

Supplementary Information:

Table S1. Commercially labelled ginseng products used for authentication testing by both *P. ginseng* and *P. quinquefolius* assays.

Sample Code	Species	Product type	Sample Code	Species	Product type
179NAT	<i>Panax ginseng</i>	root powder	347NAT	<i>Panax quinquefolius</i>	root
180NAT	<i>Panax ginseng</i>	root powder	348NAT	<i>Panax quinquefolius</i>	root
182NAT	<i>Panax ginseng</i>	root powder	249NAT	<i>Panax quinquefolius</i>	root
183NAT	<i>Panax ginseng</i>	root powder	351NAT	<i>Panax quinquefolius</i>	powder
184NAT	<i>Panax ginseng</i>	root powder	14NAT	<i>Panax quinquefolius</i>	root
201NAT	<i>Panax ginseng</i>	root powder	17NAT	<i>Panax quinquefolius</i>	root
342NAT	<i>Panax ginseng</i>	root powder	339NAT	<i>Panax quinquefolius</i>	root
350NAT	<i>Panax ginseng</i>	root powder	415NAT	<i>Panax quinquefolius</i>	root
401NAT	<i>Panax ginseng</i>	root powder	BRM803	<i>Panax quinquefolius</i>	root
487NAT	<i>Panax ginseng</i>	root powder	112NBT	<i>Panax quinquefolius</i>	root
488NAT	<i>Panax ginseng</i>	root powder	406NW	<i>Panax quinquefolius</i>	powder
3IND	<i>Panax ginseng</i>	root powder	1084NW	<i>Panax quinquefolius</i>	powder
227BI	<i>Panax ginseng</i>	root powder	TNP1	<i>Panax quinquefolius</i>	powder
125NAT	<i>Panax ginseng</i>	root powder	7PR	<i>Panax quinquefolius</i>	powder
236NAT	<i>Panax ginseng</i>	leaf	8PR	<i>Panax quinquefolius</i>	powder
280NAT	<i>Panax ginseng</i>	leaf	24PR	<i>Panax quinquefolius</i>	powder
368NAT	<i>Panax ginseng</i>	leaf	BRM705	<i>Panax quinquefolius</i>	leaf
385NAT	<i>Panax ginseng</i>	leaf	BRM871	<i>Panax quinquefolius</i>	leaf
431NAT	<i>Panax ginseng</i>	leaf	PQ21	<i>Panax quinquefolius</i>	leaf
NAT-Nov-2020	<i>Panax ginseng</i>	leaf	PQ22	<i>Panax quinquefolius</i>	root
JFN1	<i>Panax ginseng</i>	root	PQ23	<i>Panax quinquefolius</i>	leaf
104JA	<i>Panax ginseng</i>	root	PQ24	<i>Panax quinquefolius</i>	leaf

106JA	<i>Panax ginseng</i>	root	PQ25	<i>Panax quinquefolius</i>	root
74NAT	<i>Panax ginseng</i>	root	PQ26	<i>Panax quinquefolius</i>	leaf
264NAT	<i>Panax ginseng</i>	root	PQ27	<i>Panax quinquefolius</i>	root
265NAT	<i>Panax ginseng</i>	root	PQ28	<i>Panax quinquefolius</i>	leaf
PHY1	<i>Panax ginseng</i>	root	PQ29	<i>Panax quinquefolius</i>	leaf
86NW	<i>Panax ginseng</i>	root	PQ30	<i>Panax quinquefolius</i>	leaf
287NW	<i>Panax ginseng</i>	root	BRM903	<i>Panax quinquefolius</i>	root
99NBT	<i>Panax ginseng</i>	root	OAC1570	<i>Panax quinquefolius</i>	leaf
106NBT	<i>Panax ginseng</i>	root	OAC17943	<i>Panax quinquefolius</i>	leaf
107NBT	<i>Panax ginseng</i>	root	OAC22568	<i>Panax quinquefolius</i>	leaf
108NBT	<i>Panax ginseng</i>	root	OAC24225	<i>Panax quinquefolius</i>	leaf
109NBT	<i>Panax ginseng</i>	root	OAC26065	<i>Panax quinquefolius</i>	leaf
110NBT	<i>Panax ginseng</i>	root	OAC42034	<i>Panax quinquefolius</i>	leaf
111NBT	<i>Panax ginseng</i>	root	OAC56582	<i>Panax quinquefolius</i>	leaf
BRM661	<i>Panax ginseng</i>	leaf	OAC56612	<i>Panax quinquefolius</i>	leaf
BRM688	<i>Panax ginseng</i>	leaf	OAC57071	<i>Panax quinquefolius</i>	leaf
BRM689	<i>Panax ginseng</i>	leaf	OAC74790	<i>Panax quinquefolius</i>	leaf
BRM1039	<i>Panax ginseng</i>	leaf	OAC92518	<i>Panax quinquefolius</i>	leaf
NAT648	<i>Panax ginseng</i>	leaf			
BRM804	<i>Panax ginseng</i>	root			

