

#1975 Long-term Annonaceae Fruit Consumption Is Associated With Cognitive Decline And Brain Atrophy

P2-13

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Annonaceae fruits such as soursop or sweetsop are widely consumed for their taste and for traditional medicine applications in tropical areas and in diaspora populations. Our recent study suggests that long-term Annonaceae fruit consumption, even moderate, could be considered as a dementia risk factor. We recommend to limit Annonaceae fruit consumption before further prospective studies.



INTRODUCTION

METHODS

RESULTS: Behavior

RESULTS: Imaging

CONCLUSIONS

Annonaceae fruits such as soursop (*Annona muricata*) are widely available and consumed across tropical regions (Fig1 Soursop).

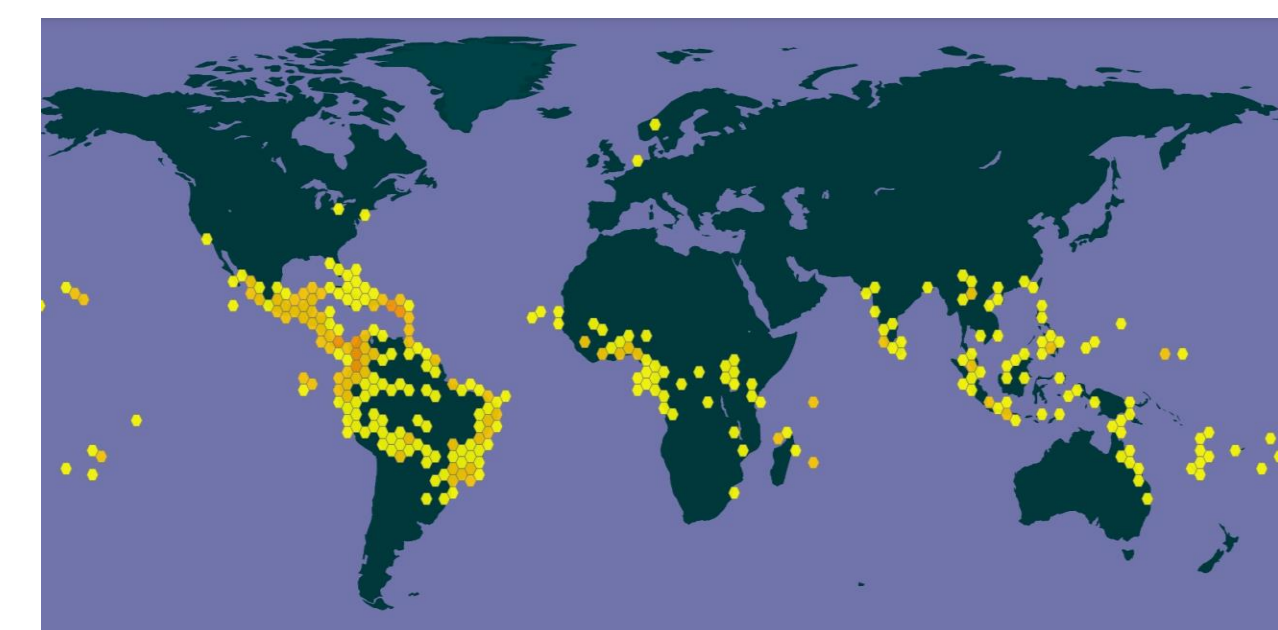


Fig 1. Geographic distribution of soursop plants (A. muricata)

Annonaceae fruits contain toxic components named acetogenins which are mitochondrial complex I inhibitors causing neuronal energy failure and tau-related neuronal degeneration in animal models.

Annonaceae fruits have been associated with increased risk of atypical and severe parkinsonism in humans, mostly in Caribbean region.

The impact of long-term dietary Annonaceae exposure on human neurocognition and brain atrophy remains unknown.

We retrospectively analyzed medical records from 96 adults of tropical origin presenting with cognitive complaints at a French tertiary memory clinic (2015-2023).

