Survey of traditional leafy vegetables-based recipes in southern Benin and nutritional values of dishes in Kpomasse district

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LEAFY VEGETABLES: CONCEPT AND NUTRITIONAL IMPORTANCE

- Leafy vegetable = rich food: protein, minerals, vitamin, antinutritional and bioactive
- Traditional Vegetables → key role in daily diets of communities in Benin
- Africa, traditional leafy vegetable are consumed after processing (trituration, blanching, precooking, cooking)

Orech *et al.* (2005); Akubugwo *et al*. (2007); Ejoh *et al*. (2008); Afolayan & Jimoh (2009)

LEAFY VEGETABLES: CONCEPT AND NUTRITIONAL IMPORTANCE

- Leafy vegetable added in stew, soup, sauce, fritter

- In Bénin, leafy vegetable are mostly consumed like sauce :«mangniyan», «mansiso», «mansinon» etc…

LEAFY VEGETABLES: CONCEPT AND NUTRITIONAL IMPORTANCE

Cooking

- Reduction level of mineral, phenolics compounds, carotenoid, Vit C, antioxydant capacity and antinutritionnels factors

Turkmen *et al*. (2001); Zhang & Hamauzu (2004); Mepha *et al*. (2007); Oscarsson & Savage (2007); Ejoh *et al*. (2008)

LEAFY VEGETABLES: CONCEPT AND NUTRITIONAL IMPORTANCE

Blanching

✓ Decrease mineral and vitamin C

✓ Decrease inhibitor activity of trypsine and chymotrypsine

✓ Inactivate enzym, elimination of bad taste

Mepha (2007); Mosha (1999); Fellow (1990)

Research Questions

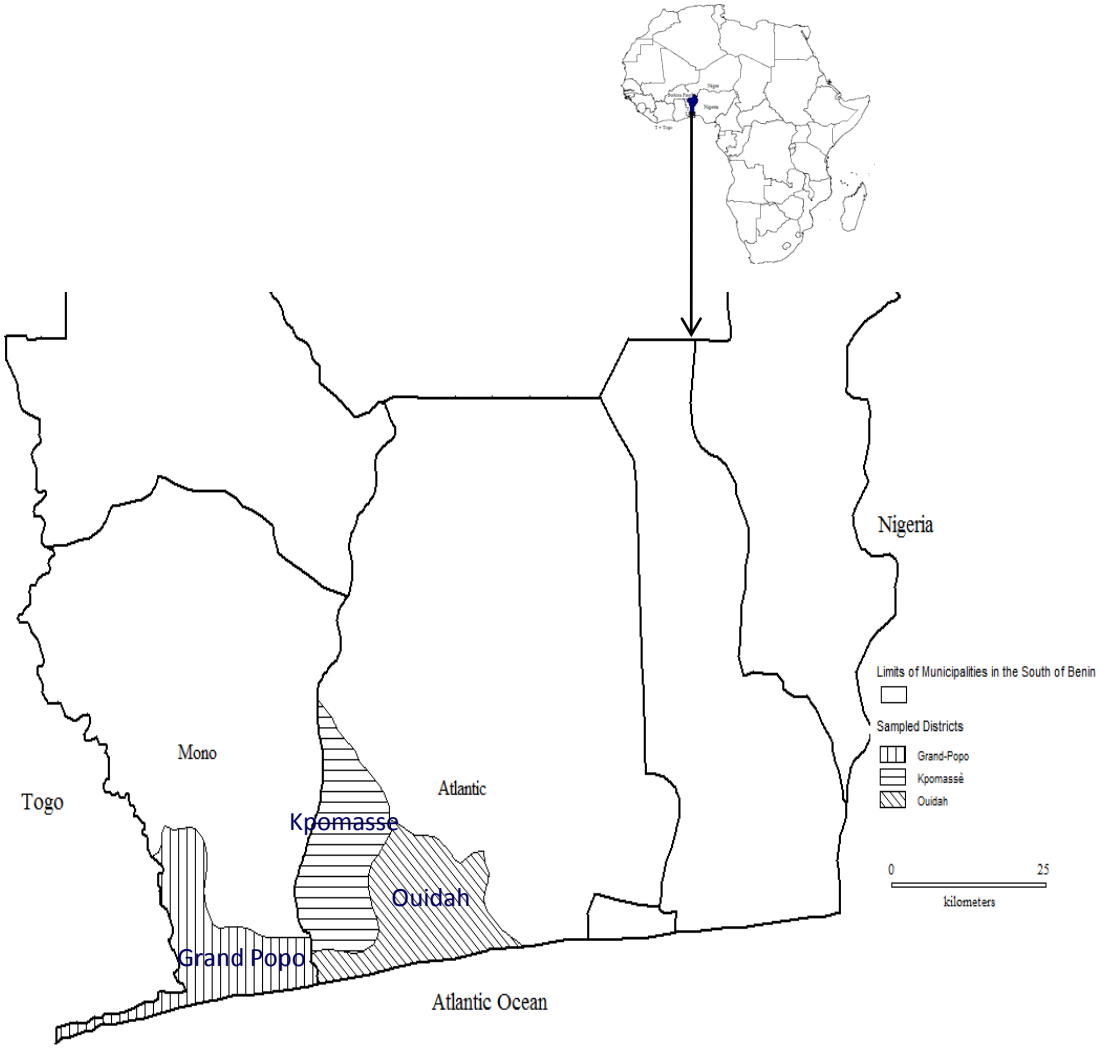
Recipes integrating four TVs consumed in South of Benin?