Table S2. Primer and probe sequences for *P. ginseng* assay

Primer FWD	5'- GTCTTGGATAGCCGCGATAAA -3'
Primer REV	5'- GGGACCCTAACCCTAAATATTCTT -3'
Probe	5' - /56-FAM/ CTC ACG CCA /ZEN/ TAT CCG CCA TTC TGA /31AbkFQ/ - 3'

Primer and probes sequences for *P. ginseng* assay were designed from full length chloroplast genome (KM067394). Length of the amplicon for this assay is around 90bp.

Table S3. Primer and probe sequences for *P. quinquefolius* assay

Primer FWD	5'- CCGGTTGCTTTCTGTCCATATAA -3'
Primer REV	5'- AACAGGGTCAGAGGGATCAA -3'
Probe	5' - /56-FAM/TGC ATA CAG/ZEN/ CTC TAG TTG CCG GTT/31AbkFQ/ - 3'

Primer and probes sequences for *P. quinquefolius* assay were designed from full length chloroplast genome (KT028714). Length of the amplicon for this assay is around 100bp.

Table S4. Repeatability of the *P. ginseng* assay

Sample ID	Sample Type	Species	Date of Analysis	Ct			Ct Mean	SD	CV %
PG3	Target	<i>Panax ginseng</i>	31/05/2019	20.43	20.66	20.19	20.46	0.03	0.12
			15/06/2019	20.49	20.64	20.32			
PG11	Target	<i>Panax ginseng</i>	31/05/2019	20.13	20.32	20.11	20.82	0.63	3
			15/06/2019	21.38	21.51	21.44			
PG33	Target	<i>Panax ginseng</i>	31/05/2019	22.93	23.09	22.23	23.41	0.66	2.82
			15/06/2019	24.12	24	24.08			
PG61	Target	<i>Panax ginseng</i>	31/05/2019	20.46	20.54	20.08	21.25	0.89	4.19
			15/06/2019	21.48	22.23	22.71			
PG27	Target	<i>Panax ginseng</i>	31/05/2019	28.86	28.79	27.91	29.57	1.05	3.55
			15/06/2019	29.72	31.19	30.94			
PG12	Target	<i>Panax ginseng</i>	31/05/2019	20.14	20.39	20.21	20.94	0.69	3.3
			15/06/2019	21.27	21.85	21.76			
PG56	Target	<i>Panax ginseng</i>	31/05/2019	21.27	21.67	21.33	22.13	0.71	3.19
			15/06/2019	22.51	22.78	23.21			
PQ13	Non-target	<i>Panax quinquefolius</i>	31/05/2019	N/A	N/A	N/A	N/A	N/A	N/A
			15/06/2019	N/A	N/A	N/A			
PQ31	Non-target	<i>Panax quinquefolius</i>	31/05/2019	N/A	N/A	N/A	N/A	N/A	N/A
			15/06/2019	N/A	N/A	N/A			
PQ50	Non-target	<i>Panax quinquefolius</i>	31/05/2019	N/A	N/A	N/A	N/A	N/A	N/A
			15/06/2019	N/A	N/A	N/A			

