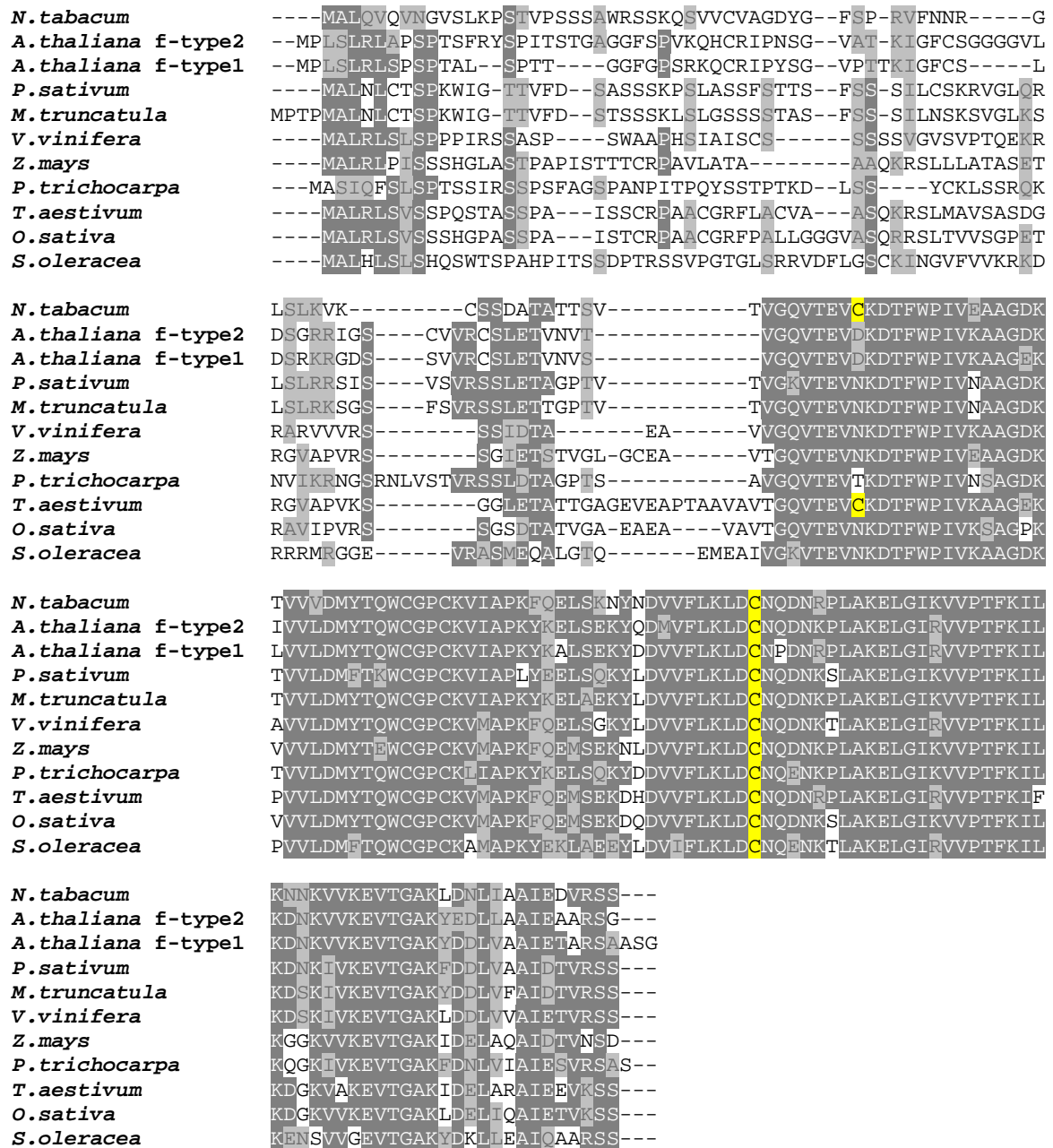


## **Chaperone-like properties of two tobacco plastid thioredoxins**

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**Fig. S1.** Alignment of the amino acid sequence of tobacco Trx f with other Trx f proteins from plant sources, using the ClustalW software. Additional non-active cysteine residues are highlighted in a yellow box. The GenBank accessions are as follows: ADQ53451, NP\_197144, NP\_186922, AAC49357, ACJ83989, XP\_002277021, NP\_001150158, XP\_002325907, CBH32529, NP\_001045167, P09856, respectively.