Annonaceae exposure was assessed using a semiquantitative scale (range 0-54). We investigated consumption of 3 fruits (A. muricata, A. squamosa and A. reticulata), during 3 periods (childhood, adulthood, last month) and under 3 preparations (fruit, juice or infusion). Other Annonaceae fruits were not assessed.

Neurocognitive disorders were diagnosed according to DSM-5 criteria. Cognitive performance was evaluated using the Mini-Mental State Examination (MMSE) and a comprehensive neuropsychological battery.

Multivariate models were adjusted for age, sex, education, origin, hypertension, diabetes, dyslipidaemia, alcohol, smoking.

Fifty participants underwent 3D T1w MRI for voxel-based morphometry (VBM).

	Whole sample	Exposed	Not-exposed	P
n	96	80	16	
Age	65.68 (10.52)	65.96 (10.38)	64.25 (11.41)	0.584
Sex ratio M/F	44/52	34/46	10/6	0.143
Origin				<0.001
Americas	56 (58.3%)	55 (68.8%)	1 (6.3%)	
Africa	25 (26.0%)	16 (20%)	9 (56.3%)	
Asia	15 (15.6%)	9 (11.3%)	6 (37.5%)	
High school or above	61 (63.5%)	46 (57.5%)	15 (93.8%)	0.010
Hypertension	55 (57.3%)	48 (60.0%)	7 (43.8%)	0.230
Diabetes	23 (24.0%)	22 (27.5%)	1 (6.3%)	0.107
Dyslipidaemia	31 (32.3%)	28 (35.0%)	3 (18.8%)	0.253
Excessive alcohol	10 (10.4%)	9 (11.3%)	1 (6.3%)	1
Smoking	7 (7.3%)	6 (7.5%)	1 (6.3%)	1
Annonaceae consumption				
Soursop	3.51 (3.54; 0-15)	4.21 (3.48; 0-15)	0	-
Sweetsop	2.32 (2.42; 0-12)	2.79 (2.40; 0-12)	0	-
Custard apple	0.57 (1.21; 0-7)	0.69 (1.30; 0-6)	0	-
Annonaceae before age 20	3.76 (3.17; 0-13)	4.51 (2.94; 0-13)	0	-
Total Annonaceae	6.41 (6.05; 0-25)	7.73 (5.81; 1-25)	0	-
Clinical presentation				
Any NCD	81 (84.4%)	70 (87.5%)	11 (68.8%)	0.131
Major NCD	35 (36.5%)	31 (38.8%)	4 (25%)	0.398
Axial parkinsonism	5 (5.2%)	5 (6.3%)	0 (0%)	0.586
Limb parkinsonism	7 (7.3%)	5 (6.3%)	2 (1.3%)	0.330
Cognitive performance				
MMSE	22.52 (5.45)	21.81 (5.55)	26.06 (3.11)	<0.001

Regular Annonaceae consumption is highly prevalent (83%) in the sample.

In multivariate models, **higher Annonaceae fruit consumption is associated with:**

- increased odds of dementia** (OR 1.22 [1.10–1.39], $P_{adj} < 0.001$)
- decreased MMSE scores** ($\beta = -0.42$, $P_{adj} < 0.001$)

Greater exposure to Annonaceae fruits is associated with reduced grey matter volume in bitateral temporal, occipitotemporal, and frontal regions ($P_{FDR-corrected} < 0.05$).

Area	T-value	N voxels	x	y	z
Left fusiform gyrus. left inferior temporal gyrus	4.78	1468	-42	-38	-26
Left inferior frontal gyrus pars opercularis BA 44/45	4.76	575	-58	14	20
Right fusiform gyrus	4.48	205	44	-38	-18
Right middle frontal gyrus posterior segment	4.33	117	39	22	54
Left middle frontal gyrus	4.30	108	-40	33	20
Left temporal pole: middle temporal gyrus	4.24	528	-42	8	-38
Right inferior temporal gyrus	4.10	76	38	-2	-39

