

PLANT FOOD PROLINE-RICH PROTEIN

CARROT PROLINE-RICH PROTEIN

Proline-rich 33kDa protein [Daucus carota]

1 MNLLLLILGVA IFAA**PS**LAD**S** H**SH**PP**IIHK**PP VY**T**PP**VHK**PP **IHK**PPVY**T** **SP** V**HK**PP**IIHK**PP
61 VY**T**PP**VHK**PP **IHK**PPVY**T** **PP** V**HK**PP**SEYK**P **PVEA**T **NSV**TE **DHY**PI**HK**PPV Y**K**PP**VQK**PAP
121 **E**H**K**PP**VHK**PP **IHK**PPV**HN** **P** **SV** **DDHY**PA**H** **PI**H**K**PP**IIH**R **PP**V**HK**PP**TE**H **KPP**V**HE**PA**TE**
181 **HK**PP**SVY**Q**PP** **K** **E**K**PV**PE**HK** **PPH**LP**PIV**R **PPP** **TH**K**PN**PP **YGH**HP**GH**PPV **EN**T**GN**

14 kDa proline-rich protein DC2.15

1 MG**S**KN**S**ASVA LFF**T**LNILFF ALV**SS**TE**K** **CP**DPY**KPK**PK**P** **PK**P**T** **P**Y**PS** AG**K**CP**R**DALK
61 LGV**C**ADVLNL VHN**V**IG**S**PP **TL**PC**CS**LL**EG** LVNLEAAV**L** **CT**AIKANILG KNLNL**PIA**L**S**
121 LVLNN**CG**KQV **PN**GF**EG**

arabinogalactan protein [Daucus carota]

1 **MT**AL**SP**K**P**IG LLHLALL**FS**T **FV**FALG**T**ATI **AQ**PP **AL**APA **P**A**PH**HH**K**PPG HHHHH**K**HAP**T**
61 **P**A**P**AP**L****K**PP **I**H**A**P**A**P**V**K **PP**V**K**PP**V**Q**P**V **K**PP**V**K**A**PS**HA** **P**I**P**L**P**ARKLV AVQGVVY**CK**P
121 **Q**NY**T**GV**E** **LL** GAT**P**LLGAVV KLQ**C**NN**K**YP LVVQ**G**K**T**DKN GY**F**SL**N**AP**K** **I**TT**Y**GV**H**K**R**
181 **V**F**V**SS**P**E**K**K **CD**K**P** **N**LRYG **V**KGAILE**K**S**T** **K**PP**V**S**T**K**PA** **T**FEM**F**SV**G**PF **A**FE**PS****T**K**K**PC
241 **S**H

Extensin (hydroxyproline)

1 MG**R**I**A**R**G**S**K**M **SS**LIV**S**LLVV LV**S**LN**L**AS**ET** **T**A**K**Y**T**Y**SS**PP **P**PE**H**S**PP**PE **H**S**PP**PPY**H**YE
61 **S**PP**PP**K**H**S**PP** **PP** **P**VYKY**S** **PP**PP**M**H**S**PP **P**Y**H**F**E**S**PP**PP **K**H**S**PP**PP** **P**V **Y**KY**K**S**PP**PP**K**
121 **H**S**PA**V**V**H**H**Y**K** **Y**K**S**PP**PP** **P**V **Y**KY**K**S**PP**PP**K** **H**S**PA**PE**H**H**Y**K **Y**K**S**PP**PP**K**H**F **P**AP**E**H**H**Y**K**Y**K**
181 **Y**K**S**PP**PP** **P**V **Y**KY**K**S**PP**PP**T** **P**VYKY**K**S**PP** **P**K**H**S**PA**V**V**H**H** **Y**KY**K**S**PP**PP**T** **P**VY**K**S**PP**PE
241 **H**S**PP**PP**T** **P**VY **Y**KY**K**S**PP**PP**M**H **S**PP**PP** **P**VY**K** **Y**K**S**PP**PP**M**H**S **PP**PP**V**Y**S**PP **P**K**H**H**Y**S**T** **SP**
301 **PP**PH**H**Y

