WELCOME TO THIS PRESENTATION

Republic of Benin
Faculty of Sciences and Technology of Dassa

Ethnobotanical investigation of three leafy vegetable (*Alternanthera sessilis* (L. DC)., *Bidens pilosa* L., *Launaea taraxacifolia* Willd.) widely consumed in southern and central Benin.

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Out line

- Introduction
- Objective
- Materials and Methods
- Results and discussions
- Conclusion
- Perspectives and policies implications

Introduction

- Sub Saharian Africa, interest of vegetable plants for food for rural communities is recognized (Andzouana and Mombouli, 2012).

- Traditional leafy vegetables (TLVs), plants whose leaves (including immature green pod and flowers) are socially accepted, used and consumed by the local populations (Dansi et al. 2008).

Introduction

- important sources of mineral for lower income people (Ejoh et al. 2007).

- rich in antioxidants (Yang and Keding 2009), and other health-related phytochemicals (Afari-sefa et al. 2012) linked to protection against cardiovascular and other degenerative diseases (Smith and Eyzaguire, 2007; Borah et al .2009).

- provide higher amounts of provitamin A, vitamin C and several important minerals than common, intensively bred vegetables [cabbage (Brassica oleracea), cucumber (Cucumis sativus) etc.], both on a fresh weight basis and after preparation (Afari-sefa et al. 2012).

Introduction

- TLVs play important roles in food security for people living in both rural and urban areas in West Africa (Ukpong and Idiong, 2013; Adjatin et al. 2013).

- Recent study in Benin, 187 species of TLVs among which
  - *Launaea taraxacifolia, Bidens pilosa and Alternanthera sessilis,* are highly consumed and record great importance for local communities (Dansi et al. 2008).

FS1

Introduction

Alternanthera sessilis

(Amaranthaceae)

- source of natural antioxidant
- anti-inflammatory
- antipyretic
- lactogogue,
- Galactogogue and
- Febrifuge (Gupta and Singh, 2012)

Bidens pilosa

(Asteraceae)

- Antihyperglycemic (diabete),
- antihypertensive,
- immunosuppressive,
- anti-inflammatory,
- antileukemic,
- antimalarial,
- antibacterial and Anti -microbial (Debah et al. 2007).
- prevented cancer

Launaea taraxacifolia

(Asteraceae)

- lactation stimulant, febrifuge
- Antioxidant
- Anti Hyperglycemic
- Anti inflammatory
- Hypocholesteroleamiant
- Anti cancer
- Anti microbal
- Anti diabetics (Arawande et al. 2013)

Slide 7

FS1 Bidens pilosa (B. pilosa), a Asteraceae plant, widely distributed in almost all tropical and subtropical countries,

Bidens pilosa (B. pilosa), a Asteraceae plant, widely distributed in almost all tropical and subtropical countries,

Faouzi Sanoussi, 9/21/2013

Introduction

- Despite their nutritional importance and their pharmaceutical properties of these plant,

Neglected and underutilized

- In Benin, unfortunately any research was not yet done to clarify:
  - Traditional knowledge related to them,
  - Diversity,
  - Nutritional status or profile,
  - Phytochemicals compounds linked to medicinal values

Objective

- Document indigenous knowledge and farmers know-how related to *Alternanthera sessilis* , *Bidens pilosa* and *Launaea taraxacifolia* leafy vegetables across villages and ethnics groups of Centre and South;

- Map the distribution and extent of the three species across the study area;

