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Phylogenetic Relationship of the Green Alga Nanochlorum eukaryotum Deduced from Its Chloroplast rRNA Sequences

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Abstract. The marine green coccoidal alga Nanochlorum eukaryotum (N.e.) is of small size with an average diameter of 1.5 µm. It is characterized by primitiveappearing biochemical and morphological properties, which are considerably different from those of other green algae. Thus, it has been proposed that N.e. may be an early developed algal form. To prove this hypothesis, DNA of N.e. was isolated by a phenol extraction procedure, and the chloroplast DNA separated by preparative CsCl density-gradient centrifugation. The kinetic complexity of the nuclear and of the chloroplast DNA was evaluated by reassociation kinetics to 3×10^7 bp and $9 \times$ 10⁴ bp, respectively. Several chloroplast genes, including the rRNA genes, were cloned on distinct fragments. The order of the rRNA genes corresponds to the common prokaryotic pattern. The 16S rRNA gene comprises 1,548 bases and is separated from the 23S rRNA gene with its 2,920 bases by a short spacer of 460 bases, which also includes the tRNA^{Ile} and tRNA^{Ala} genes. The 5S rRNA gene has not been found; it must start further than 500 bases downstream from the 3'-end of the 23S rRNA gene. From the chloroplast rRNA sequences, we have deduced secondary structures of the 16S and 23S rRNAs, which are in agreement with standard models. The rRNA sequences were aligned with corresponding chloroplast sequences; phylogenetic relationships were calculated by several methods. From these calculations, we conclude that N.e. is most closely related to Chlorella vulgaris. Therefore, N.e. does not represent an early developed

algal species; the primitive-appearing morphological and biochemical characteristics of *N.e.* must rather be explained by secondary losses.

Key words: Algal phylogeny — Chloroplast phylogeny — Large-subunit rRNA — Nanochlorum eukaryotum — rRNA secondary structure — Small-subunit rRNA

Introduction

Green coccoidal algae of extremely small size, comparable to cyanobacteria, have been described (Andreoli et al. 1978; Dempsey et al. 1980; Johnson and Sieburth 1982; Turner and Gowen 1984; Thinh and Griffiths 1985). From morphological criteria, some of them have been identified as *Chlorella* species (*Chlorella nana*, Andreoli et al. 1978; *Chlorella minutissima*, Dempsey et al. 1980). However, their phylogenetic relationship to other algae has not been inferred from macromolecular sequences. Since small species may represent primitive algal forms, investigations of green microalgae may reveal useful information about the evolution of algae and algal plastids.

The marine green alga Nanochlorum eukaryotum (N.e.) (Wilhelm et al. 1982) is also of extremely small size (1.5 µm in diameter) and furthermore shows some features unusual for eukaryotic organisms (Zahn 1984). *N.e.* contains a single chloroplast and mitochondrion; histones and nucleosomes have not been found as yet. Upon division, chromosomes and spindle apparatus have

not been observed. During mitosis, the nuclear membrane remains unchanged and forms two separate nuclei by pinching. Comparable mitotic characteristics have rarely been observed in green algae (Heath 1980; Margulis 1981). In particular, the absence of histones and thus nucleosomes and the small size have led to the assumption that *N.e.* is a "marginal" eukaryote (Zahn 1984). To either support or disprove this assumption, an even approximate knowledge of the phylogenetic relationship of this alga would be sufficient.

The phylogenetic relationship of organisms can be deduced in principle from the comparison of their macromolecular sequences. In particular, the rRNA genes, which are found not only in all prokaryotic and eukaryotic cells, but also in organelles, are well suited for such investigations (Cedergren et al. 1988; Van de Peer et al. 1990).

Thus, we have cloned and sequenced the chloroplast rRNA genes and have inferred the phylogenetic relationship of *N.e.* from these sequences.

Materials and Methods

Growth Conditions. N.e. was grown in continuous cultures as described by Zahn (1984).

DNA Isolation. Five grams (wet weight) of fresh N.e. cells were incubated overnight at 37°C in 2 ml lysis buffer (50 mmol/l Tris/HCl, pH 8, 250 mmol/l EDTA, 1 mmol/l aurintricarboxylic acid, 1.5% SDS, 2 mg/ml proteinase K). The mixture was centrifuged at 5,000g and the supernatant was extracted with an equal volume of phenol/chloroform (1:1/v:v). Nucleic acids were precipitated from the aqueous phase with isopropanol, redissolved in 4 ml TE buffer (50 mmol/l Tris/HCl, pH 8, 50 mmol/l EDTA), digested with RNase A, reextracted with phenol/ chloroform, and repeatedly precipitated with isopropanol. About 0.5 mg total DNA was thus obtained. Yeast (*Saccharomyces cerevisiae*) DNA was isolated according to Cryer et al. (1975).

Analytical Density Gradient Centrifugation. Total DNA from N.e. was dissolved in 15 mmol/l Tris/HCl, pH 8, containing CsCl at a density of 1.7010 g/ml. Centrifugation was performed at 44,000 rpm in a Beckman model E centrifuge with digital data output in double sector cells. Densities were determined according to Szybalsky and Szybalsky (1971) with DNA from *Clostridium perfringens* and *Micrococcus lysodeicticus* as internal standards.

Preparative Density Gradient Centrifugation. Total DNA of N.e. was dissolved in CsCl/Tris/HCl (see above) at a concentration of 100 μ g/ml and centrifuged for 20 h at 41,000 rpm in a Beckman VTi 50 rotor. The contents of the tubes were fractionated while reading the optical densities at 254 nm. To isolate the AT-rich DNA, the fractions containing approx. 5% of the total DNA at the "light side" of the peak were collected and recentrifuged three times until DNA of homogeneous density was obtained. Approx. 100 μ g of DNA with a GC content of 34% was obtained from 10 mg of total DNA.

Reassociation Kinetics. DNA was dissolved in phosphate buffer (0.12 mol/l, pH 7), sonicated, and dialyzed against the same buffer for 24 h. Samples containing approx. 50 μ g/ml DNA were gassed with helium, filled into the thermocuvette of a Gilford 250 spectrophotom-

eter, and heated until no further increase in absorbancy at 260 nm was observed (approx. 95°C). Then the cuvette was cooled to 65° C within 1.5 min and the absorbancies of the samples at 260 nm were recorded on digital tape for 96 h (approx. 500 data points). Data were fitted to the equation

$$S/c_o = f(1 + k_1 f c_o t)^{-0.445} + (1 - f)(1 + k_2 (1 - f) c_o t)^{-0.445}$$
 (1)

(Britten and Davidson 1976) by a curve fit program (Minuit, CERN library), where S is the concentration of single-stranded DNA, c_o is the total DNA concentration, f is the fraction of the first component, and k_1 and k_2 are the reassociation constants of the two components, respectively.

Restriction Endonuclease Digestion and Hybridization with ctDNA Probes. Restriction endonuclease digestion, Southern blotting, and hybridization were done according to Sambrook et al. (1989). ctDNA probes from spinach (cytochrome f; 32-kDa protein from photosystem II [herbicide binding protein], ribulose-1,5-bisphosphate carboxylase/ oxygenase, large subunit [rubisco]; photosystem I P700 apoprotein; ATP synthase, subunit alpha) were prepared according to Bolivar et al. (1977). Radioactive labeling of the probes was carried out as described by Rigby et al. (1977). A cDNA transcript of *Escherichia coli* 16S rRNA was obtained with the cDNA synthesis system from Amersham. All enzymes were purchased from Boehringer Mannheim; ³²P-labeled deoxyribonucleoside triphosphates came from Du Pont.

Construction of ctDNA Libraries and Mapping of the Genome. ctDNA fragments obtained from partial digestion with *Hin*dIII and from total digestion with *Cla*I were ligated into pBR322-DNA using standard methods (Sambrook et al. 1989). Transformation of *Escherichia coli* DH1 cells was carried out as described by Dagert and Ehrlich (1979). For the detection of ctDNA-containing clones, 10⁵ colonies of the ctDNA library on nitrocellulose filters were lysed according to Sambrook et al. (1989). Colony hybridization with ctDNA probes was carried out under stringent conditions (68°C, 6× SSC). A radiolabeled cDNA transcript of purified *Escherichia coli* 16S rRNA was used to detect fragments carrying ribosomal genes on Southern blots of the restricted ctDNA. With these fragments, several *Hin*dIII clones were detected, which contained ribosomal genes.

Sequence and Secondary Structure Determination of the rRNA Genes. For sequence determination, the HindIII, EcoRI, and EcoRI/ HindIII subfragments of the rRNA operon were inserted into pBR322-DNA following standard methods (Sambrook et al. 1989). Plasmid sequencing was done by the chain termination method (Sanger et al. 1977) using the T7-sequencing kit from Pharmacia-LKB. Standard primers for pBR322-derived HindIII and EcoRI sequences from Pharmacia-LKB, or specific 16-bp oligonucleotide primers produced on a DNA synthesizer (Beckman type 200) were used. Computer sequence analyses were performed with the Microgenie software package (Beckman). The sequence is available from EMBL nucleotide sequence database under access number X76084 CHNERRNA.

To obtain secondary structures of the SS and LS rRNA, the sequences were arranged in analogy to the standard models of Gutell et al. (1985) and Gutell and Fox (1988). Secondary structures of several variable domains were calculated according to Zuker and Stiegler (1981), using energy values from Freier et al. (1986).

Sequence Alignment and Tree Construction. Sequence alignments were performed with the "Clustal Software Package" (Higgins and Sharp 1988). Phylogenetic trees were calculated with different programs from the "Phylip Software Package," release 3.2 (Felsenstein 1989).

Results

DNA Isolation

The cell wall of N.e. contains a layer of sporopollenin (Geisert et al. 1987). Since no enzyme for the digestion of sporopollenin is known we were unable to produce protoplasts and subsequently failed to isolate circular ctDNA. The same experience has been reported for Chlorella (Yamada and Sakaguchi 1981), in which protoplasts have been obtained only from sporopollenin-free Chlorella strains. Treatment of N.e. cells with proteinase K and SDS, followed by phenol extraction, yielded low amounts of DNA. The average size of this DNA was 25 kb as judged from gel electrophoresis and density gradient-centrifugation profiles. Mechanical opening of the cells by grinding with alumina or passage through a French press prior to enzymatic digestion yielded DNA of even lower molecular weight, which was unsuitable for density gradient-separation procedures.

Density Gradient Centrifugation of DNA

The analytical CsCl gradient-centrifugation profile of the total DNA of *N.e.* reveals one main band and one satellite band. The GC content of the main band DNA was 44%; the GC content of the satellite band DNA was 34%, as determined from internal standards. No DNA subcomponents with a defined, but different GC content were hidden under the main band DNA. These were not expected, since in lower eukaryotes such subclasses have rarely been identified (Macaya et al. 1976). The satellite band DNA comprises 3% of the total DNA. It was separated from the main band DNA by repeated cycles of preparative CsCl gradient centrifugation without the addition of any density difference-enhancing substances.

Reassociation Kinetics

Reassociation kinetics were determined by measuring the decreasing hyperchromicity at 260 nm as a function of time. Besides the single-copy DNA, eukaryotic DNA normally contains fast-reassociating repetitive DNA and fold-back sequences. Therefore, a two-component curve (eq. 1) was selected to describe the experimental data. The reassociation constants and the portion of the singlecopy DNA were determined by a curve fit procedure. The reassociation constants, which are inversely proportional to the genetic complexity, are listed in Table 1; 95% of the main band DNA of N.e. reassociates with a constant of 0.10. Single-copy DNA from yeast, which was used as a reference, reassociates with a constant of 0.23. Using the complexity of the yeast genome of $1.4 \times$ 10^7 bp (Mortimer et al. 1992), we calculated the genetic complexity of the *N.e.* genome to be approx. 3.2×10^7 bp. This value is slightly smaller than values determined

Table 1. Reassociation constants of DNA from N.e. and yeast

	Reassociation constant (mol ⁻¹ s ⁻¹)	Proportion of DNA which reassociates with this constant
N.e. main band DNA N.e. satellite band	0.10	95.3%
DNA	35.3	90.5%
Yeast total DNA	0.23	87.9%

for several *Chlorella* species (Dörr and Huss 1990). We conclude from the kinetic complexity of the main band DNA and from the total amount of DNA per cell of 6×10^{-14} g (Zahn 1984) that the genome of *N.e.* is haploid. The reassociation constant of 35.3 for the satellite band DNA corresponds to a genetic complexity of 9×10^4 bp.

No corrections for the difference in base ratios between reference DNA and sample DNA were made. The influence of the GC content upon reassociation velocity has been differently assessed: no change (Britten et al. 1974), a decrease (Gillis et al. 1970), and an increase (Wetmur and Davidson 1968) have been reported for increasing GC content. Since yeast (42% GC) and N.e. (44% GC) have almost identical base ratios a correction in any case would be negligible. Since the base ratio of the satellite band DNA (34% GC) differs considerably from the base ratio of the yeast reference DNA, the value of the kinetic complexity for the satellite band DNA (9 \times 10^4 bp) may well be greater or smaller by a margin of up to 20%. The value of 9×10^4 bp is consistent with the data obtained from restriction endonuclease analysis. (See below.)

Identification of Chloroplast DNA in the Satellite Band DNA

The satellite band DNA, isolated by preparative density gradient centrifugation, was digested with several restriction enzymes, and the fragments were separated by gel electrophoresis (shown for *PvuII*, *SaII*, and *XbaI* in Fig. 1). Distinct from the background, a pattern of well-separated bands was obtained for each enzyme, indicating that this fraction preferentially contains DNA of low genetic complexity. The lengths of the fragments add up to 72,000 bp for the *PvuII* digest.

The DNA fragments were blotted onto a nitrocellulose sheet and probed with several chloroplast genes from spinach. The DNA probes hybridized exclusively with the digests of the satellite band DNA, but not with the main band DNA. The genetic complexity of the satellite band DNA of approx. 9×10^4 bp, the base ratio of 34% GC, and the hybridization characteristics prove that the satellite band DNA predominantly consists of ctDNA. Since the satellite band DNA was isolated by a method selective for the base ratio, it probably contains

ABCDE



Fig. 1. Electrophoretic separation of restriction endonuclease digests of the satellite DNA band of *N.e.* Lanes A and E: marker DNA (lambda DNA, restricted with *Eco*RI + *Hin*dIII, fragment lengths in kb). Lane B: *Pvu*II digest. Lane C: *Sal*I digest. Lane D: *Xba*I digest.

some additional AT-rich nuclear DNA sequences of higher genetic complexity. This fact explains the background to be seen in Fig. 1.

The genetic complexity of the ctDNA compares to approx. 0.3% of the haploid nuclear DNA of *N.e.* (9 × 10^4 bp vs 3.2×10^7 bp). Since 3% of the total DNA is ctDNA, the chloroplast of *N.e.* contains approx. ten copies of the ct genome.

Partial Mapping of the Chloroplast Genome

Satellite-band DNA libraries were established in the vector pBR322 using fragments from partial (*Hind*III) and complete (*Cla*I) restrictions. Starting with the gene for the herbicide binding protein (psb A) from spinach, overlapping clones were detected by colony hybridization, which comprise a DNA segment of 10.9 kb. This segment contained the gene for the large subunit of rubisco as well as the gene for the ATP synthase subunit alpha (Fig. 2A). The same order has been found in *Codium fragile* (Manhart et al. 1989). However, in algal ctDNA the order of genes varies considerably, even in closely related species (Palmer 1985).

A 15.4-kb segment of the chloroplast genome was mapped by hybridization analysis using overlapping *Hind*III fragments from the satellite band DNA. On this segment a ribosomal operon was identified by hybridization analysis with *Escherichia coli* 16S cDNA. As shown in Fig. 2B, this rRNA operon is entirely located on a 6-kb fragment from the *Cla*I library.

Primary Structure of the rRNA Genes

The 6-kb ctDNA fragment from the *ClaI* library contains most of the chloroplast rRNA operon and was almost

completely sequenced. The order of the rRNA and tRNA genes follows the common chloroplast pattern (Palmer 1985). No introns or internally transcribed spacer (ITS) sequences were found inside the genes. The distance between the 16S rRNA and the 23S rRNA genes comprises merely 459 bases, including the usual tRNA^{IIe} and tRNA^{Ala} genes and three spacers. This distance is comparably short, a shorter distance has only been observed in *Euglena gracilis* thus far (Palmer 1985). In contrast, the spacer sequence between the 23S rRNA and the 5S rRNA genes must be unusually long, since we sequenced 500 bases downstream from the 3'-end of the 23S rRNA gene.

Secondary Structure of Chloroplast rRNA

Arranging rRNA sequences to secondary structure models is a prerequisite for alignment procedures. A secondary structure can be obtained from the SS rRNA of *N.e.* in analogy to the structure model of Gutell et al. (1985), which corresponds very well to other chloroplast SS rRNA structures (Fig. 3). Numbering of stems and variable regions follows the proposal of Dams et al. (1988). Noticeable differences among chloroplast sequences of *N.e.* and those from other species occur in two variable regions: (1) In SS rRNA of N.e., the stem and loop structure 6 in V1 contains 40 bases while, for example, the length of this structure in the chloroplasts of Zea mays and Chlamydomonas reinhardtii comprises only 21 and 25 bases, respectively; (2) in SS rRNA of N.e., the V7 region is shorter than in other chloroplasts. Recalculating the base pairing in the V7 region according to Zuker and Stiegler (1981) led to a secondary structure not showing stem 42; however, this region can be also arranged according to the standard model. Additional minor differences in the lengths of stems or loops, respectively, were exclusively found in variable regions. (See aligned sequences in Fig. 5.)

The chloroplast large ribosomal subunit (LS) rRNA from N.e. can be arranged with minor differences according to the LS rRNA secondary structure model of Gutell and Fox (1988) (Fig. 4). Stems, loops, and variable regions are designated according to Engberg et al. (1990). Two areas of high sequence variability are known in chloroplast LS rRNA. The first is D1, which in N.e. comprises the bases 257-443. Our calculations gave a secondary structure for this region with two additional stem-loop structures (D1a and D1d) as compared to the model of Gutell and Fox (1988). Helix D1a has also been found by Engberg et al. (1990) in Tetrahymena pyriformis LS rRNA. The second variable region is D7B, which in N.e. comprises the bases 1437-1639. For this domain in N.e., our calculations led to a different secondary structure than proposed by Gutell and Fox (1988). Both regions show no homology to the corresponding sequences of other chloroplasts.

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Fig. 2. Restriction map of the two consecutive segments of the ctDNA. A 10.9-kb segment. B 15.7-kb segment. Bars indicate adjacent or overlapping clones, respectively. Restriction sites: B, BamHI; C, ClaI; E, EcoRI; H, HindIII. The approximate locations of psbA, RbcL, atp a1, and rRNA are indicated.

Michot et al. (1990), Bachellerie and Michot (1989), and Michot and Bachellerie (1987) have performed detailed comparisons of the variable domains D2, D3, and D8 and of the 3'-terminus of LS rRNA from many organisms. They observed specific conserved base motifs and secondary structures in these domains, which are characteristic for major phylogenetic groups or organelles, respectively. The LS rRNA domains of *N.e.* correspond well to the pattern characteristic for chloroplasts; for example, the variable domain 3 contains the additional short stem-loop structure (D3c), which is specific for chloroplast LS rRNA (Michot et al. 1990). This stem-loop structure is not contained in the general model of Gutell and Fox (1988).

Sequence Alignment

The chloroplast rRNA sequences from *N.e.* were aligned with the corresponding sequences from chloroplasts of algae and of some plants. The rRNA sequences from *Escherichia coli* and *Anacystis nidulans* were included as outgroups.

A satisfactory procedure for the alignment of only two DNA sequences is presently not known. (For a recent discussion of the problem see Thorne et al. 1991.) The alignment of rRNA sequences becomes particularly complicated due to the fact that rRNA genes consist of regions showing different degrees of conservation. For distantly related species, only the highly conserved regions can be aligned (Cedergren et al. 1988), while for closely related species it is even possible to align the variable regions (Lenaers et al. 1991).

We have used the "Clustal Program" (Higgins and Sharp 1988) for the alignment. With the aid of the secondary structure models, homologous, highly conserved regions were identified for all species, which could be aligned unambiguously by hand. Between such fixed regions sub-sequences several hundred bases in length were aligned with the Clustal Program. Under these conditions the program worked satisfactorily. The alignment obtained with the program was not further corrected by hand. Results are shown in Figs. 5 and 6.

Almost the complete SS rRNA sequences could be aligned, except that 21 bases from the *Escherichia coli* sequence in stem-loop structure 18 were deleted (Fig. 5). Poor alignment is observed, however, in the variable regions V1 and V7, mainly due to the greater length of the *Chlorella ellipsoidea* sequence.

The alignment of the LS rRNA was less satisfactory. Two short segments, comprising 14 and 25 nucleotides, respectively, had to be deleted from the *Escherichia coli* sequence (Fig. 6). Furthermore, for all species the variable domains D1 and D7B as well as the 3'-end with the 4.5S rRNA had to be excluded from the alignment procedure.

Phylogenetic Trees

We have calculated approx. 100 trees with the "Phylip Software Package," using parsimony, compatibility, distance matrix, and likelihood programs. Alternative tree rearrangements were employed by using the "global" option and the "Penny" algorithm. Predominantly, subsets of the aligned sequences have been used, including or excluding variable regions of uncertain alignment. The distance matrix trees calculated from the complete LS and SS rRNAs are shown as examples in Fig. 7.

From the different trees the following conclusions were drawn: On all trees the plant chloroplasts emerge on a single, defined branch in the known order; this branch always contains the chloroplasts of the *Chlorella* species, too. We could, however, not unambiguously define the position of the *Chlamydomonas reinhardtii* chloroplast. In the majority of calculations this species was located on the "plant branch." The branching point could not be determined precisely and varied with the method of calculation and the set of data used. On all SS rRNA trees we always found a close relationship be-



Fig. 3. Secondary structure of chloroplast SS rRNA of *N.e.* Stem-loop structures and variable domains are numbered according to Dams et al. (1988).

tween *Pylaiella littoralis* and *Euglena gracilis* chloroplasts. We could not determine, however, whether the branch containing *Pylaiella littoralis* and *Euglena gracilis* emerges separately from the cyanobacterial branch or whether it is contained in a monophyletic chloroplast tree. These results are almost identical to chloroplast phylogenetic trees recently constructed from SS rRNA (Turner et al. 1989; Markowicz and Loiseaux-de Goer 1991; Douglas 1992). Our LS rRNA tree corroborates these results; the branching order of the plant and the *Chlorella* chloroplasts is identical to the SS rRNA tree, but like in the SS rRNA tree the branching position of *Chlamydomonas reinhardtii* and of *Euglena gracilis* chloroplasts cannot exactly be determined.

Concerning the position of *N.e.*, we obtained identical results from all calculations: the chloroplast of *N.e.* was



Fig. 4. Secondary structure of chloroplast LS rRNA of *N.e.* Stem-loop structures and variable domains are numbered according to Engberg et al. (1990).

always located on a subbranch, which also contained the *Chlorella* species. This was valid for both SS and LS rRNA and for all methods of phylogenetic calculations, which were employed. On the SS rRNA tree, which included two *Chlorella* species, we always obtained an even closer relationship of *Chlorella* vulgaris with *N.e.* than of *Chlorella* vulgaris with *Chlorella* ellipsoidea. Bootstrap probability for the close relation among *N.e.* and *Chlorella* vulgaris was 98%.

Discussion

Inference of phylogenetic relationships from sequence data is a notoriously difficult task (for a thorough discussion of the problem see Felsenstein 1988), and thus conflicting results are numerous in the recent literature. Ambiguous results in tree construction may be due to the fact that the particular data set used may not contain sufficient information in a statistical sense to support a



Fig. 4. Continued.

