

Supplemental Information

Land Application of Beef Cattle Manure Facilitates the Transmission of Antibiotic Resistance Genes from Soil to Lettuce

Yuepeng Sun^{a,b,*}, Daniel Snow^c, Harkamal Walia^d, and Xu Li^b

^aSchool of Ecology and Environment, Inner Mongolia University, Hohhot 68588, China

^bDepartment of Civil and Environmental Engineering, University of Nebraska-Lincoln, Lincoln, Nebraska 68588, USA

^cNebraska Water Center, University of Nebraska-Lincoln, Lincoln, Nebraska 68588, USA

^dDepartment of Agronomy and Horticulture, University of Nebraska-Lincoln, Lincoln, Nebraska 68583, USA

*Corresponding author

*Yuepeng Sun

School of Ecology and Environment

Inner Mongolia University

49 Xilingol South Rd, Hohhot 010021

Inner Mongolia, P.R. China

Email: 111989064@imu.edu.cn

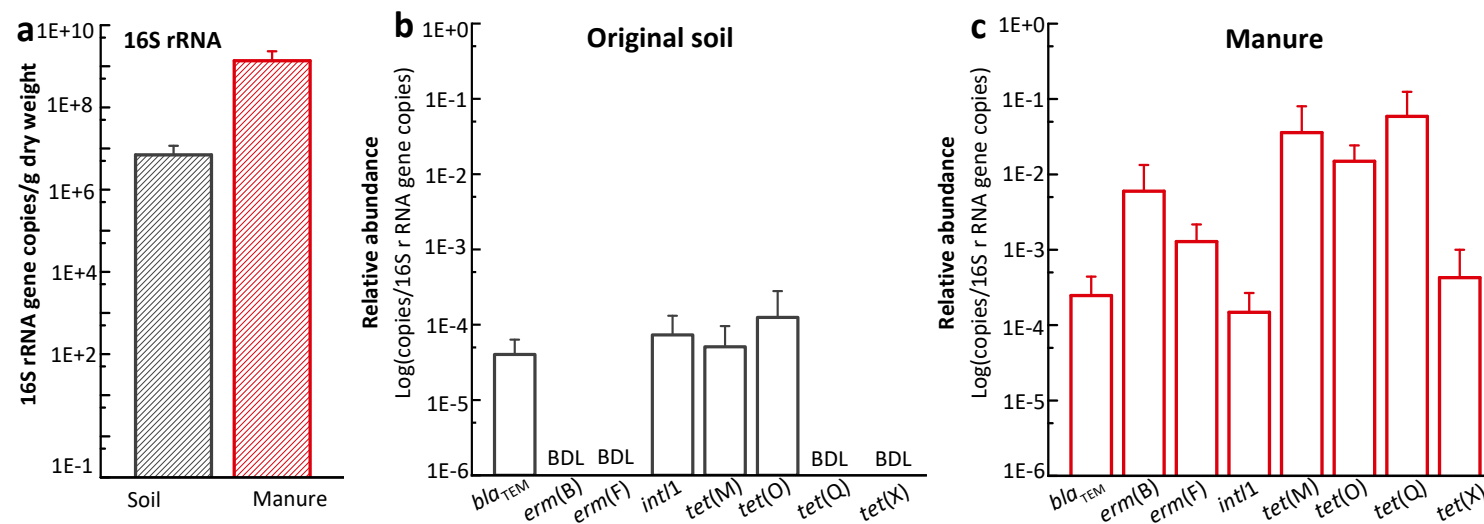


Figure S1. The abundance of the 16S rRNA gene normalized to sample weight (**a**), and relative abundance of ARGs and *int1* gene normalized to copies of 16S rRNA gene copies in original soil (**b**) and manure (**c**). Error bars represent the standard deviations ($n = 3$). BDL, below detection limit.

