

SEQUENCE LISTING

<110> Macquarie University

<120> THERMOSTABLE RUBISCO ACTIVASE COMPLEXES

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<151> 2015-01-22

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<170> PatentIn version 3.5

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<213> Oryza sativa

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1 5

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<213> Oryza australiensis

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<213> Oryza australiensis

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<213> Oryza australiensis

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<222> (11)..(11)

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<213> Oryza australiensis

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Glu Tyr Leu Ser Gln Gly Leu Lys

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<223> Xaa can be any aliphatic amino acid (Leu, Ile, Val)

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<213> *Oryza australiensis*

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Met Leu Asp Asn Thr Met Gly Gly Phe Tyr Ile

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<213> *Oryza australiensis*

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<213> *Oryza australiensis*

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Leu Asp Asn Thr Met Gly Gly Phe Tyr Ile Ala

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<213> Oryza australiensis

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<213> Oryza australiensis

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<222> (5)..(5)

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<213> Oryza australiensis

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Lys Asn Phe Met Ala Leu Pro Asn Ile

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<213> *Oryza australiensis*

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<213> *Oryza australiensis*

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<211> 9

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<400> 34

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<213> Oryza australiensis

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Lys Tyr Leu Ser Glu Ala Ala Leu Gly

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<213> Oryza australiensis

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Val Gln Leu Ala Asp Lys Tyr Leu Ser Glu

1 5 10

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<213> *Oryza australiensis*

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<213> *Oryza sativa*

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20 25 30

Asn Tyr His Gly Lys Ser Ser Asn Ile Asn Arg Phe Lys Val Met Ala

35 40 45

Lys Glu Leu Asp Glu Gly Lys Gln Thr Asp Gln Asp Arg Trp Lys Gly

50 55 60

Leu Ala Tyr Asp Ile Ser Asp Asp Gln Gln Asp Ile Thr Arg Gly Lys

65 70 75 80

Gly Phe Val Asp Ser Leu Phe Gln Ala Pro Thr Gly Asp Gly Thr His

85 90 95

Glu Ala Val Leu Ser Ser Tyr Glu Tyr Leu Ser Gln Gly Leu Arg Thr

100 105 110

Tyr Asp Phe Asp Asn Thr Met Gly Gly Phe Tyr Ile Ala Pro Ala Phe

115 120 125

Met Asp Lys Leu Val Val His Ile Ser Lys Asn Phe Met Thr Leu Pro

130 135 140

Asn Ile Lys Val Pro Leu Ile Leu Gly Ile Trp Gly Gly Lys Gly Gln

145 150 155 160

Gly Lys Ser Phe Gln Cys Glu Leu Val Phe Ala Lys Met Gly Ile Asn
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 Pro Ile Met Met Ser Ala Gly Glu Leu Glu Ser Gly Asn Ala Gly Glu
 180 185 190
 Pro Ala Lys Leu Ile Arg Gln Arg Tyr Arg Glu Ala Ala Asp Ile Ile
 195 200 205
 Lys Lys Gly Lys Met Cys Cys Leu Phe Ile Asn Asp Leu Asp Ala Gly
 210 215 220
 Ala Gly Arg Met Gly Gly Thr Thr Gln Tyr Thr Val Asn Asn Gln Met
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 Val Asn Ala Thr Leu Met Asn Ile Ala Asp Asn Pro Thr Asn Val Gln
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 Leu Pro Gly Met Tyr Asn Lys Glu Asp Asn Pro Arg Val Pro Ile Ile
 260 265 270
 Val Thr Gly Asn Asp Phe Ser Thr Leu Tyr Ala Pro Leu Ile Arg Asp
 275 280 285
 Gly Arg Met Glu Lys Phe Tyr Trp Ala Pro Thr Arg Asp Asp Arg Val
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 Gly Val Cys Lys Gly Ile Phe Arg Thr Asp Asn Val Pro Asp Glu Asp
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 Ile Val Lys Ile Val Asp Ser Phe Pro Gly Gln Ser Ile Asp Phe Phe
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 Gly Ala Leu Arg Ala Arg Val Tyr Asp Asp Glu Val Arg Lys Trp Val
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 Ser Asp Thr Gly Val Glu Asn Ile Gly Lys Arg Leu Val Asn Ser Arg
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 370 375 380
 Met Glu Tyr Gly Tyr Met Leu Val Lys Glu Gln Glu Asn Val Lys Arg
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<213> *Oryza australiensis*

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Asn Tyr His Gly Lys Ser Ser Asn Ile Asn Arg Phe Lys Val Met Ala
           35           40           45
Lys Glu Leu Asp Glu Asp Lys Gln Thr Asp Gln Asp Lys Trp Lys Gly
           50           55           60
Leu Ala Tyr Asp Ile Ser Asp Asp Gln Gln Asp Ile Thr Arg Gly Lys
65           70           75           80
Gly Leu Val Asp Ser Leu Phe Gln Ala Pro Met Gly Asp Gly Thr His
           85           90           95
Glu Ala Val Leu Ser Ser Tyr Glu Tyr Leu Ser Gln Gly Leu Lys Met
           100          105          110
Leu Asp Asn Thr Met Gly Gly Phe Tyr Ile Ala Pro Ala Phe Met Asp
           115          120          125
Lys Leu Val Val His Ile Ser Lys Asn Phe Met Ala Leu Pro Asn Ile
           130          135          140
Lys Val Pro Leu Ile Leu Gly Ile Trp Gly Gly Lys Gly Gln Gly Lys
145          150          155          160
Ser Phe Gln Cys Glu Leu Val Phe Ser Lys Met Gly Ile Asn Pro Ile
           165          170          175
Met Met Ser Ala Gly Glu Leu Glu Ser Gly Asn Ala Gly Glu Pro Ala
           180          185          190
Lys Leu Ile Arg Gln Arg Tyr Arg Glu Ala Ala Asp Ile Ile Lys Lys
           195          200          205
Gly Lys Met Cys Cys Leu Phe Ile Asn Asp Leu Asp Ala Gly Ala Gly
           210          215          220

