

Appendix

TABLE A1
Isotopic values of plant food items at the Atigun site from samples
collected in 2007 and 2008.

Food	$\delta^{13}\text{C}$ (‰)	$\delta^{15}\text{N}$ (‰)	Tissue type
<i>Arctostaphylos</i>	-29.48	-6.69	Shrub leaves
<i>Arctostaphylos</i>	-28.23	-6.81	Shrub leaves
<i>Arctostaphylos</i>	-26.70	-6.48	Shrub leaves
<i>Dryas octopetala</i>	-30.12	-3.53	Shrub leaves
<i>Dryas octopetala</i>	-28.94	-5.96	Shrub leaves
<i>Betula nana</i>	-28.35	-4.63	Shrub leaves
<i>Salix reticulata</i>	-26.91	-4.62	Shrub leaves
<i>Salix sp.</i>	-26.80	-6.40	Shrub leaves
<i>Vaccinium uliginosum</i>	-29.34	-6.68	Shrub leaves
<i>Oxytropis</i>	-27.06	-1.50	N-fixer leaves
<i>Hedysarum</i>	-29.04	-2.17	N-fixer leaves
<i>Artemisia</i>	-29.65	1.55	Forb leaves
<i>Arctostaphylos</i>	-28.97	-6.14	Berries
<i>Empetrum</i>	-28.53	-6.20	Berries
<i>Shepherdia</i>	-27.96	-0.64	Berries
<i>Vaccinium</i>	-27.44	-5.06	Berries
<i>Arctostaphylos</i>	-26.89	-6.01	Roots
<i>Dryas</i>	-28.84	-5.98	Roots
<i>Epilobium</i>	-30.03	-0.25	Roots
<i>Hedysarum</i>	-26.41	2.37	Roots
<i>Hedysarum</i>	-27.38	-2.49	Roots
<i>Oxytropis</i>	-27.72	-0.78	Roots
<i>Oxytropis</i>	-27.97	-1.18	Roots
<i>Carex</i>	-27.39	1.01	Graminoid
<i>Eriophorum angustifolium</i>	-25.69	6.15	Graminoid
<i>Eriophorum angustifolium</i>	-25.74	0.29	Graminoid
Leaf	-25.89	1.67	Graminoid
Seed head	-24.12	1.97	Graminoid

Appendix

TABLE A2

Stepwise multiple regression of the effects of site, age class, year of sampling, and sex on $\delta^{13}\text{C}$ and $\delta^{15}\text{N}$ of arctic ground squirrel hair collected in 2007, 2008, and 2012 ($n = 161$). The model with the minimum value of AICc is also shown. Age classes are designated as 1 = adult, 2 = yearling, 3 = juvenile, and 4 = unknown age. Abbreviations: $R^2 = r^2$ of model; RMSE = root mean square error; AICc = Akaike Information Criterion corrected for sample size; BIC = Bayesian Information Criterion.