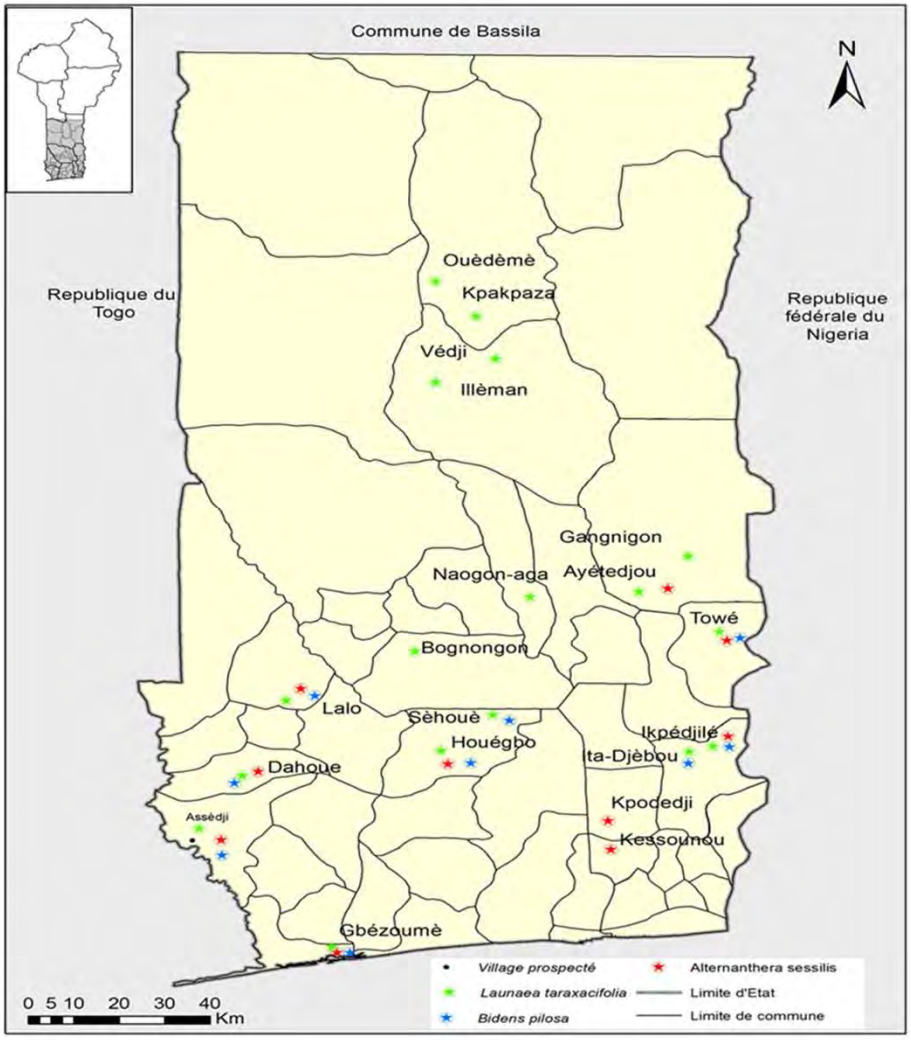
- Explore level of domestication and the diversity of these three species.

Material and Methods

- Central and Southern (Benin)
- 5 and 10 ethnics groups respectively.,
- humid agro-ecological zones with 2 rainy seasons and 2 dry seasons
- mean annual rainfall from 1,100 to 1,400 mm/year (Adam and Boko 1993).
- Mean annual temperatures: 26 to 28°C and (Adomou, 2005; Akoègninou et al., 2006

Study area

Nineteen (**19**) villages randomly selected following Adjatin et al. (2012) were surveyed



Material and Methods

Material

Plant sample of each species is presented to the local community prior to the meeting.

Launaea taraxacifolia

Alternanthera sessilis

Bidens pilosa

Material and Methods

Methods

- Data: collected during field works through the application of participatory research appraisal tools and techniques :
  - Direct observation,
  - focus group discussions (10 to 15 persons),
  - field visits
- using a questionnaire (Dansi et al. 2010; Adjatin et al. 2012).

Material and Methods

Data collected

- vernacular name of the species and its meaning,
- habitat,
- Harvesting practice of each species,
- modes of consumption (cooking pratices),
- frequency of consumption
- intraspecific morphological diversity,
- level of domestication following methods described by Vodouhè et al. (2011).
- perceived nutritional value,
- medicinal properties.

Data analysis

- descriptive statistics (frequencies, percentages, means, etc.),
- Appropriate software were used for statistics analysis.

Results and Discussions

Geographical distribution

- *L. Taraxacifolia* (89.47 %), *A. sessilis* (52.63%) and *B. pilosa* (47.36%) of villages surveyed.
- unequally distributed throughout the surveyed area and country.