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Arg Met Gly Gly Thr Thr Gln Tyr Thr Val Asn Asn Gln Met Val Asn
 225 230 235 240
 Ala Thr Leu Met Asn Ile Ala Asp Asn Pro Thr Asn Val Gln Leu Pro
 245 250 255
 Gly Met Tyr Asn Lys Glu Asp Asn Pro Arg Val Pro Ile Ile Val Thr
 260 265 270
 Gly Asn Asp Phe Ser Thr Leu Tyr Ala Pro Leu Ile Arg Asp Gly Arg
 275 280 285
 Met Glu Lys Phe Tyr Trp Ala Pro Thr Arg Asp Asp Arg Val Gly Val
 290 295 300
 Cys Lys Gly Ile Phe Arg Thr Asp Asn Val Pro Asp Glu Asp Ile Val
 305 310 315 320
 Lys Ile Val Asp Ser Phe Pro Gly Gln Ser Ile Asp Phe Phe Gly Ala
 325 330 335
 Leu Arg Ala Arg Val Tyr Asp Asp Glu Val Arg Lys Trp Val Ser Asp
 340 345 350
 Thr Gly Val Glu Asn Ile Gly Lys Lys Leu Val Asn Ser Arg Glu Gly
 355 360 365
 Pro Pro Glu Phe Glu Gln Pro Lys Met Thr Ile Asp Lys Leu Met Glu
 370 375 380
 Tyr Gly His Met Leu Val Arg Glu Gln Glu Asn Val Lys Arg Val Gln
 385 390 395 400
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 405 410 415
 Asp Ala Met Lys Thr Gly Ser Phe Tyr Gly Gln Gly Ala Gln Gln Gly
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 Phe Asp Pro Thr Ala Arg Ser Asp Asp Gly Ser Cys Leu Tyr Thr Phe
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<213> *Oryza australiensis*

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Asn Tyr His Gly Lys Ser Ser Asn Ile Asn Arg Phe Lys Val Met Ala
35           40           45
Lys Glu Leu Asp Glu Asp Lys Gln Thr Asp Gln Asp Lys Trp Lys Gly
50           55           60
Leu Ala Tyr Asp Ile Ser Asp Asp Gln Gln Asp Ile Thr Arg Gly Lys
65           70           75           80
Gly Leu Val Asp Ser Leu Phe Gln Ala Pro Met Gly Asp Gly Thr His
85           90           95
Glu Ala Val Leu Ser Ser Tyr Glu Tyr Leu Ser Gln Gly Leu Lys Met
100          105          110
Leu Asp Asn Thr Met Gly Gly Phe Tyr Ile Ala Pro Ala Phe Met Asp
115          120          125
Lys Leu Val Val His Ile Ser Lys Asn Phe Met Ala Leu Pro Asn Ile
130          135          140
Lys Val Pro Leu Ile Leu Gly Ile Trp Gly Gly Lys Gly Gln Gly Lys
145          150          155          160
Ser Phe Gln Cys Glu Leu Val Phe Ser Lys Met Gly Ile Asn Pro Ile
165          170          175
Met Met Ser Ala Gly Glu Leu Glu Ser Gly Asn Ala Gly Glu Pro Ala
180          185          190
Lys Leu Ile Arg Gln Arg Tyr Arg Glu Ala Ala Asp Ile Ile Lys Lys
195          200          205
Gly Lys Met Cys Cys Leu Phe Ile Asn Asp Leu Asp Ala Gly Ala Gly
210          215          220
Arg Met Gly Gly Thr Thr Gln Tyr Thr Val Asn Asn Gln Met Val Asn
225          230          235          240
Ala Thr Leu Met Asn Ile Ala Asp Asn Pro Thr Asn Val Gln Leu Pro
245          250          255
Gly Met Tyr Asn Lys Glu Asp Asn Pro Arg Val Pro Ile Ile Val Thr
260          265          270

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Gly Asn Asp Phe Ser Thr Leu Tyr Ala Pro Leu Ile Arg Asp Gly Arg
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 Met Glu Lys Phe Tyr Trp Ala Pro Thr Arg Asp Asp Arg Val Gly Val
 290 295 300
 Cys Lys Gly Ile Phe Arg Thr Asp Asn Val Pro Asp Glu Asp Ile Val
 305 310 315 320
 Lys Ile Val Asp Ser Phe Pro Gly Gln Ser Ile Asp Phe Phe Gly Ala
 325 330 335
 Leu Arg Ala Arg Val Tyr Asp Asp Glu Val Arg Lys Trp Val Ser Asp
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 Thr Gly Val Glu Asn Ile Gly Lys Lys Leu Val Asn Ser Arg Glu Gly
 355 360 365
 Pro Pro Glu Phe Glu Gln Pro Lys Met Thr Ile Asp Lys Leu Met Glu
 370 375 380
 Tyr Gly His Met Leu Val Arg Glu Gln Glu Asn Val Lys Arg Val Gln
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<213> *Oryza australiensis*

