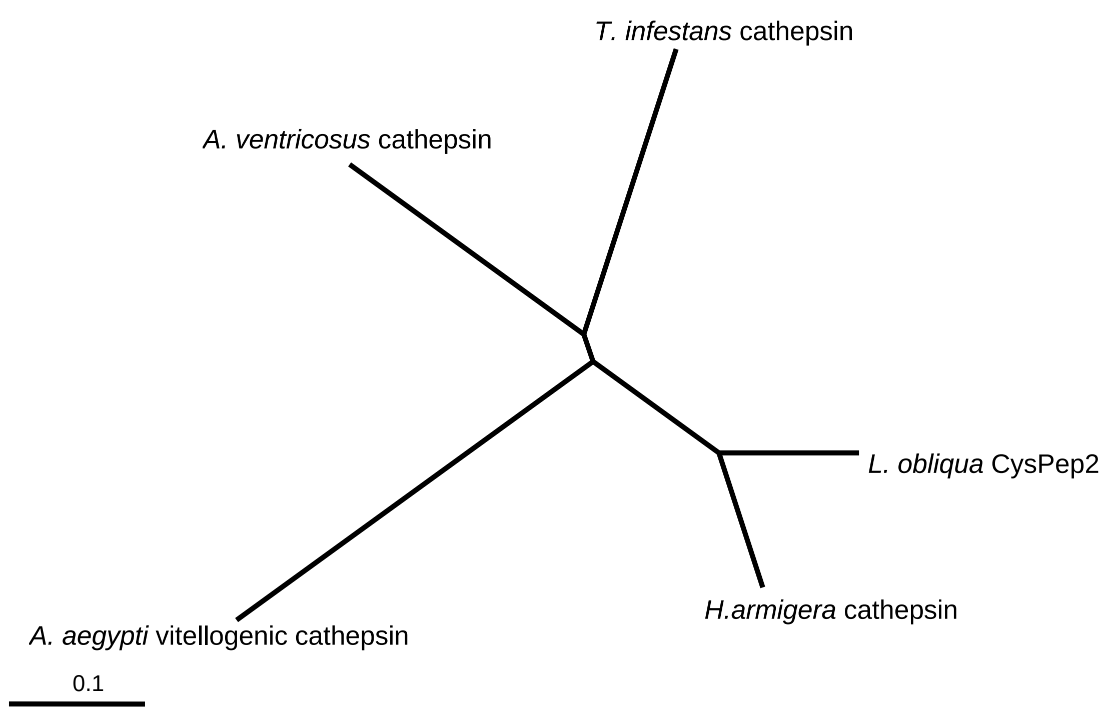
a)

```
                             1                                                          60
L.obliqua CysPep2            -------------------------------MAPVRAVCIAFACILAIAAADLVY--PLS
H.armigera cathepsin         -------------------------------MAASRATFVALVCALALAAADVQN--PLS
T.infestans cathepsin        --------------------------------MKELIPFSLLICGIFSASIPT---DPLS
A.ventricosus cathepsin      --------------------------------MKVLVVLAMVLVAVSARSQPFKHIHPLS
A.aegypti vitell-cathep      MFRFVLVLACCQAALAQGYGTPSPKFSSKNSARYQDNQYNQYSGEYSGAQYPSRQ-YPAN
                             61                                                        120
L.obliqua CysPep2            EDFINI-------------LNSKPKTWTAGRNFPANTPFAHIKMLMGALKDD-NILKLPK
H.armigera cathepsin         DDFINL-------------INTKQNSWKAGRNFPEHTPFAHIKRLAGVLPDY-HLSKLSK
T.infestans cathepsin        DEFIDY-------------INSLQTTWRAGRNFAPNTPKKYLKSLAGVHKDANNAFTLPK
A.ventricosus cathepsin      EKMIEY-------------VNFMNTTWKAGRNFHEGVTMKYIRGLLGVHKDN-HKYRLPS
A.aegypti vitell-cathep      RNQSYFGARFQNTALLASKFSHLTRTWRAGSNPKP--PAGYR---SGVNMADLERTKLPL
                                                     Active site motif
                             121                                                       180
L.obliqua CysPep2            MTHDAELIASLPENFDPRDKWPNCPTLNEIRDQGSCGSCWAFGAVEAMTDRVCTYSDGTK
H.armigera cathepsin         VEHEDELIASLPENFDPRDKWPNCPTLNEVRDQGSCGSCWAFGAVEAMTDRYCTYSNGTQ
T.infestans cathepsin        RQVS--LDVTLPKEFDARKHWPNCTSIAEIRDQGSCGSCWAFGAVEAMSDRICIHSNGKL
A.ventricosus cathepsin      IRHA--VPGDLPESFDSREQWPNCPTISEIRDQGSCGSCWAFGAAEAMSDRHCIHSNGKV
A.aegypti vitell-cathep      GIMADVEDLDLPDTFDAREKWPECPSLREIRDQGCCGSCWAVSAASAMTDRWCVRSKGKE
                             181                                                       240
L.obliqua CysPep2            HFHFSAEDLLSCCPICGLGCNGGMPTLAWEYWKHAGIVSGGSYNSTQGCIPYEVPPCEHH