TOMATO PROLINE-RICH PROTEIN

Proline-rich protein [Solanum lycopersicum]

1 **M**H**V**LI**A**CP**YC** **P**Y**PP**S**T**PK**H**P **K**L**PP**K**V**K**PP**S **T**Q**PP**H**V**K**PP**S **T**PK**H**PK**D**PP**H** **V**K**PP**S **T**PK**Q**P
61 **P**Y**V**K**PP** **T**PK **H**PP**H**V**K**PP**S** **T**PK**H**PK**H**PP**Q**K **P**CP**PP**S**SH**GP **K**PP**I**V**K**PP**H**V **P**RP**PI**V**H**PP**P**
121 **I**V**S**PP**S** **T**PK**P** **PK** **PP**F**T** **PK**P **PS**IP**PI**V**S** **SP** **P**IV**Y**PP**I** **P**T **P**PIV**H**PP**V** **T**P **K**PP**S** **P**PIV
181 **S**PP**I**V**Y**PP**I** **P**T **PP**V**V**S**PP** **I**P**T** **PP**I**V**S**PP** **F**V**PN**PP**V**V**I**P **PP**Y**V**PS**PP**VV **T** **PP**I**V**P **PP**T
241 **P**CP**PP**PP**PP**PA **I**PS**PP**A**Q**P**T** **CP**IDAL**K**LGA **C**V**D**V**L**G**G**LI**H** **I**G**I**G**G**SA**K**Q**T** **CC**P**LL**G**G**L**V**D
301 **L**DA**A**I**L** **CT** **I**RL**K**LL**N**I**N**I **I**L**P**I**A**L**Q**V**L**I **D**D**CG**K**Y**PP**K**D **F**K**CP**S**T**

CAPSICUM PROLINE-RICH PROTEIN

Proline-rich protein Capsicum annum (Bell pepper)

MVL**K**V**D**L**Q**CG**SC** **Y**KK**V**K**K**IL **CK**F**P**Q**I**R**D**Q**I** **Y**DE**K**G**N**K**V****T**I **T**V**I**CC**N**PE**K**L **R**D**K**L**CS**K**G**CG
VIK**S**IE**II**E**P** **PK**PK**PP**E**K**PK **E**PE**K**PK**Q**PE**K** **P**KE**PE**K**P**K**Q**P **E**K**P**KE**PE**K**P**K **Q**PE**K**PE**K**PE**K**
PKA**PE**K**PE**K **E**K**P**KE**PE**K**P**K **E**AP**K**PP**V**AP **PP**AP**E**SV**V**P **V**QE**Y**PP**PP**S**G** **Y**CG**G**Q**Q**Y**A**GH
TGG**PC**Y**Q**W**Y**G **RP**V**PP**PP**Q**Y**G** **N**Y**G**Y**S**Y**G**P**G** **Y**Y**N**R**G**Y**V**S **R**CD**P**Y**L**CS**DE** **N**A**T**G**S**IM

