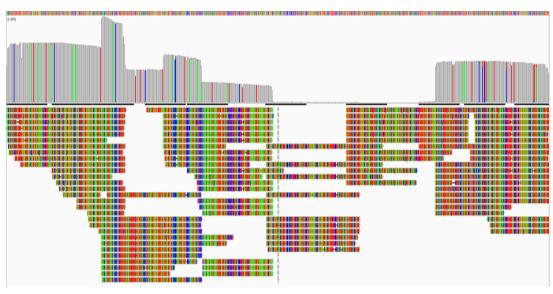
1 Supporting Information

Fig S1. Alignments of sequence records derived from two type specimens of Geometridae, one with high quality DNA (a) and one with low quality DNA (b). The alignments show only a single representative of each distinct sequence. In many cases, there were hundreds or thousands of a particular sequence. High quality reads have high coverage across the entire 658bp barcode region and originate from a single source – indicated by a single nucleotide (color) at each position in the contig. Low quality reads do not span the entire barcode region (i.e. they have regions lacking coverage) and often originate from multiple sources – indicated by multiple nucleotides (colors) at certain positions in the contig.

10 See associated image file "Figure S1.svg"





(b)



18 S1 Table. Type specimens analyzed, including sequencing results and accession numbers.

Process ID (Sanger/NGS)	Age (Yrs)	Identification	Status	Sanger Group	No. NGS Reads	Min. Cov.	Max. Cov.	Avg. Cov.	Recovered bp by NGS	NGS Contig GenBank Acc.	Sequence Read Archive Acc.
PNGTY381-13 / PNGTY1837-15	104	Myrioblephara mixticolor	Syntype	HQ	143804	7	115751	29924	658	KR070780	SRR1867808
PNGTY404-13 / PNGTY1827-15	112	Cassephyra plenimargo	Holotype	HQ	213007	72	146189	42992	658	KR070771	SRR1867811
PNGTY417-13 / PNGTY1843-15	109	Psilalcis auropurpurea	Syntype	HQ	106286	0	74012	20477	448	KR070767	SRR1867812
PNGTY466-13 / PNGTY1839-15	110	Paralcidia marginata	Syntype	HQ	221885	5	168474	44541	657	KR070779	SRR1867813
PNGTY473-13 / PNGTY1823-15	110	Atmoceras plumosa	Syntype	HQ	143340	30	76376	28215	658	KR070768	SRR1867814
PNGTY1047-14 / PNGTY1845-15	110	Tripteridia viridisecta	Syntype	HQ	188107	1	101191	37855	570	KR070783	SRR1867815
PNGTY1070-14 / PNGTY1834-15	111	Gymnoscelis ochriplaga	Holotype	HQ	186897	1	103399	38169	657	KR070772	SRR1867816
PNGTY1098-14 / PNGTY1824-15	110	Axinoptera fasciata	Holotype	HQ	166116	0	83389	31838	474	KR070785	SRR1867817
PNGTY1106-14 / PNGTY1826-15	112	Calluga semirasata	Holotype	HQ	215946	1	154302	43408	658	KR070769	SRR1867818
PNGTY1124-14 / PNGTY1833-15	123	Eois semirubra	Holotype	HQ	232024	106	143908	46803	658	KR070773	SRR1867819
PNGTY142-12 / PNGTY1831-15	112	Collix ghosha dichobathra	N/A	MQ	11665	0	11082	2142	459	KR070778	SRR1945335
PNGTY158-12 / PNGTY1838-15	111	Papuarisme brunneata	Holotype	MQ	6479	0	5747	1165	569	KR070787	SRR1945382
PNGTY189-12 / PNGTY1835-15	109	Hyposidra apicifulva	N/A	MQ	62208	0	45441	12301	570	KR070781	SRR1945383
PNGTY801-13 / PNGTY1836-15	101	Milionia knowlei	Syntype	MQ	44190	1	43301	9153	658	KR070777	SRR1945384
PNGTY587-13 / PNGTY1846-15	118	Ctimene basistraga obsoleta	Syntype	MQ	546	0	105	31	323	KR070784	SRR1946575
PNGTY639-13 / PNGTY1842-15	102	Pseudeusemia bursadoides dignitosa	Syntype	MQ	134542	37	82031	27382	658	KR070774	SRR1945385
PNGTY917-13 / PNGTY1840-15	108	Pingasa nobilis furvifrons	Holotype	MQ	46793	6	24276	9516	658	KR070782	SRR1945386
PNGTY923-13 / PNGTY1821-15	121	Aeolochroma caesia	Holotype	MQ	68837	3	43442	14002	658	KR070764	SRR1945387
PNGTY957-13 / PNGTY1844-15	106	Sarcinodes subvirgata	Holotype	MQ	99655	86	42405	20379	658	KR070762	SRR1945388
PNGTY971-13 / PNGTY1828-15	105	Celerena lerne amplimargo	Holotype	MQ	113363	1	42333	21657	569	KR070763	SRR1945389
PNGTY475-13 / PNGTY1832-15	104	Dyscheralcis retroflexa	Syntype	LQ	2681	0	1278	424	514	KR070766	SRR1867935
PNGTY1146-14 / PNGTY1822-15	110	Alcis irrufata	Holotype	LQ	49944	2	37401	8881	657	KR070770	SRR1867936

PNGTY1155-14 / PNGTY1830-15	120	Cleora repetita ab. suffusa	Holotype	LQ	7632	1	5708	731	454	KR070765	SRR1867937
PNGTY008-12* / N/A	109	Spectrobasis differens	Syntype	LQ	1468	0	1157	280	237	N/A	SRR1867938
PNGTY073-12* / N/A	104	Desmoclystia unipuncta	Syntype	LQ	320	0	116	40	357	N/A	SRR1867939
PNGTY102-12* / N/A	120	Sterrhochaeta minuta	Syntype	LQ	3081	0	215	91	324	N/A	SRR1867940
PNGTY120-12* / N/A	118	Propithex alternata	Holotype	LQ	14863	0	1554	163	323	N/A	SRR1867941
PNGTY756-13 / PNGTY1825-15	105	Bursadopsis plenifascia	Syntype	LQ	133263	4	71444	20742	634	KR070786	SRR1867942
PNGTY1080-14 / PNGTY1829-15	117	Chloroclystis rufofasciata	Syntype	LQ	4411	0	1685	647	419	KR070775	SRR1867943
PNGTY1128-14 / PNGTY1841-15	112	Polyacme straminea ab. brunneata	Holotype	LQ	141402	23	71197	28117	658	KR070776	SRR1867944

The four Process ID's marked with an asterisk (*) represent specimens where NGS analysis generated

- sequence reads from multiple species. HQ high quality; MQ medium quality; LQ low quality; N/A –
- 21 not applicable.

