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INSIGHTS

The biogeography of sodium in Neotropical figs (Moraceae)

Adriana Bravo[1,3], and **Kyle E. Harms**[2]

[1] Center for Biodiversity and Conservation, American Museum of Natural History, Central Park West at 79th street, New York, NY 10024, USA

[2] Department of Biological Sciences, Louisiana State University, 202 Life Sciences Bldg., Baton Rouge, LA 70803, USA

ABSTRACT

Sodium is essential for animals but not for most plants. Terrestrial sodium comes largely from marine aerosols, so inland ecosystems should have greater potential for sodium limitation than coastal ecosystems. We report a significant decrease of sodium in fruits of four Neotropical *Ficus* species with distance from presumed marine source.

Abstract in Spanish is available with online material.

Key words: Amazonia; *collpas*; *Ficus*; geophagy; mineral licks; Neotropics; salt.

Sodium is an essential nutrient for animals. It plays a critical role in the physiology of osmoregulation, nerve impulses and muscular function (Michell 1995). Owing in part to its importance, sodium is one of the most limiting nutrients to animals and microbes in the mid-continental Neotropics (Stark 1970, Emmons & Stark 1979, Brightsmith *et al.* 2008, Kaspari *et al.* 2008, Powell *et al.* 2009, Dudley *et al.* 2012). The heterogeneous geographic availability of sodium should have substantial consequences for animal assemblages and whole ecosystems (Kaspari *et al.* 2008, 2009).

In contrast to animals, most terrestrial plants do not require sodium, and in high concentrations it can be toxic (Maathuis 2014). The extent to which plants take up sodium from the soil varies across species and may also depend on soil concentrations of other nutrients, such as potassium (Subbarao *et al.* 2003). However, within the sodium-tolerance range, sodium concentrations found in plant tissues are expected to reflect soil (or growth-medium) concentrations of sodium (Maathuis 2014).

Sodium availability is geographically patterned (Cheeseman 2015). Most sodium input to terrestrial ecosystems comes from aerosol deposition from marine sources, and therefore sodium input decreases sharply with increasing distance from the ocean (Stallard & Edmond 1981). As a consequence, ecosystems far from the ocean should have greater potential for sodium to limit organisms compared to ecosystems in coastal areas. Inland areas are expected to have lower sodium concentrations in soils, leading to lower sodium concentrations in plants, and consequently providing limited sodium to herbivorous and frugivorous consumers (Stark 1970, Jordan & Herrera 1981).

Animal behaviors suggesting sodium-limited diets have been documented in Neotropical areas distant from the ocean. For instance, herbivorous ants had a stronger preference for higher concentrations of sodium in western Amazonia compared to Panama, and an overall higher preference for sodium over sucrose compared to carnivorous ants (Kaspari *et al.* 2008). Similarly, in western Amazonia several species of mammals and birds that feed primarily on plants visit unusual, sodium-rich soil patches along the riverbanks or forest interior—known as *collpas*, clay licks or mineral licks—to consume soil (Emmons & Stark 1979, Brightsmith & Aramburú Muñoz-Najar 2004, Bravo *et al.* 2008, 2010, Lee *et al.* 2010, Powell *et al.* 2009, Tobler *et al.* 2009, Blake *et al.* 2011). In contrast, there are no records of strictly carnivorous species consuming soil in these areas, presumably because carnivores obtain sufficient sodium from their animal prey.

Along with the accumulating evidence for sodium limitation among primary consumers in regions distant from the ocean, an important question is whether low sodium availability in the physical environment is reflected in the plants consumed by herbivores. In a study on the use of mineral licks by frugivorous bats in the Peruvian Amazon, Bravo *et al.* (2012) reported significantly lower concentrations of sodium in figs compared to those from Barro Colorado Island in Panama, as previously reported by Wendeln *et al.* (2000). To our knowledge there are no studies that have systematically assessed the biogeographic patterns of sodium concentration in plants.

We assessed the patterns of sodium concentrations in the syconia (*i.e.*, the fruits) of four *Ficus* species that occur broadly throughout the Neotropics. We used *Ficus* as a study group because of its importance as a keystone resource for the community of vertebrates (Terborgh 1986). In the Neotropics, figs are produced asynchronously year-round, providing a reliable resource for several vertebrate species (Milton *et al.* 1982, Terborgh 1986). Figs have been recorded as the main dietary components of numerous species of birds (Snow 1981), monkeys (Milton *et al.* 1982, Terborgh 1983), and bats (Morrison 1978, Giannini & Kalko 2004, Lobova *et al.* 2009, Bravo *et al.* 2012).

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[3]Corresponding author; e-mail: adrianabravo1@gmail.com

Coincidently, several of these and other largely frugivorous species, such as the lowland tapir, white-lipped peccary, red-brocket deer, spider monkey, wholly monkey, guans, parrots, and frugivorous bats, among others, have also been observed consuming sodium-rich soil in areas far from the ocean (Emmons & Stark 1979, Brightsmith & Aramburú Muñoz-Najar 2004, Bravo *et al.* 2008, Tobler *et al.* 2009, Blake *et al.* 2011).

We collected dried syconia (figs) of four *Ficus* species from 158 specimens of the herbarium collections of the New York Botanical Garden (NYBG) in New York, NY and the Missouri Botanical Garden (MBG) in Saint Louis, MO. We sampled 58 specimens of *Ficus citrifolia*, 34 of *Ficus insipida*, 56 of *Ficus maxima*, and 10 of *Ficus paraensis* (see Table S1). To avoid unnecessary destruction of herbarium specimens, we sampled whole figs preserved in paper envelopes as part of the specimen, did not remove figs that were attached to the vegetative parts of the specimen, and only sampled specimens with enough figs to remain with a sample after collection. We collected ~0.5 g of dry mass (one or two figs) using a one-gram Pesola scale. We placed the samples in a labeled paper coin envelope and took a picture of the voucher specimen to record specimen data. The geographic distribution of the samples ranged in latitude from ~21° N to ~57° S, as shown in Fig. 1. For this study, we added two samples each from *F. insipida* and *F. maxima* from a previous study (Bravo *et al.* 2012) to complete a total of 162 data points.

The sodium concentration on a dry mass basis of each fig sample, including those from Bravo *et al.* (2012), was determined at the Soil Testing and Plant Analysis Laboratory at the Louisiana State University Agricultural Center (http://www.lsuagcenter.com). First, 5 ml of concentrated HNO_3 was added to a minimum of 0.5 g ground, dry plant matter. After 50 min, 3 ml of

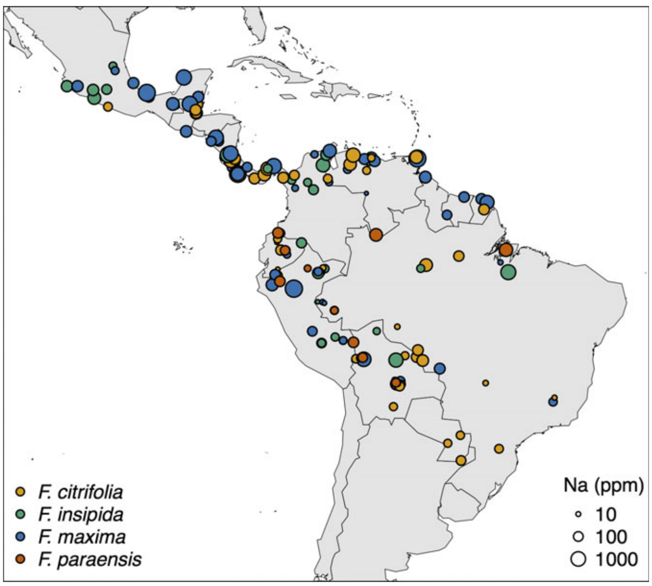

FIGURE 1. Geographic locations and sodium concentrations (ppm) of *Ficus* fruits from herbaria, sampled across the Neotropics. Circle size indicates sodium concentration.

H_2O_2 was added and the sample was digested on a heat block for 2.75 h. Finally, samples were cooled and diluted to measure the concentration of minerals using inductively coupled plasma spectrometry. Concentrations were provided in parts per million (ppm). Concentrations of aluminum, boron, calcium, copper, iron, magnesium, manganese, phosphorus, potassium, sulfur, and zinc were also provided by the lab (Table S1).

To determine the distance of the sampled figs to the closest effective source of sodium, we first plotted the location of each sample on a map. We then measured the distance (km) to the closest marine coast, or, if a mountain barrier (>2000 m asl) blocked the shortest path to the sea, to the closest coast not blocked by a mountain barrier. We assigned geographic coordinates in the Universal Transverse Mercator (UTM) system to each fig sample by using the location information from the vouchers and then plotted these points on a map using the *maptools* library in R (R Development Core Team, 2012). Using this map as a reference, we located each sample point in Google Earth (http://www.google.com/earth/) and estimated its closest distance to the ocean. For the Amazon region, we followed Stallard and Edmond (1981) by using the Atlantic coast as the region's source of sodium since the Andes Cordillera constitutes a geographic barrier to the aerosols of the Pacific Ocean.