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<213> *Oryza australiensis*

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aagtggaagg gtctcgcta cgacatctcc gatgaccagc aggacatcac cagggggaag	240
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<213> *Oryza sativa*

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Lys Glu Leu Asp Glu Gly Lys Gln Thr Asp Gln Asp Arg Trp Lys Gly
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Leu Ala Tyr Asp Ile Ser Asp Asp Gln Gln Asp Ile Thr Arg Gly Lys
65              70              75              80
Gly Phe Val Asp Ser Leu Phe Gln Ala Pro Thr Gly Asp Gly Thr His
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Glu Ala Val Leu Ser Ser Tyr Glu Tyr Leu Ser Gln Gly Leu Arg Thr
              100             105             110
Tyr Asp Phe Asp Asn Thr Met Gly Gly Phe Tyr Ile Ala Pro Ala Phe
              115             120             125
Met Asp Lys Leu Val Val His Ile Ser Lys Asn Phe Met Thr Leu Pro
              130             135             140
Asn Ile Lys Val Pro Leu Ile Leu Gly Ile Trp Gly Gly Lys Gly Gln
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Gly Lys Ser Phe Gln Cys Glu Leu Val Phe Ala Lys Met Gly Ile Asn

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165																170																175																															
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225																230																235																240															
Val	Asn	Ala	Thr	Leu	Met	Asn	Ile	Ala	Asp	Asn	Pro	Thr	Asn	Val	Gln																																																
245																250																255																															
Leu	Pro	Gly	Met	Tyr	Asn	Lys	Glu	Asp	Asn	Pro	Arg	Val	Pro	Ile	Ile																																																
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420																425																430																															
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455

460

Thr Phe

465

<210> 44

<211> 1401

<212> DNA

<213> Oryza sativa

<400> 44

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<210> 45

<211> 9

<212> PRT

<213> *Oryza australiensis*

<400> 45

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5

<210> 46

<211> 1263

<212> DNA

<213> *Oryza sativa*

<400> 46

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<210> 47

<211> 1266

<212> DNA

<213> *Oryza australiensis*

<400> 47

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agccaggggc tgaaaatgct ggataaact atgggtggct tctacattgc accggccttt    240
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<210> 48

<211> 1164

<212> DNA

<213> *Oryza sativa*

<400> 48

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<210> 49

<211> 1158

<212> DNA

<213> *Oryza australiensis*

<400> 49

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<210> 50

<211> 1395

<212> DNA

<213> *Oryza australiensis*

<400> 50

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<210> 51

<211> 1281

<212> DNA

<213> *Oryza australiensis*

<400> 51

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<210> 52

<211> 1296

<212> DNA

<213> *Oryza australiensis*

<400> 52

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<210> 53

<211> 800

<212> DNA

<213> *Oryza meridionalis*

<400> 53

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agcagaatat gtgcaggtag cagagcaaaa tatttgtggt agtccaacta gaatacaatt      240
tgcattgccat gcctcatcca agaagccggg caacgagagg cagcaaaagg cttttctgtg      300
gtgatgcaaa atgaagagggt tatgtagtag ctgagctgat gaagcaactg gtcgctagct      360
gccggccggg agacgaatgt gaggcaagga aagaaaagaa aaaacagaga gaaagagttg      420
atcagaaatg ggtgaattct gtggtgagga aaggtcaagg aactgaagcc aagagatcct      480
tcctacctac actaatacaa tactcctaac tcgctcacag actccgatcc aggtccaagt      540
catgctatgc tgtggatcgg ccggccgaga ttgcgccacg tgtgcagaac ccaatcttca      600
gcggtgtggcc tgtgggggat ctggaagctg atccacaggg agggaggagt gtgtgcctct      660
cacagcttcc aacttccatg gcgacgtcca atgctattgt attatttaag gcctaccgca      720
gctcggcctc tacactttga gcagcagcgg ctggccatca tcagtgatcc tctacaatca      780
tcgactttca gcaaattaag                                     800

```

<210> 54

<211> 1401

<212> DNA

<213> *Oryza meridionalis*

<400> 54

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atggctgctg ccttctcctc caccgttga gctccggcgt ccactccgac caacttcctg      60
gggaagaagc tgaagaagca ggtgacatcg gcggtgaact accatggcaa gagtccaac      120
atcaacaggt tcaaggatgat ggccaaggag ctggacgagg gcaagcagac cgaccaggac      180
aggtggaagg gtctcgccta cgacatctcc gatgaccagc aggacatcac cagggggaag      240
ggtttcgtcg actccctggt ccaggctccc acgggtgatg gcacccacga ggccgtcctc      300
agctcctacg agtacctcag ccagggtctc agaacgtacg acttcgacaa caccatggga      360
ggctttctaca tcgcccctgc tttcatggac aagctcgtcg tccacatctc caagaacttc      420
atgaccctcc ccaacatcaa ggtcccactc atcctgggta tctggggagg caagggtcag      480
ggaaaatcct tccagtgtga gctcgtcttc gccaagatgg ggatcaaccc catcatgatg      540
agcgcgggag agctggagag cggcaacgcc ggagagccgg cgaagctgat caggcagcgg      600
taccgtgagg cggcagacat catcaagaag gggaagatgt gctgcctctt catcaacgat      660
ctggatgccg gtgcaggtag catgggaggc accaccagc acacggtgaa caaccagatg      720
gtgaacgcc aacctgatgaa catcgccgac aacccaacca acgtgcagct ccaggggatg      780
tacaacaagg aggacaaccc ccgtgtcccc atcatcgtca ccggcaacga cttctccacg      840
ctgtacgcgc cgctcatccg tgacgggagt atggagaagt tctactgggc tcccaccgcg      900
gacgaccgtg tcggcgtctg caagggtatc ttccgcaccg acaacgtccc cgacgaggac      960
atcgtcaaga tcgtcgacag cttcccaggc caatccatcg atttcttcgg cgctctgcgt      1020
gcccgtgttt acgacgacga ggtgcgcaag tgggtgtcgg acaccggtgt ggagaacatt      1080