		col	440 2470 AGGA AGGGTC ATTGACGTTACCCGCAGA AGA AGC ACCGGCTA ACTCCGTGCCAGCAGCCG
COL	AAATTUAAUAUTTI-UAICATUUCTCAUATTUAACUCTUUCUCAUUCUTAACA	Ana	AAGAAGAAAQTGACQGTACCTGAGGAATAAGCCTCGQCTAATTCCGTGCCAGCAGCCG
DAD	TTCACGGAGAGTTT-GATCCTGGCTCAGGATGAACGCTGGCGGCATGCTTAACA	nan	AAGAATTTTGACGGTATCTGAGGAATAAGCATCGGCTAACTCTGTGCCAGCAGCCG
cla	ATCCATGGAGAGTTT-GATCCTGGCTCAGGACGAACGCTGGCGGCATGCTTAACA	cla	AAGAAGTTC-TGACGGTATCTGAGGAATAAGCACCGGCTAACTCTGTGCCAGCAGCCG
che	TTCATGGAGAGTTTCGATCCTGGCTCAGGATGAACGCTGGCGGCATGCTTAACA	che	AAGAAGTTC-TGACGGTATCTGAGGAATAAGCATCGGCTAACTCCGTGCCAGCAGCCG
chv	-TGCCTGCAGAGAGTTT-GATCCTGGCTCAGGATGAACGCTGGCGGCATGCTTAACA	chv	AAGAAGCAT-TGACGGTATCTGAGGAATAAGCATCGGCTAACTCTGTGCCAGCAGCCG
eug	GAAATGACGAGTTT-GATCCTTGCTCAGGGTGAACGCTGGCGGTATGCTTAACA	eug	AAGAAG-AAATGACGUTATTTGAGGAATAAGCATCGGCTAATTCCGTGCCAGCAGCGGCG
py1	AAACTATCGAGAGTTT-GATCCTCACCTCACGATUAACUCTGUCUGIAIGCIIIACA	271	AAGATGCAA-TGACGOTATCTGAGGAATAAGCATCGGCTAACTCCGTGCCAGCAGCGG
Bar		BAI	AAGAAACAA-TGACGGTATCTGAGGAATAAGCATCGGCTAACTCTGTGCCAGCAGCCG
tob	ATCA ATCTCATGCAGAGTT-CGATCCTCGCTCAGGATGAACGCTGGCGGCATGCTTAACA	tob	AAGAAGCAA-TGACGGTATCTGGGGGAATAAGCATCGGCTAACTCTGTGCCAGCAGCCG
.00	***** **** * ***** ***********		* ** ***** ** * *** **** ****** ** *****
	54 ¥1		528
col	CATGCAAGTCGAACGGTAACAGGAAGAAGCTTGCTTCTTTGCTGACG	col	CGGTAAT-ACGGAGGGTGCAAGCGTTAATCGGAATTACTGGGCGTAAAGCGCACGCA
ana	CATGCAAGTCGAACG	Ana	
nan	CATOCAAGTCGAACGAACATAAAATTGTGC11GCATAATTTTA-TACTG	cla	COGTAAT-ACAGAGGGTGCAAGCGTTGTCCGCAATGATTGGGCGTAAAGCGTCTGTAGGT
che	CATOCAAGICGAACGUSTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTT	che	CGGTAAG-ACGGAGGATGCAAGCGTTATCCGGAATGATTGGGCGTAAAGCGTCTGTAGGT
chy	CATGCAAGTCGTACGCATGCAATTTGGCTTGCCAGATTGCGATG	chv	COGTAAG-ACAGAGGATGCAAGCGTTATCCGGAATGATTGGGCGTAAAGCGTCTGTAGGT
eug	CATGCAAGTTGAACGAAATTACTAGCAATAGTAATTT	eug	CGGTAAT-ACGGGAGATGCGAGCGTTATCCGGAATTATTGGGCGTAAAGAGTTTGTAGGC
pyl	CATOCAAGTCGTACGAAAGTGTTAAAACTTT	pyl	CGGTAAGGACGGGGGATGCAAGTGTTATCCGGAATTACTGGGCGTAAAGCGTTTGTAGGT
mar	CATGCAAGTCGTACOGGAAGGATCCTAGTGGTGTTTCC	BAP	COUTAAU-ACAGAGGATGCAAUCUTTATCCUGGAATGATTGGGCCGTAAAGCGTCTGTAGGT
BA1	CATOCAAGTCGAACGGGAAG	tob	CGGTAAT-ACAGAGGATGCAAGCGTTATCCGGAATGATTGGGCGTAAAGCGTCTGTAGGT
top			****** ** * * ** ** ** ** * * ********
	101		587
col	AGTGGCGGACGGGTGAGTAATGTCTGGGAAACTTGCCTGATGGAGGGGATAACTACTGGA	col	GGTTTGTTAAGTCAGATGTGAAATCCCCCGGGCTCAACCTGGGAACTGCATCTGA-TACTG
ana	AGTGGCGGACGGGTGAGTAACGCGTGAGAATCTGCCTACAGGACGGGGACAACAUTTGGA	Ana	GOTTAATCAAUTUTUTUTUTUAAAGCGTGGGGGCTCAACCTCATACAGGCAATGGAA-ACTG
nan		cla	GCCCCGTAAAGTCTAATGTCAAATACCAGGGCTCAACCTTGGACCGGCAGAGAGAACACTA
ci#	AGTGGCGGACGGGTAAGTAACGCGTAAGAACCTACCTTTAGGCGGGGGACAACAACTGGA	che	GGTTTATTAAGTCTACTGTTAAAGATCAGGGCTTAACCCTGAGTCGGCAGTAGAA-ACTA
chv	AGTOGCOGACOGGTGAGTAACACGTAAGAACCTACCTTTTTOGAGAGGGATAACCATTOGA	chv	GGCTTAAAAAGTCTCCTGTCAAAGATCAGGGCTTAACCCTGGGCCGGCAGGAGAA-ACTC
eus	AGTGGCGGACGGGTGAGTAATATGTAAGAATCTGCGCTTGGGCGAGGAATAACAGATGGA	eug	GGTCAAGTGTGTTTAATGTTAAAAGTCAAAGCTTAACTTTGGAAGGGCATTAAAA-ACTG
pyl	AGTGGCGGACGGGTGAGTAACACGTGAGAATTTACCTTTAGGAGGGGAATAACAGTTGGA	pyl	GGTTTAGTAAGTCTATTGTTAAAGCTTGAAGCTTAACTTCAAAAGTGTAATAGAA-ACTA
BAT	AGTGGCGGACGGGTGAGTAACGCGTAAGAACCTGCCCTTGGGAGGGGGACAACAGCTGGA	BAT	GGCTTTTTAAGTCCGCCGTCAAATCCCAGGGCTCAACCCTGGACAGGCGGTGGAA-ACTA
mai	AGTGGCGAACGGGTGAGTAACGCGTAAGAACCTGCCCTTGGGAGGGGAACAACAACTGGA	MA1	OCTTTTTCAAGTCCCCCGTCAAATCCCCAGGGCTCAACCCTGGACAGGCGGTGGAA-ACTA
tob	AGTGGCGGACGGGTGAGTAACGCGTAAGAACCTGCCCTTGUGAGGGGAACAACAUCTUGA	100	UCCITITITANGTCCUCCUTCAAATCCCAGUGUTCAACCCTGGACAGGCGGTGGAA-ACTA
	****** ****** **** * *** * * * * * * * *		+++ +++
	161 ¥2		646
col	AACGG-TAGCTAATACCGCATAACGTCGCAA-GACCAAAGAOGGGGACCTTCGGGC	col	GCAAGCTTGAGTCTCGTAGAGGGGGGGGGGAGAATTCCAGGTGTAGCGGTGAAATGCGTAGAG
ana	AACGA-CTGCTAATACCCGATGTG-CCGAGAGGTGAAACATTTATG	ana	ATTGACTAGAGTATGGTAGGGGTAGCGGGAATTCCAGGTGTAGCGGTGAAATGCGTAGAT
nan	AACGAATGGCTAATACCTCATATTA-CTGAGAAGTGAAAGATGAATA	nan	ATAGACTAGAGTTCGGTAGGGGCAGAGGGGAATTCCCCGGTGGAGCGGTGAAATGCGTAGAG
cla	AACTG-TTGCTAATACCCCATACAG-CTGAGGAGTGAAAGGTGAAAGGTGAAAA	cla	ACGAGCTTGAGTACGGTAGGGGCAGAGGGGAATTCCATGTGGAGCGGTGAAATGCGTAGAG
che		che	TTAGGCTAGAGTTTGGTAGGGGCAGAGGGAATTCCCGGGTGTAGAGGGGGGGG
chv		euf	CTAGACTTGAGTATGGTAGGGGTGAAGGGAATTTCCCAGTGTAGCGTGAAATGCGTAGAG
eug nwl	AATG-ACTGCTAATGCCGCATATCGTAATTATGAGACATATCATAACTATGAAAGAAGAA	pyl	CTAGACTTGAGGATAGTAGGGGTAAAGGGAATTTCCAGTGGAGCGGTGAAATGCGTAGAG
BAT	AACGG-TTGCTAATACCCCATAGG-CTGAGGAGCAAAAGGAGGAAT	mar	CCAAGCTGGAGTACGGTAGGGGCAGAGGGGAATTTCCGGTGGAGCGGTGAAATGCGTAGAG
mai	AACGG-TTGCTAATACCCCGTAGG-CTGAGGAGCAAAAGGAGAAAT	mai	CCAAGCTGGAGTACGGTAGGGGGCAGAGGGAATTTCCGGTGGAGCGGTGAAATGCATTGAG
tob	AACGG-CTGCTAATACCCCGTAGG-CTGAGGAGCAAAAGGAGGAA-	tob	CCAAGCTGGAGTACGGTAGGGGCAGAGGGGAATTTCCGGTGGAGCGGTGAAATGCGTAGAG
	** ***** ** * *		
	215		706
col	215 CTCTTGCCATCGGATGTGCCCAGATGGGATTAGCTAGTGGGTG-GGGTAACGGCTCACCT	col	706 ATCTGGAGGAATACCGGTGGCGAAGGCGGCCCC-CTGGACGAAGACTGACGCTCAGGTGC
col ana	215 CTCTTGCCATCGGATGTGCCCAGATGGGATTAGCTAGTGGGTG-GGGTAACGGCTCACCT GCCTGTAGATGAGCTCGCGTCTGATTAGCTAGTGGTGGGG-TAAGGGCCTACCA	col ana	706 Atctggaggaataccggtggcgaaggcggcccc-ctggacgaagactgacgctcaggtgc Atctggaagaacaccagcggcgaaaggcgg-ctactgggccataactgacgctcatggac
col ana nan	215 Стоттвосатовоатотосссаватовоаттаютаятаюте-оботаасвостсаст осстотаватоаютсесстваттаютаютового-таловосстасса Атсассааваатовосттестоятсаюттеговогааед-таловостасса	col ana nan	706 ATCTGGAGGAATACCGGTGGCGAAGGCGGCCCC-CTGGACGAAGACTGACGCTCAGGTGC ATCTGGAAGAACACCAGCGGCGAAAGCGCG-CTACTGGGCCAATAACTGACGGCCAATGGAC ATCGGAGAACACCAAGGCGAAAGCACTTCTGCTGGGCCGCGACTGACACTGAGAGAC
col ana nan cla	215 CTCTTGCCATCGGATGTGCCCAGATGGGATTAGCTAGTAGGTG-GGGTAACGGCTCACCT GCCTGTAGATGAGCTGGCGTCTATTAGCTAGTGGTGGGG-TAAGGGCCTACCA ATCACCAGGATGGCCTTG-CTGATCAGCTTGTGGTAGGG-TAATGGCTACCA ACCGCCGATAGAGGGGCTTGCGTCGATTAGCTAGTGGTGGGGGGTAACGGCCTCCCA	col ana nan cla	706 ATCTGGAGGAATACCGGTGGCGAAGGCGGCCCC-CTGGACGAAGACTGACGGCCAGGGG ATCTGGAAGAACACCACGGCGGAAGGCGGC-CTACTGGGCCATAACTGACGCCCATGGGA ATCGG-AGAACACCAAGGCGAAGGCACTTGCTGGGGCGCGAACTGACACTGAGAGAC ATATGGAGGAACACCAGTGGGGAGGGCG-CTGCTGGGCCGGAACTGACACTGAGAGAC
col ana nan cla che	215 Стоттассатсаватотосссаватаваяттавставтавата оботоссаватавается составляется составата составата составата и составата и составата и составата и составата и составата и составата составата и составата составата составата и состава	col ana nan cla che	706 ATCTGGAGGAATACCGGTGGCGAAGGCGGCCCC-CTGGACGAAGACTGACGCTCAGGTGC ATCTGGAAGAACACCACGGCGGAAAGCGCG-CTACTGGGCCATAACTGACGCCTCATGGAAC ATCGG-AGAACACCAAGGCGAAAGCACTTCTGCTGGGCCGACTGACACTGAGAGAC ATATGGAAGAACACCAATGGCGAAGGCGCT-CTGCTGGGCCGAAACTGACACTGAGAGAC ATCGGGAAGAACACCAATGGCGAAGGCAC-CTGCTGGGCCGAAACTGACACTCAGAGAGA ATCGGGAAGAACACCAATGGCGAAGGCAC-CTGCTGGGCCCAAACTGACACTCAGAGAC
col ana nan cla che chv	215 CTCTTGCCATCGGATGTGCCCAGATGGGATTAGCTAGTAGGTG-GGGTAACGGCTCACCT GCCTGTAGATGAGCTGCCCGAGTCGATTAGCTAGTGGTGGGG-TAACGGCTCACCA ATCACCAAGAGATGGGCTTGTCTGATCACCTTGTTGGTAAGG-TAATGGCTTACCA AT-CCGCCAATGAGGGCTGCGCTGATTAGCTAGTGGTGAGG-TAATGGCTTACCA ATTCGGCTAAGATGGGCTTGCGCTGATTAGCTTGTTGGTGAGG-TAATGGCTTACCA ATTCGGCCTAGGCATGGCTTGCGCTGATTAGCTTGTTGGTGAGG-TAATGGCTTACCA	col ana nan cla che chv eug	706 ATCTGGAGGAATACCGGTGGCGAAGGCGGCCCC-CTGGACGAAGACTGACGCTCAGGTGC ATCTGGAAGAACACCAGCGGCGAAAGGCG-CTACTGGGCCATAACTGACGCTCATGGAC ATCGGAGAACACCAAAGGCGAAAGCACTTCTGCTGGGCCGGACTGACACTGAGAGAC ATTGGAGAACACCAATGGCGAAAGCACT-CTGCTGGGCCCGAACTGACACTGAGAGAC ATCGGGAAGAACACCAATGGCGAAAGCACT-CTGCTGGGCCCGAAACTGACACTGAGAGAC ATCGGGAAGAACACCAATGGCGAAGCACT-CTGCTGGGCCCAAACTGACACTGAGAGAC ATTGGAAGAACACCAATGGCGAAGCACT-CTGCTGGGCCCAAACTGACACTGAGAAGAC
col ana nan cla che chv eug pyl	215 СТСТТВССАТСОВАТОТОСССАВАТООВАТТАОСТАВТАОВОГО-ОВОТААСОВСТСАСТ ОССТОТАВАТОАВСТСОСТОАТТАОСТАВТОВОГО ОВОТСАССА АТСАССААДОАВТОВОСТТОА-ТСТВАТСАВСТВОГОТОВОСТТАССА АССОССААТОАВОВОСТТОСОТСТВАТТАОСТАВТОВОГОАВОСТТАССА АТТСТВСТААОВАТОВОСТТОСОТСТВАТТАОСТАВТОВОГОАВОСТТАССА АТТСТВСТАВОВСТВОСОТСОСОТСТВАТТАОСТОВТОВОВСТААТАВССТТВССА АТТСТВССААТОВОСТТВСОТСТВАТТАОСТПОТОВТВАВО-ТААТАВССТТВССА АТТСТВССААТОВОСТТВСОСТОСТВАТТАОСТПОТОВТВАВО-ТААТАВССТАССА АТТСТВОССААТОВОСТТВССАТСТВАТТАОСТПОТОВТВАВО-ТААТАВССТАССА АТТСТВОССААТОАВССТВОСОТСТВАТТАОСТПОТОВТВАВО-ТААСАВОСТТАССА	col ana nan cla che chv eug pyl	706 ATCTGGAGGAATACCGGTGGCGAAGGCGGCCCC-CTGGACGAAGACTGACGCTCAGGTGC ATCTGGAAGAACACCAGCGGCGAAAGCGCG-CTACTGGGCCATAACTGACGCTCATGGAC ATCGG-AGAACACCAAAGGCGAAAGCACTTCTGCTGGGCCGCGACTGACACTGAGAGAC ATCGGGAAGAACACCAATGGCGAAAGCACT-CTGCTGGGCCGAAACTGACACTGAGAGAC ATCGGGAAGAACACCAATGGCGAAGCACT-CTGCTGGGCCAAACTGACACTCAGAGAC ATCGGGAAGAACACCAATGGCGAAGCACT-CTGCTGGGCCATAACTGACACTGAGAGA ATCGGGAAGAACACCAATGGCGAAGGCACT-TTTCTAGGCAATACTGACACTGAGAAAC ATTGGAAAGAACCCAATGGCGAAGGCACTT-TTCTAGGCCATACTGACACTGAGAAAC
col ana nan cla che chv eug pyl mar	$\begin{array}{c} 215\\ \texttt{CTCTTGCCATCGGATGTGCCCAGATGGGATTAGCTAGTAGGTG-GGGTAACGGCTCACCT}\\gCCTOTAGATGAGCTGCCGCGTCTAATTAGCTAGTGGTGGGG-AAAGGCTTACCA\\ ATCACCAGAGATGGGCTTG-CTTGATCAGCTTGTTGGTAAGG-TAATGGCTTACCA\\ ACCGCCGATAGAGGGGCTTGCGTCTGATTAGCTAGTGGTGGGGGTAACGGCCTCCCA\\ ATTCTGTCTAAAGATGGCTTGCGCTCGATTAGCTTGTTGGTGAAGG-TAATGGCTTACCA\\ ATCCGCCAATGATGGCTTGCGTCTGATTAGCTTGTTGGTGAGG-TAATGGCTTACCA\\ ATTCGCCTAAGGAAGCTTGCGTCTGATTAGCTGTGTGGTGAGG-TAAAGGCTTACCA\\ ATTC-GCCTAAGGAAGGCTTGCGTCTGATTAGCTAGTTGGTGAGG-TAAAGGCTTACCA\\ ATTCGCCTAAGGAAGGCTTGCGTCTGATTAGCTAGTTGGTGAGG-TAAAGGCTTACCA\\ ATTC-GCCTAAGGAAGGCTTGCGTCTGCTTGTAGTAGCTAGTGGTAAGGCTAACAGCTTACCA\\ ATTCGCCTAAGGAAGGCTTGCGTCTGATTAGCTAGTTGGTGAGG-TAATAGCCTACCA\\ ATTCGCCTAAGGAAGGCTTGCGTCTGCTATTAGCTAGTTGGTAAGGTAAAGGCTTACCA\\ ATTCGCCTAAGGAAGGCTTGCGTCTGCTATTAGCTAGTTGGTAAGGTAAAGGCTTACCA\\ ATTCGCCTAAGGACGGCTTGCGTCTGCTATTAGCTAGTTGGTAAGGTAATGGCTACCA\\ ATTCGCCTAAGGACGTTGCGTTGCTGCTGTATTAGCTAGTTGGTAAGGTAATGGCTACCA\\ ATTCGCCTAAGGACGTTGCGTTGCTGCTGCTATTAGCTAGTTGGTAAGGTAATGGCTACCA\\ ATTCGCCTAAGGACGTTGCGTTGCTGCTGCTGCTGCTGCTATTAGCTAGTTGGTAAGGTAATGGCTACCA\\ ATTCGCCTAAGGACGTTGCGTTGCGTCTGCTGCTGCTGCTGCTGCTGCTGCTG$	col ana cla che chv eug pyl mar	706 ATCTGGAGGAATACCGGTGGCGAAGGCGGCCCC-CTGGACGAAGACTGACGCTCAGGTGC ATCTGGAAGAACACCAACGGCGGAAGGCGC-CTACTGGGCCCATAACTGACGCTCATGGAC ATCGGAGAACACCAAAGGCGAAGCGCT-CTGCTGGGCCGGAACTGACACTGAGAGAC ATTGGAAGAACACCCAATGGCGAAGGCGCT-CTGCTGGGCCGAAACTGACACTGAGAGAC ATCGGGAAGAACACCAATGGCGAAAGCACT-CTGCTGGGCCGAAACTGACACTGAGAGAC ATCGGAAGAACACCCAATGGCGAAGGCACT-CTGCTGGGCCATACTGACACTGAGAGAC ATTGGAAGAACACCCAATGGCGAAGGCACT-TTTCTAGGCCATTACTGACACTGAGAGAC ATTGGAAGGACCACCGATGGCGAAGGCACT-TTTCTGGGCCATTACTGACGCTGAGAAAC ATTGGAAGGACCACCGATGGCGAAGGCACT-TTCTGGGCCATTACTGACACTGAAGAAC ATTGGAAGAACACCAATGGCGAAGGCACT-TTCTGGGCCAATCTAACGCTCAAGGAAAC
col ana nan cla che che eug pyl mar mai	$\begin{array}{c} 215\\ \texttt{CTCTTGCCATCGGATGTGCCCAGATGGGATTAGCTAGTAGGTG-GGGTAACGGCTCACCT}\\GCCTGTAGATGAGCTGCCCCGATTAGCTAGTGGTGGGGG-TAAGGGCTACCA\\ ATCACCAAGAGTGGGCTTGCTGATCACCTTGTTGGTAAGG-TAATGGCTTACCA\\ ACCGCCAATGAGGGCTGCGCTGATTAGCTAGTGGTGAGGGCTAACGGCCTCCCA\\ ATTCTGTCTACAAAGATGGCTTGCGGCTGATTAGCTTGTGGTGAGG-TAATGGCTTACCA\\ ATT-CGCCAATGAGTGCGCTGCGCTGATTAGCTTGTGGTGAGG-TAATGGCTTACCA\\ ATT-CGCCAAGAAAGGCTGCCGCTGATTAGCTGTGTGGTGAGG-TAATGGCTTACCA\\ ATTCGCCCAAGGAGGGCTTGCGCTGATTAGCTAGTGGTGAGG-TAATGGCTTACCA\\ ATTC-GCCAAGGAGAAAGCTTGCGCTGCATTAGCTAGTGGTGAGG-TAATGGCTTACCA\\ ATTCGCCAAGGAGAGGGCTTGCGTCTGATTAGCTAGTGGTGAGG-TAATGGCTTACCA\\ ATTCGCCAAGGAGGGGCTGCCGCTGCATTAGCTAGTGGTGAGG-TAATGGCTTACCA\\ ATTCGCCAAGGAGGGGCTGCCGCTGCATTAGCTAGTGGTGAGG-TAATGGCTACCA\\CCGCCAAGGAGGGGCTGCCGCTGCTATTAGCTAGTGGTGAGG-TAATGGCTTACCA\\CCGCCAAGGAGGGGCTGCCGCTGCTGATTAGCTAGTGGTGAGG-CAATAGCTTACCA\\CCGCCAAGGAGGGGCTGCCGCTGCTGATTAGCTAGTGGTGAGGC-CAATAGCTTACCA\\CCGCCAAGGAGGGGCTGCCGCTGCTGATTAGCTAGTGGTGAGGCACAAGGCTACCA\\CCGCCAAGGAGGGGCTGCCGCTGCTGATTAGCTAGTGGTGAGGCACAAGGCTACCA\\CCGCCAAGGAGGGGCTGCCGCTGCTGATTAGCTAGTGGTGAGGCAGCCACTACCA\\CCGCCAAGGAGGGCCTGCCGCTGCCGCGCGCGCGCGCGCG$	col ana nan cla che chv eug pyl mar mai	706 ATCTGGAGGAATACCGGTGGCGAAGGCGGCCCC-CTGGACGAAGACTGACGCTCAGGTGC ATCTGGAGAAGAACACCAGCGGCGAAAGCGCG-CTACTGGGCCATAACTGACGCTCATGGAC ATCGGAGAACACCAAAGGCGAAAGCACTCTGCTGGGCCGCAACACTGACACTGAGAGAC ATCGGAAGAACACCAATGGCGAAGGCT-CTGCTGGGCCGAAACTGACACTGAGAGAC ATCGGGAAGAACACCAATGGCGAAGCACT-CTGCTGGGCCCAAACTGACACTGAGAGAC ATTGGAAGAACACCAATGGCGAGGCACT-TTCTTAGGCCATAACTGACACTGAGAGAC ATTGGAAGAACACCAATGGCGAGGCACT-TTCTTAGGCCATACTGACACTGAGAGAC ATTGGAAGAACCACCGATGGCGAAGCCACT-TACTGAGGCCATACTGACACTGAGAGAC ATTGGAAGAACCACCAATGGCGAAGCACT-TACTGAGGCCATGAGAAC ATTGGAAGAACCACCAATGGCGAAGCACT-TACTGAGGCCACTTGAGAAC ATTGGAAGAACCACCAATGGCGAAGCACT-TACTGAGGCCACTGAGAAC ATCGGAAGAACCACCAATGGCGAAGCACT-TCTGCTGGGCCCACACTGACACTGAGAAC ATCGGAAGAACCACCAACGGCGAAGCACT-CTGCTGGGCCCACACTGACACTGAGAAC
col ana nan cla che che eug pyl mar mai tob	215 CTCTTGCCATCGGATGTGCCCAGATGGGATTAGCTAGTAGTG-GGGTAACGGCTCACCT GCCTQTAGATQACCCGCCTCGATTAGCTAGTGGTGGGG-TAAGGGCTCACCA ATCACCAGAGAATGGGCTTGTCTGATCAGCTTGTTGGTGAGG-TAATGGCTTACCA AT-CCCCCAATGAGGGGCTTGCGTCTGATTAGCTAGTGGTGAGG-TAATGGCTTACCA ATTCTGCTAAGGATGGGCTTGCGCTGATTAGCTGTTGGTGAGG-TAATGGCTTACCA ATTC-CGCCAATGAGGGGCTGCGCTGATTAGCTGTGGTGAGG-TAATGGCTTACCA ATTC-CGCCAAGAGGGGGCTGCGCTGATTAGCTGTGGTGAGG-TAATGGCTACCA ATTC-CGCCAAGAGGGGGCTGCGCTGATTAGCTGGTGGTGAGG-TAATGGCTACCA ATTC-CGCCAAGGAGGGGCTGCGCTGATTAGCTGGTGGTGAGG-CAATGGCTACCA ATTC-GCCAAGGAGGGGCTGCGCTGATTAGCTAGTTGGTGAGG-TAATGGCTACCA CCGCCAAGGAGGGGCTGCGCTGGTGTAATAGCTAGTGGTGAGG-CAATGGCTACCA TCCGCCCAAGGAGGGGCTGGCGTGGCTGATTAGCAAGTTGGTGAGG-CAATGGCTACCA	col ana nan cla che chv eug pyl mar mai tob	706 ATCTGGAGGAATACCGGTGGCGAAGGCGGCCCC-CTGGACGAAGACTGACGCTCAGGTGC ATCTGGAAGAACACCAGCGGGGAAAGCGGC-CTACTGGGCCATAACTGACGCTCAGGAGA ATCGG-AGAACACCAATGGCGAAGCGCT-CTGCTGGGCCGAACTGACACTGAGAGAC ATCGGGAGAACACCAATGGCGAAG-ACT-CTGCTGGGCCGAAACTGACACTGAGAGAC ATCGGGAAGAACACCAATGGCGAAGCACT-CTGCTGGGCCAAACTGACACTCAGAGAC ATCGGGAAGAACACCAATGGCGAAGCACT-CTGCTGGGCCAAACTGACACTCAGAGAC ATCGGAAGAACACCAATGGCGAAGCACT-CTGCTGGGCCATAACTGACACTGAGAGAC ATTGGAAGAACACCAATGGCGAAGCACT-TTCTAGGCCATACTGACACTGAGAGAC ATTGGAAAGAACACCAATGGCGAAGCACT-TTCTTGGGCCAACTGACACTGAGAGAC ATCGGAAAGAACACCAATGGCGAAGCACT-CTGTGGGCCGACACTGACACTGAGAGAC ATCGGAAAGAACCCAATGGCGAAGCACT-CTGTGGGCCGACACTGACACTGAGAGAC ATCGGAAAGAACCCAATGGCGAAGCACT-CTGTCGGGCCGACACTGACACTGAGAGAC ATCGGAAAGAACCCAATGGCGAAGCACT-CTGCTGGGCCGACACTGACACTGAGAGAC ATCGGGAAGAACCCACGGCGAAGCACT-CTGCTGGGCCGACACTGACACTGAGAGAC ATCGGGAAGAACCCACGGCGAAGCACT-CTGCTGGGCCGACACTGACACTGAGAGAC
col ana nan cla che chv eug pyl mar mai tob	215 CTCTTGCCATCGGATGTGCCCAGATGGGATTAGCTAGTAGGTG-GGGTAACGGCTCACCT GCCTGTAGATGAGCTGCCCTGATTAGCTAGTGGTGGGG-AAGGCCTACCA ATCACCAGAGATGGGCTTGCCTGCTGATAGCTAGTGGTGAGG-TAAGGCCTACCA ATCCTGTCTAAGATGGGCTTGCGTCTGATTAGCTAGTTGGTGAGG-TAATGCTTACCA ATTCTGCCATAGATGGGCTTGCGTCTGATTAGCTGTGTGGTGAGG-TAATGGCTTACCA ATTCCGCCTAGGCATGAGCTTGCGTCTGATTAGCTGTGTGGTGAGG-TAATGGCTTACCA ATTCCGCCAAGAAGGGGCTGCGCTGC	col ana cla che chv eug pyl mar mai tob	706 ATCTIGAAGGAATACCGGTGGCGAAGGCGGCCCC-CTGGACGAAGACTGACGCTCAGGTGC ATCTIGAAGAACACCAAGGGGCGAAGGCGGCCCC-CTGGACGATAACTGACGCTCAGGAC ATCGG-AGAACACCAATGGCGAAAGCACTTCTGCTGGGCCGCGAACTGACACTGAGAGAC ATTGGAAGGAACACCAATGGCGAAGCACT-CTGCTGGGCCGAAACTGACACTCAGAGAC ATCGGGAAGAACACCAATGGCGAAGCACT-CTGCTGGGCCAAACTGACACTCAGAGAC ATCGGGAAGAACACCAATGGCGAAGCACT-TTTCTAGGCATACTGACACTGAGAGAC ATTGGAAGGACACCCAATGGCGAAGCACT-TTTCTAGGCCATACTGACACTGAGAGAC ATCGGGAAGAACACCAATGGCGAAGCACT-CTGCTGGGCCCACACTGACACTGAGAGAC ATCGGGAAGAACACCAATGGCGAAGCACTT-TTCTAGGCCATACTGACACTGAGAGAC ATCGGAAAGAACACCAATGGCGAAGCACT-CTGCTGGGCCGACACTGACACTGAGAGAC ATCGGAAAGAACCCAATGGCGAAGCACT-CTGCTGGGCCGACACTGACACTGAGAGAC ATCGGAAAGAACACCAATGGCGAAGCACT-CTGCTGGGCCGACACTGACACTGAGAGAC ATCGGAAAGAACACCAACGGCGGAAGCACT-CTGCTGGGCCGACACTGACACTGAGAGAC ATCGGAAAGAACACCAACGGCGGAAAGCACT-CTGCTGGGCCGACACTGACACTGAGAGAC ATCGGAAAGAACACCAACGGCGGAAAGCACT-CTGCTGGGCCGACACTGACACTGAGAGAC ATCGGAAAGAACACCAACGGCGGAAAGCACT-CTGCTGGGCCGACACTGACACTGAGAGAC ATCGGAAAGAACACCAACGGCGGAAAGCACT-CTGCTGGGCCGACACTGACACTGACACTGAGAGAC ATCGGAAAGAACACCAACGGCGGAAAGCACT-CTGCTGGGCCGACACTGACACTGAGAAGAC ATCGGAAAGAACACCAACGACGGCGAAAGCACT-CTGCTGGGCCGACACTGACACTGAGAGAC ATCGGAAAGAACACCAACGACGGCGAAAGCACT-CTGCTGGGCCGACACTGACACTGACACTGAGAGAC ATCGGAAAGAACACCAACGACGAAGCACT-CTGCTGGCGCGACACTGACACTGACACTGAGAGAC ATCGGAAAGAACACCAACGACGAAGCACT-CTGCTGGCGCGACACTGACACTGACACTGAGAGAC
col ana nan cla che chv eug pyl mar mai tob	215 CTCTTGCCATCGGATGTGCCCAGATGGGATTAGCTAGTAGTG-GGGTAACGGCTCACCT GCCTAAGATGAGCTGCCCTGATTAGCTAGTGGTGGGG-TAAGGGCTACCA ATCACCAAGAGATGGGCTTGCTGATCACCTTGTTGGTAAGG-TAATGGCTTACCA AT-CCGCCAATGAGGGCTGCGCTGATTAGCTAGTGGTGAGG-TAATGGCTTACCA ATTCTGTCTAAGATGGGCTTGCGCTGATTAGCTGTGTGGTGAGG-TAATGGCTTACCA ATTC-GCCAATGAGAAGGGCTGCGCTGATTAGCTGTGTGGGAGG-TAATGGCTTACCA ATTC-GCCAAGGAGGGCTGCGCGCTGATTAGCTGGTGGGGAGA-TAATGGCTTACCA ATTC-GCCAAGGAGGGCTGCGCGCGCGCTGATTAGCTAGTGGTGAGG-TAATGGCTTACCA ATTC-GCCCAAGGAGGGGCTGCGCGCTGCATTAGCTAGTGGGAGG-TAATGGCTTACCA CCGCCCAAGGAGGGGCTGCCGCTGCTGATTAGCTAGTGGGAGG-TAATGGCTTACCA CCGCCCAAGGAGGGGCTGCCGCTCGATTAGCTAGTTGGTGAGG-CAATAGCTTACCA CCGCCCAAGGAGGGGCTGCCGCTCGATTAGCTAGTTGGTGAGG-CAATAGCTTACCA 	col ana nan cla che chv eug pyl mar mai tob	706 ATCTGGAGGAATACCGGTGGCGAAGGCGGCCCC-CTGGACGAAGACTGACGCTCAGGTGC ATCTGGAGGAAGACCACGGCGGAAGGCGGCCCC-CTGGACGAAGACTGACGCTCAGGGGC ATCTGGAAGAACACCAAGGCGAAGGCG-CTACTGGGCCGGACTGACACTGAGAGAC ATCTGGAAGAACACCAATGGCGAAGGCC-CTGCTGGGCCGAAACTGACACTGAGAGAC ATCGGGAAGAACACCAATGGCGAAGCACT-CTGCTGGGCCCGAAACTGACACTGAGAGAC ATCGGGAAGAACACCAATGGCGAAGCACT-TTCTTAGGCCATAACTGACACTGAGAGAC ATTGGAAGAACCCAATGGCGAAGCCACT-TTCTTAGGCCATAACTGACACTGAGAGAC ATTGGAAGAACCCAATGGCGAAGCCACT-TACTGAGCCTGAGAAC ATTGGAAGAACCCACTGGCGAAGCCACT-TTCTGGCGCACACTGAGAGAC ATCGGAAAGAACCCACTGGCGAAGCCACT-TCTGTGGGCCCACACTGAGAGAC ATCGGAAAGAACCCACGGCGAAGCACT-CTGCTGGGCCGACACTGAGAGAC ATCGGAAAGAACCCACGGCGAAGCACT-CTGCTGGGCCGACACTGAGAGAC ATCGGAAAGAACCCACGGCGAAGCACT-CTGCTGGGCCGACACTGACAGCACACTGAGAGAC ATCGGAAAGAACCCAACGGCGAAGCACT-CTGCTGGGCCGACACTGACACTGAGAGAC ATCGGAAAGAACACCAACGGCGAAGCACT-CTGCTGGGCCGACACTGACACTGAGAGAC ATCGGAAAGAACACCAACGGCGAAGCACT-CTGCTGGGCCGACACTGACACTGAGAGAC ATCGGAAAGAACACCAACGGCGAAGCACT-CTGCTGGGCCGACACTGACACTGAGAGAC ATCGGAAAGAACACCAACGGCGAAGCACT-CTGCTGGGCCGACACTGACACTGAGAGAC ATCGGAAAGAACACCAACGGCGAAGCACT-CTGCTGGGCCGACACTGACACTGAGAGAC ATCGGAAAGAACACCAACGGCGAAGCACT-CTGCTGGGCCGACACTGACACTGAGAGAC ATCGGAAAGAACACCAACGGCGAAAGCACT-CTGCTGGGCCGACACTGACACTGAGAGAC ATCGGAAAGAACACCAACGGCGAAGCACT-CTGCTGGGCCGACACTGACACTGAGAGAC ATCGGAAAGAACACCAACGGCGAAAGCACT-CTGCTGGGCCGACACTGACACTGAGAGAC ATCGGAAAGAACACCAACGGCGAAGCACT-CTGCTGGGCCGACACTGACACTGAGAGAC ATCGGAAAGAACCCAACGGCGAAGCACT-CTGCTGGGCCGACACTGACACTGAGAGAC ATCGGAAAGAACCCAACGGCGAAGCACT-CTGCTGGGCCGACCTGACACTGACACTGAGAGAC ATCGGAAAGAACACCAACGACGACT-CTGCTGGGCCGACACTGACACTGACACTGAGAGAC ATCGGAAGAACCCAACGGCGAAGCACT-CTGCTGGGCCGACCTGACACTGACACTGAGAGAC ATCGGAAGAACACCAACGACGACGACT-CTGCTGGGCCGACCTGACACTGACACTGAGAGAC ATCGGAAGAACACCAACGACGACGACT-CTGCTGGGCCGACACTGACACTGACACTGAGAGAC ATCGGAAGAACCCAACGGCGAAGCACT-CTGCTGGGCCGACCTGACACTGACACTGACACTGGGAAGACACCACTGACACCTGACACTGACACTGACCACTGACACTGACACTGACCACTGACACCTGACAC
col ana nan cla chv eug pyl mar mai tob	$\begin{array}{c} 215\\ \texttt{CTCTTGCCATCGGATGTGCCCAGATGGGATTAGCTAGTAGTG-GGGTAACGGCTCACCT}\\ \texttt{GCCTQTAGATOAGCTGCCCAGATGGGATTAGCTAGTGGTGGGG-AAAGGGCTCACCA}\\ \texttt{ACACCAGAGAATGGGCTTGTCTGATCAGCTGTTGGTGAAGG-TAATGGCTACCA}\\ \texttt{ACCGCCAATGAGGGGCTGCCTCTGATTAGCTAGTGGTGAGG-AATTGGCTACCA}\\ \texttt{ATTCTGCTAAGAAAGGCTGCGCTGCGGCTGATTAGCTGTGTGGGGAGG-AATGGCTACCA}\\ \texttt{ATTCGCCTAGGCATGAGCTTGCGCTGCATTAGCTGTGTGGGGAGG-AATGGCTACCA}\\ \texttt{ATTC-GCCAAAGAAAGCTGCGCTGCGCTGATTAGCTGTGTGGGGAGG-AATGGCTACCA}\\ \texttt{ATTC-GCCAAAGAAAGCTGCGCTCGATTAGCTAGTGGTGAGG-AATAGGCTACCA}\\ \texttt{ATTC-GCCAAGAAGGGGTGCGTCTGATTAGCTAGTGGTGAGG-AATAGGCTACCA}\\ \texttt{ATTC-GCCAAGGAAGGGCTGCGCTTGATTAGCTAGTGGTGAGG-AATAGGCTACCA}\\ \texttt{CCGCCAAGGAAGGGCTGCGCTGCTGATTAGCTAGTTGGTGAGG-CAATAGCTTACCA}\\ \texttt{CCGCCCAAGGAAGGGCTCGCGTCTGATTAGCTAGTTGGTGAGG-CAATAGCTTACCA}\\ \texttt{CCGCCCAAGGAAGGGGCTCGCGTCTGATTAGCTAGTTGGTGAGG-CAATAGCTTACCA}\\ CCGCCCAAGGAAGGGGCTCGCGTCTGATTAGCTAGTTGGTGAGG-CAATAGCTTACCA \\ \texttt{CCGCCCAAGGAGGGGCTCGCGTCTGATTAGCAAGTTGGTGAGG-CAATAGCTTACCA \\ \texttt{CCGCCCCAAGGAGGGGCTCGCGTCGCGTCTGATTAGCAAGTTGGTGAGG-CAATAGCTTACCA \\ \texttt{CCGCCCCAAGGAGGGGCTCGCGTCGCGTCTGATTAGCAAGTTGGTGAGG-CAATAGCTTACCA \\ \texttt{CCGCCCCAAGGAGGGCTCGCGTCGGGCTGGAGTGAGCCAGTGGGGCACTGGGCACTTGCCA \\ \texttt{CCGCCCCAAGGAGGGCTCGCGTCGGGCTGGAGGAGGACGACCGGGCCACATGGGCACTGGGCTTACCA \\ \texttt{$	col ana nan cla che chv eug pyl mar mai tob	796 ATCTGGAAGGAATACCGGTGGCGAAGGCGGCCCC-CTGGACGAAGACTGACGCTCAGGTGC ATCTGGAAGAACACCAACGGCGGAAAGCGGC-CTACTGGGCCGATAACTGACGCTCAGGAC ATCGGAGAACACCAATGGCGAAAGCACTTCTGCTGGGCCGACATAACTGACACTGAGAGAC ATCGGAGAACACCAATGGCGAAGCGCT-CTGCTGGGCCGAAACTGACACTGAGAGAC ATCGGGAAGAACACCAATGGCGAAGCACT-CTGCTGGGCCGAAACTGACACTGAGAGAC ATCGGGAAGAACACCAATGGCGAAGCACT-CTGCTGGGCCAAACTGACACTGAGAGAC ATCGGGAAGACACCAATGGCGAAGCACT-TACTGAGGCCATAACTGACACTGAGAGAC ATCGGGAAGACACCAATGGCGAAGCACT-TACTGAGGCCATAACTGACACTGAGAAGAC ATCGGAAAGAACCCAATGGCGAAGCACTT-TACTGGGCCACACTGAGAAC ATCGGAAAGAACCCAATGGCGAAGCACT-CTCTGCGGCCGACACTGACACTGAGAAGAC ATCGGAAAGAACCCAATGGCGAAGCACT-CTCTCTGGGCCGACACTGACACTGAGAGAC ATCGGAAAGAACCCAATGGCGAAGCACT-CTCTGCGGCCGACACTGACACTGAGAGAC ATCGGAAAGAACCCAACGGCGAAAGCACT-CTCTGCGGCCGACACTGACACTGAGAGAC ATCGGAAAGAACCCAACGGCGAAAGCACT-CTGCTGGGCCGACACTGACACTGAGAGAC ATCGGAAAGAACCCAACGGCGAAAGCACT-CTGCTGGGCCGACACTGACACTGAGAGAC ATCGGAAAGAACCCAACGGCGAAAGCACT-CTGCTGGGCCGACACTGACACTGAGAGAC ATCGGAAGAACCCAACGGCGAAAGCACT-CTGCTGGGCCGACACTGACACTGAGAGAC ATCGGAAGGACACCCAACGGCGAAAGCACT-CTGCTGGGCCGACACTGACACTGAGAGAC ATCGGAAGGACCCCAACGGCGAAAGCACT-CTGCTGGGCCGACACTGACACTGAGAGAC ATCGGAAGGACCCCACGGCGAAAGCACT-CTGCTGGGCCGCCGCCGACACTGACACTGAGAGAC ATCGGAAGGACCCCAACGGCGAAAGCACT-CTGCTGGGCCGCGCCGACACTGACACTGAGAGAC ATCGGAAGGACCCAACGGCGAAAGCACT-CTGCTGGGCCGCGCCGC