BEETROOT, CHARD (BETA VULGARIS sp.) PROLINE-RICH PROTEIN

Chitinase 1 [Beta vulgaris subsp. vulgaris]. E.g. beetroot, chard

1 **M**KIK**S**PS**F**L **L**GLI**L**LALVL LLG**E**G**V**Q**CG**R **Q**NT**D**T**N**L **S**G**S**SV**G**R**PS**R **P** **PP**RP**PT** **PR**
61 **PP**PP**RP** **PR** **PP**PP**RP** **PR** **PP**PP **PR**PP **PR**PP **PR**PP **PP** **PP**PP**PP** **PP** **PP**PP**PP** **PP** **PP**PP**PP**
121 **T** **PR**PP**PP** **P** **RP**PP**SP** **PT** **RP**PP**PP** **PP** **P** **SP**PP**SP** **PE**PP **PE**PT **PP** **P** **PP** **TH**L
181 **T**DI**S**EE**M**FN **E**FL**N**R**I**Q**P** **CP**GR**W**F**Y** **Y**Q **A**F**I**T**A**E **F**P **E**F**G**N**T**GN**D**E**I** **R**K**R**E**I**A**A**FF**G**
241 **Q** **T** **S**H**E**T**S**GE**P** **T**A**Q**H**G**P**F** **T**W**G** **Y**C**F**IE**E**I**G**A**G** **P**L**S**Q**Y** **A**P**S**V **E**W**PC**IR**G**R**F**Y **Y**GR**G**P**V**Q**L****T**W
301 **N**F**N**Y**G**K**Q**V**K**H **L**GL**D**LL**F**N**D** **I**V**A**H**D**P**V**I**S**F **E****T**A**I**W**F**W**M****T** **P** **E**GN**K**P**SS**HE**V** **I**T**G**Q**W****T** **P** **PA**
361 **D**I**A**R**N**R**L** **P**GY **G**L**I** **N**I**F**NG**A** **L**E**G****T**H**G****P**D**N** **R**GEN**R**I**Q**F**Y**Q **R**Y**C** **D**LL**D**V**S**Y **G**D**N**L**D** **C**Y**R**Q**T**
421 **P**FD**W**GL**K**K**L**Q **G**A**R**E**S**W**SS**

ASPARAGUS PROLINE-RICH PROTEIN

Proline-rich protein [Asparagus officinalis]

1 MDPTKLTSL L L L L L P T L S C P H C P P T T I P T H P P T T K P I D P P T H R P H P P K G P I V H P P V F
61 R P P V I V K P P S T V P C P P S P L T P S P V P P T P V P P P P A T C P L D A L K L G A C V D L L G G L V H
121 I G L G D P V V N Q C C P L I E G L V E I E A A V C L G T T I R L K L L N I N L Y L P L A L Q L L L T C G K T P P P G Y
181 T C T I

PROFILIN: HOMOLOGY PEANUT Ara h5, TOMATO & CAPSICUM

Ara h5: MSWQTYVDNHLLEIEGDHLSAAILGQDGGVWAQSSHF P Q F K P E E I
common MSWQTYVD+ HL+ C +IEG++L+SAAI+GQDG+VWAQS++ F P Q F K P E E I
tomato: MSWQTYVDDHLMCDIEGNHLTSAAIIGQDGSVWAQSANF P Q F K P E E I
capsicumMSWQTYVDDHLM C EIEGNRLTSAAIIGQDGSVWAQSATF P Q F K P E E I

Ara h5: TAIMNDFAE P G S L A P T G L Y L G G T K Y M V I Q X X X X X X X X X X X X X X X X V T I E
Common TAIMNDFAE P G + L A P T G L + L G G T K Y M V I Q + T + +
tomato: TAIMNDFAE P G T L A P T G L H L G G T K Y M V I Q G E A G A V I R G K K G A G G I T V K
capsicumTAIMNDFAE P G T L A P T G L Y L G G T K Y M V I Q G E A G A V I R G K K G P G G I T V K

Ara h5: KTNQALIIGIYD K P M T P G Q C N M I V E R L G D Y L I D T G L
common KTNQALIIGIYD+ P M T P G Q C N M I V E R L G D Y + I + + + L
tomato: KTNQALIIGIYD E P M T P G Q C N M I V E R L G D Y I I E Q G L
capsicum KTNQALIIGIYD E P M T P G Q C N M I V E R L G D Y L I E Q S L

Profilins are widespread in the plant kingdom and are largely conserved.

P proline **P** where ginger enzymes digest protein

R arginine

C cysteine which can cross link to another cysteine bringing rigidity

T threonine that can bind to carbohydrate

S serine that can bind to carbohydrate