In accordance with Adjatin et al. (2012), which reports unequal distribution of *Crassoce-*

- All species are present in the Southern part of the country
- South Would be recommended area for carrying out their in situ conservation

Figure : Map of geographical distribution of species in Beni

Results and Discussions

Folk nomenclature

Table: Vernacular names of *L. taraxacifolia*, *B. pilosa* and *A. sessilis* and its meanings in surveyed area

Species	Vernacular name	Ethnics groups	Significations	Criteria of denomination
Launaea taraxacifolia	Yantotoé or yantoto or latotoé	Fon	Soft like meat after cooked	Organoleptic quality
	Lantoto or yantotoé	Mahi	Leaves consummed instead of meal in ancient times	Organoleptic and technologic qualities
	Odôdô & Odôdôlodôdô	Idaacha	The genuine leafy vegetable	Organoleptic and technologic qualities
	Efô gnanri	Holy/yorouba	The genuine leafy vegetable	Organoleptics quality, technological trait
	Wontou	Adja	Plant with rich biomass which tend to	Technological traits
Bidens pilosa	Gningbé ou gninman ou Gnintonou	Fon/mahi/Oueme	Herbs with sting	Morphology of plant
	Abèrè oloko	Yoruba, Nago	The sting of farmers	Morphology of plant
	Djanhounkpi	Sahouè	The plant with sting on mature flowers	Morphology of plant
Alternanthera sessilis	Houngbé	Fon	Blood provider leaves	Medicinal uses
	Idé	Holy	None, heritage from ancient	-
	Gomi	Adja	Plant with high multiplication capacity due to its important number of node	Natural habitat
	Agouègbé , Agouèman	Cotafon, Sahouè	Plant originated from Agoué river, which liked humid zone	Natural habitat, origin
	Agwè-houngbè	Goun	Leafy vegetable prohibited for « Agossou » (anormal borned baby) parents	Cultural uses
	Ossoun odô, Agômayan Goudé	Yoruba	None, heritage from ancient	-

Results and Discussions

Diversity

- Following figure and Table reveal number of types of the species studied and morphological traits used to distinguish species.

