

Table S1. Ten *Pinus massoniana* SPX proteins sequences

>PmSPX1

MKFGRILKSQIEEAPPEWRDQYLSYKKLKKRLKFIFSLKVFQEAEDETPKVVRKRPRIEA
LGVPEVAERESDSYSFAKRNDNSDCASIDDLNDIKDMSAAEFDFIELLNPELEKFNDFFV
MAKEKEYIIRQKELQERIQRARNTVGPSPGKQDLIKVSHDVVKFHGEMVLLESYSILNFTG
LVKITKKYDKRTGGILRLAFIQKVLGQPFFTMELLFKLVKQCEETLHNLFSSSEDEGEET
EDEEEETEDEAVVDLGQDQIYRSTMAALRSMKEMRRGSSTYGPFSLPPLH

>PmNLA2

MKFGERFAEYLHGEDEHFLDKCSHLEYKRLKKVLKKCRDGYLHDGMGSDFEAGLYSSQ
TTENEDVICGETAKGISNSCDSFSTCSSETCAVCDRIFFYELTKEVSAIVGCFSSRARLLH
LHLASGFQRYLWRVKHFFADDHEAMIREGRHLVSYVAMNAIAIRKILKKYDKVHSSVNGR
NFKTKLQAKHIELLKSPWLIELIAFQINTRDSEHGHISDIFPECSCDFTASDPVLTCTLP
DSVKLEFSLTCPICLDIVFDPVALGCGHIFCKNCACTGASIPTIEGVKAANPRARCPICR
QMGVYADSVHLPGLLVKKRCRGYWKERLHTERAERVKQAKEHWDLQSRFVLGY

>PmSPX-MFS1

MVAFGKKMKDWQYPEWKKYYIDYKLMKKKVRQYAQQIQEGKMDRRQVLKEMSTMLD
KQIERTVFLFLEQQGYLAGRLEALGEEREMLEHNDLSSVHELQVAYTDIGQDLLKLLYF
VEINATGLRKILKKFDKRVGYRFTNYVVTTRSNHPYSQLQQVFKHVGLGAVVGALSRLN
AELRHHSGSYLSIYDQPSGVLPQDPVVDSIKAAVERLTHSTNFLRFLGQHALIIEEELPSHP
GEDVEKQEFHLSLSLNLASTFLYMVNTYIIVPTANDYATSLGAAATVSGLIIGCMPIAQLV
SSVYLSAWSNRSYFRPLLFSIFLVIGNLVYAIAYNLDLSLYILLGRLLCGLGSARAVNR
RYITDCVPLKMRLRFSAYFVISSAMGMACGPALAGLLEFNTSVLGLTLNANTLPGWVMSA
LWFFYVFWLWLSFKEPIHFKDNSHSSQVVNGLMERDIVDSDLTQPLALSSEAKEEMQDE
ESIQNNSNRNKTHEMSHKPANSIFEACKLVTRPVKVTLLVYFMLKYATEM

>PmPHO1;H1

MVKFSKQFEAQLVPEWKDAFVDYRQLKKEIKKIQRQRQQAERADEAHGPGLNFNFERFS
RMTKFIKKKACHCLGRDLEPKLIQVRKPEEDVYETEVIKQGFQDRDAAQVFFSTLDTQLN
KVNQFYRTKEKEFLERGDALKEQLGILKGLKASLTTELKEKQSSHGGESENNSTHSVASTD
DCRDDSI REPAEDGDLEDKQETAQLEEEGIIGFENNAGLVESPRRRSMDGIRSKKNSDKH
LSKIKSNPRSRSSFSSHGRSMRMDIPLTTPTRTFSALTHVLWDDL MNQQNKDTPEGNRFML
NKKNLHRAEKLIRGALVELYRGLGFLNTYRSLNMLAFEKILKKFDKVTGQQILPIYFKV
VEKSYFNSTDKVVKLSDEIEELFVQYFAADRRKAMTYLKPQSKVSHTVTFFIGLFTGC
FLALSVGYIIMAHLDKRYLLSNMTTSYQVFSLINLHIFLYGCNIVMWKRHRINYIFIFE
ARKRELKYQDVFLICTTFMTIVAGCMVAQLALRGKGVSSVQVDTIPGLLLLASVVLLCP
LNIIYRSTRFTFLRVLRNIVLSPFYKVVMVDFFMADQLTSQVPLLRQLEYVTCYYVSGSY
KGNSNSHSCTDNKNYTDLLYVVSFLPYWVRAMQCARRWFDEGDIDHIANLGKYVSAMV
AAGARLTHDRDLTHDRQHTAGWLAMVVITSTIATYQLYWDFVKDWGLLQRHSRNPWLR
DELILKHKIIYFLAMALNLVLRRLAWLQTIMPSLFGINEAGFLLASLEVIRRGHWNFYRLENE
HLNNAAGKYRAVTTVPLPFREVED