Model	Number	RSquare	RMSE	AICc	BIC		$\delta^{13}\text{C}$ Model
Site2only{Atigun-Toolik}	1	0.7937	0.8654	414.488	423.58	()	Site2only{Atigun-Toolik}
AgeClass{4&3-1&2}	1	0.0249	1.8815	664.572	673.663	()	AgeClass{4&3&2-1}
Site2only{Atigun-Toolik},Year (nominal){2007-2011}	2	0.8155	0.8211	398.641	410.71	()	Site2only{Atigun-Toolik},AgeClass{4&3&2-1}
Site2only{Atigun-Toolik},Sex{Male-Female}	2	0.8059	0.8421	406.787	418.856	()	Site2only{Atigun-Toolik},AgeClass{4-3&2}
Site2only{Atigun-Toolik},Sex{Male-Female},Year (nominal){2007-2011}	3	0.8255	0.8009	391.749	406.769	()	Site2only{Atigun-Toolik},Year (nominal){2011-2008&2007},AgeClass{4&3&2-1}
Site2only{Atigun-Toolik},Year (nominal){2007-2011},AgeClass{4&3-1&2}	3	0.8195	0.8147	397.264	412.284	()	Site2only{Atigun-Toolik},Sex{Male-Female},AgeClass{4&3&2-1}
Site2only{Atigun-Toolik},Sex{Male-Female},Year (nominal){2007-2011},AgeClass{4&3-1&2}	4	0.8286	0.7965	391.086	409.029	(x)	Site2only{Atigun-Toolik},Sex{Male-Female},Year (nominal){2011-2008&2007},AgeClass{4&3&2-1}
Site2only{Atigun-Toolik},Sex{Male-Female},Year (nominal){2007-2011},AgeClass{4-3}	4	0.8269	0.8003	392.65	410.593	()	Site2only{Atigun-Toolik},Year (nominal){2011-2008&2007},AgeClass{4&3&2-1},AgeClass{3-2}
Site2only{Atigun-Toolik},Sex{Male-Female},Year (nominal){2007-2011},AgeClass{4&3-1&2},AgeClass{4-3}	5	0.8291	0.7977	392.739	413.577	()	Site2only{Atigun-Toolik},Sex{Male-Female},Year (nominal){2011-2008&2007},AgeClass{4&3&2-1},AgeClass{3-2}
Site2only{Atigun-Toolik},Sex{Male-Female},Year (nominal){2007-2011},AgeClass{4&3-1&2},AgeClass{1-2}	5	0.8289	0.7983	392.986	413.824	()	Site2only{Atigun-Toolik},Sex{Male-Female},Year (nominal){2011-2008&2007},AgeClass{4&3&2-1},AgeClass{4-3&2}
Site2only{Atigun-Toolik},Sex{Male-Female},Year (nominal){2007-2011},AgeClass{4&3-1&2},AgeClass{4-3},AgeClass{1-2}	6	0.8294	0.7996	394.682	418.386	()	Site2only{Atigun-Toolik},Sex{Male-Female},Year (nominal){2011-2008&2007},Year (nominal){2008-2007},AgeClass{4&3&2-1},AgeClass{3-2}

Site2only{Atigun-Toolik},Sex{Male-Female},Year (nominal){2007&2011-2008},Year (nominal){2007-2011},AgeClass{4&3-1&2},AgeClass{4-3}	6	0.8292	0.8002	394.907	418.611	()	Site2only{Atigun-Toolik},Sex{Male-Female},Year (nominal){2011-2008&2007},AgeClass{4&3&2-1},AgeClass{4-3&2},AgeClass{3-2}
Response Avg ¹⁵ N							Response Avg ¹³ C
R ²	0.828578						R ²
R ² Adj	0.824182						R ² Adj
Root Mean Square Error	0.796464						Root Mean Square Error
Mean of Response	2.126542						Mean of Response
Observations (or Sum Wgts)	161						Observations (or Sum Wgts)
Analysis of Variance							Analysis of Variance
Source	DF	Sum of Squares	Mean Square	F Ratio			Source
Model	4	478.3249	119.581	188.5083			Model
Error	156	98.95941	0.634		Prob > F		Error
C. Total	160	577.2844		<.0001			C. Total
Parameter Estimates							Parameter Estimates
Term		Estimate	Std Error	t Ratio	Prob> t		Term
Intercept		2.59	0.08	34.14	<.0001		Intercept
Site2only[Atigun]		-1.88	0.07	-26.81	<.0001		Site2only[Atigun]
Sex[Female]		-0.19	0.06	-2.88	0.0045		Year (nominal){2011-2008&2007}
Year (nominal){2007-2011}		-0.42	0.11	-3.78	0.0002		AgeClass{4&3&2-1}
AgeClass{4&3-1&2}		-0.11	0.07	-1.66	0.0988		
Effect Tests							Effect Tests
Source	%Variance	DF	Sum of Squares	F Ratio	Prob > F		Source
Site2only	96.6	1	455.8679	718.632	<.0001		Site2only
Sex	1.1	1	5.2593	8.2908	0.0045		Year (nominal){2011-2008&2007}
Year (nominal){2007-2011}	1.9	1	9.0594	14.2813	0.0002		AgeClass{4&3&2-1}
AgeClass{4&3-1&2}	0.4	1	1.74963	2.7581	0.0988		

Appendix

Table A3

Results of MixSIAR analyses for contributions of dicots, graminoids, and fungi to arctic ground squirrel diets at Toolik and Atigun. Quantiles for contributions of the three dietary sources are indicated. ^{13}C enrichment of hair relative to dietary items was set at $3.3 \pm 1.0\text{‰}$, ^{15}N enrichment was set at $1.9 \pm 1.0\text{‰}$. SD = standard deviation.