col ana nan cla chv eug pyl mar mai tob col	215 CTCTTGCCATCGGATGGCCCAGATGGGATTAGCTAGTAGGGG-GGGTAACGGCTCACCT GCCTGTAGATGAGCGGCTGCATTAGCTAGTGGTGGGG-TAAGGGCTACCA ATCACCAGAGATGGGCTTG-CTGATTAGCTAGTGGTGAGG-TAATGGCTTACCA ACCGCCGATGAGGGCTTGCCGCTGATTAGCTAGTGGTGGGGG-TAATGGCCTTCCCA ATTCTGTCTAAGAAGGGGCTTGCGCGCTGATTAGCTGGTGGGGG-TAATGGCCTTACCA ATCCGGCCATGAGGGCTGCGGCTGCGGCTGATTAGCTGGTGGGGGAACGGGCTTACCA ATTCGGCCTAGGCATGAGCTTGCGGCTGATTAGCTGGTGGGGGAGGGCTACCA ATTCGGCCTAAGGAAGGGCTGCGGCTGCGATTAGCTGGTGGGGGAGGGCTACCA CCGGCCTAAGGAAGGGGCTGCGGCTGGATTAGCTAGTTGGTGAGG-CAATAGCTTACCA CCGGCCCAAGGAGGGGCTGCGGCTGCGATTAGCTAGTGGTGAGG-CAATAGCTTACCA CCGGCCCAAGGAGGGGCTGCGCGCTCGATTAGCTAGTGGTGAGG-CAATAGCTTACCA CCGGCCCAAGGAGGGGCTGCGCGCTCGATTAGCTAGTGGTGAGG-CAATAGCTTACCA CCGGCCCAAGGAGGGGCCGCGCGCGCTCGATTAGCTAGTGGTGAGG-CAATAGCTTACCA CCGGCCCAAGGAGGGCCGCGCGCCGCGCTCGATTAGCTAGC	col ana nan cla che chv eug pyl mar mai tob col ana	706 ATCTGGAAGAATACCGGTGGCGAAGGCGGCCCC-CTGGACGAAGACTGACGCTCAGGTGC ATCTGGAAGAACACCAGCGGCGAAAGCGCGCCCC-CTGGACGAAACTGACGCTCATGGGAC ATCGGG-AGACACCAAGCGGAAGCCGT-CTGCTGGGCCGACGACTGACACTGACAGAC ATCGGGAAGACACCAATGGCGAAGCGCT-CTGCTGGGCCGAACTGACACTGACAAC ATCGGGAAGACACCAATGGCGAAGCACT-TTCTAGGCCAAACTGACACTGAGAAC ATCGGAAAGACACCAATGGCGAAGGCACT-TTCTAGGCCATACTGACACTGAGAAC ATCGGAAGAACACCAATGGCGAAGGCACT-TTCTAGGCCATACTGACACTGAGAAC ATCGGAAGAACACCAATGGCGAAGGCACT-TTCTGGGCGCAACTGACACTGAGAAC ATCGGAAGAACACCAATGGCGAAGCACT-CTGCTGGGCCGACTGACACTGAGAAC ATCGGAAGAACACCAATGGCGAAGCACT-CTGCTGGGCCGACCTGACACTGAGAAC ATCGGAAGAACACCAACGGCGAAGCACT-CTGCTGGGCCGACCTGACACTGAGAAC ATCGGAAGAACACCAACGGCGAAGCACT-CTGCTGGGCCGACCTGACACTGAGAAC ATCGGAAGAACACCAACGGCGAAGCACT-CTGCTGGGCCGACCTGACACTGAGAAC ATCGGAAGAACACCAACGGCGAAGCACT-CTGCTGGGCCGACCTGACACTGAGAAC ATCGGAAGAACACCAACGGCGAAGCACT-CTGCTGGGCCGACCTGACACTGAGAAC ATCGGAAGAACACCAACGGCGAAGCACT-CTGCTGGGCCGCGCCACTGACACTGAGAAC ATCGGAAGAACACCAACGGCGAAGCACT-CTGCTGGGCCGCCGCCACTGACACTGAGAAC ATCGGAAGAACACCAACGGCGAAGCACT-CTGCTGGGCCGCCGCCGACACTGACACTGAGAGC ATCGGAAGAACACCAACGGCGAAGCACT-CTGCTGGGCCGCCGCCGACCTGACACTGAGAGC ATCGGAAGAACACCAACGGCGAAGCACT-CTGCTGGGCCGCCGCCGCCACTGACACTGAGAGC ATCGGAAGAACACCAACGAGGATTAGATACC-CTGCTGGCCGCCGCCGCGCAACGGACGGACGCGACGC
col ana nan cla che chv eug pyl mai tob col ana nan	215 CTCTTGCCATCGGATGTGCCCAGATGGGATTAGCTAGTAGTG-GGGTAACGGCTCACCT GCCTAAGATGAGCTGCCCCGATGGGATTAGCTAGTGGTGGGG-TAAGGGCTACCA ATCACCAAGAGATGAGGCTTGTCTGATCACCTTGTTGGTAAGG-TAATGGCTACCA ATCCCCCAATAAGATGGCTTG-TCTGATAGCTTGTGGTGAGG-TAATGGCTTACCA ATTCGTCTACAAAGATGGCTTGCCTCTGATTAGCTAGTGGTGAGG-TAATGGCTTACCA ATTCGGCCTAAGAAAGCTTGCCTCTGATTAGCTGTGTGGTGAGG-TAATGGCTTACCA ATTCGGCCTAAGGAAGGCTTGCGCTGATTAGCTAGTGGTGAGG-TAATGGCTTACCA ATTCGGCCCAAGGAAGGGCTGCCGCTGCATTAGCTAGTGGTGAGG-TAATGGCTTACCA ATTCGGCCCAAGGAAGGGGGCTGCCGCTGCATTAGCTAGTTGGTGAGG-TAATGGCTTACCA ATTCGGCCCAAGGAAGGGGCTGCCGCTGCTGATTAGCTAGTTGGTGAGG-TAATGGCTTACCA CCGCCCAAGGAAGGGGCTGCCGCTGCTGATTAGCTAGTTGGTGAGG-CAATAGCTTACCA CCGCCCAAGGAGGGGCTGCCGCTGCTGATTAGCTAGTTGGTGAGG-CAATAGCTTACCA 	col ana nan cla che chv eug pyl mai tob col ana nan	706 ATCTGGAAGAATACCGGTGGCGAAGGCGGCCCC-CTGGACGAAGACTGACGCTCAGGTGC ATCTGGAAGAACACCAACGGCGAAAGGCGC-CTACTGGGCCATAACTGACGCTCATGGAC ATCTGGAAGAACACCAACGGCGAAGCGCC-CTGCTGGGCCGCAACGACACTGACACTGAGAGAC ATCTGGAAGAACACCAATGGCGAAGCACT-TGCTGGGCCGAAACTGACACTGAGAGAC ATCGGGAAGAACACCAATGGCGAAGCACT-CTGCTGGGCCCGAAACTGACACTGAGAGAC ATCGGGAAGAACACCAATGGCGAAGCACT-TTCTTGTGGGCCGAAACTGACACTGAGAGAC ATTGGAAGAACACCAATGGCGAAGCACT-TTCTTGTGGGCCGAAACTGACACTGAGAGAC ATTGGAAGAACCCAATGGCGAAGCACT-TTCTTGGCGCGCATACTGACACTGAGAGAC ATGGGAAGAACACCAATGGCGAAGCACT-TTCTTGGGCGCACACTGACACTGAGAGAC ATGGGAAGAACACCAATGGCGAAGCACT-TACTGGGGCCCACACTGACACTGAGAGAC ATGGGAAGAACACCAATGGCGAAGCACT-TACTGGGGCCCACACTGACACTGAGAGAC ATCGGAAAGAACACCAACGGCGAAGCACT-CTGCTGGGCCGACACTGACACTGAGAGAC ATCGGAAAGAACACCAACGGCGAAAGCACT-CTGCTGGGCCGACACTGACACTGAGAGAC ATCGGAAAGAACACCAACGGCGAAAGCACT-CTGCTGGGCCGCACACTGACACTGAGAGAC ATCGGAAAGAACACCAACGGCGAAAGCACT-CTGCTGGGCCGCACACTGACACTGAGAGAC ATCGGAAAGAACACCAACGGCGAAAGCACT-CTGCTGGGCCGCCACCTGACACTGAGAGAC ATCGGAAAGAACACCAACGGCGAAAGCACT-CTGCTGGGCCGCCACCTGACACTGAGAGAC ATCGGAAAGAACACCAACGACGAAGGATTAGATACC-CTGGTGGTCCACCGCCGAAACGATGTC GAAAGCTGGGGGGGAAAACAGGATTAGATACC-CCTGTAGTCCTGCCGACCGACGAAACGATGGA
col ana nan cla che chv eug pyl mar mai tob col ana ncla	215 CTCTTGCCATCGGATGTGCCCAGATGGGATTAGCTAGTAGTG-GGGTAACGGCTCACCT GCCTQTAGATGAGCTGCCCAGATGGGATTAGCTAGTGGTGGGG-TAAGGGCTCACCA ATCACCAAGAGTGGGCTTG-TCTGTATAGCTAGTGGTGGGG-TAAGGGCTACCA ATCCCCCCAAGAGGGCTTGC-TCTGATAGCTAGTGGTGGGG-TAATGGCTTACCA AT-CCGCCAATGAGGCTTGC-TCTGATTAGCTAGTGGTGAGG-TAATGGCTTACCA ATCCTGTCTAAGATGGGCTTGCGCTGATTAGCTAGTGGTGAGG-TAATGGCTTACCA ATTCTGCCTAAGGATGAGCTTGCGCTGGATAGATAGCTGGTGAGG-TAATGGCTTACCA ATTCGGCCTAAGGAAGGGCTGCGCTGCATTAGCTAGTGGTGAGG-TAATGGCTACCA ATTCGGCCTAAGGAAGGGCTGCGCTGCTGATTAGCTAGTGGTGAGG-TAATGGCTACCA CCGCCCAAGGAGGGGCTGCGCTGCTGATTAGCTAGTGGTGAGG-CAATAGGCTACCA CCGCCCAAGGAGGGGCTGCGCGTCGTGATTAGCTAGTTGGTGAGG-CAATAGCTTACCA CCGCCCAAGGAGGGGCTGCGCGTCGCATTAATAGCTAGTGGTGAGG-CAATAGCTTACCA CCGCCCAAGGAGGGGCTGCGCGTCGCGTCAATAGCTGATGGTGAGG-CAATAGCTTACCA CCGCCCAAGGAGGGGCTGCGCGTCGCGTGAATAGCTGACAGTGGCAACTGGGCCAAGGGCCACTAGCCAACTGGGCTGAGGCGCGCGC	col ana nan cla che chv eug pyl mar mai tob col ana nan cla	706 ATCTGGAAGAATACCGGTGGCGAAGGCGGCCCC-CTGGACGAAGACTGACGCTCAGGTGC ATCTGGAAGAACACCAGCGGCGAAAGCGGC-CTACTGGGCCGATAACTGACGCTCAGGGGC ATCGG-AGAACACCAGCGGGGAAAGCGCC-CTGCTGGGCCGACATAACTGACACTGAGAGAC ATCGGGAAGAACACCAATGGCGAAGCACT-CTGCTGGGCCGAAACTGACACTGAGAGAC ATCGGGAAGAACACCAATGGCGAAGCACT-CTGCTGGGCCAAACTGACACTGAGAGAC ATCGGGAAGACACCAATGGCGAAGCACT-CTGCTGGGCCAAACTGACACTGAGAGAC ATCGGGAAGACACCAATGGCGAAGCACT-TACTGGGCCATAATCTGACGCTGAGAAC ATCGGGAAGACACCAAGGGGAAGCACT-TACTGGGCCAACTGACACTGAGAGAC ATCGGGAAGAACACCAAGGGGAAGCACCT-TACTGGGCCAACTGACACTGAGAAC ATCGGGAAGAACACCAATGGCGAAGCACT-CTGTGGGCCGACACTGACACTGAGAGAC ATCGGGAAGAACACCAATGGCGAAGCACT-CTGTGGGCCGACACTGACACTGAGAGAC ATCGGGAAGAACACCAACGGCGAAAGCACT-CTGTGGGCCGACACTGACACTGAGAGAC ATCGGGAAGAACACCAACGGCGAAAGCACT-CTGTGGGCCGACACTGACACTGAGAGAC ATCGGGAAGAACACCAACGGCGAAAGCACT-CTGTGGGCCGACACTGACACTGAGAGAC ATCGGGAAGAACACCAACGGCGAAAGCACT-CTGCTGGGCCGACACTGACACTGAGAGAC ATCGGGAAGGACCCAACGGCGAAGGATTAGATACC-CTGGTGGCCGCGCGCACACTGACGATGAGAGAC ATCGGGGGGGGGG
col ana nan che chv eug pyl mar mai tob col ana nan cla che	215 CTCTTGCCATCGGATGTGCCCAGATGGGATTAGCTAGTAGTG-GGGTAACGGCTCACCT GCCTGTAGATGAGCCGCGCTGATTAGCTAGTGGTGGGG-TAAGGGCTCACCT ATCACCAGAGAAGGGCTTG-CTGATCAGCTTGTTGGTAAGG-TAATGGCTTACCA ACCGCCGATAAGGGGCTTGCGTCTGATTAGCTAGTGGTGAGGG-TAATGGCTTACCA ATTCTGCTAGGATGAGCTTGCGTCTGATTAGCTGTGTGGGGGACAACGGCCTCCCA ATTCTGCCTAGGAAGAGGGCTTGCGTCTGATTAGCTGTGTGGTGAGG-TAATGGCTTACCA ATTC-GCCAAGAAGAGGGCTTGCGTCTGATTAGCTGTGTGGTGGGG-TAATGGCTTACCA ATTC-GCCAAGAAGAGGGCTGCGCTGGATTAGCTGGTGGTGGGGAGGACTACCA CTC-GCCCAAGGAAGGGCTGCGCTGCGATTAGCTGGTGGTGGGGCAAGGGCTACCA ATTC-GCCAAGGAAGGGCTGCGCTGCGTGATTAGCTGGTGGTGGGGCAAGGGCTACCA ATTC-GCCCAAGGAAGGGCTGCGCTGCGTGTATTAGCTAGTTGGTAAGG-AATAGCTTACCA CCGCCCAAGGAAGGGCTGCGCTGCGTGTAATAGCTAGTGGTGAGG-CAATAGCTTACCA CCGCCCAAGGAAGGGCTGCGCTGCGGTGTGATTAGCTAGTGGTGAGG-CAATAGCTTACCA CCGCCCAAGGAAGGGCTGCGCTGCGGTGTGATTAGCTAGTGGTGAGG-CAATAGCTTACCA **********************************	col ana nan cla che chv eug pyl mar mai tob col ana nan cla che chv	706 ATCTGGAAGAATACCGGTGGCGAAGGCGGCCCC-CTGGACGAAGACTGACGCTCAGGTGC ATCTGGAAGAACACCAGCGGCGAAAGCGCGCCCC-CTGGACGAAAACTGACGCTCAGGGGC ATCTGGAAGAACACCAAGCGGAAAGCACTTCTGCTGGGCCGACTGACACTGAGAGAC ATCGGGAAGACACCAATGGCGAAGCGCT-CTGCTGGGCCGAACTGACACTGAGAGAC ATCGGGAAGACACCAATGGCGAAGCACT-TTCTAGGCCATAACTGACACTGAGAAC ATCGGAAAGACACCAATGGCGAAGGCACT-TTCTAGGCCATACTGACACTGAGAAC ATCGGAAGAACACCAATGGCGAAGGCACT-TTCTAGGCCATACTGACACTGAGAAC ATCGGAAGAACACCAATGGCGAAGCACT-TTCTGGGCGCAACTGACACTGAGAAC ATCGGAAGAACACCAAGGCGAAGCCACT-TTCTGGGCCGCACTGACACTGAGAAC ATCGGAAGAACACCAACGGCGAAGCCACT-CTGCTGGGCCGACCTGACACTGAGAAC ATCGGAAGAACACCAACGGCGAAGCACT-CTGCTGGGCCGACCTGACACTGAGAAC ATCGGAAGAACACCAACGGCGAAGCACT-CTGCTGGGCCGACCTGACACTGAGAAC ATCGGAAGAACACCAACGGCGAAGCACT-CTGCTGGGCCGACCTGACACTGAGAAC ATCGGAAGAACACCAACGGCGAAGCACT-CTGCTGGGCCGACCTGACACTGAGAAC ATCGGAAGAACACCAACGGCGAAGCACT-CTGCTGGGCCGACCTGACACTGAGAGAC ATCGGAAGAACACCAACGGCGAAGCACT-CTGCTGGGCCGACCTGACACTGAGAGC ATCGGAAGAACACCAACGGCGAAGCACT-CTGCTGGGCCGACCTGACACTGAGAGC ATCGGAAGACACCAACGGCGAAGCACT-CTGCTGGGCCGACCTGACACTGAGAGC ATCGGAAGAACACCAACGGCGAAGCACT-CTGCTGGGCCGACCTGACACTGAGAGC ATCGGAAGAACACCAACGGGGATAGCATC-CTGCTGGCCGCGACACTGACACTGAGAGC ATCGGAAGACACAACAGGATTAGATACC-CTGTAGTCCTAGCGCGTAAACGATGGA GAAAGCGAGGGGAGCAATGGGATTAGATACC-CCTGTAGTCTAGCCGCGTAAACGATGGA GAAAGCTAGGGGAGCGAATGGGATTAGATACC-CCTGTAGTCTAGCCGCGTAAACGATGGA GAAAGCTAGGGGAGCGAATGGATTAGATACC-CCCTGTAGTCTAGCCGCGTAAACGATGGA GAAAGCTAGGGGAGCGAATGGATTAGATACC-CCCTGTAGTCTAGCCGCGTAAACGATGGA GAAAGCAGGGGGAGCGAATGGATTAGATACC-CCCTGTAGTCTAGCCGCGTAAACGATGGA GAAAGCAGGGGGAGCGAATGGATTAGATACC-CCTGTAGTCTAGCCGCGTAAACGATGGA GAAAGCTAGGGGAGCGAATGGATTAGATACC-CCCTGTAGTCTAGCCGCGTAAACGATGGA GAAAGCAGGGGAGCGAATGGATTAGATACC-CCCTGTAGTCTAGCCGCGTAAACGATGGA
col ana nan cla che che eug pyl mari tob col ana nan cla che che che eug	215 CTCTTGCCATCGGATGTGCCCAGATGGGATTAGCTAGTAGTG-GGGTAACGGCTCACCT GCCTATAGATGAGCTGCCCCGATTAGCTAGTGGTGGGG-TAAGGGCTACCA ATCACCAAGAGATGAGCTGCGCTCGATTAGCTAGTGGTGGGG-TAAGGGCTACCA ACCGCCAATAGAGGGCTTGCGTCTGATTAGCTAGTGGTGAGG-TAATGGCTTACCA ATTCGTCTACTAAAGATGGCTTGCGCTGATTAGCTGTGTGGTGAGG-TAATGGCTTACCA ATTCGGCCTAAGGATGGCTGCGCTGCATTAGCTGGTGAGG-TAATGGCTTACCA ATTCGGCCTAAGGATGGCTGCGCTGCGTCTGATTAGCTGGTGAGG-TAATGGCTTACCA ATTCGGCCCAAGGAAGGGGCTGCGCGCTCGATTAGCTAGTGGTAAGGG-TAATGGCTTACCA ATTCGGCCCAAGGAGGGGGCTGCGCGCTCGATTAGCTAGTGGTAAGGG-TAATGGCTTACCA ATTCGGCCCAAGGAGGGGGCTGCGCGCTCGATTAGCTAGTTGGTAAGG-TAATGGCTTACCA CCGCCCAAGGAGGGGCTGCGCGTCTGATTAGCTAGTTGGTAAGG-CAATAGCTTACCA CCGCCCAAGGAGGGGCTGCGCGTCTGATTAGCTAGTTGGTAAGG-CAATAGCTTACCA CCGCCCAAGGAGGGGGCTGCGCGTCTGATTAGCTAGTTGGTAAGG-CAATAGCTTACCA CCGCCCAAGGAGGGGCCTGCGGTCTGATTAGCTAGTTGGTAAGG-CAATAGCTTACCA CCGCCCAAGGAGGGGCCGCGCGCTCGATTAGCAGTGGTAGGCAACTGGGACCAGCC 	col ana che che chv eug pyl mai tob col ana nan cla che chv eug	706 ATCTGGAAGGAATACCGGTGGCGAAGGCGGCCCC-CTGGACGAAGACTGACGCTCAGGGGC ATCTGGAAGAACACCAACGGCGAAAGCGCG-CTACTGGGCCATAACTGACGCTCATGGAC ATCTGGAAGAACACCAACGGCGAAGCCGC-CTGCTGGGCCGAAACTGACACTGACAGAGAC ATCGGGAAGAACACCAATGGCGAAGCACT-TGCTGGGCCGAAACTGACACTGACAAC ATCGGGAAGAACACCAATGGCGAAGCACT-TCTTCTGGCGGCAAACTGACACTGAGAGAC ATCGGGAAGAACACCAATGGCGAAGCACT-TTCTTCTGGCCGAAACTGACACTGAGAGAC ATCGGGAAGAACACCAATGGCGAAGCACT-TTCTTGGCGCGAAACTGACACTGAGAGAC ATCGGGAAGAACCCAATGGCGAAGCACT-TTCTTGGCGCGCAAACTGACACTGAGAGAC ATCGGGAAGAACCCAATGGCGAAGCACT-TCTTCTGGCCGCACACTGACACTGAGAGAC ATCGGAAAGAACACCAATGGCGAAGCACT-TCTTCTGGCCGACACTGACACTGAGAGAC ATCGGAAAGAACCCAACGGCGAAGCACT-TCTGGCGGCGCGACACTGACAGAC ATCGGAAAGAACACCAACGGCGAAGCACT-CTGCTGGGCCGACACTGACAGCACTGAGAGAC ATCGGAAAGAACACCAACGGCGAAAGCAT-CTGCTGGGCCGACACTGACACTGAGAGAC ATCGGAAAGAACACCAACGGCGAAAGCAT-CTGCTGGGCCGACACTGACACTGAGAGAC ATCGGAAAGAACACCAACGGCGAAAGCATC-CTGCTGGGCCGACACTGACACTGAGAGAC ATCGGAAAGAACACCAACGGCGAAAGCATTAGATACC-CTGGTGGTCCAGCGCTAACGATGGA AGAAGCTGGGGGAGCAAACAGGATTAGATACC-CCTGTAGTCCTAGCGCTAAACGATGGA AGAAGCTAGGGGAGCGAATGGATTAGATACC-CCAGTAGTCCTAGCCGTAAACGATGGA AGAAGCTAGGGGAGCGAATGGATTAGATACC-CCAGTAGTCCTGCCGGCAAACCATATGGA AGAAGCTAGGGGAGCGAATGGATTAGATACC-CCAGTAGTCCTGCCGACACTAGGAGTGG AAAGCTAGGGGAGCGAATGGGATTAGATACC-CCAGTAGTCCTGCCGAAACCATATGGA AAACGAGGGGAGCGAATGGGATTAGATACC-CCAGTAGTCCTGCCGTAAACGATGGA AGAAGCTAGGGGAGCGAATGGGATTAGATACC-CCAGTAGTCCTGCCGTAAACGATGGA AGAAGCTAGGGGAGCGAATGGGATTAGATACC-CCAGTAGTCCTGCCGTAAACGATGGA AAAGCAGGGGAGCGAATGGGATTAGATACC-CCAGTAGTCCTGCCGGAAACGATGGA AAAGCAGGGGAGCGAATGGGATTAGATACC-CCAGTAGTCCTGCCGTAAACGATGGA AAAGCAGGGGAGCGAATGGGATTAGATACC-CCAGTAGTCCTGCCGTAAACGATGGA AAAGCAGGGGAGCGAATGGGATTAGATACCC-CCAGTAGTCCTGCCGTAAACGATGGA AAAGCAGGGGAGCGAATGGGATTAGATACCC-CCAGTAGTCCTGCCGTAAACGATGGA AAAGCAGGGGAGCAAACAGGGATTAGATACCC-CCAGTAGTCCTGGCGTAAACGATGGA AAAGCAGGGGGAGCAAACAGGGATTAGATACCC-CCGGTAACGATCTGGCGTAAACGATGGA
col ana che che che eug pyl mari tob col ana nan cla che chv eug pyl	215 CTCTTGCCATCGGATGTGCCCAGATGGGATTAGCTAGTAGTG-GGGTAACGGCTCACCT GCCTGTAGATGAGCTGCCCCAGATGGGATTAGCTAGTGGTGGGG-TAACGGCTCACCA ATCACCAAGAGATGGGCTTGTCTGATTAGCTAGTTGGTGAGG-TAATGGCTTACCA ATCCGCCAATGAGGGCTGCGCTGATTAGCTAGTGGTGGGG-TAATGGCTTACCA ATTCTGTCTAAGATGGGCTTGCGCTGATTAGCTGTGTGGTGAGG-TAATGGCTTACCA ATTCGCCTAAGGATGGGCTGCGCTGGTGATTAGCTGTGTGGTGAGG-TAATGGCTTACCA ATTCGCCCAAGGAGGGCTGCGCTGCTGATTAGCTAGTTGGTGAGG-TAATGGCTTACCA ATTCGCCCAAGGAGGGCTGCGCTGCGTCTGATTAGCTAGTGGTAAGGG-TAATGGCTTACCA ATTCGCCCAAGGAGGGCTGCGCTGCGTCTGATTAGCTAGTTGGTGAGG-TAATGGCTTACCA ATTCGCCCAAGGAGGGGCTGCGCTGCGTCTGATTAGCTAGTTGGTAAGGG-TAATGGCTTACCA CCGCCCAAGGAGGGGCTGCGCTGCTGATTAGCTAGTTGGTGAGG-CAATGGCTTACCA CCGCCCAAGGAGGGGCTGCGCGTCTGATTAGCTAGTTGGTGAGG-CAATGGCTTACCA CCGGCCAAGGAGGGGCTGCGCGTCTGATTAGCTAGTTGGTGAGG-CAATGGCTTACCA -TCCGGCCCAAGGAGGGGCTGCGGCTGCGGCTGAATAGCCAGCTGGGCCTGGGACTGAGCCGCG CGGCACGATCACTAGCTGGTCTGAGAGGATGACCAGCCACCTGGGACTGAGACCGGC AGGCAGGACGATCAGTAGCTGGTCTGAGAGGATGACCAGCCACCTGGGACTGAGACCGGC AGGCACGATCAGTAGCTGGTCTGAGAGGATGACCAGCCACCTGGGACTGAGACCGGC AGGCACGATCAGTAGCTGGTCTGAGAGGATGACCAGCCACCTGGGACTGAGACCGGC AGGCACGATCAGTAGCTGGTCTGAGAGGATGATCAGCCACCTGGGACTGAGACCGGC AGGCACGATCAGTAGCTGGTCTGAGAGGATGATCAGCCACCTGGGACTGAGACCGGC AGGCACGATCAGTAGCTGGTCTGAGAGGATGATCAGCCACCTGGGACTGAGACCGGC AGGCACGATCAGTAGCTGGTCTGAGAGGATGATCAGCCACCTGGGACTGAGACCGGC AGGCACGATCAGTAGCTGGTCTGAGAGGATGATCAGCCACCTGGGACTGAGACCGGC AGGCACGATCAGTAGCTGGTCTGAGAGGATGATCAGCCACCTGGGACTGAGACCGGC AGGCACGATCAGTAGCTGGTCTGAGAGGATGATCAGCCACCTGGGACTGAGACCGGC AGGCACGATCAGTAGCTGGTCTGAGAGGATGATCAGCCACCTGGGACTGAGACCGGCC AGGCACGATCAGTAGCTGGTCTGAGAGGATGACCAGCCACCTGGGACTGAGACCGGCC AGGCACGATCAGTAGCTGGTCTGAGAGGATGATCAGCCACCTGGGACTGAGACCGGCC AGGCACGATCAGTAGCTGGTCTGAGAGGATGACCAGCCCACCTGGGACTGAGACCAGGC AGGCACGATCAGTAGCTGGTCTGAGAGGATGACCAGCCACCTGGGACTGAGACCGGCC AGGCACGATCAGTAGCTGGTCTGAGAGGATGACCAGCCCACCTGGGACTGAGACCGGC AGGCACGATCAGTAGCTGGTTGAGAGGAGGACCACCACCACCGGCACGGACCAGGACCAGGCCAGGACCAGGCCACGGCCACGGCCACGGCCAGGACCAGGCCACGGCCACGGACCACGGCCACGGCCACGGCCACGGCCACGGCCACGGCCA	col ana cha che che che eug pyl mai tob col ana nan cha che chv eug pyl	706 ATCTGGAAGAATACCGGTGGCGAAGGCGGCCCC-CTGGACGAAGACTGACGCTCAGGTGC ATCTGGAAGAACACCACGGCGGAAAGCGGC-CTACTGGGCCGATAACTGACGCTCAGGGAC ATCGG-AGAACACCAACGGGAAGGCG-CTACTGGGCGCGATAACTGACGCTAGGAC ATCGGAAGAACACCAATGGCGAAGCACT-TGGCTGGGCCGAAACTGACACTGAGAGAC ATCGGGAAGAACACCAATGGCGAAGCACT-CTGCTGGGCCCGAAACTGACACTGAGAGAC ATCGGGAAGAACACCAATGGCGAAGCACT-TTCTGCTGGGCCGAAACTGACACTGAGAAC ATCGGGAAGAACACCAATGGCGAAGCACT-TTCTTGGCGACACTGACACTGAGAAC ATCGGAAGAACCCAACGGCGAAGCACT-TTCTTAGGCCGAAACTGACACTGAGAAC ATCGGAAAGAACCCAACGGCGAAGCACT-TTCTTGGCGCGCACACTGACACTGAGAAGAC ATCGGAAAGAACACCAACGGCGAAGCACT-TCTCTGGCGGCCGACACTGACACTGAGAAGAC ATCGGAAAGAACACCAACGGCGAAGCACT-CTGCTGGGCCGACACTGACACTGAGAGAC ATCGGAAAGAACACCAACGGCGAAAGCACT-CTGCTGGGCCGACACTGACACTGAGAGAC ATCGGAAAGAACACCAACGGCGAAAGCACT-CTGCTGGGCCCGACACTGACACTGAGAGAC ATCGGAAAGAACACCAACGGCGAAAGCACT-CTGCTGGGCCCGACACTGACACTGAGAGAC ATCGGAAAGAACACCAACGGCGAAAGCACT-CTGCTGGGCCGACACTGACACTGAGAGAC ATCGGGAAGGACCAACGAGTTAGATACC-CTGGTGGTCCACGCCGTAAACGATGGA AAGCTAGGGGAGCAAATGGGATTAGATACC-CTGGTGGTCCACGCCGCGAAACGATGGA GAAAGCTGGGGGAGCAAATGGGATTAGATACC-CCTGATGTCCTAGCCGTAAACGATGGA GAAAGCTGGGGGAGCAAATGGGATTAGATACC-CCTGTAGTCCTGGCCGTAAACGATGGA GAAAGCTGGGGGAGCAAATGGGATTAGATACC-CCTGTAGTCCTGGCCGTAAACGATGGA GAAAGCTGGGGGAGCAAAAGGGATTAGATACC-CCTGTAGTCCTGGCCGTAAACGATGGA GAAAGCTGAGGGAGCAAATGGGATTAGATACC-CCTGTGGTCTGGCCGTAAACGATGGA GAAAGCTGAGGGAGCAAATGGGATTAGATACC-CCTGTGGTCTGGCCGTAAACGATGGA GAAAGCTGAGGGAGCAAAACGGATTAGATACC-CCTGTGGTCTGGCCGTAAACGATGGA GAAAGCTGAGGGAGCAAAACGGATTAGATACC-CCAGTAGTCCTGGCCGTAAACGATGGA GAAAGCTGAGGGAGCAAAACGGATTAGATACC-CCAGTAGTCTGGCCGTAAACGATGGA
col anan cla che che che che che che che che che che	215 CTCTTGCCATCGGATGGCCCAGATGGGATTAGCTAGTGAGGG-GGGTAACGGCTCACCT GCCTQTAGATQAGCTGGCCTGGATTAGCTAGTGGTGGGG-AAAGGGCTCACCA ATCACCAGAGATGGGCTTGTCTGATCAGCTTGTGGTGAGG-TAATGGCTTACCA ACCGCCGATAGAGGGGCTTGCGTCTGATTAGCTAGTGGTGAGG-TAATGGCTTACCA ATCCTGTCTAAGATGGGCTTGCGCTGGATTAGCTGGTGAGG-AATGGCTTACCA ATCCTGCTAAGAAAGGGCTTGCGCTGGATTAGCTGGTGGTGGGC-AATGGCTTACCA ATTCTGCCTAAGGAAGGGCTGCGCTGCGGCTGATTAGCTGGTGGGGCAAAGGG-AATGGCTTACCA ATTC-GCCAAGAAGAGGGCTGCGCTGCGTGTGATTAGCTGGTGGGGGAAGGGGAAAGGGCAACCA ATTC-GCCAAGAAGGGGCTGCGCTGCTGATTAGCTAGTGGTGAGG-AATGGCTAACCA ATTC-GCCAAGAAGGGGGCTGCGCTGCTGATTAGCAGTGGTGAAGGACAAGGGC-AACGACCA ATTC-GGCCAAGAGGGGGCTGCGCTGCGTGTAATAGCTGGTGAGGGCAATGAGGC-AATAGCTTACCA CCGCCCAAGGAGGGGCTGCGCGTCGTGATTAGCAGTGGTGAGGGC-AATAGGCTTACCA CCGCCCCAAGGAGGGGCTGCGGCTGCGGTCTGATTAGCAAGTGGGGCAATGGGC-CAATGGCTTACCA CCGCCCCAAGGAGGGGCTGCGGCTGCGGCTGAATAGCACGGCCAACGGCCAAGGACGATCCCAAGCCGGCCAAGGACGGATCAGTGCGCGCTGGGGCTGGGGCTGGGGTCGAGGAGGATGACACGCCAACTGGGACTGAGACCGGGC AGGCGACGATCCCTAGCTGGTCTGAGAGGAGGATGACCAGCCAACTGGGACTGAGACCGGC AGGCAACGATCAGTAGCTGGTCTGAGAGGATGATCAGCCACACTGGGACTGAGACCGGC AGGCAACGATCAGTAGCTGGTCTGAGAGGAGATGATCAGCCACACTGGGACTGAGACCGGC AGGCAACGATCAGTAGCTGGTCTGAGAGGAGATGATCAGCCACCACTGGGACTGAGACCGGC AGGCAACGATCAGTAGCTGGTCTGAGAGGAGATGACCAGCCACCACTGGGACTGAGACCGGC AGGCAACGATCAGTAGCTGGTCTGAGAGGAGATGACCAGCCACCCTGGGACTGAGACCGG	col ana cha che che che eug pyl mai tob col ana nan cla che chv eug pyl mai tob	706 ATCTGGAAGAATACCGGTGGCGAAGGCGGCCCC-CTGGACGAAGACTGACGCTCAGGTGC ATCTGGAAGAACACCAGCGGCGAAGGCGGCCCC-CTGGACGACAACTGACGCTCAGGGGC ATCTGGAAGAACACCAAGCGGAAGCGATCTCTGCTGGGCCGACTGACACTGAGAGAC ATCGGGAAGACACCAATGGCGAAGCGCT-CTGCTGGGCCGAACTGACACTGAGAGAC ATCGGGAAGACACCAATGGCGAAGCACT-TTCTAGGCCATAACTGACACTGAGAGAC ATCGGAAGAACACCAATGGCGAAGGCACT-TTCTAGGCCATAACTGACACTGAGAAC ATCGGAAGAACACCAATGGCGAAGGCACT-TTCTAGGCCATACTGACACTGAGAAC ATCGGAAGAACACCAATGGCGAAGGCACT-TTCTGGCGGCCAATCGACACTGAGAAC ATCGGAAGAACACCAACGGCGAAGCACT-CTGCTGGGCCGAACTGACACTGAGAAC ATCGGAAGAACACCAACGGCGAAGCACT-CTGCTGGGCCGACCTGACACTGAGAAC ATCGGAAGAACACCAACGGCGAAGCACT-CTGCTGGGCCGACCTGACACTGAGAAC ATCGGAAGAACACCAACGGCGAAGCACT-CTGCTGGGCCGACCTGACACTGAGAAC ATCGGAAGAACACCAACGGCGAAGCACT-CTGCTGGGCCGACCTGACACTGAGAAC ATCGGAAGAACACCAACGGCGAAGCACT-CTGCTGGGCCGACCTGACACTGAGAGAC ** * ** ** ** ** ** ** ***** *********
col anan cla che chv eug pyl mar mai che chv eug pyl mar	215 CTCTTGCCATCGGATGGCCCGGATGGGATTAGCTAGTAGTG-GGGTAACGGCTCACCT GCCTAAGATGAGCTGCCCGCTGTATTAGCTAGTGGTGGGG-TAAGGGCTACCA ATCACCAAGAGAGGGCTGCCGCTGGATAGCTAGCTGGTGGGGGATAAGGCCTACCA ATCCGCCGATAAGGGGCTGC-TCTGTGTAAGGCTAACGGCTCCCCA ATCGCCAATAAGGGGCTGCGCTGATTAGCTAGTGGTGGGGGATAACGGCCTCCCA ATCTGTGTCAAAGATGGCTTGCGCTGATTAGCTAGTGTGGGGGATAACGGCTTACCA ATTCGGCTAAGGAAGGCTGCGCTGCGTCTAATTAGCTGGTGAGGG-TAATGGCTTACCA ATTCGGCCTAAGGAAGGGCTGCGCTGCGATTAGCTAGTGGTGAGGG-TAATGGCTTACCA CCGCCTAAGGAAGGGGCTGCGCTGCATTAGCTAGTTGGTGAGG-TAATGGCTTACCA CCGCCCAAGGAGGGGCTGCGCTGCATTAGCTAGTTGGTGAGG-TAATGGCTTACCA CCGCCCAAGGAGGGGCTGCGCTGCATTAGCTAGTTGGTGAGG-CAATAGCTTACCA CCGCCCAAGGAGGGGCTGCGCTGCATTAGCAAGTTGGTGAGG-CAATAGCTTACCA CCGCCCAAGGAGGGGCTGCGCTGCATTATAGCTAGTTGGTGAGG-CAATAGCTTACCA CCGCCCAAGGAGGGGCTGCGCTGCATTATAGCAAGTTGGTAAGG-CAATAGCTTACCA CCGCCCAAGGAGGGGCTGCGCTCGATTAGCACAGCCACATGGAACTGAGCAAGGCC CCGCCCAAGGAGGGGCTGCGCTGCGATGAGAGGAGGACCAGCCACA CCGCCCAAGGAGGGGCTGCGCTGCGAGGAGGAGGACCACGCCACACTGGGACCGAGCACGGCCAGGCCAGGACCAGTGCCAGGACGAGCACGGCCAGGACGACCAGCCCACTGGGACCGAGCACGGCCAGGCCAGGACCAGGCCAGGACCAGGCCACGGCCAGGCCAGGACCAGTAGCTGGTCTGAGAGGAGATCACAGCCACACTGGGACTGAGACCGGCCAGGGCAGGCA	col ana che chv eug pyl tob col ana nan cla che chv eug pyl pyl pyl pal ana	706 ATCTGGAAGGAATACCGGTGGCGAAGGCGGCCCC-CTGGACGAAGACTGACGCTCAGGTGC ATCTGGAAGAACACCAACGGCGAAAGCGCG-CTACTGGGCCGAAACTGACGCTCATGGAC ATCTGGAAGAACACCAACGGCGAAGCGCA-CTACTGGGCCGCAAACTGACACTGAGAGAC ATCTGGAAGAACACCAATGGCGAAGCACT-TGCTGGGCCGAAACTGACACTGAGAGAC ATCGGGAAGAACACCAATGGCGAAGCACT-TCTGCTGGGCCCAAACTGACACTGAGAGAC ATCGGGAAGAACACCAATGGCGAAGCACT-TTCTTCTGGCGCAAACTGACACTGAGAGAC ATTGGAAGGAACACCAATGGCGAAGCACT-TTCTTCTGGCCGAAACTGACACTGAGAGAC ATCGGGAAGAACCCAATGGCGAAGCACT-TTCTTGGCGGCCAAACTGACACTGAGAGAC ATCGGAAGGAACACCAATGGCGAAGCACT-TCTTCTGGCCGACACTGACACTGAGAGAC ATCGGAAGGAACACCAATGGCGAAGCACT-TCTTCTGGCCGACACTGAGAGAC ATCGGAAAGAACACCAACGGCGAAGCACT-CTGCTGGGCCGACACTGACACTGAGAGAC ATCGGAAAGAACACCAACGGCGAAAGCACT-CTGCTGGGCCGACACTGACACTGAGAGAC ATCGGAAAGAACACCAACGGCGAAAGCACT-CTGCTGGGCCGACACTGACACTGAGAGAC ATCGGAAAGAACACCAACGGCGAAAGCACT-CTGCTGGGCCGACACTGACACTGAGAGAC ATCGGAAAGAACACCAACGGCGAAAGCACT-CTGCTGGGCCGACACTGACACTGAGAGAC ATCGGAAAGAACACCAACGGCGAAAGCACT-CTGCTGGGCCGACACTGACACTGAGAGAC ATCGGAAAGAACACCAACGGCGAAAGCACT-CTGCTGGGCCGACACTGACACTGAGAGAC ATCGGAAGGAGCGAAACAGGATTAGATACC-CTGGTGGCCGACACTGACACTGAGAGAC CAAAGCTGGGGGGGCAAACAGGATTAGATACC-CCTGTAGTCCTAGCGCTAAACGATGGA GAAAGCTAGGGGAGCAAATAGGATTAGATACC-CCAGTAGTCCTAGCCGTAAACGATGGA GAAAGCTAGGGGAGCAAATAGGATTAGATACC-CCAGTAGTCCTGGCCGTAAACGATGGA GAAAGCTAGGGGAGCAAATAGGATTAGATACC-CCAGTAGTCCTGGCCGTAAACGATGGA GAAAGCTAGGGAGCGAATGGGATTAGATACC-CCAGTAGTCCTGGCCGTAAACGATGGA GAAAGCTAGGGAGCGAATGGGATTAGATACC-CCAGTAGTCTAGCCGTAAACGATGGA GAAAGCTAGGGAGCAAACAGGATTAGATACC-CCAGTAGTCCTAGCCGTAAACGATGGA GAAAGCTAGGGAGCGAATGGGATTAGATACC-CCAGTAGTCCTAGCCGTAAACGATGGA GAAAGCTAGGGAGCGAATGGGATTAGATACC-CCAGTAGTCCTAGCCGTAAACGATGGA GAAAGCTAGGGAGCGAATGGGATTAGATACC-CCAGTAGTCCTAGCCGTAAACGATGGA GAAAGCTAGGGAGCGAATGGGATTAGATACC-CCAGTAGTCCTAGCCGTAAACGATGGA GAAAGCTAGGGAGCGAATGGGATTAGATACC-CCCAGTAGTCCTAGCCGTAAACGATGGA GAAAGCTAGGGAGCAAATGGGATTAGATACC-CCAGTAGTCCTAGCCGTAAACGATGGA GAAAGCTAGGGAGCAAATGGGATTAGATACC-CCAGTAGTCCTAGCCGTAAACGATGGA GAAAGCTAGGGAGCAAATGGGATTAGATACC-CCCAGTAGCCTAGCGTAAACGATGGA