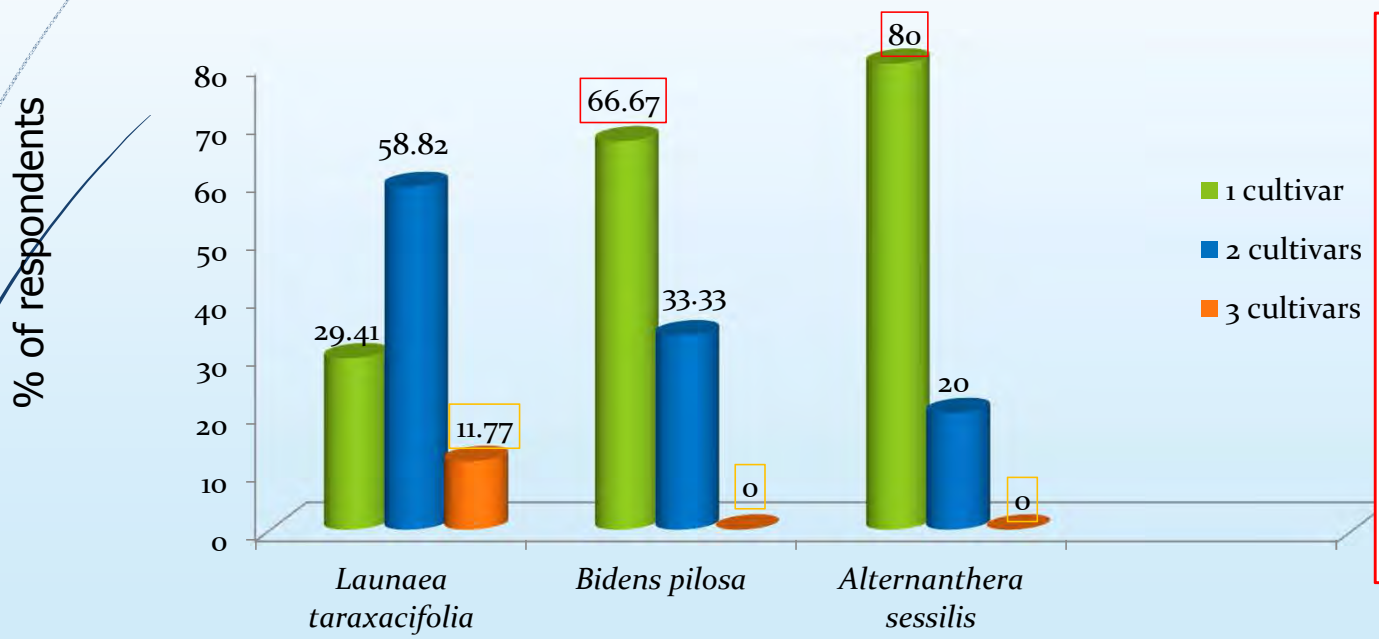


Figure: Diversity of *L. taraxacifolia*, *B. pilosa* and *A. sessilis* in surveyed zone

These results are in accordance with the observation Dansi et al (2008), who report that with TLVs, intraspecific agromorphological diversity is frequent.

Results and Discussions

Diversity

Table: Morphotypes of species studied per ethnics groups and traits used to distinguish species

Species	Number of cultivars	Ethnics groups	Local names	Distinguishes traits
Bidens pilosa	2	Adja	Djanhounkoui Adjatô	Odor of leaves
			Djanhounkoui Yovotô	Odor, color, height of leaves; important ramifications on stem
		Cotafon		
Launaea taraxacifolia	3	Fon	Yantotoé wéwé	Color of leaves (clear green), forms of leaves (lobes), Emptiness of stem
		Holy		
			Yantotoé Vôvô	Color of leaves (green, redish), forms of leaves (lobes), stem
			Yantotoé wouiwoui	Color of leaves (Darkness green)
Alternanthera sessilis	2	Adja	Gomi	Height and color of leaves
		Ouemé	Agwè-aguéton	Development of leaves and color

Results and Discussions

Different color of leaves and forms of stem of *L. taraxacifolia*

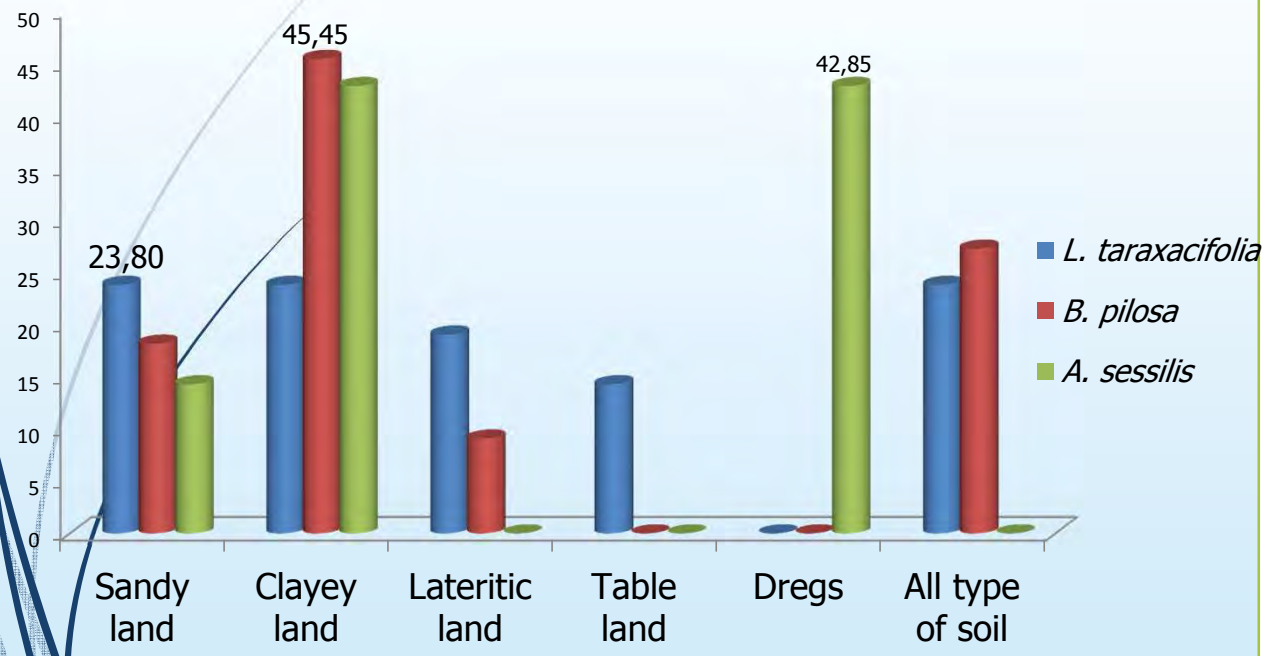
Different observed forms of leaves

Fiigure: Morphological traits observed on differents morphotypes of *L. taraxacifolia* in surveyed zone

Results and Discussions

Habitat of species

- The perceived natural habitat of the TLVs by farmers are surveyed and report.