Toolik

	Mean	SD	2.50%	50%	97.50%
Dicots	0.137	0.043	0.056	0.134	0.226
Graminoids	0.368	0.085	0.207	0.366	0.54
Fungi	0.496	0.065	0.361	0.496	0.62

Atigun

	Mean	SD	2.50%	50%	97.50%
Dicots	0.366	0.046	0.275	0.368	0.453
Graminoids	0.593	0.056	0.486	0.593	0.701
Fungi	0.041	0.025	0.001	0.04	0.092

Appendix

TABLE A4

Stepwise multiple regression of the effects of site, year, date of sampling, loge of C/N, the interaction of date and site, and the interaction of date and the natural log of C/N on $\delta^{13}\text{C}$ and $\delta^{15}\text{N}$ of arctic ground squirrel feces collected in 2008 and 2012 (n = 109). The model with the minimum value of AICc is also shown. Date unit is 100 days, e.g., July 12 would be 1.94 (termed DoY/100 (Day of Year/100) in the model). Mean of date values was 1.94128 and mean of natural log (ln) of C/N was 2.71825. The square of the date and the cube of the date were also included as independent variables in the stepwise regression. Abbreviations: $R^2 = r^2$ of model; RMSE = root mean square error; AICc = Akaike Information Criterion corrected for sample size; BIC = Bayesian Information Criterion.

#NAME?						$\delta^{15}\text{N}$ model						
Model	Number	R^2	RMSE	AICc	BIC	Model	Number	R^2	RMSE	AICc	BIC	
Site{ Atigun-Toolik }	1	0.2359	0.5927	199.528	207.373	Site{ Atigun-Toolik }	1	0.4926	1.3898	385.3	393.146	()
(DoY/100-1.94128)*(DoY/100-1.94128)	1	0.0422	0.6636	224.152	231.997	DoY/100	1	0.0758	1.8759	450.675	458.52	()
Site{ Atigun-Toolik },(DoY/100-1.94128)*(DoY/100-1.94128)*(DoY/100-1.94128)	2	0.2939	0.5725	193.086	203.467	Site{ Atigun-Toolik },ln C/N	2	0.5675	1.2892	370.053	380.434	()
Site{ Atigun-Toolik },DoY/100	2	0.2823	0.5772	194.851	205.232	Site{ Atigun-Toolik },DoY/100	2	0.5516	1.3128	374.002	384.383	()
Site{ Atigun-Toolik },DoY/100,(DoY/100-1.94128)*(DoY/100-1.94128)*(DoY/100-1.94128)	3	0.3047	0.5708	193.601	206.475	Site{ Atigun-Toolik },DoY/100,Site{ Atigun-Toolik }*(DoY/100-1.94128)	3	0.6207	1.2131	357.948	370.822	()
Site{ Atigun-Toolik },(DoY/100-1.94128)*(DoY/100-1.94128),(DoY/100-1.94128)*(DoY/100-1.94128)*(DoY/100-1.94128)	3	0.3012	0.5722	194.15	207.025	Site{ Atigun-Toolik },DoY/100,(DoY/100-1.94128)*(DoY/100-1.94128)	3	0.6089	1.2318	361.28	374.154	()
Site{ Atigun-Toolik },DoY/100,(DoY/100-1.94128)*(DoY/100-1.94128)*(DoY/100-1.94128),ln C/N	4	0.3102	0.5713	194.974	210.298	Site{ Atigun-Toolik },Year{ 2008-2011 },(DoY/100-1.94128)*(DoY/100-1.94128),ln C/N	4	0.662	1.1506	347.625	362.949	()
Site{ Atigun-Toolik },DoY/100,(DoY/100-1.94128)*(DoY/100-1.94128),Site{ Atigun-Toolik }*(ln C/N-2.71825)	4	0.3084	0.572	195.255	210.579	Site{ Atigun-Toolik },DoY/100,(DoY/100-1.94128)*(DoY/100-1.94128)*(DoY/100-1.94128),ln C/N	4	0.6555	1.1617	349.703	365.028	()
Site{ Atigun-Toolik },Year{ 2008-2011 },(DoY/100-1.94128)*(DoY/100-1.94128),(DoY/100-1.94128)*(DoY/100-1.94128),ln C/N	5	0.3131	0.5728	196.791	214.521	Site{ Atigun-Toolik },Year{ 2008-2011 },DoY/100,(DoY/100-1.94128)*(DoY/100-1.94128),ln C/N	5	0.6909	1.1057	340.166	357.897	()
Site{ Atigun-Toolik },DoY/100,(DoY/100-1.94128)*(DoY/100-1.94128),(DoY/100-1.94128)*(DoY/100-1.94128),ln C/N	5	0.3129	0.5729	196.838	214.568	Site{ Atigun-Toolik },Year{ 2008-2011 },DoY/100,(DoY/100-1.94128)*(DoY/100-	5	0.689	1.1091	340.835	358.566	()