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N.tabacum Trx m      MAGVLEMISVPRAS---ALPSS-----SLAPVAGSSFSSPRRS-SVRFSSQERGLKIQST
P.trichocarpa Trx m4 MATVLESLTAPSRSS-AVLPKP-----TTLVTAFASTINRR-SLRFPPQLKGLKIHFH
P.sativum Trx m2    MATVQ-----LESFSL-IPSSQ-----HPRTVASSLSRPIA-ARFPPTGLK-LRP
P.trichocarpa Trx m2 MDSSMALSSY-SSRLKCSLNPMPMMVPSPLPGVLPSSRRRCGIASAEERGLRIQMG
P.trichocarpa Trx m1 MVSSMVLSSYPSSRLKCSLNPQSVIMMSSPQPTVALLFPVRLGGAASAEFGGLRIQMG
P.trichocarpa Trx m6 MALHASNMSTMSTTRAG-----VLCSNHVACSKK--LKLPTGRGLRRS-S
P.sativum Trx m     MALES---LFKSIHTKT-----SLSSSIVFIFKKGACLLTSKSR-IQESFA
A.thaliana Trx m4  MASLLDSVTVTRVFLPIAASV-----SSSSAAPSVSRRIISPARLEERGLKSSRS
A.thaliana Trx m1  MAAYTCTSRPPIISIRSEMR-----IASS-PTG-SFSTROM-FSVLPPESSGLRTRVS
S.oleracea Trx m   MAIENCLQLSTSASVGT-----VAVKSHVHHLQPSKVNVPTRGLKRSFP
A.thaliana Trx m2  MAaftCTSRPPIISLRSETR-----IVSSSPSASSLSRRM-FAVLPPESSGLRIRLS

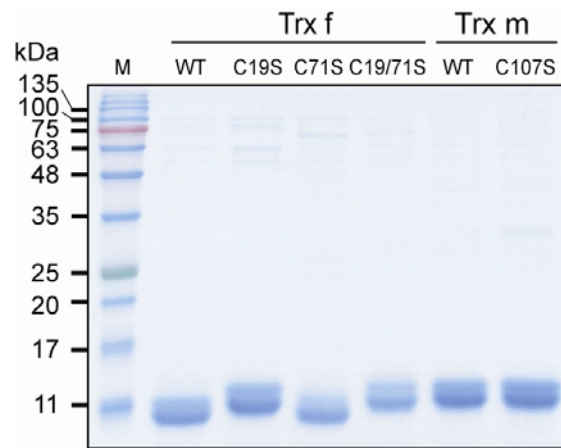
N.tabacum Trx m      RSS-----VSTTSCSKIIIPGRARIVCEAQT-----ALEVGA VNDKTKWLSLVVESDIPVL
P.trichocarpa Trx m4 SSSTVNRSLGVSQSSSLACAGRIVCEAQDI----AVKVPVTDATWKSILVLESESPVL
P.sativum Trx m2    LAAT---SLRSRFAASRVVPRGGRVLCARDT----AVEVASITDGNWQSLVIESDTPVL
P.trichocarpa Trx m2 SKLS--TSLVSIQ-TRRNPKVFSRIVSEAHET----FVDIPAVTDETWQSLIIEADGPVL
P.trichocarpa Trx m1 SKLS--PSLVSIN-TRRNPKVFCRIVSEAQET----VVDIPTVTDETWQSLVLEADGPVM
P.trichocarpa Trx m6 SLSF-----PSSFSSSYASVKNHKIHHCMQSSRS--CRVQVVDSSWDLSVIGCEIPVL
P.sativum Trx m     ELN-----SFTSLVLLIENHVLHAREAVN----EVQVVDSSWDELVIIGSETPVL
A.thaliana Trx m4  LVTQ---SASLGANRRTRIARGGRIACEAODTTA-AAVEVPNLSDSEWQIKVLESDVPVL
A.thaliana Trx m1  LS-----SLS--KNSRVSLRRG-VIACEAODT----ATGIPVVDSTWDSLVLKADEPVF
S.oleracea Trx m   ALSS-----SVSSSSPRQFRYSSVCKASEAVK----EVQVDVNDSSWKEFVLESEVPVM
A.thaliana Trx m2  LSPA---SLTSLIHQPRVSRLRRA-VVCEAQET----TTDIQVVDSTWDSLVLKATGPVM