Nutritional values of dishes based on traditional leafy vegetables?

SO1: Collect recipes based on LfV

Survey area

Survey carried out in
21 localities
In three districts:
Ouidah, Kpomasse
and Grand-Popo
in southern Benin



SO1: Collect recipes based on LfV

Respondents and species of interest

Members of health clubs of project area, selected by APRETECTRA NGO

Respondents: women, 15 to 21 in each district

Four species selected by health clubs

Talinum triangulare (Jacq.) Willd.

Ocimum gratissimum L.

Moringa oleifera Lam.

Cleome gynandra L.

SO1: Collect recipes based on LfV

Data collection

56 individual interviews

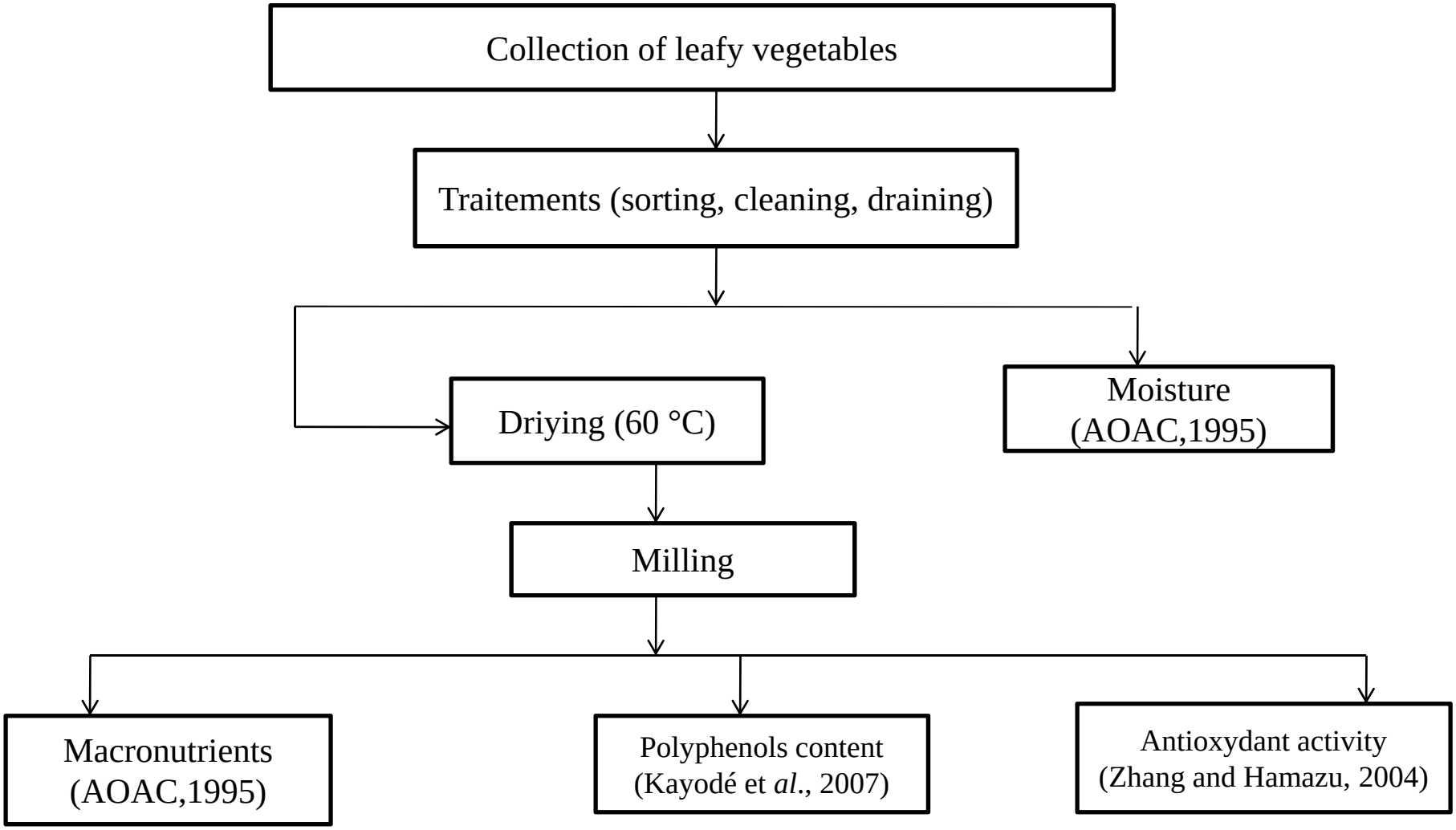
Information collected: species sold, use patterns and preferences, age categories, consumption frequencies, most consumed species, recipes, medicinal attributes, species acquisition modes, and preservation techniques

Data analysis

Descriptive stats, ANOVA, Spearman’s test

SO2: Nutritional values of dishes based on traditional leafy vegetable

Nutritional value of leafy vegetables



SO2: Nutritional values of dishes based on traditional leafy vegetable

Nutritional values of dishes

- Choice of widespread recipes based on survey results
- Random choice of 2 housewifes per processing methods

SO2: Nutritional values of dishes based on traditional leafy vegetable

Preparation of samples

* samples with or without source of protein

* Milling

Biochemical analysis (FSA/UAC, Benin)

Statistical analysis: ANOVA (Statistica)