>PmSPX4

MKFGKRLQIQIDETLPEWRDKFLSYKPLKKRLKQVAGPEWFTAVGFCAASPQHDGSSSSV
VDKFIQELRKGSAAALGEIVDKPANESAAEAASSKPASEIGAGINDEVSSSESSTHAPAERN
SERKTGNFDEEDFINLINEELEKFNNFFLEKEEEYVIHLQELKERIERLKERSRQNGTYT
SEYEFNEETVKIRRDIVAIHGEMVLLENYSSLNFIGLVKILKKYDKRTGALLRLPFTQSV
LQQPFFTTELLSKLVRECEANLQSI FPSIPVDERGDCATEQSRDENNDANAQETLSLQGD
TGIYRSTLAALRTIQDLRKGSSTYNPLSFAPFVPGDIEDGLVAGGNDKSKSNSSSHSTNG
NAQNEE

>PmSPX-MFS2

MVEFGKKLKQRQYPEWQRYYINYKLMKKKKVRQYAQQAQEGTQDRRHLLKEFSKMLDH
QVEKTVLFFLEQQGHLA GRRLALGEKCEALTQLNDVAEVHALREAYRALGQDLLKLLNF
VEMNAIGVRKILKKFDKRF GYSFTDYYVTTRSHPYSQLQQVFKHV GIAAVVGALSRLNT
VFQNRGGSYLSIYDQPIQALTLQDPVIDEIKDAVERLTNSTNFLRFLGQHALIIEEELPRPSEE
YIQDQRYHFVSLVLNLVNTFLYMVNTYIIVPTADKYSMSLGAAATLCGVIIGSMAVAQLV
SSVYFSAWSNKS YFRPLVFSSIVLFLGNIMYAMAYDLDSL SILLIGRILCGLGSARAVNR
RYISDCVPLKTRLKASAAFVSASALGMAAGPAFAGILQINKSFFGITLNENTLPGWVMAA
AWFVYLLWLWISFKEPSHEDEEDHTGEASSGGQAEEDAVKDGLTQPLLLSSRTSEKFIDE
EAELEIDDSVESSEDSRKPASSIVEAYKLVTPPVKVQLLIYFMLKYAMEILLSSESVVTA
YYFNWTTSSVAIFLALLGLTLLPVNVVVGNYSISNMFEDRQILFAAEVFTCVGILLSFNII
FPYSVAQYVSGAFITFVSAEVLEGVNL SLLSKVMSSRLARGTYNGGLLSTEAGTLARVLA
DGTITLAGYLGQGLLLNVTLLPTLIIGVISLIATGYTYNFLY

>PmNLA1

VCDRTFFPSLLNEMSAVLCCFNTGARQLLKLHIATGFQKYFAWLTSKWADDHLGMFKKG
EDLVNYASINALAVRKILKKYDKIHYSKQGREFKTRAQSMQMEILQSPWLNELIAFRINSM
NLSNGVTPVSDLSEDYSLTFDGEKPSLSCTVLD SVKLDIDLTCSICLETFFDPVSLKCH
IFCFSACASAAVTIVDGLECADPKSKCPLCRQERVFGDAVRLGELSVLLSKSCPEYWEQ
RLQTEKVERLRQTKEHWEKQCRAFMGF