```

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ggcaagagggc tgggtgaactc gagggagggc ccaccggagt tgcagcagcc caagatgacg      1140
atcgaaaagc tcatggagta cggatacatg cttgtgaagg agcaggagaa cgtcaagcgt      1200
gtgcagctgg ctgagcagta cttgagcgag gctgctcttg gtgacgctaa ctccgacgcc      1260
atgaagactg gttccttcta cgggcaagga gcacagcaag caggtaacct gcctgtgccg      1320
gaaggttgca ccgaccctgt tgccaagaac ttcgacccaa cggcgaggag cgacgacggc      1380
agctgccttt acacctttta a      1401

```

<210> 55

<211> 466

<212> PRT

<213> *Oryza meridionalis*

<400> 55

```

Met Ala Ala Ala Phe Ser Ser Thr Val Gly Ala Pro Ala Ser Thr Pro
1              5              10              15
Thr Asn Phe Leu Gly Lys Lys Leu Lys Lys Gln Val Thr Ser Ala Val
      20              25              30
Asn Tyr His Gly Lys Ser Ser Asn Ile Asn Arg Phe Lys Val Met Ala
      35              40              45
Lys Glu Leu Asp Glu Gly Lys Gln Thr Asp Gln Asp Arg Trp Lys Gly
      50              55              60
Leu Ala Tyr Asp Ile Ser Asp Asp Gln Gln Asp Ile Thr Arg Gly Lys
65              70              75              80
Gly Phe Val Asp Ser Leu Phe Gln Ala Pro Thr Gly Asp Gly Thr His
      85              90              95
Glu Ala Val Leu Ser Ser Tyr Glu Tyr Leu Ser Gln Gly Leu Arg Thr
      100             105             110
Tyr Asp Phe Asp Asn Thr Met Gly Gly Phe Tyr Ile Ala Pro Ala Phe
      115             120             125
Met Asp Lys Leu Val Val His Ile Ser Lys Asn Phe Met Thr Leu Pro
      130             135             140
Asn Ile Lys Val Pro Leu Ile Leu Gly Ile Trp Gly Gly Lys Gly Gln
145             150             155             160
Gly Lys Ser Phe Gln Cys Glu Leu Val Phe Ala Lys Met Gly Ile Asn
      165             170             175
Pro Ile Met Met Ser Ala Gly Glu Leu Glu Ser Gly Asn Ala Gly Glu

```

180	185	190
Pro Ala Lys Leu Ile Arg Gln Arg Tyr Arg Glu Ala Ala Asp Ile Ile		
195	200	205
Lys Lys Gly Lys Met Cys Cys Leu Phe Ile Asn Asp Leu Asp Ala Gly		
210	215	220
Ala Gly Arg Met Gly Gly Thr Thr Gln Tyr Thr Val Asn Asn Gln Met		
225	230	235
Val Asn Ala Thr Leu Met Asn Ile Ala Asp Asn Pro Thr Asn Val Gln		
245	250	255
Leu Pro Gly Met Tyr Asn Lys Glu Asp Asn Pro Arg Val Pro Ile Ile		
260	265	270
Val Thr Gly Asn Asp Phe Ser Thr Leu Tyr Ala Pro Leu Ile Arg Asp		
275	280	285
Gly Arg Met Glu Lys Phe Tyr Trp Ala Pro Thr Arg Asp Asp Arg Val		
290	295	300
Gly Val Cys Lys Gly Ile Phe Arg Thr Asp Asn Val Pro Asp Glu Asp		
305	310	315
Ile Val Lys Ile Val Asp Ser Phe Pro Gly Gln Ser Ile Asp Phe Phe		
325	330	335
Gly Ala Leu Arg Ala Arg Val Tyr Asp Asp Glu Val Arg Lys Trp Val		
340	345	350
Ser Asp Thr Gly Val Glu Asn Ile Gly Lys Arg Leu Val Asn Ser Arg		
355	360	365
Glu Gly Pro Pro Glu Phe Glu Gln Pro Lys Met Thr Ile Glu Lys Leu		
370	375	380
Met Glu Tyr Gly Tyr Met Leu Val Lys Glu Gln Glu Asn Val Lys Arg		
385	390	395
Val Gln Leu Ala Glu Gln Tyr Leu Ser Glu Ala Ala Leu Gly Asp Ala		
405	410	415
Asn Ser Asp Ala Met Lys Thr Gly Ser Phe Tyr Gly Gln Gly Ala Gln		
