

Compendium

Technology profile, mentoring and services



- Technology transfer and Commercialization
 - Technical and Consultancy Services
 - Incubation Centre
 - Licensing of IPR
 - R & D Services

TECHNOLOGIES

- 1) [Oneer](#) - a novel solution for safe drinking water (community model and domestic model).
- 2) FSSAI-approved Argemone oil detection kit ([AO Kit](#)) for detection of Argemone Oil in edible oils.
- 3) FSSAI-approved Mustard oil check ([MO Check](#)) for detection of Butter yellow in edible oils.
- 4) [Milk adulteration check strips](#) for detection of various adulterants (such as urea, boric acid, detergent, ammonia & ammonium ions and nitrates & nitrites) in milk.
- 5) [Test-strips for the detection of adulterants](#) (argemone oil, karanja oil and butter yellow) in edible oil.
- 6) [Test-strips for the detection of spoilage markers](#) (furfural, 5-hydroxymethylfurfural and polyphenols) in fruit juices.
- 7) A 2000-Litre [Bioreactor for treatment of effluent](#) from paper mill. Customization is also possible for treatment of effluent from different industries.
- 8) Early non-transgenic wistar rat and cellular model of Alzheimer's disease, induced through heavy metal mixture; Patent No. 2997136 (EP, AT).

- 9) [Innovative extraction method](#) for multi-residue pesticide analysis.
- 10) Portable [water analysis kit](#)

Facility for Mentorship and Incubation

- 1) CSIR-IITR BioNEST ([CITAR](#))
- 2) [CRTDH](#) hub

Services

- 1) [Toxicity/Safety Testing](#): NABL and GLP Accredited Services

Oneer[®] - technology for disinfection of drinking water



Domestic model

Community model



CSIR- Indian Institute of Toxicology Research (CSIR-IITR), Lucknow has developed a novel solution for safe drinking Water

Advantages:

- Innovative and award winning technology
- Provides 450 L/hr drinking water
- Continuous water disinfection system for communities
- Cost effective and maintenance free.

Title of Product/Process/Design/Equipment	Oneer- a novel solution for safe drinking water
Salient Technical Features including Competing Features	<ul style="list-style-type: none"> ❑ Low-cost water disinfection device that can even treat brackish or turbid water unlike UV technology. ❑ High disinfection efficiency of >8 Log reduction of bacteria viz. <i>Escherichia coli</i>, <i>Vibrio cholerae</i>, <i>Staphylococcus aureus</i>, <i>Salmonella typhimurium</i> and fungus (<i>Candida albicans</i>) ❑ No leaching of toxic heavy metals from stainless steel electrodes. ❑ Conforms to WHO safe limits for drinking water through innovative design of electrodes and controlled treatment energy for specific period. ❑ No exogenous chemicals added during decontamination process. ❑ Maintenance-free and long-life water-disinfection device for safe water. ❑ Can provide ~400L/hr treated water (5000 L/day) for schools, hospitals, restaurants and other public places
Application/Uses	Disinfection of drinking water having microbial contamination
Level/Scale of Development	Commercial prototype ready
Status of Commercialization	Licensed in past. Readily available for commercialization
IPR Status Patent/Copyright/Trademark Secured in India/Abroad	Patented Technology Trademark and copyright applications have been filed
IPR Details	
Environmental Considerations	No environmental constraints for running the system. There is no water wastage like other disinfection devices.
Major Raw Materials to be Utilized	Food grade stainless steel and minor electronic components
Major Raw Materials to be Utilized	Food grade stainless steel and minor electronic components
Major Plant Equipment and Machinery Required	None
Techno-Economics	Maintenance-free and long-life water-disinfection device for safe water. Cost of treated water ~0.3 US \$/1000L
Technology Package	Ready for licensing

Argemone oil detection kit (AO-Kit)



CSIR- Indian Institute of Toxicology Research (CSIR-IITR), Lucknow has scientifically developed a novel technology to rapidly detect Argemone contamination in edible oils.