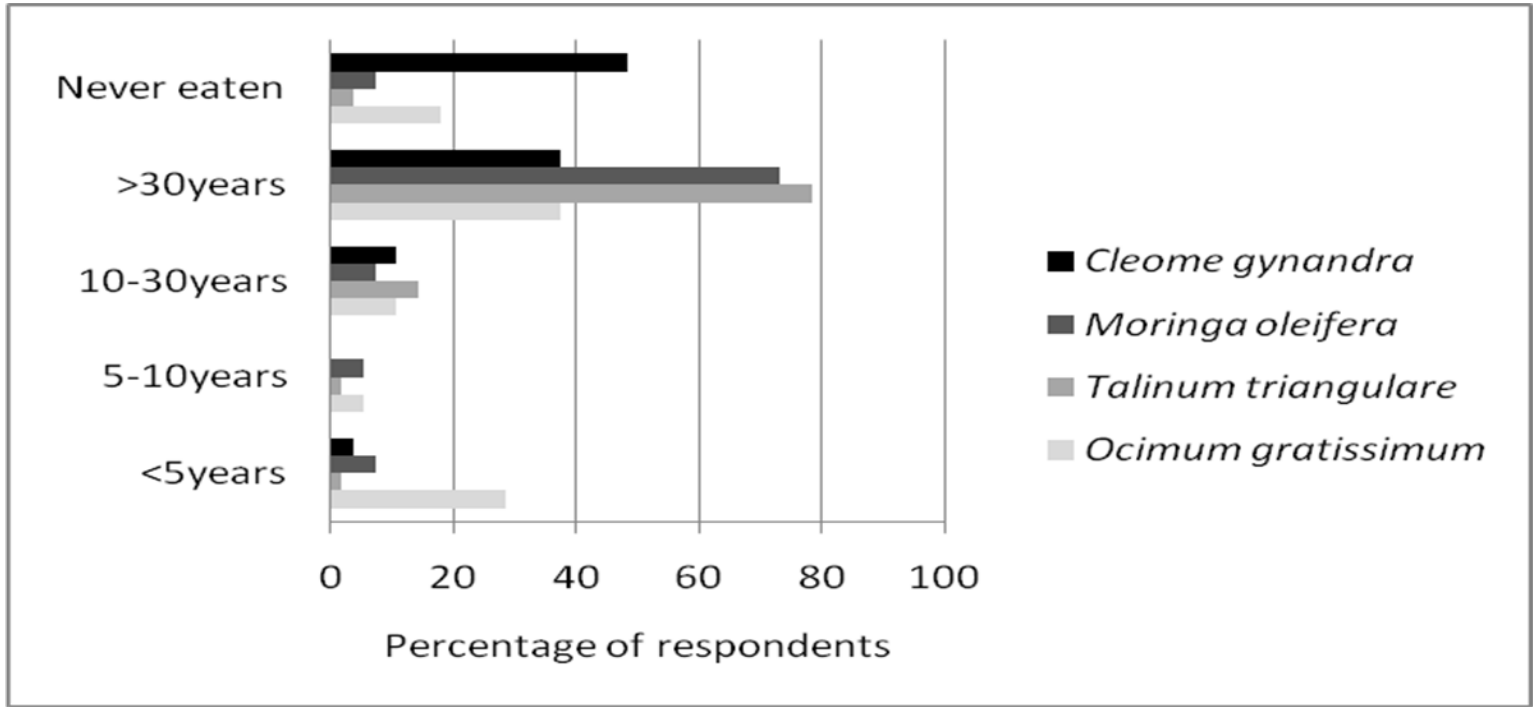
Key Results

Main recipes from the 4 target species

Recipes groups	*O. gratissimum*	*C. gynandra*	*M. oleifera*	*T. triangulare*
M1	Precooked with / without water and cooked in palm nut sauce			
M2	Precooked with / without water and cooked in oil sauce			
M3	Fresh leaves directly cooked in palm nut or oil sauce		-	
M4	Triturated and precooked leaves in water, cooked in palm nut sauce	-	Triturated precooked leaves in water cooked in palm nut sauce	-

Key Results

Species Consumption History



No cultural (ethnicity) influence on the preference for any of the four selected species ($p>0.05$).

Key Results

Consumption patterns (%)

Recipe groups	***Ocimum gratissimum***	***Talinum triangulare***	***Moringa oleifera***	***Cleome gynandra***
M1	36,36	38,18	38,18	14,55
M2	52,73	89,09	80,00	34,55
M3	1,82	-	-	1,82
M4	12,73	-	1,82	-