- **Figure** : Habitat of *L. taraxacifolia*, *B. pilosa* and *A. sessilis* as perceived by farmers

- *Launaea taraxacifolia* seem to be adaptable to all types of soil,
- *Bidens pilosa* and *Alternanthera sessilis* seem to prefer respectively clayey land (45.45 of % of responses) and dregs (42.85 % of % of response).

large distribution of *Launaea taraxacifolia* across the surveyed zone

Results and Discussions

Domestication status

Table: Variation of the domestication levels of *Launaea taraxacifolia*, *Bidens pilosa and Alternanthera sessilis* across villages and ethnic areas.

Species	Number of villages	Level of domestication (% of village)						
		N0	N1	N2	N3	N4	N5	N6
Launaea taraxacifolia	17	11,11a	61,11c	5,56	5,56	16,67a	-	-
Bidens pilosa	9	55,56b	22,22b	-	-	22,22b	-	-
Alternanthera sessilis	10	90.00c	10.00a	-	-	-	-	

status of domestication of the three TLVs species investigated varies among the species and surveyed villages.

Results and Discussions

Harvesting methods and procurement practices

- **Table:** Different methods used to harvest *L. taraxacifolia*, *B. pilosa* and *A. sessilis* TLVs in prospected area

Harvesting methods (%)	Plant stem cutting	Uprooting	Defoliation	Plant stem cutting and uprooting	Defoliation and uprooting	Defoliation and plant stem cutting
L. taraxacifolia	11.76	35.29	5.88	29.41	11.76	5.88
B. pilosa	33.33	11.11	11.11	22.22	0.00	22.22
A. sessilis	40.00	30.00	10.00	10.00	10.00	0.00

Conclusion: these two major harvesting practices can contributed significantly to losses of species especially uprooting which can cause a severe losses of species lead to possible genetic erosion.

Results and Discussions

Consumption methods

Table : Consumption methods of *L. taraxacifolia*, *B. pilosa* and *A. sessilis* in Centre and Southern Benin

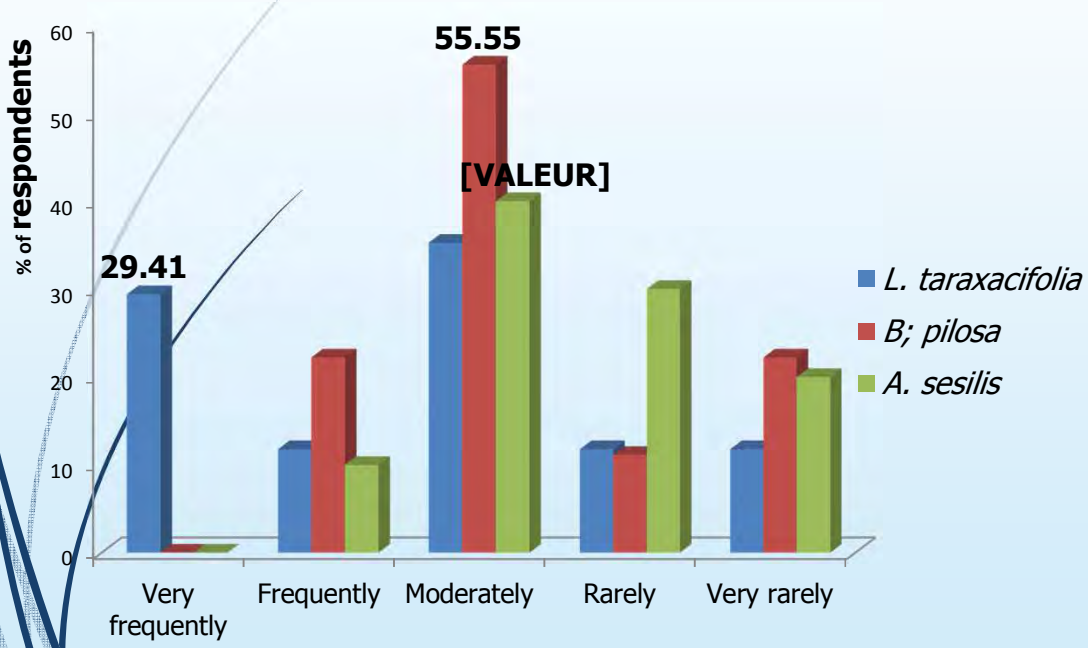
Consumption methods (%)	Pre-cooked and add to sauces or non cooked ingredients	Triturate and add to sauce or non-cooked ingredients	Raw as salad
Launaea taraxacifolia	68.28	17.07	14.63
Bidens pilosa	100.00	0.00	0.00
Alternanthera sessilis	100.00	0.00	0.00