col anan cla chev eug pyl tob col ana nan cla chv eug pyl tob	215 CTCTTGCCATCGGATGGCCCAGATGGGATTAGCTAGTGGTG-GGGTAACGGCTCACCT GCCTGTAGATGGCTTGCTGATTAGCTAGTGGTGGGG-TAAGGGCTACCA ATCACCAAGAAGGGGCTTGC-TCGTGATAGCTAGTGGTGGGG-TAAGGGCTACCA ATCCGCCAAGAAGGGCTTGC-TCGTGATTAGCTAGTGGTGGGG-TAAGGGCTACCA ATCGGCCAATAAGGGCTGCGCTGGATTAGCTAGTGGTGGGG-TAATGGCTTACCA ATC-GGCAATAAGGCTGGCGTGGGCTGATTAGCAGTGGTGGGGAGGAACGGGCTACCA ATTCGGCTAAGGAAGGGCTGCGGCTGGATTAGCTAGTGGTGAGGG-TAATGGCTTACCA ATTCGGCTAAGGAAGGGCTGCGGCTGGATTAGCTAGTGGTGAGGG-TAATGGCTTACCA CCGCCCAAGGAAGGGCTGCGCTGCTGATTAGCTAGTTGGTGAGGG-AATGGCTTACCA CCGCCCAAGGAAGGGCTGCGCTGCTGATTAGCTAGTTGGTGAGG-CAATAGCTTACCA CCGCCCAAGGAAGGGCTGCGCTCGCTGATTAGCTAGTTGGTGAGG-CAATAGCTTACCA CCGCCCAAGGAAGGCTGCGCTCGCTGATAGCTAGTGGTGAGG-CAATAGCTTACCA CCGCCCAAGGAAGGCTGCGCTCGCTGATAGCTAGTAGTGGTAAGG-CAATAGCTTACCA CCGCCCAAGGAAGGCTGCGCTCGCTGATAGCACAGTGTGGACCAGGC-CAATGGCTTACCA CCGCCCAAGGAGGGGCTCGCGTCTGAGAGGAGGATGACACGGC-CAATGGCACTGAGACCGGC AGGCGACGATCCCTAGCTGGTCTGAGAGGAGGATGACCAGCCACCTGGGACCTGAGACCGGC AGGCGACGATCCATAGCTGGTCTGAGAGGAGGATGACCAGCCACCTGGGACTGAGACCGGC AGGCACGATCAGTAGCTGGTCTGAGAGGAGGATGACCAGCCACCACTGGGACTGAGACCGGC AGGCACGATCAGTAGCTGGTCTGAGAGGAGGATGACCAGCCACCACTGGGACTGAGACCAGGC AGGCACGATCAGTAGCTGGTCTGAGAGGAGGATGACCAGCCACCACTGGGACTGAGACCAGGC AGGCACGATCAGTAGCTGGTCTGAGAGGAGGATGACCAGCCACCACTGGGACTGAGACCGGC	col ana che chv eug pyl mar mai tob col ana nan cla chv eug pyl mar mar tob	706 ATCTGGAAGAATACCGGTGGCGAAGGCGGCCCC-CTGGACGAAGACTGACGCTCAGGTGC ATCTGGAAGAACACCACGGCGGAAAGCGGC-CTACTGGGCCGAAAGACTGACGCTCAGGGC ATCGG-AGAACACCAACGGGAAAGCGC-CTACTGGGCCGAAACTGACACTGAGAGAC ATCGGGAAGAACACCAATGGCGAAGCGCT-CTGCTGGGCCGAAACTGACACTGAGAGAC ATCGGGAAGAACACCAATGGCGAAGCACT-CTGCTGGGCCCGAAACTGACACTGAGAGAC ATCGGGAAGAACACCAATGGCGAAGCACT-TTCTGCTGGGCCGAAACTGACACTGAGAGAC ATCGGGAAGAACACCAATGGCGAAGCACT-TTCTTGCGGGCGCAAACTGACACTGAGAGAC ATCGGGAAGAACACCAATGGCGAAGCACT-TACTGAGGCCATAACTGACACTGAGAGAC ATCGGGAAGAACACCAACGGCGAAGCACT-TACTGAGGCCGACACTGACACTGAGAGAC ATCGGAAAGAACACCAACGGCGAAGCACT-TACTGGGCGCGACACTGACACTGAGAGAC ATCGGAAAGAACACCAACGGCGAAAGCACT-CTGCTGGGCCGACACTGACACTGAGAGAC ATCGGAAAGAACACCAACGGCGAAAGCACT-CTGCTGGGCCGACACTGACACTGAGAGAC ATCGGAAAGAACACCAACGGCGAAAGCACT-CTGCTGGGCCGACACTGACACTGAGAGAC ATCGGAAAGAACACCAACGGCGAAAGCACT-CTGCTGGGCCGACACTGACACTGAGAGAC ATCGGAAAGAACACCAACGGCGAAAGCACT-CTGCTGGGCCGACACTGACACTGAGAGAC ATCGGGAAGGACCAACGAGGATTAGATACC-CTGGTGGTCCAGCCGCGAAACGATGGA AGAAGCTGGGGGAGCAAATGGGATTAGATACC-CCTGTAGTCCTAGCCGTAAACGATGGA GAAAGCTGGGGGAGCAAATGGGATTAGATACC-CCAGTAGTCCTAGCCGTAAACGATGGA GAAAGCTGGGGGAGCAAATGGGATTAGATACC-CCTAGTAGTCCCAGCCGCTAAACGATGGA GAAAGCTGGGGGAGCAAATGGGATTAGATACC-CCTAGTAGTCCTGGCCGTAAACGATGGA GAAAGCTGGGGGAGCAAATGGGATTAGATACC-CCTGTAGTCCTGACCCTAACCGATGGA GAAAGCTAGGGGAGCAAATGGGATTAGATACC-CCAGTAGTCCTGGCCGTAAACGATGGA GAAAGCTAGGGGAGCAAATGGGATTAGATACC-CCAGTAGTCCTGGCCGTAAACGATGGA GAAAGCTAGGGAAGCAAATGGGATTAGATACC-CCAGTAGTCCTGGCCGTAAACGATGGA GAAAGCTAGGGAGCAAATGGGATTAGATACC-CCAGTAGTCCTGGCCGTAAACGATGGA GAAAGCTAGGGAGCAAATGGGATTAGATACC-CCAGTAGTCCTGGCCGTAAACGATGGA GAAAGCTAGGGAGCAAATGGGATTAGATACC-CCAGTAGTCCTGGCCGTAAACGATGGA GAAAGCTAGGGAGCAAATGGGATTAGATACC-CCAGTAGTCCTGGCCGTAAACGATGGA GAAAGCTAGGGAGCAAATGGGATTAGATACC-CCAGTAGTCCTAGCCGTAAACGATGGA GAAAGCTAGGGAGCAAATGGGATTAGATACC-CCAGTAGTCCTAGCCGTAAACGATGGA GAAAGCTAGGGAGCAAATGGGATTAGATACC-CCAGTAGTCCTAGCCGTAAACGATGGA GAAAGCTAGGGAGCAAATGGGATTAGATACC-CCAGTAGTCCTAGCCGTAAACGATGGA GAAAGCTAGGGAGCAAATGGGATTAGATACC-CCAGTAGTCCTAGCCGTAAACGATGGA GAAAGCTAGGGAACCAAATGGGATTAGATACC-CCAGTAGT
col anan cla che chv eug bar mar tob col ana nan cla che chv eug pyl mar mai tob	215 CTCTTGCCATCGGATGGCCCCGGATGGGATGGCATAGCTACTGGGGCTAACGGCTCACCT	col ana cha chv eug pyl mar mai tob col ana che che che che che che chu ana nan nan cla che tob	706 ATCTGGAAGGAATACCGGTGGCGAAGGCGGCCCC-CTGGACGAAGACTGACGCTCAGGGGC ATCTGGAAGAACACCAACGGCGAAAGCGGCGCCCC-CTGGACCATAACTGACGCTCAGGGCA ATCGGA-AGACCAAAGCGGAAAGCGCGA-CTACTGGGCCGACTGACACTGACGACA ATCGGGA-AGACCAAAGCGGAAAGCACTTCTGCTGGGCCGAACTGACACTGACGACA ATCGGGAACACCAAAGGCGAAAGCACTTCTGCTGGGCCGAACTGACACTGACAGAC ATCGGGAAGACACCAATGGCGAAGGCACT-TTCTGCTGGGCCGAAACTGACACTGAGAGAC ATTGGAAGGAACACCAATGGCGAAGGCACT-TTCTTAGGCCATAACTGACACTGAGAGAC ATTGGAAGGAACACCAATGGCGAAGGCACT-TTCTTGGGCGCAACTGACACTGAGAGAC ATCGGGAAGGAACACCAACGGGGAAGCACT-TCTCTGGCGGCCGACACTGACACTGAGAGAC ATCGGAAAGAACACCAACGGCGAAAGCACT-CTGCTGGGCCGACACTGACACTGAGAGAC ATCGGAAAGGAACACCAACGGCGAAAGCACT-CTGCTGGGCCGACACTGACACTGAGAGAC ATCGGAAAGAACACCAACGGCGAAAGCACT-CTGCTGGGCCGACACTGACACTGAGAGAC ATCGGAAAGGAACACCAACGGGGAAAGCACT-CTGCTGGGCCGACACTGACACTGAGAGAC ATCGGAAAGGAACACCAACGGGGAAAGCACT-CTGCTGGGCCGACACTGACACTGAGAGAC ATCGGAAAGGAACCCAACCGGGGAAAGCACT-CTGCTGGGCCGACACTGACACTGAGGATGC ATGGGAAGGAACCAACCAACGGGAAAGGATTAGATACC-CCTGTGGCCCGCGCGAAACGATGGA GAAAGCTAGGGGAGCAAACAGGATTAGATACC-CCTGTAGTCCTAGCCGCTAAACGATGGA GAAAGCTAGGGGAGCAAATGGGATTAGATACC-CCAGTAGTCTAGCCGCGTAAACGATGGA GAAAGCTAGGGGAGGAAACAGGATTAGATAGAC-CCAGTAGTCTAGCGCGCGAAACGATGGA GAAAGCTAGGGGAGCAAACAGGATTAGATAGACC-CCAGTAGTCTAGCGCTAAACGATGGA GAAAGCTAGGGGAGCAAACAGGATTAGATAGACC-CCAGTAGTCTAGCGCGTAAACGATGGA
col anan cla chv eug pyl mari tob col anan cla chv eug pyl mari mari tob	215 CTCTTGCCATCGGATGGCCCAGATGGGATTAGCTAGTAGTG-GGGTAACGGCTCACCT GCCTAAGATGAGCTGCCCCAGATGGGATTAGCTAGTGGTGGGG-TAAGGGCTACCA ATCACCAAGAGATGGGCTTGCTGATCACCTGTTGGTGAGG-TAAGGGCTACCA ATCCGCCAATAAGGGGCTGC-CTGATTAGCTAGTTGGTGAGG-TAATGGCTTACCA ATC-CGCCAATAAGGGGCTGCCGCTGATTAGCTAGTTGGTGAGG-TAATGGCTTACCA ATC-CGCCAATAAGTGGCTTGCGCTGATTAGCTAGTTGGTGAGG-TAATGGCTTACCA ATTCGGCTAAGGAAGGGCTGCCGCTGATTAGCTAGTTGGTGAGG-TAATGGCTTACCA ATTCGGCCTAAGGAAGGGGCTGCCGCTGAATTAGCTAGTTGGTGAGG-TAATGGCTTACCA CCGCCTAAGGAAGGGGCTGCCGCTGCATTAGCTAGTTGGTGAGG-TAATGGCTTACCA CCGCCCAAGGAGGGGCTGCCGCTGCATTAGCAAGTTGGTGAGG-TAATGGCTTACCA CCGCCCAAGGAGGGGCTGCCGCTGCATTAGCAAGTTGGTGAGG-CAATAGCTTACCA	col anan cla chv eug pyl mari tob col anan cla chv eug pyl mari tob	706 ATCTGGAAGGAATACCGGTGGCGAAGGCGGCCCC-CTGGACGAAGACTGACGCTCAGGTGC ATCTGGAAGAACACCAACGGCGAAAGCGGCGCCCC-CTGGACGAAAACTGACGCTCAGGGCC ATTGGAAGAACACCAACGGCGAAAGCGCG-CTACTGGGCCGAAACTGACACTGAGAGAC ATTGGAAGAACACCAATGGCGAAGGCGAACCACTCTGCTGGGCCGAAACTGACACTGAGAGAC ATTGGAAGAACACCAATGGCGAAGGCACT-TTCTGCTGGGCCGAAACTGACACTGAGAGAC ATTGGAAGGAACACCAATGGCGAAGGCACT-TTCTGCTGGGCCGAAACTGACACTGAGAGAC ATTGGAAGGAACACCAATGGCGAAGGCACT-TTCTTGGCGCGAAACTGACACTGAGAGAC ATGGGAAGGAACACCAACGGCGAAGGCACT-TTCTGGCGGCGACACTGACACTGAGAGAC ATCGGAAAGAACACCAACGGCGAAAGCACT-CTGCTGGGCCGACACTGACACTGAGAGAC ATCGGAAAGAACACCAACGGCGAAAGCACT-CTGCTGGGCCGACACTGACACTGAGAGAC ATCGGAAAGAACACAACGAGGGAAAGCACT-CTGCTGGGCCGACACTGACACTGAGAGAC ************************************
col anan cla chv eug pyl mar tob col ana nan cla chv eug pyn mar tob col achv eug pyn tob	215 CTCTTGCCATCGGATGGGCTGGCCTGGGTATAGCTAGTGGTGGGG-TAAGGGCTCACCT ATCGCCAAGAGGGGCTGCCCCGATTAGCTAGTGGTGGGG-TAAGGGCTCACCA ATCGCCAAGAGGGGCTGC-TCGTGATTAGCTAGTGGTGGGG-TAAGGGCTCACCA ATCCGCCAAGAGGGCTGCCTCGATTAGCTAGTGGTGGGG-TAAGGGCTCACCA ATCGGCCAATAGGGCTGC-TCGGTCTGATTAGCTAGTGGTGGGG-TAATGGCTTACCA ATC-GGCTAAGGAAGGCTGCGCTCGGTCTGATTAGCTAGTGGTGAGG-TAATGGCTTACCA ATTCGGCTAAGGAAGGGCTGCGCTCGGTTGATTAGCTAGTGGTGAGGG-TAATGGCTTACCA ATTC-GGCTAAGGAAGGGCTGCGCTCGGTTGATTAGCTAGTGGTAAGGG-TAATGGCTTACCA ATTC-GGCTAAGGAAGGGCTGCGCTCGCTGATTAGCTAGTGGTAAGGG-AATAGGCTTACCA CCGCCCAAGGAGGGGCTGCGCTCGCTGATTAGCTAGTTGGTGAGG-CAATAGCTTACCA CCGGCCAAGGAGGGCTGCGCTCGCTGATAGCTAGTTGGTGAGG-CAATAGCTTACCA CCGGCCAAGGAGGGGCTGCGCTCGCTGATAGCAGTGTGGACGGC-CAATGGCTTACCA CCGCCCAAGGAGGGGCTGCGCTCGCTGATAGCACAGTTGGTGAGGC-CAATGGCTTACCA CCGCCCAAGGAGGGGCTGCGCTCGGCTGAATGGCCAGCTGGGCCAAGGCCAAGGACCGGCAGGACGATCAGTACCGCGCCACGGCCAAGGACGATCAGTAGCTGGTCTGAGAGGATGACCAGCCACACTGGGACTGAGACCGGC AGGCGACGACCACCCAGTGGCTGAGAGGATGACCACCGCCACCTGGGACTGAGACCGGC AGGCACGACCAGTCAGTAGCTGGTCTGAGAGGATGACCAGCCACACTGGGACTGAGACCGGC AGGCACGACCAGTCAGTGGTCTGAGAGGAGGATGACCAGCCACCACTGGGACTGAGACCGGC AGGCACGATCAGTACCTGGTCTGAGAGGAGGATGACCAGCCACCACTGGGACTGAGACCGGC AGGCACGATCAGTACCTGGTCTGAGAGGAGGATGACCAGCCACCACTGGGACTGAGACCGGC AGGCAAGACTCATAACTGGTCCGAGAGGAGGATACCAGCCACCACTGGGACTGAGACCGGC	col ana cla chv eug pyl mar mar tob col ana cla chv eug pyl mar tob col ana tob col ana cla col ana tob col ana col col col col col col col col col col	706 ATCTGGAAGGAATACCGGTGGCGAAGGCGGCCCC-CTGGACGAAGACTGACGCTCAGGTGCAAGGACCATACTGACGCTCAGGGCGAAGGCCCATACTGACGCTAGGGCAAGGCCATACTGACACTGACGCATGGCAAGGCCATACTGACACTGACGCAGGCCATACTGACACTGACGCAGGCCATACTGACACTGACGACGCACTGGGAAGGACCCATATGGGAAGAACCACATGGCGAAGGCCCT-TTCTGGCGGCCGAAACTGACCACTGAGAAGACACTGACGCATGGCGAAGGACT-TTCTTCTGGCGCCGAAACTGACCACTGAGAAGACACTGACGACGCACTGACACTGACGCAGAGGCACTGACTCTAGCGGAAGGACCCACTGACACTGACACTGAGAAGACACTGACGACGGAAGGACT-TTCTTGGGCGCGACACTGACACTGAGAAGACACCGACGGGAAGGCACT-TACTGGGGCGCGACACTGACACTGAGAAGACACCGACGGGAAGGACT-CTGCTGGGGCCGACACTGACACTGAGAGAACCACCGACGGGAAGGACT-CTGCTGGGGCCGACACTGACACTGAGAGAACCACGGGAAGGACT-CTGCTGGGGCCGACACTGACACTGAGAGAACCACGGGAAAGGACT-CTGCTGGGGCCGACACTGACACTGAGAGAACCACGGGGAAGGACT-CTGCTGGGGCCGACACTGACACTGAGAGAACCACGGGGAAGGACT-CTGCTGGGGCCGACACTGACACTGAGAGAACCACGGGGAAGGACTAGATAGA
col anan cla chv eug pyl mari tob col ana che chv eug pyl mari tob col anan cla chv col anan cha chv chv col anan tob col anan tob col anan tob chv chv eug pyl mari tob col a col col a col a col a col a col a col a col a col a col a col a col a col a col a col a col a col a col a col a col col col col col col col col col col	215 CTCTTGCCATCGGATGGCCCCGGATGGGATTAGCTAGTAGTGC-GGGTAACGGCTCACCT ATCCCCAAGAGATGGCCTGCCCCGATAGCAGTGTGTGGGG-TAAGGGCCTACCA ATCCGCCAAGAGGGGCTGCCCCGCTGATTAGCTAGTGGTGGGG-TAAGGGCCTACCA ATCCGCCAAGAGGGGCTGCCTCGATTAGCTGTGTGGGGATAACGGCCTACCA AT-CCGCCAAGAGAGGGCTGCCCTCGATTAGCTGGTGGGG-TAAGGGCTACCA AT-CCGCCAAGAGAGGCTGCCCCGGCTGATTAGCTGGTGGGGATAACGGCCTCACCA ATCCGTCTAAGATGGCTTGCCCCTGATTAGCTAGTGGTGAGG-TAATGGCTTACCA ATTCGGCTAAGGAGGCTGCCGCTGATTAGCTAGTGGTGAGG-TAATGGCTTACCA ATTCGGCCTAAGGAGGGCTGCCGCTCGATTAGCTAGTGGTGAGG-TAATGGCTTACCA CCGCCCAAGGAGGGCTGCCGCTCGATTAGCTAGTGGTGAGG-CAATAGGCTTACCA CCGCCCAAGGAGGGCTGCCGCTCGATAGCTAGTGGTGAGG-CAATGGCTTACCA CCGCCCAAGGAGGGCTGCCGCTCGATAGCTAGCAAGTGGTGAGG-CAATGGCTTACCA CCGCCCAAGGAGGGCTGCCGCTCGATAGCAGCCACCACTGGGAACTGGACCAACCA	col ana cla chv echv pyl mari tob col ana che che chy eug pyl man tob col ana che chy col ana ana che chv echv echv echv echv echv echv e	706 ATCTGGAAGGAATACCGGTGGCGAAGGCGGCCCC-CTGGACGAAGACTGACGCTCAGGGGC ATCTGGAAGAACACCAAGCGGCGAAAGCGGCGCCCC-CTGGACGATAACTGACGCTCAGGGCA ATCGGA-AGACCAAAGCGGAAAGCGCGA-CTACTGGGCCGACTGACACTGACGACA ATCGGGAAGACACCAAGGGGAAGCGACT-TTCTGCTGGGCCGAACTGACACTGAGAGAC ATCGGGAAGACACCAATGGCGAAGGCGAT-CTGCTGGGCCGAACTGACACTGAGAGAC ATCGGGAAGGACACCAATGGCGAAGGCACT-TTCTTAGGCCGAAACTGACACTGAGAGAC ATTGGAAGGAACACCAATGGCGAAGGCACT-TTCTTAGGCCGAAACTGACACTGAGAGAC ATTGGAAGGAACACCAATGGCGAAGGCACT-TTCTTGCGCGCCAACTGACACTGAGAGAC ATCGGAAAGAACACCAACGGCGAAGCACT-TCTCTGGCGGCCGACATGACACTGAGAGAC ATCGGAAAGAACACCAACGGCGAAAGCACT-CTGCTGGGCCGACACTGACACTGAGAGAC ATCGGGAAGGAACACCAACGGCGAAAGCACT-CTGCTGGGCCGACACTGACACTGAGAGAC ATCGGAAAGAACACCAACGGCGAAAGCACT-CTGCTGGGCCGACACTGACACTGAGAGAC ATCGGAAAGGAACACCAACGGCGAAAGCACT-CTGCTGGGCCGACACTGACACTGAGAGAC ATCGGAAAGGAACCCAACGGGGAAGCACT-CTGCTGGGCCGACACTGACACTGAGAGAC ATCGGAAAGGAACGCGAAAGGGATTAGATACC-CTGTGGTGCCGCGCAAACGATGGA GAAAGCTGGGGGAGCAAACGGGAATAGGATTAGATACC-CCTGTGTGTCCAGCGCGTAAACGATGGA GAAGCTAGGGGAGCAAATGGGATTAGATACC-CCAGTAGTCTAGCCGCGTAAACGATGGA GAAGCTAGGGGAGCAAATGGGATTAGATACC-CCAGTAGTCTAGCCGCGTAAACGATGGA GAAGCTAGGGGAGGAAATGGGATTAGATACC-CCAGTAGTCTAGCCGCGTAAACGATGGA GAAGCTAGGGGAGGAAATGGGATTAGATACC-CCAGTAGTCTAGCGCTAACGATGGA
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col anan cla chy eyyl mari tob col anan che chy pyl mari tob col anan che chy eyyl mari tob col anan che chy col anan chy col anan che chy col col col col col col col col col col	215 CTCTTGCCATCGGATGGCCCGAGATGGGATTAGCTAGTAGTGGTG-GGGTAACGGCTCACCA ATCACCAAGAGATGGCTTG-TCTGATTAGCTAGTGGTGGGG-TAAGGGCTACCA ATCACCAAGAGAGGGCTTGCCTCGATTAGCTAGTTGTGGGAG-TAAGGGCTACCA ATCACCAAGAGGGGCTTGCCTCGATTAGCTGTTGTGGTAAGG-TAATGGCTTACCA ATCCGCCAATAAGTGGCTTGCCTCGATTAGCTGTTGTGTGAGG-TAATGGCTTACCA AT-CTGTGCTAAGAAGGGCTTGCCTCGATTAGCTGTGTGGGAGG-TAATGGCTTACCA ATTCTGGCTAAGGAGGGCTGCGCTGATTAGCTAGTTGGTGAGG-TAATGGCTTACCA ATTCGGCTAAGGAGGGCTGCGCTGCTGATTAGCTAGTTGGTGAGG-TAATGGCTTACCA CCGCCCAAGGAGGGGCTGCGCTCGATTAGCTAGTTGGTGAGG-CAATGGCTTACCA CCGCCCAAGGAGGGCTGCGCTCGATTAGCTAGTTGGTGAGG-CAATGGCTTACCA CCGCCCAAGGAGGGCTGCGCGTCGATTAGCAGTGGTGAGGCCAACTGGGAACTGGGCCAACGACCA CCGCCCAAGGAGGGCTGCGCTCGATAGGAGGATGACCAGCCAACTGGGAACTGAGAACGGC AGCGAGGATCACTAGCTGGTCTGAGAGGATGACCAGCCAACTGGGACTGAGACACGGC AGCGAACGATCAGTAGCTGGTCTGAGAGGAGGATGACCAGCCAACTGGGACTGAGACACGGC AGCGAACGATCAGTAGCTGGTCTGAGAGGATGATCAGCCAACTGGGACTGAGACACGGC AGCGAACGATCAGTAGCTGGTCTGAGAGGAGGATGACCAGCCAACTGGGACTGAGACACGGC AGCGAACGATCAGTAGCTGGTCTGAGAGGAGGATGACCAGCCAACTGGGACTGAGACACGGC AGCGAACGATCAGTAGCTGGTCGAGAGGAGGATGACCAGCCAACTGGGACTGAGACACGGC AGGCAACGATCAGTAGCTGGTGCTGAGAGGAGGATGACACGCCAACTGGGACTGAGACACGGC AGGCAACGATCAGTAGCTGGTGCTGAGAGGAGGACACCGCCACCTGGGACTGAGACACGGC AGGCAACGATCAGTAGCTGGTGCTGAGAGGAGACACGCCCACTGGGACTGAGACACGGC	col anan cla chv eug pyl mai tob col ana nan cla chv eug pyl mai tob col ana nan cla chv eug pyl mai tob col ana nan cla chv eug pyl mai tob col ana anan cla chv eug pyl mai tob col ana anan cla chv eug pyl mai tob col anan cla chv eug pyl mai tob col anan cla chv eug pyl mai tob col anan cla chv eug pyl mai tob col anan cla chv eug pyl mai tob col anan cla chv eug pyl mai tob col anan cla chv eug pyl mai tob col anan cla chv eug pyl mai tob col anan cla chv eug pyl mai tob col anan cla chv eug pyl col anan cla chv eug pyl col anan cla chv eug pyl col anan cla chv eug pyl col anan cla chv eug pyl col anan cla chv eug pyl col anan cla chv eug pyl col anan cla chv eug pyl col anan cla chv eug pyl col anan cla chv eug pyl col anan cla chv eug pyl col anan cla chv col anan cla chv col col col col col col col col col col	706 ATCTGGAAGGAATACCGGTGGCGAAGGGCGCCCC-CTGGACGAAAGACTGACGCTAGGGTGC ATCTGGAAGAACACCAACGGCGGAAAGCGCG-CTACTGGGCCGACTAACTGACGCTAGGGAC ATCGGGAAGACACCAAGGGGGAAGCGACT-TTCTGCTGGGCCGAACTGACACTGAGAGAC ATCGGGAAGACACCAATGGCGAAGGCGT-CTGCTGGGCCGAACTGACACTGAGAGAC ATCGGGAAGACACCAATGGCGAAGGCACT-TTCTGGCGGGCCAAACTGACACTGAGAGAC ATTGGAAGGAACACCAATGGCGAAGGCAT-TTCTGGCGGCCAAACTGACACTGAGAGAC ATTGGAAGGACACCAATGGCGAAGGCAT-TTCTGGCGGCCAACTGACACTGAGAGAC ATCGGAAAGAACACAAGGGAAAGGCAT-TTCTGGCGGCCGACACTGACACTGAGAGAC ATCGGAAAGAACACAACGGCGAAAGCACT-CTGCTGGGCCGACACTGACACTGAGAGAC ATCGGAAAGAACACCAACGGCGAAAGCACT-CTGCTGGGCCGACACTGACACTGAGAGAC ATCGGAAAGAACACCAACGGCGAAAGCACT-CTGCTGGGCCGACACTGACACTGAGAGAC ATCGGAAAGAACACCAACGGCGAAAGCACT-CTGCTGGGCCGACACTGACACTGAGAGTGC GAAGCTGGGGAGCGAAACGGGATAGGATTAGATACC-CTGTAGTCCTAGCCGCTAAACGATGGA GAAGCTAGGGGAGCAAACAGGATTAGATACC-CCAGTAGTCTAGCCGCGTAAACGATGGA GAAAGCTAGGGGAGCAAATGGGATAGAATAGATACC-CCAGTAGTCTAGCCGCTAAACGATGGA GAAAGCTAGGGGAGCAAATGGGATTAGATACC-CCAGTAGTCTAGCCGTAAACGATGGA GAAAGCTAGGGGAGCAAATGGGATAGAATAGATACC-CCAGTAGTCTAGCCGTAACGATGGA GAAAGCTAGGGGAGCAAATGGGATAGAATAGATACC-CCAGTAGTCTAGCCGTAACGATGGA GAAAGCTAGGGGAGCAAATGGGATAGAATAGATACC-CCAGTAGTCTAGCCGTAACGATGGA GAAAGCTAGGGGAACGAAATGGGATAGAATAGATACC-CCAGTAGTCTAGCCGTAACGATGGA GAAAGCTAGGGGAAACGGGATTAGAATAGATACC-CCAGTAGTCCTAGCCGTAACGATGGA
col anan cla chv eug pyl mari tob col anan cla chv eug pyl col anan cla chv eug pyl mari tob col anan cla chv eug pyl mari tob	215 CTCTTGCCATCGGATGGCCCCGATGGCATTAGCTAGTGGTGGGGC-AACGGCCACCT GCCTAGAGTGGCCCCCGATGAGGCATGGCATGGTGGGGGCAACGGCCACCA ACCGCCGATAGGGGCTGCCTCGATTAGCTAGTTGGTGGGGC-AACGGCCTACCA ACCGCCGATGAGGCTGGCCTCGCTGATTAGCTAGTTGGTGGGGC-AACGGCCTACCA ACCGCCGATGAGGCTGGCGTGCGTGATTAGCTGGTGGGGACAACGGGC-TACCA ATTCGGCCTAAGGAAGGCTTGCGCTGGGTGATTAGCTGGTGGGGAGAAGGGCTACCA ATTCGGCCTAAGGAAGGCTGCGCTGCGGTGATTAGCTGGTGGGGAGAAGGGCTACCA ATTCGGCCTAAGGAAGGGCTGCGCGTGGTGATTAGCTAGTTGGTGAGGC-AATGGCTTACCA ATTCGGCCCAAGGAGGGGCTGCGCGTGCGGTGATTAGCTAGTTGGTGAGGC-AATAGGCTTACCA ATTCGGCCCAAGGAGGGGCTGCGCGTGCGAATAGCTGGTGGGGAAGTGGGCAAGGGC-TACCA CCGCCTAAGGAAGGGGCTGCGCGTCGATTAGCTAGTTGGTGAGGC-AATAGGCTTACCA CCGCCCAAGGAGGGGCTGCGCGTCGATTAGCTAGTGGTGAGGC-CAATAGCTTACCA CCGCCCAAGGAGGGGCTGCGCGTCGATTAGCTAGTGGTGAGGACCAGGCCACGGGCAGGACCAGGC CCGCCCAAGGAGGGGCTGCGCGTGCGAGAGGATGATCAGCCACCTGGGACTGGAACCGGC 	col anan cla chv eug pyl mai tob col anan cla chv eug pyl mai tob	706 ATCTGGAAGGAATACCGGTGGCGAAGGCGGCCCC-CTGGACGAAAGACTGACGCTAGGTGC ATCTGGAAGAACACCAACGGCGGAAAGCGCG-CTACTGGGCCGATAACTGACACTGAGGACA ATTGGAAGAACACCAATGGCGAAGGCGAAAGCACT-TACTGGGCCGAAACTGACACTGAGAGAC ATTGGAAGAACACCAATGGCGAAGCGAT-CTGCTGGGCCGAAACTGACACTGAGAGAC ATTGGAAGAACACCAATGGCGAAGCGAT-TTCTGGCGGGCCAAACTGACACTGAGAGAC ATTGGAAGAACACCAATGGCGAAGCACT-TTCTGGCGGCGAAACTGACACTGAGAGAC ATTGGAAGGAACACCAATGGCGAAGCACT-TTCTGGCGGCGAACTGAACT
col anan cla chv eug pyl mari tob col anan cla chv eug col anan cla chv eug tob col anan cla col col anan cla col col col col col col col col col col	215 CTCTTGCCATCGGATGGGCTGCCGATGGGATTAGCTAGTGGTGGGCG-TAAGGGCTCACCA ATCACCAAGAGATGGGCTTGTCTGATAGCTAGTTGGTGGGG-TAAGGGCTACCA ATCGCCAAGAGAGGGCTTGCGTCGATTAGCTAGTTGGTGGGG-TAATGGCCTACCA ATCGCCAATAAGGGGCTTGCGTCGATTAGCTAGTTGGTGAGG-TAATGGCTTACCA ATCGCCAATAAGTGGCTTGCGCTGATTAGCTAGTTGGTGAGG-TAATGGCTTACCA ATC-CGCCAAGAGAGGGCTGCGCTCGATTAGCTAGTTGGTGAGG-TAATGGCTTACCA ATTCGGCCTAGGCATGGGCTGCGCTCGATTAGCTAGTTGGTGAGG-TAATGGCTTACCA ATTCGCCCAAGGAGGGGCTGCGCTCGCTGATTAGCTAGTTGGTGAGG-TAATGGCTTACCA CCGCCCAAGGAGGGGCTGCGCTCGATTAGCTAGTTGGTGAGG-CAATAGCTTACCA CCGCCCAAGGAGGGGCTGCGCTCGATTAGCAAGTTGGTGAGG-CAATAGCTTACCA CCGCCCAAGGAGGGGCTGCGCTCGATAGCAAGCAGCCACAGTGGAACGGGCAAGGGCCAAGGAGCAAGGTCGGGCTGGGGTGGGAGGAGCACGGCCAGGGACGGAC	col anan cla chv eug pyl mari tob col anan chv eug col anan chv eug col col col col col col col col col col	706 ATCTGGAAGAACACCGACGGCGAAAGGCGGCCCC-CTGGACGAAGACTGACGCTCAGGTGC ATCTGGAAGAACACCGACGGCGAAAGCGCC-CTGCTGGGCCGAAACTGACACTGAGAGAC ATCGGGAAGAACACCAATGGCGAAGGCG-CTGCTGGGGCCGAAACTGACACTGAGAGAC ATCGGGAAGAACACCAATGGCGAAGGCGT-CTGCTGGGCCGAAACTGACACTGAGAGAC ATCGGGAAGAACACCAATGGCGAAGGCAT-TTCTTCTGGCGCGAAACTGACACTGAGAGAC ATCGGGAAGAACACCAATGGCGAAGGCAT-TTCTTGGCGGCCAAACTGACACTGAGAGAC ATCGGGAAGAACACCAATGGCGAAGGCAT-TTCTTGGCGCGAAACTGACACTGAGAGAC ATCGGAAGAACACCAATGGCGAAGCACT-TTCTTGGCGCGACACTGACACTGAGAGAC ATCGGAAGGACACCAATGGCGAAGCACT-TCTTCTGGCGCGACACTGACACTGAGAGAC ATCGGAAAGAACACCAACGGCGAAGCACT-TCTTGGCGGCGACACTGACACTGAGAGAC ATCGGAAAGAACACCAACGGCGAAAGCAT-CTGCTGGGCCGACACTGACACTGAGAGAC ATCGGAAAGAACACCAACGGCGAAGCAT-CTGCTGGGCCGACACTGACACTGAGAGAC ATCGGAAAGGACACCAAACGGCGAAAGCAT-CTGCTGGGCCGACACTGACACTGAGAGAC ATCGGAAAGAACACAAACAGGATTAGATACC-CTGGTGGTCCAGCGCGAAACGATGGA AGAGGTGGGGGAGCAAACAGGATTAGATACC-CTGTTGTCCAGCGCGAAACGATGGA GAAGCTGGGGGAGGAAATGGGATTAGATACC-CCTGTAGTCCTGGCCGTAAACGATGGA GAAGCTGGGGGAGGAAATGGGATTAGATACC-CCAGTAGTCCTGGCCGTAAACGATGGA GAAGCTGGGGGAGGAAATGGGATTAGATACC-CCAGTAGTCCTAGCCGTAAACGATGGA GAAGCTAGGGGAGCGAATGGGATTAGATACC-CCAGTAGTCCTAGCCGTAAACGATGGA GAAGCTAGGGGAGCGAATGGGATTAGATACC-CCAGTAGTCCTAGCCGTAAACGATGGA GAAGCTAGGGGAGCGAATGGGATTAGATACC-CCAGTAGTCCTAGCCGTAAACGATGGA GAAGCTAGGGGAGCGAATGGGATTAGATACC-CCAGTAGTCCTAGCCGTAAACGATGGA GAAGCTAGGGGAGCGAATGGGATTAGATACC-CCAGTAGTCCTAGCCGTAAACGATGGA GAAGCTAGGGAGCGAATGGGATTAGATACC-CCAGTAGTCCTAGCCGTAAACGATGGA GAAGCTAGGGAGCGAATGGGATTAGATACC-CCAGTAGTCCTAGCCGTAAACGATGGA GAAGCTAGGGAGCGAATGGGATTAGATACC-CCAGTAGTCCTAGCCGTAAACGATGGA GAAGCTAGGGAGCGAATGGGATTAGATACC-CCAGTAGTCCTAGCCGTAAACGATGGA GAAGCTAGGGAGCGAATGGGATTAGATACC-CCAGTAGTCCTAGCCGTAAGCGATGAG GAAGCTAGGGAGCGAATGGGATTAGATACC-CCAGTAGTCCTAGCCGTAAGCGATGAG GAAGCTAGGGAGCGCGCGCGCAACGGGCCCCCCACAGCG GACTAGGGAGCTAGCGCGCGCACACGGCGCCCCCCACAGCG GCTGGGGAGTACGCCGCGAGGGTTAAACCCCAGGGGCCCCCCACAGCG GCTGGGGAGTACGCCGCAGGGGTAAACCCCAGGGGCCCCGCACAAGCG CCTGGGGAGTACGCCGCAGGGGTAAACCCCAAGGGGCCCGCCC
col anan cla chy eyyl mari tob col anan che chy gyl mari tob col anan che chy gyl mari tob col anan che chy gyl mari tob col anan che chy gyl mari tob col anan che chy gyl mari tob col anan che chy gyl mari tob col anan che chy gyl mari tob col anan che chy gyl mari tob col anan che chy gyl mari tob col anan che chy gyl mari tob col anan che chy gyl col anan che chy gyl mari tob col anan che chy gyl mari tob col anan che chy gyl mari tob col anan che chy gyl mari tob col anan che chy gyl mari tob col anan che chy gyl mari tob col anan che chy gyl mari tob col anan che chy gyl mari tob col anan che chy gyl mari tob col anan che chy gyl mari tob col anan che chy gyl mari tob col anan che chy gyl mari tob col anan che chy col anan che chy col anan col a col a col anan col a col an col an col an col col col col col col col col col col	215 CTCTTGCCATCGGATGGGCTGCCCGATGAGTGGGATTAGCTAGTGGTGGGGCTAACGGGCTACCA ATCACCAAGAGATGGGCTTG-TCTGATTAGCTAGTTGGTGGGG-TAACGGCCTACCA ATCACCAAGAGATGGGCTTGCCTCGATTAGCTAGTTGGTGGGG-TAACGGCCTACCA ATCACCAAGAGAGGGCTTGCCTCGATTAGCTAGTTGGTGAGG-TAATGGCTTACCA ATCACCAAGAGAGGGCTTGCCTCGATTAGCTGTGTGGTGAGG-TAATGGCTTACCA ATCTGTGCTAAGGATGGCCTGCGCTGATTAGCTGGTGGTGGGATAACGGCTTACCA ATTCGGCTAAGGAGGGCTGCGCTGCGTGATTAGCTAGTTGGTGAGG-TAATGGCTTACCA ATTCGGCCTAAGGAGGGCTGCGCTGCGTGATTAGCTAGTTGGTGAGG-TAATGGCTTACCA CCGCCCAAGGAGGGCTGCGCTGCGTCTGATTAGCTAGTTGGTGAGG-CAATGGCTTACCA CCGCCCAAGGAGGGCTGCGCTGCGTCTGATAGCTAGTGGTGAGGG-CAATGGCTTACCA CCGCCCAAGGAGGGCTGCGGTCGGTGTGATAGCAGCCACCACTGGGACTGAGACCGGC AGGCGACGATCCCTAAGCTGGTCTGAGAGGATGACCAGCCACCTGGGACTGAGACCGGC AGGCGACGATCCCTAGCTGGTCTGAGAGGATGATCAGCCACCTGGGACTGAGACCGGC AGGCGACGATCCCTAGCTGGTCTGAGAGGATGATCAGCCACCTGGGACTGAGACCGGC AGGCGACGATCAGTAGCTGGTCTGAGAGGATGATCAGCCACCTGGGACTGAGACCGGC AGGCGACGATCAGTAGCTGGTCTGAGAGGAGGATGATCAGCCACCTGGGACTGAGACCGGC AGGCAACGATCAGTAGCTGGTCTGAGAGGATGATCAGCCACCTGGGACTGAGACCAGGC AGGCAACGATCAGTAGCTGGTCTGAGAGGAGGATGATCAGCCACCTGGGACTGAGACCAGGC AGGCAACGATCAGTAGCTGGTCTGAGAGGAGGATGATCAGCCACCTGGGACTGAGACCAGGC AGGCAACGATCAGTAGCTGGTCTGAGAGGAGGATGATCAGCCACCTGGGACTGAGACCAGGC AGGCAACGATCAGTAGCTGGTCTGAGAGGAGGACACGCCCCTGGGACTGAGACCAGGC	col anan cla chv eug pyl mai tob col ana nan cla chv eug pyl mai tob col ana nan cla chv eug pyl mai tob col ana nan cla chv eug pyl mai tob col ana nan cla chv eug pyl mai tob col ana nan cla chv eug pyl mai tob col ana nan cla chv eug pyl mai tob col ana nan cla chv eug pyl mai tob col ana nan cla chv eug pyl mai tob col anan cla chv eug pyl mai tob col anan cla chv eug pyl mai tob col anan cla chv eug pyl mai tob col anan cla chv eug pyl mai tob col anan cla chv eug pyl mai tob col anan cla chv eug pyl mai tob col anan cla chv eug pyl mai tob col anan cla chv eug pyl mai tob col anan cla chv eug pyl mai tob col anan cla chv eug pyl mai tob col anan cla chv eug pyl mai tob col anan cla chv eug pyl mai tob col anan cla chv eug pyl mai tob col anan cla chv eug pyl mai tob col col anan col col col col col col col col col col	706 ATCTGGAAGGAATACCGGTGGCGAAGGCGGCCCC - CTGGACGAAGACTGACGTCAGGGTGC ATCGGAAGAACACCAACGGCGGAAAGCGCG - CTGCTGGGCCGACTAACTGACACTGAGAGAC ATCGGGAAGACACCAATGGCGAAGGCGT - CTGCTGGGCCGAACTGACACTGAGAGAC ATCGGGAAGACACCAATGGCGAAGGCGT - CTGCTGGGCCGAACTGACACTGAGAGAC ATCGGGAAGAACACCAATGGCGAAGGCAT - TTCTTAGGCCATAACTGACACTGAGAGAC ATTGGAAGGAACACCAATGGCGAAGGCAT - TTCTTAGGCCATAACTGACACTGAGAGAC ATTGGAAGGAACACCAACGGCGAAGGCAT - TTCTTGGGCGCCAACTGACACTGAGAGAC ATCGGAAAGAACACAACGGGAAGGCAT - TTCTTGGGCGCCACTGACACTGAGAGAC ATCGGAAAGAACACAACGGCGAAAGCACT - CTGCTGGGCCGACACTGACACTGAGAGAC ATCGGAAAGAACACCAACGGCGAAAGCACT - CTGCTGGGCCGACACTGACACTGAGAGAC ATCGGAAAGAACACCAACGGCGAAAGGCAT - CTGCTGGGCCGACACTGACACTGAGAGAC ATCGGAAAGAACACCAACGGCGAAAGGATTAGATACC - CTGGTGGTCCAGCGCGTAAACGATGGA ATCGGAAGGAACGCAAACGGGGATAGGATTAGATACC - CCTGTAGTCCTAGCCGCTAAACGATGGA GAAGCTGGGGGAGCAAATGGGATTAGATACC - CCTGTAGTCCTAGCCGCTAAACGATGGA GAAGCTAGGGGAGCAAATGGGATTAGATACC - CCAGTAGTCTAGCCGCGTAAACGATGGA GAAGCTAGGGGAGCAAATGGGATTAGATACC - CCAGTAGTCCTAGCCGTAAACGATGGA GAAGCTAGGGGAGCAAATGGGATTAGAATCC - CCAGTAGT

