Bu proje Avrupa Birliği ve Türkiye Cumhuriyeti tarafından finanse edilmektedir
This project is co-funded by the European Union and the Republic of Turkey

Çöp Değil, Kompost

TÜRKİYE ÇÖPÜNÜ DÖNÜŞTÜRÜYOR!

Uluslararası Kompost Konferansı

Türkiye ve Avrupa'dan İyi Uygulama Örnekleri:

İspanya'nın Katalunya Bölgesi'nden Başarılı Uygulamalar ve Deneyimler

Teresa Guerrero

Agència de Residus de Catalunya

Bu proje Avrupa Birliği ve Türkiye Cumhuriyeti tarafından finanse edilmektedir
This project is co-funded by the European Union and the Republic of Turkey

The biowaste management in Catalonia

Teresa Guerrero

Istambul, 12th January 2017

Generalitat de Catalunya

Agència de Residus de Catalunya

How can we prepare a good composting strategy?

Agència de Residus de Catalunya

1 – Who I am and were I come from?

2.- The biowaste management in Catalonia

3.- The composting strategy keys

Agència de Residus de Catalunya

1 – Who I am and were I come from?

2.- The biowaste management in Catalonia

3.- The composting strategy keys

Agència de Residus de Catalunya

1 – Who I am and were I come from?

- My location: Catalonia (Spain)
- My company: The Waste Agency of Catalonia
- My experience: 16 years in biowaste management

My location: Catalonia (Spain)

Catalonia

Agència de Residus de Catalunya

My location: Catalonia (Spain)

Spain

- Surface: 504 645 km^2
- Population: 46,5 million inhab.
- **17** Autonomous Communities

Catalonia

- Surface: 32,000 km^2
- Population: 7,5 inhab.
- County: 41
- Municipalities: 946

x 1,5

x 10

x 2

Turkey

- Surface: 783,562 km^2
- Population: 78,7 million inhab.
- **81** provinces

2015
Istanbul (14.7 million)

Agència de Residus de Catalunya

My location: Catalonia (Spain)

Spain

- Surface: 504 645 km^2
- Population: 46,5 million inhab.
- **17** Autonomous Communities

Catalonia

- Surface: 32,000 km^2
- Population: 7,5 inhab.
- County: 41
- Municipalities: 946
- **MSW 3,7 millions tons/year**