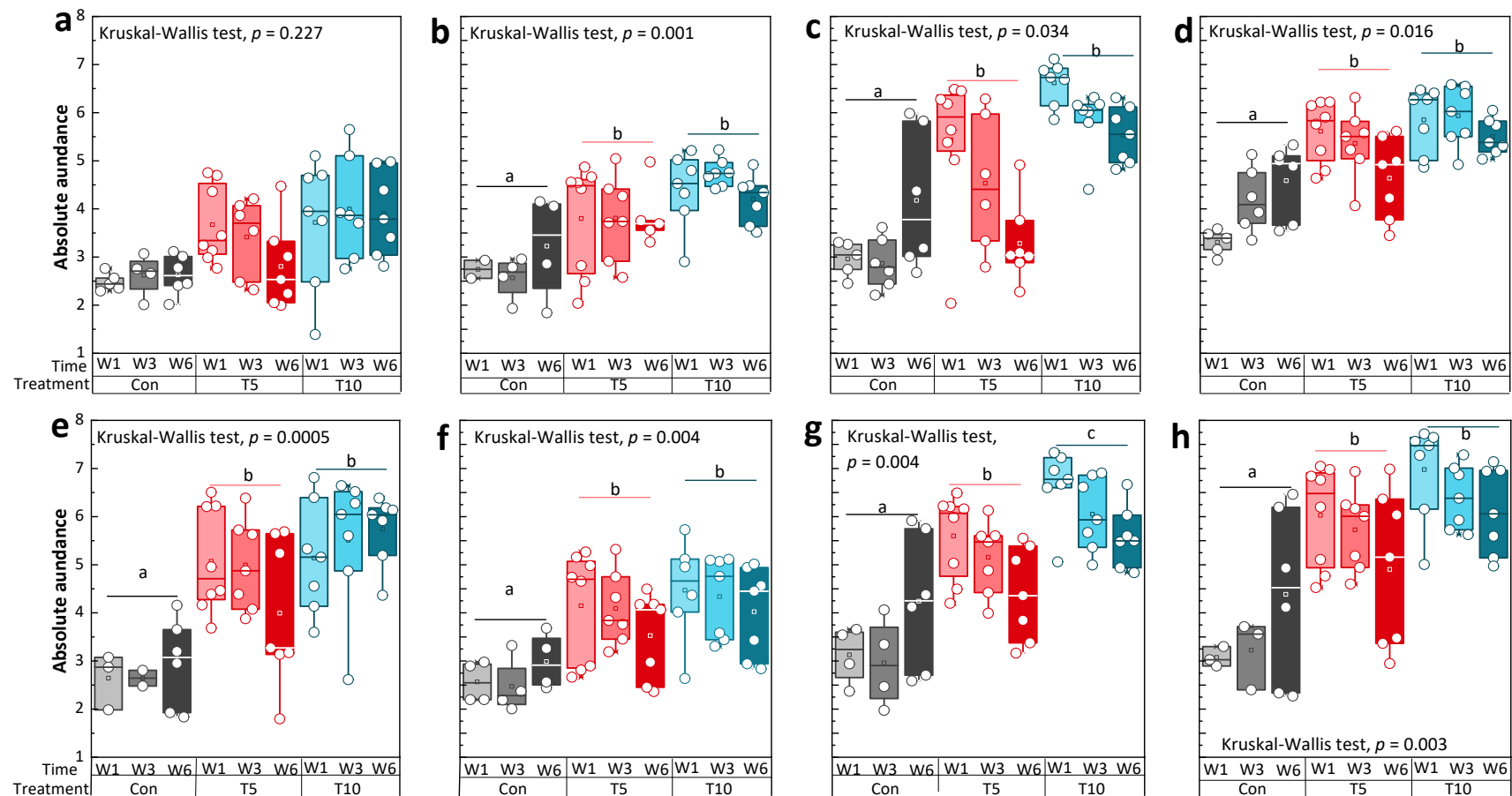


Figure S2. Absolute abundances of (a) *bla*_{TEM}, (b) *erm*(B), (c) *erm*(F), (d) *intI1*, (e) *tet*(M), (f) *tet*(O), (g) *tet*(Q) and (h) *tet*(X) in surface soil at different sampling time (W1: week 1, W3: week 3, W6: week 6). Boxes with maximum (upper whiskers), minimum (lower whiskers) and the mean (Con: $n = 6$; T5 and T10: $n = 9$) ARGs abundance (hollow box) are shown. Box groups with different letter are significantly different according to pairwise-comparison between treatment scenarios ($p < 0.05$).

