTCGGATGGGGTCTGCAACTCGACCCATGAA TCTCAGTCGGATTGGGGTCTGCAACTCGACCCCATGAA TCTCAGTCGGATTGGGGTCTGCAACTCGACCCCATGAA TCTCAGTCGGATTGGGGTCTGCAACTCGACCCCATGAA TCTCAGTCGGATTGGGGTCTGCAACTCGACCCCATGAA
<pre>NR_103947.1 S. fulvissimus DBM NR_025155.1 S. luridiscables ATC NR_125621.1 S. pratensis ch24 NR_043854.1 S. microflavus NRRL B NR_043869.1 S. anulatus NRRL B NR_043869.1 S. anulatus NRRL B NR_04380.1 S. badius CSSP536 NR_041093.1 S. rubiginoschelvo NR_115966.1 S. flavofuscus NRR NR_11230.1 S. griseinum MERC NR_043351.1 S. griseinum MERC NR_043351.1 S. griseinum MERC NR_043351.1 S. albovinceus NR NR_11210.1 S. argenteolus CSB NR_041425.1 S. albovinceus NR NR_11230.1 S. argenteolus UCM NR_04333.1 S. parvus NRRL B-1 NR_041425.1 S. albovinceus NR NR_112350.1 S. parvus NRRL B-1 NR_041355.1 S. parvus NRRL NR_041355.1 S. preacox NBRC 1 NR_112350.1 S. albovinidis NRRL INR_112350.1 S. albovinidis NRRL NR_112300.1 S. argenteolus NBRC 1 NR_112285.1 S. puniceus NBRC 1 NR_112285.1 S. puniceus NBRC 1 NR_112285.1 S. puniceus NBRC 1 NR_112257.1.1 S. aulticus NBRC 1 NR_112285.1 S. puniceus NBRC 1 NR_112285.1 S. puniceus NBRC 1 NR_112257.1 S. californicus NB NR_04277.1 S. sudiarbansensis NR_11255.1 S. sudiarbansensis</pre>	CTTCCAGATCCCTTCGGGTCATGGGACT GTTCCAGATCCCTTCGGGTCATGGGACT GTTCCAGATCCCTTCGGGTCATGGGACT GTTCCAGATCCCTTCGGGTCATGGGACT GTTCCAGATCCCTTCGGGTCATGGGACT GTTCCAGATCCCTTCGGGTCATGGGACT GTTCCAGATCCCTTCGGGTCATGGGACT GTTCCAGATCCCTTCGGGTCATGGGACT GTTCCAGATCCCTTCGGGTCATGGGACT GTTCCAGATCCCTTCGGGTCATGGGACT GTTCCAGATCCCTTCGGGTCATGGGACT GTTCCAGATCCCTTCGGGTCATGGGACT GTTCCAGCATCCCTTCGGGTCATGGGACT GTTCCAGCATCCCTTCGGGTCATGGGACT GTTCCAGCATCCCTTCGGGTCATGGGACT GTTCCAGCATCCCTTCGGGTCATGGGACT GTTCCAGCATCCCTTCGGGTCATGGGACT GTTCCAGCATCCCTTCGGGTCATGGGACT GTTCCAGCATGCCTTCGGGTCATGGGACT GTTCCAGCATGCCTTCGGGTCATGGGACT GTTCCAGCATGCCTTCGGGTCATGGGACT GTTCCAGCATGCCTTCGGGTCATGGGACT GTTCCAGCATGCCTTCGGGTCATGGGACT GTTCCAGCATGCCTTCGGGTCATGGGACT GTTCCAGCATGCCTTCGGGTCATGGGACT GTTCCAGCATGCCTTCGGGTCATGGGACT GTTCCAGCATGCCTTCGGGTCATGGGACT GTTCCAGCATGCCCTTCGGGTCATGGGACT GTTCCAGCATGCCCTTCGGGTCATGGGACT GTTCCAGCATGCCCTTCGGGTCATGGGACT GTTCCAGCATGCCCTTCGGGTCATGGGACT GTTCCCAGCATGCCCTTCGGGTCATGGGACT GTTCCCAGCATGCCCTTCGGGTCATGGGACT GTTCCCAGCATGCCCTTCGGGTCATGGGACT GTTCCCAGCATGCCCTTCGGGTCATGGGACT GTTCCCAGCATGCCCTTCGGGTCATGGGACT GTTCCCAGCATGCCCTTCGGGTCATGGGACT GTTCCCAGCATGCCCTTCGGGTCATGGGACT GTTCCCAGCATGCCCTTCGGGTCATGGGACT GTTCCCAGCATGCCCTTCGGGTCATGGGACT GTTCCCAGCATGCCCTTCCGGGTCATGGGACT GTTCCCAGCATGCCCTTCCGGTCATGGGACT GTTCCCAGCATGCCCTTCCGGGTCATGGGACT					ACTICAL CONTRACTOR ACARTGOCOGTACANTGAGC ACARTGGCOGTACANTGAGC ACARTGOCOGTACANTGAGC ACARTGOCOGTACANTGAGC ACARTGOCOGTACANTGAGC ACARTGOCOGTACANTGAGC ACARTGOCOGTACANTGAGC ACARTGOCOGTACANTGAGC ACARTGGC ACARTGGCOGTACANTGAGC ACARTGGCACANTGAGC ACARTGGC ACARTGA		CACCGANTCTCAAAAACCCG GACCGAATCTCAAAAACCCG GACCGANTCTCAAAAACCCG GACCGANTCTCAAAAACCCG GACCGANTCTCAAAAACCCG GACCGANTCTCAAAAACCCG GACCGAATCTCAAAAACCCGAACCCC GACCGAATCTCAAAAACCCG GACCGAATCTCAAAAACCCG GACCGAATCTCAAAAACCCG GACCGAATCTCAAAAACCCG GACCGAATCTCAAAAACCCG GACCGAATCTCAAAAACCCG GACCGAATCTCAAAAACCCG GACCGAATCTCAAAAACCCG GACCGAATCTCAAAAACCCG GACCGAATCTCAAAAACCCG GACCGAATCTCAAAAACCCG GACCGAATCTCAAAAACCCG GACCGAATCTCAAAAACCCG GACCGAATCTCAAAAACCCG GACCGAATCTCAAAAACCCG