1476

448

Fig. 5. Alignment of chloroplast SS rRNA sequences from 11 species. *Nucleotide numbers* refer to the *Escherichia coli* sequence. One deletion in this sequence is indicated by an *exclamation mark*. Variable regions are indicated and refer to Fig. 3. Abbreviations: *col, Escheri*-

chia coli; ana, Anacystis nidulans; nan, Nanochlorum eukaryotum; cla, Chlamydomonas reinhardtii; che, Chlorella ellipsoidea; chv, Chlorella vulgaris; eug, Euglena gracilis; pyl, Pylaiella littoralis; mar, Marchantia polymorpha; mai, Zea mays; tob, Nicotiana tabacum.

	942	
col	GTOGAGCATGTGGTTTAATTCGAT-GCAACGCGAAGAACCTTACCTGGTCTTGACATCCA	co
ana	GTGGAGTATOTOGTTTAATTCGAT-GCAACGCGAAGAACCTTACCAGGGTTTGACATCCC	AD
348	-TURANULATUTUGTTTAATTCGAT-GCAACGCGAAGAACCTTACCAGGGCTTGACATGCC	nai
che	TOGATIATUTOGATTAATTCGATA-CAACOCGAAGAACCTTACCAGGGTTTGACATG	c14
chv	GTGGAGCATGTGGTTTTAATTCGATG_CAACGCGAAGAACCTTACCAGGGCTTGACATGCC	chi
eur	GTGGAGCATGTGGTTTAATTCGATG-CAACACGAAGAACCTTACCAGGACTTGACAT	C II
P71	TOGCAGCATOTOGTTTAATTCGATGGCAACGC-AAGAACCTTACCAGGGTTTGACATTAT	DV
mar	GTGGAGCATGTGGTTTAATTCGAT-GCAACGCGAAGAACCTTACCAGGGCTTGACATGCC	
mai	GTGGAGCATGTGGTTTAATTCGAT-GCAAGGCGAAGAACCTTACCAGGGCTTGACATGCC	8.6.
tob	GTOGAGCATOTOGTTTAATTCGAT-GCAAAGCGAAGAACCTTACCATGGCTTGACATGCC	tol
60]		
Ana	CCGAATCTCTTGGAAAACGAGAGAATTTTTTTTTTTTTT	
nan	ACTT-TTTCTTGAAAAAGAAAGTTCCGAGTGGACACA	nai
cla	TCAAGAACCTCTCAGAAATGGGAGGGTGCCCT-AACGGACTTGAACACA	cla
che	ATTTAATCTCTTGAAAAAGAGATTTTGAAAACTTGTGCTTTGCACAAGTTGGGTGGACACA	che
CRV	GCCACTTTTTCCCTGAAAGGGGAAGTT-CCAGAGTGGACACA	chy
pyl	GTAAATCTATTTGGAACGTACCTT-CGGGAATACATAAACA	DV
BAT	OTGAATCTTTTTGAAAGAAAAGAGTGCCTT-CGGGAACGCGGACACA	ma)
Bai	GCGAATCCTCTTGAAAGAGAGGGGTGCCCT-CGGGAACGCGGACACA	ma
	UCUARICCTCTTURRRGAGAGUUGGTGCCTT-CUUGAACGCGGACACA * **	to
	1047	
col	OGTOCTOCATGOCTOTCOTCAGC-TCOTOTTOTGAAATGTTGGGTTAAGTCCCGCAACGA	col
ana	GOTOGTOCATOGCTGTCGTCAGC-TCGTGTCGTGAGATGTTGGGTTAAGTCCCGCAACGA	ana
nan	OGTGGTGCATGGCTGTCGTCGTCGTCGTCGTGGGTTAAGTC-CGCAACGA	nai
CIA	WINGING TO TOTO TO T	cla
chv	GOTGGTGCATGOCTGTCGTCAGC-TCGTGTCGTGAGATGTTGGGTTAAGTCCCGCAACGA	chi
eug	GGTGGTGCATGGCTGTCGTCAGC-TCGTGTCGTGAGATGTTGGGTTAAGTCCCGCAACGA	eur
pyĺ	OGTOGTOCATOGCTOTCGTCAGC-TCGTGTCGTGAGATGTTGGGTTAAGTCCCGCAACGA	Py
Bar	GGTGGTGCATGGCTGTCGTCAGC-TCGTGCCGTAAGGTGTTGGGTTAAGTCCCGCAACGA	na i
881 tob	UTING INTERCONTRACTOR CONTRACTOR CONTRA	ma:
	**** ****************** ***** * * *** ****	
cal	GCGCAACCCTTATCCTTTGTTGCCAGCGG V7	col
ana	GCGCAACCCACGTTTTTAGTTGCCATCA	ana
nan	GCGCAACCCTTATTTGT-GTTGC	nai
cla	GCGCAACCCTCGTCTTTAGTTGCCATTTGGTTCTC	cla
che	GCGCAACCCTTGTTTTTAGTTGCTTTTTAAAATATACAATTTAAAAGGAATGCGAAGCATA	che
eug	GCGCAACCCTTTTTTTTTAATTAACGCTTGTCATT	eur
pyl	GCGCAACCCTTGTTTCTAGTTGCTTTACAAAAGGAAT	py
mar	OCGCAACCCTCTTGTTTAGTTGCCATCA	mai
tob	GCGCAACCCTCGTGTTTAGTTGCCACTA	nna: toi
	******** * **	
1	V7 1135	
ana	TTCAGTTGGGCACTCTAGAGAAACTGCCGGCAAACCGGAGGA	
nan	TATTTTAGGAACTCAAAGACTCGTGATAGCGAGA	
cla	TAAAGAGACTGCCAGT-GTAAGCTGGAGGA	
che	ACTTCQCATACTTTAGTATGTGAAGGAAACTACAAAGACTGCCGGTGATAAGCCGGAGGA	
euf	TAGAAATACTGCTGGTTATTA-CCGGAGGA	
pyl	CTTGAAGACTGCCGGTTATAAACCGGAGGA	
Bar	TTAAGTTTGGAACCCTAAACAGACTGCCGGTGATAAGCCGGAGGA	
mai	T-GAGTTTGGAACCCTGAACAGACCGCCGGTGTTAAGCCGGAGGA	
100	* ** * * * * *	
	1100	
col	AGGTGGGGATGACGTCAAGTCATCATGGCCCTTACGACCAGGGCTACACACGTG-CTACA	
ana	AGGTGTGGACGACGTCAAGTCATCATGCCCCTTACATCCTGGGCTACACACGTA-CTACA	
nan	AGGTGAGGATGACGTCAAGTCAGCATGCCTGACGCTGGGC-ACACACGTGA-TACA	
che	AGOTGAGGATGACGTCAAGTCAGCATGCCCCTTACATCCTGGGCGACACGCGTGA-TACA	
chv	AGGTGAGGATGACGTCAAGTCAGCATGCCCCTTACGTCCTGGGCGACACACGTGC-TACA	
eug	AGGTGAGGACGACGTCAAGTCATCATGCCCCTTATATCCTGGGCTACACACGTGC-TACA	
pyl	AGGTGAGGATGACGTCAAGTCATGCCCCCTTATACCCTGGGCTACACAGTGCCTACA	
mai	AGGAGAGGATGAGGCCAAGTCATCATGCCCCTTATGCCCTGGGCGACACACGTG-CTACA	
tob	AGGTGAGGATGACGTCAAGTCATCATGCCCCTTATGCCCTTGGCGACACACGTG-CTACA	
	*** * *** ** * ******* **** *** * * *** ****	
	1239	
col	ATGGCGCATACAAAGAGAAGCGACCTCGCGAGAGCAAGCGGACCTCATAAAGTGCGTCGT	
ana	ATGCTCCGGACAGCGAGACGCGAAGCCGCGAGGTGAAGCAAATCTCCCCAAACCGGGGCTC	
nan cla	ATGGTTGGGACAATCAGAAGCGA-CTCGTGAGAGCTAGCGGCTCTGTTAAACCCAGTCTT	
che	ATGGCCAGGACAATGAGATGCTACCTCGCGAGAGCAAGCTAACCTCAAAAACCTGGTCTC	
chv	ATGGCCGGGACAAAGAGATGCAAACCCGCGAGGGCTAGCCAACCTCAAAAACCCGGTCTC	
eug	ATGGTTAAGACAATAAGTTGCAATTTTGTGAAAATGAGCTAATCTTAAAACTTAG-CCTA	
PYI	ATGGCCGGGACAAAGGGTCGCGACCTCGCGAGAGAAAGCTAACCTCAAAAACCCGGCCTC	
mai	ATGGGCGGGACAAAGGGTCGCGATCTCGCGAGGGTGAGCTAACTCCAAAAACCCGTCCTC	
tob	ATGGCCGGGACAAAGGGTCGCGATCCCGCGAGGGTGAGCTAACCCCCAAAAACCCGTCCTC	
	+ + + +	
_	1299	
col	AGTCCGGATTGGAGTCTGCAACTCGACTCCATGAAGTCGGAATCGCTAGTAAT-CGTGGA	
ana	AGTTCGGATTGTAGGCTGAAACTCGCCTGCATGAAGGCGGAATCGCTAGTAAT-CGCAGG AGTTCGGATTGTAGGCTGAAACTCGCCTACATGAAGCTGGAAT-CCCTAGTAATACCCCAGG	
cla	AGTTCGGATTGTAGGCTGCAACTCGCCTACATGAAGCCGGAATCGCTAGTAAT-CGCCAG	
che	AGTTCGGATTGCAGGCTGCAACTCGCCTGCATGAAGTCGGAATCGCTAGTAAT-CGCTGG	
chv	AUTTCUDATTGCAGGCTGCAACTCGCCTGCATGAAGTCGGAATCGCTAGTAAT-CGCAGG AGTTCGGATTGTAGGCTGAAACTCGCCTACATGAAGCCGGAATCGCTAGTAAT-	
eug pyl	AGTTCGGATTGAAGGCTGCAACTCGCCTTCATGAAGATGGAATCGCTAGTAAT-CGCCGG	
mar	AGTTCGGATTGCAGGCTGCAACTCGCCTGCATGAAGCCGGAATCGCTAGTAAT-CGCCGG	
na i	AGTTCGGATTGCAGGCTGCAACTCGCCTGCATGAAGCAGGAATCGCTAGTAAT-CGCCGG	

TCACCTCCTTA-TCACCTCCTTT-

TCACCTCCTTT-TCACCTCCTTA-TCACCTCCTTA-TCACCTCCTTA-TCACCTCCTTA-TCACCTCCTTA-TCACCTCCTTA-TCACCTCCTTT-TCACCTCCTTT-** ****

Fig. 5. Continued.

