Supplementary Information

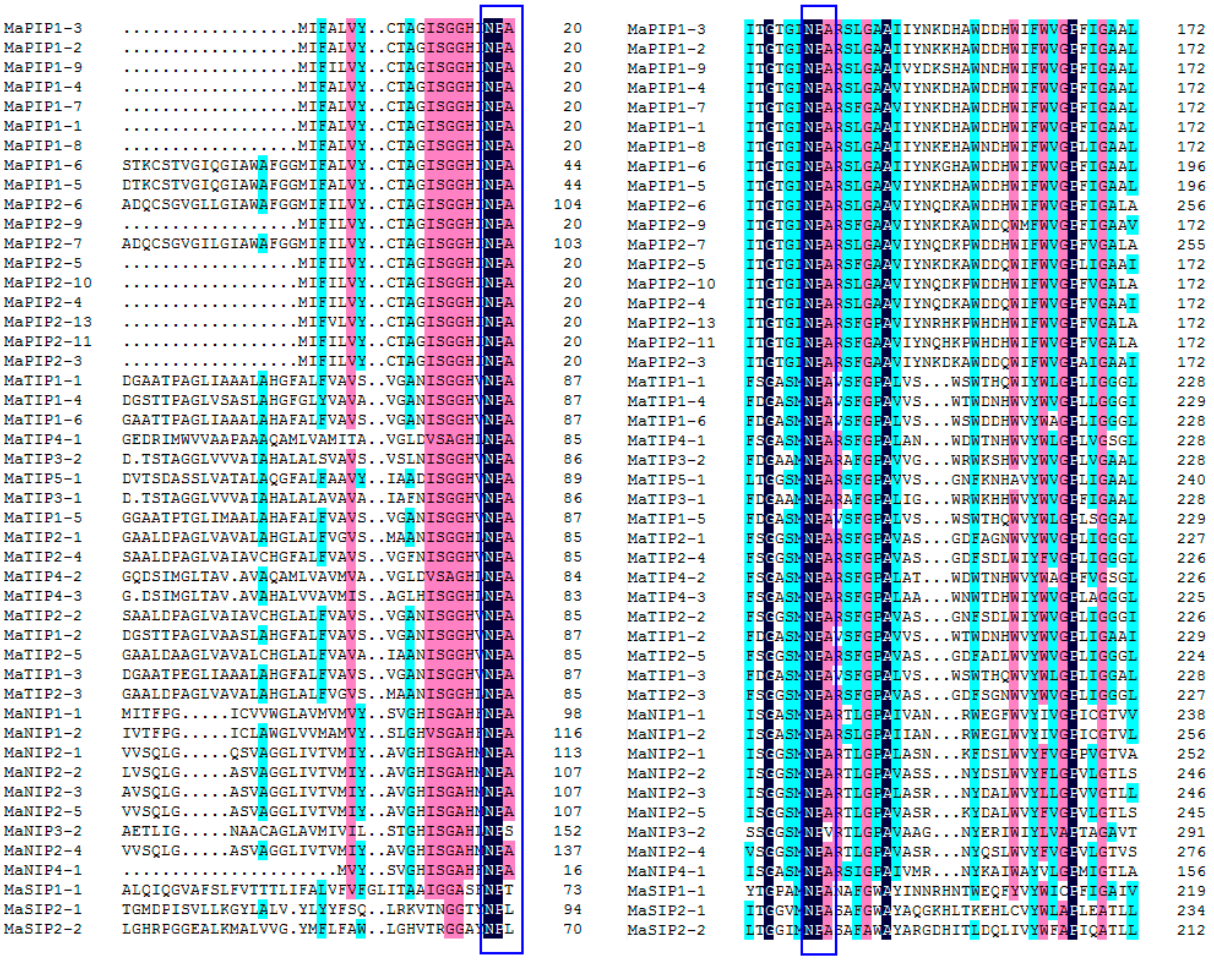

Figure S1. Alignment of amino acid sequences of MaAQPs. The two conserved NPA motifs are shown in blue box. Amino acids with high identities were shown in black background.