To determine if distance to the nearest effective source of sodium predicts sodium concentration in *Ficus* fruits, we built four Generalized Least Squares models including two that accounted for spatial autocorrelations (Gaussian and exponential correlation structure). We compared all models using the Akaike Information Criteria (AIC, Burnham & Anderson 2002) and calculated the pseudo R-square for the fittest model (Nagelkerke 1991). We also explored the responses of the other eleven elements to the same distances (Table S1). All analyses were conducted in R (R Development Core Team, 2012). We did not include the collection year of each specimen as a covariate in the model, since we found no correlation between this variable and sodium concentration in figs.

Sodium concentration in figs decreased as a function of the effective distance to the ocean (Fig. 2). Based on the model selection, distance to the nearest effective marine source is the best explanatory variable for the concentrations found in four *Ficus* species (pseudo $R^2 = 0.22$; Table 1). Adding species identity or spatial autocorrelation to the models did not improve model support (Table 1). In the case of the other eleven elements, only three (Bo, Ca, and Mn) showed significant variation with distance, but in all cases the variation was of a much lower magnitude than that of sodium (Fig. S1; Table S2).

We found that sodium concentration in *Ficus* fruits (figs) decreased as a function of the distance to the nearest effective marine source of sodium. This pattern supports one prediction of the geographic sodium limitation hypothesis, that is, a decrease in plant-tissue concentrations with increasing effective distance from the sea (Stallard & Edmond 1981, Kaspari *et al.* 2008). Similar to our findings, Bravo *et al.* (2012) found that the sodium concentrations in fruits of *Ficus* species from southeastern Peru were significantly and substantially (by two orders of magnitude)

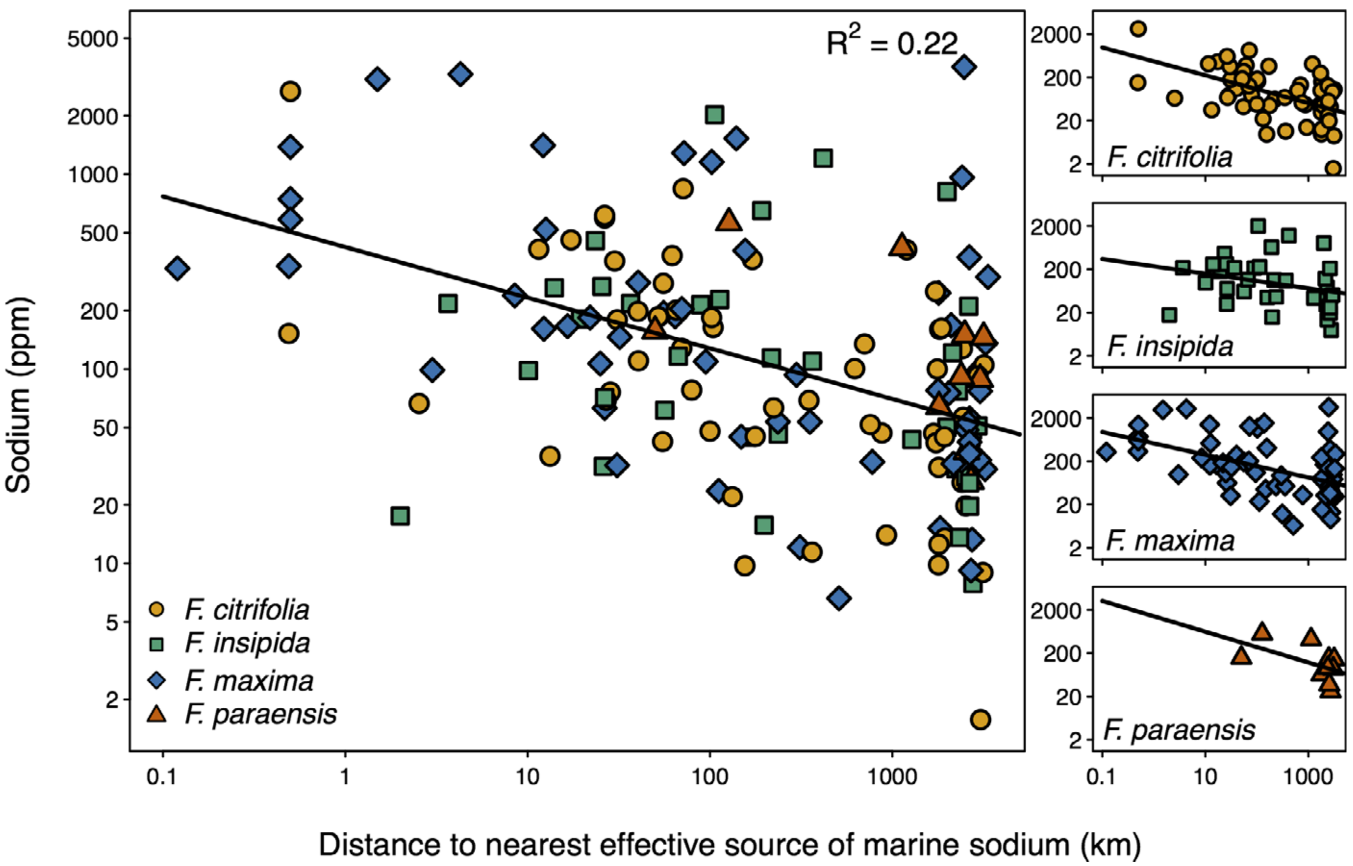

FIGURE 2. Sodium concentration (ppm) in fruits relative to the nearest effective source of marine sodium (km) (*i.e.,* nearest ocean not blocked by a mountain chain) in four Neotropical *Ficus* species. Pseudo R^2 value is provided.

TABLE 1. *Models and model-selection statistics for the relationship between sodium concentration in fruits of four* Ficus *species and distance to the nearest effective source of marine sodium.*

Model	logLik	AIC	ΔAIC	ω
Constant	−282.9	569.8	36.6	0.00
log(Distance)	−263.6	533.2	0	0.32
log(Distance) + Species	−260.9	533.7	0.5	0.25
log(Distance) + Species (Gaussian autocorrelation)	−259.8	533.5	0.3	0.27
log(Distance) + Species (Exponential autocorrelation)	−260.2	534.5	1.3	0.17

log-Lik = logarithm of the maximized likelihood; AIC = Akaike Information Criterion; ΔAIC = difference in AIC values between a model and the best model; ω = model probability.

lower than those from *Ficus* species found in Panama (Wendeln *et al.* 2000). Together, these observations suggest that sodium availability in the fruits of keystone species such as *Ficus* species is strongly influenced by the geographic distribution of sodium inputs into Neotropical ecosystems.

The limited availability of sodium in fruits of multiple *Ficus* species in inland regions in the Neotropics, such as western Amazonia, suggests that concentrations in other tissues and other plant species in this region may also be low. For instance, Gilardi (1996) reported an average sodium concentration of 38.8 ± 11.3 ppm for various parts of 50 plant species (including fruits of eight *Ficus* species) consumed by parrots in southeastern Peru. Later, Brightsmith *et al.* (2008) reported similar findings for 12 other plant species. As a consequence, plant-eating animals in inland Amazonia potentially face sodium limitation in their primary diets (Gilardi 1996, Brightsmith *et al.* 2008), which may explain the use of secondary sources of sodium, such as the licks used by a diversity of primarily herbivorous and frugivorous animal species (Emmons & Stark 1979, Brightsmith & Aramburú Muñoz-Najar 2004, Bravo *et al.* 2008, Brightsmith *et al.* 2008, Powell *et al.* 2009, Tobler *et al.* 2009). Furthermore, although numerous species of herbivores and frugivores have been observed engaging in geophagous behavior (*i.e.*, soil consumption) and drinking sodium-rich water (see Bravo *et al.* 2012 and references therein), this does not seem to be a common behavior in regions closer to the ocean (Lee *et al.* 2010).

The biogeographic pattern of sodium in figs reported in this study could have numerous implications for plant-eating animals and ecosystems. For instance, studies have shown that herbivorous ants in the western Amazon have a strong preference for sodium-rich solutions compared to other baits (Kaspari *et al.* 2008, Arcila Hernandez *et al.* 2012). Similarly, species of phyllostomid bats, ungulates, rodents, primates, birds, and insects in western Amazonia visit sodium-rich licks to consume sodium-rich soil or to drink sodium-rich muddy water from soil depressions made by the excavations of larger geophagous mammals (Bravo *et al.* 2008, Brightsmith *et al.* 2008, Lee *et al.* 2010, Blake *et al.* 2011). Although no studies have reported the consequences of sodium limitation for Neotropical animals at the population or community levels, the physiological importance of sodium suggests that they could be substantial for absolute and relative population-level phenomena such as local abundances, distribution patterns, and overall population sizes. At the ecosystem level, sodium has been shown to play a critical role in the process of litter decomposition, such that in ecosystems with limited sodium, carbon cycling could be slower relative to sites with greater sodium availability (Kaspari *et al.* 2009).