Huelsenbeck 1992; Goldman 1993). Furthermore, the

methods for tree construction which are presently em-

Fig. 6. Alignment of LS rRNA from nine species. Nucleotide numbers refer to the Escherichia coli sequence. Two deletions in this sequence are indicated by exclamation marks. Variable domains are indicated and refer to Fig. 4. Domains D1 and D7B were deleted before the alignment; respective deletions are indicated. For abbreviations see Fig. 5.

mai tob	ФТАВСААССААСВАААТССТТСОВОВОЛТТСААААТААВСАТАС-АТССОВОВСАТСОССА GTASTAATCACCAAACTCCTTCOBGOAGTTGAAAATAABCATAG-ATCCGBOAGTTCCCG * *** * * * * * * * * * * * * * * * *	nai tob	CCGACTGATGTTGAAGAATCAGCGGATGAGTTGAGTTAGGGGTGAAATGCCACTCGAAC CCGACTGATGTTGAAGAATCAGCGGATGAGTTGTGGTTAGGGGTGAAATGCCACTCGAAC **********************************
col ana nan cla che eug mar tob	118 /147 ААТGGGGAAACCCAGT-CTATCATTAACTGAATCCATAGGTAATGAGGCGAAC ААТGGGGAAACCCAGT-CTTACGGCCACCTGAATCCATAGGGTGGCGGCGACGAAC ААТGGGGCAACCCCATATACGTCCTTACTGAATCCATAGGTAGAAAGAGAAAAC ААТAGGGCAACCCCATACAACTCCTATTAATTCATAGGTAAGAAGGCAAGAGACAAC ААТAGGGCAACCCTATTACAACTCCTATTAATTCATAGTAAGAAGAAGAGACAAC А-TGGGGCAACCTTTTATA-CTACCTATTAATTCATAGGTAAGAAGGAAGA-AGACAAC A-TGGGGCAACCTTTTATA-CTACCTAGTAATCCATAGAATGGTATGCAAGAAGAAC A-TGGGCAACCTTTTAACTGC-TGCTGAATTCATAGGAAGACAAGAGACAAC AATAGGTCAACCTTTTGAACTGC-TGCTGAATCCATAGGCAGGCAAGAGACAAC AATAGGTCAACCTTTTGAACTGC-TGCTGAATCCATGGGCAGGCAAGAGACAAC AATAGGTCAACCTTTTGAACTGC-TGCTGAATCCATGGGCAGGCAAGAGACAAC	col ana nan cla che eug mar mai tob	798 D4 Содадатаостодттстсссссдаласс-таттадбласосстсоятдалтсат ссбаластаостодттстсссссдалатаса-тта-Авосотласовота-салттатад тобалостластодятстсссссд-лалтасд-тта-Авосотласовота-салба тсодалостластодятстсссссд-лалтасд-тта-Авососасовота-сасатсал тсодалостластодятстстссс-лалтасд-тта-Авососасовота-сасатте ссаластластодатстстссссд-лалтасд-тта-Авососасовота-старасттвод ссаластластодятстстссссд-лалтасд-тта-Авососасовотатеаст-ода ссаластластовотсссссд-лалтасд-тта-Авососасосовотатеаст-ода ссаладотластовотсссссд-лалтасд-тта-Авососасасарттеаст-ода ссаладотластовотсссссд-лалтасд-тта-Авососасасарттеаст-ода ссаладотластовотссссс -лалтассд-тта-Авососасасарттеаст-ода
col ana nan cla che eug mar mai tob	184 ССВОВОАЛСТВАЛАСАТСТАЛОТ-АССССВАВДАЛАЛДАЛАТСАЛССВАВАТТСССССАВ ССОВСОВАЛТВАЛАСАТСТТАЛТ-АСССВАВДАЛАДАЛАЛСАЛАЛВТАТСССТСАВ ТТАОТВАЛСТВАЛАСАТСТТАЛТ-АССВАВДАЛАДАЛАДСАЛАСВСАЛТСССТВАВ ССАВТВАЛСТВАЛАСАТСТТАЛЯТ-АССТВАВДАЛАЛДАЛАДСАЛАСВСОВАТТСССТТАВ ССАВТВАЛСТВАЛАСАТСТТАЛЯТ-АССТВАВДАЛАЛВАЛАЛССАЛАСССОВТСССТТАВ СТОВСБАЛСТВАЛАСАТСТТАЛТ-АССТВАВДАЛАЛВАЛАВСАЛАСВСОВАТТСССТТАВ ТТВОТВАЛСТВАЛАСАТСТТАТТ-АВССВАВДАЛАЛВАЛАВСАЛАСВСОВАТТСССТТАВ ТТВОТВАЛСТВАЛАСАТСТТАТТ-АВССВАВДАЛАЛВАЛАВСАЛАСВСОВАТТСССТТАВ СТВОЕСВАЛСТВАЛАСАТСТТАТТ-АВССВАВДАЛАЛВАЛАВСАЛАВССВАТТСССТТАВ СТВОЕСВАЛСТВАЛАСАТСТТАТТ-АВССВАВДАЛАВСАЛАВССАЛАТСССЭТАВ СТВОЕСВАЛСТВАЛАСАТСТТАТТ-АВССВАВДАЛАВСАЛАВССАЛАВССВАТТСССЭТАВ СТВОЕСВАЛСТВАЛАСАТСТТАТТ-АВССВАВДАЛАВСАЛАВССАЛАВССВАТТСССЭТАВ СТВОЕСВАЛСТВАЛАСАТСТТАТТ-АВССВАВДАЛАЛВАЛАВСАЛАВССВАТТСССЭТАВ СТВОЕСВАЛСТВАЛАСАТСТТАТТ-АВССВАВДАЛАВСАЛАВСАЛАВССВАТТСССЭТАВ СТВОЕСВАЛСТВАЛАСАТСТТАТТ-АВССВАВДАЛАВСАЛАВСАЛАВССВАТТСССЭТАВ СТВОЕСВАЛСТВАЛАСАТСТТАТТ-АВССВАВДАЛАВСАЛАВССАЛАВСССЭТСВ ****	col ana nan cla che eug mar mai tob	851 CTCCGGGGGTAGAG-CACTGTTTCGGCLAGGGGGTCATCCCGACT-TACCAACCCGAT CGGTGGGGTAGAG-CACTGATTCGGTGCGGGCTGCGAAAGCGGTACCAAATCGAG CTATCTAGGGTAAAAGCACTGTTTCGGTGCGGGCTGCGAAAGCGGTACCAAATCGTG CTATCTAGGGTAAAG-CACTGTTTCGTTGCGGGCTGCGAAGCGGTACCAAATCGAA CTATCTAGGGTAAAG-CACTGTTTCGTGCGGGCTACGAAAGCGGTACCAAATCGAG CTATCTAGGGGTAAAG-CACTGTTTCGGTGCGGGCTACGAAAACGGTACCAAATCGAG C-ATCTAGGGGTAAAG-CACTGTTTCGGTGCGGGCTACGAAAACGGTACCAAATCGAG C-ATCTAGGGGTAAAG-CACTGTTTCGGTGCGGGCTGCGAGAGCGGTACCAAATCGAG C-ATCTAGGGGTAAAG-CACTGTTTCGGTGCGGGCTGCGAGAGCGGTACCAAATCGAG C-ATCTAGGGGTAAAG-CACTGTTTCGGTGCGGGCGCGCGAGCGGTACCAAATCGAG ******
col ana nan cla che eug mar mai tob	243 D1 deleted	col ana nan cla che eug mar mai tob	907 D5 ССАЛАСТСССАЛТАСССССАТАТАТОТТАТСАССССАССАСТСАД ССАЛАСТСССАЛТАССССССТТАСАССАТСАССССАСТСАД ССАЛАСТССТАЛТАСТАСАТАТОТТАТТТТТСАССАСТСАД ССАЛАСТАКААТАСТАСАКАСАТОТСТТСССТААССАОТСАД ССАЛАСТАКААТАСТАСАТАСТТССА
col ana nan cla che eug mar mai tob	404 ATGGGGGGACCATCCTCCAAGGCTAAATACTCCTGACTGA	col ana han cla che eug mar mai tob	947 Асодсовотосталсятся от салабловодала слассса са с
col ana nan cla che eug mar mai tob	181 Талабала адостала - Адалссссодства адодатталала адасстталал сотта- салабала адоттала - Адалссссодства адода адтала тадалса тадала сотта- - алаладала адалссства - Атода - Аттадала тадалса тадала сотта- салабала адоттала - Адалсссства - Ттодаба адтадала саталалсо ста- салабала адоттала - Адалсссства - Ттодаба адтадала саталалсоста- талабала адостала - Адалсссства - Садатада тадалса тадала сотта- талабала адостала - Адалсссства - Садатада тадалса тадала сотта- талабала Адостала - Садатаса - Садатада тадалса тадала - тадабала Адоттала - Садатаса - Стадаба сотталалсостала тадабала Адоттала - Садансе соста - Стадаба сотталалсостала тадабала бадатада - Садансе соста - Стадаба сотталалсостала тадаба соттала - Садансе соста - Стадаба сотталалсостала. • Садаба соттала - Садансе соста - Стадаба соттала соттала - Сада сотала. • Садаба соттала - Садансе соста - Стадаба соттала соттала - Сада соттала - тадаба соттала - Садансе соста - Стадаба соталала соттала - Сада соттала - Стадаба сото сотта сотта соттала сотта сотта • Садаба соттала - Садансе соста - Стадаба соталала соттала - Стадаба сото сотта сталаба соттала сотта Садаба сотада со сотта сотта сотта ва сотта - Сада сотта Сото сотта сотта сотта сотта ста сотта сотта Сада соста Сото сота сота сота сота сота сота ста сота сотта Сада соста Сото сота сота сота сота сота сота сота ста сота сота сота Соста со сота сота сота сота сота сота ста сота сота Соста сота сота сота сота сота сота сота	col ana han cla che eug mar nai tob	1006 CCAAATCATGGT-TAAGTGGGAAACGATGTGGGAAGGCCCAGGAAGCCAGGATGTTGGC CTCAAATCAGAAC-TTAGTGGTAAAGGAGGTGGGAGTGGCATAGACAACCAGGAGGTTTGC CCTAAATGATGT-TAAGTGGCAAAGGAGTTGGAGAAGGCTAGACCAGAAGGTTTGC CCTAAATGGCCC-TAAGTGGAAAGGAGTTGAGAATGGCTGAAACAACCAGGAGGTTGC CCTAAATGACCCC-TAAGTGGCAAAGGAGTGGCAGAGAACCACGAGGGTTGC CCTAAATGACCCC-TCAGTGGTAAAGGAGTGGCAGTGCAAAGCACCCAGGAGGTTGC CCTAAATGACCCC-TCAGTGGTAAAGGAGTGGCAGGCAAGCACGCAGGAGGTTGC CCTAAATGACCCC-TCAGTGATAAAGGAGTGGGAGGCAAGCACGCAGGCATTGC CCTAAATGACCCC-TCAGTGATAAAGGAGTGGGGGTGCAAAGACAGCCATGAGGTTGC CCTAAATGACCCC-TCAGTGATAAAGGAGTGGGGGTGCAAAGACACCCATGAGGTTGC CCTAAATGATCCC-TCAGTGATAAAGGAGTGGGGGTGCAAAGACACCCATGAGGTTGC CCTAAATGATCCC-TCAGTGATAAAGGAGTGGGGGTGCAAAGACACCCAGGAGGTTGC CCTAAATGATCCC-TCAGTGATAAAGGAGTGGGGGTGCAAAGACACCCAGGAGGTTGC CCTAAATGATCCC-TCAGTGATAAAGGAGTGCGGGGTGCAAAGACCACCAGGAGGTTGC CCTAATGATCCC-TCAGTGATAAAGGAGTGGGGGTGCAAAGACCCCATGAGGTTGCC
col ana nan cla che eug mar mai tob	522 D2 АССТАСААGCAGTGGGAGCACGCTTAGGCGTGCGCGCGCCCTTTGTATAATGGG GCTTACAAGCAGTGGGAGCCCGATTCAACGGGTGCCGGGTGCCTGTTGTAGAGATGAG GCTGGACAACGATGGGAGCACAT GCTTGTGACCGCGGTGCCTGTTGAAGAATGAG GCTGGACAAGCAGTGGGAGCA	col ana nan cla che eug mar mai tob	
col ana nan cla che eug mar nai tob	580 D3 TCABGGACTTATATTCTGTAGCAAGGTTAACCGAAATAGG-GGAGCCGA- CCGGCGACTTATAGCACTGCA-GGTT-AAGGAGAAATGCCGAAGCCAA- CCGGCGACTTATAGGAGTGGCTGGGTT-AAGGAGTAAATTCCGAAGCCAA- CCGGCGACTTATAGGAGTGGCTGGGTT-AAGGAGTAAATTCCGAAGCCA- CCGGCGACTTATAGGAGTGGCTGGGTTAAGGGTTCCGAACCCA- CCGGCGACTCATAGGCAGTGGCTTGGTTAAGGGACCGAACCCA- CCGGCGACTCATAGGCAGTGGCTTGGTTAAGGGAACCGAACCCA- CCGGCGACTCATAGGCAGTGGCTTGGTTAAGGGAACCGAACCCA- CCGGCGACTCATAGGCAGTGGCTTGGTTAAGGGAACCGGAACCGT- CCGGCGACTCATAGGCAGTGGCTTGGTTAAGGGAA	col ana nan cla che eug mar mai tob	1124
col ana nan cla che eug mar nsi tob	627 b3 AGGGAAAGCGAG ТОТТААСТӨӨӨСӨ ТТА GTTGCAGGGTATAGACCCGAAA AGGGAAAGCAAG ТОТGAATAGGGCGAТА GTCAGTGTTTATAGACCCGAAC AGGGAAAGCAAG ТОТGAATAGGGCGCA ТАПОТСАСТТСТТАТСВАССССААС AGGGAAAGCAAG ТОТGAATATATTTGC ТАЛОТСАСТТСТТАТСВАССССААС AGGGAAAGCGAG ТОТТСААТАСССААС AGGGAAAGCGAG ТОТТСАТАGGCCG АТПОТСАСТССТАТАGGACCCGAAC AGGGAAAGCGAG ТСТТСАТАGGCCG АТПОТСАСТССТАТАGGACCCGAAC AGGGAAAGCGAG ТСТТСАТАGGCCG АТПОТСАСТССТАТАGGACCCGAAC AGGGAAAGCGAG TCTTCATAGGCCG АТПОТСАСТССТАТАGGACCCGAAC AGGGAAAGCGAG TCTTCATAGGCC АТПОТСАСТССТАТАGGACCCGAAC AGGGAAAGCGAG TCTTCATAGGCC АТПОТСАСТССТАТАGGACCCGAAC	col ana nan cla che eug mar mai tob	1184 -TGGTAGGGAGGGT-CTGTAAGCCTGCGAAGGTGTGCTGTGAGGCATGCTGGAGGTA -TTGGTAGGGAAGCGTT-CCGTCGTAGGGTGAAGCAGCGGAAGCAGCCGTGGACGAA ATCGGTAGGGAGCGTT-CCGTCTGCGGTGAAGCTTCACGTAAGTATTTGTGGACGAA ATCGGTAGGGAGCGTT-CCGCTCTGGGTGAAGCATTAATTATGTGGGAGGACGAA ATCGGTAGGGAGCGTT-CCGCTCTAGGGTGAAGCATTAATGTAAGTTAATTTGGAGATGGAAGCAA ATCGGTAGGGAACGCTT-CCGCTTTAGGAGAAGGAATAATATGTAAATTATGTGGAGACGAA -TCGGTAGGGAACGCTT-CCGCCTTAGGGAGAAGCAACACGCAAGCAGGGGGGGGGG

col ana nan cia che eug mar mai tob col ana nan cla che eug mar

col ana nan cla che eug

878

978 СССОВС-ТСАТСТАЛССАТОВССАОДС-ТТОАЛОСТТОССТАЛСАСТАЛСТССАЛОДОСССАЛА СССОВС-ТСАТСТАЛССАТОВССАОДИТССАЛОСТТОССТАЛАСТСОЛАОТССАЛА СССОДС-ТСАТСТАЛССАТОВССАОДИТС-ЛАССТТОССТАЛАСТСАЛОСТССАЛА СССОДС-ТСАТСТАТСАТОВССАОДИТС-ЛАССТТОССТАЛАСССАЛАТССАЛОСССАЛА СССОДСТАЛТСТАТССАТОВССАОДИТС-ЛАССТТОССТАЛАСССАЛАТССАЛОСТСАЛА СССАОС-ТСАЛТСТАТССАТОВССАОДИТС-ЛАССТТОССТАЛАЛСАСАЛАТСАОДОСССАЛА СТОСС-ТСАТСТАТССАТОВССАОДИТС-ЛАССТТОССТАЛАЛСАСАЛАТСАОДОВСТССАЛА СТОСС-ТСАТССАТОСАССАОДИТС-ЛАССТТОССТАЛАЛСАСАЛАТСАОДОВСТССАЛА СТОСС-ТСАТССАТССАТОВССАОДИТС-ЛАССТТОССТАЛАЛСАСАЛАСТАЛОССАОДОТСССАЛА СТОСС-ТСАТССАТОСАССАОДИТС-ЛАССТТОССТАЛАЛСАЛАЛСАЛОСССАЛА СТОСС-ТСАТССАТОВССАОДИТС-ЛАССТТОССТАЛАЛСАЛАЛСАЛОССАЛАСТАЛОССАОДОТССАЛА СТОСС-ТСАТССАТОВССАОДИТС-ЛАССТТОССТАЛАСТАЛОСАЛОДСАОСТССАЛА СТОСС-ТСАТСТАТССАТОВССАОДИТС-ЛАССТТОССТАЛАЛСАЛОЛОССАЛАСТАЛОСАОДСТССАЛА СТОСС-ТСАТСТАТССАТОВССАОДИТС-ЛАССТТОССТАЛАЛСАЛОЛОССАЛАСТАЛОССАОДСТССАЛА СТОССТАТСТАТССАТОВССАОДИТС-ЛАССТТОССТОВАЛСТАЛАСТАЛОСАЛОДСАОДСТССАЛА СТОССТАЛСТАТССАТОВССАОДИТС-ЛАССТТОСАТСОЛАСТАЛОСАЛОДСАЛОСТСАЛАСТАЛОСАЛОЛОССАЛОСТОВСА СТОССТСАЛСТАТССАТОВССАОДИТС-ЛАССТТОССАЛОСТАЛАСТАЛОДСАЛОДСАЛОССАЛА *** col ana nan cla che eug mar mai tob