420	425	430
Gln Ala Gly Asn Leu Pro Val Pro Glu Gly Cys Thr Asp Pro Val Ala		
435	440	445
Lys Asn Phe Asp Pro Thr Ala Arg Ser Asp Asp Gly Ser Cys Leu Tyr		
450	455	460

Thr Phe

465

<210> 56

<211> 433

<212> PRT

<213> *Oryza meridionalis*

<400> 56

Met Ala Ala Ala Phe Ser Ser Thr Val Gly Ala Pro Ala Ser Thr Pro

1 5 10 15

Thr Asn Phe Leu Gly Lys Lys Leu Lys Lys Gln Val Thr Ser Ala Val

20 25 30

Asn Tyr His Gly Lys Ser Ser Asn Ile Asn Arg Phe Lys Val Met Ala

35 40 45

Lys Glu Leu Asp Glu Gly Lys Gln Thr Asp Gln Asp Arg Trp Lys Gly

50 55 60

Leu Ala Tyr Asp Ile Ser Asp Asp Gln Gln Asp Ile Thr Arg Gly Lys

65 70 75 80

Gly Phe Val Asp Ser Leu Phe Gln Ala Pro Thr Gly Asp Gly Thr His

85 90 95

Glu Ala Val Leu Ser Ser Tyr Glu Tyr Leu Ser Gln Gly Leu Arg Thr

100 105 110

Tyr Asp Phe Asp Asn Thr Met Gly Gly Phe Tyr Ile Ala Pro Ala Phe

115 120 125

Met Asp Lys Leu Val Val His Ile Ser Lys Asn Phe Met Thr Leu Pro

130 135 140

Asn Ile Lys Val Pro Leu Ile Leu Gly Ile Trp Gly Gly Lys Gly Gln

145 150 155 160

Gly Lys Ser Phe Gln Cys Glu Leu Val Phe Ala Lys Met Gly Ile Asn

165 170 175

Pro Ile Met Met Ser Ala Gly Glu Leu Glu Ser Gly Asn Ala Gly Glu

180 185 190

Pro Ala Lys Leu Ile Arg Gln Arg Tyr Arg Glu Ala Ala Asp Ile Ile

195 200 205

Lys Lys Gly Lys Met Cys Cys Leu Phe Ile Asn Asp Leu Asp Ala Gly

210	215	220	
Ala Gly Arg Met Gly Gly Thr Thr Gln Tyr Thr Val Asn Asn Gln Met			
225	230	235	240
Val Asn Ala Thr Leu Met Asn Ile Ala Asp Asn Pro Thr Asn Val Gln			
	245	250	255
Leu Pro Gly Met Tyr Asn Lys Glu Asp Asn Pro Arg Val Pro Ile Ile			
	260	265	270
Val Thr Gly Asn Asp Phe Ser Thr Leu Tyr Ala Pro Leu Ile Arg Asp			
	275	280	285
Gly Arg Met Glu Lys Phe Tyr Trp Ala Pro Thr Arg Asp Asp Arg Val			
	290	295	300
Gly Val Cys Lys Gly Ile Phe Arg Thr Asp Asn Val Pro Asp Glu Asp			
305	310	315	320
Ile Val Lys Ile Val Asp Ser Phe Pro Gly Gln Ser Ile Asp Phe Phe			
	325	330	335
Gly Ala Leu Arg Ala Arg Val Tyr Asp Asp Glu Val Arg Lys Trp Val			
	340	345	350
Ser Asp Thr Gly Val Glu Asn Ile Gly Lys Arg Leu Val Asn Ser Arg			
	355	360	365
Glu Gly Pro Pro Glu Phe Glu Gln Pro Lys Met Thr Ile Glu Lys Leu			
	370	375	380
Met Glu Tyr Gly Tyr Met Leu Val Lys Glu Gln Glu Asn Val Lys Arg			
385	390	395	400
Val Gln Leu Ala Glu Gln Tyr Leu Ser Glu Ala Ala Leu Gly Asp Ala			
	405	410	415
Asn Ser Asp Ala Met Lys Thr Gly Ser Phe Tyr Gly Ser Ala Pro Ser			
	420	425	430
Ser			

<210> 57

<211> 428

<212> PRT

<213> Deschampsia caespitosa

<400> 57

Met	Ala	Ala	Ala	Phe	Ser	Ser	Thr	Val	Gly	Ala	Pro	Ala	Ser	Thr	Pro
1				5					10					15	
Thr	Ser	Phe	Leu	Gly	Asn	Lys	Leu	Lys	Lys	Gln	Val	Thr	Ser	Ala	Val
			20					25					30		
Asn	Tyr	His	Gly	Lys	Ser	Phe	Lys	Ala	Asn	Arg	Phe	Thr	Val	Met	Ala
		35					40					45			
Lys	Asp	Ile	Asp	Glu	Gly	Lys	Gln	Thr	Asp	Gly	Asp	Lys	Trp	Lys	Gly
	50					55				60					
Leu	Ala	Tyr	Asp	Ile	Ser	Asp	Asp	Gln	Gln	Asp	Ile	Thr	Arg	Gly	Lys
65					70				75					80	
Gly	Ile	Val	Asp	Ser	Leu	Phe	Gln	Ala	Pro	Met	Gly	Asp	Gly	Thr	His