Key Results

3 recipes with *Moringa*, *Ocimum*

* precooking + cooking with palm oil

* precooking + cooking with palm nut juice

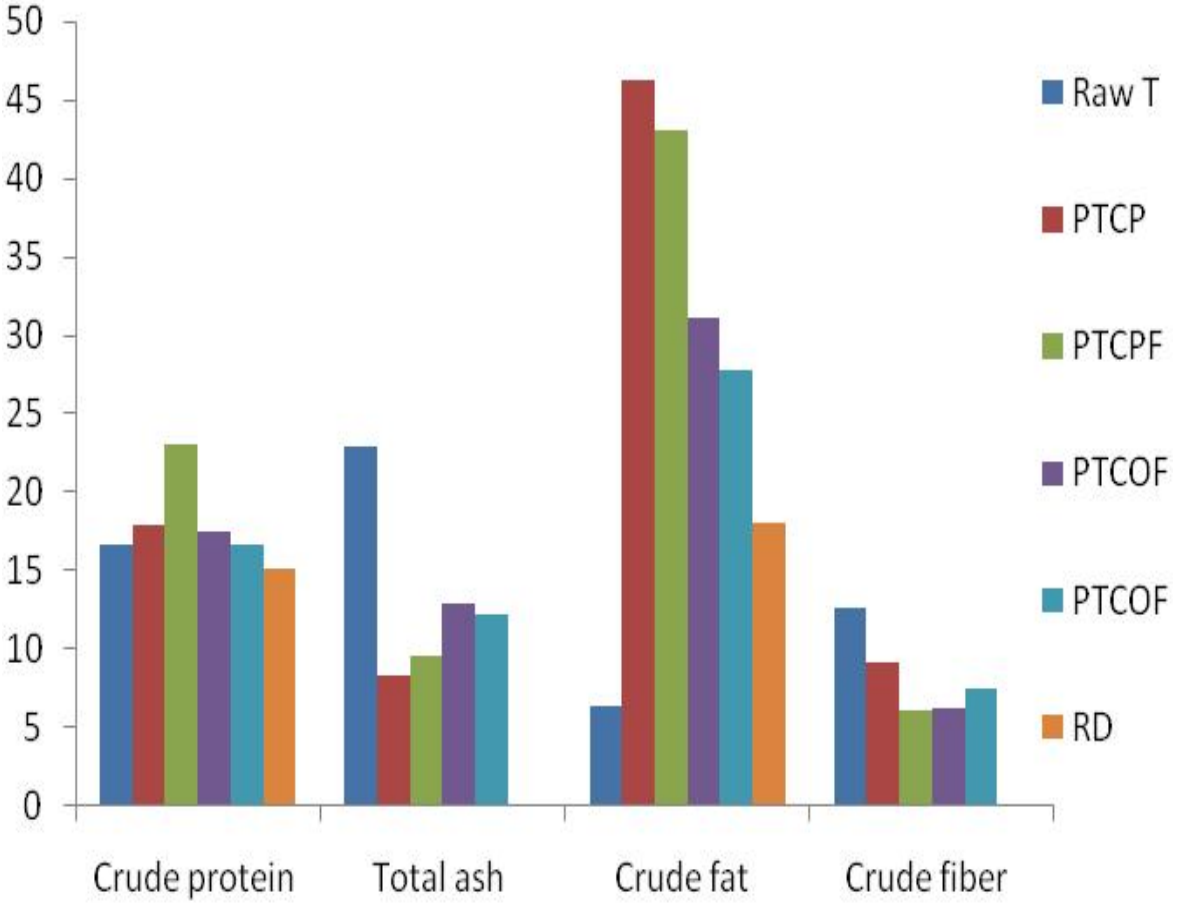
*trituration +precooking + cooking with palm oil