Advantages:

- Fluorescent detection technique
- Quick and effortless method to ensure food safety
- Useful to detect adulterants in edible oils.
- Least detection limits and precise accuracy

Title of Product/Process/Design/Equipment	AO Kit (Argemone Oil Detection Kit)
Salient Technical Features including Competing Features	Quick and easy to perform field test kit. Minimum detection limit of 0.01% (100 ppm)
Application/Uses	For the detection of Argemone oil contamination in mustard, olive and other edible oils
Level/Scale of Development	Commercial prototype ready
Status of Commercialization	Ready for commercialization
IPR Status Patent/Copyright/Trademark Secured in India/Abroad IPR Details	Patented Technology
Environmental Considerations	No environmental constraints for running the system.
Major Raw Materials to be Utilized	Locally available materials and minor electronic components
Major Plant Equipment and Machinery Required	None
Techno-Economics	Cheap and easy to perform test.
Technology Package	Ready for licensing

Mustard oil Check (MO-Check)



CSIR- Indian Institute of Toxicology Research (CSIR-IITR), Lucknow has scientifically developed a novel technology to rapidly detect contaminants in edible mustard oil.

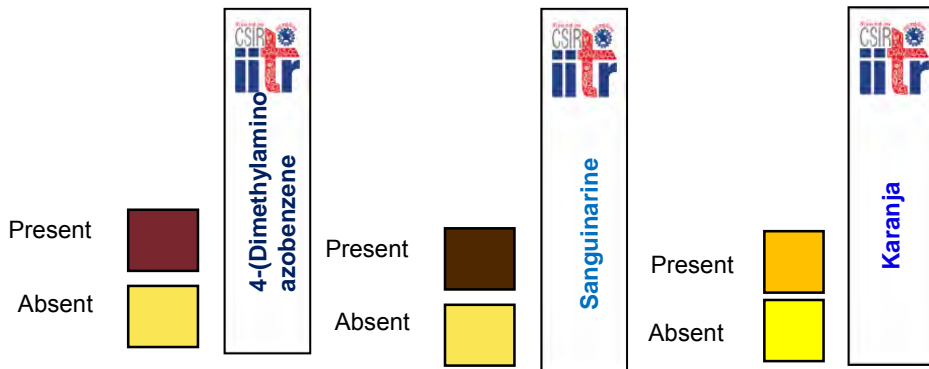
Advantages:

- Strip-type sensor for visual assessment
- Quick and effortless method to ensure food safety
- Useful to detect adulterants in edible mustard oil.
- Least detection limits and precise accuracy

Title of Technology	MO Check (Mustard oil check)
Salient Technical Features including Competing Features	<ul style="list-style-type: none"> ➤ The test is easy to perform, takes only a few minutes ➤ Requires only visual observation. ➤ Sensitive (Minimum detection limit of 0.001% (10 ppm) ➤ Cost effective (< 10 Rs. per test) ➤ Serves as a handy tool for consumers
Application/Uses	<p>The MO check strips are useful for the detection of an artificial color, Butter Yellow in mustard/edible oils. This can be employed as a handy tool at the retail outlet by cautious dealers, consumers/ house-wives themselves: consumer guidance organization/ societies and for random preliminary checks by food inspectors and health authorities even at the remotest areas.</p>
Level/Scale of Development (TRL-6)	Commercial prototype ready
Status of Commercialization	Ready for commercialization
IPR Status Patent/Copyright/Trademark Secured in India/Abroad IPR Details	<p>Patented Technology. Indian Patent No. 185972</p>
Environmental Considerations, if any	No environmental constraints for the preparation and running the test.
Major Raw Materials to be Utilized	Locally available materials and minor electronics.
Major Plant Equipment and Machinery Required	None
Techno-Economics	Cost effective and easy to perform test.
Technology Package	Ready for commercialization.