N.tabacum Trx m      VEFWAPWCGPCRMIHPVIDELAKEYAGKIKFFKLNNTDESPSTATELGIRSIPTVMIFKNG
P.trichocarpa Trx m4 VEFWAPWCGPCRMIHPVIDELANQYAGKIKCYKLNNTDCSSIAATEYGIRSIPTVLIIFKNG
P.sativum Trx m2    VEFWAPWCGPCRMIHPVIDELAKEYVGGFKCYKLNNTDESPSTATRYGIRSIPTVLIFFKDG
P.trichocarpa Trx m2 VEFWAPWCGPCRMIHPVIAELSTEYDGGKIKCFKLNNTDESPSTTTKYGIRSIPTIMIFKNG
P.trichocarpa Trx m1 VEFWAPWCGPCRMIHPVIAELSTEYGGKIKCFMLNTDESPSTVTKYGIRSIPTLIIFKKG
P.trichocarpa Trx m6 VEFWAPWCGPCRMIHPVIDELAAEYAGKIACFKVNNTDCPNIASQYAIRSIPTVLMFKNG
P.sativum Trx m     VDFWAPWCGPCRMIAPVIDELAKEYAGKIKCYKLNNTDESPNTATKYGIRSIPTVLIFFKNG
A.thaliana Trx m4  VEFWAPWCGPCRMIHPVIDQLAKDFAGKIKFYKLNNTDESPNTANRYGIRSIPTVLIIFKGG
A.thaliana Trx m1  VDFWAPWCGPCRMIHPVINELAQKYAGQKFKFYKLNNTDESPATPGQYGVRSIPTIMIFVNG
S.oleracea Trx m   VDFWAPWCGPCRMIHPVIDELAKEYSKIKAVYKLNNTDEAPGIATQYNIRSIPTVLIFFKNG
A.thaliana Trx m2  VDFWAPWCGPCRMIHPVINDLAQHHTGKIKFYKLNNTDESPNTPGQYGVRSIPTIMIFVGG

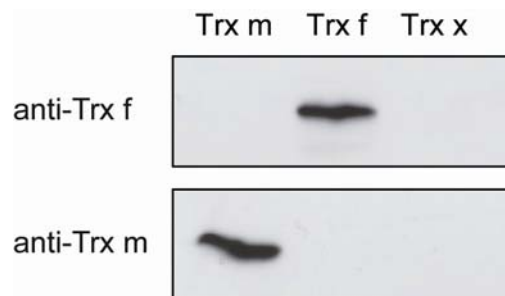
N.tabacum Trx m      EKKDAVIGAVPKSTLTITTEKFL--
P.trichocarpa Trx m4 EKKEAIIIGAVPKTTLTTSIEKFL--
P.sativum Trx m2    EKKDAIIGSVPKASLITTEKFL--
P.trichocarpa Trx m2 EKKDAIIGSVPKTTLISNMKKFL--
P.trichocarpa Trx m1 EKKDAIIGAVPKTTLISNKKFL--
P.trichocarpa Trx m6 EKKEGVIGAVPKATLAAAI EK YVEA
P.sativum Trx m     ERKDSVIGAVPKATLSEKVEKYI--
A.thaliana Trx m4  EKKDSIIGAVPRETLEKTIERFLVE
A.thaliana Trx m1  EKKDTIIGAVSKDTLATSINKFL--
S.oleracea Trx m   ERKESIIGAVPKSTLTDSEKYLSP
A.thaliana Trx m2  EKKDTIIGAVPKTTLTSSLDKFLP-

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**Fig. S2.** Alignment of the amino acid sequence of tobacco Trx m with other Trx m proteins from plant sources, using the ClustalW software. The additional non-active cysteine residue is highlighted in a yellow box. The GenBank accessions are as follows: ADQ53450, EEE97513, CAC69854, EEF00430, XP\_002330680, XP\_002328471, CAA53900, NP\_188155, NP\_849585, P07591, NP\_192261, respectively.



**Fig. S3.** SDS-PAGE analysis of purified tobacco Trx f, Trx m and mutant proteins expressed in *E. coli*. The eluates of the purified proteins obtained from the soluble fraction of *E. coli* BLR (DE3) transformed with the corresponding pET-Trx construct were loaded onto SDS-PAGE (13% acrylamide) gels and stained with Coomassie Brilliant Blue R-250. His-tagged proteins were purified by Ni-NTA affinity chromatography. M, protein marker.



**Fig. S4.** Cross-reactivity of anti-Trx f and anti-Trx m antibodies. 250 ng of purified Trx were loaded onto 13% SDS-PAGE gels. Blots were detected using anti-Trx f or anti-Trx m as indicated. Trx f, tobacco Trx f; Trx m, tobacco Trx m; Trx x, *Arabidopsis* Trx x.