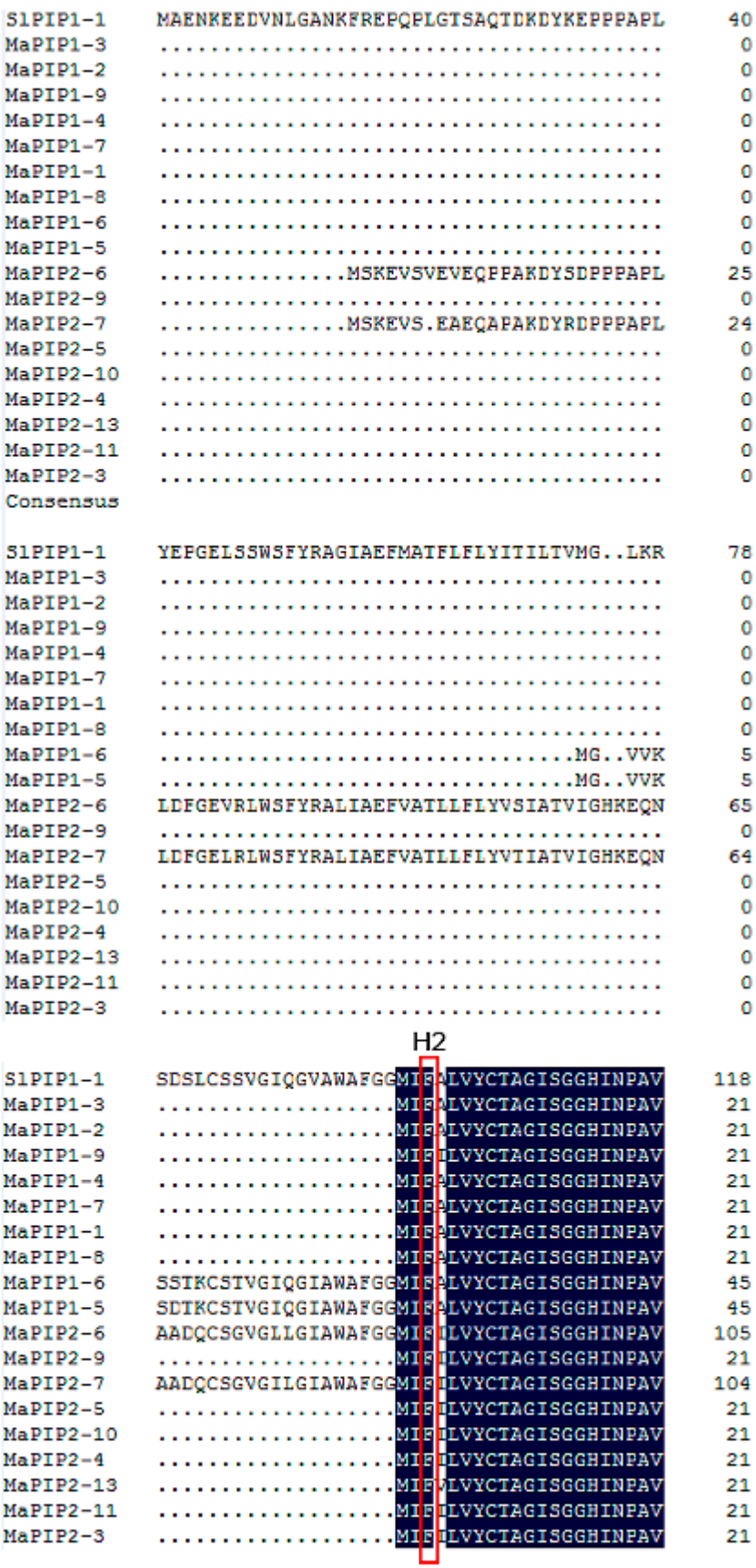

Figure S2. *Cont.*

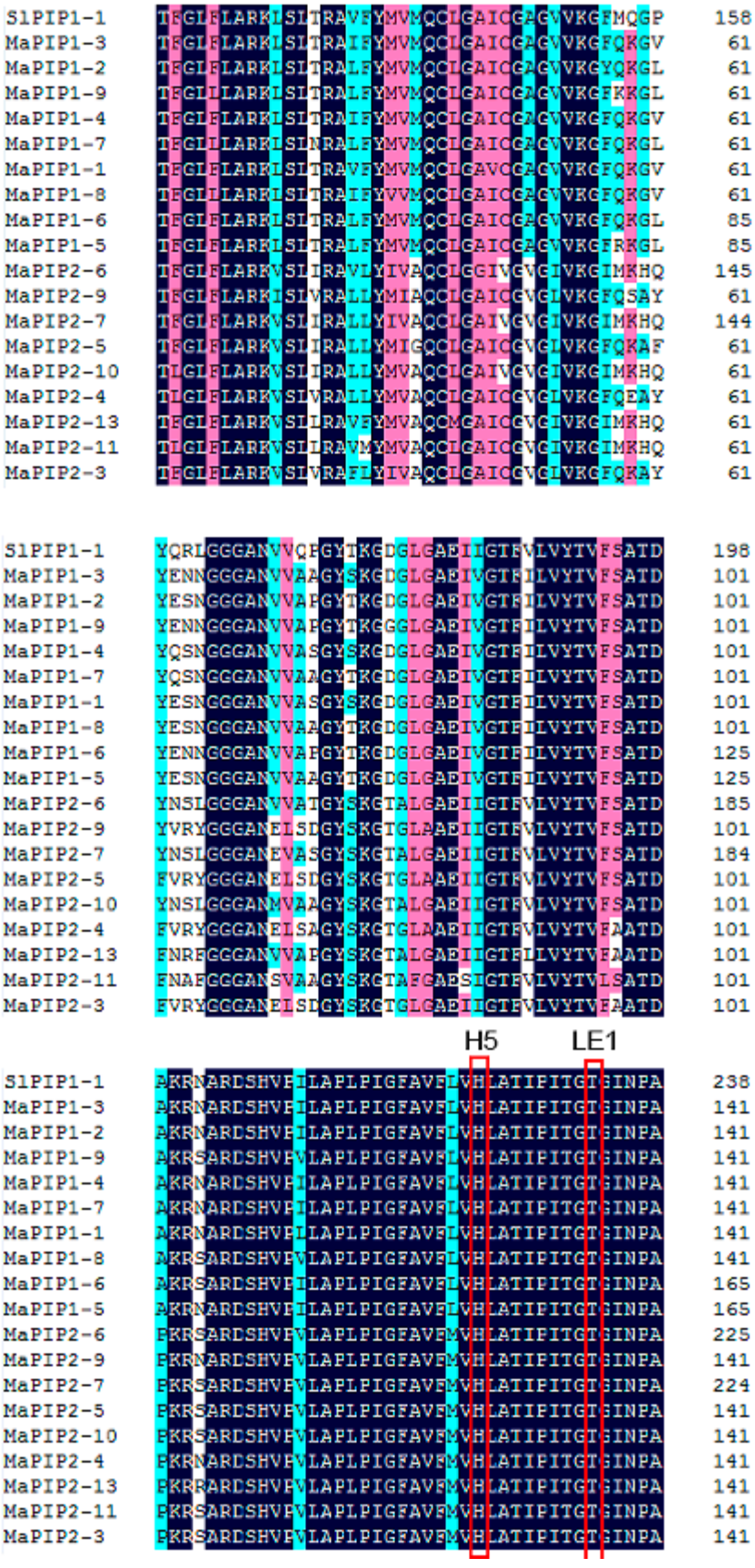

Figure S2. *Cont.*

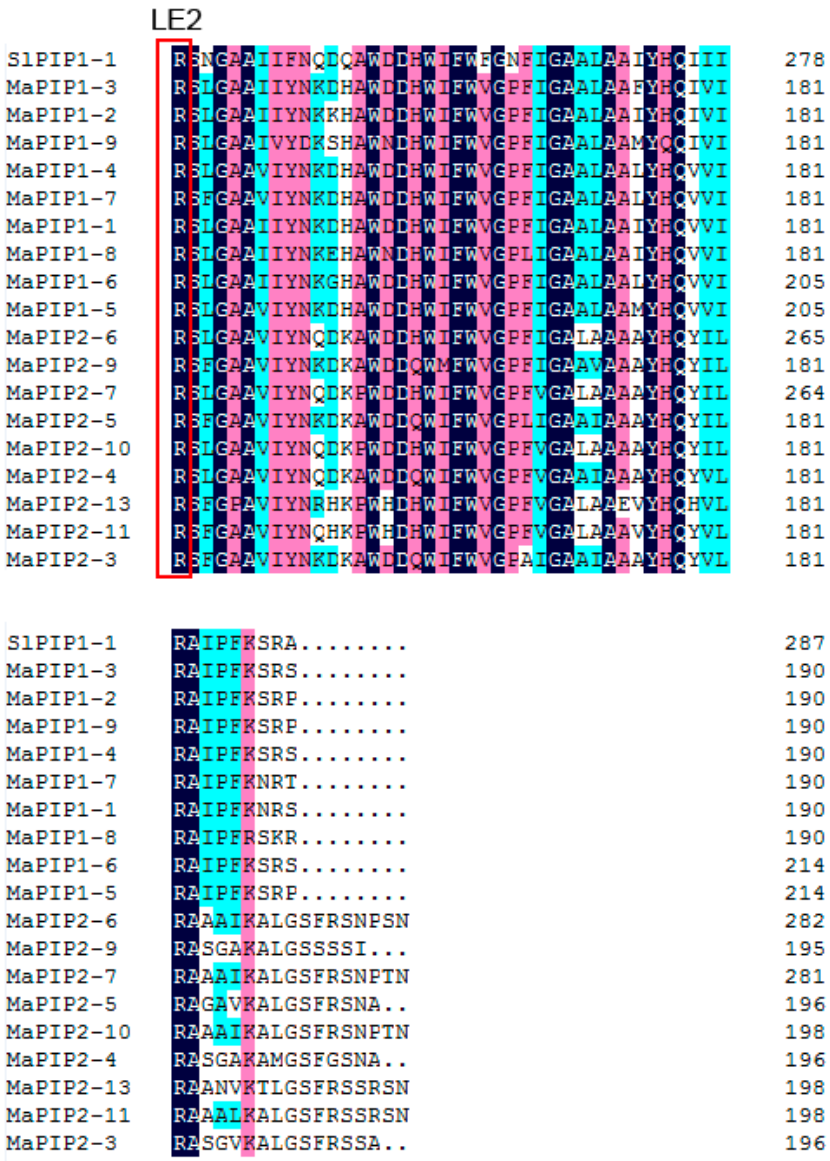

Figure S2. Alignment of amino acid sequences of MaPIPs. Residues comprising the ar/R filter are marked in red box and labeled as H2, H5, LE1 and LE2. Amino acids with high identities were shown in black background.