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Table S2. Primers used in the first (PCR1) and second (PCR2) reactions to allow the analysis of 10

specimens in an Ion Torrent PGM run.

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PCR	Code	Primer Name	Sequence (5'-3')	MID	Adapter
	F1	ARTH-NGS-F1.1-ion1	CTAAGGTAACATTCAACCAATCATAAAGATATTGG	None	None
	F2	ARTH-NGS-F2.1-ion1	CTAAGGTAACATTRRWRATGATCAARTWTATAAT	None	None
PCR1	F3 ARTH-NGS-F3.1-ion1 CTAAGGTAACTTATAATTGGDGGRTTTGGWAATTG		None	None	
	F4	ARTH-NGS-F4.1-ion1	CTAAGGTAACAGWAGWATWRTWRAWAVWGG	None	None
	F5	ARTH-NGS-F5.1-ion1	CTAAGGTAACATTTTTWSWCTWCATWTDGCWGG	None	None
	F6	ARTH-NGS-F6.1-ion1	CTAAGGTAACTATTTGTWTGAKCWRTWKKWATTAC	None	None
	R1	ARTH-NGS-R1.1-ion1	CTAAGGTAACWGGTATWACTATRAARAAAATTAT	None	None
	R2	ARTH-NGS-R2.1-ion2	TAAGGAGAACTCARAAWCTWATRTTRTTTADWCG	None	None
PCR1	R3	ARTH-NGS-R3.1-ion3	AAGAGGATTCARDGGDGGRTAWACWGTTCAWCC	None	None
	R4	ARTH-NGS-R4.1-ion4	TACCAAGATCGTWGWAATRAARTTDATWGCWCC	None	None
	R5	ARTH-NGS-R5.1-ion5	CAGAAGGAACGTTARWARTATDGTRATDGCWCC	None	None

	R6	ARTH-NGS-R6.1-ion6	CTGCAAGTTCTAAACTTCTGGATGTCCAAAAAATCA	None	None
	F1	ARTH-NGS-F1.2-ion1	CCATCTCATCCCTGCGTGTCTCCGACTCAGCTAAGGTAACATTCAACCAATCATAAAGAT ATTGG	IonXpress1	А
	F2	ARTH-NGS-F2.2-ion1	CCATCTCATCCCTGCGTGTCTCCGACTCAGCTAAGGTAACATTRRWRATGATCAARTWTA TAAT	IonXpress1	А
DCD2	F3	ARTH-NGS-F3.2-ion1	CCATCTCATCCCTGCGTGTCTCCGACTCAGCTAAGGTAACTTATAATTGGDGGRTTTGGW AATTG	IonXpress1	А
PCR2	F4	ARTH-NGS-F4.2-ion1	CCATCTCATCCCTGCGTGTCTCCGACTCAGCTAAGGTAACAGWAGWATWRTWRAWAVW GG	IonXpress1	А
	F5	ARTH-NGS-F5.2-ion1	CCATCTCATCCCTGCGTGTCTCCGACTCAGCTAAGGTAACATTTTTWSWCTWCATWTDG CWGG	IonXpress1	А
	F6	ARTH-NGS-F6.2-ion1	CCATCTCATCCCTGCGTGTCTCCGACTCAGCTAAGGTAACTATTTGTWTGAKCWRTWKK WATTAC	IonXpress1	А
	F1	ARTH-NGS-F1.2-ion2	CCATCTCATCCCTGCGTGTCTCCGACTCAGTAAGGAGAACATTCAACCAATCATAAAGAT ATTGG	IonXpress2	Α
	F2	ARTH-NGS-F2.2-ion2	CCATCTCATCCCTGCGTGTCTCCGACTCAGTAAGGAGAACATTRRWRATGATCAARTWT ATAAT	IonXpress2	Α
PCR2	F3	ARTH-NGS-F3.2-ion2 CCATCTCATCCCTGCGTGTCTCCGACTCAGTAAGGAGAACTTATAATTGGDGGRTTTGGW		IonXpress2	Α
I ONZ	F4	ARTH-NGS-F4.2-ion2	CCATCTCATCCCTGCGTGTCTCCGACTCAGTAAGGAGAACAGWAGWATWRTWRAWAVW GG	IonXpress2	А
	F5	ARTH-NGS-F5.2-ion2	CCATCTCATCCCTGCGTGTCTCCGACTCAGTAAGGAGAACATTTTTWSWCTWCATWTDG CWGG	IonXpress2	А
	F6	ARTH-NGS-F6.2-ion2	CCATCTCATCCCTGCGTGTCTCCGACTCAGTAAGGAGAACTATTTGTWTGAKCWRTWKK WATTAC	IonXpress2	А
	F1	ARTH-NGS-F1.2-ion3	CCATCTCATCCCTGCGTGTCTCCGACTCAGAAGAGGATTCATTC	IonXpress3	А
PCR2	F2	ARTH-NGS-F2.2-ion3	CCATCTCATCCCTGCGTGTCTCCGACTCAGAAGAGGATTCATTRRWRATGATCAARTWTA TAAT	IonXpress3	А
	F3	ARTH-NGS-F3.2-ion3	CCATCTCATCCCTGCGTGTCTCCGACTCAGAAGAGGATTCTTATAATTGGDGGRTTTGGW AATTG	IonXpress3	Α
	F4	ARTH-NGS-F4.2-ion3	CCATCTCATCCCTGCGTGTCTCCGACTCAGAAGAGGATTCAGWAGWATWRTWRAWAVW GG	IonXpress3	А
	F5	ARTH-NGS-F5.2-ion3	CCATCTCATCCCTGCGTGTCTCCGACTCAGAAGAGGATTCATTTTTWSWCTWCATWTDG CWGG	IonXpress3	Α
	F6	ARTH-NGS-F6.2-ion3	CCATCTCATCCCTGCGTGTCTCCGACTCAGAAGAGGATTCTATTTGTWTGAKCWRTWKK WATTAC	IonXpress3	Α
	F1	ARTH-NGS-F1.2-ion4	CCATCTCATCCCTGCGTGTCTCCGACTCAGTACCAAGATCATTCAACCAATCATAAAGAT ATTGG	IonXpress4	Α
	F2	ARTH-NGS-F2.2-ion4	CCATCTCATCCCTGCGTGTCTCCGACTCAGTACCAAGATCATTRRWRATGATCAARTWTA TAAT	IonXpress4	Α
PCR2	F3	ARTH-NGS-F3.2-ion4	CCATCTCATCCCTGCGTGTCTCCGACTCAGTACCAAGATCTTATAATTGGDGGRTTTGGW AATTG	IonXpress4	Α
. 5112	F4	ARTH-NGS-F4.2-ion4	CCATCTCATCCCTGCGTGTCTCCGACTCAGTACCAAGATCAGWAGWATWRTWRAWAVW GG	IonXpress4	Α
	F5	ARTH-NGS-F5.2-ion4	CCATCTCATCCCTGCGTGTCTCCGACTCAGTACCAAGATCATTTTTWSWCTWCATWTDGC WGG	IonXpress4	Α
	F6	ARTH-NGS-F6.2-ion4	CCATCTCATCCCTGCGTGTCTCCGACTCAGTACCAAGATCTATTTGTWTGAKCWRTWKK WATTAC	IonXpress4	Α
	F1	ARTH-NGS-F1.2-ion5	CCATCTCATCCCTGCGTGTCTCCGACTCAGCAGAAGGAACATTCAACCAATCATAAAGAT ATTGG	IonXpress5	Α
	F2	ARTH-NGS-F2.2-ion5	CCATCTCATCCCTGCGTGTCTCCGACTCAGCAGAAGGAACATTRRWRATGATCAARTWT ATAAT	IonXpress5	Α
PCR2	F3	ARTH-NGS-F3.2-ion5	CCATCTCATCCCTGCGTGTCTCCGACTCAGCAGAAGGAACTTATAATTGGDGGRTTTGGW AATTG	IonXpress5	Α
	F4	ARTH-NGS-F4.2-ion5	CCATCTCATCCCTGCGTGTCTCCGACTCAGCAGAAGGAACAGWAGWATWRTWRAWAV WGG	IonXpress5	Α
	F5	ARTH-NGS-F5.2-ion5	CCATCTCATCCCTGCGTGTCTCCGACTCAGCAGAAGGAACATTTTTWSWCTWCATWTDG CWGG	IonXpress5	Α
	F6	ARTH-NGS-F6.2-ion5	CCATCTCATCCCTGCGTGTCTCCGACTCAGCAGAAGGAACTATTTGTWTGAKCWRTWKK WATTAC	IonXpress5	Α
PCR2	F1	ARTH-NGS-F1.2-ion6	CCATCTCATCCCTGCGTGTCTCCGACTCAGCTGCAAGTTCATTCA	IonXpress6	Α