Title of Technology	Milk Adulteration Detection Kit
Salient Technical Features including Competing Features	<ol style="list-style-type: none"> 1. The test is easy to perform, takes only a few minutes 2. Requires only visual observation. 3. High sensitivity 4. Cost effective (<Rs. 1 per test) 5. Serves as a handy tool for consumers/ retailers
Application/Uses	For the detection of urea, boric acid and detergent in adulterated milk.
Level/Scale of Development (TRL-6)	TRL-5
Status of Commercialization	Under process
IPR Status Patent/Copyright/Trademark Secured in India/Abroad IPR Details	Patent application filed.
Environmental Considerations, if any	No environmental constraints for the preparation and running the test.
Major Raw Materials to be Utilized	Locally available materials
Major Plant Equipment and Machinery Required	None
Techno-Economics	Cost effective and easy to perform test.
Technology Package	Strips and Manual

Test-strips for detection of adulteration in edible oils

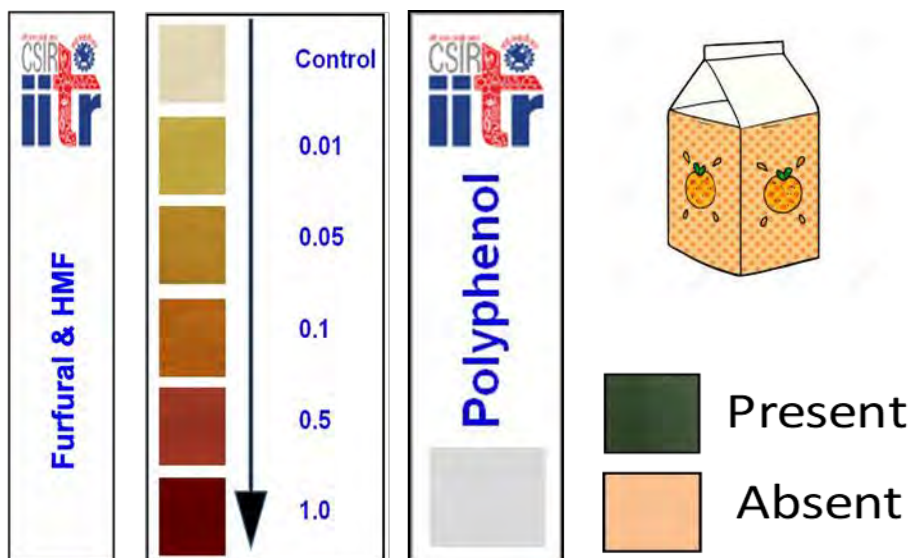


CSIR- Indian Institute of Toxicology Research (CSIR-IITR), Lucknow has scientifically developed a novel technology to rapidly detect edible oil adulteration.

Advantages:

- Strip-type sensor for visual assessment
- Quick and effortless method to ensure food safety
- Useful to detect adulterants in edible oils and fats.
- Least detection limits and precise accuracy

Test-strips for detection of spoilage in fruit juices



CSIR- Indian Institute of Toxicology Research (CSIR-IITR), Lucknow has scientifically developed a novel technology to rapidly detect spoilage in fruit juices.

Advantages:

- Based on Furfural and Hydroxy Methyl Furfural detection
- Quick detection of polyphenolic degradation.
- Useful to detect adulterants in fruit juices.
- Least detection limits and accuracy

Bioreactor for Paper & Pulp Industry effluent treatment



CSIR- Indian Institute of Toxicology Research (CSIR-IITR), Lucknow has scientifically developed a novel technology development to reduce, recycle and reuse of effluents.