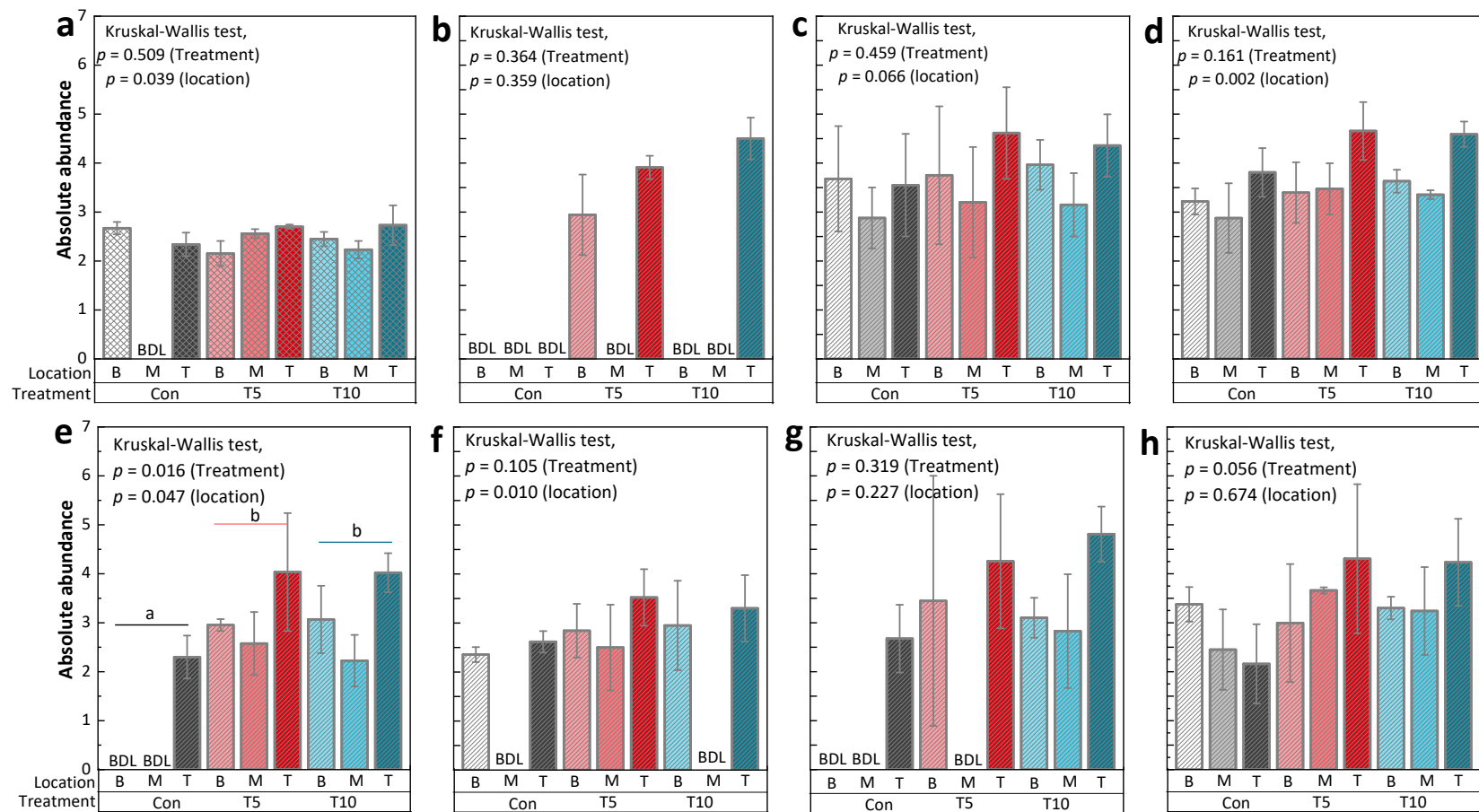