The biogeographic pattern of sodium limitation was similar in all species we studied, suggesting that the environmental influence (*i.e.*, soil concentration) is more consequential than species identity or phylogeny. Although there was variation in sodium concentration within sites, we found no significant effect of species identity on the concentration of sodium in figs. These results contrast with a previous report for 14 species of figs on Barro Colorado Island, Panama, but in that case the values varied across a relatively small range of high values, from a minimum of 1050 ppm to a maximum of 2800 ppm (Wendeln *et al.* 2000).

We tried to thoroughly cover the Neotropics from samples available in two herbaria. Future studies could extend our results with additional herbarium sampling or collection of fresh material, particularly from central Amazonia, for which limited material was found in the herbaria visited in this study. In addition, sampling other species of plants consumed by herbivores and frugivores would provide a test for the generality of these biogeographic patterns and their potential consequences for plant-eating heterotrophs. Another important topic of research is to understand the effects of temporal (*e.g.*, seasonality, year-to-year variability in rainfall/drought) and spatial (*e.g.*, habitat, topography) factors on the availability of sodium in the soil and plant tissues. Detailed information at the local scale and over time would refine our findings and potentially explain additional variation in the sodium concentration of figs. Finally, to fully establish the links between sodium availability in the soil and sodium concentrations in plant tissues (*i.e.,* where sodium becomes available to heterotrophic consumers), we need detailed, coordinated studies of soils and plant tissues, together with sodium-manipulation experiments directed toward all ecosystem components, including animal and microbial consumers.

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DATA AVAILABILITY

Data deposited in the Dryad Repository: http://dx.doi.org/10.5061/dryad.k5k3n (Bravo & Harms 2016).

SUPPORTING INFORMATION

Additional Supporting Information may be found online in the supporting information tab for this article:

FIGURE S1. Concentrations of eleven elements in relation to sodium in fruits of four *Ficus* species from herbaria, sampled across the Neotropics.

TABLE S1. *Models and model-selection statistics for the relationship between the concentrations of 11 elements in fruits of four* Ficus *species and distance to the nearest effective source of marine sodium.*

TABLE S2. Ficus *specimen information including distance to an effective marine sodium source and concentration of twelve minerals.*

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SUPPORTING INFORMATION

I N S I G H T S

The biogeography of sodium in Neotropical figs (Moraceae)

Adriana Bravo[1,3] and **Kyle E. Harms**[2].

[1] Center for Biodiversity and Conservation, American Museum of Natural History, Central Park West at 79th street, New York, NY 10024, USA

[2] Department of Biological Sciences, Louisiana State University, 202 Life Sciences Bldg., Baton Rouge, LA 70803, USA

[3] Corresponding author; e-mail: adrianabravo1@gmail.com

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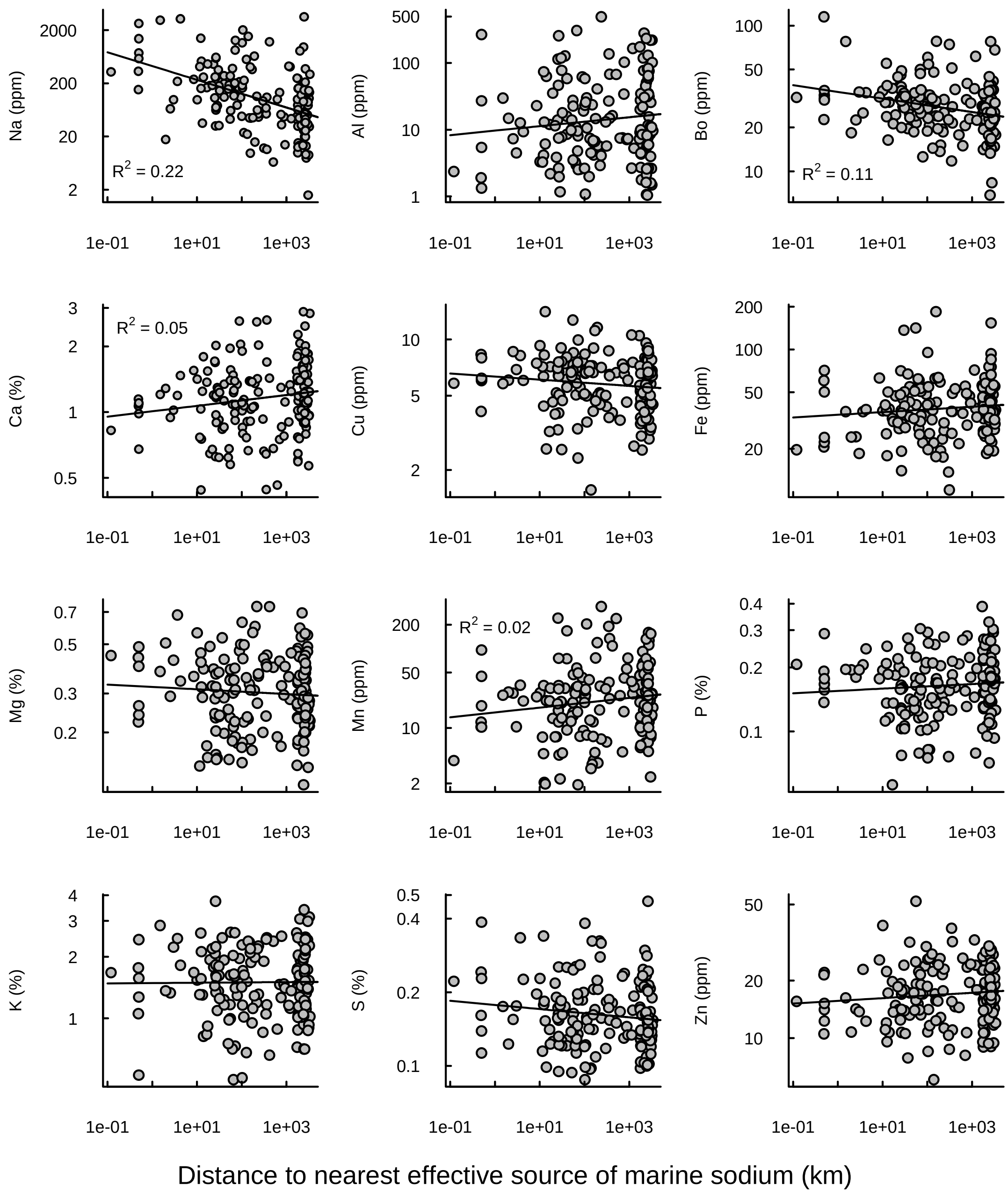

FIGURE S1. Concentrations of eleven elements in relation to sodium (Na) in fruits of four *Ficus* species (*F. citrifolia*, *F. insipida*, *F. maxima*, and *F. paraensis*) from herbaria, sampled across the Neotropics. Pseudo R^2 values indicate a significant effect of distance (ΔAIC>2).

TABLE S1. Models and model-selection statistics for the relationship between the concentrations of 11 elements in fruits of four *Ficus* species and distance to the nearest effective source of marine sodium.

Element	Model	AIC	ΔAIC	Pseudo-R^2
Al	Costant	560.94	0.04	0.01
	log(Distance)	560.90		
Bo	Costant	177.13	10.60	0.11
	log(Distance)	166.53		
Ca	costant	144.49	2.39	0.05
	log(Distance)	142.10		
Cu	costant	124.00	0.20	0.03
	log(Distance)	123.80		
Fe	costant	206.74	0.29	0.01
	log(Distance)	207.03		
Mg	costant	158.90	1.20	0.00
	log(Distance)	160.10		
Mn	costant	474.20	2.10	0.02
	log(Distance)	472.10		
P	costant	122.20	1.00	0.01
	log(Distance)	123.20		
K	costant	166.07	1.99	0.00
	log(Distance)	168.06		
S	costant	93.14	0.74	0.04
	log(Distance)	92.40		
Zn	costant	129.60	0.47	0.02
	log(Distance)	130.07		

Table S2. *Ficus* specimen information including distance to an effective sodium marine source and concentration of twelve minerals.