x 1,5

x 10

x 8

Turkey

- Surface: 783,562 km^2
- Population: 78,7 million inhab.
- **81** provinces

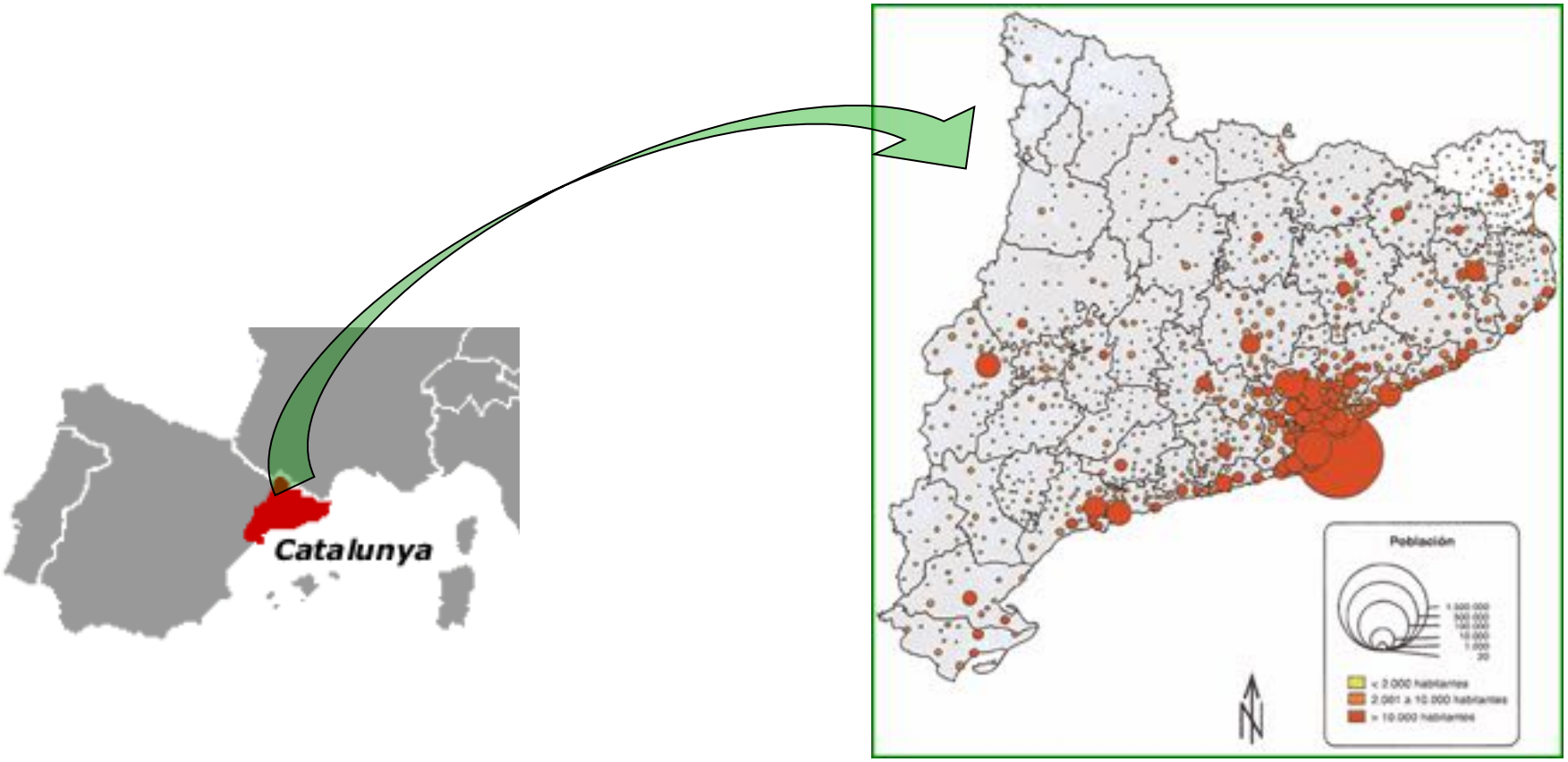
MSW 28,8 millions tons/year

MSW Municipal solid waste

Agència de Residus de Catalunya

My location: Catalonia (Spain)

The distribution of the population is important for a waste management strategy



My company:
The Waste Agency of Catalonia

- A **public** company within the Government of Catalonia.
- There are **204 workers**, the majority (75%) **technicians**.
- We have competences in all kinds of waste managed in Catalonia, such as industrial, sanitary construction and **municipal** wastes.

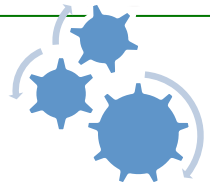
Areas of activity:	**Tools**
- Legislation	→ **laws**
- Planning	→ **objectives**
- Technical & economic support	→ **money and knowledge**
- Monitoring	→ **results**
- Control	→ **penalties**
- Environmental authorization	→ **permits**
- Information	→ **data**
- Awareness	→ **education**

In Catalonia (and in Turkey)

The municipalities are responsible for providing

- Waste collection
- Transportation
- Separation
- Waste treatment: recycling, disposal

@ www.arc-cat.net



My experience

I am the coordinator of biowaste management team in the Waste Agency of Catalonia since 2000, for 16 years.

The biowaste team (7 + 1)

- 2 experts in selective collection
- 2 experts in biotreatment
- 1 expert in organic fertilizers
- 1 administrative support
- 1 coordinator

The team is in charge of giving technical and economical assistance to the municipalities for:

- starting and improving selective collection of organic waste
- design and construction composting and anaerobic digestion facilities
- register and selling the compost

Agència de Residus de Catalunya

1 – Who I am and were I come from?

2.- The biowaste management in Catalonia

3.- The key for a good composting strategy

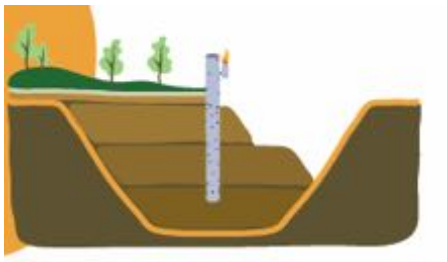
2.- The biowaste management in Catalonia

2.- The biowaste management in Catalonia

COMPOSTING - The controlled decomposition of organic matter
Two different applications for the composting process

1 - Biological pre-treatment before dumping
Composting reduces the content **of biodegradable** materials and its effects, such is:

- methane **emissions**
- liquid **leachates**
- **odours**



Disposal strategy
It is necessary to achieve the UE requirements
Out of my presentation scope