H.armigera cathepsin         HFHFSAEDLLSCCPICGLGCNGGMPTLAWEYWKHFGLVSGGSYNSSQGCRPYEIPPCEHH
T.infestans cathepsin        QVHLSAENLVSCCDSCGFGCDGGYPASAWDYWQNVGIVSGGNYGSKQGCQPYSIAPCEHH
A.ventricosus cathepsin      NVEISAEDLLTCCDSCGMGCNGGFPGSAWEYWVDKGLVTGGLYNSHVGCQPYTIASCEHH
A.aegypti vitell-cathep      QFIFGSLDLLSCCHSCGQGCRGGTLGPAWQFWVEKGLSSGGPLNSRQGCHPYPIGECR--
                             241                                                       300
L.obliqua CysPep2            VPGNRLPCNGDTKTPKCQKTCEAGYNVP-FKKDKHYGKHVYSVSGNEDNIKAELFKNGPV
H.armigera cathepsin         VPGNRMPCNGDSKTPKCEKTCESNYNVD-YRKDKRYGKHVFSVSSKEDHIRAELFKNGPV
T.infestans cathepsin        VPGPRPACSGEGSTPDCRNQCDKRSGIS-YDKDLYYGESAYSLEDEAKQIQAEILKNGPV
A.ventricosus cathepsin      TKGKLPPCGDIVDTPQCVHMCEKGYNVS-YRADKYFGKKSYSIDEQEDQIKTEISTNGPV
A.aegypti vitell-cathep      IPGE------DEDTPKCSNKCRSGYNVTDVWQDRHIGRVAYSLPNDERKIMEEIFINGPV
                             301                                                       360
L.obliqua CysPep2            EGAFTVYSDLLSYKSGVYQHTDGSALGGHAVKILGWGVENGSKYWLIANSWNSDWGDNGF
H.armigera cathepsin         EGAFTVYSDLLNYKTGVYKHTIGDALGGHAVKILGWGVENGNKYWLIANSWNSDWGDNGF
T.infestans cathepsin        EAAFTVYEDLVNYKEGVYQHVAGSVLGGHAIKILGWGVENDTPYWLVANSWNTDWGNNGF
A.ventricosus cathepsin      EAAFTVYADFVTYKSGVYRHVTGEEMGGHAVRILGWGTESGTPYWLVANSWNTDWGDKGY
A.aegypti vitell-cathep      QAAFHTYLDLHAYKSGIYRHVWGPLSGGHAVKLLGWGVENGVKYWLVANSWGREWGENGF
                             361                                   400
L.obliqua CysPep2            FKILRGEDHCGIESSIVTGEPLLTDD--------------
H.armigera cathepsin         FKILRGEDHCGIESSIVAGEPMFVEY--------------
T.infestans cathepsin        FKILRGKDECGIEIDVSAGLPRL-----------------
A.ventricosus cathepsin      FKILRGSDECGIESSIVAGLPKV-----------------
A.aegypti vitell-cathep      FKMVRGENHCGIEENIHAGLPNFHRQGEAAKYFAAGYGYN
```

b)