F2 ARTH-NGS-F2.2-ion6 F3 ARTH-NGS-F3.2-ion6 F4 ARTH-NGS-F3.2-ion6 F5 ARTH-NGS-F3.2-ion6 F6 ARTH-NGS-F3.2-ion6 F6 ARTH-NGS-F3.2-ion6 F6 ARTH-NGS-F3.2-ion6 F7 ARTH-NGS-F3.2-ion7 F7 ARTH-NGS-F3.2-ion7 F7 ARTH-NGS-F3.2-ion7 F8 ARTH-NGS-F3.2-ion8 F7 ARTH-NGS-F3.2-ion8 F7 ARTH-NGS-F3.2-ion8 F7 ARTH-NGS-F3.2-ion8 F7 ARTH-NGS-F3.2-ion8 F7 ARTH-NGS-F3.2-ion9 F8 ARTH-NGS-F3.2-ion9 F8 ARTH-NGS-F3.2-ion9 F9 ARTH-NGS-F3.2-ion9	1					
F3		F2	ARTH-NGS-F2.2-ion6		IonXpress6	А
F4 ARTH-NGS-F3.2-lon8 GG CATCTCATCCCTGCGTGTCTCCGACTCAAGTTCATTTTTWSWCTWCATWTDGC (CATCTCATCCCTGCGTGTCTCCGACTCAAGTTCATTTTTWSWCTWCATWTDGC (CATCTCATCCCTGCGTGTCTCCGACTCAAGTTCATTTTTWSWCTWCATWTCATWTGACCWTWKK WATTAC (CATCTCATCCCTGCGTGTCTCCGACTCAAGTTCATTCATCATCAAAGATA (CATCTCATCCATCCATCCATCCATCCATCCATCCATCCA		F3	ARTH-NGS-F3.2-ion6		IonXpress6	Α
F5 ARTH-NGS-F6.2-lon6		F4	ARTH-NGS-F4.2-ion6		IonXpress6	А
F6 ARTH-NGS-F6.2-ion6 WATTAC F1 ARTH-NGS-F6.2-ion7 CCATCTCATCCTGCGTGTCTCCGACTCAGTTCGTGATTCATCTACACCAATCATAAAGATA IonXpress7 A IonXpress8 A Io		F5	ARTH-NGS-F5.2-ion6		IonXpress6	А
F1 ARTH-NGS-F2.2-ion7 TTG6 F2 ARTH-NGS-F2.2-ion7 TAXT F3 ARTH-NGS-F2.2-ion7 CCATCTCATCCCTGCGTGTCTCCGACTCAGTTCGTGATTCATTRRWRATGATCAARTWTA IONXpress7 A ATTG6 F4 ARTH-NGS-F3.2-ion7 CCATCTCATCCCTGCGTGTCTCCGACTCAGTTCGTGATTCATATTGGGGGRTTTGGW IONXpress7 A ATTG6 F5 ARTH-NGS-F4.2-ion7 CCATCTCATCCCTGCGTGTCTCCGACTCAGTTCGTGATTCATTATTGGGGGRTTTGGW IONXpress7 A CCATCTCATCCCTGCGTGTCTCCGACTCAGTTCGTGATTCATTTGTWTGAKCWRTWKKW IONXpress7 A CCATCTCATCCCTGCGTGTCTCCGACTCAGTTCGTGATTCATTTGTWTGAKCWRTWKKW IONXpress7 A CCATCTCATCCCTGCGTGTCTCCGACTCAGTTCCGATACAGTTCATTTGTWTGAKCWRTWKKW IONXpress8 A ATTG6 F1 ARTH-NGS-F2.2-ion8 CCATCTCATCCCTGCGTGTCCGACTCAGTTCCGATACAGTTCAAACAATCATAAAAAAT IONXpress8 A CCATCTCATCCCTGCGTGTCTCCGACTCAGTTCCGATACAGTTCAACCAATCATAAAAAAT IONXpress8 A CCATCTCATCCCTGCGTGTCTCCGACTCAGTTCCGATAACAGTTGAACCAATCATAAAAAAT IONXpress8 A CCATCTCATCCCTGCGTGTCTCCGACTCAGTTCCGATAACAGTTAAAATTGGGGGRTTTGGW IONXpress8 A CCATCTCATCCCTGCGTGTCTCCGACTCAGTTCCGATAACAGTTAAAATTGGGGGRTTTGGW IONXpress8 A CCATCTCATCCCTGCGTGTCTCCGACTCAGTTCCGATAACAGTTTATTAGTTGGGGGRTTTGGW IONXpress8 A CCATCTCATCCCTGCGTGTCTCCGACTCAGTTCCGATAACAGTTTTTWSWCTWCATWTTDGC IONXpress8 A CCATCTCATCCCTGCGTGTCTCCGACTCAGTTCCGATAACAGTTTTTTWSWCTWCATWTTDGC IONXpress8 A CCATCTCATCCCTGCGTGTCTCCGACTCAGTTCCGATAACAGTTTTTTGATCCAATCAAAAAGAT IONXpress8 A CCATCTCATCCCTGCGTGTCTCCGACTCAGTTCCGATAACAGTTTTTTGATCCAATCAAAAAAAT IONXpress8 A CCATCTCATCCCTGCGTGTCTCCGACTCAGTGAGCGGAACAGTAACAATCATAAAAGAT IONXpress8 A ATTGG A ARTH-NGS-F3.2-ion9 CCATCTCATCCCTGCGTGTCTCCGACTCAGTGAGCGGAACATTAATATTGGGGGRTTTGGW AATTG CCATCTCATCCCTGCGTGTCTCCGACTCAGTGAGCGGAACATTAATTGGGGGRTTTGGW IONXpress9 A CCATCTCATCCCTGCGTGTCTCCGACTCAGTGAGCGGAACAGTAACAATCATAAAAAAT IONXpress9 A CCATCTCATCCCTGCGTGTCTCCGACTCAGTGAGCGGAACATTTTTWSWCTWCATWTAK IONXpress9 A CCATCTCATCCCTGCGTGTCTCCGACTCAGTGAGCGGAACATTTTTWSWCTWCATWTAK IONXpress9 A CCATCTCATCCCTGCGTGTCTCCGACTCAGCTGAGCGGAACATTTTTWSWCTWCATWTAK IONXpress9 A CCATCTCATCCCTGCGTGTCTCCGACTCAGCTGAGCGGAACATTTTTWSWCTWCATWTAK IONXpress10 A ATTGC ACTCTCATCCCTGCGTGTCTCCGACTCAGCTGACCGAACATTTTTTTT		F6	ARTH-NGS-F6.2-ion6		IonXpress6	Α
F2		F1	ARTH-NGS-F1.2-ion7		IonXpress7	Α
PCR2		F2	ARTH-NGS-F2.2-ion7		IonXpress7	Α
F4 ARTH-NGS-F4.2-ion7 F5 ARTH-NGS-F5.2-ion7 F6 ARTH-NGS-F5.2-ion7 F6 ARTH-NGS-F5.2-ion7 F6 ARTH-NGS-F5.2-ion7 F6 ARTH-NGS-F6.2-ion7 F7 ARTH-NGS-F6.2-ion8 F8 ARTH-NGS-F6.2-ion8 F9 ARTH-NGS-F6.2-ion8 F9 ARTH-NGS-F6.2-ion8 F9 ARTH-NGS-F6.2-ion8 F1 ARTH-NGS-F6.2-ion8 F1 ARTH-NGS-F6.2-ion8 F1 ARTH-NGS-F6.2-ion8 F1 ARTH-NGS-F6.2-ion8 F1 ARTH-NGS-F6.2-ion8 F1 ARTH-NGS-F6.2-ion9 F1 ARTH-NGS-F6.2-ion9 F2 ARTH-NGS-F6.2-ion9 F1 ARTH-NGS-F6.2-ion9 F2 ARTH-NGS-F6.2-ion9 F3 ARTH-NGS-F6.2-ion9 F4 ARTH-NGS-F6.2-ion9 F5 ARTH-NGS-F6.2-ion9 F6 ARTH-NGS-F6.2-ion9 F7 ARTH-NGS-F6.2-ion9 F6 ARTH-NGS-F6.2-ion9 F7 ARTH-NGS-F6.2-ion9 F7 ARTH-NGS-F6.2-ion9 F8 ARTH-NGS-F6.2-ion9 F9 ARTH-NGS-F6.2-ion9 F1 ARTH-NGS-F6.2-ion9 F2 ARTH-NGS-F6.2-ion9 F2 ARTH-NGS-F6.2-ion9 F3 ARTH-NGS-F6.2-ion9 F4 ARTH-NGS-F6.2-ion9 F5 ARTH-NGS-F6.2-ion9 F6 ARTH-NGS-F6.2-ion9 F7 ARTH-NGS-F6.2-ion9 F1 ARTH-NGS-F6.2-ion9 F2 ARTH-NGS-F6.2-ion9 F3 ARTH-NGS-F6.2-ion9 F4 ARTH-NGS-F6.2-ion9 F5 ARTH-NGS-F6.2-ion9 F6 ARTH-NGS-F6.2-ion9 F7 ARTH-NGS-F6.2-ion9	DCD2	F3	ARTH-NGS-F3.2-ion7		IonXpress7	Α