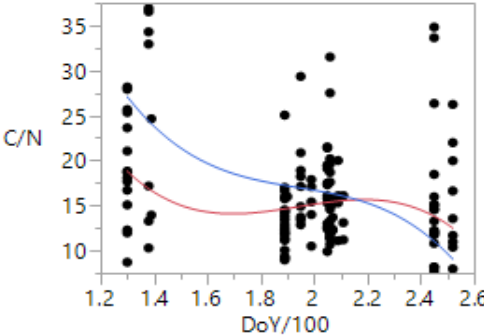
						1.94128),Site{Atigun-Toolik}*(DoY/100-1.94128)						
Site{Atigun-Toolik},DoY/100,(DoY/100-1.94128)*(DoY/100-1.94128),(DoY/100-1.94128)*(DoY/100-1.94128)*(DoY/100-1.94128),ln C/N,Site{Atigun-Toolik}*(ln C/N-2.71825)	6	0.3159	0.5744	198.684	218.775	Site{Atigun-Toolik},Year{2008-2011},DoY/100,(DoY/100-1.94128)*(DoY/100-1.94128),ln C/N,Site{Atigun-Toolik}*(DoY/100-1.94128)	6	0.7168	1.0634	332.942	353.032	()
Site{Atigun-Toolik},Year{2008-2011},(DoY/100-1.94128)*(DoY/100-1.94128),(DoY/100-1.94128)*(DoY/100-1.94128)*(DoY/100-1.94128),ln C/N,Site{Atigun-Toolik}*(ln C/N-2.71825)	6	0.3152	0.5747	198.788	218.879	Site{Atigun-Toolik},Year{2008-2011},(DoY/100-1.94128)*(DoY/100-1.94128),(DoY/100-1.94128)*(DoY/100-1.94128),ln C/N,Site{Atigun-Toolik}*(DoY/100-1.94128)	6	0.7155	1.066	333.463	353.554	()
Site{Atigun-Toolik},Year{2008-2011},DoY/100,(DoY/100-1.94128)*(DoY/100-1.94128),(DoY/100-1.94128)*(DoY/100-1.94128)*(DoY/100-1.94128),ln C/N,Site{Atigun-Toolik}*(ln C/N-2.71825)	7	0.3172	0.5767	200.862	223.266	Site{Atigun-Toolik},Year{2008-2011},DoY/100,(DoY/100-1.94128)*(DoY/100-1.94128),ln C/N,Site{Atigun-Toolik}*(ln C/N-2.71825),Site{Atigun-Toolik}*(DoY/100-1.94128)	7	0.7207	1.0614	333.837	356.241	()
Site{Atigun-Toolik},DoY/100,(DoY/100-1.94128)*(DoY/100-1.94128),(DoY/100-1.94128)*(DoY/100-1.94128),ln C/N,Site{Atigun-Toolik}*(ln C/N-2.71825),Site{Atigun-Toolik}*(DoY/100-1.94128)	7	0.3162	0.5771	201.013	223.417	Site{Atigun-Toolik},Year{2008-2011},(DoY/100-1.94128)*(DoY/100-1.94128),(DoY/100-1.94128)*(DoY/100-1.94128),ln C/N,Site{Atigun-Toolik}*(ln C/N-2.71825),Site{Atigun-Toolik}*(DoY/100-1.94128)	7	0.7187	1.0653	334.618	357.022	()
Site{Atigun-Toolik},Year{2008-2011},DoY/100,(DoY/100-1.94128)*(DoY/100-1.94128),(DoY/100-1.94128)*(DoY/100-1.94128)*(DoY/100-1.94128),ln C/N,Site{Atigun-Toolik}*(ln C/N-2.71825),Site{Atigun-Toolik}*(DoY/100-1.94128)	8	0.3178	0.5794	203.192	227.861	Site{Atigun-Toolik},Year{2008-2011},DoY/100,(DoY/100-1.94128)*(DoY/100-1.94128),(DoY/100-1.94128)*(DoY/100-1.94128),ln C/N,Site{Atigun-Toolik}*(ln C/N-2.71825),Site{Atigun-Toolik}*(DoY/100-1.94128)	8	0.7207	1.0667	336.255	360.923	()
Fit Group						Fit Group						
Response $\delta^{13}\text{C}$						Response $\delta^{15}\text{N}$						
R^2	0.293853					R^2	0.716843					
R^2 Adj	0.280529					R^2 Adj	0.700187					
Root Mean Square Error	0.572507					Root Mean Square Error	1.063434					
Mean of Response	-27.8889					Mean of Response	1.075046					
Observations (or Sum Wgts)	109					Observations (or Sum Wgts)	109					
Analysis of Variance						Analysis of Variance						