				85				90					95		
Glu	Ala	Val	Leu	Ser	Ser	Tyr	Glu	Tyr	Val	Ser	Gln	Gly	Leu	Lys	Lys
		100					105					110			
Tyr	Asp	Phe	Asp	Asn	Thr	Met	Gly	Gly	Phe	Tyr	Ile	Ala	Pro	Ala	Phe
	115					120				125					
Met	Asp	Lys	Leu	Val	Val	His	Leu	Ser	Lys	Asn	Phe	Met	Thr	Leu	Pro
	130					135				140					
Asn	Ile	Lys	Ile	Pro	Leu	Ile	Leu	Gly	Ile	Trp	Gly	Gly	Lys	Gly	Gln
145				150					155					160	
Gly	Lys	Ser	Phe	Gln	Cys	Glu	Leu	Val	Phe	Ala	Lys	Met	Gly	Ile	Asn
			165					170				175			
Pro	Ile	Met	Met	Ser	Ala	Gly	Glu	Leu	Glu	Ser	Gly	Asn	Ala	Gly	Glu
		180					185					190			
Pro	Ala	Lys	Leu	Ile	Arg	Gln	Arg	Tyr	Arg	Glu	Ala	Ala	Asp	Met	Ile
	195					200					205				
Lys	Lys	Gly	Lys	Met	Cys	Cys	Leu	Phe	Ile	Asn	Asp	Leu	Asp	Ala	Gly
	210				215					220					
Ala	Gly	Arg	Met	Gly	Gly	Thr	Thr	Gln	Tyr	Thr	Val	Asn	Asn	Gln	Met
225				230					235					240	
Val	Asn	Ala	Thr	Leu	Met	Asn	Ile	Ala	Asp	Ala	Pro	Thr	Asn	Val	Gln
			245					250					255		
Leu	Pro	Gly	Met	Tyr	Asn	Lys	Glu	Glu	Asn	Pro	Arg	Val	Pro	Ile	Ile
	260						265					270			
Val	Thr	Gly	Asn	Asp	Phe	Ser	Thr	Leu	Tyr	Ala	Pro	Leu	Ile	Arg	Asp

275	280	285
Gly Arg Met Glu Lys Phe Tyr Trp Ala Pro Thr Arg Glu Asp Arg Ile		
290	295	300
Gly Val Cys Lys Gly Ile Phe Gln Thr Asp Asn Val Ser Asp Glu Ser		
305	310	315
Val Val Lys Ile Val Asp Thr Phe Pro Gly Gln Ser Ile Asp Phe Phe		
325	330	335
Gly Ala Leu Arg Ala Arg Val Tyr Asp Val Glu Val Arg Lys Trp Val		
340	345	350
Ser Ser Thr Gly Ile Glu Asn Ile Gly Lys Arg Leu Val Asn Ser Arg		
355	360	365
Asp Gly Pro Val Thr Phe Glu Gln Pro Lys Met Thr Val Glu Lys Leu		
370	375	380
Leu Glu Tyr Gly His Met Leu Val Gln Glu Gln Asp Asn Val Lys Arg		
385	390	395
Val Gln Leu Ala Asp Thr Tyr Met Ser Gln Ala Ala Leu Gly Asp Ala		
405	410	415
Asn Lys Asp Ala Met Lys Thr Gly Ser Phe Tyr Gly		
420	425	

<210> 58

<211> 421

<212> PRT

<213> *Gossypium hirsutum*

<400> 58

Met Ala Ala Glu Lys Glu Ile Asp Glu Glu Thr Gln Thr Glu Lys Asp		
1	5	10
Arg Trp Lys Gly Leu Ala Tyr Asp Ile Ser Asp Asp Gln Gln Asp Ile		
20	25	30
Thr Arg Gly Lys Gly Met Val Asp Ser Leu Phe Gln Ala Pro Met Asn		
35	40	45
Asp Gly Thr His Tyr Ala Val Met Ser Ser Tyr Glu Tyr Ile Ser Gln		
50	55	60
Gly Leu Lys Thr Tyr Asn Leu Asp Asn Asn Met Asp Gly Phe Tyr Ile		
65	70	75
		80

Ala	Pro	Ala	Phe	Met	Asp	Lys	Leu	Val	Val	His	Ile	Ser	Lys	Asn	Phe			
				85					90					95				
Met	Ser	Leu	Pro	Asn	Ile	Lys	Val	Pro	Leu	Ile	Leu	Gly	Ile	Trp	Gly			
			100					105					110					
Gly	Lys	Gly	Gln	Gly	Lys	Ser	Phe	Gln	Cys	Glu	Leu	Val	Phe	Ala	Lys			
		115					120					125						
Met	Gly	Ile	Asn	Pro	Ile	Met	Met	Ser	Ala	Gly	Glu	Leu	Glu	Ser	Gly			
	130					135					140							
Asn	Ala	Gly	Glu	Pro	Ala	Lys	Leu	Ile	Arg	Gln	Arg	Tyr	Arg	Glu	Ala			
145					150				155					160				
Ala	Asp	Ile	Ile	Lys	Lys	Gly	Lys	Met	Cys	Ala	Leu	Phe	Ile	Asn	Asp			
			165					170				175						
Leu	Asp	Ala	Gly	Ala	Gly	Arg	Met	Gly	Gly	Thr	Thr	Gln	Tyr	Thr	Val			
		180				185						190						
Asn	Asn	Gln	Met	Val	Asn	Ala	Thr	Leu	Met	Asn	Ile	Ala	Asp	Asn	Pro			
	195					200					205							