N	Herbarium	Species	Locality	Collector and especimen number	Year*	Distance (km)**	Sodium source***	Lat. (dec)	Long. (dec)	Na (ppm)	Al (ppm)	Bo (ppm)	Ca (%)	Cu (ppm)	Fe (ppm)	Mg (%)	Mn (ppm)	P (%)	K (%)	S (%)
1	MBG	*Ficus citrifolia*	Honduras, Toledo	Gentle, P.H. 6677	1949	0.49	Caribbean sea	16.099	-88.809	152.059	1.899	114.831	1.147	8.315	60.484	0.223	11.893	0.192	1.055	0.161
2	MBG	*Ficus citrifolia*	Panama, Cocle	Gentry, A. 6883	1972	11.5	Pacific ocean	8.406	-80.259	412.148	3.269	29.607	0.767	7.149	40.712	0.141	7.688	0.112	1.307	0.115
3	MBG	*Ficus citrifolia*	Panama, Canal Zone	Mori, S. & J. Kallunki 4038	1974	27	Pacific ocean	9.156	-79.682	68.997	1.962	32.546	0.896	5.053	29.924	0.151	4.574	0.159	1.592	0.122
4	MBG	*Ficus citrifolia*	Panama, BCI	Croat, T.B. 7891	1969	26.44	Caribbean sea	9.152	-79.846	614.54	7.48	19.958	0.971	6.37	35.77	0.203	31.12	0.077	1.342	0.095
5	MBG	*Ficus citrifolia*	Panama, Darien	Hartman, R.L. 12515	1981	52	Pacific ocean	8.023	-77.901	185.67	13.978	34.515	0.679	6.354	50.906	0.151	14.209	0.128	0.982	0.094
6	MBG	*Ficus citrifolia*	Costa Rica, Heredia	Alcazar, E. 89	1990	65.28	Caribbean sea	10.160	-83.974	200.353	2.943	26.829	1.228	7.006	60.776	0.212	32.498	0.079	0.502	0.113
7	MBG	*Ficus citrifolia*	Ecuador, Napo	Zaruma, J. 783	1986	2411	Atlantic ocean	-1.067	-77.600	26.085	1.066	38.889	1.133	5.844	36.18	0.116	16.027	0.071	0.935	0.109
8	MBG	*Ficus citrifolia*	Nicaragua, Municipio Castillo	Rueda, R., I. Coronado, F. Flores, W. Velásquez, & O. Caballero 9430	1998	62	Caribbean sea	11.012	-84.396	382.244	3.258	33.483	1.085	6.161	62.212	0.183	27.206	0.125	0.709	0.121
9	MBG	*Ficus citrifolia*	Ecuador, Esmeraldas	Dodson, C. 17577	1988	100	Pacific ocean	0.382	-78.603	47.839	2.631	18.873	1.105	5.116	40.823	0.171	20.996	0.102	1.423	0.12
10	MBG	*Ficus citrifolia*	Ecuador, Napo	Vargas, H., E. Narváez & S. Orellana 2246	1998	2420	Atlantic ocean	-1.017	-78.200	126.852	2.103	44.654	1.637	6.687	31.71	0.165	37.266	0.141	1.029	0.132
11	MBG	*Ficus citrifolia*	Peru, Cuzco	Nuñez, P. & M. Salas 8171	1987	2950	Atlantic ocean	-12.623	-73.088	92.148	11.262	22.498	1.094	6.741	48.31	0.464	22.424	0.303	1.732	0.167
12	MBG	*Ficus citrifolia*	Bolivia, La Paz	Alanes, D., A.F. Fuentes, D. Salazar, Cusi, Saul & R. Lipa 107	2009	2447	Atlantic ocean	-14.581	-68.776	56.379	2.579	27.073	1.081	7.858	44.991	0.181	16.347	0.115	0.709	0.1
13	MBG	*Ficus citrifolia*	Peru, Loreto	Gentry, A., R. Vásquez & N. Jaramillo 39737	1983	2530	Atlantic ocean	-3.250	-72.917	19.792	1.042	30.315	1.492	8.908	45.313	0.216	22.07	0.163	1.66	0.155
14	MBG	*Ficus citrifolia*	Brazil, Goias	Prance, G.T. & N.T Silva 59600	1964	929	Atlantic ocean	-17.616	-52.499	13.99	7.331	29.41	1.113	6.059	41.912	0.397	75.893	0.18	1.408	0.134
15	MBG	*Ficus citrifolia*	Costa Rica, Alajuela	Liesner, R., E. Judziewicz & B. Pérez 15198	1983	102	Pacific ocean	7.921	-81.503	183.428	23.349	60.499	1.013	8.362	54.44	0.146	29.557	0.075	0.512	0.088
16	MBG	*Ficus citrifolia*	Belize, Toledo	Davidse, G. & D.L. Holland 36722	1997	31	Caribbean sea	16.483	-88.883	178.967	7.774	32.056	0.62	7.624	50.43	0.236	20.843	0.103	1.62	0.121
17	MBG	*Ficus citrifolia*	Costa Rica, Alajuela	Carvajal, A. 204	1982	30	Pacific ocean	10.051	-84.483	358.42	119.04	34.401	1.269	9.02	136.74	0.301	21.57	0.191	1.357	0.185
18	MBG	*Ficus citrifolia*	Costa Rica, Punta Arenas	Gentry, A. with OTS class 84-3 48477	1984	0.5	Pacific ocean	8.474	-83.594	2667.657	5.422	35.818	1.093	6.112	71.259	0.24	10.284	0.157	0.528	0.113
19	MBG	*Ficus citrifolia*	Costa Rica, Heredia	Solano, D. 1255	2004	55.5	Caribbean sea	10.427	-84.006	275.136	3.503	28.658	1.397	6.78	52.392	0.233	15.726	0.135	0.998	0.138
20	MBG	*Ficus citrifolia*	Costa Rica, Guanacaste	Rodriguez, G. 146	1993	70	Pacific ocean	10.611	-85.000	127.761	4.792	50.01	1.388	7.541	53.179	0.224	33.413	0.177	1.604	0.146
21	MBG	*Ficus insipida*	Costa Rica, Alajuela	Flores, K., K. Martínez, U. Chavarría & N. Zamora 42	1993	106	Caribbean sea	10.893	-84.788	2021.119	25.944	54.263	0.797	6.643	54.645	0.431	30.819	0.261	1.711	0.122
22	MBG	*Ficus insipida*	Nicaragua, Rio San Juan	Guadamúz, C. 2526	2005	67	Caribbean sea	11.055	-84.455	116.057	307.998	32.433	1.259	5.829	25.285	0.345	57.099	0.148	1.649	0.129
23	MBG	*Ficus insipida*	Mexico, Michoacan	Ibarra Manriquez, G. 5957	2008	113	Pacific ocean	18.969	-101.754	227.297	10.591	33.416	1.07	3.614	41.932	0.497	8.158	0.135	1.63	0.154
24	MBG	*Ficus insipida*	Panama, Canal Zone	Tyson, E. L. 5325	1969	2	Pacific ocean	8.986	-79.539	17.527	14.826	18.371	1.285	6.052	24.18	0.507	28.361	0.195	1.365	0.123
25	MBG	*Ficus insipida*	Panama, canal Zone BCI	Croat, T.B. 11012	1970	26.44	Caribbean sea	9.152	-79.846	71.075	257.151	30.383	1.19	7.571	19.247	0.321	75.749	0.125	2.241	0.132
26	MBG	*Ficus insipida*	Peru, Maynas	Gentry, A., C. Diaz & N. Jaramillo 21761	1978	2140	Atlantic ocean	-0.115	-75.605	120.99	281.57	14.916	1.394	5.069	35.876	0.54	48.083	0.271	1.442	0.211
27	MBG	*Ficus insipida*	Peru, Madre de Dios	Suclli, E. & I. Huamantupa 1899	2004	2524	Atlantic ocean	-12.482	-68.982	27.892	31.479	6.861	1.098	6.124	23.287	0.349	26.354	0.218	1.691	0.206
28	MBG	*Ficus insipida*	Peru, Loreto	Ayala, E. 5847	1987	2624	Atlantic ocean	-3.876	-73.515	209.782	131.226	20.591	1.075	8.212	40.088	0.445	56.421	0.223	1.526	0.202
29	MBG	*Ficus insipida*	Brazil, Amazonas	Tsugaru, S. & Y. Sano 791	1987	1278	Atlantic ocean	-3.309	-60.648	43.275	5.274	22.418	1.243	2.682	33.447	0.457	33.086	0.198	1.365	0.193
30	MBG	*Ficus insipida*	Bolivia, Sta Cruz	Lewis, M. 37679	1990	1995	Atlantic ocean	-14.750	-63.750	814.769	22.089	27.393	1.402	5.193	57.879	0.362	92.021	0.163	1.275	0.234
31	MBG	*Ficus insipida*	Bolivia, Madidi	Araujo, A., C. Davidson, S, Davidson, P. Gismondi, M. Cornejo, E. Ticona & O. Valdes 3019	2006	2335	Atlantic ocean	-14.542	-67.680	13.596	45.445	17.624	1.567	5.734	19.59	0.276	28.741	0.137	1.921	0.163
32	MBG	*Ficus insipida*	Peru, Cuzco	Nuñez, P. & C. Cardenas 10275	1989	2950	Atlantic ocean	-12.623	-73.088	50.959	220.619	21.952	1.491	5.015	36.144	0.551	67.173	0.158	1.406	0.127
33	MBG	*Ficus maxima*	Panama, San Blas	de Nevers, G., H. Herrera & S. Charnley 7195	1986	0.5	Caribbean sea	9.473	-79.076	1382.537	27.165	31.618	1.102	6.201	50.31	0.398	44.859	0.167	1.272	0.228
34	MBG	*Ficus maxima*	Panama, Bocas del Toro	Croat T.B. & D.M. Porter 16330	1971	3	Atlantic ocean	9.346	-82.416	98.559	4.482	35.034	1.021	6.903	18.537	0.424	10.364	0.195	2.229	0.176
35	MBG	*Ficus maxima*	Costa Rica, Punta Arenas	Obando, N. 96	1990	0.5	Pacific ocean	8.483	-83.600	586.069	1.331	30.832	0.676	7.976	24.069	0.264	19.055	0.177	1.574	0.139