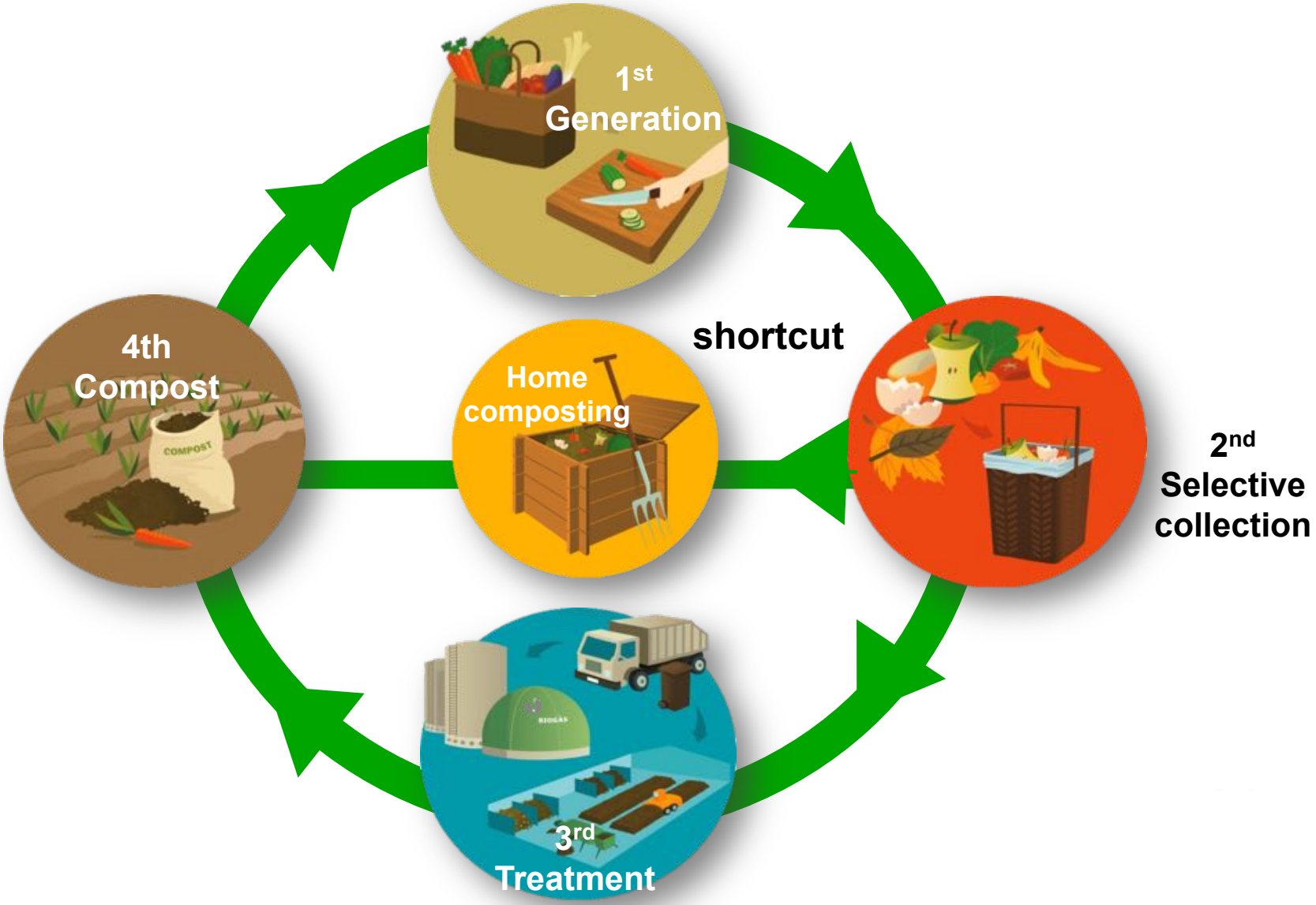
2 – Bio-treatment of organic matter from selective collection.
Composting produces **compost**, an organic **fertilizer** which improves the quality of soil.