2 recipes for *Talinum*

* precooking of leaves + cooking with palm oil

* precooking of leaves + cooking with palm nut juice

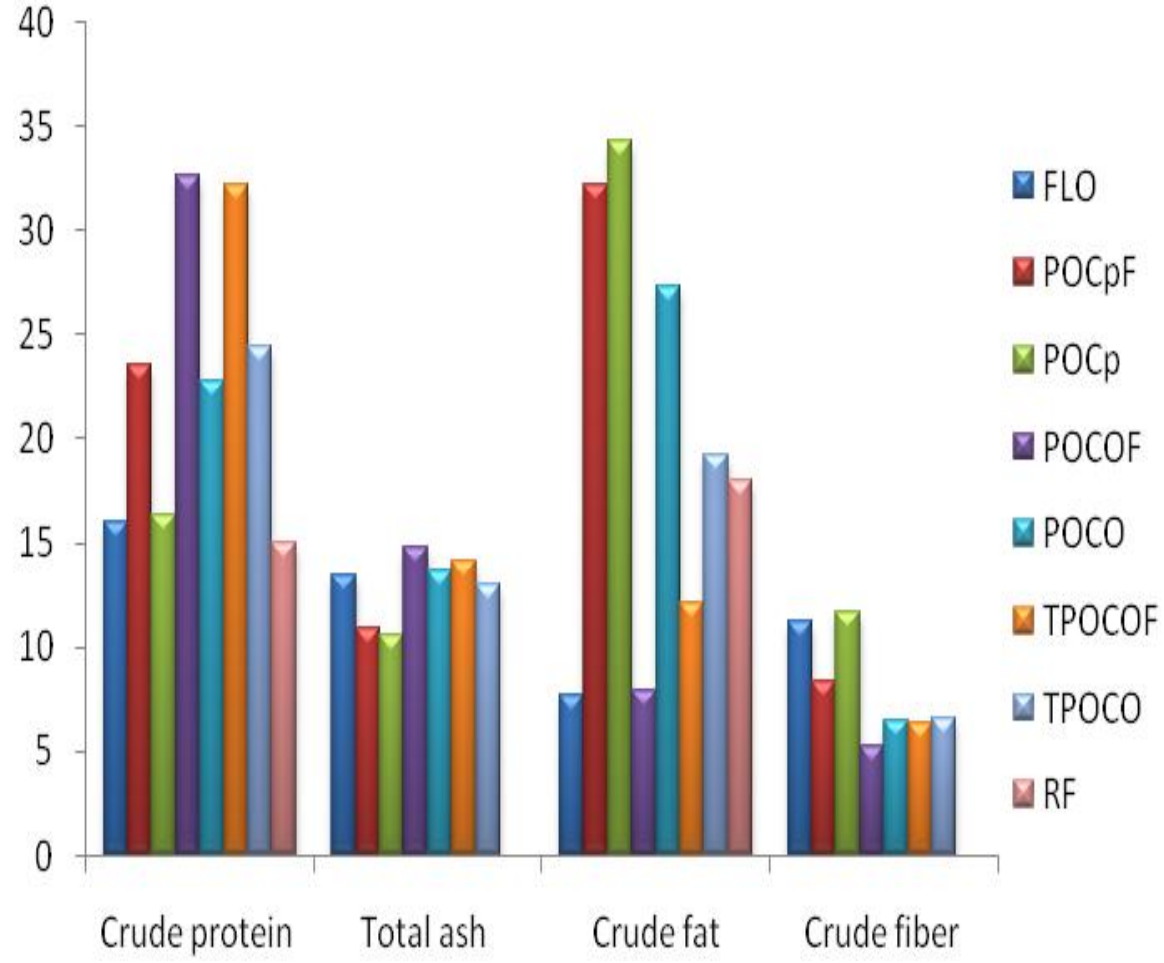
Nutritional values of *Talinum* leaves *and* dishes (DB)



- Protein of *T* based food (16.53-23.02)> Raw *Talinum* (16.53) > R dish
- Ash (8.28-12.81%) < 22,89 : loss of mineral during precooking
- Fat (27.65 -46.18) > R dish
- Crude fiber (6.01-9.03) < 12.58