Source	DF	Sum of Squares	Mean Square	F Ratio		Source	DF	Sum of Squares	Mean Square	F Ratio		
Model	2	14.45782	7.22891	22.0552		Model	6	292.0245	48.6707	43.0375		
Error	106	34.74305	0.32776		Prob > F	Error	102	115.3511	1.1309		Prob > F	
C. Total	108	49.20087		<.0001		C. Total	108	407.3755		<.0001		
Parameter Estimates						Parameter Estimates						
Term		Estimate	Std Error	t Ratio	Prob> t	Term		Estimate	Std Error	t Ratio	Prob> t	
Intercept		-27.7521	0.061123	-454	<.0001	Intercept		1.8234	1.541037	1.18	0.2395	
Site[Atigun]		-0.38205	0.061168	-6.25	<.0001	Site[Atigun]		-1.61626	0.120563	-13.41	<.0001	
(DoY/100-1.94128)*(DoY/100-1.94128)*(DoY/100-1.94128)		-1.32788	0.450203	-2.95	0.0039	Year[2008]		0.541802	0.134291	4.03	0.0001	
						DoY/100		1.507321	0.363729	4.14	<.0001	
						(DoY/100-1.94128)*(DoY/100-1.94128)		3.903318	0.772554	5.05	<.0001	
						ln C/N		-1.2137	0.383203	-3.17	0.002	
						Site[Atigun]*(DoY/100-1.94128)		-0.99823	0.326531	-3.06	0.0029	
Effect Tests						Effect Tests						
Source	Nparm	DF	Sum of Squares	F Ratio	Prob > F	Source	Nparm	DF	Sum of Squares	F Ratio	Prob > F	
Site	1	1	12.78632	39.0107	<.0001	Site	1	1	203.2429	179.719	<.0001	
DoY/100*DoY/100*DoY/100	1	1	2.851441	8.6997	0.0039	Year	1	1	18.40816	16.2775	0.0001	
						DoY/100	1	1	19.42127	17.1734	<.0001	
						DoY/100*DoY/100	1	1	28.86899	25.5276	<.0001	
						ln C/N	1	1	11.34446	10.0314	0.002	
						Site*DoY/100	1	1	10.56889	9.3456	0.0029	

Appendix

TABLE A5

Stepwise multiple regression of the effects of site, year, date of sampling, and the interaction of date and site on C/N of arctic ground squirrel feces collected in 2008 and 2012 ($n = 109$). The model with the minimum value of AICc is also shown. Date unit is 100 days, e.g., July 12 would be 1.94 (termed DoY/100 (Day of Year/100) in the model). The square of the date and the cube of the date were also included as independent variables in the stepwise regression. Abbreviations: $R^2 = r^2$ of model; RMSE = root mean square error; AICc = Akaike Information Criterion corrected for sample size; BIC = Bayesian Information Criterion.