36	MBG	*Ficus maxima*	El Salvador, Auachapán	Rosales, J.M. 2468	2004	8.5	Pacific ocean	13.800	-90.067	238.329	22.922	32.353	1.551	7.464	62.99	0.358	24.75	0.177	1.677	0.197
37	MBG	*Ficus maxima*	Nicaragua, Rio San Juan	Moreno, P.P. 23358	1984	72	Atlantic ocean	11.050	-84.500	1285.063	2.529	36.236	1.085	9.938	34.223	0.312	49.36	0.157	1.409	0.186
38	MBG	*Ficus maxima*	Mexico, Chiapas, Chilen	Ibarra Manríquez, G. 5846	2008	156	Gulf of Mexico	17.229	-91.744	404.944	6.902	30.379	0.909	4.125	17.619	0.311	7.841	0.136	2.191	0.162
39	MBG	*Ficus maxima*	Nicaragua, Chinandagua	Araquistain, M. 2984	1982	25	Pacific ocean	12.567	-86.933	106.511	13.963	31.242	1.712	7.001	48.07	0.243	20.254	0.158	1.444	0.157
40	MBG	*Ficus maxima*	Mexico, Veracruz	Ibarra Manriquez, G. 3240	1989	22	Gulf of Mexico	19.839	-96.694	183.37	11.454	44.511	0.675	3.985	30.637	0.324	7.739	0.22	2.195	0.218
41	MBG	*Ficus maxima*	Mexico, Colima	Lott, E.J.2974	1990	70	Pacific ocean	19.450	-103.700	203.016	9.579	46.855	0.99	3.326	31.233	0.39	15.971	0.305	2.624	0.197
42	MBG	*Ficus maxima*	Mexico, Veracruz	Ibarra M., G. 3302	1989	1.5	Gulf of Mexico	18.624	-95.008	3077.776	29.846	77.803	1.205	5.801	36.507	0.377	25.905	0.196	2.847	0.175
43	MBG	*Ficus maxima*	Brazil, Acre	Silveira, M., J. Ramos, C.S. Figueiredo & R.C. Ruiz 791	1994	2700	Atlantic ocean	-7.633	-72.733	9.19	34.11	14.303	0.793	3.72	51.65	0.306	159.93	0.212	1.177	0.159
44	MBG	*Ficus maxima*	Suriname, Sipaliwini	Evans, R., G. Lewis, E. Klass & M. Wegman 1995	1994	298	Atlantic ocean	3.370	-57.343	93.11	13.11	22.617	0.929	5.01	13.71	0.2	31.23	0.076	0.855	0.118
45	MBG	*Ficus maxima*	Suriname, Para	Evans, R. & G. Lewis 1896	1994	32	Atlantic ocean	5.608	-55.200	145.794	17.924	32.712	1.231	4.711	28.172	0.239	4.852	0.12	1.25	0.162
46	MBG	*Ficus maxima*	Brazil, Acre	Daly, D.C., M. Silveira, D. Costa, A.R.S. Oliveira, L. Lima, C.S. Figueiredo & C. Ehringhaus 8558	1995	2550	Atlantic ocean	-8.547	-71.477	48.562	81.616	13.309	1.48	5.492	36.269	0.318	30.068	0.139	1.74	0.151
47	MBG	*Ficus maxima*	Bolivia, Madidi	Araujo, A., H. Pariamo, M. Villanueva & P. Sevillano 302	2002	2395	Atlantic ocean	-14.500	-68.233	33.661	234.615	22.881	1.214	3.774	33.089	0.364	132.397	0.11	1.973	0.133
48	MBG	*Ficus maxima*	Ecuador, Zamora	Fuentes, P., B. Merino, P. Conza & P. Villa 1310	1999	3249	Atlantic ocean	-4.083	-78.917	135.483	102.17	29.506	1.242	6.389	29.884	0.278	26.375	0.177	2.27	0.147
49	MBG	*Ficus maxima*	Peru, Loreto	Pipoly, J.J., R. Vásquez, N. Jaramillo, M. Amaya & J. Figueroa 12306	1990	2608	Atlantic ocean	-3.713	-73.505	52.904	7.583	77.719	2.479	7.723	52.397	0.559	22.622	0.267	2.051	0.471
50	MBG	*Ficus maxima*	Ecuador, Pastaza	Gudiño, E. 1140	1990	2162	Atlantic ocean	-1.567	-77.417	32.533	30.574	25.314	1.022	4.089	26.675	0.308	19.516	0.095	1.014	0.103
51	MBG	*Ficus paraensis*	Peru, Madre de Dios	Foster, R.B. et al. 6953	1979	2496	Atlantic ocean	-12.530	-69.083	149.35	8.208	21.189	1.22	6.409	44.521	0.291	12.358	0.191	1.222	0.14
52	MBG	*Ficus paraensis*	Peru, Bagua	Jaramillo, N., M. Jaramillo & E. Dekentai 914	1996	3168	Atlantic ocean	-4.917	-78.317	145.661	10.878	23.098	1.736	7.778	32.054	0.268	26.535	0.168	0.93	0.138
53	MBG	*Ficus paraensis*	Bolivia, Santa Cruz	Nee, M. 38139	1989	1803	Atlantic ocean	-17.567	-63.750	64.007	4.453	34.17	0.646	6.581	37.766	0.231	6.06	0.22	1.013	0.14
54	MBG	*Ficus paraensis*	Peru, Loreto	Grández, C. & N. Jaramillo 1988	1990	2700	Atlantic ocean	-3.300	-74.833	26.462	5.95	36.079	1.103	8.403	43.47	0.258	10.176	0.213	1.157	0.142
55	MBG	*Ficus paraensis*	Ecuador, Esmeraldas	Tipaz, G., M. Burbabo & B. Canticuz 505	1992	50	Pacific ocean	1.133	-78.549	156.534	9.83	18.664	0.62	6.675	32.621	0.254	12.146	0.139	0.753	0.138
56	MBG	*Ficus paraensis*	Ecuador, Napo	Ervik, F. 36879	1991	3030	Atlantic ocean	-1.050	-77.667	88.405	1.585	22.933	1.128	6.596	56.218	0.287	154.267	0.178	0.873	0.112
57	MBG	*Ficus paraensis*	Brazil, Para	Sobel, G.L., J. Strudwick, A.B. Anderson, M.G. Silva, R.P. Baia & C. Rosario 4931	1984	127	Atlantic ocean	-0.981	-49.941	563.197	1.975	31.732	0.764	6.739	32.038	0.353	40.586	0.144	0.68	0.142
58	MBG	*Ficus paraensis*	Venezuela, Amazonas	Liesner, R. 16989	1984	1130	Atlantic ocean	0.883	-66.250	419.578	2.655	36.866	0.902	10.574	71.619	0.357	38.6	0.145	1.159	0.134
59	MBG	*Ficus paraensis*	Bolivia, Madidi	Araujo-M., A. et al. 3147	2006	2385	Atlantic ocean	-14.425	-67.921	91.183	1.615	35.513	2.885	9.572	75.778	0.428	75.139	0.328	1.047	0.166
60	MBG	*Ficus paraensis*	Brazil, Acre	Daly, D.C. et al. 10578	2000	2550	Atlantic ocean	-8.547	-71.477	37.578	NA	15.926	0.99	7.137	42.503	0.201	18.178	0.142	0.708	0.101
61	NYBG	*Ficus citrifolia*	Panama, BCI, Canal Zone	Dwyer, J., M. Correa & R. Pasco 8460	1968	26.44	Caribbean sea	9.152	-79.846	595.652	2.655	35.654	1.166	6.702	47.035	0.159	11.891	0.128	1.827	0.154
62	NYBG	*Ficus citrifolia*	Mexico, Acapulco	Palmer, E. 355	1895	2.54	Pacific ocean	16.883	-99.885	66.46	7.324	22.483	0.945	8.615	24.315	0.291	27.497	0.18	1.332	0.155
63	NYBG	*Ficus citrifolia*	Belize (B. Honduras), El cayo	Gentle, P.H. 9159	1956	40.26	Caribbean sea	17.153	-88.686	197.505	15.892	24.621	1.127	8.05	42.882	0.287	74.713	0.125	1.234	0.128
64	NYBG	*Ficus citrifolia*	Panama, Canal Zone	Mori, S. & J. Kallunki 4038	1974	28.43	Caribbean sea	9.211	-79.617	75.941	1.169	27.782	1.294	4.986	44.963	0.153	2.286	0.161	1.093	0.177
65	NYBG	*Ficus citrifolia*	Costa Rica, San Jose	Jimenez, A. 1296	1963	54.93	Pacific ocean	9.946	-84.176	42.312	27.643	24.034	1.96	12.717	141.689	0.344	20.936	0.179	1.168	0.153
66	NYBG	*Ficus citrifolia*	Ecuador, Pichincha	Gavilanez, M. & P. Mena 1002	1992	155.31	Pacific ocean	-0.033	-78.683	9.735	6.527	24.036	1.381	6.647	184.713	0.186	11.958	0.169	2.094	0.141
67	NYBG	*Ficus citrifolia*	Bolivia, Chiquisaca	Gutierrez, J. 822	2004	1683	Atlantic ocean	-20.565	-64.067	46.663	7.294	28.028	1.54	10.482	55.865	0.466	33.873	0.388	2.618	0.222
68	NYBG	*Ficus citrifolia*	Brazil, Minas Gerais	Duarte, A.P. 7824	1963	362.78	Atlantic ocean	-19.436	-43.855	11.442	14.841	27.771	2.64	6.391	36.581	0.396	23.488	0.214	1.165	0.136
69	NYBG	*Ficus citrifolia*	Brazil, Curitiba	Hatschbach, G., J.M. Silva & J.M. Cruz 68311	1998	223.53	Atlantic ocean	-25.821	-50.821	63.082	2.904	18.644	1.422	4.494	17.494	0.271	33.757	0.13	2.189	0.279
70	NYBG	*Ficus citrifolia*	Brazil, Rondonia	Texeira, L.O.A., A.J. Fife, K. McFarland, C.D.A. Mota, J.L. dos Santos, S.P. Gomes & B.W. Nelson 531	1982	1939	Atlantic ocean	-10.583	-63.583	13.508	4.567	32.677	0.963	2.557	24.487	0.26	9.065	0.152	1.612	0.122
