

Applying Biogeochemistry to Identify the Geographic Origins of Insects-A Model Using *Prostephanus truncatus*

Supplementary Files

Table S1: Sources of maize used for elemental profiling and feeding trials with *P. truncatus*.

Maize type	Name of collection site	Region	Feeding trial	Soil sample
1	Santa Maria Pesqueria 1	NL	✓	1
2	Santa Maria Pesqueria 2	NL	✓	2
3	Santa Maria la Floreña	NL	✓	3
4	Cantabria store 1	Mich	✓	4
5	Casas Blancas store 1	Mich	✓	5
6	Celaya store 1	Gto	✓	6
7	Celaya store 2	Gto	✓	6
8	Cacahuazintle	Mex	✓	-
9	Haiths' plate maize	Fr	✓	-
10	La Mesa de Moctezuma	Son	✓	-
11	La Mesa de Moctezuma	Son	✓	-
12	Lombardillo	Mich	✓	-
13	Cantabria 2	Mich	-	4
14	El Tarejero 1	Mich	-	4
15	El Tarejero 2	Mich	-	4
16	El Tarejero 3	Mich	-	4
17	Casas Blancas 2	Mich	-	5
18	La Peña de Panal	Mich	-	-
19	Casas Blancas 3	Mich	-	-
20	Casas Blancas 4	Mich	-	-
21	La Mesa de Moctezuma	Son	-	-
22	Lombardillo	Mich	-	-

NL: Nuevo León; Son: Sonora; Mich: Michoacán; Gto: Guanajuato; Mex: Mexico (unknown location); Fr: France (unknown location).

Table S2: Shapiro-Wilks results on elemental determinations of *P. truncatus*.

Element	Shapiro-Wilk Statistic	Shapiro-Wilks p-Value
Al	0.977	0.335
B	0.940	0.020
Ba	0.455	0.000
Ca	0.918	0.000
Cr	0.625	0.000
Cu	0.943	0.005
Fe	0.971	0.142
K	0.905	0.000
P	0.679	0.000
Mg	0.912	0.000
Mn	0.973	0.166
Ni	0.887	0.001
S	0.937	0.003
Si	0.952	0.014
Sr	0.965	0.065
Ti	0.888	0.005
Zn	0.979	0.359

Where p-values ≤ 0.05 are considered a bad fit for the normal distribution (those values shown in bold fit a normal distribution).

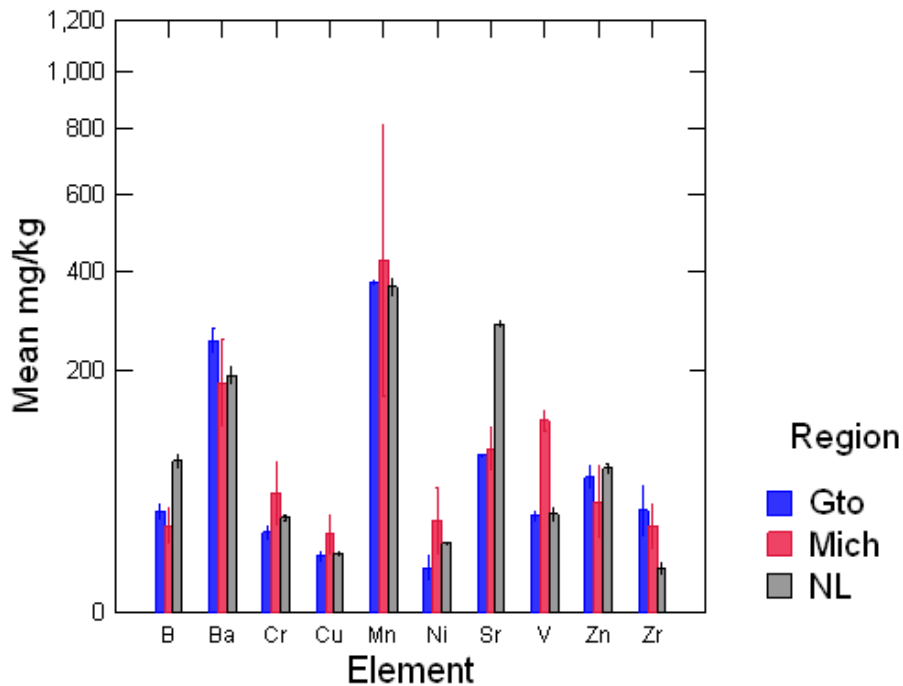


Figure S3: Bar chart of mean mg/kg of elements detected at low concentrations in soil by region. Error bars are standard error around the mean at 0.68. Gto: Guanajuato; Mich: Michoacán; NL: Nuevo León.

