

Prof. KIRTIRAJ K. GAIKWAD, Ph.D., FLS

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Packaging Technology Division|
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RESEARCH AREAS

- Sustainable Smart Packaging
- Active Food Packaging
- Intelligent Food Packaging (Use of Indicators/Labels)
- Food safety and Shelf life
- Waste valorization, Food waste management and preservation
- Biomaterial based high barrier coatings for packaging applications

EDUCATION

- **Ph.D. (Packaging):** Yonsei University, Seoul, South Korea, 2014-2018.
- **M.S. (Packaging):** Michigan State University, East Lansing, USA, 2011-2013.
- **M.Tech. (Food Safety):** Sam Higginbottom University of Agriculture, Technology & Sciences Allahabad, India, 2009-2011.
- **B.Tech. (Food Science):** Dr. Panjabrao Deshmukh Agriculture University, Akola, India, 2005-2009.

WORK EXPERIENCE

Postdoctoral Fellow: Department of Chemical Engineering, **Ecole Polytechnique de Montréal, Montreal, Canada.** March 2018–Feb 2019 (Prof. Abdellah Ajji Lab)

Assistant Professor: Packaging Technology Division, Department of Paper Technology, **Indian Institute of Technology (IIT) Roorkee, India,** Jan 2020 - Present

HONORS/AWARDS

1. Received **FSSAI Research Award 2022** from Food Safety & Standards Authority of India (FSSAI), Prize includes a certificate of excellence and a **cash prize of 5000 USD**
2. Elected as **Fellow of the Linnean Society of London**, UK October 2019.
3. Prestigious **DST INSPIRE Faculty Award** by Department of Science and Technology, Government of India in 2019.
4. Research papers (Ph.D. work) ranked in **ScienceDirect top 25 most downloaded articles** for Progress in Organic Coatings Journal from September- November 2017.
5. **Student Travel Scholarship Award** by International Association for Food Protection (IAFP) USA to participate in IAFP annual meeting at St Louise, USA, in July 2016. **(Grant: \$ 2000 USD)**
6. **A J Banks Travel Award** by Society of Chemical Industries (SCI) London, UK, to participate in an international conference in Munich, Germany, in September 2015. **(Grant: \$1500 USD)**
7. **Outstanding Foreign Student Scholarship Award** in the Ph.D. program by Yonsei University, Seoul, South Korea, in 2014. **(Grant: \$ 26500)**
8. **Certificate of Appreciation** from Indian Society of Agriculture Engineers (ISAE), at 48th Annual

convention and symposium of engineering intervention in conservation agriculture February 2014.

- 9. Student of the Month Award** by Packaging Graduate Association, Michigan State University, USA, in 2011.
- 10.** Worked as **Food Safety Officer** in **Common Wealth Games (CWG)** Delhi 2010 to inspect the quality of athlete's food.
- 11. Merit Scholarship** for the M.Tech program by Directorate of Technical Educational, Government of Maharashtra, India, in 2010. (**Grant: 60000 INR**)

SPONSORED RESEARCH PROJECTS

Sr. No.	Title of the project	Role (sole PI/PI/Co-PI)	Funding agency and duration	Total outlay (in INR)
1	Turning Waste to Wealth: Development of active packaging material from agriculture waste via green route for sustainable environment	Sole principal investigator	SERB , Govt. of India <u>Awarded</u> : Nov. 2021 <u>Status</u> : On-going <u>Duration</u> : 2 Years	32,000 USD
2	<i>Towards sustainable flexible packaging: Development of high barrier active films for packaging applications"</i>	Sole principal investigator	DST , Govt. of India <u>Start Date</u> : May 2019 <u>Status</u> : On-going <u>Duration</u> : 5 Years	42,000 USD
3	Scientific Management of Natural Resources for Sustainable Development in UBA Clusters of Shivalik Region	Co-investigator	DST , Govt. of India <u>Awarded</u> : April 2021 <u>Status</u> : On-going <u>Duration</u> : 5 Years	55,000 USD

ADMINISTRATIVE POSITIONS

Sr No	Position	Organization
1	Technical Expert Committee Member	Paper and Its Products, Bureau of Indian Standards (BIS) India
2	Chairman	Department Academic Program Committee (DAPC), Dept. of Paper Technology IITR
3	Chairman	Chairman, Department Placement Coordinator, Dept. of Paper Technology IITR
4	Faculty Advisor	Gender Advancement in Transforming Institutions (GATI), Paper Technology Dept., IIT Roorkee