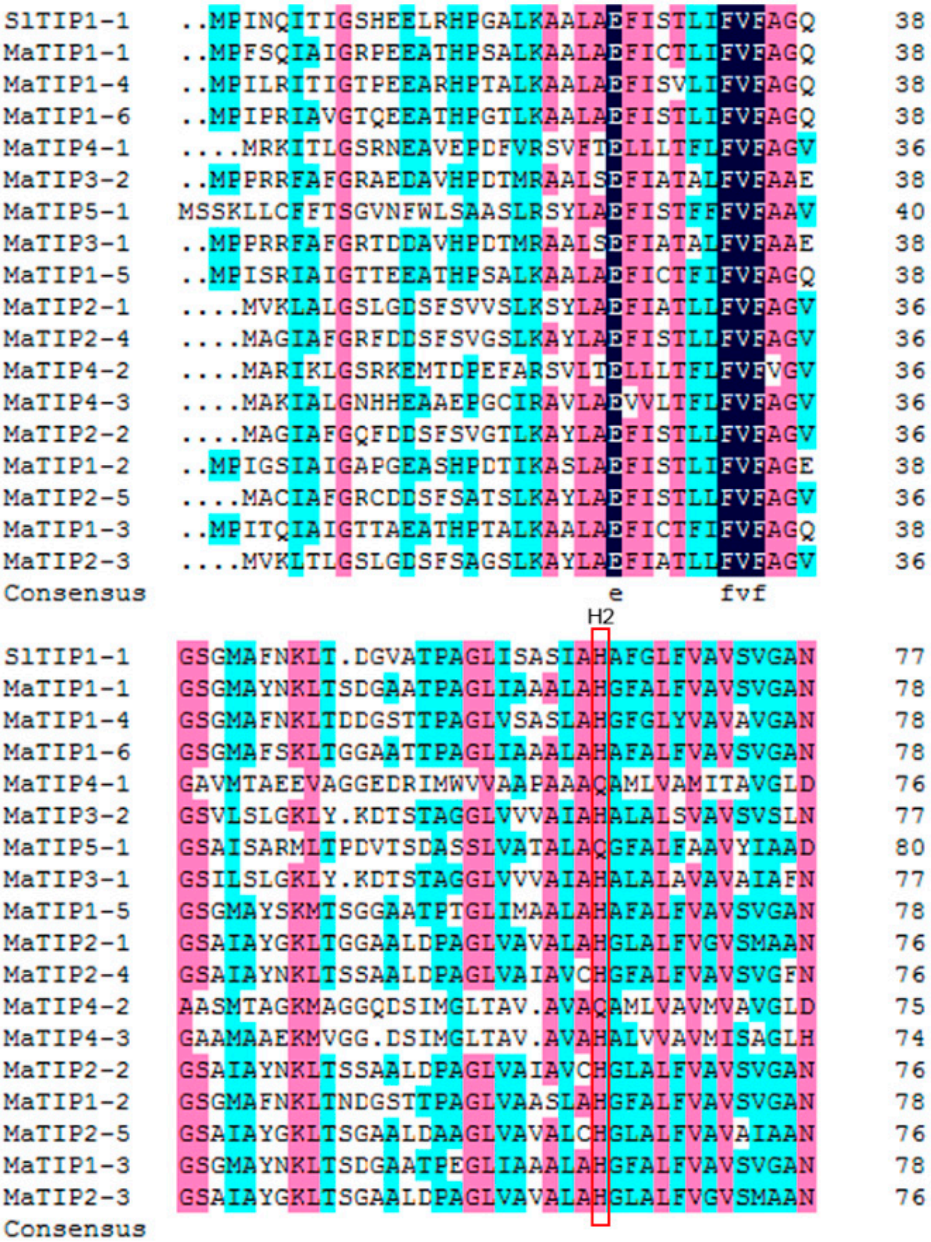

Figure S3. *Cont.*

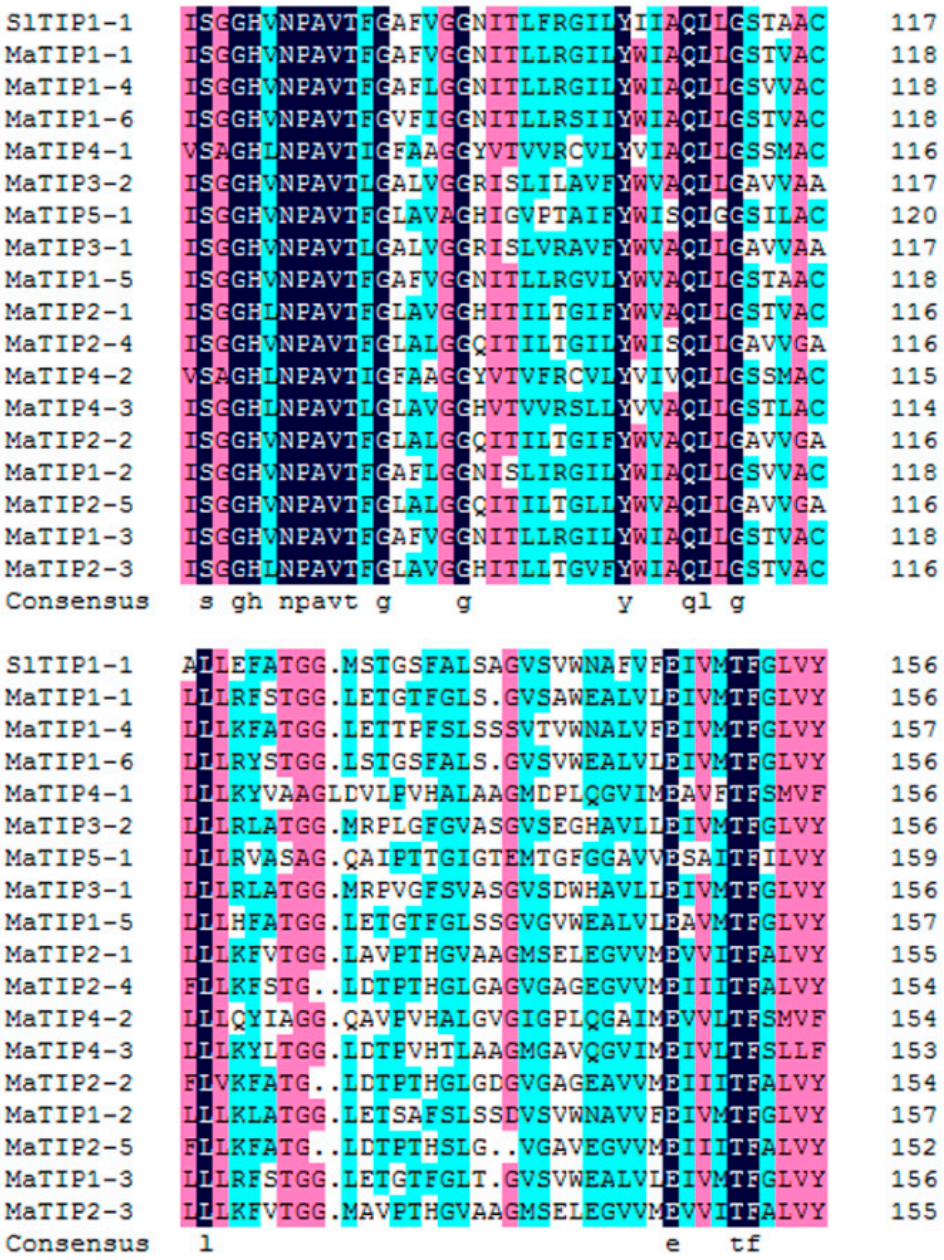

Figure S3. *Cont.*

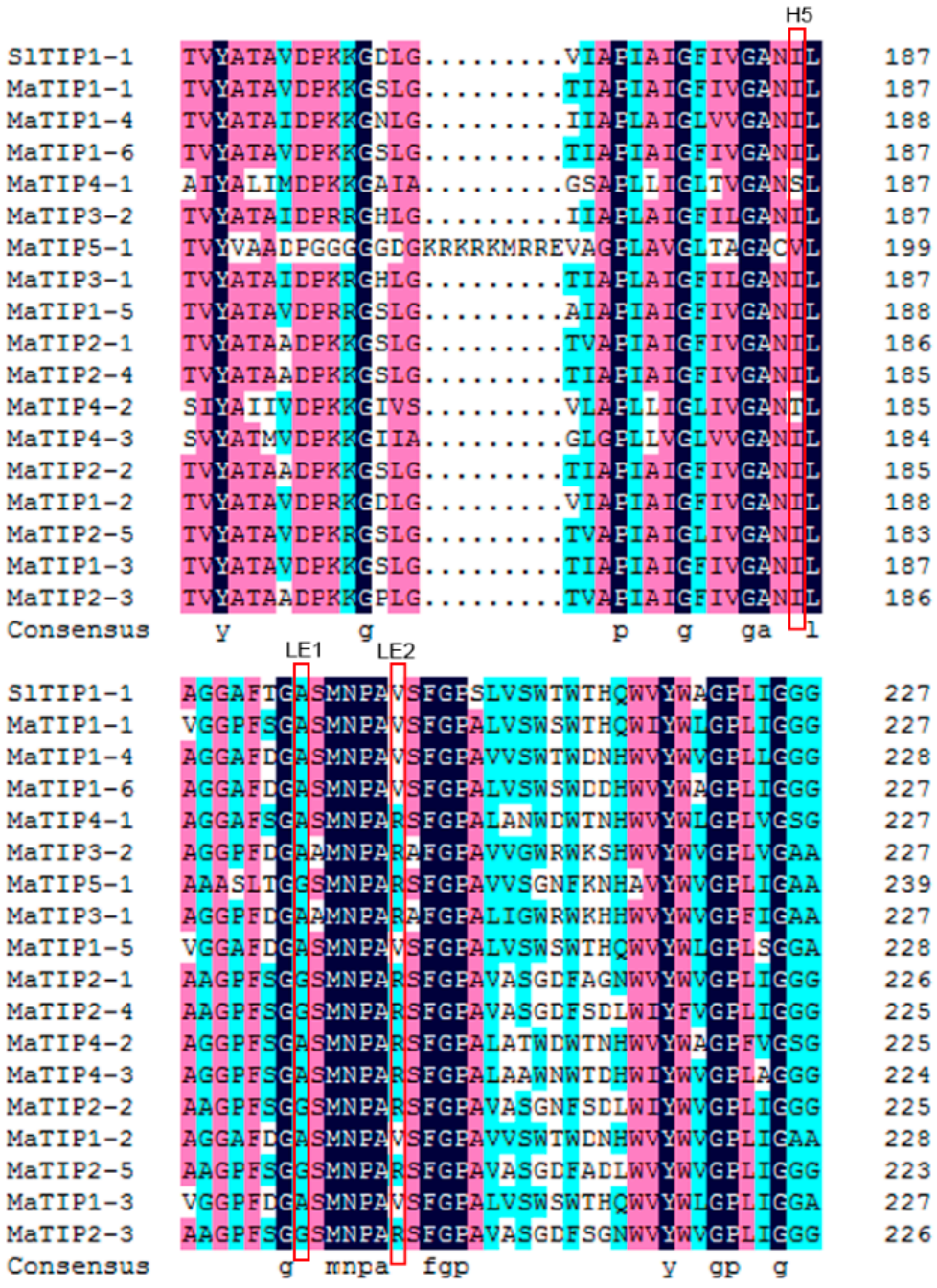

Figure S3. *Cont.*

Figure S3. Alignment of amino acid sequences of MaTIPs. Residues comprising the ar/R filter are marked in red box and labeled as H2, H5, LE1 and LE2. Amino acids with high identities were shown in black background.