No significant difference between nutritional values of dishes with/without fish

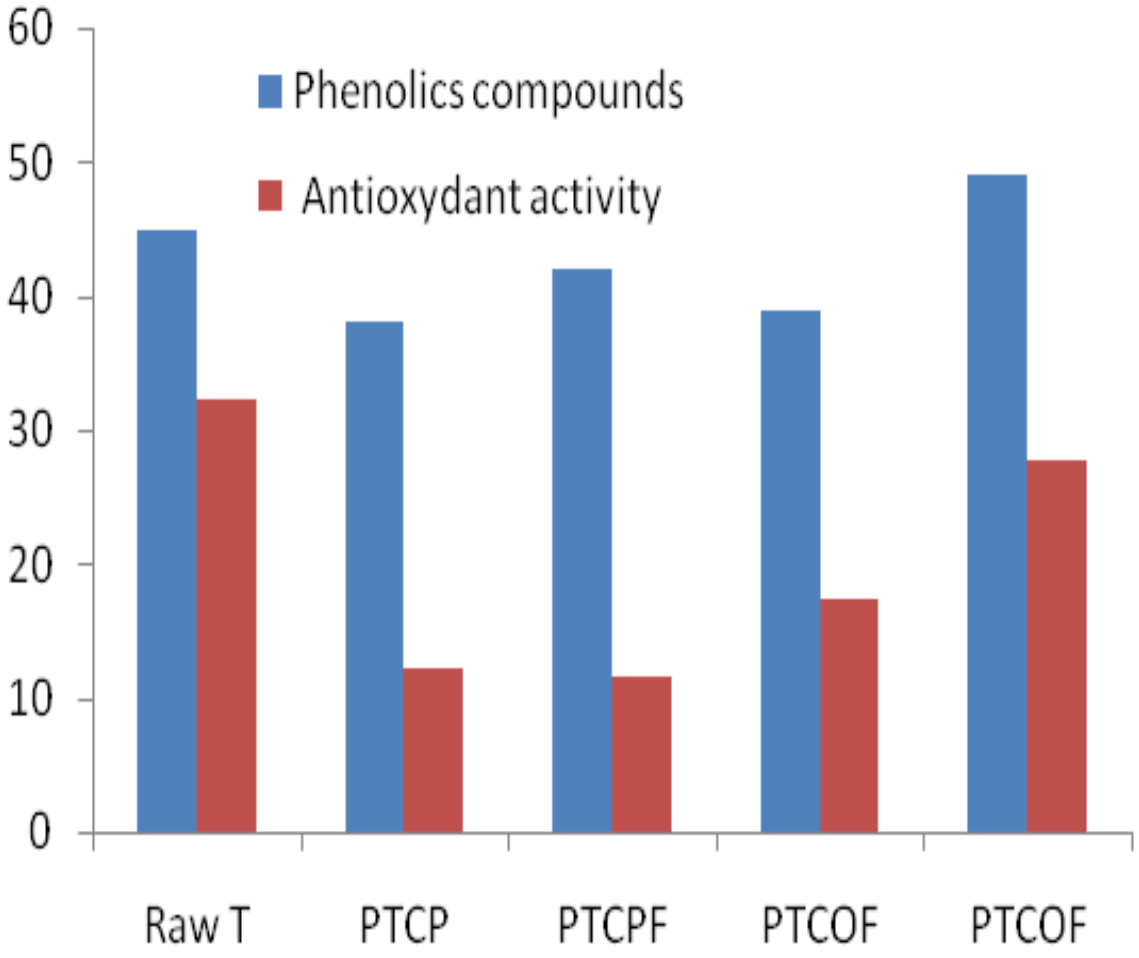
Nutritional values of *Ocimum* leaves and dishes (DB)



- Protein of *O.* based food (16.33-32.68)> Raw O. (16.05) > R dish
- Ash (10.62-14.78%) / 13.47 (used of Kanmu)
- Fat (27,65 -46,18) > R dish
- Crude fiber (6,01-9,03) < 11,25

No significant difference between ash level of dishes with/without fish

Phenolics compounds and antioxydant activity of *Talinum* leaves and dishes (DB)