GACCGAATCTCAAAAACCCG GACCGAATCTCAAAACCCG GACCGAATCTCAAAACCCG GACCGAATCTCAAAACCCGAACCCG GACCGAATCTCAAAACCCGAACCCG GACCGAATCTCAAAACCCGAACCCGAACCCCAACCCG GACCGAATCTCAAAACCCGAACCCGAACCCCAACCCCAACCCGAACCCCAACCCCAACCCCGAACCCCAACCCAACCCCAACCCCGAACCCCAACCCCAACCCGAACCCCAACCCAACCCCCAACCCCCAACCCCAACCCCCAACCCC	TCTCAGTTCGATTCGGGTCTGCAACTCGACCCATGAA TCTCAGTTCGATTCGGGTCTGCAACTCGACCCATGAA TCTCAGTTCGATTCGGGTCTGCAACTCGACCCATGAA TCTCAGTTCGATTCGGGTCTGCAACTCGACCCATGAA TCTCAGTTCGATTGGGGTCGCAACTCGACCCATGAA TCTCAGTTCGATTGGGGTCGCAACTCGACCCATGAA TCTCAGTTCGATTGGGGTCGCAACTCGACCCATGAA TCTCAGTTCGGATTGGGGTCGCAACTCGACCCATGAA TCTCAGTTCGGATTGGGGTCGCAACTCGACCCATGAA TCTCAGTTCGGATTGGGGTCGCAACTCGACCCATGAA TCTCAGTTCGGATTGGGGTCGCAACTCGACCCATGAA TCTCAGTTCGGATTGGGGTCGCAACTCGACCCATGAA TCTCAGTTCGGATTGGGGTCGCAACTCGACCCATGAA TCTCAGTTCGGATTGGGGGTCGCAACTCGACCCATGAA TCTCAGTTCGGATTGGGGTCTGCAACTCGACCCCATGAA TCTCAGTTCGGATTGGGGTCTGCAACTCGACCCCATGAA TCTCAGTTCGGATTGGGGTCTGCAACTCGACCCCATGAA TCTCAGTTCGGATTGGGGTCTGCAACTCGACCCCATGAA TCTCAGTTCGGATTGGGGTCTGCAACTCGACCCCATGAA TCTCAGTTCGGATTGGGGTCTGCAACTCGACCCCATGAA TCTCAGTTCGGATTGGGGTCTGCAACTCGACCCCATGAA TCTCAGTTCGGATTGGGGTCTGCAACTCGACCCCATGAA TCTCAGTTCGGATTGGGGTCTGCAACTCGACCCCATGAA TCTCAGTTCGGATTGGGGTCTGCAACTCGACCCCATGAA TCTCAGTTCGGATTGGGGTCTGCAACTCGACCCCATGAA TCTCAGTTCGGATTGGGGTCTGCAACTCGACCCCATGAA TCTCAGTTCGGATTGGGGTCTGCAACTCGACCCCATGAA TCTCAGTTCGGATTGGGGTCTGCAACTCGACCCCCATGAA TCTCAGTTCGGATTGGGGTCTGCAACTCGACCCCCATGAA TCTCAGTTCGGATTGGGGTCTGCAACTCGACCCCATGAA TCTCAGTTCGGATTGGGGTCTGCAACTCGACCCCATGAA TCTCAGTTCGGATTGGGGTCTGCAACTCGACCCCATGAA TCTCAGTTCGGATTGGGGTCTGCAACTCGACCCCATGAA TCTCAGTTCGGATTGGGGTCTGCAACTCGACCCCATGAA
<pre>NR_103947.1 S. fulvissimus DBM NR_025155.1 S. luridiscables ATC NR_125621.1 S. pratensis ch24 NR_043854.1 S. microflavus NRRL B NR_043869.1 S. anulatus NRRL B NR_043869.1 S. anulatus NRRL B NR_04380.1 S. badius CSSP536 NR_041093.1 S. rubiginoschelvo NR_115966.1 S. flavofuscus NRR NR_11230.1 S. griseinum MERC NR_043351.1 S. griseinum MERC NR_043351.1 S. griseinum MERC NR_043351.1 S. albovinceus NR NR_11210.1 S. argenteolus CSB NR_041425.1 S. albovinceus NR NR_11230.1 S. argenteolus UCM NR_04333.1 S. parvus NRRL B-1 NR_041425.1 S. albovinceus NR NR_112350.1 S. parvus NRRL B-1 NR_041355.1 S. parvus NRRL NR_041355.1 S. preacox NBRC 1 NR_112350.1 S. albovinidis NRRL INR_112350.1 S. albovinidis NRRL NR_112300.1 S. argenteolus NBRC 1 NR_112285.1 S. puniceus NBRC 1 NR_112285.1 S. puniceus NBRC 1 NR_112285.1 S. puniceus NBRC 1 NR_112257.1.1 S. aulticus NBRC 1 NR_112285.1 S. puniceus NBRC 1 NR_112285.1 S. puniceus NBRC 1 NR_112257.1 S. californicus NB NR_04277.1 S. sudiarbansensis NR_11255.1 S. sudiarbansensis</pre>	CTTCCCAGCATCCCTTCGGGTCATGGGGAC GTTGCCAGCATCCCTTCGGGTCATGGGGAC GTTGCCAGCATCCCTTCGGGTCATGGGGAC GTTGCCAGCATGCCTTCGGGTCATGGGGAC GTTGCCAGCATGCCTTCGGGTCATGGGGAC GTTGCCAGCATGCCTTCGGGTGATGGGGAC GTTGCCAGCATGCCCTTCGGGTGATGGGGAC				A HARDET TEGGET CACAGESET ANGENT TEGGET CACAGESET	ACATEGCCGGTACATEGAC ACATEGCCGGTACATEGAC		CACCONTICADAAAACCCG GACGAATCTCADAAACCCG GACGAATCTCADAAACCCG GACGAATCTCADAAACCCG GACGAATCTCADAAACCGG GACGGAATCTCADAAACCGAACCGG GACGGAATCTCADAAACCGG GACGGAATCTCADAAACCGG GACGGAATCTCADAAACCGG GACGGAATCTCADAAACCGG GACGGAATCTCADAAACCGG GACGGAATCTCADAAACCGG GACGGAATCTCADAAACCGG