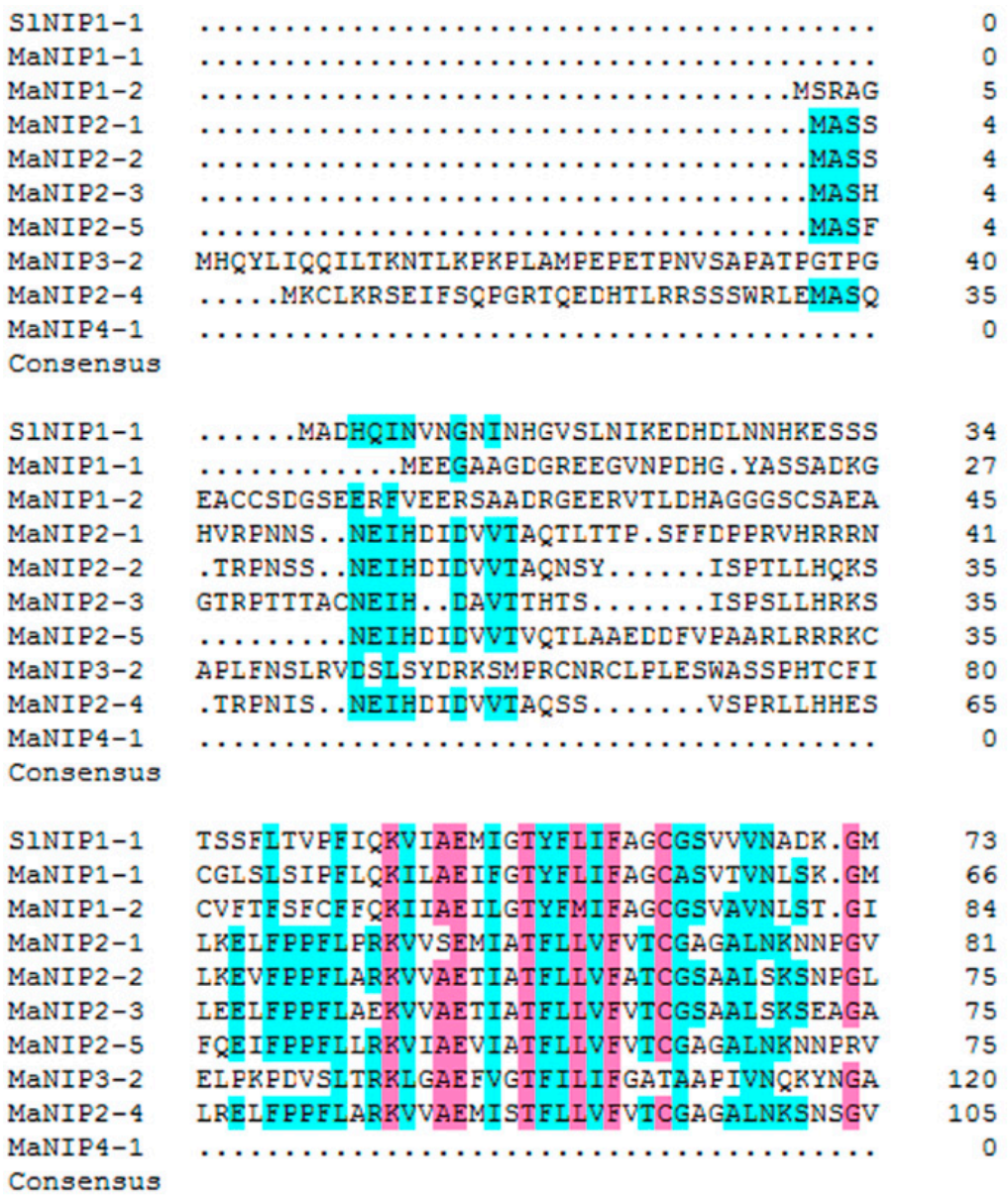

Figure S4. *Cont.*

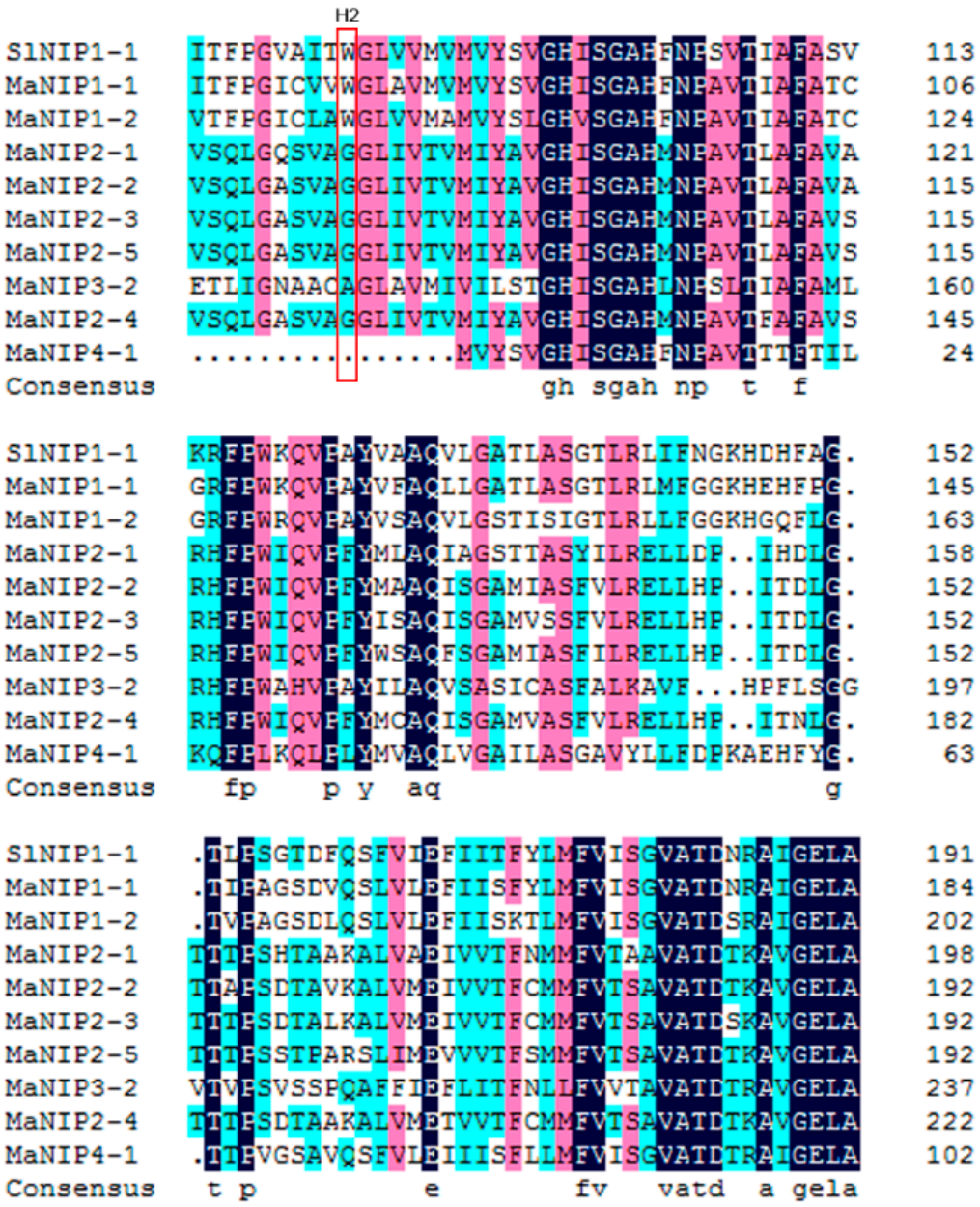

Figure S4. *Cont.*

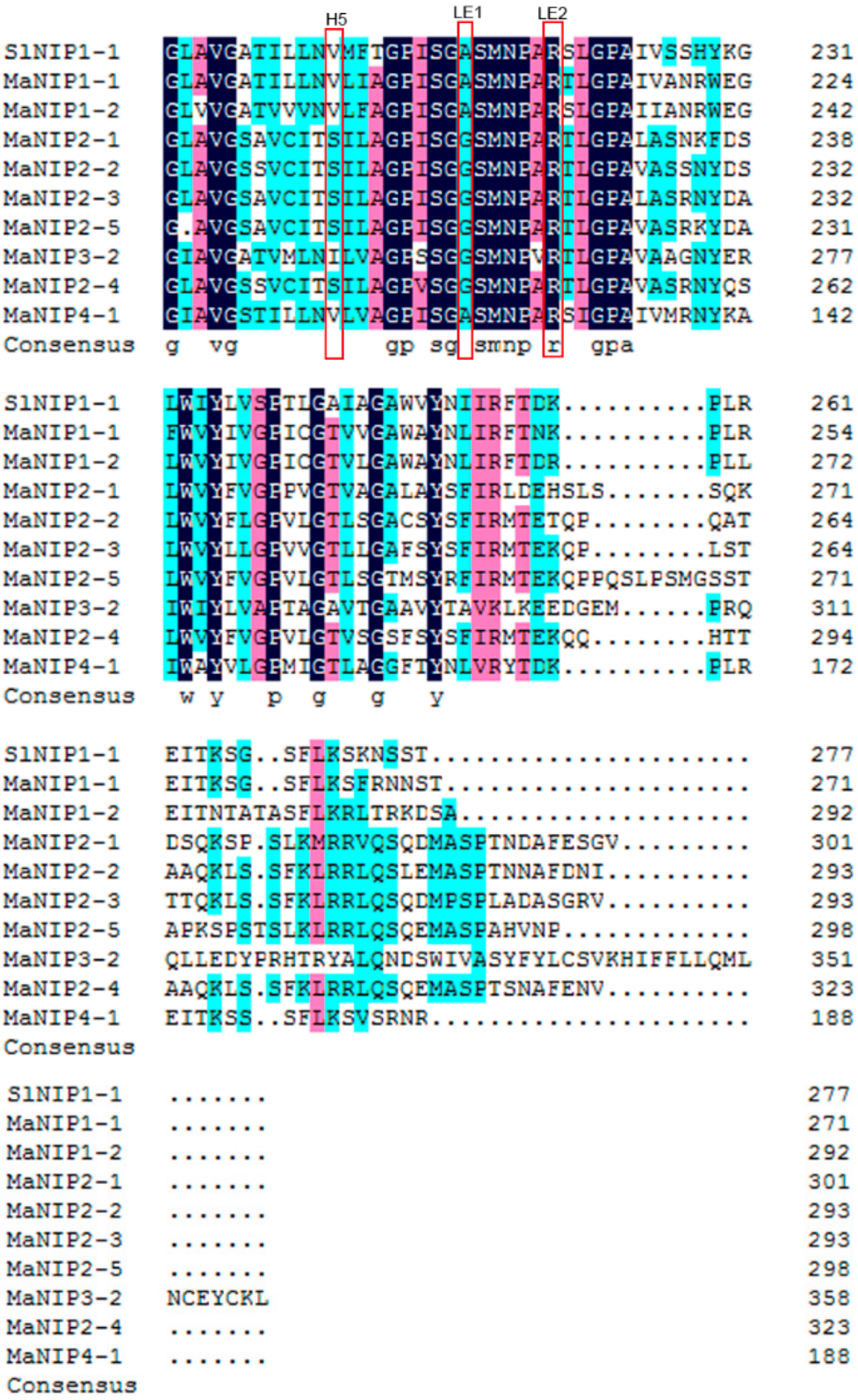

Figure S4. Alignment of amino acid sequences of MaNIPs. Residues comprising the ar/R filter are marked in red box and labeled as H2, H5, LE1 and LE2. Amino