Composting strategy

The separate collection of organic fraction is essential in order to produce a quality **compost** and close the cycle

Agència de Residus de Catalunya

2.- The biowaste management in Catalonia



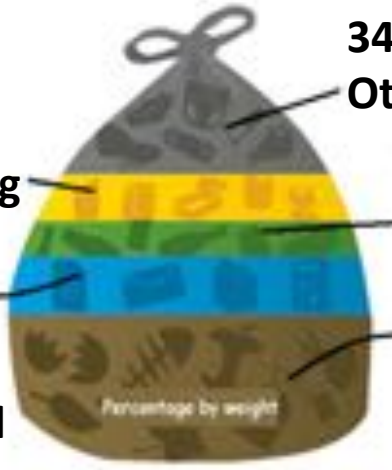
Agència de Residus de Catalunya

The bio-waste cycle

1st step- Generation

Before Generation ➡ **Prevention**
Avoid and reduce

Municipal Waste Composition



- 34,4 % Other
- 9,4% Packaging
- 7,7 % Glass
- 11,3 % Paper & Cardboard
- 37,3 % Organic matter

- 2/3 citizens, 1/3 commercial activities (hotels, restaurants, food distribution)

Agència de Residus de Catalunya

The bio-waste cycle

2nd step - Selective collection

1. The separate collection of bio-waste became **compulsory** in 1993

2. The total separate collection rate is at almost **40%**, with a significant contribution of bio-waste

3. We separate 400.000 t/year of bio-waste, 1**/3 of total bio-waste generated**

7. 80% of the (948) municipalities in Catalonia have selective collection of bio-waste

8. The service covers **95%** of the population, and the other part are small towns which are doing **home composting**.

The bio-waste cycle

Selective collection

We have **different models** of bio-waste selective collection

We are **monitoring** the whole system

1600 samples/year

RESULTS	Door to door (DtD)	Street area
• Bio-waste separate collection rate	70%	35 %
• g/inh/day bio-waste	296	130
• % impurities	5,72%	13,69%
• Number of municipalities	130	600
	Tiana,Canet, Manco La Plana and Pallars S	Manresa, Baix Empordà, Barcelona ...

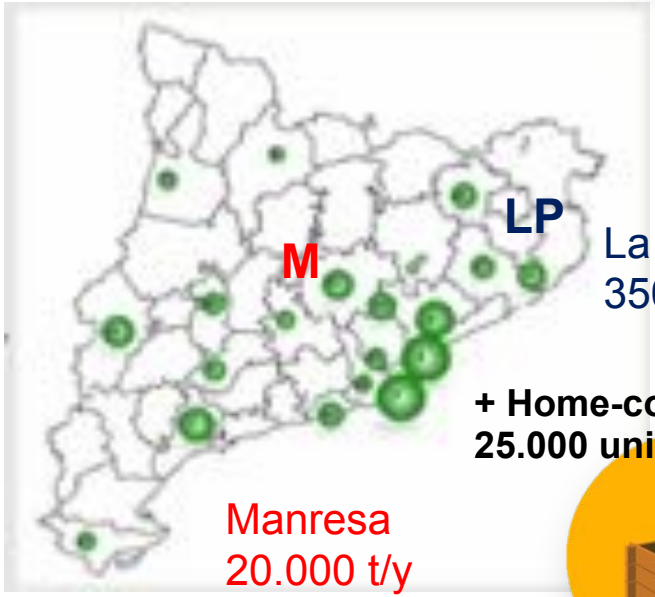
Agència de Residus de Catalunya

The bio-waste cycle

3rd step - Bio-treatment

Treatment

4 anaerobic digestion plants



La Plana
3500 t/y

+ Home-composting
25.000 units installed

Manresa
20.000 t/y

20 composting plants

Biowaste facilities:

- Geographical distribution
- Capacities from 300 to 90.000 t/year
- Biowaste total treated: 375.000 t/year

Small and medium biological treatment

Self-composting

Agricultural composting

- Flexibility (capacity/modules)

Agència de Residus de Catalunya

BOADELLA
First composting plant -- > inside an old farm

BOADELLA
First composting plant

TECNICAL DATA

- **Biowaste input**: < 2% impurities from a restaurant in the municipality of Boadella i les Escaules
- **Capacity**: 100 t/y

Agència de Residus de Catalunya

BOADELLA New composting plant. Construction









Agència de Residus de Catalunya

BOADELLA
New composting plant working

The better the selective collection,
the more simple the process becomes,
the higher the compost quality will be

Big composting/biological plants

Anaerobic digestion

Agència de Residus de Catalunya

The bio-waste cycle

4th step

Compost

- Production: **60,000 t/year**
- Analysis of nutrients and pollutants

(approx. 4 samples/year in each composting plant)

Application:

- 80% Agriculture
- 20% Gardening

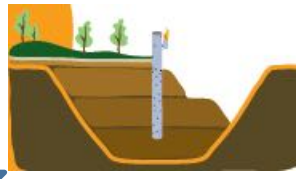
In agricultural areas, **all** high quality compost is sold. (10€/t in average)