GACGGAATCTCADAAACCGG GACGGAATCTCADAAACCGG GACGGAATCTCADAAACCGG GACGGAATCTCADAAACCGG GACGGAATCTCADAAACCGG GACGAATCTCADAAACCGAACCGG GACGAATCTCADAAACCGG GACGAATCCADAAACCGAACCGG GACGAATCTCADAAACCGG GACGAATCCADAAACCGAACCGAATCCADAACCGAACCGG GACGAATCCADAAACCGAACCGAATCCADAAACCGAACCG	TCTCAGTTCGATTCGGGTCTGCAACTCGACCCATGAA TCTCAGTTCGATTCGGGTCTGCAACTCGACCCATGAA TCTCAGTTCGATTGGGGTCTGCAACTCGACCCATGAA TCTCAGTTCGATTGGGGTCTGCAACTCGACCCATGAA TCTCAGTTCGATTGGGGTCTGCAACTCGACCCATGAA TCTCAGTTCGGATTGGGGTCTGCAACTCGACCCATGAA TCTCAGTTCGGATTGGGGTCTGCAACTCGACCCCATGAA TCTCAGTTCGGATGGGGTCTGCAACTCGACCCCATGAA TCTCAGTTCGGATGGGGTCTGCAACTCGACCCCATGAA TCTCAGTTCGGATGGGGTCTGCAACTCGACCCCATGAA TCTCAGTTCGGATGGGGTCTGCAACTCGACCCCATGAA TCTCAGTTCGGATGGGGTCTGCAACTCGACCCCATGAA TCTCAGTTCGGATGGGGTCTGCAACTCGACCCCATGAA TCTCAGTTCGGATGGGGTCTGCAACTCGACCCCATGAA TCTCAGTTCGGATGGGGTCTGCAACTCGACCCCATGAA TCTCAGTTCGGATGGGGTCTGCAACTCGACCCCATGAA TCTCAGTTCGGATGGGGTCTGCAACTCGACCCCATGAA TCTCAGTTCGGATGGGGTCTGCAACTCGACCCCATGAA TCTCAGTCGGATGGGGTCTGCAACTCGACCCCATGAA TCTCAGTCGGATTGGGGTCTGCAACTCGACCCCATGAA TCTCAGTCGGATTGGGGTCTGCAACTCGACCCCATGAA TCTCAGTCGGATTGGGGTCTGCAACTCGACCCCATGAA TCTCAGTCGGATTGGGGTCTGCAACTCGACCCCATGAA TCTCAGTCGGATTGGGGTCTGCAACTCGACCCCATGAA TCTCAGTCGGATTGGGGTCTGCAACTCGACCCCATGAA TCTCAGTCGGATTGGGGTCTGCAACTCGACCCCATGAA TCTCAGTCGGATTGGGGTCTGCAACTCGACCCCATGAA TCTCAGTCGGATTGGGGTCTGCAACTCGACCCCATGAA TCTCAGTCGGATTGGGTCTGCAACTCGACCCCATGAA TCTCAGTCGGATTGGGTCTGCAACTCGACCCCATGAA TCTCAGTCGGATTGGGTCTGCAACTCGACCCCATGAA TCTCAGTCGGATTGGGTCTGCAACTCGACCCCATGAA TCTCAGTCGGATTGGGTCTGCAACTCGACCCCATGAA TCTCAGTCGGATTGGGGTCTGCAACTCGACCCCATGAA TCTCAGTCGGATTGGGGTCTGCAACTCGACCCCATGAA TCTCAGTCGGATTGGGGTCTGCAACTCGACCCCATGAA TCTCAGTCGGATTGGGGTCTGCAACTCGACCCCATGAA TCTCAGTCGGATTGGGGTCTGCAACTCGACCCCATGAA TCTCAGTCGGATTGGGTCTGCAACTCGACCCCATGAA TCTCAGTCGGATTGGGTCTGCAACTCGACCCCATGAA TCTCAGTCGGATTGGGGTCTGCAACTCGACCCCATGAA TCTCAGTCGGATTGGGGTCTGCAACTCGACCCCATGAA TCTCAGTCGGATTGGGGTCTGCAACTCGACCCCATGAA TCTCAGTCGGATTGGGGTCTGCAACTCGACCCCATGAA TCTCAGTCGGATTGGGTCTGCAACTCGACCCCATGAA TCTCAGTCGGATTGGGGTCTGCAACTCGACCCCATGAA TCTCAGTCGGATTGGGGTCTGCAACTCGACCCCATGAAC TCCAGTCGGATTGGGGTCTGCAACTCGACCCCATGAAC TCCAGTCGGATTGGGGTCTGCAACTCGACCCCATGAAC
<pre>NR_103947.1 S. fulvissimus DEM NR_02515.1 s. luridiscablei S NR_114493.1 S. caviscables ATC NR_125221.1 S. pratensis ch24 NR_043859.1 S. anulatus NRRL B NR_043850.1 S. badius CS9536 NR_041093.1 S. tubiginoschelvo NR_115965.1 S. flavofuscus NRR NR_112309.1 S. globisporus NNR NR_112309.1 S. globisporus NNR NR_043833.1 S. fimicarius CSSP KM 207217.2 S. lunaelactis MNL NR_115264.1 S. baarnensis NNRL NR_11220.1 S. argenteolus JCM NR_043833.1 S. parvus NNRL B-1 NR_112257.1 S. alubovinics NNRL NR_112320.1 S. fulvorobus NNRC 1 NR_112320.1 S. argenteolus NNRC 1 NR_112285.1 S. puniceus NNRC 1 NR_112285.1 S. puniceus NNRC 1 NR_112285.1 S. guniceus NRC 1 NR_112264.1 S. gluticolorescen NR_112453.1 S. cluifornicus NN NR_1264.1 S. guniceus NRC 1 NR_112453.1 S. dustariopsis JC NR_11543.1 S. guniceus NSP 23 NR_11543.1 S. guniceus NSP 23</pre>	CTTCCAGARCCTTCGGGTARTGGGACT GTTCCAGARCCTTCGGGTARTGGGACT GTTCCAGARCCTTCGGGTARTGGGACT GTTCCAGARCCCTTCGGGTARTGGGACT GTTCCAGARGCCTTCGGGTGARGGGACT GTTCCAGARGCCTTCGGGTGARGGGACT GTTCCAGCARGCCCTTCGGGTGARGGGACT