F5 ARTH-NGS-F6.2-ion7 WGG	FURZ	F4	ARTH-NGS-F4.2-ion7		IonXpress7	Α
F6 ARTH-NGS-F6.2-ion7 ATTAC IONXpress7 A F1 ARTH-NGS-F1.2-ion8 CCATCTCATCCCTGCGTGTCTCCGACTCAGTTCCGATAACATTCAACCAATCATAAGAT IONXpress8 A F2 ARTH-NGS-F2.2-ion8 CCATCTCATCCCTGCGTGTCTCCGACTCAGTTCCGATAACATTCAACCAATCATAAGAT IONXpress8 A F3 ARTH-NGS-F3.2-ion8 CCATCTCATCCCTGCGTGTCTCCGACTCAGTTCCGATAACATTATAATTGGDGGRTTTGGW AATTG IONXpress8 A F4 ARTH-NGS-F3.2-ion8 CCATCTCATCCCTGCGTGTCTCCGACTCAGTTCCGATAACATTATAATTGGDGGRTTTGGW IONXpress8 A F5 ARTH-NGS-F3.2-ion8 CCATCTCATCCCTGCGTGTCTCCGACTCAGTTCCGATAACATTTTTWSWCTWCATWTDGC IONXpress8 A F6 ARTH-NGS-F5.2-ion8 CCATCTCATCCCTGCGTGTCTCCGACTCAGTTCCGATAACATTTTTWSWCTWCATWTDGC IONXpress8 A F6 ARTH-NGS-F5.2-ion8 CCATCTCATCCCTGCGTGTCTCCGACTCAGTTCCGATAACATTTTTTWSWCTWCATWTDGC IONXpress8 A F6 ARTH-NGS-F6.2-ion8 CCATCTCATCCCTGCGTGTCTCCGACTCAGTTCCGATAACATTTTTTWSWCTWCATWTDGC IONXpress8 A F7 ARTH-NGS-F1.2-ion9 CCATCTCATCCCTGCGTGTCTCCGACTCAGTGAGCGGAACATTTCAACCAATCATAAAGAT IONXpress9 A F7 ARTH-NGS-F2.2-ion9 CCATCTCATCCCTGCGTGTCTCCGACTCAGTGAGCGGAACATTRTWRATGATCAARTWT IONXpress9 A F7 ARTH-NGS-F3.2-ion9 CCATCTCATCCCTGCGTGTCTCCGACTCAGTGAGCGGAACATTRTWRATGATCAARTWT IONXpress9 A F7 ARTH-NGS-F3.2-ion9 CCATCTCATCCCTGCGTGTCTCCGACTCAGTGAGCGGAACATTTTWSWCTWCATWTDG IONXpress9 A F7 ARTH-NGS-F3.2-ion9 CCATCTCATCCCTGCGTGTCTCCGACTCAGTGAGCGGAACATTTTTWSWCTWCATWTDG IONXpress9 A F7 ARTH-NGS-F3.2-ion9 CCATCTCATCCCTGCGTGTCTCCGACTCAGTGAGCGGAACATTTTTTGTWTGAKCWRTWKK IONXpress9 A F8 ARTH-NGS-F3.2-ion10 CCATCTCATCCCTGCGTGTCTCCGACTCAGTGAGCGGAACATTTTTTGTWTGAKCWRTWKK IONXpress10 A F7 ARTH-NGS-F3.2-ion10 CCATCTCATCCCTGCGTGTCTCCGACTCAGCTGACCGAACATTTTTTGTWTGAKCWRTWKK IONXpress10 A F7 ARTH-NGS-F3.2-ion10 CCATCTCATCCCTGCGTGTCTCCGACTCAGCTGACCGAACATTTTTTGTWTGAKCWRTWKK IONXpress10 A F7 ARTH-NGS-F3.2-ion10 CCATCTCATCCCTGCGTGTCTCCGACTCAGCTGACCGAACATTTTTAGTTGGMGGTTTTGGW IONXpress10 A F7 ARTH-NGS-F3.2-ion10 CCATCTCATCCCTGCGTGTCTCCGACTCAGCTGACCGAACATTTTTAGTTGGMGGTTTTGGW IONXpress10 A F7 ARTH-NGS-F3.2-ion10 CCATCTCATCCCTGCGTGTCTCCGACTCAGCTGACCGAACATTTTAATTTGGDGGTTTTGGW IONXpress10 A F7 ARTH-NGS-F3.2-ion10 CCATCTCATCCCTGC		F5	ARTH-NGS-F5.2-ion7		IonXpress7	Α
F1 ARTH-NGS-F1.2-ion8 ATTG F2 ARTH-NGS-F2.2-ion8 TAAT CCATCTCATCCCTGCGTGTCTCCGACTCAGTTCCGATAACATTRRWRATGATCAARTWTA IONXpress8 A ATTG F3 ARTH-NGS-F3.2-ion8 CCATCTCATCCCTGCGTGTCTCCGACTCAGTTCCGATAACATTRRWRATGATCAARTWTA IONXpress8 A ATTG F4 ARTH-NGS-F3.2-ion8 CCATCTCATCCCTGCGTGTCTCCGACTCAGTTCCGATAACATTATAATTGGDGGRTTTGGW IONXpress8 A CCATCTCATCCCTGCGTGTCTCCGACTCAGTTCCGATAACAGWAGWATWRTWRAWAWW IONXpress8 A CCATCTCATCCCTGCGTGTCTCCGACTCAGTTCCGATAACAGTWATWAWWW IONXpress8 A CCATCTCATCCCTGCGTGTCTCCGACTCAGTTCCGATAACATTTTTWSWCTWCATWTDGC IONXpress8 A CCATCTCATCCCTGCGTGTCTCCGACTCAGTTCCGATAACATTTTTTWSWCTWCATWTDGC IONXpress8 A CCATCTCATCCCTGCGTGTCTCCGACTCAGTGCGGAACATTCAACCAATCATAAAGAT IONXpress9 A ATTGG CCATCTCATCCCTGCGTGTCTCCGACTCAGTGAGCGGAACATTCAACCAATCATAAAGAT IONXpress9 A ATTGG CCATCTCATCCCTGCGTGTCTCCGACTCAGTGAGCGGAACATTATAATTGGDGGTTTTGGW IONXpress9 A ATTGG CCATCTCATCCCTGCGTGTCTCCGACTCAGTGAGCGGAACATTATAATTGGDGGTTTTGGW IONXpress9 A ATTGG CCATCTCATCCCTGCGTGTCTCCGACTCAGTGAGCGGAACATTATAATTGGDGGTTTTGGW IONXpress9 A ATTGG CCATCTCATCCCTGCGTGTCTCCGACTCAGTGAGCGGAACATTATAATTGGDGGTTTTGGW IONXpress9 A CCATCTCATCCCTGCGTGTCTCCGACTCAGTGAGCGGAACATTTTTWSWCTWCATWTDG IONXpress9 