	1242		2040
col	TCAGAAGTGCGAATGCTGACATAAGTAACGATAAAGCGGGGTGAAAAGCCCGCTCGCCGGA	col	GTACCCGCGG CTACCTGCAC
ana nan	ACGGAAGTGAGAATGTCGGCTTGAGTAGCGAAAACATGGGTGAGAATCCCATGCCCCGAA GCAGAAGTGAGAATGTCGGCTTGAGTAACGTAAACATTGGTGAGAATCCCAATGCCCCGAA	nan	CTACCTACAC
cla	GCGGAAGTGAGAATGTCGGCTTGAGTAACGAAAACATTGGTGAGAATCCAATGCCCCCGAA	cla	CTACCTACAC
che	GCGGAAGTGAGAATGTCGGCTTGAGTAACGCAAACATTGGTGAGAATCCAATGCCCC-AA	che	CTTCCTGCAC
mar	GCGGAAGCGAGAATGTCGGCTTGAGTAACGCAAACATTGGTGAGAATCCAATGCCCCGAA	Har	CTACCTGCAC
mai	GCGGAAGCGAGAATGTCGGCTTGAGTAACGAAAACATTGGTGAGAATCCAATGCCCCGAA	mai	CTACCTOCAC
100	* **** * ***** * * * **** ** ** ***** ** ** ** **	200	* * *
	1302		2099
col	AGACCAAGGGTTCCTGTCCAACGTTAATCGGGGCAGGGTGAGTCGACCCCTAAGGCGAGG	col	TGAGCCTTGA
ana	ATCCCAAGGGTTCCTCCGGAAGGCTCGTCCGCGGGGGTTAGTCAGGTCCTAAGGCGAGG CCTAAGGATCCTCACCAGG-TCGTC-ATGGAGGTGAGTCAGGACCTAAGGCGAGG	ana nan	COGOCTTTCA
cla	AACCTAAGGGTTCCTCCACTAGGTTCGTCCATGGGGGGGTTAGTCAGGACCTAAGACTAGG	cla	TGGGCTTTTC
che	AACCTAAGGATTGGAGGACTAGGCTCGCTCATGGAGGATGAGTCAGGACCTAAGGCAAGG	che	COOCTTT-C
aar aar	AACCTAAGGGTTCCTCCGCAAGGTTCGTCCACGGAGGGTGAGTCAGGGCCTAAGATCAGG	mar	TGGGTTTTTC
mai	AACCCAAGGTTTCCTCCGCAAGGTTCGTCCACGGAGGGTGAGTCAGGGCCTAAGATCAGG	mai	TOGOCTITIC
top	AACCTAAGGGTTCCTCCGCAAGGTTCGTCCACGGAGGTGAGTCAGGGCCTAAGATCAGG * **** * * * * * * * * * **** **** *	COD	* * **
	1362 D78 deleted 1600		2158
col	CCGAAAGGCGTAG-TCGATGGGAAACAGGTTAATATTCCTGTACG-TACCCCCAAA-CCGA	col	AGCCGACC-T
ana	CAGAAGTGCGTAG-TCGATGGACAACAGGTTAATATTCCTGTACG-TACCCTAAA-CCGA	ana	AGCC-AACGG
cla	CCAAACGGCGTCG-TCGATGGAAAACAGGTTAATATTCCTGTACG-TACCTGAAA-CCGA	cla	AGCC-GTCAT
che	CCGAAAGGCGTAG-TCGATGGAAAACAGGTTAATATTCCTGTACG-TACCCCAAA-CCGA	che	AGCC-ATCAG
eug	TTTAACAACGTAAATTGATGGATGACAGGTTAATATTCCTGTACG-TACCGTAAA-CTGA CCGAAAGGCGTAG-TCGATGGACAACAGGCAAATATTCCTGTACG-TACCCGAAA-CCGA	eug	AGCATCAG
mai	CCGAAAGGCTAAG-TCGATGGACAACAGGTCAATATTCCTGTACGGTACCCGAAA-CCGA	mai	AGCC-ATCAG
tob	CCGAAAGGC-TAG-TCGATGGACAACAGGTGAATATTCCTGTACG-TACCCGAAA-CCGA	tob	AGCC-ATCAG ***
	1616		9910
co)	CACAGGTGGT-CAGGTAGAGAATACCAA-GGCG-CTTGAGAGAACTCGGGGTG-AAGG	col	-TAATCCGGG
ana	CACAGGTGG-GACGGTAGAGTATACCAAGGGGCGCGAGGTAACTCT-CTCTAAGG	ana	TCCGQC
nan cle	CACAGGUTACAGCGTTAGTAGAGGATATACTAACGGCGGCGCGAGATAACTCTCTCT	nan	TCAGGA
che	CACAGGTAG-TTGGGTAGAGTATACTTAGGGGCGCGGACATAACTCT-CTCTAAGG	che	TCAGGA
eug	CACAGGTAG-GTTAGTAGAATATACTAAGGAGCGCGAGATAACTCT-TTCTAAGG	eug	ACAATCATGA
Bar Bai	CACAGGTGG-GTAGGTAGAGAATACCTAGGGGCGCGAGATAACTCT-CTCTAAGG CACAGGTGG-GTAGGTAGAGAATACCTAGGGGCGCGAGACAACTCT-CTCTAAG-	mar Mai	CCG~-CGGGC
tob	CACAGGTGG-GTAGGTAGAGAATACCTAGGGGCGCGAGACAACTCT-CTCTAAGG	tob	CTACGGGC
	**** * * * * * **** * ***		* *
	1668 !1741	-	2269
col	AA-CTAGGCAAAATGGTGCCGTAACTTCGGGAGAAGGCACGCTGATATGTCTGAAATCAG	col	GAGTAACGGA
nan	AATCTCGGCAAAATGAC-CCGTA-CTTCGGGAGAGGGGTGCCCCCCCTAAGACGTGG	nan	AGGTAACGGA
cla	AA-CTCGGCAAACTGGCCCCTGAACTTCGGAAGAAGGGGGCACCCATCCGTAACAAGGTGG	cla	AGGTAACGGA
che	AA-CTCGGCAAAATGGCCCCGTAACT-CGGGAGGAGGGGGGGGCCCCCTAGAAATAGAG AA-CTCGGCAAAATGACTTCGTAACTTCGGAAGAAGTACCTCTAATGAG	che	GACTAACGGA
Har	AA-CTCGGCAAAATAGCCCCGTAACTTCGGGAGAAGGGGTGCCTCCTCTAAAAGGAG	-	AGGTAACGGA
BAI	AA-CTCGGCAAAATAGCCCCGTAACTTCGGGAGAAGGGGTGCCCCCTCGCAAAAG	mai tob	AGGTAACGGA
	** ** ****** * * * * ** *** **** * * *	100	******
	1751		2720
col	-TCGAAG-ATACCAGCTGGCTGCAACTGTTTATTAAAAACACAGCACTGTGCAAACACGA	col	TOOCATAAGC
ana	GTCGCAGTG-AAGAGGCCCAGGCGACTGTTTACCAAAAACACAGGTCTCCGCTAAGTCGT	ADA	AGGCATAAGG
cla	GTCGCAGTG-ACCAGGCCCAGGCGACTGTTTATCAAAAAACATAGGTCTCCGCAAAGTCGT	nan cla	AGGCAGAAGG
che	GCCGCAGTG-TCCAG-CCCAG-CGACTGTTTACCAAAAACACAGGTCTCCGCTAAGTCGC	che	AGGCAAAAGG
		Cillo	
1945	GTOGCAGAA-AAGAGGTCCCAAGCGACTGCTTACCAAAAGCACAGGTCTCCGCGAAGTTGA GTCGCAGTG-ACCAGGCCCAGGCGACTGTTACCAAAAACACAGGTCTCCGCGAAGTTGA	eug	AGGCAGAAGA
mai	GTGGCAGAA-AAGAGGTCCAAGGGACTGCTTACCAAAAGCACAGGTCTCCGCGAAGTTOA GTCGCAGTG-ACCAGGCCCAGGCGACTGTTACCAAAAACACAGGTCTCCGCAAAGTCGT 	eug Bar Bai	AGGCAGAAGG AGGCAGAAGG
nar nai tob	GTGGCAGAA-AAGAGGTCCAAGGGACTGCTTACCAAAAGCACAGGTCTCCGGCGAAGTTOA GTCGCAGTG-ACCAGGCCAGGCGACTGCTTACCAAAAACACAGGTCTCCGGCAAATCGT 	eug mar mai tob	AGGCAGAAGG AGGCAGAAGG AGGCAGAAGG
nar nai tob	GTQGCAGAA-AAGAGGTCCAAGGGACTGCTTACCAAAAGCACAGGTCTCCGGCGAAGTTOA GTCGCAGTG-ACCAGGCCAGGCGACTGCTTACCAAAAACACAGGTCTCCGGCAAAGTCGT 	eug mar mai tob	AGGCATAAGA AGGCAGAAGG AGGCAGAAGG AGGCAGAAGG **** ***
nar mai tob	GTGGCAGAA-AAGAGGTCCAAGCGACTGCTTACCAAAAGCACAGGTCTCCGCGAAGTTAA GTCGCAGTG-ACCAGGCCAGGGCGACTGTTTACCAAAAACACAGGTCTCCGCAAAGTCGT 	eug mar mai tob	AGGCATAAGA AGGCAGAAGGA AGGCAGAAGGA AGGCAGAAGGA **** *** 2388 GTGATCCOGT
col	GTOGCAGAA-AAGAGGTCCAAGGGACTGCTTACCAAAGGCACAGGTCTCCGGGAAGTTGA GTOGCAGTG-ACCAGGCCCAGGGCACTGTTATACCAAAACACAGGGTCTCCGGCAAAGTCGT GTCGCAGTG-ACCAGGCCGGGGCGACTGTATACCAAAAACACAGGTCTCCGGCAAAGTCGT GTCGCAGTG-ACCAGGCCGGGGCGACTGTTATACCAAAAACACAGGTCTCCGGCAAAGTCGT **********************************	eug mar mai tob col ana	AGGCAGAAGGA AGGCAGAAGGA AGGCAGAAGGA **** *** 2388 GTGATCCGGTC GTGATCCGAC
col ana cla	GTQGCAGAA-AAAAQGTCCAAQGGACTQCTTACCAAAAAGCACAGGTCTCCGGGAAGTTAA GTQGCAGAA-AAAAQGACCCAGQGAACTGTTTACCAAAAACACAQGTCTCCGGCAAAGTCGT GTQGCAGTG-ACCAGQCCCGGGGCAACTGTTACCAAAAACACAQGTCTCCGGCAAAGTCGT GTQGCAGTG-ACCAQGCCCGGGCCACTGTTACCAAAAACACAQGTCTCCGGCAAGTCGT # ***** ******************************	col ana nan	AGGCAGAAGG AGGCAGAAGG AGGCAGAAGG AGGCAGAAGG **** *** 2388 GTGATCCGGC GTGATCCGAC GTGATCCGAC
col ana cla che	GTQGCAGAA-AAAAGOTCCAAGGGACTGCTTACCAAAAGCACAGGTCTCCGGGAAGTTAA GTQGCAGGA-ACCAGOCCCAGGCGACTGTTTACCAAAAAGCACAGGTCTCCGGCAAAGTCGT GTQGCAGTG-ACCAGOCCCAGGCGACTGTTTACCAAAAACACAGGTCTCCGGCAAAGTCGT GTQGCAGTG-ACCAGGCCGGGCGACTGTTTACCAAAAACACAGGTCTCCGGCAAAGTCGT **********************************	col ana col col ana cla	AGGCAGAAGG AGGCAGAAGG AGGCAGAAGG AGGCAGAAGG AGGCAGAAGG TGATCCGAC GTGATCCGAC GTGATCCGAC GTGATCCGAC
col ana che eug	GTQGCAGAA-AAAAGQTCCAAGGGACTGCTTACCAAAAGCACAGGTCTCCGGCAAGTTAA GTCGCAGTG-ACCAGGCCAGGCGACTGTTACCAAAAACACAGGTCTCCGGCAAGTCGT GTCGCAGTG-ACCAGGCCGGGCCGACTGTTATACCAAAAACACAGGTCTCCGGCAAGTCGT GTCGCAGTG-ACCAGGCCGGGCCGCCTGTTATACCAAAAACACAGGTCTCCGGCAAGTCGT # ***** ******************************	col ana col col ana cla che eug	AGGCAGAAAGG AGGCAGAAAGG AGGCAGAAGG CAGCAGAAGG CAGCAGAAGG CAGCCAGAC CAGCACCAGAC CAGCACCGAC CAGCACCGAC
col ana col ana che eug mar nan cla che eug	GTOGCAGAA-AAGAGGTCCAAGCGACTGCTTACCAAAGCCACAGGTCTCCGGCAAGTTGA GTOGCAGTA-ACCAGGCCCAGGCACTGTTATACCAAAACCACAGGTCTCCGCAAAGTCGT 	col ana col ana cla che eug mar	AGGCAGAAAGG AGGCAGAAAGG AGGCAGAAAGG **** *** 2388 GTGATCCGAC GTGATCCGAC GTGATCCGAC GTGATCCGAC GTGATCCGAC GTGATCCGAC GTGATCCGAC
col ana cla che eug mar mai tob	GTQCAGAA-AAAAQQTCCAAQCGACTQCTTACCAAAAQCACAQGTCTCCGQCAAQTTCA GTQCAGAG-ACCAQCCCCAQCGACTGTATACCAAAAACACAQGTCTCCGCGAAAGTCGT GTCGCAGTG-ACCAQCCCCAQCGACTGTATACCAAAAACACAQGTCTCCGCAAAGTCGT GTCGCAGTG-ACCAQCCCGQGCGACTGTATACCAAAAACACAQGTCTCCGCAAAGTCGT 9TCGCAGTG-ACCAQCCCGQGCGACTGTATACCAAAAACACAQGTCTCCGCAAAGTCGT **********************************	col ana col ana nan che eug mani tob	AGGCAGAAGG AGGCAGAAGG AGGCAGAAGG **** *** 2388 GTGATCCGAC GTGATCCGAC GTGATCCGAC GTGATCCGAC GTGATCCGAC GTGATCCGAC GTGATCCGAC GTGATCCGAC
col ana col ana nan che eug mar mai tob	GTQCCAGAA-AAAAQGTCCAAQGGACTGCTTCTACCAAAAACCACAGGTCTCCGGCAAGTTGA GTQCCAGAG-ACCAGGCCCAGGCGACTGTTATACCAAAAACCACAGGTCTCCGGCAAAGTCGT GTCGCAGTG-ACCAGGCCCGAGGCGACTGTATACCAAAAACCACAGGTCTCCGGCAAAGTCGT GTCGCAGTG-ACCAGGCCGAGGCCACTGTATACCAAAAACCACAGGTCTCCGGCAAAGTCGT **********************************	col ana col ana che eug mar mai tob	AGGCAGAAGG AGGCAGAAGG **** *** 2388 GTGATCCGGT GTGATCCGAC GTGATCCGAC GTGATCCGAC GTGATCCGAC GTGATCCGAC GTGATCCGAC GTGATCCGAC (CGTGATCCGAC (CGTGATCCGAC)
col ana cla che eug mar tob col	GTQCCAGAA-AAAAGQTCCCAAGCGACTQCTTACCAAAAGCACAGQTCTCCGGCAAGTTGA GTQCCAGTG-ACCAGCCCCAGGCGACTQTTACCAAAAACCACAGGTCTCCGCAAAGTCGT GTQCCAGTG-ACCAGCCCCGGGGCGACTGTTACCAAAAACACAGGTCTCCGGCAAGTCGT GTQCCAGTG-ACCAGCCCCGGGGCGACTGTTACCAAAAACACAGGTCTCCGGCAAGTCGT 3 ***** ******************************	col ana col col ana nan cla che eug mar mai tob	AGGCAGAAGG AGGCAGAAGG AGGCAGAAGG **** *** 2388 GTGATCCGAC GTGATCCGAC GTGATCCGAC GTGATCCGAC GTGATCCGAC GTGATCCGAC GTGATCCGAC CTGATCCGAC TGATCCGAC TGATCCGAC TGATCCGAC TGATCCGAC TGATCCGAC TGATCCGAC TGATCCGAC
col ana cla che eug mar bai tob col ana	GTQGCAGAA-AAAAGGTCCAAGGACTGCTTACCAAAAGCACAGGGTCTCCGGCAAGTTAA GTQGCAGAA-ACAAGCCCCAGGCGACGTTTTACCAAAAACACACAGGTCTCCGGCAAGTCAT GTQGCAGTG-ACCAGGCCCCGGGGCCGCTGCCAAAACACACAGGTCTCCGGCAAGTCGT GTQGCAGTG-ACCAGGCCGGGCCGGCCGGGAAGGTTAATGATGGTGCCC *******************************	col mar mai tob col ana cha cha cug mar tob col ana	AGGCAGAAGG AGGCAGAAGG GTGATCCGGT GTGATCCGGT GTGATCCGAC GTGATCGAC GTGATCGAC GTGATCGAC GTGATCGAC GTGAC GTGAC GTGATCGAC GTGAC
col ana cla che eug mar bai tob col ana nan cla col	GTOGCAGAA-AAAAGOTCCAAGGGCACTGCTTACCAAAAGCACAGGTCTCCGGCAAGTTG GTOGCAGTG-ACCAGGCCCAGGGCACTGTTATACCAAAAACCACAGGTCTCCGCAAAGTCGT GTOGCAGTG-ACCAGGCCCGAGGGCGCACTGTTATACCAAAAACCACAGGTCTCCGCAAAGTCGT GTCGCAGTG-ACCAGGCCGGGGCGCGCCCCAGTGCCGGAAAGTCGTCCCCCAAAGTCGT **********************************	col ana cob col ana nan cla che eug tob col ana nan cob	AGGCAGAAGG AGGCAGAAGG AGGCAGAAGG **** *** 2388 GTGATCCGAC GTGATCCGAC GTGATCCGAC GTGATCCCAC GTGATCCAC GTGATCCAC GTGATCCAC GTGATCCAC GTGATCCAC GTGATCCAC GTGATCCAC GTGATCCAC GTGATCCAC GTGATCCAC GTGATCCAC GTGATCCAC GTGATCCAC GTGATCCAC GTGATCCAC GTGATCCAC GTGATCCAC GTGATCCAC GTGATCAC GTGAT GTGAT GTGAT GTGATCCAC GTGAT
col ana che eug mai tob che eug mai tob col ana nan cla che	GTQCCAGAA-AAAAQGTCCCAAGGGCGCCGAAGGCCGAAAGCCACGGCCGCGCGAAGTTGAA GTQCCAGAA-AAAAQGTCCCAAGGGCGCCGAAGGCCGAAAGCCAAGGCCGCGAAGTCGA GTQCCAGTG-ACCAGGCCCGAGGGCGCCGAAAACCCAAGGTCTCCGGCAAAGTCGT GTCGCAGTG-ACCAGGCCCGAGGCCGCCGAAAAACCACAGGTCTCCGGCAAAGTCGT 3000000000000000000000000000000000000	col ana col col ana che eugr mai tob col ana cla che	AGGCAGAAGG AGGCAGAAGG AGGCAGAAGG **** *** 2388 GTGATCCGAC GTGATCCGAC GTGATCCGAC GTGATCCGAC GTGATCCGAC GTGATCCGAC GTGATCCGAC GTGATCCGAC GTGATCCGAC STAACAGGCTG TAACAGGCTG TAACAGGCTG TAACAGGCTG
col ana che eug ani tob col ana nan cla che eug	GTQCCAGAA-AAAAGQTCCCAAGCGACTQCTTACCAAAAGCACAGQTCTCCGCGAAGTTGA GTQCCAGTG-ACCAGQCCCCAGGCGACTQTTTACCAAAAACCACAQGTCTCCGCAAAGTCGT GTQGCAGTG-ACCAGQCCCCGAGGCGACTQTTTACCAAAAACACAQGTCTCCGGCAAGTCGT GTQGCAGTG-ACCAGQCCCGAGGCGACTQTTACCAAAAACACAQGTCTCCGGCAAGTCGT GTGGCAGTG-ACCAGQCCCGGGCCGCCCGCGAAAGTTAATTGATGGGGTTAGC ************************************	col ana cla cha cha cha cha cha cha cha cha cha ch	AGGCAGAAGG AGGCAGAAGG GTGATCCGAC GTGATCGAC GTGATCGAC GTGATCGAC GTGATCGAC GTGATCGAC GTGATCGAC GTGATCGAC GTGATCGAC GTGATCGAC GTGATCGAC GTGATCGAC GTGATCGAC GTGATCGAC GTGATCGAC GTGATCGAC GTGATCGAC GTGATCGAC GTGAT GTGAT GTGAT GTGAT GTGAT GTGAC GTGAT GTGAC GTGATCGAC GTGAT GTGAC GTGAT GTGAT GTGAC GTGAT GTGAC GTGAC GTGAC GTGAT GTGAC G
col ana cla che uar bai tob col ana che uar bai tob col ana che uar uar uar	GTOGCAGAA - AAAAGOTCCAAGGGACTACTACTACCAAAAGCACAGGTCTCCGCGAAGTTAG GTOGCAGTG - ACCAGGCCCGAGGGACGTGTTATACCAAAAACACAGGTCTCCGCAAAGTCGT GTCGCAGTG - ACCAGGCCCGGGGCGCACTGTATACCAAAAACACAGGTCTCCGCCAAAGTCGT GTCGCAGTG - ACCAGGCCCGGGGCGCACTGTATACCAAAAACACAGGTCTCCCCCAAAGTCGT # * ** ** ** ** ** ** ** ** 1809 AAGTGGACGTATACGGTGTGACGCCTGCCCAGTGCCGGAAGGTTATGAGAAGTCGTGTCACC AAGACGATGTATGGGGGCTGACGCCTGCCCAGTGCCGGAAGGTTAAGGAAGTGGTCACC AAGACGATGTATGGGGGCTGACGCCTGCCCAGTGCCGGAAGGTTAAGGAAGTGGTTACC AAGACGATGTATGGGGCTGACGCCTGCCCAGTGCCGGAAGGTTAAGGAAGTGGTTAT AAGACGATGTATGGGGCTGACGCCTGCCCCAGTGCCGGAAGGTTAAGGAAGTGGTTAT AAAGCAGTATATGGGGCTGACGCCTCCCCAGTGCCGGAAGGTAAGGAAGTGGTTAT AAAGCAGTATGTGGGGCGCGCGCGCCCCGGGAAGGTCAAGGAAGTGGTTAT AAAGCAGTGTATGGGGCTGACGCCTCCCCAGTGCCGGAAGGTCAAGGAAGTGGTTAT AAAGCAGTGTGTGGGGCTGACGCCTGCCCAGTGCCGGAAGGTCAAGGAAGTGGTTAC AAGACCATGTATGGGGCTGACGCCTGCCCAGTGCCGGAAGGTCAAGGAAGTTGGTCAC AAGACCATGTATGGGGCTGACGCCTGCCCAGTGCCGGAAGGTCAAGGAAGTTGGTCAC AAGACCATGTATGGGGCTGACGCCTGCCCAGTGCCGGAAGGTCAAGGAAGTTGGTCAC AAGACCATGTATGGGGCTGCACGCCTGCCCAGTGCCGGAAGGTCAAGGAAGTTGGTCAC AAGACCATGTATGGGGCTGCCGCGCGGGAAGGTCAAGGAAGTTGGTCAC AAGACCATGTATGGGGCTGCCCGCGGGAAGGTCAAGGAAGTTGGTCAAC AAGACCATGTATGGGGCTGACGCCTGCCCGGTGAACGGCGGCGCGTAACTATAAC GCA	eug mar mai tob col ana che che col ana tob col ana nan cla che g mar mar mar mar mar mar mar	AGGCAGAAGG AGGCAGAAGG AGGCAGAAGG **** *** 2388 GTGATCCGAC: GTGATCGACCGCCGAC: GTGATCGACCGCGAC: ACCAGCCGAC: ACCAGCCGCGAC: ACCAGCGACCGAC: ACCAGCGAC; ACCAGCGAC; ACCAGCGAC; ACCAGCGAC; ACCAGCGACGAC; ACCAGCGAC; ACCAGCGAC; ACCAGCGACGAC; ACCAGCGAC; ACCAGCGACGAC; ACCAGCGAC; ACCAGCGAC; ACCAGCGACGAC; ACCAGCGAC; ACCAGCGAC; ACCGACGACGAC; ACCAGCGACGACGAC;
col ana cla che eug sar col col ana che eug sar col col ana cla che tob	GTOGCAGAA-AAAAGOTCCAAGGGACTGCTTACCAAAAGCACAGGTCTCCGGCAAGTTAG GTOGCAGTA-ACCAGGCCCAGGGACGTGTTTACCAAAAACCACAGGTCTCCGCAAAGTCGT 	col anan cla col anan cla col ana tob col ana nan cla col ana nan cla col ana i tob	AGGCAGAAGG AGGCAGAAGG AGGCAGAAGG **** *** 2388 GTGATCCGACI GTGATCCGACI GTGATCCGACI GTGATCCGACI GTGATCCCACI GTGATCCCACI GTGATCCCACI GTGATCCCACI GTGATCCCACI GTGATCCCACI GTGATCCCACI GTGATCCGACI GTGATCGACI GTGATCGACI GTGATCGACI GTGATCGACI GTGATCGACI GTGATCGACI GTGATCGACI GTGACI GTGATCGACI GTGATCGACI GTGATCGACI GTG
col ana cla cha eug mai tob col ana cha eug mai tob col ana cha cha col ana tob col ana tob	GTOGCAGAA - AAAAGOTCCAAGGACTACTTACCAAAAGCACAGOTCTCCGGCAAGTTAG GTOGCAGAA - ACAAAGCCCCAGGACGCACTOTTACCAAAAACCACAGOTCTCCCGCAAAGTCGT GTCGCAGTG - ACCAAGCCCGAGGCGCCGTATACCAAAAACCACAGOTCTCCCGCAAAGTCGT CCCAGTG - ACCAGGCCCGGGCCGCCCCGTGTCCCCAGGCTCCCCCAAGTCGT * * ** ** ** ** ** ** ** ** ** ** ** **	col anan cla cla col anan cla col anan cla col anan cla col ana nan cla col ana i tob	AGGCAGAAGG AGGCAGAAGG AGGCAGAAGG **** *** 2388 GTGATCCGACI GTGATCCGACI GTGATCCGACI GTGATCCGACI GTGATCCCACI GTGATCCCACI GTGATCCCACI GTGATCCCACI GTGATCCCACI GTGATCCCACI GTGATCCCACI GTGATCCCACI GTGATCCCACI GTGATCCCACI GTGATCCGACI GTGATCGACI GTGAT
col ana cla cha cha cha cha cha cha cha cha cha ch	GTOCCAGAA-AAAAGOTCCAAGCACTOCTATOCTAACCAAAACCACAGOTCTCCGCCAAGTTAA GTOCCAGAGT-ACCAGOCCCAGCACACTOTTTACCAAAAACCACAGOTCTCCGCCAAAGTCAT GTCGCAGTG-ACCAGOCCCCGAGCACACTOTTTACCAAAAACCACAGOTCTCCGCAAAGTCGT GTCGCAGTG-ACCAGOCCCGAGCCCCCTGTCCAAAAACCACAGOTCTCCGCAAAGTCGT **********************************	col ana nan cla col ana nan cla col ana cla col ana nan cla col ana nan tob	AGGCAGAAGG AGGCAGAAGG GTGATCCGAC GTGATCGAC GTGATCGAC GTGATCGAC GTGATCGAC GTGATCGAC GTGATCGAC GTGATCGAC GTGATCGAC GTGATCGAC GTGATCGAC GTGATCGAC GTGATCGAC GTGATCGAC GTGATCGAC GTGATCGAC GTGATCGAC GTGATCGAC GTGAT GTGAT GTGAT GTGAT GTGAT GTGAC GTGAT GTGAC GTGATCGAC GTGAT GTGAC GTGATCGAC GTGAT GTGAC GTGAT GTGAC GT
col ana che col ana ran che che che che che che che che che che	GTOCCAGAA-AAAAGOTCCAAGGACTACTTICTACCAAAAACCACAGOTCTCCGCGAAGTTATA GTOCCAGAG-ACCAGOCCCAGGCAGCTOTTITACCAAAAACCACAGOTCTCCGCAAAGTCAT GTOCCAGTG-ACCAGOCCCAGGCAGCTOTTITACCAAAAACCACAGOTCTCCGCAAAGTCAT GTOCCAGTG-ACCAGOCCCGAGGCCGCACTATACCAAAAACCACAGOTCTCCGCAAAGTCAT GTOCCAGTG-ACCAGOCCCGAGGCCGCCGTTATACCAAAAACCACAGOTCTCCGCAAAGTCAT 3	col ana nan cla eug mar tob col ana nan cla che eug mar tob col ana che che col ana che che col ana che che col ana che che col ana che che col ana che che col ana che che col ana che che col ana che che col ana che che col ana che che col ana che che col ana che che col ana che che col ana che che col ana che che col ana col ana col a col ana col ana col a col ana col a col a col ana col a col a col ana col a col a col ana col ana col ana col a col ana col ana col ana col ana col ana col ana col ana col ana col ana col ana col ana col ana col ana col ana col ana col col col col col col col col col col	AGGCAGAAGG AGGCAGAAGG GTGATCCGAC GTGATCCGAC GTGATCCGAC GTGATCCGAC GTGATCCGAC GTGATCCGAC GTGATCCGAC GTGATCCGAC GTGATCCGAC GTGATCCGAC GTGATCCGAC GTGATCCGAC GTGATCCGAC GTGATCGAC GTGATCGAC TAACAGGCTG TAACAGCTG TA
col ana nan cla che eug mar mai tob col ana nan cla eug mar mai tob	GTOGCAGAA - AAAAGOTCCAAGGACTACTICTACCAAAAGCACAGOTCTCCOCCAAAGTCGT GTOGCAGTA - ACCAGOCCCAGGCACTTATACCAAAAACCACAGOTCTCCOCCAAAGTCGT GTOGCAGTG - ACCAGOCCCAGGCACTTATACCAAAAACCACAGOTCTCCOCCAAAGTCGT GTCGCAGTG - ACCAGOCCCAGGCACTTATACCAAAAACACAGGTCTCCOCCAAAGTCGT gTCGCAGTG - ACCAGOCCCGGGGCACTGTTATACCAAAAACACAGGTCTCCCCCAAAGTCGT gTCGCAGTG - ACCAGOCCGGGGCGCCCCGGGACGCGTAACTATGCCAAAGTCGT aAGTGGACGTATACGGTGTGACGCCTGCCCCGGGGCGGAAGGTTAATGAGAAGCTGGTCACC AAGTGGACGTATACGGTGTGACGCCTGCCCCATGCCGGAAGGTTAAGGAAGTGGTTAGC AAGTGGACGTATACGGTGTGACGCCTGCCCCATGCCGGAAGGTTAAGGAAGTGGTTATT AAGACGACTATACGGGTGACGCCTGCCCCATGCCGGAAGGTTAAGGAAGTGGTTATT AAGACGATGTATGGGGCTGACGCCTGCCCCATGCCGGAAGGTTAAGGAAGTTGGTCACC AAGACATGTATGGGGCGGCGGCGGCCGCCCGGGAAGGTCAAGGAAGTTGGTCACC AAGACATGTATGGGGCGGCGGCGGCGGCGGAAGGTCAAGGAAGTTGGTCAAC AAGACATGTATGGGGCGGCGGCGGCGGAAGGTCAAGGAAGTTGGTCAAC AAGACATGTATGGGGCTGCCGCGCCGGGAAGGTCAAGGAAGTTGGTCAAC AAGACATGTATGGGCGCGGCGGAAGCTCCCCATGCCGGAAGGTCAAGGAAGTTGGTCAAC AAGACATGTATGGAGCTGTGACCCCCCCCCGTGGAAGGGCGGGC	col ana col ana che eug mar man cla eug col ana che eug col ana che eug col ana col ana che che col ana col a col ana col col col col col col col col col col	AGGCAGAAGG AGGCAGAAGG GTGATCCGAC GTGATCCGAC GTGATCCGAC GTGATCCGAC GTGATCCGAC GTGATCCGAC GTGATCCGAC GTGATCCGAC GTGATCCGAC GTGATCCGAC GTGATCCGAC GTGATCCGAC GTGATCCGAC GTGATCGAC GTGATCGAC GTGATCGAC SC TAACAGGCTG TAACAGCTG TAACAGCTG TAACAGCTG TAACAGCTG TAACAGCTG TAACAGCTG TAACAGCTG TAACAGCTG TAACAGCTG TAACAGCTG TAACAGCTG TAACAGCTG
col ana cla cha col ana cha cha col ana col ana col col col col col col col col col col	GTOCCAGAA-AAAAGOTCCAAGCGACTOCTACTACCAAAACCACGOTCTCCGCCAAGTCA GTOCCAGTG-ACCAGCCCCAGGCGCCTOTTTACCAAAAACCACGOTCTCCCGCAAAGTCGT GTCGCAGTG-ACCAGCCCCAGGCGCCTOTTTACCAAAAACCACGOTCTCCCGCAAAGTCGT GTCGCAGTG-ACCAGCCCGGGGCGCCTOTTTACCAAAAACCACGOTCTCCCGCAAAGTCGT **********************************	col ana cla che eug mar man tob col ana cla cla cla cob eug tob	AGGCAGAAGG AGGCAGAAGG AGGCAGAAGG **** *** 2388 GTGATCCGACT GTGATCCGACT GTGATCCGACT GTGATCCGACT GTGATCCGACT GTGATCCGACT GTGATCCGACT GTGATCCGACT GTGATCCGACT GTGATCCGACT TAACAGGCTG TAACAGCTG TAACAGCTG TAACAGCTG TAACAGGC TAACAGGCTG TAACAGGCTG TAACAGGCTG TAACAGGCTG TAACAGGCTG TAACAGGCTG TAACAGC TAACAGC TAACAGCTG
col ana cla cla cla cla cla cla cla cla cla cl	GTOCLAGA-AAAAGOTCCAAGGACTGCTTCTCTACCAAAAGCACAGOTCTCCGCGAAGTTACA GTOCCAGTG-ACCAGOCCCAGGCAGCTGTTTACCAAAAACCACAGOTCTCCGCAAAGTCGT GTCGCAGTG-ACCAGOCCCAGGCAGCTGTTTACCAAAAACCACAGOTCTCCGCAAAGTCGT GTCGCAGTG-ACCAGOCCCGGGCCCAGTGCCGAAAACCACAGOTCTCCGCAAAGTCGT #************************************	col ana che eug col ana che eug col ana che eug ana tob col ana cha che eug col ana nan cla che eug col ana che eug col ana che eug col ana an che ana che che eug col ana che che col ana che che col ana che che col ana che che col ana che che col ana che che col ana che che col ana che che col ana che che col ana che che col ana che che col ana che col ana che col ana che col col col col col col col col col col	AGGCAGAAGG AGGCAGAAGG GTGATCCGAC GTGATCCGAC GTGATCCGAC GTGATCCGAC GTGATCCGAC GTGATCCGAC GTGATCCGAC GTGATCCGAC GTGATCCGAC CTGATCCGAC CTGATCCGAC CTGATCGCAC SC CACGGCTG TAACAGGCTG TAACAGGCTG TAACAGGCTG TAACAGGCTG TAACAGGCTG TAACAGGCTG TAACAGGCTG TAACAGGCTG TAACAGGCTG TAACAGGCTG TAACAGGCTG TAACAGGCTG TAACAGGCTG TAACAGGCTG TAACAGGCTG CTCATCACAA CTCATCACCAA CTCATCACCAA
col ana cla cla cla cla cla cla cla cla cla cl	GTOGCAGAA - AAAAGOTCCAAGGACTGCTTGCCAAAAGCACAGGTCTCCGCCAAAGTCGT GTOGCAGTA - ACCAGGCCCGAGGACGTTGTTACCAAAAACACAGGTCTCCCGCAAAGTCGT GTOGCAGTG - ACCAGGCCCGGGGCGCACTGTATACCAAAACCACAGTCTCCCCCAAAGTCGT GTCGCAGTG - ACCAGGCCCGGGGCGCACTGTATACCAAAACCACAGTCTCCCCCAAAGTCGT GTCGCAGTG - ACCAGGCCGGGGCGGCACTGTTACCCAAAACCACAGTCTCCCCCCAAAGTCGT TBOP AAGTGGACGTATACGGTGTGACGCCTGCCCCATGCCGGAAAGGTTAATGACAGGACTGGTCACC AAGTGGACGTATACGGTGTGACGCCTGCCCCATGCCGGAAAGGTTAATGAGAAGCTGGTCACC AAGTGGACGTATACGGTGTGACGCCTGCCCCATGCCGGAAAGGTTAATGAGAAGCTGGTCACC AAGTGGACGTATACGGTGACGCCTGCCCCATGCCGGAAAGGTAAAGAAATGGTTATT AAGACGATGTATGGGGCTGACGCCTGCCCCATGCCGGAAAGGTAAAGAAATGGTTATT AAGACATGTATGGGGCGGCGGCGGCCGCCGGGAAGGTAAAGGAAGTTGGTCACC AAGACATGTATGGGGCTGACGCCTGCCCATGCCGGAAGGTCAAGGAAGTTGGTCACC AAGACATGTATGGGGCGGCGGCGGCGGAAGGTCAAGGAAGTTGGTCAAC AAGACCATGTATGGGGCTGCCGCGGCCGGGAAGGTCAAGGAAGTTGGTCAAC AAGACCATGTATGGGGCTGCCGCGCCGGTGACGGGAAGGTCAAGGAAGTTGGTCAAC AAGACATGTATGGGGCGGCGGAAGCCTGCCCGGTGAACGGGGGGCGGTAACTATAC AAGACAACGAGCCGGAAGCCTGACGCCGGAAGCCCGGAAGGTCAAGGAAGTTGGTAAC AAGACAACGAGCTGTAGCCCTGATGCGGGAAGGTCAAGGACGTGGCGTAACTATAC AAGACAACGAGCTGTAAGCCTGAAGCCGGGAAGGCCGGAAGGTCAACTATAC AAGACAACGAGCTGCTGAACGTGAAGCCGGGAAGGCCGGAACGTAACTATAC GCA	col anan col anan cla cheg mar man cla col anan cla col anan cla cla col anan cla col anan cla col anan cla col anan col an col anan col col col col col col col col col col	AGGCAGAAGG AGGCAGAAGG GTGATCCGAC GTGATCCGAC GTGATCCGAC GTGATCCGAC GTGATCCGAC GTGATCCGAC GTGATCCGAC GTGATCCGAC GTGATCCGAC GTGATCCGAC GTGATCCGAC GTGATCCGAC GTGATCCGAC GTGATCCGAC GTGATCCGAC GTGATCCGAC SC CCCCGC GTGATCCGAC SC CCCCCCC SC CCCCCCCC SC CCCCCCCCC SC CCCCCCCC
col ana col col ana col col col col col col col col col col	GTOGCAGAA - AAAAGOTCCAAGGGCACTGTTTGCCAAAAGCCAGGTTCTCGCGCAAGTTGTGTGTG	col ana col ana che eug mar man cla eug tob col ana n cla eug tob col ana n cla eug tob col ana n an cla che eug tob	AGGCAGAAGG AGGCAGAAGG AGGCAGAAGG TGATCCGAC GTGATCCGAC GTGATCCGAC GTGATCCGAC GTGATCCGAC GTGATCCGAC GTGATCCGAC GTGATCCGAC GTGATCCGAC GTGATCCGAC GTGATCCGAC GTGATCCGAC GTGATCCGAC GTGATCCGAC GTGATCCGAC GTGATCCGAC GTGATCCGAC GTGATCCGAC SC GTGATCCGAC SC GTGATCGCAC SC TAACAGGCTG TAACAGGCTG TAACAGGCTG TAACAGGCTG TAACAGGCTG TAACAGGCTG TAACAGGCTG TAACAGGCTG TAACAGGCTG CTCATCGCAA GCTCATCGCAC GCTCATCGCAC GCTCATCGCAC GCTCATCGCCAC GCTCATCGCCAC
col ana cla cha col col ana nan nan cla cha col ana cha col ana cha cha col ana cha cha cha cha cha cha cha cha cha ch	GTOCCAGAA-AAAAGOTCCAAGCGACTOCTICTTCCCAAAACCAGOTCTCCCGCAAAGTCG GTOCCAGAG-ACCAGOCCCCAGGCAGCTOTTATACCAAAAACCAGOTCTCCCGCAAAGTCGT GTCGCAGTG-ACCAGOCCCGAGGCACGTOTTATACCAAAAACCAGOTCTCCCGCAAAGTCGT GTCGCAGTG-ACCAGOCCCGGGGCGCACTOTATACCAAAAACCAGOTCTCCCGCAAAGTCGT **********************************	col anan cla col anan cla che mar tob col anan cla cug tob col anan cla cug tob col anan cla cug tob col anan cla cug tob col anan cla cug tob col anan cla cug tob col anan cla cug tob col anan cla cug tob col anan cla cug tob col anan cla cug tob col anan cla cug tob col anan cla cug tob col anan cla cug tob col anan cla cug tob col anan cla cug tob col anan cla cug tob col cug tob cug tob cug cug cug cug cug cug cug cug cug cug	AGGCAGAAGG AGGCAGAAGG GTGATCCGACI GTGATCCGACI GTGATCCGACI GTGATCCGACI GTGATCCGACI GTGATCCGACI GTGATCCGACI GTGATCCGACI GTGATCCGACI GTGATCCGACI GTGATCCGACI GTGATCCGACI GTGATCCGACI GTGATCCGACI GTGATCCGACI GTGATCCGACI GTGATCCGACI GTGATCCGACI GTGATCCGACI GTGATCGCACI CTACAGGCTG/ TAACAGGCTG/ TAACAGGCTG/ TAACAGGCTG/ TAACAGGCTG/ TAACAGGCTG/ TAACAGGCTG/ TAACAGGCTG/ TAACAGGCTG/ CTCATCGCACI GCTCATCCGCACI GCTCATCCG
col ana cha cha cha cha cha cha cha cha cha ch	GTOCLAGA-AAAAGOTCCAAGCACTECTIGTACCAAAACCACAGOTCTCCGCAAAGTCA GTOCCAGTG-ACCAGCCCCAGGCACACTITTACCAAAAACCACAGOTCTCCGCAAAGTCA TCGCAGTG-ACCAGCCCCAGGCACACTITTACCAAAAACCACAGOTCTCCGCAAAGTCA TCGCAGTG-ACCAGCCCCAGGCACCTITTACCAAAAACCACAGOTCTCCGCAAAGTCA TCGCAGTG-ACCAGCCCCGGGCACCTITTACCAAAAACCACAGOTCTCCGCAAAGTCA TCGCAGTG-ACCAGCCCGGGCCACTITTACCAAAAACCACAGOTCTCCGCAAAGTCA TCGCAGTG-ACCAGCCCGGGCCGCCCCCAGTGCCGGAAGGTTAAGGAAGTAGGTTAC AGACAATATATGGGGCTGACGCCTGCCCAGTGCCGGAAGGTTAAGGAAGTAGGTTAC AGACAATATATGGGGCTGACGCCTGCCCAGTGCCGGAAGGTTAAGGAAGTTGGTAAC AGACAATATATGGGGCTGACGCCTGCCCAGTGCCGGAAGGTTAAGGAAGTTGGTAAC AGACAATATATGGGGCTGACGCCTGCCCAGTGCCGGAAGGTAAGGAAGTTGGTAAC AGACAATATATGGGGCTGACGCCTGCCCAGTGCCGGAAGGTAAGGAAGTTGGTAAC AGACAATATATGGGGCTGACGCCTGCCCAGTGCCGGAAGGTAAGGAAGTTGGTAAC AGACAATATATGGGGCTGACGCCTGCCCAGTGCCGGAAGGTAAGGAAGTTGGTAAC AGACAATATATGGGGCTGACGCCTGCCCAGTGCCGGAAGGTAAGGAAGTTGGTAAC AGACAATATATGGGGCTGACGCCTGCCCAGTGCCGGAAGGTAAGGAAGTTGGTAAC AGACAATATATGGGGCAGGCCGCGCGGGAAGGTAAGGAAGTTGGTAAC AGACAATATATGGGGCAGGCCGCGAGGCCGGGAAGGTAAGGAAGTTGGTAAC AGACAATATATGGGGCAGGCCGCGAGGCCGGAAGGTAAGGAAGTTGGTAAC AGACAATATATGGGGCAGGCCGGAAGGCCGGGAAGGTAAGGAAGTTGGTAAC AGACAATATATGGGGCAGGCGGCGGAAGGTAAGGAAGTTGGTAAC AGACAATATATGGGGACTGACGCCGGAAGGCCGGAAGGTAAGGAAGTTGGTAAC AGACAATATATGGGGACTGACGCCGGAAGGCCGGAAGGTAAGGAAGTTGGTAAC AGACAAGGAAAGCTGACGCCGGAAGGCCGGAAGGCGGACGGCGGAAGTAAGT	col ana ncla che eug mari mai tob col ana ncla cla cug mari ncla che eug mari ncla che eug mari mai tob	AGGCAGAAGG AGGCAGAAGG GTGATCCGAC GTGATCCGAC GTGATCCGAC GTGATCCGAC GTGATCCGAC GTGATCCGAC GTGATCCGAC GTGATCCGAC GTGATCCGAC GTGATCCGAC TAACAGGCTG CTCATCCCAC GCTCATCCCAC GCTCATCGCAC GCTCATCGCCAC GCTCATCGCCAC GCTCATCGCCAC GCTCATCGCAC GCTCATCGCCAC GCTCATCGCCAC GCTCATCGCCAC GCTCATCGCCAC GCTCATCGCCAC GCTCATCGCCAC GCTCATCGCCAC GCTCATCGCCAC GCTCATCGCCAC GCTCATCGCCAC GCTCATCGCCAC GCTCATCGCAC GCTCATCGCCAC GCTCATCGCCAC GCTCATCGCCAC GCTCATCGCCAC GCTCATCGCCAC GCTCATCGCA
col col col col col col col col col col	GTOGCAGAA -AAAAGOTCCAAGGACTGCTTGCCAAAGCACAGOTCTCCGCAAAGTCGT GTOGCAGTG -ACCAGGCCCGAGGACGTGTATACCAAAAACACAGGTCTCCGCAAAGTCGT GTCGCAGTG -ACCAGGCCCGAGGACGCCATGTATACCAAAAACACAGGTCTCCGCAAAGTCGT GTCGCAGTG -ACCAGGCCGGGGCGCACTGTTATACCAAAAACACAGGTCTCCGCCAAAGTCGT GTCGCAGTG -ACCAGGCCGGGGCGCACTGTTATACCAAAAACACAGGTCTCCCGCAAAGTCGT **********************************	col ana nan cla col ana nan cla col ana nan cla col ana nan cla col ana nan cla col ana nan cla col ana nan cla col ana nan cla col ana nan col ana nan col ana nan col ana nan col ana nan col ana nan col ana nan col ana nan col ana nan col ana nan col ana nan col ana nan col ana nan col ana nan col ana nan col ana nan col ana nan col ana nan col a col ana nan col a col ana nan col a col a col ana nan col a col col col col a col col col col col col col col col col	AGGCAGAAGG AGGCAGAAGG GTGATCCGAC GTGATCCGAC GTGATCCGAC GTGATCCGAC GTGATCCGAC GTGATCCGAC GTGATCCGAC GTGATCCGAC GTGATCCGAC GTGATCCGAC GTGATCCGAC GTGATCCGAC GTGATCCGAC GTGATCCGAC GTGATCCGAC GTGATCCGAC GTGATCCGAC GTGATCCGAC GTCATCGCAC GCTCATCGCA GCTCATCGCAC
col ana nan cla che eug war war tob col ana nan nan cla che che eug war war war war tob col ana nan nan nan nan nan nan nan nan na	GTOGCAGAA-AAAAGOGTCCAAGGGCACTGTGTTGCGAAAGCCAGGTTCTCGGCAAAGTCGT GTOGCAGTA-ACCAGGCCCAGGGGCACTGTATACCAAAAACCAGGTCTCCGCCAAAGTCGT GTOGCAGTG-ACCAGGCCCGGGGGCGCGGACTGTTATACCAAAACCAGGTCTCCCGCAAAGTCGT GTCGCAGTG-ACCAGGCCCGGGGGCGCCGGGACTGTTTACCAAAAACCACGGTCTCCCCCAAAGTCGT TAGTGGACGTA-ACCGGCCGGGGGGCGCCGGGACGTTTTCCGCAAAGTCGT TCGCAGTG-ACCAGGCCGGGGGGCGCCCCCCGGGGAGGTTAACCACGGTTACGCAAGTCGTCCCCATGCCGGAAGGTTAATGGAGGTTACGGACGCTGCCCATGCCGGAAGGTTAAGGAAGTGGTTACGAAGACCTGGTCAGCAACCCCCATGCCGGAAGGTTAAGGAAGTGGTTATTAAGGAGTTAGGGGCTGACGCCTGCCCCATGCCGGAAGGTTAAGGAAGTGGTTATAAAGAACGAGGTTAAGGGAGTTGAGGCGGCGGCGGCGGAGGCTGAACGAAGACTAGTTAGCAAGACCATGTATGGGGGCTGACGCCTGCCCCATGCCGGAAGGTCAAGGAAGTTGGTCACCAAGACCATGTATGGGGGCTGACGCCGCCCCCCCC	col anan cla col anan cla cug mar man cla cug col anan cla cug tob col anan cla cug tob col anan cla cug cug tob col anan cla cug cug tob col anan cla cug cug tob col anan cla cug cug cug cug cug cug cug cug cug cug	AGGCAGAAGG AGGCAGAAGG AGGCAGAAGG AGGCAGAAGG Y Y Y Y Y Y Y GTGATCCGAC TAACAGGCTG TAACAGGCTGCG GCTCATCCCAAC
col ana nan cla che eug war mai tob col ana nan cla che eug uar tob col ana nan cla che eug uar mai tob col ana nan cla che che eug che che col che	GTOCLAGA-AAAGOTCCAAGCACTECTICICAAAGCACAGOTCTCCOCAAAGTCA GTOCCAGTG-ACCAGCCCCAGGCACGTTTTICACAAAAACCACAGGTCTCCOCCAAAGTCGT GTCGCAGTG-ACCAGCCCCAGGCACGTGTTTICACCAAAAACCACAGGTCTCCOCCAAAGTCGT GTCGCAGTG-ACCAGCCCCGGGCACGTGTTTICACCAAAAACCACAGGTCTCCOCCAAAGTCGT CCCAAGTG-ACCAGCCCGGGCCACTGTTTICACCAAAAACCACAGGTCTCCOCCAAAGTCGT CCCAAGTG-ACCAGCCCGGGCCACTGCCCAGTGCCGGAAGGTTAAGGAAGTCGTTACC AGACCATGTATGGGGCTGACGCCTGCCCAGTGCCGGAAGGTTAAGGAAGTGGTTACC AGACCATGTATGGGGCTGACGCCTGCCCAGTGCCGGAAGGTTAAGGAAGTGGTTACC AAGACCATGTATGGGGCTGACGCCTGCCCAGTGCCGGAAGGTTAAGGAAGTGGTTACC AAGACCATGTATGGGGCTGACGCCTGCCCAGTGCCGGAAGGTTAAGGAAGTGGTTACC AAGACCATGTATGGGGCTGACGCCTGCCCAGTGCCGGAAGGTTAAGGAAGTGGTTACC AAGACCATGTATGGGGCTGACGCCTGCCCAGTGCCGGAAGGTTAAGGAAGTGGTTACC AAGACCATGTATGGGGCTGACGCCTGCCCAGTGCCGGAAGGTAAGGAAGTGGTAAC AAGACCATGTATGGGGCTGACGCCTGCCCAGTGCCGGAAGGTAAGGAAGTGGTAAC AAGACCATGTATGGGGCTGACGCCTGCCCAGTGCCGGAAGGTAAGGAAGTGGTAAC AAGACCATGTATGGGGCTGACGCCTGCCCAGTGCCGGAAGGTAAGGAAGTGGTAAC AAGACCATGTATGGGGCTGACGCCTGCCCAGTGCCGGAAGGTCAAGGAAGTGGTAAC AAGACCATGTATGGGGCTGACGCCTGCCCAGTGCCGGAAGGTCAAGGAAGTTGGTAAC AAGACCATGTATGGGGCTGACGCCTGCCCAGTGCCGGAAGGTCAAGGAAGTTGGTAAC AAGACCATGTATGGGGCTGACGCCGCGGGAAGGTCAAGGAAGTTGGTAAC AAGACCATGTATGGGGACTGAGGCCGCGGAAGGCCGGAAGTCAAGAATTGCTAAC AAGACCATGTATGGGGACGTGAGGCCCGGAAGGCCGGGACGGCGGCGTAACTATAAC TGTT	col anan cla col anan cla che eug mar mai tob col anan cla che eug mar mai tob col anan cla che eug mar mai tob col anan cla che eug mar mai tob col anan cla che eug tob col anan cla che eug tob col anan cla che eug tob col anan cla che eug tob col anan cla che eug tob col anan cla che eug tob col anan cla che eug tob col anan cla che eug tob col anan cla che eug tob col col anan cla che col col col col col col col col col col	AGGCAGAAGG AGGCAGAAGG AGGCAGAAGG TGGATCCGAC GTCATCGCA GCTCATCGCA G
col ana che eug mari tob col col col col col col col col col col	GTOCCAGA-AAAAGOTCCAAGCGACTOCTICTCCAAAAACCACAGOTCTCCGCAAAGTCG GTCGCCAGGT-ACCAGCCCCAGGCGCACTOTTICACCAAAAACCACAGOTCTCCGCAAAGTCGT GTCGCAGTG-ACCAGCCCCAGGCGCCTOTTICACCAAAAACCACAGOTCTCCGCCAAAGTCGT GTCGCAGTG-ACCAGCCCGGGGCGCCTGTTITACCAAAAACCACAGOTCTCCGCAAAGTCGT GTCGCAGTG-ACCAGCCCGGGGCGCCTGCCCAGTGCCGGAAGGTTAATGAGGAGTCGT ACCAGCGCTTACCGGGCCGGCCGCCCCGCGCGGAAGGTTAAGGAAGTCGGTCACC ACCCCATAC-TQG-GCTGACGCCTGCCCAGTGCCGGAAGGTTAAGGAAGTGGTTAAT AAGCAATATATGGGGCTGACGCCTGCCCAGTGCCGGAAGGTTAAGGAAGTGGTTAAT AAAACCATATATGGGGCTGACGCCTGCCCCAGTGCCGGAAGGTAAGGAAGTTGGTAACC AAGCCATGTATGGGGCTGACGCCTGCCCAGTGCCGGAAGGTAAGGAAGTTGGTAACC AAGCCATGTATGGGGCTGACGCCTGCCCAGTGCCGGAAGGTAAGGAAGTTGGTAACC AAGCCATGTATGGGGCTGACGCCTGCCCAGTGCCGGAAGGTAAGGAAGTTGGTAACC AAGCCATGTATGGGGCTGACGCCTGCCCAGTGCCGGAAGGTAAGGAAGTTGGTAACC AAGCCATGTATGGGGCTGACGCCTGCCCAGTGCCGGAAGGTAAGGAAGTTGGTAACC AAGCCATGTATGGGGCTGACGCCTGCCCAGTGCCGGAAGGTAAGGAAGTTGGTAACC AAGCCATGTATGGGGCTGACGCCTGCCCAGTGCCGGAAGGTAAGGAAGTTGGTAACC AAGCCATGTATGGGGCTGACGCCTGCCCAGTGCCGGAAGGTCAAGGAAGTTGGTAACC AAGCCATGTATGGGGCTGACGCCTGCCCAGTGCCGGAAGGTCAAGGAAGTTGGTAACC AAGCCATGTATGGGGCAGCGGCGCGGGAAGGCCGGGCCTAACTATAAC GCA	col ana nan che eug mari mai tob col ana ncla che eug mari tob col ana ncla che eug mari mai tob col ana ncla che eug mari mai tob col ana nch an che eug mari mai tob col ana nch che eug mari mai tob col ana nch che eug mari mai tob col ana nch che eug mari mai tob col ana nch che eug mari tob col ana nch che eug mari tob col ana nch che eug mari tob col ana nch che eug mari tob col ana nch che eug col ana nch che eug col col ana nch che eug col col col ana nch che eug mari tob col ana nch che eug mari tob col ana nch che eug mari tob col ana nch che col ana nch che col ana nch che col col ana nch col col col col col col col col col col	AGGCAGAAGG AGGCAGAAGG GTGATCCGAC GTGATCCGAC GTGATCCGAC GTGATCCGAC GTGATCCGAC GTGATCCGAC GTGATCCGAC GTGATCCGAC GTGATCCGAC CTGATCCGAC CTGATCCGAC CTGATCCGAC CTGATCGAC CTGATCGAC CTGATCGCAC CTGATCGCAC CTCATCAC CTCATCAC CTCATCAC CTCATCAC CTCATCAC CTCATCAC CTCATCAC CTCATCAC CTCATCAC CTCATCAC CTCATCAC CTCATCAC CTCATCAC CTCATCAC CTCATCAC CTCATCAC CTCATCAC CTCATCAC CTCAT
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col ana nan cla che eug mar mai tob col ana nan cla che eug mar tob col ana nan nan cla che eug mar mai tob col ana nan nan rela che eug mar mai tob col ana nan nan rela che eug mar mai tob col col ana nan nan rela che eug mar mai tob col col ana nan nan rela che eug mar mai tob col	GTOCCAGA -ACAGGCCCCAGGCACTGCTTACCAAAACCAGGTCTCCGCCAAAGTCGT GTOCCAGGG -ACCAGGCCCGGGGCGCACTGTTACCAAAACCAGGTCTCCCCCAAAGTCGT GTCGCAGTG - ACCAGGCCCGGGGCGCCTGTTACCAAAACCACGGTCTCCCCCAAAGTCGT GTCGCAGTG - ACCAGGCCGGGGCGCCTGTTTACCAAAACCACGGTCTCCCCCAAAGTCGT GTCGCAGTG - ACCAGGCCGGGGCGCCTGCCCATGCCGGAAGGTTAATGAGAAGTCGT T T T T T T T T T T T T T T T T T	col anan cla eug mari man cla eug mari man tob col anan cla eug tob col an col an col an col col col col col col col col col col	AGGCAGAAGG AGGCAGAAGG AGGCAGAAGG AGGCAGAAGG AGGCAGAAGG TGTGATCCGACC GTGATCCGACC TAACAGGCTG GCTCATCGCAA
col ana nan cla che eug mar mai tob	GTOCLAGA-AAAGOTCCAAGCACTECTITICCAAAGCACAGOTTCCCOCAAAGTCGT GTOCLAGA-CACAGOCCCAGGCACTITITICACAAAAACACAGGTCTCCCOCAAAGTCGT GTOCLAGAT-ACCAGOCCCAGGCACGTGTTTIACCAAAAACACAGGTCTCCCOCAAAGTCGT GTCGACGTG-ACCAGOCCCGGGCACTGTTTIACCAAAAACACAGGTCTCCCOCAAAGTCGT **********************************	col anan cla che mari man cla che mari man cla che eugr man tob col anan cla che eugr man tob col anan cla che eugr man tob col anan cla che eugr man tob col anan cla che eugr man tob col anan cla che eugr man tob col anan cla che eugr man tob col anan cla che eugr man tob col anan cla che eugr man tob col anan cla che eugr tob col anan cla che eugr man tob col anan cla che eugr tob col col anan cla che eugr tob col col anan cla che eugr tob col col col anan cla che eugr tob col col col col col col col col col col	AGGCATAAGA AGGCAGAAGG AGGCAGAAGG TAGGCAGAAGG TAGGCAGAAGG TGTGATCCGACI GTGATCCGACI GTGATCCGACI GTGATCCGACI GTGATCCGACI GTGATCCGACI GTGATCCGACI TAACAGGCTG/ TAACAGGC
col ana nan cla che eug mar tob col ana nan cla che eug mar mai tob col ana nan nan cla che eug mar tob col ana nan nan cla che eug mar tob col ana nan nan cla che eug mar tob col ana nan nan cla che eug mar mar mar mar nan cha che eug mar mar mar mar mar nan cha che eug mar	GTOCLAGA-AAAAGOTCCAAGGACTECTITICCAAAAACCACAGOTCTCCGCAAAGTCA GTOCCAGTG-ACCAGCCCCAGGCACGTITTICACCAAAAACCACAGOTCTCCGCAAAGTCGT GTCGCAGTG-ACCAGCCCCAGGCACGTITTICACCAAAAACCACAGOTCTCCGCAAAGTCGT GTCGCAGTG-ACCAGCCCCAGGCACGCTITITICACCAAAAACCACAGOTCTCCGCCAAAGTCGT GTCGCAGTG-ACCAGCCCCAGGCCCGCCGGGAAGGTTAAGGAAGTCGT CCCAAGTG-ACCAGCCCGGGCCGCCCCCAGTGCCGGAAGGTTAAGGAAGTCGTACC AGACCATTATAGGGGCTGACGCCTGCCCAGTGCCGGAAGGTTAAGGAAGTGGTTACC AGACCATTATATGGGGCTGACGCCTGCCCAGTGCCGGAAGGTTAAGGAAGTGGTTACC AGACCATTATATGGGGCTGACGCCTGCCCAGTGCCGGAAGGTAAGGAAGTGGTTACC AGACCATTATATGGGGCTGACGCCTGCCCAGTGCCGGAAGGTAAGGAAGTGGTTACC AGACCATTATATGGGGCTGACGCCTGCCCAGTGCCGGAAGGTAAGGAAGTGGTACC AGACCATTATATGGGGCTGACGCCTGCCCAGTGCCGGAAGGTAAGGAAGTGGTACC AGACCATGTATGGGGCTGACGCCTGCCCAGTGCCGGAAGGTAAGGAAGTGGTACC AGACCATGTATGGGGCTGACGCCTGCCCAGTGCCGGAAGGTAAGGAAGTGGTACC AGACCATGTATGGGGCTGACGCCTGCCCAGTGCCGGAAGGTAAGGAAGTGGTACC AGACCATGTATGGGGCCTGCCCGCGGGAAGGTAAGGAAGTGGTAAC AGACCATGTATGGGGCTGACGCCTGCCCAGTGCCGGAAGGTAAGGAAGTTGGTAAC AGACCATGTATGGGGCCTGACGCCGCGGGAAGGTAAGGAAGTTGGTAAC AGACCATGTATGGGGCCTGACGCCGCGGGAAGGTAAGGAAGTTGGTAAC AGACCATGTATGGGGCCTGACGCGCGGGAAGGTAAGGAAGTTGGTAAC AGACCATGTATGGGGCCTGACGCGCGGGAAGGTAAGGAAGTTGGTAAC AGACCATGTATGGGGCCTGACGCGCGGGAAGGTAAGGAAGTTGGTAAC AGACCATGTATGGGGCCTGACGCGGCGGAAGGTAAGGAAGTTGGTAAC AGACCATGTATGGGGACTGACGCGCGGGAAGGCCGGAAGGTAAGGAAGTTGGTAAC AGACGAGGGAAGCCGGCGCCGGAAGGCCGGGCCG	col anan che eug mari mai tob col anan cla eug mari tob col anan cla eug mari tob col anan cla che eug mari mai tob col anan cla che eug mari mai tob col anan cla che eug mari mai tob col anan cla che eug mari mai tob col anan cla che eug mari mai tob col anan cla che eug mari tob col anan cla che eug mari tob col anan cla che eug mari tob col anan cla che eug mari tob col anan cla che eug mari tob col anan cla che eug mari tob col anan cla che eug mari tob col anan cla che eug mari tob col anan cha che eug mari tob col anan cha che col anan cha che col anan cha che col anan cha che che col anan cha che che col anan cha che che col anan cha che col anan cha che col anan cha che col anan cha che col anan cha che col anan che col col anan che col col col anan che col col col col col col col col col col	AGGCATAAGA, AGGCAGAAGG AGGCAGAAGG AGGCAGAAGG 2388 GTGATCCGACT GTGATCCGACT GTGATCCGACT GTGATCCCACC GTGATCCCACC GTGATCCCACC GTGATCCCACC GTGATCCCACC GTGATCCCACC GTGATCCCACC GTGATCCCACC GTGATCCCACC TAACAGGCTG/ CTCATCCCACA GCTCATCGCAA GCTCATCGCAA GCTCATCGCAA GCTCATCGCAA GCTCATCGCAA GCTACTCACCAA