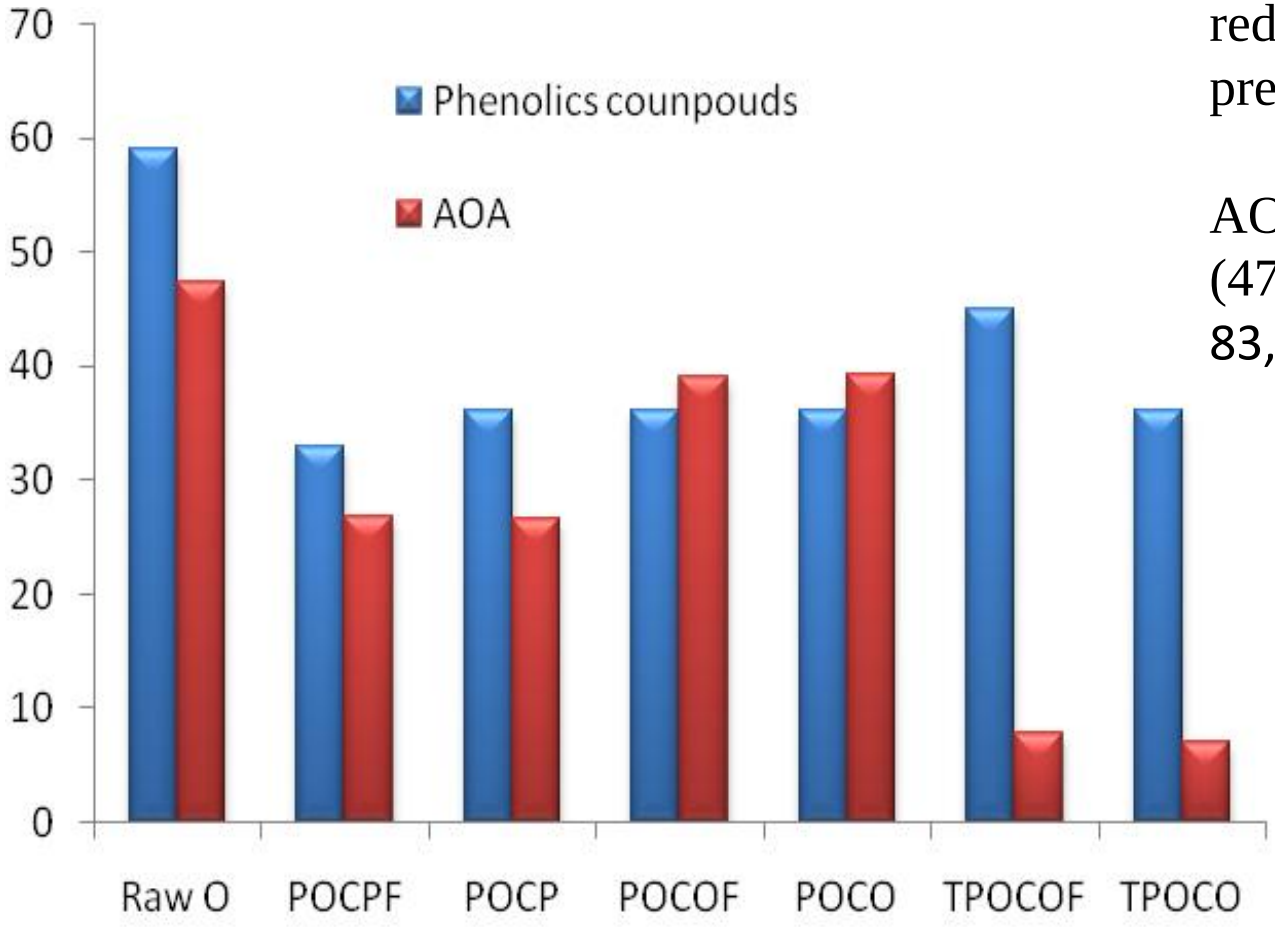


T P (39-49)/ Raw T (45): reduction lixiviation in precooking water

AOA (11.53-27.72) < Raw T (32.28): reduction 14.13 to 64,28 %

Significant difference between TP and AOA of dishes (oil) with/without fish

Phenolics compounds and antioxydant activity of *Ocimum* leaves and dishes (DB)



T P (33-45)/ Raw T (59): reduction lixiviation in precooking water

AOA (6.95-39.05) < Raw T (47.35): reduction 17 to 83,62 %

No significant difference between TP and AOA of dishes with/without fish

Conclusion

-12 recipe groups were collected on the 4 species

-*Talinum* and *Moringa* stand for important vegetables in diets in the surveyed communities, unlike *Cleome* and *Ocimum*

-No age or cultural (ethnicity) influence on the preference for any of the 4 study species

Conclusion

Dishes based on leafy are great sources of protein, fiber

Housewives must reduce quantity of fat

Reduction of precooking time to reduce mineral loss

Further research: determination of other antinutritional factors and micronutrients constituents contains in dishes

Acknowledgments

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Thank you for your attention