A CCATCTCATCCCTGCGTGTCTCCGACTCAGTGAGCGGAACATTTTTWSWCTWCATWTDG IONXpress9 A CCATCTCATCCCTGCGTGTCTCCGACTCAGTGAGCGGAACATTTTTTWTGAKCWRTWKK IONXpress9 A CCATCTCATCCCTGCGTGTCTCCGACTCAGTGAGCGGAACATTTTTTWTGAKCWRTWKK IONXpress9 A ATTGG CCATCTCATCCCTGCGTGTCTCCGACTCAGCTGACCGAACATTCAACCAATCATAAAGAT IONXpress10 A ATTGG CCATCTCATCCCTGCGTGTCTCCGACTCAGCTGACCGAACATTCAACCAATCATAAAGAT IONXpress10 A ATTGG CCATCTCATCCCTGCGTGTCTCCGACTCAGCTGACCGAACATTCAACCAATCATAAAGAT IONXpress10 A ATTGG CCATCTCATCCCTGCGTGTCTCCGACTCAGCTGACCGAACATTTTTATATTTGGGGGTTTTGGW IONXpress10 A ATTGG CCATCTCATCCCTGCGTGTCTCCGACTCAGCTGACCGAACATTTTATAATTTGGGGGTTTTGGW IONXpress10 A CCATCTCATCCCTGCGTGTCTCCGACTCAGCTGACCGAACATTTTATAATTTGGGGGTTTTGGW IONXpress10 A CCATCTCATCCTCGCTGTGTCTCCGACTCAGCTGACCGAACATTTTATAATTTGGGGGTTTTGGW IONXpress10 A CCATCTCATCCCTGCGTGTCTCCGACTCAGCTGACCGAACATTTTTATATTTGGGGGTTTTGGW IONXpress10 A CCATCT		F6	ARTH-NGS-F6.2-ion7		IonXpress7	А
F2 ARTH-NGS-F2.2-ion8 TAAT IonXpress8 A		F1	ARTH-NGS-F1.2-ion8		IonXpress8	Α
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F4 ARTH-NGS-F4.2-ion8 F5 ARTH-NGS-F5.2-ion8 F6 ARTH-NGS-F6.2-ion8 F1 ARTH-NGS-F5.2-ion8 F2 ARTH-NGS-F5.2-ion8 F3 ARTH-NGS-F5.2-ion9 F4 ARTH-NGS-F5.2-ion9 F5 ARTH-NGS-F5.2-ion9 F6 ARTH-NGS-F5.2-ion9 F7 ARTH-NGS-F5.2-ion9 F6 ARTH-NGS-F5.2-ion9 F7 ARTH-NGS-F5.2-ion9 F6 ARTH-NGS-F5.2-ion9 F7 ARTH-NGS-F5.2-ion9 F8 ARTH-NGS-F5.2-ion9 F9 ARTH-NGS-F5.2-ion9 F9 ARTH-NGS-F5.2-ion9 F9 ARTH-NGS-F5.2-ion9 F1 ARTH-NGS-F5.2-ion9 F1 ARTH-NGS-F5.2-ion9 F1 ARTH-NGS-F5.2-ion9 F1 ARTH-NGS-F5.2-ion9 F1 ARTH-NGS-F5.2-ion9 F2 ARTH-NGS-F5.2-ion9 F3 ARTH-NGS-F5.2-ion9 F4 ARTH-NGS-F5.2-ion9 F5 ARTH-NGS-F5.2-ion9 F6 ARTH-NGS-F5.2-ion9 F7 ARTH-NGS-F5.2-ion9 F1 ARTH-NGS-F5.2-ion9 F2 ARTH-NGS-F5.2-ion9 F3 ARTH-NGS-F5.2-ion9 F4 ARTH-NGS-F5.2-ion9 F5 ARTH-NGS-F5.2-ion9 F6 ARTH-NGS-F5.2-ion9 F7 ARTH-NGS-F5.2-ion9 F8 ARTH-NGS-F5.2-ion9 F9 ARTH-NGS-F5.2-ion9 F1 ARTH-NGS-F5.2-ion9 F2 ARTH-NGS-F5.2-ion9 F3 ARTH-NGS-F5.2-ion9 F4 ARTH-NGS-F5.2-ion9 F5 ARTH-NGS-F5.2-ion9 F6 ARTH-NGS-F5.2-ion9 F7 ARTH-NGS-F5.2-ion9 F8 ARTH-NGS-F5.2-ion9 F9 ARTH-NGS-F5.2-ion9 F1 ARTH-NGS-F5.2-ion9 F2 ARTH-NGS-F5.2-ion10 CCATCTCATCCCTGCGTGTCTCCGACTCAGCTGACCGAACATTCAACCAATCATAAAGAT IOnXpress10 ARTIGG F7 ARTH-NGS-F5.2-ion10 CCATCTCATCCCTGCGTGTCTCCGACTCAGCTGACCGAACATTRRWRATGATCAARTWTA IONXpress10 ARTIGG F8 ARTH-NGS-F5.2-ion10 CCATCTCATCCCTGCGTGTCTCCGACTCAGCTGACCGAACATTRRWRATGATCAARTWTA IONXpress10 ARTIGG F8 ARTH-NGS-F5.2-ion10 CCATCTCATCCCTGCGTGTCTCCGACTCAGCTGACCGAACATTATAATTGGDGGRTTTGGW IONXpress10 ARTIGG F8 ARTH-NGS-F4.2-ion10 CCATCTCATCCCTGCGTGTCTCCGACTCAGCTGACCGAACATTATAATTGGDGGRTTTGGW IONXpress10 ARTIGG F9 ARTH-NGS-F4.2-ion10 CCATCTCATCCCTGCGTGTCTCCGACTCAGCTGACCGAACATTATAATTGGDGGRTTTGGW IONXpress10 ARTIGG F9 ARTH-NGS-F4.2-ion10 CCATCTCATCCCTGCGTGTCTCCGACTCAGCTGACCGAACATTATAATTGGDGGRTTTGGW IONXpress10 ARTIGG F9 ARTH-NGS-F4.2-ion10 CCATCTCATCCCTGCGTGTCTCCGACTCAGCTGACCGAACATTTTTWWCTWCATWTDG	DCDO	F3	ARTH-NGS-F3.2-ion8		IonXpress8	А
F5	PCR2	F4	ARTH-NGS-F4.2-ion8		IonXpress8	А
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F4 ARTH-NGS-F4.2-ion9 F5 ARTH-NGS-F5.2-ion9 F6 ARTH-NGS-F6.2-ion9 F1 ARTH-NGS-F1.2-ion10 F2 ARTH-NGS-F3.2-ion10 F3 ARTH-NGS-F3.2-ion10 F4 ARTH-NGS-F3.2-ion10 F5 ARTH-NGS-F4.2-ion10 F6 ARTH-NGS-F4.2-ion10 F7 ARTH-NGS-F4.2-ion10 F7 ARTH-NGS-F4.2-ion10 F8 ARTH-NGS-F4.2-ion10 F9 ARTH-NGS-F3.2-ion10 F1 ARTH-NGS-F3.2-ion10 F2 ARTH-NGS-F3.2-ion10 F3 ARTH-NGS-F4.2-ion10 F4 ARTH-NGS-F4.2-ion10 F5 ARTH-NGS-F4.2-ion10 F6 ARTH-NGS-F4.2-ion10 F7 ARTH-NGS-F4.2-ion10 F8 ARTH-NGS-F4.2-ion10 F9 ARTH-NGS-F4.2-ion10 CCATCTCATCCCTGCGTGTCTCCGACTCAGCTGACCGAACATTATAATTGGDGGRTTTGGW AATTG CCATCTCATCCCTGCGTGTCTCCGACTCAGCTGACCGAACATTATAATTGGDGGRTTTGGW IonXpress10 ACCATCTCATCCCTGCGTGTCTCCGACTCAGCTGACCGAACAGWAGWATWRTWRAWAWW IONXpress10 ACCATCTCATCCCTGCGTGTCTCCGACTCAGCTGACCGAACAGWAGWATWRTWRAWAWW IONXpress10 CCATCTCATCCCTGCGTGTCTCCGACTCAGCTGACCGAACATTTTTWSWCTWCATWTDG	DCD2	F3	ARTH-NGS-F3.2-ion9		IonXpress9	А