>PmPHO1

MVKFSKQLEAQLIPEWKGA FVNRYLLKKDIKKIKLLRKNESWNKAHDSAEGFGCSKLES
VIDFLKEKTKAWLPKASSHGDAIQVRRSISPSTRGYVYETELIQLFEQADAAKAFFASLDA
ELNKVNEFYKRKEAEFLERGETLKRQTQILIDLKDILNDQGSSKKSSSGHGGSESGSDSS
RYGGRSIPSEDGSGVAGEKEGEKEDEDVVASVFEKNGVTFVDSPSRLSGNRSKTKKGNTKL
YLKGKSGSAGSARIGNTL SRQMRVDIPATTPSRTVSAITQMLWEDLVQNQPAKKDEAAFQ
GGSGSTRINKKKLQHA EKMIRGAFVELYKGLGLLKTYSNLNMVAFGKILKKFDKVSEQQA
APVYLKAVEKSYFNHSDKAVKLADDIESTFIKYFMEDDRKKAMKFLRPREKKDSHAVTLF
IGIFTGFFLALFVG YAILAHLTGLYRDS DQSGYVATFFPIFSTLVLFNLHLFLYGCNIYM
WRSTRINYSFIFEFS PATELTYRDVFLICSTFMTVVMGGMVAHLTLRLKGFSSDVIDSIP
ALLLVSAAVLFCPINIIYRSSRFCFLRIMRNILLAPLYKVEMTDFFMADQLTSQIPLLR
NVEYVACYYL TGSFAKHEYGACDHKTSYRQMAYVISFLPYYSRAMQCARRWFEEGDLSH
LANLGKYVSAMIAAGARLSYTNQPHNDFLLALVVITSTIATYQLYWDFVRDWGLLNPRS
KNPWLRDELI IKQKTVYFLSMALNFVLRRLAWVQSV MHLKMTGPGYRETPADKVIGFVLA

SLEVIRRGHWNFYRLENEHLNNVGKFRAVKTVPPLPFREVDSD

>PmSPX2

MKFGKRLKSQIEDTLPKWRDKFLAYKYLKKLVNSMSTGREASPPFGSDEIRGGSDLPNK
RQKVSAGPVEAGAASDDYLPAFVLDFECNKRKMTAEESDFVDLLNAEIDKFNAFFMEQE
EEYIIRQKELQDRIERLKSNRQNGAVFSETEYNEEMIKLRKDIVNFHGEMVLLNYSALN
YTGIKILKKYDKRTGGLLRHPFIQKVLQQPFFTTEQLSKLIRECENTLQSLFPDYPQSV
LQVPASPSSNGNHAETSSSTGKSDSQRLRVPLAATTKEEFGEENALFKGRGDEDGDCDAE
GMESIYRSTMAALRTMKEIRRGSSSTYSVFSLPPLDETKSMPLCSLIPIC

>PmNLA3

MKFGERFSEYLHGADEHFLQKCSHVGYKRLKKVLKNCRVQYYDGTSPDPGVGLRNLPT
ENVISPETASHIPKSCNSSSKTCSSETCTVCDQIFFYELTKEVSAIMGCFSARVRLLHLH
LASRFQRYLWRVKHFFADDHEALIREGRHLVAYVAMNATAIRKILKKYDKVHSSVNGRNF
KTKLQAKRIELLKSPWLIELIAFQINTRDPEHGHIGEIFPECSCDFTGSDPVITCTLLDS
VKLEFNLTCPICLDTVFDPVVALGCGHVFCNICACTGASILTIEGVKSANQRARCPTCRQM
GVYADSVHLTELGLLVKKRCRSYWNERLHTERAQRVKQAKEHWDLQSRFILGF