In accordance with Arawande et al. (2013) reports L. taraxacifolia leaves are eaten fresh as salad or cooked in soupe in Nigeria

probable non toxicity of this specie for human consumption like as reported to species of vegetable Gbolo in Nigeria (Denton, 2004) and in Benin (Adjatin *et al.* 2012).

Results and Discussions

Frequency of consumption



- Legend
- More than 2 times a week (Very frequently),
- 1 - 2 times a week (frequently),
- 1 - 2 times a month (moderately),
- 1 - 2 times per six month (rarely),
- 1 time a year(Very rarely) *pilosa*.

Figure: Frequency of consumption of *L. taraxacifolia, B. pilosa* and *A. sessilis* in surveyed area

Results and Discussions

Medicinal properties

Table : Medicinal properties and possible cured diseases associate to leafyvegetables of *Launaea taraxacifolia*, *Bidens pilosa* and *Alternanthera sessilis*

Medicinal properties (% of responses)	**Possible cured Diseases**	***Launaea taraxacifolia***	***Bidens pilosa***	***Alternanthera sessilis***
Antibiotic	Wound, sore throat, abscess	5,26	33,33	10
Anti-venimous	Scorpio/ snake bite	21,05	-	-
Anti-poisonous	poison	5,26	-	-
Anti-anemic	Anemia	2,63	-	10
Anti-inflammatory	Cramp, Navel cicatrizing (baby)	2,63	-	10
Antalgic	Head, eyes and ear aches	10,53	-	-
Fungicide	Tetter, tinea, Mycosis	13,16	-	10
Febrifuge	Fever	7,90	-	-
Sedative	Convulsive attack	5,26	-	-
Parasiticide	Guinea worm	2,63	-	-
Blood pressure regulator	Blood pressure	7,90	-	-
Anti-diabetic	Diabetes	2,63	-	-
Anti-coughing	Cough	2,63	-	-
Anti-colic	Stomach disorders	-	-	10
Anti-dizzy	Dizzy	5,26	-	-
Galactogen	Breast milk production default	2,63	-	-
Laxative	Indigestion, constipation	2,64	33,33	50
Aphrodisiac	Aphrodisiacs	-	33,33	-

Results and Discussions

- *L. taraxacifolia* (the most valued medicinally), used for the prevention or healing of 21 diseases with 16 possible pharmacological functions
- Alternanthera sessilis implicated in only 7 diseases with 6 possible pharmacological functions

- High similarity between local people and others reports on the medicinal properties of these three vegetable
- respondents have a good knowledge on the various ways of usage of these three plant and so can well implicate in their promotion