Model	Number	RSquare	RMSE	AICc	BIC				
(DoY/100-1.94128)*(DoY/100-1.94128)*(DoY/100-1.94128)	1	0.1986	4.9678	662.988	670.834				
DoY/100	1	0.1974	4.9716	663.155	671.001				
(DoY/100-1.94128)*(DoY/100-1.94128)*(DoY/100-1.94128),Site{Atigun-Toolik}*(DoY/100-1.94128)	2	0.2754	4.7462	654.17	664.551				
DoY/100,Site{Atigun-Toolik}*(DoY/100-1.94128)	2	0.2646	4.7812	655.776	666.157				
Site{Atigun-Toolik},(DoY/100-1.94128)*(DoY/100-1.94128)*(DoY/100-1.94128),Site{Atigun-Toolik}*(DoY/100-1.94128)	3	0.305	4.6701	651.815	664.69				
(DoY/100-1.94128)*(DoY/100-1.94128),(DoY/100-1.94128)*(DoY/100-1.94128)*(DoY/100-1.94128),Site{Atigun-Toolik}*(DoY/100-1.94128)	3	0.2848	4.7376	654.942	667.816				
Site{Atigun-Toolik},(DoY/100-1.94128)*(DoY/100-1.94128),(DoY/100-1.94128)*(DoY/100-1.94128)*(DoY/100-1.94128),Site{Atigun-Toolik}*(DoY/100-1.94128)	4	0.3115	4.6706	653.036	668.361				
Site{Atigun-Toolik},DoY/100,(DoY/100-1.94128)*(DoY/100-1.94128)*(DoY/100-1.94128),Site{Atigun-Toolik}*(DoY/100-1.94128)	4	0.3072	4.6854	653.723	669.047	Atigun, red			
Site{Atigun-Toolik},Year{2008-2011},(DoY/100-1.94128)*(DoY/100-1.94128),(DoY/100-1.94128)*(DoY/100-1.94128)*(DoY/100-1.94128),Site{Atigun-Toolik}*(DoY/100-1.94128)	5	0.3149	4.6816	654.779	672.509	Toolik, blue			
Site{Atigun-Toolik},Year{2008-2011},DoY/100,(DoY/100-1.94128)*(DoY/100-1.94128),Site{Atigun-Toolik}*(DoY/100-1.94128)	5	0.3142	4.6841	654.897	672.628				
Site{Atigun-Toolik},Year{2008-2011},DoY/100,(DoY/100-1.94128)*(DoY/100-1.94128),(DoY/100-1.94128)*(DoY/100-1.94128)*(DoY/100-1.94128),Site{Atigun-Toolik}*(DoY/100-1.94128)	6	0.3157	4.7017	656.98	677.071				

Response C/N									
R^2	0.305028								
R^2 Adj	0.285171								
Root Mean Square Error	4.670147								
Mean of Response	15.95752								
Observations (or Sum Wgts)	109								
Analysis of Variance									
Source	DF	Sum of Squares	Mean Square	F Ratio					
Model	3	1005.13	335.043	15.3617					
Error	105	2290.079	21.81		Prob > F				
C. Total	108	3295.208		<.0001					
Parameter Estimates									
Term		Estimate	Std Error	t Ratio	Prob> t				
Intercept		15.92808	0.498609	31.95	<.0001				
Site[Atigun]		-1.0587	0.500266	-2.12	0.0367				
(DoY/100-1.94128)^3		-26.5489	4.018035	-6.61	<.0001				
Site[Atigun]*(DoY/100-1.94128)		4.809234	1.355242	3.55	0.0006				
Effect Tests									
Source	Nparm	DF	Sum of Squares	F Ratio	Prob > F				
Site	1	1	97.67998	4.4786	0.0367				
DoY/100*DoY/100*DoY/100	1	1	952.1979	43.6582	<.0001				
Site*DoY/100	1	1	274.6497	12.5927	0.0006				

Appendix

TABLE A6

Fungal taxa recorded and other observations from microscopy in fecal samples from Atigun and Toolik. Columns include Scat Identifier, Site (Atigun or Toolik), Date collected, Age of individuals (Yearling, Adult, or Juvenile), 30 columns of microscopy identifications (numbered 1-30), Background material and observations, and the dominant observed material (insect, insect & plants, plants, and fungal).