GTTCCAGCARGCCCTTCGGGTGARGGGACT GTTCCAGCARGCCCTTCGGGTGARGGGACT GTTCCAGCARGCCCTTCGGGTGARGGGACT GTTCCAGCARGCCCTTCGGGGTGARGGGACT GTTCCAGCARGCCCTTCGGGTGARGGGACT GTTCCAGCARGCCCTTCGGGTGARGGGACT GTTCCAGCARGCCCTTCGGGTGARGGGACT GTTCCAGCARGCCCTTCGGGTGARGGGACT GTTCCAGCARGCCCTTCGGGTGARGGGACT GTTCCAGCARGCCCTTCGGGTGARGGGACT GTTCCAGCARGCCCTTCGGGTGARGGGACT GTTCCAGCARGCCCTTCGGGTGARGGGACT GTTCCAGCARGCCCTTCGGGTGARGGGACT GTTCCAGCARGCCCTTCGGGTGARGGGACT GTTCCAGCARGCCCTTCGGGTGARGGGACT					LALTIGCCGGTACARTGAGC ACARTGGCCGGTACARTGAGC		CACCONTICADAAAACCCG GAGCGAATCTCADAAAACCCG GAGCGAATCTCADAAAACCCG GAGCGAATCTCADAAAACCCG GAGCGAATCTCADAAAACCGG GAGCGAATCTCADAAACCGG GAGCGAATCTCAAAACCGAACCGG GAGCGAATCTCAAAACCGG GAGCGAATCTCAAAACCGG GAGCGAATCTCAAAAACCGG GAGCGAATCTCAAAAACCGG GAGCGAATCTCAAAAACCGG GAGCGAATCTCAAAAACCGG GAGCGAATCTCAAAAACCGG GAGCGAATCTCAAAAACCGG GAGCGAATCTCAAAAACCGG GAGCGAATCTCAAAACCGAACCG	TCTCAGTTCGATTCGGGTCTGCAACTCGACCCATGAA TCTCAGTTCGATTCGGGTCTGCAACTCGACCCATGAA TCTCAGTTCGATTGGGGTCGCAACTCGACCCATGAA TCTCAGTTCGATTGGGGTCTGCAACTCGACCCATGAA TCTCAGTTCGGATTGGGGTCTGCAACTCGACCCATGAA TCTCAGTTCGGATTGGGGTCTGCAACTCGACCCATGAA TCTCAGTTCGGATGGGGTCTGCAACTCGACCCCATGAA TCTCAGTTCGGATGGGGTCTGCAACTCGACCCCATGAA TCTCAGTTCGGATGGGGTCTGCAACTCGACCCCATGAA TCTCAGTTCGGATGGGGTCTGCAACTCGACCCCATGAA TCTCAGTTCGGATGGGGTCTGCAACTCGACCCCATGAA TCTCAGTTCGGATGGGGTCTGCAACTCGACCCCATGAA TCTCAGTTCGGATGGGGTCTGCAACTCGACCCCATGAA TCTCAGTTCGGATGGGGTCTGCAACTCGACCCCATGAA TCTCAGTTCGGATGGGGTCTGCAACTCGACCCCATGAA TCTCAGTTCGGATGGGGTCTGCAACTCGACCCCATGAA TCTCAGTTCGGATGGGGTCTGCAACTCGACCCCATGAA TCTCAGTTCGGATGGGGTCTGCAACTCGACCCCATGAA TCTCAGTCGGATGGGGTCTGCAACTCGACCCCATGAA TCTCAGTCGGATGGGGTCTGCAACTCGACCCCATGAA TCTCAGTCGGATGGGGTCTGCAACTCGACCCCATGAA TCTCAGTCGGATGGGGTCGCAACTCGACCCCATGAA TCTCAGTCGGATTGGGGTCGCAACTCGACCCCATGAA TCTCAGTCGGATTGGGGTCGCAACTCGACCCCATGAA TCTCAGTCGGATTGGGGTCGCAACTCGACCCCATGAA TCTCAGTCGGATTGGGGTCGCAACTCGACCCCATGAA TCTCAGTCGGATTGGGGTCGCAACTCGACCCCATGAA TCTCAGTCGGATTGGGGTCGCAACTCGACCCCATGAA TCTCAGTCGGATTGGGGTCGCAACTCGACCCCATGAA TCTCAGTCGGATTGGGGTCGCAACTCGACCCCATGAA TCTCAGTCGGATTGGGGTCGCAACTCGACCCCATGAA TCTCAGTCGGATTGGGGTCGCAACTCGACCCCATGAA TCTCAGTCGGATTGGGGTCGCAACTCGACCCCATGAA TCTCAGTCGGATTGGGGTCGCAACTCGACCCCATGAA TCTCAGTCGGATTGGGGTCGCAACTCGACCCCATGAA TCTCAGTCGGATTGGGGTCCCAACTCGACCCCATGAA TCTCAGTCGGATTGGGGTCGCAACTCGACCCCATGAA TCTCAGTCGGATTGGGGTCGCAACTCGACCCCATGAA TCTCAGTCGGATTGGGGTCGCAACTCGACCCCATGAA TCTCAGTCGGATTGGGGTCGCAACTCGACCCCATGAA TCTCAGTCGGATTGGGGTCGCAACTCGACCCCATGAA TCTCAGTCGGATTGGGGTCGCAACTCGACCCCATGAA TCTCAGTCGGATTGGGGTCGCAACTCGACCCCATGAA TCTCAGTCGGATTGGGGTCGCAACTCGACCCCATGAA TCTCAGTCGGATTGGGGTCGCAACTCGACCCCATGAA TCTCAGTCGGATTGGGGTCTGCAACTCGACCCCATGAA TCTCAGTCGGATTGGGGTCTGCAACTCGACCCCATGAA TCTCAGTCGGATTGGGGTCGCACTGAACTCGACCCCATGAA
<pre>NR_103947.1 S. fulvissimus DBM NR_025155.1 S. luridiscables ATC NR_125621.1 S. pratensis ch24 NR_043854.1 S. microflavus NRRL B NR_043869.1 S. anulatus NRRL B NR_043869.1 S. anulatus NRRL B NR_041093.1 S. rubiginoschelvo NR_115965.1 S. flavofuscus NRR NR_112309.1 S. griseinus MRR NR_043351.1 S. priseinus MRR NR_043351.1 S. priseinus MRR NR_043351.1 S. latorical S. MRL NR_043351.1 S. latorical S. MRL NR_043351.1 S. alportaceus NRR NR_11210.1 S. argenteolus JCM NR_04333.1 S. parvus NRRL B- NR_043351.1 S. plavenesis NRRL