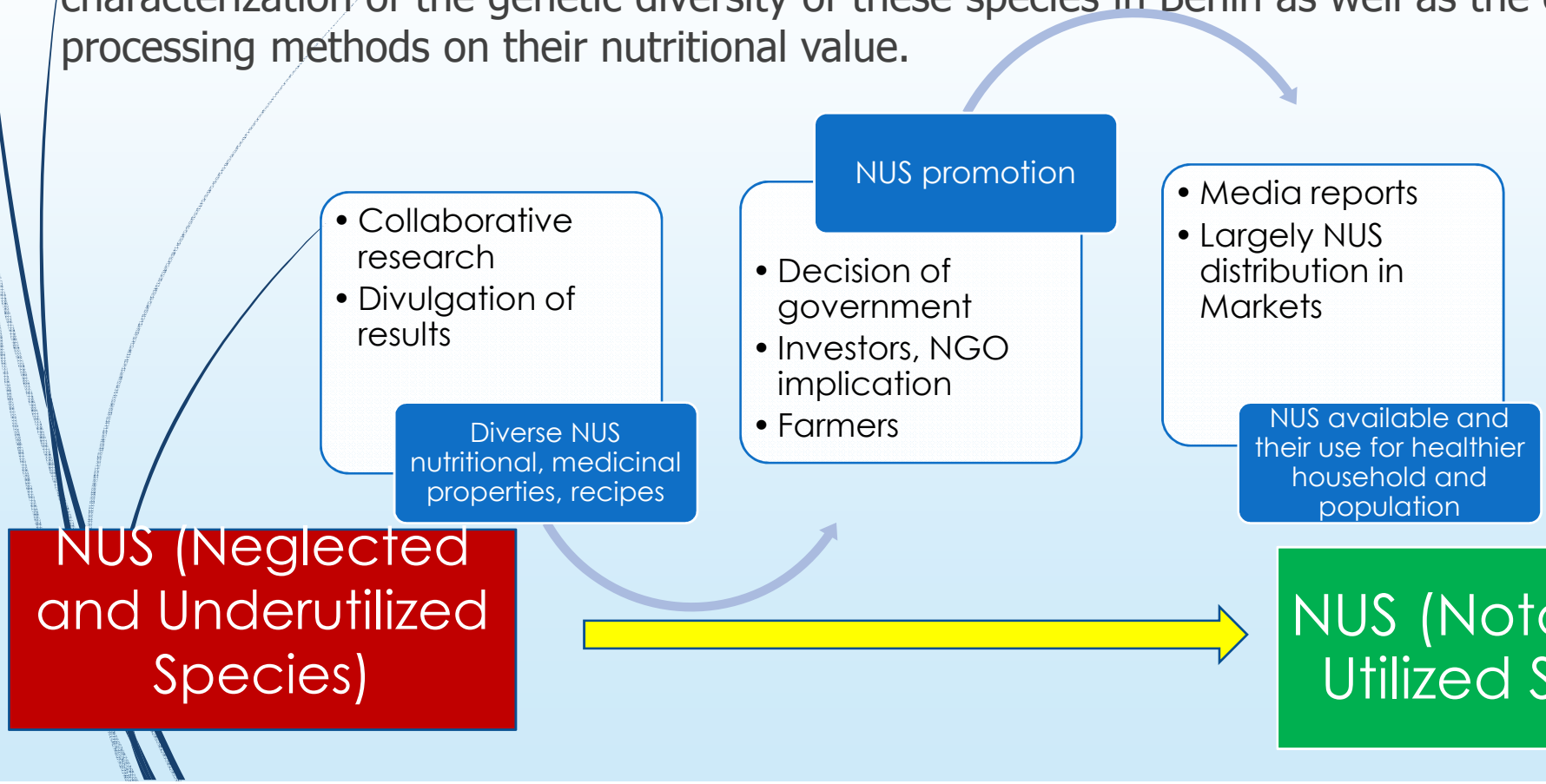
- Results similar to observations of Smith and Eyzaguire (2007),
- indigenous knowledge of the health promoting and protecting attributes of TLVs is clearly linked to their nutritional and non-nutrient bioactive properties.

Conclusion

- Three species studied still majoretely wild in Benin and their production is still traditional and biologic.
- Southern Benin may be good to carry out conservation of these species.
- Existence of morphotypes among each of specie which could be well studied.
- Domestication process as found across surveyed areas is still ongoing and should be encouraged for intensive and optimal production
- surveyed people have good knowledge of medicinally values of the species and so can well implicate in them promotion.

Perspectives and policies Implication

- Further research is required on the value chain, biochemical and phytochemical characterization of the genetic diversity of these species in Benin as well as the effects of loca processing methods on their nutritional value.



Thank you for your attention