Scat Identifier	Site	Date collected	Sex	Age	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	Background material and observations	Material	
					Boletoid 16-21x5-8μ, smooth, not prominently beaked	Boletoid 11-16x6-7μ, smooth, prominently beaked	Boletoid 17x4μ, smooth, bacilliform	Boletoid 21-26x5-6μ, smooth, elongate bacilliform	Cortinaroid elongate-ovoid 13-16x6-9μ	Cortinaroid citrifor m-ovoid 11-13x7-9μ	Cortinaroid citrifor m-ovoid 9x5μ	Cortinaroid ovoid 20-22x10-12μ	Russuloid ovoid 10x7-9μ, prominent apiculus, low spines forming partial ridges	Russuloid globose 8-10x7-9μ w/o apiculus, spines discret (could be end-view of #9?)	Dark reddish brown dimpled cushion-shape, 15-32μ diam, 8-15μ thick	Globose, 11-15μ diam, spiny/cogged inner wall, hyaline	Ovoid, 15x10μ, with apiculus, thin-walled, minutely spiny(?), hyaline, 10x8μ	Globose, 20x20μ, hyaline, angular interior, smooth walls 2.5μ thick	Ovoid, 10-13x10-13μ, thick-walled, hyaline, smooth	Globose, 32-36x32-36μ, brown interior, smooth hyaline walls 2.5μ thick	Globose, 22x22μ, reddish brown textured interior	Ovoid, 26x18μ, smooth, hyaline	Pale green spheres (pollen?), thick walled, angular interior 42μ diam, similar to #14m but larger	Ellipsoid 22-26x11-13μ, smooth hyaline, Geopora?	Very dark globose “cannonballs” 9-22μ diam	Glomus type, large globose 60-95μ diam, dark brown, smooth, subtended by hyphae	Glomus type, large globose 32-48μ diam, dark brown, smooth, subtended by hyphae	Flamelike structure, mycelial weft? 80-100μ base to tips, 165μ across, ‘arms’ 4μ wide	Teliopore? 14x6μ, dark brown, three segments	Teliopore? 100x12μ, dark brown, 5μ wide at ends, 10+ segments	Angular cells 43-140x13-37μ, maybe bug or plant parts?	Needle like spindles 10-50x1μ, not segmented, likely bacteria	Segmented rods 20-50x1μ, likely bacteria	Thick walled globose, 20x15μ, hyaline, smooth walls 2.5μ thick			
A826 I	Atigun	5/9/2012	M	Yearling																													no spores, almost entirely insect parts	insect			
A823	Atigun	5/9/2012	M	Adult																			2-10					[3]						mostly insect	insect		
A813	Atigun	5/9/2012	F	Yearling																														no spores, mostly insect parts	insect		
A766	Atigun	5/9/2012	M	Adult																												5-20		no spores, equal parts insect& plants	insect&plants		
A804	Atigun	5/9/2012	M	Adult																														no spores, almost entirely insect parts	insect		
A783	Atigun	5/9/2012	M	Adult	1-2										[8]										1-2								100's		mostly insect	insect	
A832 II	Atigun	5/9/2012	M	Yearling																[12]														almost entirely	insect		

[illegible]

[illegible]

Appendix

TABLE A7

Stepwise multiple regression on $\delta^{13}\text{C}$, $\delta^{15}\text{N}$, and C/N of arctic ground squirrel feces collected in 2012 and examined microscopically ($n = 37$). For $\delta^{13}\text{C}$ and $\delta^{15}\text{N}$, independent factors include site (location), date of sampling, C/N, and the interaction of scat material and site. For C/N, independent factors include site (location), date of sampling, and the interaction of scat material and site. The three models with the minimum values of AICc for $\delta^{13}\text{C}$, $\delta^{15}\text{N}$, and C/N are also shown. Date unit is 100 days, e.g., July 12 would be 1.94 (termed DoY/100 (Day of Year/100) in the model). Mean of date values was 1.94128. The square of the date and the cube of the date were also included as independent variables in the stepwise regression. Abbreviations: $R^2 = r^2$ of model; RMSE = root mean square error; AICc = Akaike Information Criterion corrected for sample size; BIC = Bayesian Information Criterion.