NR_043351.1 S. alportaceus NR NR_11220.1 S. argenteolus JCM NR_043351.1 S. parvus NRRL B- NR_041355.1 S. protecos NRRC 1 NR_112350.1 S. alportaceus NR NR_112350.1 S. alportaceus NRC NR_112350.1 S. alportaceus NRC 1 NR_112350.1 S. argenteolus NRRC 1 NR_112350.1 S. argenteolus NRRC 1 NR_112350.1 S. argenteolus NRC 1 NR_112350.1 S. supriceus NRCC 1 NR_115264.1 S. supriceus NRCC 1 NR_11578.1 S. melanogenes NR NR_026200.1 S. subrillos DSN</pre>	CTTCCCAGCATCCCTTCGGGTCATGGGGACT GTTGCCAGCATCCCTTCGGGTCATGGGGACT GTTGCCAGCATCCCTTCGGGTCATGGGGACT GTTGCCAGCATCCCTTCGGGTCATGGGGACT GTTGCCAGCATCCCTTCGGGTCATGGGGACT GTTGCCAGCATGCCTTCGGGTCATGGGGACT GTTGCCAGCATGCCTTCGGGTCATGGGGACT GTTGCCAGCATGCCTTCGGGTCATGGGGACT GTTGCCAGCATGCCTTCGGGTCATGGGGACT GTTGCCAGCATGCCTTCGGGTCATGGGGACT GTTGCCAGCATGCCTTCGGGTCATGGGGACT GTTGCCAGCATGCCTTCGGGTCATGGGGACT GTTGCCAGCATGCCTTCGGGTCATGGGGACT GTTGCCAGCATGCCTTCGGGTCATGGGGACT GTTGCCAGCATGCCTTCGGGTCATGGGGACT GTTGCCAGCATGCCTTCGGGTCATGGGGACT GTTGCCAGCATGCCTTCGGGTCATGGGGACT GTTGCCAGCATGCCTTCGGGTCATGGGGACT GTTGCCAGCATGCCTTCGGGTCATGGGGACT GTTGCCAGCATGCCTTCGGGTCATGGGGACT GTTGCCAGCATGCCTTCGGGTGATGGGGACT GTTGCCAGCATGCCTTCGGGTGATGGGGACT GTTGCCAGCATGCCTTCGGGTGATGGGGACT GTTGCCAGCATGCCTTCGGGTGATGGGGACT GTTGCCAGCATGCCTTCGGGTGATGGGGACT GTTGCCAGCATGCCCTTCGGGTGATGGGGACT GTTGCCAGCATGCCCTTCGGGTGATGGGGACT GTTGCCAGCATGCCCTTCGGGTGATGGGGACT GTTGCCAGCATGCCCTTCGGGTGATGGGGACT GTTGCCAGCATGCCCTTCGGGTGATGGGGACT GTTGCCAGCATGCCCTTCGGGTGATGGGGACT GTTGCCAGCATGCCCTTCGGGTGGTGGGGGACT GTTGCCAGCATGCCCTTCGGGTGATGGGGACT					ACTICCCCGTACATCGACC ACATCGCCGGTACATCGACC ACATCGCCGGTACATCGACC ACATCGCCGGTACATCGACC ACATCGCCGGTACATCGACC ACATCGCCGGTACATCGACC ACATCGCCGGTACATCGACC ACATCGCCGGTACATCGACC ACATCGCCGGTACATGGACC			TCTCAGTTCGATTGGGTTGCAACTCGACCCATGAA TCTCAGTTCGATTGGGTTGCAACTCGACCCATGAA TCTCAGTTCGATTGGGTTGCAACTCGACCCATGAA TCTCAGTTCGATTGGGTTGCAACTCGACCCATGAA TCTCAGTTCGATTGGGTTGCAACTCGACCCATGAA TCTCAGTTCGATTGGGTTGCAACTCGACCCATGAA TCTCAGTTCGATTGGGTTGCAACTCGACCCATGAA TCTCAGTTCGATTGGGTTGCAACTCGACCCATGAA TCTCAGTTCGATTGGGTTGCAACTCGACCCATGAA TCTCAGTTCGATTGGGGTTGCAACTCGACCCATGAA TCTCAGTTCGATTGGGGTTGCAACTCGACCCATGAA TCTCAGTTCGATTGGGGTTGCAACTCGACCCATGAA TCTCAGTTCGATTGGGGTTGCAACTCGACCCATGAA TCTCAGTTCGATTGGGGTTGCAACTCGACCCATGAA TCTCAGTTCGATTGGGGTTGCAACTCGACCCATGAA TCTCAGTTCGATTGGGGTTGCAACTCGACCCATGAA TCTCAGTTCGATTGGGGTTGCAACTCGACCCATGAA TCTCAGTTCGATTGGGGTTGCAACTCGACCCATGAA TCTCAGTTCGATTGGGGTTGCAACTCGACCCATGAA TCTCAGTTCGATTGGGGTTGCAACTCGACCCATGAA TCTCAGTTCGGATTGGGGTTGCAACTCGACCCATGAA TCTCAGTTCGGATTGGGGTTGCAACTCGACCCCATGAA TCTCAGTTCGGATTGGGGTTGCAACTCGACCCCATGAA TCTCAGTTCGGATTGGGGTTGCAACTCGACCCCATGAA TCTCAGTTCGGATTGGGGTTGCAACTCGACCCCATGAA TCTCAGTTCGGATTGGGGTTGCAACTCGACCCCATGAA TCTCAGTTCGGATTGGGGTTGCAACTCGACCCCATGAA TCTCAGTTCGGATTGGGGTTGCAACTCGACCCCATGAA TCTCAGTTCGGATTGGGGTTGCAACTCGACCCCCATGAA TCTCAGTTCGGATTGGGGTTGCAACTCGACCCCCATGAA TCTCAGTTCGGATTGGGGTTGCAACTCGACCCCATGAA TCTCAGTTCGGATTGGGGTTGCAACTCGACCCCATGAA TCTCAGTTCGGATTGGGGTTGCAACTCGACCCCATGAA TCTCAGTTCGGATTGGGGTTGCAACTCGACCCCATGAA TCTCAGTTCGGATTGGGGTTGCAACTCGACCCCATGAA TCTCAGTTCGGATTGGGGTTGCAACTCGACCCCATGAA TCTCAGTTCGGATTGGGGTTGCAACTCGACCCCATGAA TCTCAGTTCGGATTGGGGTTGCAACTCGACCCCATGAA TCTCAGTTCGGATTGGGGTTGCAACTCGACCCCATGAA TCTCAGTTCGGATTGGGGTTGCAACTCGACCCCATGAA