Table S5. Reproducibility of the *P. ginseng* assay

Sample ID	Sample Type	Species	Date of Analysis	Ct			Ct Mean	SD	CV %
PG3	Target	<i>Panax ginseng</i>	Operator 1	20.43	20.66	20.19	19.93	0.50	2.51
			Operator 2	20.89	19.35	18.06			
PG11	Target	<i>Panax ginseng</i>	Operator 1	20.13	20.32	20.11	19.9	0.30	1.48
			Operator 2	19.84	19.63	19.34			
PG33	Target	<i>Panax ginseng</i>	Operator 1	22.93	23.09	22.23	22.28	0.47	2.11
			Operator 2	22.18	21.91	21.33			
PG61	Target	<i>Panax ginseng</i>	Operator 1	20.46	20.54	20.08	20.03	0.34	1.67
			Operator 2	20.46	19.74	18.88			
PG27	Target	<i>Panax ginseng</i>	Operator 1	28.86	28.79	27.91	27.84	0.68	2.44
			Operator 2	28.12	27.17	26.19			
PG12	Target	<i>Panax ginseng</i>	Operator 1	20.14	20.39	20.21	20.76	0.51	2.46
			Operator 2	21.98	21.36	20.46			
PG56	Target	<i>Panax ginseng</i>	Operator 1	21.27	21.67	21.33	22.02	0.60	2.72
			Operator 2	23.58	22.74	21.53			
PQ13	Non-target	<i>Panax quinquefolius</i>	Operator 1	N/A	N/A	N/A	N/A	N/A	N/A
			Operator 2	N/A	N/A	N/A			
PQ31	Non-target	<i>Panax quinquefolius</i>	Operator 1	N/A	N/A	N/A	N/A	N/A	N/A
			Operator 2	N/A	N/A	N/A			
PQ50	Non-target	<i>Panax quinquefolius</i>	Operator 1	N/A	N/A	N/A	N/A	N/A	N/A
			Operator 2	N/A	N/A	N/A			

Table S6. Repeatability of the *P. quinquefolius* assay

Sample ID	Sample Type	Species	Date of Analysis	Ct			Ct Mean	SD	CV %
PQ6	Target	<i>Panax quinquefolius</i>	30/04/2019	19.84	20.67	19.55	20.32	0.30	1.45
			22/05/2019	20.73	20.87	20.22			
PQ7	Target	<i>Panax quinquefolius</i>	30/04/2019	21.11	20.94	20.81	20.91	0.04	0.19
			22/05/2019	20.86	20.92	20.84			
PQ50	Target	<i>Panax quinquefolius</i>	30/04/2019	22.28	22.43	22.13	22.38	0.10	0.45
			22/05/2019	22.5	22.49	22.46			
PQ9	Target	<i>Panax quinquefolius</i>	30/04/2019	21.25	21.55	21.1	21.47	0.17	0.77
			22/05/2019	21.66	21.87	21.35			
PG3	Non-target	<i>Panax ginseng</i>	30/04/2019	N/A	N/A	N/A	N/A	N/A	N/A
			22/05/2019	N/A	N/A	N/A			
PG11	Non-target	<i>Panax ginseng</i>	30/04/2019	N/A	N/A	N/A	N/A	N/A	N/A
			22/05/2019	N/A	N/A	N/A			
PG33	Non-target	<i>Panax ginseng</i>	30/04/2019	N/A	N/A	N/A	N/A	N/A	N/A
			22/05/2019	N/A	N/A	N/A			