F5 ARTH-NGS-F5.2-ion9 CWGG IonXpress9 A F6 ARTH-NGS-F6.2-ion9 CCATCTCATCCCTGCGTGTCTCCGACTCAGTGAGCGGAACTATTTGTWTGAKCWRTWKK WATTAC IonXpress9 A F1 ARTH-NGS-F1.2-ion10 CCATCTCATCCCTGCGTGTCTCCGACTCAGCTGACCGAACATTCAACCAATCATAAAGAT ATTGG IONXpress10 A F2 ARTH-NGS-F2.2-ion10 CCATCTCATCCCTGCGTGTCTCCGACTCAGCTGACCGAACATTRWRATGATCAARTWTA IONXpress10 A F3 ARTH-NGS-F3.2-ion10 CCATCTCATCCCTGCGTGTCTCCGACTCAGCTGACCGAACATTATAATTGGDGGRTTTGGW AATTG IONXpress10 A CCATCTCATCCCTGCGTGTCTCCGACTCAGCTGACCGAACATTATAATTGGDGGRTTTGGW IONXpress10 A CCATCTCATCCCTGCGTGTCTCCGACTCAGCTGACCGAACAGWAGWATWRTWRAWAVW IONXpress10 A CCATCTCATCCCTGCGTGTCTCCGACTCAGCTGACCGAACATTTTTWSWCTWCATWTDG	FUNZ	F4	ARTH-NGS-F4.2-ion9		IonXpress9	Α
F6 ARTH-NGS-F6.2-ion9 WATTAC IONXpress9 A F1 ARTH-NGS-F1.2-ion10 CCATCTCATCCCTGCGTGTCTCCGACTCAGCTGACCGAACATTCAACCAATCATAAAGAT IONXpress10 A F2 ARTH-NGS-F2.2-ion10 CCATCTCATCCCTGCGTGTCTCCGACTCAGCTGACCGAACATTRWRATGATCAARTWTA IONXpress10 A F3 ARTH-NGS-F3.2-ion10 CCATCTCATCCCTGCGTGTCTCCGACTCAGCTGACCGAACATTATAATTGGDGGRTTTGGW IONXpress10 A F4 ARTH-NGS-F4.2-ion10 CCATCTCATCCCTGCGTGTCTCCGACTCAGCTGACCGAACAGWAGWATWRTWRAWAVW IONXpress10 A CCATCTCATCCCTGCGTGTCTCCGACTCAGCTGACCGAACAGWAGWATWRTWRAWAVW IONXpress10 A CCATCTCATCCCTGCGTGTCTCCGACTCAGCTGACCGAACATTTTTWSWCTWCATWTDG		F5	ARTH-NGS-F5.2-ion9		IonXpress9	Α
F1 ARTH-NGS-F1.2-ion10 ATTGG IONXpress10 A F2 ARTH-NGS-F2.2-ion10 CCATCTCATCCCTGCGTGTCTCCGACTCAGCTGACCGAACATTRRWRATGATCAARTWTA IONXpress10 A F3 ARTH-NGS-F3.2-ion10 CCATCTCATCCCTGCGTGTCTCCGACTCAGCTGACCGAACATTATAATTGGDGGRTTTGGW IONXpress10 A F4 ARTH-NGS-F4.2-ion10 CCATCTCATCCCTGCGTGTCTCCGACTCAGCTGACCGAACAGWAGWATWRTWRAWAVW IONXpress10 A CCATCTCATCCCTGCGTGTCTCCGACTCAGCTGACCGAACAGWAGWATWRTWRAWAVW IONXpress10 A CCATCTCATCCCTGCGTGTCTCCGACTCAGCTGACCGAACATTTTTWSWCTWCATWTDG		F6	ARTH-NGS-F6.2-ion9		IonXpress9	А
PCR2 F2 ARTH-NGS-F2.2-ion10 TAAT IONXpress10 A CCATCTCATCCCTGCGTGTCTCCGACTCAGCTGACCGAACTTATAATTGGDGGRTTTGGW IONXpress10 A ATTG CCATCTCATCCCTGCGTGTCTCCGACTCAGCTGACCGAACAGWAGWATWRTWRAWAVW IONXpress10 A CCATCTCATCCCTGCGTGTCTCCGACTCAGCTGACCGAACAGWAGWATWRTWRAWAVW IONXpress10 A CCATCTCATCCCTGCGTGTCTCCGACTCAGCTGACCGAACATTTTTWSWCTWCATWTDG		F1	ARTH-NGS-F1.2-ion10		IonXpress10	А
PCR2 F3 ARTH-NGS-F3.2-ion10 AATTG IonXpress10 A F4 ARTH-NGS-F4.2-ion10 CCATCTCATCCCTGCGTGTCTCCGACTCAGCTGACCGAACAGWAGWATWRTWRAWAVW IONXpress10 A CCATCTCATCCCTGCGTGTCTCCGACTCAGCTGACCGAACATTTTTWSWCTWCATWTDG CCATCTCATCCCTGCGTGTCTCCGACTCAGCTGACCGAACATTTTTWSWCTWCATWTDG		F2	ARTH-NGS-F2.2-ion10		IonXpress10	A
F4 ARTH-NGS-F4.2-ion10 CCATCTCATCCCTGCGTGTCTCCGACTCAGCTGACCGAACAGWAGWATWRTWRAWAVW IonXpress10 A CCATCTCATCCCTGCGTGTCTCCGACTCAGCTGACCGAACATTTTTWSWCTWCATWTDG	DCD2	F3	ARTH-NGS-F3.2-ion10		IonXpress10	A
	FURZ	F4	ARTH-NGS-F4.2-ion10		IonXpress10	А
F5 ARTH-NGS-F5.2-ion10 CWGG IonXpress10 A		F5	ARTH-NGS-F5.2-ion10	CCATCTCATCCCTGCGTGTCTCCGACTCAGCTGACCGAACATTTTTWSWCTWCATWTDG CWGG	IonXpress10	А
F6 ARTH-NGS-F6.2-ion10 CCATCTCATCCCTGCGTGTCTCCGACTCAGCTGACCGAACTATTTGTWTGAKCWRTWKK WATTAC IonXpress10 A		F6	ARTH-NGS-F6.2-ion10		IonXpress10	А
R1 ARTH-NGS-R1.2-ion1-trP1 CCTCTCTATGGGCAGTCGGTGATCTAAGGTAACWGGTATWACTATRAARAAATTAT lonXpress1 trP1		R1	ARTH-NGS-R1.2-ion1-trP1	CCTCTCTATGGGCAGTCGGTGATCTAAGGTAACWGGTATWACTATRAARAAATTAT	IonXpress1	trP1
PCR2 R2 ARTH-NGS-R2 2-ion2-trP1 corcerctateggcagetgattaaggagaactcapaawctwatpttptttapwcg lonXpress2 trP1	PCR2	R2	ARTH-NGS-R2.2-ion2-trP1	CCTCTCTATGGGCAGTCGGTGATTAAGGAGAACTCARAAWCTWATRTTRTTTADWCG	IonXpress2	trP1
THE ARTH-ROB-REZE-ROBE-RET CONCENTRATION OF THE PROPERTY OF TH		R3	ARTH-NGS-R3.2-ion3-trP1	CCTCTCTATGGGCAGTCGGTGATAAGAGGATTCARDGGDGGRTAWACWGTTCAWCC	IonXpress3	trP1

