Response of Telomere Length & Telomerase Activity to Alfalfa *(Medicago sativa* L.*)* Seed Vigour

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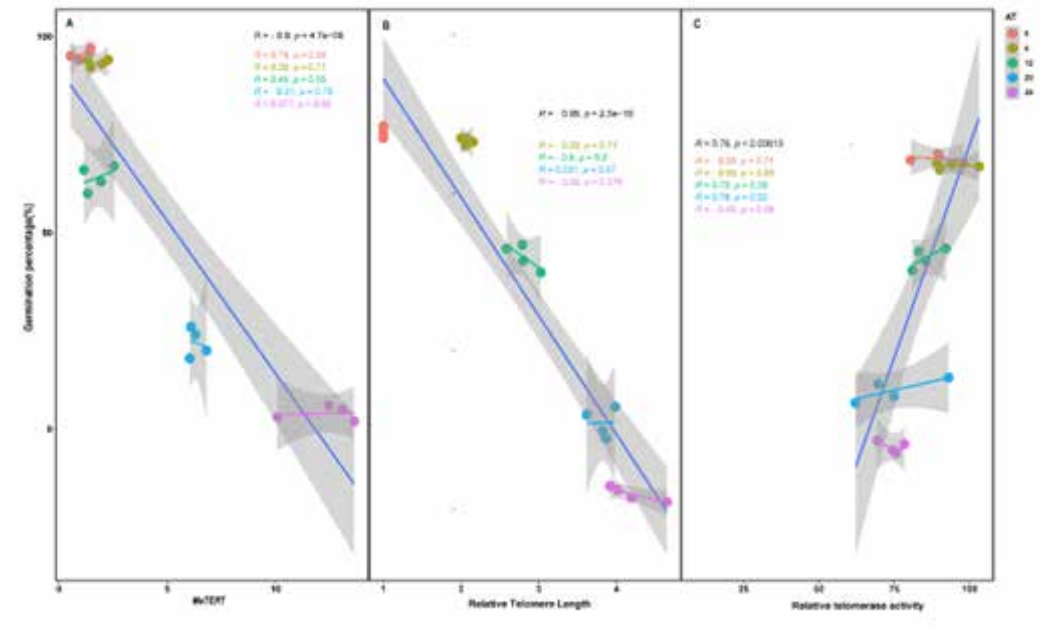
The prediction of seed germination and seed vigour is valuable for alfalfa germplasm conservation and the seed industry. In agricultural production, it is necessary to ensure that the seeds have high germination percentage, good consistency, and strong resistance. Telomerase is a special reverse transcriptase, ribonucleoprotein (RNP) composed of two core subunits, telomerase RNA and telomerase reverse transcriptase (TERT). Telomerase has an important catalytic repair effect, thereby extending telomere length, maintaining the integrity of the chromosome end structure, and ensuring normal cell metabolism. We found that *MsTERT* expression level was lower in high vigor seeds and relatively higher in low vigor seeds. In addition, *MsTERT* respond to various abiotic stress such as salt (100 mmol/L NaCl) and drought(20% PEG6000). The germination percentage, as a representative index of seed vigor, was positively correlated with the relative telomerase activity, and negatively correlated with aging days, *MsTERT* expression and telomere length. Aging days were positively correlated with *MsTERT* expression and telomere length, and negatively correlated with germination rate and telomerase activity.

Figure 1. Correlation of seed germination percentage with *MsTERT* expression, relative telomere length and relative telomerase activity. (A)Linear regressions of seed germination percentage and relative expression of *MsTERT*. (B) Linear regressions of seed germination percentage and relative telomere length. (C) Linear regressions of seed germination percentage and relative telomerase activity. The relative expression of *MsTERT* was plotted against seed germination at 0,4,12,20,28 days of ageing. Error bars indicate ±se (n=4).



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