Table S7. Reproducibility of the *P. quinquefolius* assay

Sample ID	Sample Type	Species	Operator	Ct			Ct Mean	SD	CV %
PQ6	Target	<i>Panax quinquefolius</i>	Operator 1	19.84	20.67	19.55	20.41	0.39	1.91
			Operator 2	20.99	21.33	20.08			
PQ7	Target	<i>Panax quinquefolius</i>	Operator 1	21.11	20.94	20.81	21.23	0.28	1.32
			Operator 2	22.53	21.12	20.89			
PQ50	Target	<i>Panax quinquefolius</i>	Operator 1	22.28	22.43	22.13	22.5	0.22	0.96
			Operator 2	23.38	22.8	21.94			
PQ9	Target	<i>Panax quinquefolius</i>	Operator 1	21.25	21.55	21.1	21.4	0.10	0.47
			Operator 2	22.5	20.81	21.19			
PG3	Non-target	<i>Panax ginseng</i>	Operator 1	N/A	N/A	N/A	N/A	N/A	N/A
			Operator 2	N/A	N/A	N/A			
PG11	Non-target	<i>Panax ginseng</i>	Operator 1	N/A	N/A	N/A	N/A	N/A	N/A
			Operator 2	N/A	N/A	N/A			
PG33	Non-target	<i>Panax ginseng</i>	Operator 1	N/A	N/A	N/A	N/A	N/A	N/A
			Operator 2	N/A	N/A	N/A			

Table S8. Amplicon sequences obtained from *Panax ginseng* commercial products

>PHY1 _Pangiprobe
CTCACGCCATATCCGCCATTCTGACCTTTTTCCAGTGAAAGAATATTGGGTTAGGGTCCC
>108NBT Pangiprobe
CTCACGCCATATCCGCCATTCTGACCTTTTTCCAGTGAAAGAATATTGGGTTAGGGTCCC
>111NBT Pangiprobe
CTCACGCCATATCCGCCATTCTGACCTTTTTCCAGTGAAAGAATATTGGGTTAGGGTCCC
>201NAT Pangiprobe
CTCACGCCATATCCGCCATTCTGACCTTTTTCCAGTGAAAGAATATTGGGTTAGGGTCCC
>227BI Pangiprobe
CTCACGCCATATCCGCCATTCTGACCTTTTTCCAGTGAAAGAATATTGGGTTAGGGTCCC
>236NAT Pangiprobe
CTCACGCCATATCCGCCATTCTGACCTTTTTCCAGTGAAAGAATATTGGGTTAGGGTCCC
>249NAT Pangiprobe
CTCACGCCATATCCGCCATTCTGACCTTTTTCCAGTGAAAGAATATTGGGTTAGGGTCCC
>287NW Pangiprobe
CTCACGCCATATCCGCCATTCTGACCTTTTTCCAGTGAAAGAATATTGGGTTAGGGTCCC
>348NAT Pangiprobe
CTCACGCCATATCCGCCATTCTGACCTTTTTCCAGTGAAAGAATATTGGGTTAGGGTCCC
>385NAT Pangiprobe
CTCACGCCATATCCGCCATTCTGACCTTTTTCCAGTGAAAGAATATTGGGTTAGGGTCCC
>401NAT Pangiprobe
CTCACGCCATATCCGCCATTCTGACCTTTTTCCAGTGAAAGAATATTGGGTTAGGGTCCC
>431NAT Pangiprobe
CTCACGCCATATCCGCCATTCTGACCTTTTTCCAGTGAAAGAATATTGGGTTAGGGTCCC
>99NBT Pangiprobe
CTCACGCCATATCCGCCATTCTGACCTTTTTCCAGTGAAAGAATATTGGGTTAGGGTCCC
>BRM1039 Pangiprobe
CTCACGCCATATCCGCCATTCTGACCTTTTTCCAGTGAAAGAATATTGGGTTAGGGTCCC
>BRM661 Pangiprobe
CTCACGCCATATCCGCCATTCTGACCTTTTTCCAGTGAAAGAATATTGGGTTAGGGTCCC
>339NAT Pangiprobe
CTCACGCCATATCCGCCATTCTGACCTTTTTCCAGTGAAAGAATATTGGGTTAGGGTCCC
>109NBT Pangiprobe
CTCACGCCATATCCGCCATTCTGACCTTTTTCCAGTGAAAGAATATTGGGTTAGGGTCCC
>110NBT Pangiprobe
CTCACGCCATATCCGCCATTCTGACCTTTTTCCAGTGAAAGAATATTGGGTTAGGGTCCC
>415NAT Pangiprobe
CTCACGCCATATCCGCCATTCTGACCTTTTTCCAGTGAAAGAATATTGGGTTAGGGTCCC
>104JA Pangiprobe
CTCACGCCATATCCGCCATTCTGACCTTTTTCCAGTG-AAGAATATTGGGTTAGGGTCCC
>106JA Pangiprobe