<pre>NR_103947.1 S. fulvissimus DEM NR_02515.1 s. luridiscablei S NR_114493.1 S. caviscables ATC NR_125221.1 S. pratensis ch24 NR_043849.1 S. anulatus NRRL B NR_043350.1 S. badius CS9536 NR_041093.1 S. tubiginoschelvo NR_115965.1 S. flavofuscus NRR NR_112309.1 S. globisporus NNR NR_112309.1 S. globisporus NNR NR_043033.1 S. funcarius CSSP RM 207217.2 S. lunaelactis MNL NR_115264.1 S. baarnensis NNRL NR_041425.1 S. albovinaceus NN NR_112210.1 S. argenteolus JCM NR_043033.1 S. parvus NNRL B-1 NR_112257.1 S. anulatus NNRC 1 NR_112240.1 S. gluricobus NNRC 1 NR_112285.1 S. pracecox NBRC 1 NR_112285.1 S. puniceus NBRC 1 NR_112285.1 S. guniceus NBRC 1 NR_112285.1 S. guniceus NBRC 1 NR_112265.1 S. gliesus NAC2 20 NR_115264.1 S. subtariopsis JC NR_115264.1 S. subtariopsis JC NR_11526.3 S. griseus SNRC 15 NR_11543.1 S. melanogenes NNR NR_112453.1 S. melanogenes NNR NR_112453.1 S. subtariopsis JC NR_11543.1 S. subtariopsis JC NR_11543.1 S. subtariopsis JC NR_11545.1 S. griseus NBRC 1 NR_112457.1 S. griseus NBRC 1 NR_112457.1 S. griseus NBRC 1 NR_11547.1 S. griseus NBRC 1</pre>	CTTCCAGARCCTTCGGGTARTGGGACT GTTCCAGARCCTTCGGGTARTGGGACT GTTCCAGARCCTTCGGGTARTGGGACT GTTCCAGARTCCCTTCGGGTARTGGGACT GTTCCAGARTCCCTTCGGGTARTGGGACT GTTCCAGARTCCCTTCGGGTARTGGGACT GTTCCAGARTCCCTTCGGGTARTGGGACT GTTCCAGARTCCCTTCGGGTARTGGGACT GTTCCAGARTCCCTTCGGGTARTGGGACT GTTCCAGARTCCCTTCGGGTARTGGGACT GTTCCAGARTCCCTTCGGGTARTGGGACT GTTCCAGARTCCCTTCGGGTARTGGGACT GTTCCAGARTCCCTTCGGGTARTGGGACT GTTCCAGARTCCCTTCGGGTARTGGGACT GTTCCAGARTCCCTTCGGGTARTGGGACT GTTCCAGARTCCCTTCGGGTARTGGGACT GTTCCAGARTCCCTTCGGGTARTGGGACT GTTCCCAGARTCCCTTCGGGTARTGGGACT GTTCCAGARTCCCTTCGGGTARTGGGACT GTTCCAGARTCCCTTCGGGTARTGGGACT GTTCCAGARTCCCTTCGGGTARTGGGACT GTTCCAGARTCCCTTCGGGTARTGGGACT GTTCCAGARTCCCTTCGGGTARTGGGACT GTTCCAGARTCCCTTCGGGTARTGGGACT GTTCCAGARTCCCTTCGGGTARTGGGACT GTTCCAGARTCCCTTCGGGTARTGGGACT GTTCCAGARTCCCTTCGGGTARTGGGACT GTTCCAGARTCCCTTCGGGTARTGGGACT GTTCCAGARTCCCTTCGGGTGARTGGGACT GTTCCAGARTCCCTTCGGGTGARTGGGACT GTTCCAGARTCCCTTCGGGTGARTGGGACT GTTCCAGARTCCCTTCGGGTGARTGGGACT GTTCCAGARTCCCTTCGGGTGARTGGGACT GTTCCAGARTCCCTTCGGGTGARTGGGACT GTTCCAGARTCCCTTCGGGTGARTGGGACT GTTCCAGARTCCCTTCGGGTGARTGGGACT GTTCCAGARTCCCTTCGGGTGARTGGGACT GTTCCAGARTCCCTTCGGGTGARTGGGACT GTTCCAGARTCCCTTCGGGTGARTGGGACT GTTCCAGARTCCCTTCGGGTGARTGGGACT GTTCCAGARTCCCTTCGGGTGARTGGGACT GTTCCAGARTCCCTTCGGGTGARTGGGACT GTTCCAGARTCCCTTCGGGTGARTGGGACT GTTCCAGARTCCCTTCGGGTGARTGGGACT GTTCCAGARTCCCTTCGGGTGARTGGGACT GTTCCAGARTCCCTTCGGGTGARTGGGACT GTTCCAGARTCCCTTCGGGTGARTGGGACT GTTCCAGCARTCCCTTCGGGTGARTGGGACT GTTCCAGCARTCCCTTCGGGTGARTGGGACT					LALTIGCCGGTACARTGAGC ACARTGCCGGTACARTGAGC		CACCONTICADAAAACCCG GAGCGAATCTCADAAAACCCG GAGCGAATCTCADAAAACCCG GAGCGAATCTCADAAAACCCG GAGCGAATCTCADAAAACCCG GAGCGAATCTCADAAAACCCG GAGCGAATCTCADAAAACCCG GAGCGAATCTCADAAAACCGG GAGCGAATCTCADAAACCGG GAGCGAATCTCADAAACCGG GAGCGAATCTCADAAACCGG GAGCGAATCTCADAAACCGG GAGCGAATCTCADAAACCGG GAGCGAATCTCADAAACCGG GAGCGAATCTCADAAACCGG GAGCGAATCTCADAAACCGG GAGCGAATCTCADAAACCGG GAGCGAATCTCADAAACCGG GAGCGAATCTCAAAAACCGG GAGCGAATCTCAAAAACCGG GAGCGAATCTCAAAAACCGG GAGCGAATCTCAAAAACCGG GAGCGAATCTCAAAAACCGG GAGCGAATCTCAAAAACCGG GAGCGAATCTCAAAAACCGG GAGCGAATCTCAAAAACCGG GAGCGAATCTCAAAAACCGG GAGCGAATCTCAAAAACCGG GAGCGAATCTCAAAAACCGG GAGCGAATCTCAAAAACCGG GAGCGAATCTCAAAAACCGG