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FGGTAC	GCGA	GCTG	GGTT	TAG/	ACG	тсат	040	ACAI	ንምምርሳ	aare	CCT	TOTO	ссато	10000
CGGTACO	GTGA	GCTG	GGTT	CAG/	ACG	TCGT	GAG	ACA	TTC	GGTC	CAT	TCCG	GTGC	AGGCO
CG-TACC	STAA	GCTC	GGGT	CAG/	ACG	T-GA	GAG	-CA	TTC	GGTC	CATA	TCCG	GTGT	10000
TGGTACO	ITGA	GCTG	GGTT	CAAA	ACG	TCGT	GAG	ACA	TTT	GGTC	CAT	TCCG	GTGT	00000
CGGTACO	ITGA	GCTG	GGTT	CAG/	ACG	TCGT	GAG	CAA	TTC	GTC	CATA	TCCG	GTGTA	GGCG
CGGTACO	TGA	GCTG	GGTT	CAGA	ACG	TCGA	GAG.	ACAG	TTC	GTC	CATA	TCCG	TGTC	AGCG
CGGTACO	TGA	GCTG	GGTT	CAGA	ACG	TCGT	GAG.	ACAG	TTC	GTC	CATA	TCCG	TOTO	IGGCG
COGTACO	STGA	GCTG	GGTT(CAG/	ACG	TCGT	GAG.	AC-C	TTC	GGTC	CATA	TCCG	TOTO	GGCG
CGGTACO	STGA	GCTG	GGTT	CAGA	ACG	TCGT	GAG.	ACAG	TTC	GTC	CATA	TCCG	TGTG	GGCG
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ATCTTCCCCAAGAGTTCACATCGACGGAAGGTTTGGCACCTCGATGTCG ATCTTCCCCAAGAGTTCACATCGACGGAAGGTTTGGCACCTCGATGTCG ATCTTCCCCAAGAGTTCACATCGACGGGAAGGTTTGGCACCTCGATGTCG ATCTTCCCCAAGAGTTCACATCGACGGAAGGTTTGGCACCTCGATGTCG ATCTTCCCCAAGAGTCCACATCGACGGAAGGTTTGGCACCTCGATGTCG ATCTTCCCCAAGAGTCCACATCGACGGAAGGTTTGGCACCTCGATGTCG ATCTTCCCCAAGAGTCCACATCGACGGAAGGTTTGGCACCTCGATGTCG ATCTTCCCCAAGAGTCCACATCGACGGAAGGTTTGGCACCTCGATGTCG ATCTTCCCCAAGAGTCCACATCGACGGAAGGTTTGGCACCTCGATGTCG TCCTGGGGCTGAAGTAGGT-CCCAAGGGTATGGCTGTTCGCCATTTAAG ACCTGGGCTGAAGTCGGTCCC-AAGGGTTGGGCTGTCGCCATTAAG ACCTGGC-CGTAGTACGT-CCAAGGGTTGGGCTGTCGCCATTAAG CCTCGGTCTGTAGTAGGT-CCCAAGGGTTGGGCTGTTCGC-ATTAAG ACCTGGGACGTAGTACGTTCCCAAGGGTTGGGCTGTTCCC-ATTAAG ACCTGGGGCGTAGTACGTCC-AAGGGTTGGGCTGTTCCCCCATTAAAG ACCTGGGGCGGTAGTACGTCC-AAGGGTTGGGCTGTTCCCCCATTAAAG

ATACCGCCCAAGAGTTCATATCGACGGCGGTGTTTGGCACCTCGATGTCG ATCTCCCTCCAAGAGTTCACATCGACGAGGAGGTTTGGCACCTCGATGTCG ATCTTCCC-AAGAGTTCACATCGACGGAAGGTTTGGCACCTCGATGTCG ATCTTCCCCAAGAGTTCACATCGACGGAAGGTTTGGCACCTCGATGTCG

GGTTCTGAATGGAAGGGCCATCGCTCAACGGATAAAAGTACTCCGGGGA GGTTCTGAGTGGAAGGGCCGTCGCTCAACGGATAAAAGTTACTCTAGGGA GGTTCCGGTGTGGA-GGCGGTCGCTCAACGGATAAAAGTTACTCTAGGGA GGTGCCGGCTTGAAGGGCCGTCGCTCAACGGATAAAAGTTACTCTAGGA GGTGCCGTATGGAAGGCCGTCGCTCAACGGATAAAAGTTACTCTAGGGA GGTGCCGATGGAAGGGCCGTCGCTCAACGGATAAAAGTTACTCTAGGGA GGTGCCGAGTGGAAGGGCCGTCGCTCAACGGATAAAAGTTACTCTAGGGA GGTGCCGAGTGGAAGGGCCGTCGCTCAACGGATAAAAGTTACTCTAGGGA GGTGCCGAGTGGAAGGGCCGTCGCTCAACGGATAAAAGTTACTCTAGGGA CGTGCCGAGTGGAAGGGCCGTCGCTCAACGGATAAAAGTTACTCTAGGGA CGTGCCCGAGTGGAAGGGCCGTCGCTCGACGGATAAAAGTTACTCTAGGGA

GGAGCACGAAGGTTGGCTAATCCTGGTCGGACATCAGGAGGTTAGTGCAA

ЭТТОСОВАСАӨТӨТСТӨӨТӨӨӨСАӨТТТӨАСТӨВӨСӨӨТСССТССТААА ССОА – АӨСАӨТАТСАӨӨТӨӨСАӨТТТӨАСТӨВӨСӨӨТСӨССТССТААА КОССТТИАСАӨТТТСАӨӨТӨӨСАӨТТТӨАСТӨӨӨСӨӨТСӨССТССТААА КССТТИАСАӨТТТСАӨӨТӨӨӨСАӨТТТАСТӨӨӨСӨӨЛ АТӨССТССТААА КОПТТИАСАӨТТТСАӨӨТӨӨӨСӨӨТТТӨАСТӨӨӨӨСӨӨ АӨССТССТААА ХСААӨӨӨАСАГТССАӨӨТӨӨСӨӨТТТСАТӨӨӨӨСӨЛ АӨССТССССАА ХСААӨӨӨАСАГТССКАӨТАӨАСАӨТТТСАТӨӨӨӨСӨЛ АӨӨССТСССААА ХСААӨӨӨАСАГТССКАӨТАӨСАӨТТТСАТӨӨӨӨСӨГ АӨӨССТСССААА ХСААӨӨӨАСАГТССКАӨТАӨСАӨТТТСАТӨӨӨӨСӨГ АӨӨССТСССААА ХСААӨӨӨАСАГТССКАӨТАӨСАӨТТТСАТӨӨӨӨСӨГ АӨӨССТСССААА

- D10 ----

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Fig. 6. Continued.

using various methods of calculation. Although methods to prove the correctness of such trees are still lacking (Hillis and Huelsenbeck 1992), these trees are considered to be correct.

Obviously, due to reasons cited above, the phylogeny of plastids has not been elucidated conclusively, although many investigations have been performed on this subject, using either rRNA sequences (Hori and Osawa 1987; Woese 1987; Cedergren et al. 1988; Giovannoni et al. 1988; Turner et al. 1989; Van de Peer et al. 1990; Markowicz and Loiseaux-de Goer 1991; Douglas 1992) or protein sequences (Schwartz and Dayhoff 1978; Janssen et al. 1989; Grace 1990; Kraus et al. 1990; Morden et al. 1992) or gross genome organization (Shivji et al. 1992). Most of these authors agree that plastids originated from cyanobacteria and are of monophyletic origin. However, a "robust" tree comprising all plastids has not been found yet. The branching order of most algal chloroplasts could not be determined precisely. Only the tree containing exclusively the chloroplasts of plants was found to be "robust." This tree is also in agreement with "classical" taxonomy, based on morphological criteria.

Recently, the monophyletic origin of the plastids has, however, been questioned (Boczar et al. 1989; Assali et al. 1990). High homology has been found between the ribulosebisphosphate carboxylase gene of the chloroplast of *Pylaiella littoralis* and β -purple bacteria (Assali et al. 1991; Markowicz and Loiseaux-de Goer 1991) and between the same gene of the chloroplast of Ectocarpus siliculosus and hydrogen bacteria (Valentin and Zetsche 1990). However, the rRNA genes of these algae show the usual homology to cyanobacteria. Thus, it has been proposed that the plastid genomes from Chromophyta, Rhodophyta, and Cryptophyta are of a composite phylogenetic origin. Furthermore, plastids have also originated from secondary symbiotic events. It has been shown that several algae are intertaxonic chimaeras generated from different protozoa (Douglas et al. 1991; Eschbach et al. 1991; Douglas 1992).

Considering the preliminary status of sequence derived chloroplast phylogeny, we will cautiously assess the significance of our results. The position of *N.e.* on the tree with respect to the positions of the plant and *Chlorella* chloroplasts was "robust," which means it is identical under all conditions. Consequently, we conclude that *N.e.* is most closely related to *Chlorella vulgaris* and therefore belongs to the order Chlorococcales. This con-



Fig. 7. Phylogenetic trees inferred from SS rRNA and LS rRNA sequences. The complete, aligned sequences from Figs. 5 and 6 were used. No distance corrections were used. Distance matrices were calculated according to Kimura (1980) with the program DNADIST, trees with the program FITCH, both from the Phylip software package. Lengths of vectors are proportional to evolutionary distances.

clusion is supported by investigations using the nuclear SS rRNA sequence of *N.e.* (Sargent et al. 1988), which has been included in calculations of the phylogeny of algae (Rausch et al. 1989; Eschbach et al. 1991; Hendriks et al. 1991; Douglas 1992). In all investigations, *N.e.* was found to be closely related to *Chlorella*.

Even if this taxonomic position is only approximately correct, we certainly can exclude that *N.e.* belongs to an ancestral algal lineage. Consequently, the primitive morphological and biochemical appearance of *N.e.* must be due to reduction. A comparable phylogenetic misinterpretation of unusual biochemical properties has occurred in dinoflagellates. In particular, the absence of histones has led to the assumption that dinoflagellates are an "ancestral" taxon (Herzog et al. 1984). However, phylogenetic analysis, based on LS rRNA sequences, places dinoflagellates close to ciliates and yeast in the middle of the kingdom of unicellular eukaryotes (Lenaers et al. 1989).

Thus, it is obviously unwarranted to draw phylogenetic conclusions from biochemical peculiarities, even if they differ significantly from established standards. The phylogenetic position of an organism can be inferred only from a thorough analysis using sequences of several suitable genes.

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