71	NYBG	*Ficus citrifolia*	Brazil, Para	Davidson, C. & G. Martinelli 10313	1980	703.54	Atlantic ocean	-1.761	-55.863	134.344	7.562	20.589	0.75	7.377	55.15	0.42	4.998	0.155	1.465	0.233
72	NYBG	*Ficus citrifolia*	Venezuela, Lara	DeWolf 2061	1968	132.44	Caribbean sea	9.967	-69.276	22.048	7.393	14.414	0.905	7.232	37.447	0.235	12.593	0.21	1.516	0.097
73	NYBG	*Ficus citrifolia*	Brazil, Amazonas	Ribeiro, J.E.L.S. 1694	1995	1199	Atlantic ocean	-2.883	-59.967	409.446	165.415	61.512	1.334	7.549	38.512	0.282	27.073	0.079	1.121	0.169
74	NYBG	*Ficus citrifolia*	Bolivia, Velazco	Guillén, R. & V. Chore 3661	1995	1791	Atlantic ocean	-14.691	-61.171	9.841	NA	25.081	1.019	5.387	44.414	0.177	47.176	0.131	0.877	0.128
75	NYBG	*Ficus citrifolia*	Bolivia, Sta Cruz	Guillén, R. & G. Roca 2497	1994	1818	Atlantic ocean	-14.367	-61.150	159.721	34.737	27.637	1.127	4.812	40.204	0.184	10.73	0.128	1.03	0.121
76	NYBG	*Ficus citrifolia*	Argentina, Misiones	Zuloaga, F.O., O. Morrone & M. Múlgura 5735	1996	621.83	Atlantic ocean	-27.283	-55.583	100.32	7.474	14.988	0.463	3.697	35.552	0.191	25.63	0.27	0.886	0.167
77	NYBG	*Ficus citrifolia*	Bolivia, Santa Cruz	Nee, M. 35514	1987	1735	Atlantic ocean	-17.767	-63.067	41.742	9.119	24.865	1.799	7.217	54.114	0.27	21.141	0.24	1.711	0.174
78	NYBG	*Ficus citrifolia*	Bolivia, Santa Cruz	Perry, L.A. 677	1992	1860	Atlantic ocean	-13.500	-61.000	161.868	1.772	26.311	1.185	3.043	26.207	0.299	29.086	0.13	1.144	0.12
79	NYBG	*Ficus citrifolia*	Ecuador, Morona	Palacios, W. 1505	1986	3138	Atlantic ocean	-3.417	-78.583	8.987	2.622	14.802	0.568	4.584	27.352	0.216	14.011	0.093	0.899	0.128
80	NYBG	*Ficus citrifolia*	Colombia, Antioquia	Callejas, R., S. Churchill, M.V. Arbeláez & V. Maza 9768	1990	40.5	Caribbean sea	8.333	-76.500	110.032	8.53	23.358	1.342	5.547	54.736	0.198	9.441	0.142	1.164	0.121
81	NYBG	*Ficus citrifolia*	Bolivia, Sta Cruz	Nee, M. 54990	2007	1763	Atlantic ocean	-17.993	-63.294	99.79	20.092	23.267	1.396	4.424	46.685	0.234	10.116	0.182	1.435	0.17
82	NYBG	*Ficus citrifolia*	Bolivia, Velazco	Killen, Panfil & Arroyo 5053	1993	1725	Atlantic ocean	-14.803	-60.393	249.88	175.41	22.05	1.44	5.68	46.24	0.142	45.76	0.103	0.723	0.135
83	NYBG	*Ficus citrifolia*	Bolivia, Sta Cruz	Nee, M. 49719	1998	1800	Atlantic ocean	-17.383	-63.600	12.55	9.998	19.355	0.603	3.813	35.669	0.334	35.288	0.216	2.481	0.104
84	NYBG	*Ficus citrifolia*	Bolivia, Ichilo	Vargas C., I.G. 5331	1996	1795	Atlantic ocean	-17.604	-63.599	31.174	2.719	14.087	0.593	4.409	25.695	0.342	13.847	0.219	1.411	0.139
85	NYBG	*Ficus citrifolia*	Bolivia, Beni	Beck, G. 5646	1984	1932	Atlantic ocean	-14.200	-62.617	44.746	8.477	22.708	0.756	3.653	63.421	0.44	60.208	0.255	1.625	0.161
86	NYBG	*Ficus citrifolia*	Ecuador, Carchi	Barfod, A.S., L.P. Kvist & D. Nissen 48629	1983	79.37	Pacific ocean	1.083	-78.283	77.831	2.551	12.565	1.34	5.542	22.039	0.179	7.843	0.117	1.295	0.259
87	NYBG	*Ficus citrifolia*	French Guiana, Aratuye	Riéra, B. & O. Poncy 1685	1993	104	Atlantic ocean	4.050	-52.700	163.331	1.078	23.118	0.851	6.591	19.762	0.18	25.784	0.082	1.161	0.099
88	NYBG	*Ficus citrifolia*	Paraguay, Rio Piribebuy	Zardini, E. 20081	1990	876.6	Atlantic ocean	-25.133	-57.250	46.803	7.104	22.862	0.777	4.616	46.982	0.295	55.626	0.223	1.472	0.145
89	NYBG	*Ficus citrifolia*	Paraguay, Canendiyu	Bernardi 19448	1979	756.49	Atlantic ocean	-24.138	-55.669	51.741	34.201	31.049	1.297	7.024	49.089	0.173	16.11	0.131	1.264	0.13
90	NYBG	*Ficus citrifolia*	Peru, Loreto	Revilla, J. 2296	1977	2679	Atlantic ocean	-3.892	-73.319	41.722	2.659	24.635	1.243	7.289	38.532	0.2	5.069	0.122	1.156	0.16
91	NYBG	*Ficus citrifolia*	Peru, Pasco	Smith, D. 2965	1982	3049	Atlantic ocean	-10.600	-75.383	1.575	NA	18.463	1.37	3.387	36.748	0.139	8.278	0.209	1.392	0.12
92	NYBG	*Ficus citrifolia*	Ecuador, Zamora	Quishpe, W., C. Chimbo & A. Jiménez 195	2002	3179	Atlantic ocean	-4.217	-78.633	104.86	1.485	25.308	0.961	6.618	36.23	0.23	14.569	0.192	1.53	0.133
93	NYBG	*Ficus citrifolia*	Venezuela,Lara	Davidse, G. & A.C. González 20933	1982	170.81	Caribbean sea	9.683	-69.500	364.858	6.695	19.584	1.378	11.151	63.249	0.166	4.916	0.169	0.95	0.17
94	NYBG	*Ficus citrifolia*	Venezuela Caracas	DeWolf, G. 1995	1968	13.26	Caribbean sea	10.493	-66.840	35.577	6.11	16.376	1.246	14.093	50.28	0.288	1.973	0.186	1.303	0.153
95	NYBG	*Ficus citrifolia*	Venezuela, Guarico	DeWolf 2085	1968	177	Caribbean sea	8.922	-67.428	44.966	14.702	23.839	1.053	4.684	63.491	0.565	76.421	0.118	1.119	0.109
96	NYBG	*Ficus citrifolia*	Venezuela, PN Qda. Cueva del Toro	Liesner, R., A. González & R. Wingfield 7921	1979	71.27	Caribbean sea	10.833	-69.117	843.419	8.099	24.935	0.918	2.317	50.609	0.191	1.927	0.101	0.732	0.135
97	NYBG	*Ficus citrifolia*	Venezuela, Tachira	Liesner, R. & M. Guariglia 11695	1981	348.8	Caribbean sea	7.900	-72.300	68.861	26.953	11.768	0.643	8.701	36.683	0.237	190.819	0.126	1.051	0.173
98	NYBG	*Ficus citrifolia*	Trinidad, Tamana	Kalloo, M.B. 503	1962	17.29	Caribbean sea	10.600	-61.183	460.02	2.178	21.219	1.541	7.143	31.129	0.154	31.698	0.136	0.917	0.123
99	NYBG	*Ficus maxima*	Belize, Orange Walk	Dwyer, J.D 12766	1974	64.4	Caribbean sea	18.110	-88.552	186.026	10.916	30.568	1.476	5.048	27.879	0.301	NA	0.116	2.031	0.255
100	NYBG	*Ficus maxima*	Costa Rica, Puntarenas	Grayum, M. 7980	1987	0.12	Pacific ocean	9.400	-84.167	328.477	2.351	32.134	0.825	5.828	19.705	0.445	3.889	0.207	1.675	0.222
101	NYBG	*Ficus maxima*	Nicaragua, Managua	Araquistain, M. 3557	1983	94.75	Pacific ocean	12.583	-86.000	109.062	19.034	33.387	2.045	5.081	48.44	0.5	9.312	0.211	1.479	0.2
102	NYBG	*Ficus maxima*	Mexico, San Luis de Potosi	Merril, R. 4285	1961	148.29	Gulf of Mexico	21.383	-98.991	44.779	23.687	29.267	1.388	7.237	62.567	0.331	3.494	0.257	2.358	0.324
103	NYBG	*Ficus maxima*	Panama, BCI	Croat, T.B. 8363	1969	26.44	Caribbean sea	9.152	-79.846	62.932	NA	48.912	2.021	4.034	14.01	0.367	34.322	0.103	1.626	0.254
104	NYBG	*Ficus maxima*	Nicaragua, Esteli	Stevens, W.D. 9962	1978	102.16	Pacific ocean	13.033	-86.333	1157.252	58.481	27.135	1.905	6.789	95.367	0.629	24.245	0.293	2.289	0.383
105	NYBG	*Ficus maxima*	Guatemala, Peten	Lundell, C.L. 17073	1962	139.38	Caribbean sea	17.226	-89.615	1528.597	4.489	47.894	0.666	1.563	22.013	0.23	3.081	0.106	2.385	0.098
106	NYBG	*Ficus maxima*	Belize (B. Honduras), Toledo	Gentle, P.H. 6763	1949	0.49	Caribbean sea	16.099	-88.809	337.42	NA	22.656	1.067	4.117	20.593	0.436	10.337	0.137	1.766	0.242
107	NYBG	*Ficus maxima*	Mexico, Calkini	May P., F., S. Hernández A. & C. Yam 1924	2001	12.15	Gulf of Mexico	20.533	-90.364	1408.1	4.145	55.074	1.034	6.342	25.479	0.457	4.754	0.209	2.613	0.34