Response $\delta^{15}\text{N}$						Response $\delta^{13}\text{C}$						Response C/N					
R^2	0.544					R^2	0.433					R^2	0.241				
R^2 Adj	0.518					R^2 Adj	0.399					R^2 Adj	0.219				
Root Mean Square Error	1.35					Root Mean Square Error	0.55					Root Mean Square Error	5.72				
Mean of Response	1.28					Mean of Response	-27.78					Mean of Response	17.11				
Observations (or Sum Wgts)	37				Prob> t	Observations (or Sum Wgts)	37			Prob> t		Observations (or Sum Wgts)	37				Prob> t
C. Total	36				<.0001	C. Total	36			<.0001		C. Total	36				0.002
Parameter Estimates						Parameter Estimates						Parameter Estimates					
Term		Estimate	Std Error	t Ratio	Prob> t	Term		Estimate	Std Error	t Ratio	Prob> t	Term		Estimate	Std Error	t Ratio	Prob> t
Intercept		3.33	0.64	5.22	<.0001	Intercept		-26.68	0.39	-68.3	<.0001	Intercept		30.13	4.02	7.5	<.0001
Location[Atigun]		-1.26	0.22	-5.66	<.0001	Location[Atigun]		-0.42	0.09	-4.64	<.0001	DoY/100		-6.98	2.09	-3.33	0.002
C/N		-0.12	0.03	-3.37	0.0019	DoY/100		-0.58	0.20	-2.87	0.007						
Effect Tests						Effect Tests											
Source	Nparm	DF	Sum of Squares	F Ratio	Prob > F	Source	Nparm	DF	Sum of Squares	F Ratio	Prob > F						
Location	1	1	58.34	31.99	<.0001	Location	1	1	6.44	21.51	<.0001						
C/N	1	1	20.67	11.33	0.0019	DoY/100	1	1	2.46	8.23	0.007						
Model	Number	RSquare	RMSE	AICc	BIC	Model	Number	RSquare	RMSE	AICc	BIC	Model	Number	RSquare	RMSE	AICc	BIC
Location{ Atigun-Toolik}	1	0.3925	1.537	141.5	145.6	Location{ Atigun-Toolik}	1	0.2953	0.6009	72.0	76.1	DoY/100	1	0.2409	5.7162	238.7	242.8
Scat material{insect-plant&insect&plants& fungal}	1	0.1605	1.8069	153.5	157.6	Scat material{insect&insect&plants&fungal-plant}	1	0.1132	0.6741	80.5	84.6	Scat material{insect&plants&fungal-plant&insect}	1	0.0942	6.244	245.2	249.3
Location{Atigun-Toolik},C/N	2	0.5444	1.3506	133.4	138.6	Location{Atigun-Toolik},DoY/100	2	0.4326	0.5471	66.5	71.7	DoY/100,Scat material{insect&plants-fungal}	2	0.2814	5.6427	239.2	244.4
Scat material{plant-insect&plants},Location{ Atigun-Toolik}	2	0.4285	1.5126	141.7	146.9	Location{ Atigun-Toolik},C/N	2	0.3461	0.5873	71.7	76.9	DoY/100,Location{ Atigun-Toolik}	2	0.2678	5.6959	239.9	245.1
Scat material{plant-insect&plants},Location{ Atigun-Toolik},C/N	3	0.5567	1.3522	135.0	141.2	Scat material{insect&insect&plants&fungal-plant},Location{ Atigun-Toolik},DoY/100	3	0.4522	0.5457	67.9	74.0	DoY/100,Location{ Atigun-Toolik},Scat material{insect&plants-fungal}	3	0.3013	5.6478	240.8	246.9