		R4	ARTH-NGS-R4.2-ion4-trP1	CCTCTCTATGGGCAGTCGGTGATTACCAAGATCGTWGWAATRAARTTDATWGCWCC	lonXpress4	trP1			
		R5	ARTH-NGS-R5.2-ion5-trP1	CCTCTCTATGGGCAGTCGGTGATCAGAAGGAACGTTARWARTATDGTRATDGCWCC	lonXpress5	trP1			
	R6 ARTH-NGS-R6.2-ion6-trP1 CCTCTCTATGGGCAGTCGGTGATCTGCAAGTTCTAAACTTCTGGATGTCCAAAAAAATCA lonXpress6 trP1								
27	The "Code" column refers to primer labels in Fig. 1. The COI binding region within each primer								

The "Code" column refers to primer labels in Fig. 1. The COI binding region within each primer sequence is shown in black, while the 10bp tail (PCR1) or MID tag (PCR2) is shown in blue. The "key sequence" (required for Ion Torrent sequencing) is shown in green and the sequencing adapters are shown in red. The 10bp tails on the PCR1 primers are technically IonXpress MID tags, but they serve only to block short amplicons from acting as primers during PCR1. They were chosen over random decamer tails to maximize primer-template matching in PCR2. The same forward and reverse PCR1 primers are used for all ten samples in the first round of PCR. In the second round of PCR, samples are discriminated by using ten different sets of MID-tagged forward PCR2 primers (the same set of PCR2 reverse primers is used for all ten samples).