108	NYBG	*Ficus maxima*	Venezuela, Aragua Road	Edwards, K.S. & T. Roe 450	1990	16.55	Caribbean sea	10.350	-67.717	165.861	11.981	37.102	1.371	3.214	32.729	0.174	21.927	0.056	0.837	0.141
109	NYBG	*Ficus maxima*	Peru, Junin	Killip A.P. & A.C. Smith 25166	1929	2944	Atlantic ocean	-11.151	-74.246	97.357	8.623	41.538	1.609	3.266	32.754	0.488	16.804	0.205	2.426	0.207
110	NYBG	*Ficus maxima*	Peru, Loreto	Rimachi, M.Y. 2317	1976	2042	Atlantic ocean	-3.788	-73.346	75.11	118.803	23.468	1.184	4.706	37.125	0.36	66.159	0.184	1.932	0.248
111	NYBG	*Ficus maxima*	Brazil, Acre	Daly, D.C., M. Silveira, J.M.D. Torezan, R. Saraiva, A.R.S. Oliveira & L. Lima 8830	1996	2736	Atlantic ocean	-7.510	-72.972	13.257	15.661	31.241	1	3.44	32.066	0.344	111.768	0.138	1.112	0.214
112	NYBG	*Ficus maxima*	Brazil, Para	Prance, G.T., T.D. Pennington & N.T. Silva 1631	1965	311	Atlantic ocean	-2.550	-50.633	12.097	5.688	74.254	0.662	4.376	10.264	0.433	6.689	0.156	1.902	0.183
113	NYBG	*Ficus maxima*	Venezuela, Amazonas	Wurdack, J.J. & L.S. Adderley 43068	1959	510	Caribbean sea	6.071	-67.459	6.625	67.654	17.774	0.681	6.635	21.747	0.394	239.372	0.208	2.384	0.15
114	NYBG	*Ficus maxima*	Colombia, Antioquia	Sánchez, D., C. Orrego, S. Sylva, G. Martínez & D. Restrepo 1510	1987	111.64	Pacific ocean	6.717	-76.401	23.589	30.044	20.606	1.141	4.984	25.58	0.223	204.584	0.082	1.017	0.158
115	NYBG	*Ficus maxima*	Brasil, Matto Grosso	Silva, M.G. & C. Rosario 4838	1979	2100	Atlantic ocean	-15.811	-58.258	167.737	77.307	20.776	0.945	7.273	18.559	0.258	16.764	0.106	1.903	0.13
116	NYBG	*Ficus maxima*	French Guiana, Cirque Canceler	Toriola-Marbot, D. & M. Hoff 208	1992	12.27	Atlantic ocean	5.367	-53.033	160.662	74.117	23.698	0.44	4.399	36.984	0.415	34.301	0.136	1.564	0.178
117	NYBG	*Ficus maxima*	Ecuador, Napo	Zaruma, J., D. Neill, M. Baker & W. Palacios 246	1985	3026	Atlantic ocean	-1.067	-77.600	76.871	25.614	25.125	1.853	5.797	19.357	0.266	7.643	0.163	1.536	0.139
118	NYBG	*Ficus maxima*	Venezuela, Delta Amacuro	Steyermark, J.A. 87237	1960	40.37	Atlantic ocean	8.088	-60.066	277.537	58.645	30.118	0.854	6.134	33.6	0.428	167.731	0.246	1.927	0.253
119	NYBG	*Ficus maxima*	Bolivia, Madidi	Fuentes, A., A. Araujo, D. de la Quintana & M. Villanueva 3978	2002	2413	Atlantic ocean	-14.648	-67.794	963.422	50.922	38.815	0.893	5.598	58.847	0.196	45.335	0.265	2.353	0.235
120	NYBG	*Ficus maxima*	Trinidad, Nariva Swamp	Ramcharan, E.K. 420	1978	4.28	Atlantic ocean	10.417	-61.066	3268.577	9.324	34.664	1.471	6.032	37.805	0.341	21.879	0.245	1.82	0.226
121	NYBG	*Ficus maxima*	Venezuela, Zulia	Bunting, G.S. & C. Bowles 5254	1977	12.59	Caribbean sea	11.361	-72.059	519.923	13.045	38.774	0.752	8.254	17.871	0.321	2.063	0.252	2.12	0.184
122	NYBG	*Ficus maxima*	Peru, San Martin	Schunke V., J. 6235	1973	3227	Atlantic ocean	-6.047	-76.982	30.504	221.217	68.125	0.968	6.805	55.094	0.214	27.212	0.243	3.131	0.19
123	NYBG	*Ficus maxima*	Peru, San Martin	Belshaw, C.M. 3509	1937	2993	Atlantic ocean	-6.361	-76.362	34.02	3.978	36.238	1.845	6.286	29.852	0.255	2.419	0.293	2.984	0.147
124	NYBG	*Ficus maxima*	Venezuela, Tachira	Liesner, R. & A. Gonzáles 10936	1981	776.12	Caribbean sea	7.467	-72.150	33.283	103.285	40.054	0.856	6.53	29.363	0.325	42.644	0.282	2.522	0.239
125	NYBG	*Ficus maxima*	Bolivia, Santa Cruz	Nee, M. & I. Vargas C. 39239	1990	2642	Atlantic ocean	-17.717	-63.650	374.475	11.693	28.271	1.723	3.695	35.497	0.29	6.606	0.162	1.208	0.139
126	NYBG	*Ficus maxima*	Bolivia, Sta Cruz	Lewis, M. 37791	1990	1795	Atlantic ocean	-17.733	-63.650	245.605	5.326	27.583	2.268	3.534	26.752	0.479	9.762	0.168	1.46	0.166
127	NYBG	*Ficus maxima*	Bolivia, Sta Cruz	Nee, M. 43195	1992	1783	Atlantic ocean	-17.367	-63.200	77.463	27.712	27.183	0.769	5.275	41.748	0.263	5.664	0.152	1.754	0.098
128	NYBG	*Ficus maxima*	Bolivia, Sta Cruz	Nee, M. 45976	1994	1830	Atlantic ocean	-17.250	-63.900	15.168	4.309	22.734	1.87	4.594	32.603	0.339	10.983	0.272	2.037	0.21
129	NYBG	*Ficus maxima*	Peru, Loreto	Killip A.P. & A.C. Smith 28381	1929	2477	Atlantic ocean	-5.831	-76.559	3562.255	5.603	39.461	1.309	4.785	51.181	0.353	11.215	0.274	3.396	0.282
130	NYBG	*Ficus maxima*	Venezuela, Portugesa	Stergios, B., G. Aymard & L. Paez 7936	1985	235.6	Caribbean sea	9.076	-69.817	53.489	4.088	31.078	1.236	5.088	30.478	0.368	7.257	0.279	2.259	0.318
131	NYBG	*Ficus maxima*	Peru, Cajamarca	Campos, J. & O. Cano 4685	1997	3347	Atlantic ocean	-5.352	-79.284	296.712	9.631	17.798	2.836	4.489	37.64	0.226	18.124	0.126	1.022	0.154
132	NYBG	*Ficus maxima*	Peru, Loreto	Revilla, J. 268	1976	2652	Atlantic ocean	-3.715	-73.200	55.644	35.142	39.084	2.011	6.092	75.442	0.372	14.551	0.192	2.497	0.244
133	NYBG	*Ficus maxima*	Brazil, Amazonia	Oliveira, E. 4433	1968	353	Atlantic ocean	-19.966	-44.038	53.405	137.029	51.102	0.442	3.816	25.661	0.407	37.72	0.169	2.437	0.187
134	NYBG	*Ficus maxima*	Venezuela, Fdo Miranda	DeWolf 2077	1968	55.65	Caribbean sea	10.100	-66.431	193.578	22.601	30.815	0.576	7.313	32.218	0.385	14.256	0.165	1.625	0.247
135	NYBG	*Ficus maxima*	F. Guyana, Cayenne	Prévost, M.F. 3604	1998	0.5	Atlantic ocean	4.948	-52.318	745.935	267.966	33.248	0.983	6.026	22.199	0.487	96.157	0.289	2.427	0.387