CTCACGCCATATCCGCCATTCTGACCTTTTCCAGTG-AAGAATATTTGGGTTAGGGTCCC
>107NBT Pangiprobe
CTCACGCCATATCCGCCATTCTGACCTTTTCCAGTG-AAGAATATTTGGGTTAGGGTCCC
>125NAT Pangiprobe
CTCACGCCATATCCGCCATTCTGACCTTTTCCAGTG-AAGAATATTTGGGTTAGGGTCCC
>179NAT Pangiprobe
CTCACGCCATATCCGCCATTCTGACCTTTTCCAGTG-AAGAATATTTGGGTTAGGGTCCC
>180NAT Pangiprobe
CTCACGCCATATCCGCCATTCTGACCTTTTCCAGTG-AAGAATATTTGGGTTAGGGTCCC
>182NAT Pangiprobe
CTCACGCCATATCCGCCATTCTGACCTTTTCCAGTG-AAGAATATTTGGGTTAGGGTCCC
>183NAT Pangiprobe
CTCACGCCATATCCGCCATTCTGACCTTTTCCAGTG-AAGAATATTTGGGTTAGGGTCCC
>264NAT Pangiprobe (Labelled as <i>P. ginseng</i> but not amplified by <i>P. ginseng</i> probe)
CTCACCCCATATCCGCCATTCTGACCTTTTCCAGTG-AAGAATATTTGGGTTAGGGTCCC
>265NAT Pangiprobe
CTCACGCCATATCCGCCATTCTGACCTTTTCCAGTG-AAGAATATTTGGGTTAGGGTCCC
>280NAT Pangiprobe
CTCACGCCATATCCGCCATTCTGACCTTTTCCAGTG-AAGAATATTTGGGTTAGGGTCCC
>342NAT Pangiprobe
CTCACGCCATATCCGCCATTCTGACCTTTTCCAGTG-AAGAATATTTGGGTTAGGGTCCC
>350NAT Pangiprobe (Labelled as <i>P. ginseng</i> but not amplified by <i>P. ginseng</i> probe)
CTCACCCCATATCCGCCATTCTGACCTTTTCCAGTG-AAGAATATTTGGGTTAGGGTCCC
>3IND Pangiprobe
CTCACGCCATATCCGCCATTCTGACCTTTTCCAGTG-AAGAATATTTGGGTTAGGGTCCC
>487NAT Pangiprobe
CTCACGCCATATCCGCCATTCTGACCTTTTCCAGTG-AAGAATATTTGGGTTAGGGTCCC
>488NAT Pangiprobe
CTCACGCCATATCCGCCATTCTGACCTTTTCCAGTG-AAGAATATTTGGGTTAGGGTCCC
>74NAT Pangiprobe
CTCACGCCATATCCGCCATTCTGACCTTTTCCAGTG-AAGAATATTTGGGTTAGGGTCCC
>86NW Pangiprobe
CTCACGCCATATCCGCCATTCTGACCTTTTCCAGTG-AAGAATATTTGGGTTAGGGTCCC
>BRM688 Pangiprobe
CTCACGCCATATCCGCCATTCTGACCTTTTCCAGTG-AAGAATATTTGGGTTAGGGTCCC
>106NBT Pangiprobe
CTCACGCCATATCCGCCATTCTGACCTTTTCCAGTG-AAGAATATTTGGGTTAGGGTCCC
>184NAT Pangiprobe
CTCACGCCATATCCGCCATTCTGACCTTTTCCAGTG-AAGAATATTTGGGTTAGGGTCCC
>347NAT Pangiprobe
CTCACGCCATATCCGCCATTCTGACCTTTTCCAGTG-AAGAATATTTGGGTTAGGGTCCC
>351NAT Pangiprobe
CTCACGCCATATCCGCCATTCTGACCTTTTCCAGTG-AAGAATATTTGGGTTAGGGTCCC