acids with high identities were shown in black background.

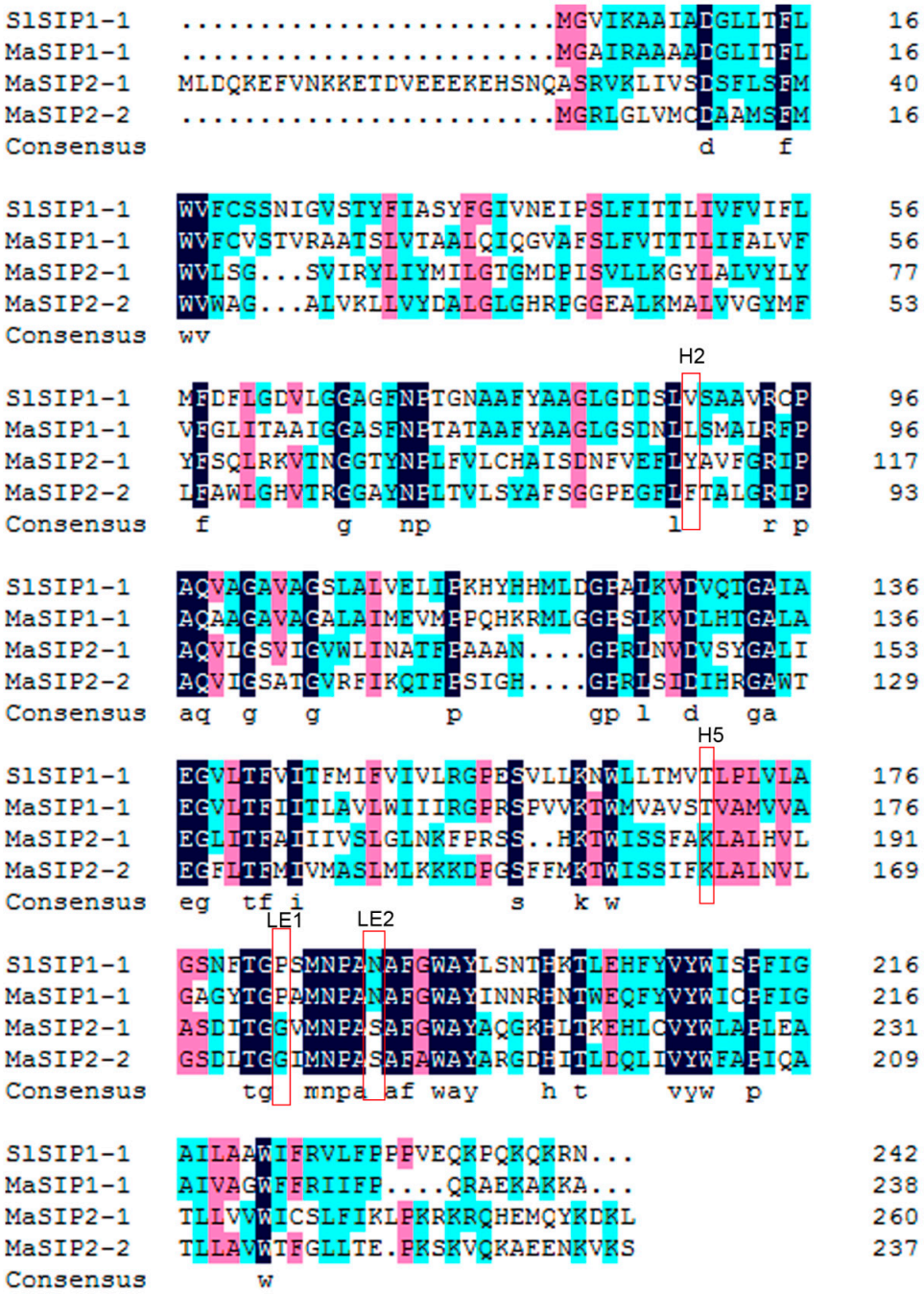

Figure S5. Alignment of amino acid sequences of MaSIPs. Residues comprising the ar/R filter are marked in red box and labeled as H2, H5, LE1 and LE2. Amino acids with high identities were shown in black background.