GAGCGAATCTCAAAAACCGG GAGCGAATCTCAAAAACCGG GAGCGAATCTCAAAAACCGG GAGCGAATCTCAAAAACCGG GAGCGAATCTCAAAAACCGAACCG	TCTCAGTTCGATTCGGGTCTGCAACTCGACCCATGAA TCTCAGTTCGATTCGGGTCTGCAACTCGACCCATGAA TCTCAGTTCGATTGGGGTCGCAACTCGACCCATGAA TCTCAGTTCGATTGGGGTCTGCAACTCGACCCATGAA TCTCAGTTCGGATTGGGGTCTGCAACTCGACCCATGAA TCTCAGTTCGGATTGGGGTCTGCAACTCGACCCATGAA TCTCAGTTCGGATGGGGTCTGCAACTCGACCCCATGAA TCTCAGTTCGGATGGGGTCTGCAACTCGACCCCATGAA TCTCAGTTCGGATGGGGTCTGCAACTCGACCCCATGAA TCTCAGTTCGGATGGGGTCTGCAACTCGACCCCATGAA TCTCAGTTCGGATGGGGTCTGCAACTCGACCCCATGAA TCTCAGTTCGGATGGGGTCTGCAACTCGACCCCATGAA TCTCAGTTCGGATGGGGTCTGCAACTCGACCCCATGAA TCTCAGTTCGGATGGGGTCTGCAACTCGACCCCATGAA TCTCAGTTCGGATGGGGTCTGCAACTCGACCCCATGAA TCTCAGTTCGGATGGGGTCTGCAACTCGACCCCATGAA TCTCAGTTCGGATGGGGTCTGCAACTCGACCCCATGAA TCTCAGTTCGGATGGGGTCTGCAACTCGACCCCATGAA TCTCAGTCGGATGGGGTCTGCAACTCGACCCCATGAA TCTCAGTCGGATGGGGTCTGCAACTCGACCCCATGAA TCTCAGTCGGATGGGGTCTGCAACTCGACCCCATGAA TCTCAGTCGGATGGGGTCGCAACTCGACCCCATGAA TCTCAGTCGGATTGGGGTCGCAACTCGACCCCATGAA TCTCAGTCGGATTGGGGTCGCAACTCGACCCCATGAA TCTCAGTCGGATTGGGGTCGCAACTCGACCCCATGAA TCTCAGTCGGATTGGGGTCGCAACTCGACCCCATGAA TCTCAGTCGGATTGGGGTCGCAACTCGACCCCATGAA TCTCAGTCGGATTGGGGTCGCAACTCGACCCCATGAA TCTCAGTCGGATTGGGGTCGCAACTCGACCCCATGAA TCTCAGTCGGATTGGGGTCGCAACTCGACCCCATGAA TCTCAGTCGGATTGGGGTCGCAACTCGACCCCATGAA TCTCAGTCGGATTGGGGTCGCAACTCGACCCCATGAA TCTCAGTCGGATTGGGGTCGCAACTCGACCCCATGAA TCTCAGTCGGATTGGGGTCGCAACTCGACCCCATGAA TCTCAGTCGGATTGGGGTCGCAACTCGACCCCATGAA TCTCAGTCGGATTGGGGTCCCAACTCGACCCCATGAA TCTCAGTCGGATTGGGGTCGCAACTCGACCCCATGAA TCTCAGTCGGATTGGGGTCGCAACTCGACCCCATGAA TCTCAGTCGGATTGGGGTCGCAACTCGACCCCATGAA TCTCAGTCGGATTGGGGTCGCAACTCGACCCCATGAA TCTCAGTCGGATTGGGGTCGCAACTCGACCCCATGAA TCTCAGTCGGATTGGGGTCGCAACTCGACCCCATGAA TCTCAGTCGGATTGGGGTCGCAACTCGACCCCATGAA TCTCAGTCGGATTGGGGTCGCAACTCGACCCCATGAA TCTCAGTCGGATTGGGGTCGCAACTCGACCCCATGAA TCTCAGTCGGATTGGGGTCTGCAACTCGACCCCATGAA TCTCAGTCGGATTGGGGTCTGCAACTCGACCCCATGAA TCTCAGTCGGATTGGGGTCGCACTGAACTCGACCCCATGAA

	1330	1340	1350	1360	1370	1380	1390	1400	1410	1420	1430	1440	1450	1460	1470	1480	1490	1500
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Streptomyces sp.TBG19NRA1	CGGAGTTGCTAGTAA	TCGCAGATCAG	-CATTGCTGC					ACGTCACGAAA										
NR_103947.1 S. fulvissimus DSM	CGGAGTTGCTAGTAA							ACGTCACGAAA										
NR_025155.1 S. luridiscabiei S	CGGAGTTGCTAGTAA							ACGTCACGAAA										
NR_114493.1 S. caviscabies ATC	CGGAGTTGCTAGTAA							ACGTCACGAAA										AGCCGTA
NR_125621.1 S. pratensis ch24	CGGAGTTGCTAGTAA							ACGTCACGAAA										
NR_043854.1 S. microflavus NRR	CGGAGTTGCTAGTAA							ACGTCACGAAA										
NR_043489.1 S. anulatus NRRL B	CGGAGTTGCTAGTAA							ACGTCACGAAA										
NR_043350.1 S. badius CSSP536	CGGAGTTGCTAGTAA																	
NR_041093.1 S. rubiginosohelvo	CGGAGTTGCTAGTAA																	
NR_115965.1 S. flavofuscus NRR	CGGAGTTGCTAGTAA							ACGTCACGAAA										
NR_112309.1 S. globisporus NBR	CGGAGTTGCTAGTAA																	
NR_112311.1 S. griseinus NBRC	CGGAGTTGCTAGTAA	TCGCAGATCAG																
NR_043834.1 S. pluricolorescen	CGGAGTTGCTAGTAA	TCGCAGATCAG						ACGTCACGAAA										
NR_043351.1 S. fimicarius CSSP	CGGAGTTGCTAGTAA	TCGCAGATCAG						ACGTCACGAAA										
KM 207217.2 S. lunaelactis MM1	CGGAGTTGCTAGTAA																	