>368NAT Pangiprobe
CTCACGCCATATCCGCCATTCTGACCTTTTTCCAGTG-AAGAATATTTGGGTTAGGGTCCC
>NAT-Nov-2020 Pangiprobe
CTCACGCCATATCCGCCATTCTGACCTTTTTCCAGTG-AAGAATATTTGGGTTAGGGTCCC
>BRM689 Pangiprobe
CTCACGCCATATCCGCCATTCTGACCTTTTTCCAGTG-AAGAATATTTGGGTTAGGGTCCC
>JFN1 Pangiprobe
CTCACGCCATATCCGCCATTCTGACCTTTTTCCAGTG-AAGAATATTTGGGTTAGGGTCCC

Table S9. Amplicon sequences obtained from *Panax quinquefolius* commercial products

>249NAT _Panqprobe
GGTTGCTTTCTGTCCATATAATGCATACAGCTCTAGTTGCCGGT
>OAC1570 _Panqprobe
GGTTGCTTTCTGTCCATATAATGCATACAGCTCTAGTTGCCGGT
>348NAT _Panqprobe
GGTTGCTTTCTGTCCATATAATGCATACAGCTCTAGTTGCCGGT
>PQ21 _Panqprobe
GGTTGCTTTCTGTCCATATAATGCATACAGCTCTAGTTGCCGGT
>PQ23 _Panqprobe
GGTTGCTTTCTGTCCATATAATGCATACAGCTCTAGTTGCCGGT
>339NAT _Panqprobe
GGTTGCTTTCTGTCCATATAATGCATACAGCTCTAGTTGCCGGT
>351NAT _Panqprobe
GGTTGCTTTCTGTCCATATAATGCATACAGCTCTAGTTGCCGGT
>406NW _Panqprobe
GGTTGCTTTCTGTCCATATAATGCATACAGCTCTAGTTGCCGGT
>415NAT _Panqprobe
GGTTGCTTTCTGTCCATATAATGCATACAGCTCTAGTTGCCGGT
>OAC26065 _Panqprobe
GGTTGCTTTCTGTCCATATAATGCATACAGCTCTAGTTGCCGGT
>PQ25 _Panqprobe
GGTTGCTTTCTGTCCATATAATNCATACAGCTCTAGTTGCCGGT
>1084NW _Panqprobe
GGTTGCTTTCTGTCCATATAATGCATACAGCTCTAGT-GCCGGT
>OAC57071 _Panqprobe
GGTTGCTTTCTGTCCATATAATGCATACAGCTCTAGT-GCCGGT
>OAC74790 _Panqprobe
GGTTGCTTTCTGTCCATATAATGCATACAGCTCTAGT-GCCGGT
>112NBT _Panqprobe