Advantages:

- Based on activated sludge process
- Pilot scale bioreactor (2000 Lt Capacity)
- Useful for pulp, paper & textile Industries
- Community and sewage effluent treatment

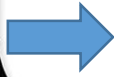


8. Early non-transgenic wistar rat and cellular model of Alzheimer's disease, induced through heavy metal mixture; Patent No. 2997136 (EP, AT)

Multiresidue Pesticide Analysis Kit



Analysis kit



Reagent



Reagent



Reagent



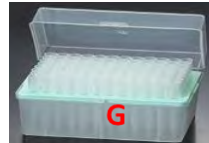
Mix standard



5 ml Centrifuge tube (100 nos)



Pipette 1 ml



Tips 1 ml (100 nos)



Syringes 5 ml (100 nos)



0.22um PVDF filter (100 nos)



2 ml Eppendorf tube (100 nos)



Tissue roll



Instruction manual

CSIR- Indian Institute of Toxicology Research (CSIR-IITR), Lucknow has developed a novel technology for pesticide analysis

Portable water analysis kit



CSIR- Indian Institute of Toxicology Research (CSIR-IITR), Lucknow has scientifically developed a novel technology to rapidly detect contaminants in drinking water.

Advantages:

- Rapid water quality assessment technology
- Organic and inorganic contaminants detection
- Microbial disinfection and clean water solution
- Least detection limits and precise accuracy

Centre for Innovation and Translational Research (CITAR)



CSIR-IITR BioNEST

Thematic R&D areas

- ✓ Agro biotechnologies
- ✓ Food and Cosmetics
- ✓ Pharma and Biopharma
- ✓ Pollution and Environment

Deliverables

- ✓ Enabling Startups and Innovations
- ✓ Promoting Bio-entrepreneurship
- ✓ Supporting industries and MSMEs
- ✓ Connecting Academia and Industries

Sophisticated instrumentation and Analytical facility

In silico toxicity prediction and testing facility

NABL and GLP Accredited testing facility

Incubation and Lab spaces for start-ups

Cell and Molecular Biology Facility



Funding Support



DSIR-Common Research and Technology Development Hub (CRTDH)

Thematic areas

- ✓ Water treatment and monitoring
- ✓ Effluent treatment
- ✓ Air pollution abatement

Deliverables

- ✓ Drinking water disinfection technologies
- ✓ Water quality assessment technologies
- ✓ Pulp & paper industries effluent treatment technologies
- ✓ Air quality as well as pollution abatement.
- ✓ Human resource development
- ✓ Support MSMEs



Toxicity/Safety Testing: NABL and GLP Accredited Services



One Stop Solution for Toxicology Testing

- A Global Leader in Toxicology R&D for over five decades
- The only GLP compliant CRO for regulatory toxicology in CSIR
- 360° testing facility for Bio-stimulants based on National (FSSAI) and International quality standards (OECD) & guidelines
- Agrochemicals, Cosmetics products, Food/Feed additives, Industrial Chemicals and Pharmaceuticals
- Air and water quality testing in different matrices



National GLP Compliance Monitoring Authority (NGCMA)

Annexure to Certificate of GLP Compliance No. GLP/C-154/2020

Areas of Expertise:

- **Toxicity Studies**
 - o Acute Toxicity
 - o Inhalation Toxicity
 - o Repeated Dose Toxicity
 - o Skin Irritation/ Corrosion (*in vivo*)
 - o Skin Sensitization (*in vivo*)
- **Mutagenicity Studies**
 - o Chromosomal Aberration Test (*in vitro* and *in vivo*)
 - o Micronucleus Test (*in vitro* and *in vivo*)
- **Environmental Toxicity Studies on Aquatic and Terrestrial Organisms**
- **Analytical and Clinical Chemistry Testing**

Test Item(s): Agrochemicals, Cosmetics Products, Feed Additives, Food Additives, Industrial chemicals and Pharmaceuticals (Human)

Test System(s): Algae, Cell lines, Daphnia magna, Earthworm, Guinea Pig, Mouse, Rabbit, Rat and Zebra Fish.



(Dr. Neera) Sharma
Head, NGCMA



For further information contact

Director, CSIR-Indian Institute of Toxicology Research, Vishvigyan
Bhawan, 31, Mahatma Gandhi Marg, Lucknow-226001

e-mail: director@iitrindia.org