NR_115964.1 S. baarnensis NRRL	CGGAGTTGCTAGTAA	TCGCAGATCAG	-CATTGCTGC	GGTGAATAC	STTCCCGGGC(CTTGTACACA	CCGCCCGTC	ACGTCACGAAA	GTCGGTAACA(CCGAAGCCG	GTGGCCCAAC	CCCTTGTGGG	AGGGAGCTGTC	GAAGGTGGGA	CTGGCGATTG(GGACGAAGTC	GTAACAAGGTI	AGCCGTA
NR_041425.1 S. albovinaceus NB																		
NR_112120.1 S. argenteolus JCM	CGGAGTTGCTAGTAA																	
NR_043833.1 S. parvus NRRL B-1	CGGAGTTGCTAGTAA	TCGCAGATCAG	-CATTGCTGC	GGTGAATAC	STTCCCGGGC(CTTGTACACA	CCGCCCGTC	ACGTCACGAAA	GTCGGTAACA(CCGAAGCCG	GTGGCCCAAC	CCTTGTGGG	AGGGAGCTGTC	GAAGGTGGGA	CTGGCGATTG(GGACGAAGTC	GTAACAAGGT	AGCCGTA
NR_112527.1 S. anulatus NBRC 1	CGGAGTTGCTAGTAA	TCGCAGATCAG	-CATTGCTGC	GGTGAATAC	STTCCCGGGC(CTTGTACACA	CCGCCCGTC	ACGTCACGAAA	GTCGGTAACA(CCGAAGCCG	GTGGCCCAAC	CCTTGTGGG	AGGGAGCTGTC	GAAGGTGGGA	CTGGCGATTG	GACGAAGTC	GTAACAAGGT	AGCCGTA
NR_041196.1 S. fulvorobeus NBR	CGGAGTTGCTAGTAA																	
NR_112358.1 S. praecox NBRC 13	CGGAGTTGCTAGTAA	TCGCAGATCAG	-CATTGCTGC	GGTGAATAC	GTTCCCGGGC(CTTGTACACA	CCGCCCGTC	ACGTCACGAAA	GTCGGTAACA(CCGAAGCCG	GTGGCCCAAC	CCTTGTGGG	AGGGAGCTGTC	GAAGGTGGGA	CTGGCGATTG(GGACGAAGTC	GTAACAAGGT	AGCCGTA
NR_112340.1 S. alboviridis NBR	CGGAGTTGCTAGTAA	TCGCAGATCAG	CATTGCTG	GGTGAATAC	GTTCCCGGGC(CTTGTACACA	CCGCCCGTC	ACGTCACGAAA	GTCGGTAACA(CCGAAGCCG	GTGGCCCAAC	CCTTGTGGG	AGGGAGCTGTC	GAAGGTGGGA	CTGGCGATTG	GGACGAAGTC	GTAACAAGGT	AGCCGTA
NR_112300.1 S. argenteolus NBR	CGGAGTTGCTAGTAA																	
NR_112285.1 S. puniceus NBRC 1	CGGAGTTGCTAGTAA																	
NR_112284.1 S. pluricolorescen	CGGAGTTGCTAGTAA																	
NR_112257.1 S. californicus NB	CGGAGTTGCTAGTAA																	
NR_042791.1 S. griseus KACC 20	CGGAGTTGCTAGTAA																	
NR_115264.1 S. sundarbansensis	CGGAGTTGCTAGTAA																	
NR_112453.1 S. clavifer NBRC 1	CGGAGTTGCTAGTAA																	AGCCGTA
LC 102485.1 S. wistariopsis JC	CGGAGTTGCTAGTAA	TCGCAGATCAG	-CATTGCTGC	GGTGAATAC	STTCCCGGGC(CTTGTACACA	CCGCCCGTC	ACGTCACGAAA	GTCGGTAACA(CCGAAGCCG	GTGGCCCAAC	CCTTGTGGG	AGGGAGCTGTC	GAAGGTGGGA	CTGGCGATTG	GACGAAGTC	GTAACA	
NR_115143.1 S. griseus ISP 523		TCGCAGATCAG	CATTGCTG	GGTGAATAC	GTTCCCGGGC	CTTGTACACA	CCGCCCGTC	ACGTCACGAAA	GTCGGTAACA(CCGAAGCCG	GTGGCCCAAC	CCTTGTGGG	AGGGAGCTGTC	GAAGGTGGGA	CTGGCGATTG	GGACGAAGTC	GTAACAAGGT	AGCCGTA
NR_115783.1 S. melanogenes NRR	CGGAGTTGCTAGTAA	TCGCAGATCAG	-CATTGCTGC	CGGTGAATAC	STTCCCGGGC	CTTGTACACA	CCGCCCGTC	ACGTCACGAAA	GTCGGTAACA(CCGAAGCCG	GTGGCCCAAC	CCCTTGTGGG	AGGGAGCTGTC	GAAGGTGGGA	CTGGCGATTG	GGACGAAG <mark>T</mark> C	GTAACAAGGT	AGCCGTA
NR 026203.1 S. subrutilus DSM	CGGAGTTGCTAGTAA	TCGCAGATCAG	-CATTGCTGC	GGTGAATAC	STTCCCGGGC	TTGTACACA	CCGCCCGTC	ACGTCACGAAA	GTCGGTAACA	CCGAAGCCG	GTGGCCCAAC	CGT-AAGGGA	AGGGAGCTGTC	GAAGGTGGGA	CTGGCGATTG	GACGAAGTC	GTAACAAGGT	AGCCGTA
NR_112475.1 S. griseus NBRC 15	CGGAGTTGCTAGTAA	TCGCAGATCAG	CATTGCTG	GGTGAATAC	STTCCCGGGC	CTTGTACACA	CCGCCCGTC	ACGTCACGAAA	GTCGGTAACA	CCGAAGCCG	GTGGCCCAAC	CCTTGTGGG	AGGGAGCTGTC	GAAGGTGGGA	CTGGCGATTG	GGACGAAG <mark>T</mark> C	GTAACAAGGT	AGCCG
NR_112314.1 S. griseus NBRC 12	CGGAGTTGCTAGTAA	TCGCAGATCAG	-CATTGCTGC	CGGTGAATAC	GTTCCCGGGC(CTTGTACACA	CCGCCCGTC	ACGTCACGAAA	GTCGGTAACA(CCGAAGCCG	GTGGCCCAAC	CCCTTGTGGG	AGGGAGCTGTC	GAAGGTGGGA	CTGGCGATTG	GGACGAAG <mark>T</mark> C	GTAACAAGGT	AGCCG

Fig. S5: Clustal W Alignment of closely related species of TBG19NRA1 after BLAST analysis