136	NYBG	*Ficus maxima*	Colombia, Magdalena	Kirkbride, J.H., Jr. 2380	1972	30.92	Caribbean sea	10.933	-73.967	31.973	77.801	27.271	0.923	2.571	40.066	0.374	13.405	0.106	1.798	0.127
137	NYBG	*Ficus insipida*	Veracruz, Mexico	M. Nee & K. Taylor 26512	1983	19.5	Gulf of Mexico	18.133	-94.767	180.579	35.352	24.42	0.646	4.63	47.117	0.489	13.206	0.184	1.936	0.126
138	NYBG	*Ficus insipida*	Brazil, Acre	Silveira, M., D. Daly, J.M.D. Torezan, A.R.S. Oliveira, & L. Lima 1199	1996	2768	Atlantic ocean	-7.469	-73.568	7.877	76.043	8.342	0.852	2.937	43.355	0.269	127.368	0.125	1.328	0.102
139	NYBG	*Ficus insipida*	Colombia, Antioquia	Callejas, R., J. Betancur, F.J. Roldán 4664	1987	237	Caribbean sea	7.433	-74.833	46.186	494.241	25.237	2.028	7.08	26.891	0.359	339.928	0.137	1.313	0.157
140	NYBG	*Ficus insipida*	Bolivia, Beni	Solomon, J.C. 6528	1981	2232	Atlantic ocean	-11.133	-66.167	30.624	8.014	21.392	1.605	7.994	32.57	0.693	40.583	0.245	2.403	0.297
141	NYBG	*Ficus insipida*	Colombia, Antioquia	Feddema, C. 1957	1962	56.45	Caribbean sea	7.750	-76.833	61.258	11.353	21.523	1.561	8.493	40.848	0.349	47.177	0.224	2.637	0.164
142	NYBG	*Ficus insipida*	Peru, Loreto	Vasquez, R. & N. Jaramillo 012	1980	1992	Atlantic ocean	-3.333	-72.667	50.082	35.754	21.418	2.066	7.256	36.721	0.592	27.393	0.25	3.065	0.225
143	NYBG	*Ficus insipida*	Venezuela, Zulia	Bunting, G.S., G. Panapera, H. Lobo 10989	1982	192	Caribbean sea	9.592	-72.899	650.686	40.883	13.681	1.063	11.589	59.119	0.31	119.042	0.159	1.289	0.224
144	NYBG	*Ficus insipida*	Venezuela, Zulia	Bunting, G.S., R. León 12866	1983	89	Caribbean sea	10.880	-72.486	213.461	62.153	27.859	2.613	7.698	34.074	0.468	43.369	0.197	1.964	0.186
145	NYBG	*Ficus insipida*	Venezuela, Caracas	DeWolf 1990	1968	14	Caribbean sea	10.493	-66.839	261.224	63.206	29.763	1.794	2.591	38.213	0.387	22.137	0.116	0.817	0.099
146	NYBG	*Ficus insipida*	Venezuela, Aragua-Miranda	Stayermark, J. A & J. Steyermark 110030	1974	36.7	Caribbean sea	10.238	-67.081	216.946	127.953	19.613	0.835	7.419	67.208	0.535	31.759	0.275	2.479	0.175
147	NYBG	*Ficus insipida*	Ecuador, Napo	Bennett, B., R. Alarcón & SFS 4320	1990	2300	Atlantic ocean	-1.067	-77.650	76.809	29.951	18.198	1.642	5.329	33.881	0.237	6.509	0.22	2.006	0.139
148	NYBG	*Ficus insipida*	Mexico, Vallecitos	Hinton, B.G. et al. 10276	1937	23.52	Pacific ocean	17.976	-101.601	455.973	3.849	38.192	1.198	5.175	27.699	0.387	7.757	0.202	1.784	0.191
149	NYBG	*Ficus insipida*	Colombia, Santander	Rentería, E. et al. 1837	1979	364	Caribbean sea	6.517	-74.100	109.441	67.995	21.49	1.696	6.502	49.117	0.447	134.18	0.185	2.48	0.154
150	NYBG	*Ficus insipida*	Peru, Madre de Dios	Manice, P. PHM-106	1986	2750	Atlantic ocean	-11.867	-71.383	48.425	31.455	22.382	1.214	4.224	22.23	0.39	11.89	0.108	1.742	0.127
151	NYBG	*Ficus insipida*	Para, Brazil	Revilla, J., F.E. Miranda, E. Lima & A. Silva 8657	1983	418	Atlantic ocean	-3.776	-49.653	1208.574	16.234	36.486	1.431	4.045	52.886	0.74	108.461	0.161	0.661	0.181
152	NYBG	*Ficus insipida*	Mexico, Jalisco	Ayala, M.G. 126	1991	3.66	Pacific ocean	19.450	-105.033	216.805	12.706	25.141	1.191	8.206	36.514	0.678	34.665	0.206	2.459	0.334
153	NYBG	*Ficus insipida*	Mexico, San Luis de Potosi	Palmer, E. 679	1905	160	Gulf of Mexico	21.967	-99.256	44.48	4.161	77.977	1.031	8.989	42.527	0.318	3.897	0.177	1.876	0.206
154	NYBG	*Ficus insipida*	Mexico, Temascaltepec	Hinton, B.G. 8888	1936	217.34	Pacific ocean	19.044	-100.047	114.076	5.64	19.497	2.592	5.182	23.41	0.741	16.888	0.15	1.195	0.324
155	NYBG	*Ficus insipida*	Panama, BCI	Croat, T.B. 8220	1969	25.5	Caribbean sea	9.152	-79.846	264.943	114.602	45.891	1.689	3.282	70.871	0.284	242.543	0.129	2.075	0.173
156	NYBG	*Ficus insipida*	Costa Rica, Rio Ciruelas de Miramar	Burger, W. & W. Ramirez 4050	1966	10.1	Pacific ocean	10.017	-84.717	97.958	3.309	35.733	1.415	9.277	36.945	0.563	27.752	0.194	1.54	0.228
157	NYBG	*Ficus insipida*	Costa Rica, Liberia-Bagaces	Burger, W. & W. Ramirez 4119	1966	26	Pacific ocean	10.550	-85.383	31.497	46.419	38.026	0.625	6.404	37.316	0.233	16.661	0.165	3.737	0.163
158	NYBG	*Ficus insipida*	Mexico, Chiapas	Aguilar, G. 902	2002	198	Gulf of Mexico	16.984	-91.285	15.72	5.788	15.124	1.355	5.02	19.372	0.602	3.639	0.204	1.989	0.206
159	Los Amigos	*Ficus insipida*	Peru, Madre de Dios	--	2008	2651	Atlantic ocean	-12.302	-70.384	19.683	59.446	16.164	1.725	9.05	153.907	0.385	42.245	0.173	2.148	0.145
160	Los Amigos	*Ficus insipida*	Peru, Madre de Dios	--	2008	2651	Atlantic ocean	-12.302	-70.384	25.912	83.217	16.78	1.891	8.69	93.383	0.411	61.292	0.182	2.184	0.154
161	Los Amigos	*Ficus maxima*	Peru, Madre de Dios	--	2008	2651	Atlantic ocean	-12.302	-70.384	42.098	60.111	25.411	0.889	6.499	85.191	0.233	25.866	0.175	2.445	0.138
162	Los Amigos	*Ficus maxima*	Peru, Madre de Dios	--	2008	2651	Atlantic ocean	-12.302	-70.384	36.683	64.593	25.422	0.9	6.679	66.487	0.239	36.234	0.18	2.437	0.137

(*) Year of specimen collection

(**) Distance to the nearest effective source of marine sodium

(***) Nearest effective marine sodium source

MBG = Missouri Botanical Garden

NYBG = New York Botanical Garden

Zn (ppm)
21.437
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