Table S1. The amino acids of banana AQPs.

>MaPIP1-3

MIFALVYCTAGISGGHINPAVTFGLFLARKLSLTRAIFYMVMQCLGAICGAGVVKGFQKGVYENNGGGANVVAAG
YSKGDGLGAEIVGTFILVYTVFSATDAKRNARDSHVPILAPLPIGFAVFLVHLATIPITGTGINPARSLGAAIIYNKDHA
WDDHWIFWVGPFIGAALAAFYHQIVIRAIPFKSRS

>MaPIP1-2
MIFALVYCTAGISGGHINPAVTFGLFLARKLSLTRALFYMVMQCLGAICGAGVVKGYQKGLYESNGGGANVVAPG
YTKGDGLGAEIVGTFILVYTVFSATDAKRNARDSHVPILAPLPIGFAVFLVHLATIPITGTGINPARSLGAAIIYNKKH
AWDDHWIFWVGPFIGAALAAIYHQIVIRAIPFKSRP

>MaPIP1-9
MIFILVYCTAGISGGHINPAVTFGLLLARKLSLTRALFYMVMQCLGAICGAGVVKGFKKGLYENNGGGANVVAPG
YTKGGGLGAEIVGTFILVYTVFSATDAKRSARDSHVPVLAPLPIGFAVFLVHLATIPITGTGINPARSLGAAIVYDKSH
AWNDHWIFWVGPFIGAALAAMYQQIVIRAIPFKSRP

>MaPIP2-9
MIFILVYCTAGISGGHINPAVTFGLFLARKISLVRALLYMIAQCLGAICGVGLVKGFQSAYYVRYGGGANELSDGYS
KGTGLAAEIIGTFVLVYTVFSATDPKRNARDSHVPVLAPLPIGFAVFMVHLATIPITGTGINPARSFGAAVIYNKDKA
WDDQWMFWVGPFIGAAVAAAYHQYILRASGAKALGSSSSI

>MaPIP1-4
MIFALVYCTAGISGGHINPAVTFGLFLARKLSLTRAIFYMVMQCLGAICGAGVVKGFQKGVYQSNGGGANVVASG
YSKGDGLGAEIVGTFILVYTVFSATDAKRNARDSHVPILAPLPIGFAVFLVHLATIPITGTGINPARSLGAAVIYNKDH
AWDDHWIFWVGPFIGAALAALYHQVVIRAIPFKSRS

>MaTIP1-6
MPIPRIAVGTQEEATHPGTLKAALAEFISTLIFVFAGQGSGMAFSKLTGGAATTPAGLIAAALAHAFALFVAVSVGAN
ISGGHVNPAVTFGVFIGGNITLLRSIIYWIAQLLGSTVACLLLRYSTGGLSTGSFALSGVSVWEALVLEIVMTFGLVY
TVYATAVDPKKGSLGTIAPIAIGFIVGANILAGGAFDGASMNPAVSFGPALVSWSWDDHWVYWAGPLIGGGLAGLV
YEFFFISHTHEQLSSADY

>MaPIP2-6
MSKEVSVEVEQPPAKDYSDPPPAPLLDFGEVRLWSFYRALIAEFVATLLFLYVSIATVIGHKEQNAADQCSGVGLLG
IAWAFGGMIFILVYCTAGISGGHINPAVTFGLFLARKVSLIRAVLYIVAQCLGGIVGVGIVKGIMKHQYNSLGGGANV
VATGYSKGTALGAEIIGTFVLVYTVFSATDPKRSARDSHVPVLAPLPIGFAVFMVHLATIPITGTGINPARSLGAAVIY
NQDKAWDDHWIFWVGPFIGALAAAAYHQYILRAAAIKALGSFRSNPSN

>MaNIP3-2
MHQYLIQQILTKNTLKPKPLAMPEPETPNVSAPATPGTPGAPLFNSLRVDSLSYDRKSMPRCNRCLPLESWASSPHT
CFIELPKPDVSLTRKLGAEFVGTFILIFGATAAPIVNQKYNGAETLIGNAACAGLAVMIVILSTGHISGAHLNPSLTIAF
AMLRHFPWAHVPAYILAQVSASICASFALKAVFHPFLSGGVTVPSVSSPQAFFIEFLITFNLLFVVTAVATDTRAVGEL
AGIAVGATVMLNILVAGPSSGGSMNPVRTLGPAVAAGNYERIWIYLVAPTAGAVTGAAVYTAVKLKEEDGEMPRQQ
LLEDYPRHTRYALQNDSWIVASYFYLCSVKHIFFLLQMLNCEYCKLR

>MaTIP4-1

MRKITLGSRNEAVEPDFVRSVFTELLLTFLFVFAGVGAVMTAEEVAGGEDRIMWVVAAPAAAQAMLVAMITAVGL
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GSGLAGFAHHHLYVAGTHGVLLPKDDEVGF

>MaPIP1-7
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AWDDHWIFWVGPFIGAALAALYHQVVIRAIPFKNRT

>MaTIP3-2
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GLIYEFLVIPDETPRTHQPLAPEDY

>MaPIP2-7
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WAFGGMIFILVYCTAGISGGHINPAVTFGLFLARKVSLIRALLYIVAQCLGAIVGVGIVKGIMKHQYNSLGGGANEV
ASGYSKGTALGAEIIGTFVLVYTVFSATDPKRSARDSHVPVLAPLPIGFAVFMVHLATIPITGTGINPARSLGAAVIYN
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>MaPIP2-5
MIFILVYCTAGISGGHINPAVTFGLFLARKVSLIRALLYMIGQCLGAICGVGLVKGFQKAFFVRYGGGANELSDGYS
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WDDQWIFWVGPLIGAAIAAAYHQYILRAGAVKALGSFRSNA

>MaTIP5-1
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>MaTIP3-1
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>MaPIP2-10

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>MaPIP1-1
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GLVYTVYATAVDPRRGSLGAIAPIAIGFIVGANILVGGAFDGASMNPAVSFGPALVSWSWTHQWVYWLGPLSGGAL
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>MaNIP2-3
MASHGTRPTTTACNEIHDAVTTHTSISPSLLHRKSLEELFPPFLAEKVVAETIATFLLVFVTCGSAALSKSEAGAVSQL
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DTALKALVMEIVVTFCMMFVTSAVATDSKAVGELAGLAVGSAVCITSILAGPISGGSMNPARTLGPALASRNYDAL
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>MaSIP1-1
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RAEKAKKA

>MaSIP2-1
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>MaSIP2-2
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YMCAQISGAMVASFVLRELLHPITNLGTTTPSDTAAKALVMETVVTFCMMFVTSAVATDTKAVGELAGLAVGSSV
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QSQEMASPTSNAFENV

>MaTIP2-4
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QSLVLEFIISFYLMFVISGVATDNRAIGELAGLAVGATILLNVLIAGPISGASMNPARTLGPAIVANRWEGFWVYIVGP
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>MaTIP1-4
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VYEFFFISHSHEQLPTTDY