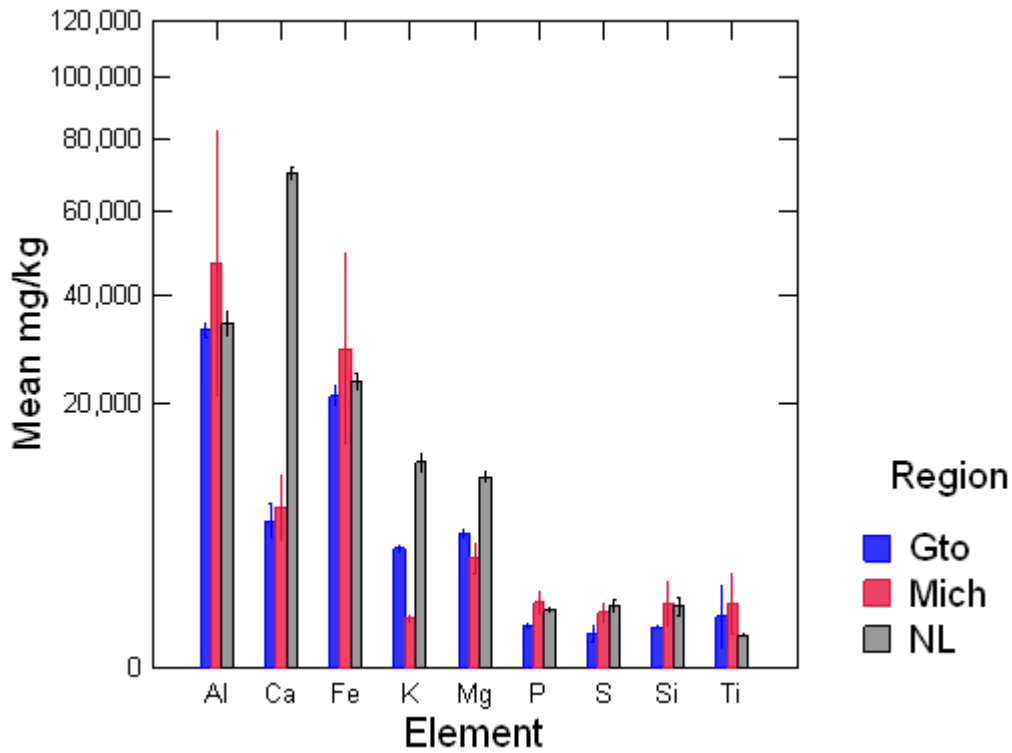


Figure S4: Bar chart of mean mg/kg of elements detected at high concentrations in soil by region. Error bars are standard error around the mean at 0.68. Gto: Guanajuato; Mich: Michoacán; NL: Nuevo León.

Table S5: Kruskal-Wallis comparison of elemental determinations for maize by region for elements above DL.

Element	Kruskal-Wallis Test Statistic	P(2-Tail) Asymptotic	P(2-Tail) Monte Carlo Exact
Al	6.272	0.099	0.066
B	5.775	0.217	0.214
Ba	DL	DL	DL
Ca	6.735	0.151	0.141
Cr	DL	DL	DL
Cu	9.775	0.044	0.025
Fe	5.822	0.213	0.218
K	8.165	0.086	0.066
P	1.119	0.891	0.905
Mg	3.604	0.462	0.497
Mn	6.525	0.163	0.155
Ni	DL	DL	DL
S	10.909	0.028	0.013
Si	6.533	0.163	0.157
Sr	15.678	0.003	0.000
Ti	DL	DL	DL
Zn	7.108	0.130	0.117

Figures in bold are significantly different at $P < 0.05$. All have 4 df and 10,000 Monte Carlo simulations.

Table S6: Kruskal-Wallis comparison of elemental determinations for *P. truncatus* by region for elements above DL.

Element	Kruskal-Wallis Test Statistic	P(2-Tail) symptotic	P(2-Tail) Monte Carlo Exact
Al	9.037	0.029	0.026
B	0.752	0.861	0.869
Ba	8.374	0.039	0.034
Ca	11.545	0.009	0.006
Cr	5.911	0.116	0.117
Cu	6.276	0.099	0.095
Fe	13.537	0.004	0.002
K	4.776	0.189	0.188
P	3.713	0.294	0.294
Mg	0.407	0.939	0.944
Mn	3.808	0.283	0.293
Ni	5.900	0.117	0.114
S	17.436	0.001	0.000
Si	8.750	0.033	0.029
Sr	13.150	0.004	0.002
Ti	9.881	0.020	0.008
Zn	11.081	0.011	0.008

Figures in bold are significantly different at $P < 0.05$. All have 3 df and 10,000 Monte Carlo simulations.