Thr	Asn	Val	Gln	Leu	Pro	Gly	Met	Tyr	Asn	Lys	Glu	Glu	Asn	Pro	Arg			
	210					215					220							
Val	Pro	Ile	Ile	Val	Thr	Gly	Asn	Asp	Phe	Ser	Thr	Leu	Tyr	Ala	Pro			
225				230				235						240				
Leu	Ile	Arg	Asp	Gly	Arg	Met	Glu	Lys	Phe	Tyr	Trp	Ala	Pro	Thr	Arg			
		245				250					255							
Asp	Asp	Arg	Ile	Gly	Val	Cys	Lys	Gly	Ile	Phe	Arg	Thr	Asp	Gly	Val			
		260				265					270							
Arg	Asp	Glu	Asp	Ile	Val	Lys	Leu	Val	Asp	Thr	Phe	Pro	Gly	Gln	Ser			
	275					280					285							
Ile	Asp	Phe	Phe	Gly	Ala	Leu	Arg	Ala	Arg	Val	Tyr	Asp	Asp	Glu	Val			
	290				295					300								
Arg	Lys	Trp	Ile	Ser	Glu	Val	Gly	Val	Ala	Ser	Val	Gly	Lys	Lys	Leu			
305				310				315						320				
Val	Asn	Ser	Arg	Glu	Gly	Pro	Pro	Thr	Phe	Glu	Gln	Pro	Lys	Met	Thr			
			325					330				335						
Ile	Glu	Lys	Leu	Leu	Glu	Tyr	Gly	Asn	Met	Leu	Val	Ala	Glu	Gln	Glu			
		340					345					350						
Asn	Val	Lys	Arg	Val	Gln	Leu	Ala	Asp	Lys	Tyr	Leu	Ser	Glu	Ala	Ala			

355 360 365
 Leu Gly Glu Ala Asn Glu Asp Ser Ile Asn Arg Gly Thr Phe Tyr Gly
 370 375 380
 Lys Ala Ala Gln Gln Val Gly Val Pro Val Pro Glu Gly Cys Thr Asp
 385 390 395 400
 Pro Asn Ala Asp Asn Phe Asp Pro Thr Ala Arg Ser Asp Asp Gly Thr
 405 410 415
 Cys Thr Tyr Gln Phe
 420

<210> 59

<211> 435

<212> PRT

<213> *Larrea tridentata*

<400> 59

Met Ala Ala Ala Tyr Ser Thr Val Gly Ala Val Asn Arg Ala Pro Leu
 1 5 10 15
 Ser Leu Asn Gly Ser Gly Ala Arg Ala Ser Leu Val Pro Ser Thr Ala
 20 25 30
 Phe Phe Gly Ser Ser Leu Lys Lys Ser Ala Ala Lys Phe Pro Lys Ala
 35 40 45
 Ser Ser Gly Asn Phe Lys Ile Val Ala Gln Glu Ile Ser Glu Asp Gln
 50 55 60
 Gln Thr Asp Lys Asp Lys Trp Lys Gly Leu Ala Tyr Asp Ile Ser Asp
 65 70 75 80
 Asp Gln Gln Asp Ile Thr Arg Gly Lys Gly Met Val Asp Thr Leu Phe
 85 90 95
 Gln Ala Pro Met Gln Ser Gly Thr His Tyr Ala Val Met Ser Ser Tyr
 100 105 110
 Asp Tyr Ile Ser Gln Gly Leu Arg Gln Tyr Asn Leu Asp Asn Asn Met
 115 120 125
 Asp Gly Phe Tyr Ile Ala Pro Ala Phe Met Asp Lys Leu Val Val His
 130 135 140
 Ile Thr Lys Asn Phe Leu Ser Leu Pro Asn Ile Lys Ile Pro Leu Ile
 145 150 155 160

Leu Gly Ile Trp Gly Gly Lys Gly Gln Gly Lys Ser Phe Gln Cys Glu
 165 170 175
 Leu Val Phe Ala Lys Met Gly Ile Asn Pro Ile Met Met Ser Ala Gly
 180 185 190
 Glu Leu Glu Ser Gly Asn Ala Gly Glu Pro Ala Lys Leu Ile Arg Gln
 195 200 205
 Arg Tyr Arg Glu Ala Ala Asp Ile Ile Lys Lys Gly Lys Met Cys Cys
 210 215 220
 Leu Phe Ile Asn Asp Leu Asp Ala Gly Ala Gly Arg Met Gly Gly Thr
 225 230 235 240
 Thr Gln Tyr Thr Val Asn Asn Gln Met Val Asn Ala Thr Leu Met Asn
 245 250 255
 Ile Ala Asp Asn Pro Thr Asn Val Gln Leu Pro Gly Met Tyr Asn Lys
 260 265 270
 Glu Glu Asn Pro Arg Val Pro Ile Ile Val Thr Gly Asn Asp Phe Ser
 275 280 285
 Thr Leu Tyr Ala Pro Leu Ile Arg Asp Gly Arg Met Glu Lys Phe Tyr
 290 295 300
 Trp Ala Pro Thr Arg Glu Asp Arg Ile Gly Val Cys Lys Gly Ile Phe
 305 310 315 320
 Arg Thr Asp Asn Val Pro Glu Glu Asp Ile Val Lys Val Val Asp Gln
 325 330 335
 Phe Pro Gly Gln Ser Ile Asp Phe Phe Gly Ala Leu Arg Ala Arg Val