GGTTGCTTTCTGTCCATATAATGCATACAGCTCTAGT-GCCGGT
>TNP1 _Panquprobe
GGTTGCTTTCTGTCCATATAATGCATACAGCTCTAGT-GCCGGT
>BRM705 _Panquprobe
GGTTGCTTTCTGTCCATATAATGCATACAGCTCTAGT-GCCGGT
>BRM871 _Panquprobe
GGTTGCTTTCTGTCCATATAATGCATACAGCTCTAGT-GCCGGT
>BRM903 _Panquprobe
GGTTGCTTTCTGTCCATATAATGCATACAGCTCTAGT-GCCGGT
>OAC24225 _Panquprobe
GGTTGCTTTCTGTCCATATAATGCATACAGCTCTAGT-GCCGGT
>PQ24 _Panquprobe
GGTTGCTTTCTGTCCATATAATGCATACAGCTCTAGT-GCCGGT
>PQ27 _Panquprobe
GGTTGCTTTCTGTCCATATAATGCATACAGCTCTAGT-GCCGGT
>PQ30 _Panquprobe
GGTTGCTTTCTGTCCATATAATGCATACAGCTCTAGT-GCCGGT
>OAC17943 _Panquprobe
GGTTGCTTTCTGTCCATATAATGCATACAGCTCTAGT-GCCGGT
>OAC92518 _Panquprobe
GGTTGCTTTCTGTCCATATAATGCATACAGCTCTAGT-GCCGGT
>PQ29 _Panquprobe
GGTTGCTTTCTGTCCATATAATGCATACAGCTCTAGT-GCCGGT
>PQ22 _Panquprobe
GGTTGCTTTCTGTCCATATAATGCATACAGCTCTAGT-GCCGGT
>OAC42034 _Panquprobe
GGTTGCTTTCTGTCCATATAATG-ATACAGCTCTAGT-GCCGGT
>14NAT _Panquprobe
GGTTGCTTTCTGTCCATATAATGCATACAGCTCTAGT-GCCGGT
>347NAT _Panquprobe
GGTTGCTTTCTGTCCATATAATGCATACAGCTCTAGT-GCCGGT
>BRM803 _Panquprobe
GGTTGCTTTCTGTCCATATAATGCATACAGCTCTAGT-GCCGGT
>PQ26 _Panquprobe
GGTTGCTTTCTGTCCATATAATGCATACAGCTCTAGT-GCCGGT
>OAC56612 _Panquprobe
GGTTGCTTTCTGTCCATATAATGCATACAGCTCTAGT-GCCGGT
>7PR _Panquprobe
GGTTGCTTTCTGTCCATATAATGCATACAGCTCTAGT-GCCGGT
>OAC22568 _Panquprobe
GGTTGCTTTCTGTCCATATAATGCATACAGCTCTAGT-GCCGGT
>8PR _Panquprobe
GGTTGCTTTCTGTCCATATAATGCATACAGCTCTAGT-GCCGGT

>PQ28 _Panqprobe
---NTCTTTCTGTCCATATAATGCATACAGCTCTAGT-GCCGGT
>24PR _Panqprobe
GGTTGCTTTCTGTCCATATAATGCATACAGCTCTAGT-GCCGGT
>17NAT _Panqprobe
GGTTGCTTTCTGTCCATATAATG-ATACAGCTCTAGTTGCCGGT
>OAC56582 _Panqprobe
GGTTGCTTTCTGTCCATATAATGCATACAGCTCTAGT-GCCGGT

Panax ginseng amplicon:AAAGTCTTGGATAGCCGCGATAAA
TCCAAATCTGG
CTCACG
CCATATCCGCCATTCTGA
CCTTTTCCAGTGAAAGAATATTGGGTTAGGGTCCCCA

Panax quinquefolius:
AAAGTCTTGGATAGCCGCGATAAA
TCCAAATCTGG
CTCAC
CCATATCCGCCATTCTGA
CCTTTTCCAGTGAAAGAATATTGGGTTAGGGTCCCCA

Primer 1
Probe
Primer 2

Fig S1. *Panax ginseng* amplicon sequence showing variability with *Panax quinquefolius*

Panax quinquefolius amplicon:CGGCCGGTTGCTTCTGTCCATATAATG
CATACAGCTCTAGTTGC
GGTT
GGGCGGGTTCGATGGCTCTATGAATTAGCAGTTTT
TGATCCCTCTGACCCGTTCCTT

Panax ginseng:
CGGCCGGTTGCTTCTGTCCATATAATG
CATACAGCTCTAGTTGC
GGTT
GGGCGGGTTCGATGGCTCTATGAATTAGCAGTTTT
TGATCCCTCTGACCCGTTCCTT

Primer 1
Probe
Primer 2

Fig S2. *Panax quinquefolius* amplicon sequence showing variability with *Panax ginseng*