2.- The biowaste management in Catalonia

Fiscal incentives

Disposal tax. Simplified scheme

PAY per ton of Residual waste



19,1€/t FR

Agència de Residus de Catalunya

PAY-BACK per ton of Biowaste fraction

~50 €/t BW x BW Quality factor

2016: 19,1 € / t

Foreseen by 2020: near 50 € / t

Since we have the disposal tax our selective collection rate is increasing each year

Agència de Residus de Catalunya

Economical balance

Average example 2017

BIOWASTE	FEE	TAX/ PAYBACK	FINAL COSTS
Selective collection	150 €	- 35 €	115 €
Treatment*	60 €	- 15 €	45 €
TOTAL	210 €	**- 50 €**	160 €

* Overall costs, including the incomes of selling the compost

RESIDUAL FRACTION	FEE	TAX	FINAL COSTS
Collection	100 €		100 €
Treatment	30 €	+ **20 €**	50 €
TOTAL	130 €		150 €

Agència de Residus de Catalunya

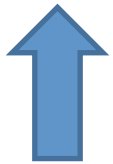
Economical balance

Average example 2020

BIOWASTE	FEE	TAX/ PAYBACK	FINAL COSTS
Selective collection	150 €	- 35 €	115 €
Treatment*	60 €	- 15 €	45 €
TOTAL	210 €	- **50 €**	160 €

* Overall costs, including the incomes of selling the compost

REST FRACTION	FEE	TAX	FINAL COSTS
Collection	100 €		100 €
Treatment	30 €	+ **50€**	80 €
TOTAL	130 €		180 €



Agència de Residus de Catalunya

1 – Who I am and were I come from?

2.- The biowaste management in Catalonia

3.- Composting strategy keys

Agència de Residus de Catalunya

3.- Composting strategy keys

- ✓ **Tools**
- ✓ **Key factors**
- ✓ **First steps**

Agència de Residus de Catalunya

3.- Composting strategy keys

Tools

- Legislation	→ **laws**
- Planning	→ **objectives**
- Technical & economic support	→ **investment and knowledge**
- Monitoring / Information	→ **results and data**
- Control	→ **penalties**
- Environmental authorization	→ **permits**
- Awareness	→ **education**

3.- Composting strategy keys

Key factors

- **Separate collection of organic fraction** in order to achieve a good quality compost
- Start with the selective collection from **rural** areas and **large** generators
- Simple and modular composting facilities
- Fair taxes internalising the whole cost for each treatment
- **Fiscal incentives** to improve the waste management

3.- Composting strategy keys

First steps

- Improve the **self composting** and networking
- Build a small composting facility
- Implement a **separate collection of organic fraction** in the area (rural area or commercial activities)
- Make a high quality compost
- **Communicate and disseminate the result**

Agència de Residus de Catalunya

Bu proje Avrupa Birliği ve Türkiye Cumhuriyeti tarafından finanse edilmektedir
This project is co-funded by the European Union and the Republic of Turkey

The better the selective collection,
the more simple the process becomes,
the higher the compost quality will be

Thank you for your attention

For more information tguerrero@gencat.cat

The role of the municipalities and the citizens

The bio-waste cycle

collaboration

SME,
ONG,
etc

Bio-circular Economy

population

The local authorities have an important role in order to make the whole cycle work and to show it to citizens. But the most important action is the individual action.

To get the individual action to react we need to show the whole cycle to the citizens. We have 2 main demonstration projects:

The role of the municipalities and the citizens

Bio-circular Economy

The bio-waste cycle

DECISIVE
A DECentralIsed management Scheme for Innovative Valorization of urban biowastE

revolta

EUROPEAN PROJECT

Summary →

Agència de Residus de Catalunya

revolta

Distribution and nearby consumption

Generation and separation in origin

Pre-treatment in origin

Fertilization and ecological production (in a social coop)

Composting

Agència de Residus de Catalunya

DECISIVE

13 European partners (ACR+ and others)

A DECentralIsed management Scheme for Innovative Valorization of urban biowastE

To change the present **urban metabolism** for organic matter (foods, plants, etc.), energy and bio-waste to a **more circular economy**

The project DECISIVE will develop and demonstrate eco-innovative solutions, addressed to waste operators and public services, consisting of:

1) a **decision support** tool to plan, design and assess efficient decentralized management networks for bio-waste in urban areas

(2) eco-designed micro-scale **anaerobic digestion** and **solid-state fermentation processes.**