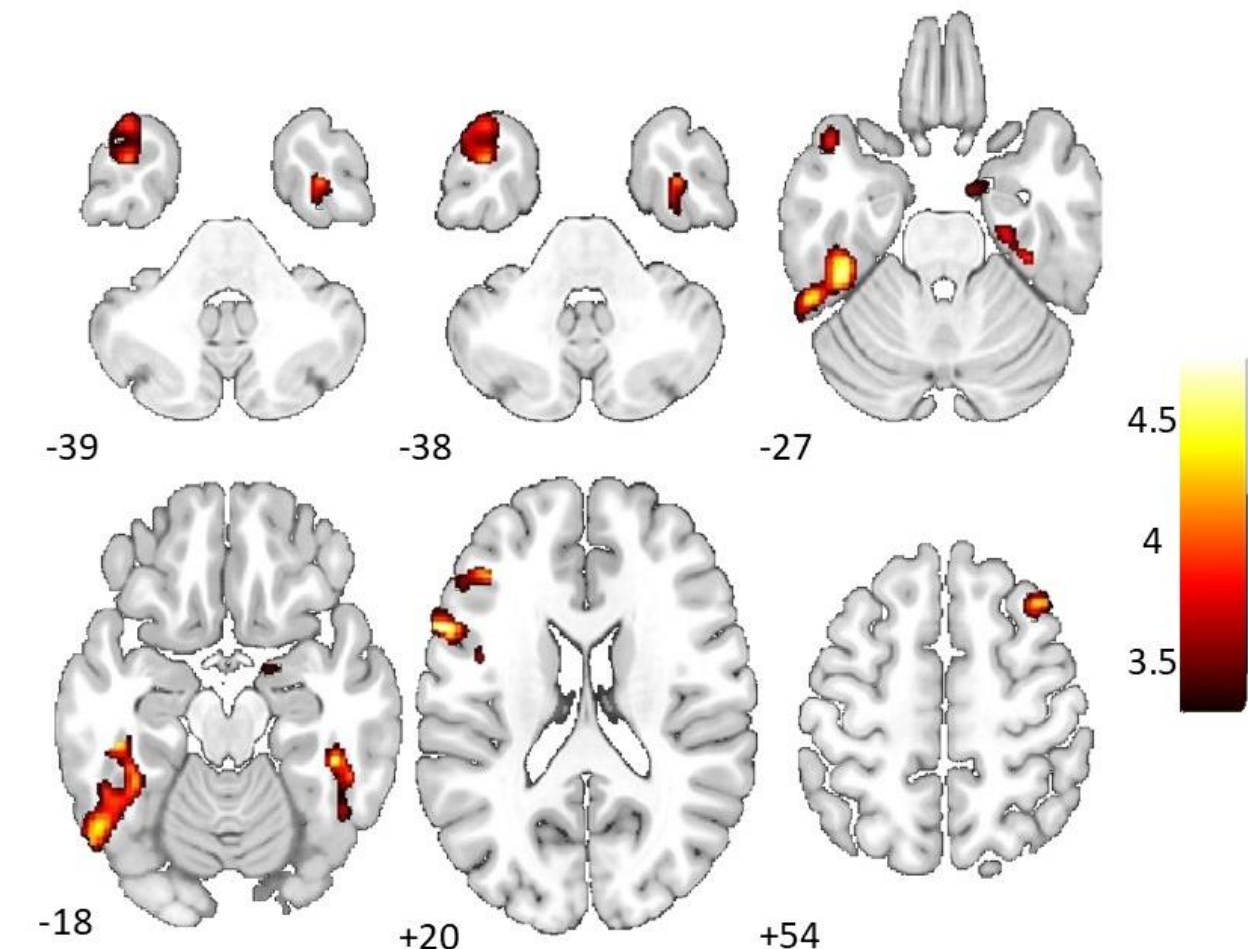


Fig 2. Reduced grey matter regions associated with higher Annonaceae consumption (N = 50, VBM analysis, adjusted for age, education and total intracranial volume)

Chronic Annonaceae consumption is associated with worse cognitive performance and region-specific brain atrophy in this exploratory study. These findings identify chronic Annonaceae fruit consumption as a candidate environmental risk factor for dementia in tropical and diaspora populations, warranting prospective epidemiological investigation with quantitative exposure assessment.

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