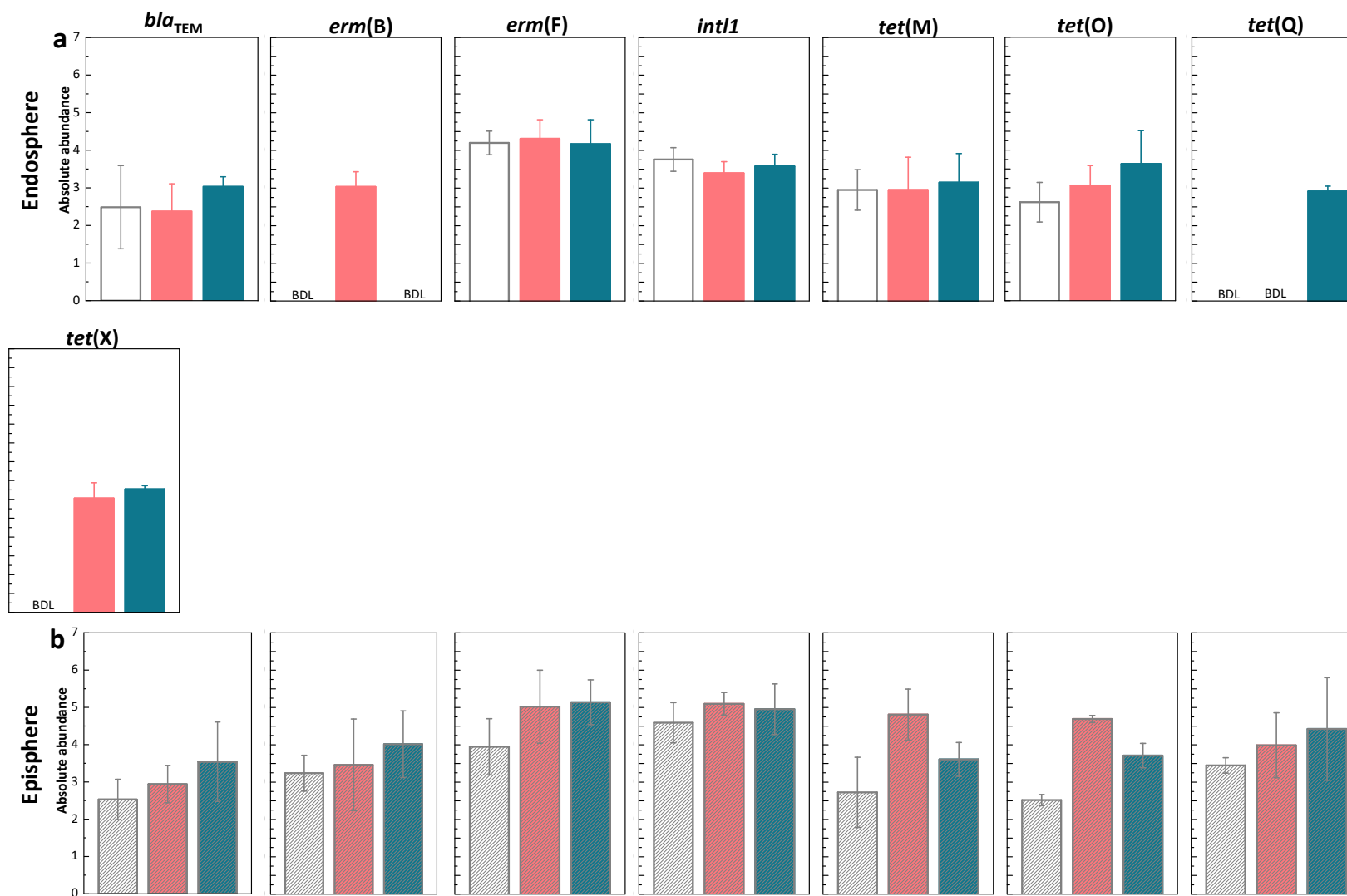