>MaPIP2-4
MIFILVYCTAGISGGHINPAVTLGLFLARKVSLVRALLYMVAQCLGAICGVGLVKGFQEAYFVRYGGGANELSAGY
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AWDDQWIFWVGPFVGAAIAAAYHQYVLRASGAKAMGSFGSNA

>MaPIP2-13
MIFVLVYCTAGISGGHINPAVTFGLFLARKVSLLRAVFYMVAQCMGAICGVGIVKGIMKHQFNRFGGGANVVAPG
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PWHDHWIFWVGPFVGALAAEVYHQHVLRAANVKTLGSFRSSRSNC

>MaPIP2-11
MIFILVYCTAGISGGHINPAVTLGLFLARKVSLLRAVMYMVAQCLGAICGVGIVKGIMKHQFNAFGGGANSVAAGY
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WHDHWIFWVGPFVGALAAAVYHQYVLRAAALKALGSFRSSRSN

>MaNIP4-1
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GFTYNLVRYTDKPLREITKSSSFLKSVSRNR

>MaTIP4-2
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VSAGHLNPAVTIGFAAGGYVTVFRCVLYVIVQLLGSSMACLLLQYIAGGQAVPVHALGVGIGPLQGAIMEVVLTFS
MVFSIYAIIVDPKKGIVSVLAPLLIGLIVGANTLAGGPFSGASMNPARSFGPALATWDWTNHWVYWAGPFVGSGLA
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>MaTIP2-2
MAGIAFGQFDDSFSVGTLKAYLAEFISTLLFVFAGVGSAIAYNKLTSSAALDPAGLVAIAVCHGLALFVAVSVGANIS
GGHVNPAVTFGLALGGQITILTGIFYWVAQLLGAVVGAFLVKFATGLDTPTHGLGDGVGAGEAVVMEIIITFALVYT
VYATAADPKKGSLGTIAPIAIGFIVGANILAAGPFSGGSMNPARSFGPAVASGNFSDLWIYWVGPLIGGGIAGLVYTY
AYMCSDHQPLPQ

>MaNIP2-1
MASSHVRPNNSNEIHDIDVVTAQTLTTPSFFDPPRVHRRRNLKELFPPFLPRKVVSEMIATFLLVFVTCGAGALNKN
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HDLGTTTPSHTAAKALVAEIVVTFNMMFVTAAVATDTKAVGELAGLAVGSAVCITSILAGPISGGSMNPARTLGPAL
ASNKFDSLWVYFVGPPVGTVAGALAYSFIRLDEHSLSSQKDSQKSPSLKMRRVQSQDMASPTNDAFESGV

>MaPIP1-6
MGVVKSSTKCSTVGIQGIAWAFGGMIFALVYCTAGISGGHINPAVTFGLFLARKLSLTRALFYMVMQCLGAICGAG
VVKGFQKGLYENNGGGANVVAPGYTKGDGLGAEIVGTFILVYTVFSATDAKRSARDSHVPILAPLPIGFAVFLVHL
ATIPITGTGINPARSLGAAIIYNKGHAWDDHWIFWVGPFIGAALAALYHQVVIRAIPFKSRS

>MaTIP1-2
MPIGSIAIGAPGEASHPDTIKASLAEFISTLIFVFAGEGSGMAFNKLTNDGSTTPAGLVAASLAHGFALFVAVSVGANI
SGGHVNPAVTFGAFLGGNISLIRGILYWIAQLLGSVVACLLLKLATGGLETSAFSLSSDVSVWNAVVFEIVMTFGLV
YTVYATAVDPRKGDLGVIAPIAIGFIVGANILAGGAFDGASMNPAVSFGPAVVSWTWDNHWVYWVGPLIGAAIAAL
VYDGVFIGQATHEQLPPSDY

>MaTIP2-5

MACIAFGRCDDSFSATSLKAYLAEFISTLLFVFAGVGSAIAYGKLTSGAALDAAGLVAVALCHGLALFVAVAIAANIS
GGHVNPAVTFGLALGGQITILTGLLYWVAQLLGAVVGAFLLKFATGLDTPTHSLGVGAVEGVVMEIIITFALVYTVY
ATAVDPKRGSLGTVAPIAIGLIVGANILAAGPFSGGSMNPARSFGPAVASGDFADLWVYWVGPLIGGGLAGLVYTYA
YMCTDHTPLPQ

>MaNIP2-2
MASSTRPNSSNEIHDIDVVTAQNSYISPTLLHQKSLKEVFPPFLARKVVAETIATFLLVFATCGSAALSKSNPGLVSQL
GASVAGGLIVTVMIYAVGHISGAHMNPAVTLAFAVARHFPWIQVPFYMAAQISGAMIASFVLRELLHPITDLGTTAP
SDTAVKALVMEIVVTFCMMFVTSAVATDTKAVGELAGLAVGSSVCITSILAGPISGGSMNPARTLGPAVASSNYDSL
WVYFLGPVLGTLSGACSYSFIRMTETQPQATAAQKLSSFKLRRLQSLEMASPTNNAFDNI

>MaTIP4-3
MAKIALGNHHEAAEPGCIRAVLAEVVLTFLFVFAGVGAAMAAEKMVGGDSIMGLTAVAVAHALVVAVMISAGLHI
SGGHLNPAVTLGLAVGGHVTVVRSLLYVVAQLLGSTLACLLLKYLTGGLDTPVHTLAAGMGAVQGVIMEIVLTFSL
LFSVYATMVDPKKGIIAGLGPLLVGLVVGANILAGGPFSGASMNPARSFGPALAAWNWTDHWIYWVGPLAGGGL
AGLVYEHLFMVSTHVPLPREDEGF

>MaPIP2-3
MIFILVYCTAGISGGHINPAVTFGLFLARKVSLVRAFLYIVAQCLGAICGVGLVKGFQKAYFVRYGGGANELSDGYS
KGTGLGAEIIGTFVLVYTVFAATDPKRSARDSHVPVLAPLPIGFAVFMVHLATIPITGTGINPARSFGAAVIYNKDKA
WDDQWIFWVGPAIGAAIAAAYHQYVLRASGVKALGSFRSSA

>MaTIP1-3
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ISGGHVNPAVTFGAFVGGNITLLRGILYWIAQLLGSTVACLLLRFSTGGLETGTFGLTGVSVWEALVLEIVMTFGLV
YTVYATAVDPKKGSLGTIAPIAIGFIVGANILVGGPFDGASMNPAVSFGPALVSWSWTHQWVYWLGPLIGGALAGIV
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>MaTIP2-3
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>MaPIP1-5
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>MaTIP2-1
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>MaNIP1-2
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>MaNIP2-5
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Table S2. The full length cDNAs of banana AQPs.

>MaNIP1-1
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>MaPIP1-9
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>MaTIP2-5
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>MaTIP4-3

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>MaNIP2-3

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>MaTIP3-2
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>MaSIP2-2

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>MaTIP1-1

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>MaPIP1-3

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>MaPIP2-7

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