37 Table S3. Components of PCR reactions in the NGS protocol.

	PCR 1.1	PCR 1.2	PCR 2.1, 2.2, 2.3, 2.4	PCR 2.5	PCR 2.6
10% Trehalose	5.125 µL	5.25 μL	5.75 μL	5.875 μL	6.0 µL
H ₂ O	0.13 µL	0.13 μL	0.13 μL	0.13 μL	0.13 μL
5X Buffer	2.5 µL	2.5 µL	2.5 μL	2.5 μL	2.5 μL
25 mM MgCl ₂	1.25 µL	1.25 µL	1.25 µL	1.25 µL	1.25 µL
10 μM primers	0.125 µL each	0.125 μL each	0.125 µL each	0.125 µL each	0.125 µL each
10 μM dNTP	0.0625 μL	0.0625 μL	0.0625 μL	0.0625 μL	0.0625 μL
Taq (5U/ μL)	0.06 µL	0.06 μL	0.06 μL	0.06 µL	0.06 µL
Template	2 μL	2 μL	2 μL	2 μL	2 μL
TOTAL	12.5 µL	12.5 μL	12.5 µL	12.5 µL	12.5 μL

Reactions differ only in the number of primers and the amount of trehalose. Trehalose sourced from Fluka Analytical; Hyclone ultra-pure water from Thermo Fisher Scientific; Buffer (- MgCl₂), MgCl₂, and Taq polymerase from KAPA Biosystems (while standard CCDB protocols utilize Platinum Taq, KAPA Taq was found to be less prone to co-amplifying trace amounts of residual DNA - derived from the Taq manufacturing process - and is therefore more amenable to high cycle PCR); primers from Integrated DNA Technologies.