Figure S3. Absolute abundances of (a) *bla*_{TEM}, (b) *erm*(B), (c) *erm*(F), (d) *int11*, (e) *tet*(M), (f) *tet*(O), (g) *tet*(Q) and (h) *tet*(X) in rhizosphere soil of different sampling locations (B: bottom, M: middle, T: top). Error bar indicates the mean ($n = 3$) with standard deviation. Bar group with different letter indicates significant difference (Kruskal-Wallis rank sum test and multiple pairwise-comparison between treatment scenarios, $p < 0.05$).



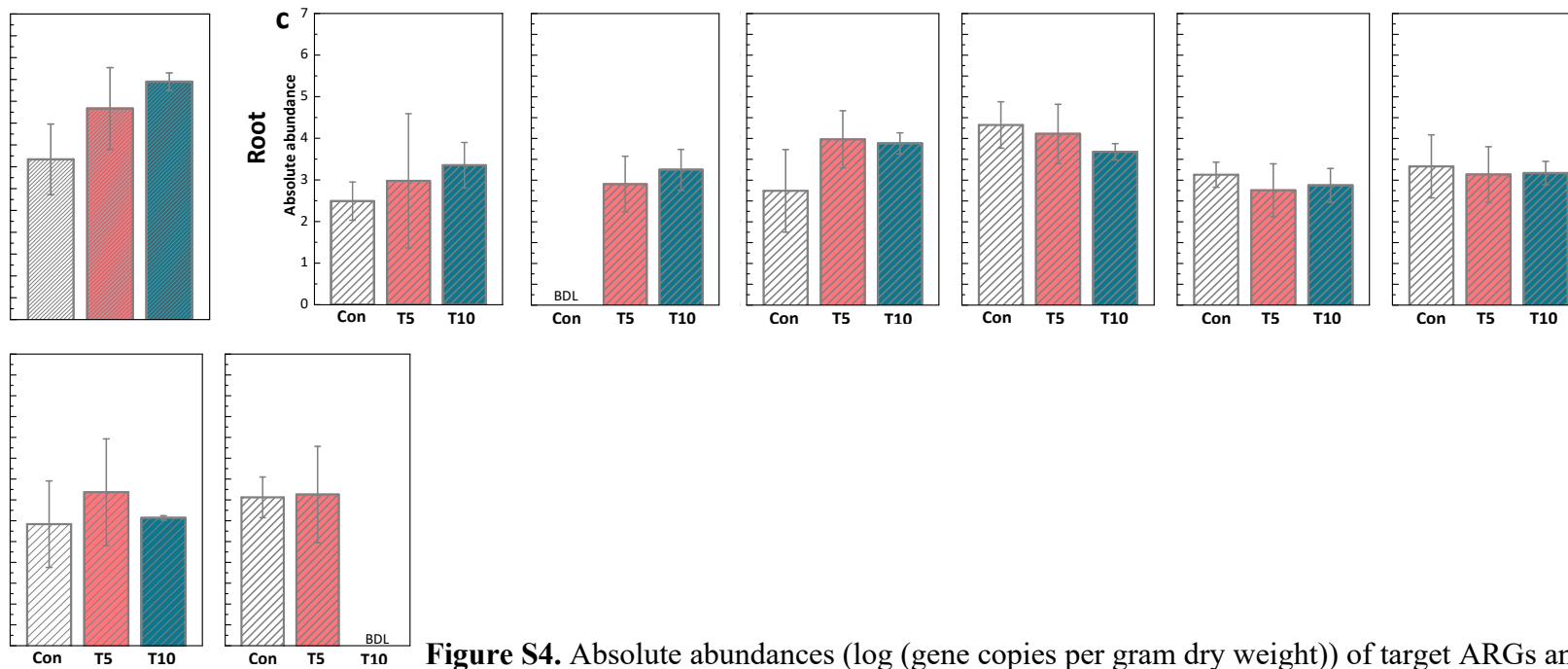


Figure S4. Absolute abundances (log (gene copies per gram dry weight)) of target ARGs and *int11* in

endosphere (a), episphere (b) and root (c) of lettuce. Error bar indicates the mean ($n = 3$) abundance with standard deviation. Bar with different letter indicates significant difference (t -test, $p < 0.05$).

Table S1. Primers used for ARG quantification.

Gene	Primer	Primer Sequence (5'–3')	Annealing temperature	Reference
16S	FW	CGGTGAATACGTTTCYCGG	56 °C	Suzuki et al., 2000
	RV	GGWTACCTTGTTACGACTT		
<i>bla</i> _{TEM}	FW	TTCCTGTTTTTGCTCACCCAG	60 °C	Bibbal et al., 2007
	RV	CTCAAGGATCTTACCGCTGTTG		
<i>intI1</i>	FW	TGCCGTGATCGAAATCCAGATCCT	65 °C	Rosewarne et al., 2010
	RV	TTTCTGGAAGGCGAGCATCGTTTG		
<i>erm</i> (B)	FW	GGTTGCTCTTGCACACTCAAG	65 °C	Aminov et al., 2010
	RV	CAGTTGACGATATTCTCGATTG		
<i>erm</i> (F)	FW	TCTGGGAGGTTCCATTGTCC	65 °C	Aminov et al., 2010
	RV	TTCAGGGACAACCTCCAGC		
<i>tet</i> (O)	FW	ACGGARAGTTTATTGTATAACC	50 °C	Aminov et al., 2001
	RV	TGGCGTATCTATAATGTTGAC		
<i>tet</i> (Q)	FW	AGAATCTGCTGTTTGCCAGTG	63 °C	Aminov et al., 2001
	RV	CGGAGTGTCAATGATATTGCA		
<i>tet</i> (M)	FW	GCA ATTCTACTGATTTCTGC	60 °C	Laht et al., 2014
	RV	CTGTTTGATTACAATTTCCGC		
<i>tet</i> (X)	FW	GAAAGAGACAACGACCGAGAG	56 °C	Huang et al., 2015
	RV	CTTAGCCTTACCAATGGGTGT		

Reference

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