 340 345 350
 Tyr Asp Asp Glu Val Arg Lys Trp Val Ser Glu Val Gly Val Asp Thr
 355 360 365
 Ile Gly Lys Lys Leu Val Asn Ser Lys Glu Gly Pro Pro Thr Phe Glu
 370 375 380
 Gln Pro Lys Met Thr Ile Asp Lys Leu Leu Gln Tyr Gly Asn Met Leu
 385 390 395 400
 Val Glu Glu Gln Glu Asn Val Lys Arg Val Gln Leu Ala Asp Lys Tyr
 405 410 415
 Met Ser Glu Ala Ala Leu Gly Asp Ala Asn Gln Asp Ala Ile Lys Arg
 420 425 430
 Gly Thr Phe

435

<210> 60

<211> 472

<212> PRT

<213> Spiacia oleracia

<400> 60

Met Ala Thr Ala Val Ser Thr Val Gly Ala Ala Thr Arg Ala Pro Leu

1 5 10 15

Asn Leu Asn Gly Ser Ser Ala Gly Ala Ser Val Pro Thr Ser Gly Phe

20 25 30

Leu Gly Ser Ser Leu Lys Lys His Thr Asn Val Arg Phe Pro Ser Ser

35 40 45

Ser Arg Thr Thr Ser Met Thr Val Lys Ala Ala Glu Asn Glu Glu Lys

50 55 60

Asn Thr Asp Lys Trp Ala His Leu Ala Lys Asp Phe Ser Asp Asp Gln

65 70 75 80

Leu Asp Ile Arg Arg Gly Lys Gly Met Val Asp Ser Leu Phe Gln Ala

85 90 95

Pro Ala Asp Ala Gly Thr His Val Pro Ile Gln Ser Ser Phe Glu Tyr

100 105 110

Glu Ser Gln Gly Leu Arg Lys Tyr Asp Ile Asp Asn Met Leu Gly Asp

115 120 125

Phe Tyr Ile Ala Pro Ala Phe Met Asp Lys Leu Val Val His Ile Thr

130 135 140

Lys Asn Phe Leu Asn Leu Pro Asn Ile Lys Ile Pro Leu Ile Leu Gly

145 150 155 160

Val Trp Gly Gly Lys Gly Gln Gly Lys Ser Phe Gln Cys Glu Leu Val

165 170 175

Phe Ala Lys Leu Gly Ile Asn Pro Ile Met Met Ser Ala Gly Glu Leu

180 185 190

Glu Ser Gly Asn Ala Gly Glu Pro Ala Lys Leu Ile Arg Gln Arg Tyr

195 200 205

Arg Glu Ala Ala Asp Leu Ile Ala Lys Gly Lys Met Cys Ala Leu Phe

210 215 220

Ile	Asn	Asp	Leu	Glu	Pro	Gly	Ala	Gly	Arg	Met	Gly	Gly	Thr	Thr	Gln
225				230				235				240			
Tyr	Thr	Val	Asn	Asn	Gln	Met	Val	Asn	Ala	Thr	Leu	Met	Asn	Ile	Ala
245				250				255							
Asp	Asn	Pro	Thr	Asn	Val	Gln	Leu	Pro	Gly	Met	Tyr	Asn	Lys	Gln	Asp
260				265				270							
Asn	Ala	Arg	Val	Pro	Ile	Ile	Val	Thr	Gly	Asn	Asp	Phe	Ser	Thr	Leu
275				280				285							
Tyr	Ala	Pro	Leu	Ile	Arg	Asp	Gly	Arg	Met	Glu	Lys	Phe	Tyr	Trp	Ala
290				295				300							
Pro	Thr	Arg	Glu	Asp	Arg	Ile	Gly	Val	Cys	Thr	Gly	Ile	Phe	Lys	Thr
305				310				315				320			
Asp	Lys	Val	Pro	Ala	Glu	His	Val	Val	Lys	Leu	Val	Asp	Ala	Phe	Pro
325				330				335							
Gly	Gln	Ser	Ile	Asp	Phe	Phe	Gly	Ala	Leu	Arg	Ala	Arg	Val	Tyr	His
340				345				350							
Asp	Glu	Val	Arg	Lys	Trp	Val	Asn	Ser	Val	Gly	Val	Asp	Asn	Val	Gly
355				360				365							
Lys	Lys	Leu	Val	Asn	Ser	Lys	Asp	Gly	Pro	Pro	Val	Phe	Glu	Gln	Pro
370				375				380							
Glu	Met	Thr	Leu	Gln	Lys	Leu	Met	Glu	Tyr	Gly	Asn	Met	Leu	Val	Gln
385				390				395				400			
Glu	Gln	Glu	Asn	Val	Lys	Arg	Val	Gln	Leu	Ala	Asp	Gln	Tyr	Met	Ser
405				410				415							
Ser	Ala	Ala	Leu	Gly	Asp	Ala	Asn	Lys	Asp	Ala	Ile	Asp	Arg	Gly	Thr
420				425				430							
Phe	Phe	Gly	Lys	Ala	Ala	Gln	Gln	Val	Ser	Leu	Pro	Val	Ala	Gln	Gly
435				440				445							
Cys	Thr	Asp	Pro	Glu	Ala	Lys	Asn	Tyr	Asp	Pro	Thr	Ala	Arg	Ser	Asp
450				455				460							
Asp	Gly	Ser	Cys	Thr	Tyr	Asn	Leu								
465				470											