PATENTS

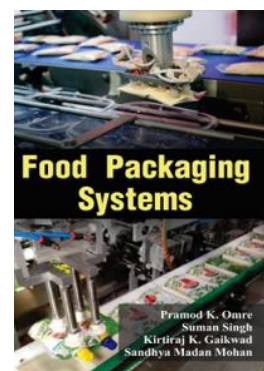
Sr No	Name of Patent	Assignee	Country	Patent/ Registration number	Status
1	Novel oxygen scavenging film and composition for packaging comprising the same	You Suk Lee; Kirtiraj K. Gaikwad	South Korea	KR101935245B1	Granted
2	UV activated oxygen absorbing packaging materials and preparation method thereof	You Suk Lee; Kirtiraj K. Gaikwad	South Korea	KR101911284B1	Granted
3	Rigid Bottle design for packaging applications	Pragya Srivastava, Kirtiraj K Gaikwad	India	376109-001	Granted
4	Method for preparing an edible ink for printing on edible and non-edible commodities	Kirtiraj K Gaikwad Lokman Hakim	India	202311017518	Filled

BOOKS (Authored & Edited)

Editors: Kirtiraj K. Gaikwad, Suman Singh
Title: Novel Packaging Systems for Fruits and Vegetables
Publisher: CRC Press, Taylor & Francis Group, USA.
Year of Publication: 2023
ISBN: 978177491496



Author: Pramod Omre, Suman Singh, Kirtiraj K. Gaikwad
Title: Food Packaging System
Publisher: BioTech Books Publisher, New Delhi.
Year of Publication: 2015
ISBN: 978-81-7622



2023

1. Jitendra Kumar, Konala Akhila, Pardeep Kumar, Ram Deshmukh, **Kirtiraj K. Gaikwad* (2023)** Novel temperature-sensitive label based on thermochromic ink for hot food packaging and serving applications. *Journal of Thermal Analysis and Calorimetry*. DOI: 10.1007/s10973-023-12147-8 **(Impact Factor: 4.75) (Q1)**
2. Konala Akhila, Afreen Sultana, Dakuri Ramakanth, **Kirtiraj K. Gaikwad* (2023)** Monitoring freshness of chicken using intelligent pH indicator packaging film composed of polyvinyl alcohol/guar gum integrated with Ipomoea coccinea extract. *Food Bioscience*. <https://doi.org/10.1016/j.fbio.2023.102397> **(Impact Factor: 5.31) (Q1)**
3. Lokesh Kumar, Shefali Tripathi, **Kirtiraj K. Gaikwad* (2023)** Valorization of cactus biomass to manufacture sustainable packaging films: moisture sorption behavior and influence of citric acid as crosslinking agent. *Biomass Conversion and Biorefinery*. <https://doi.org/10.1007/s13399-023-04391-7> **(Impact Factor: 4.00) (Q2)**
4. Afreen Sultana, Lokesh Kumar, **Kirtiraj K. Gaikwad* (2023)** Lignocellulose nanofibrils/guar gum-based ethylene scavenging composite film integrated with zeolitic imidazolate framework-8 for food packaging. *International Journal of Biological Macromolecules*. <https://doi.org/10.1016/j.ijbiomac.2023.125031>. **(Impact Factor: 8.02) (Q1)**
5. Lokesh Kumar, Ram Deshmukh, Lokman Hakim, **Kirtiraj K. Gaikwad* (2023)** Halloysite Nanotube as a Functional Material for Active Food Packaging Application: A Review. *Food and Bioprocess Technology*. <https://doi.org/10.1007/s11947-023-03092-3> **(Impact Factor: 5.58) (Q1)**
6. Lokman Hakim, Lokesh Kumar, **Kirtiraj K. Gaikwad* (2023)** Screen printing of catechu (*Senegalia catechu*)/guar gum based edible ink for food printing and packaging applications. *Progress in Organic Coatings* 182: 107629 <https://doi.org/10.1016/j.porgcoat.2023.107629> **(Impact Factor: 6.20) (Q1)**
7. Prachi Jain, Shefali Tripathi, Ram Deshmukh, **Kirtiraj K. Gaikwad***, Suman Singh **(2023)** Functionalization of sugarcane bagasse-based paper with amla pomace/titanium dioxide nanoparticles providing antimicrobial protection for food safety. *Biomass Conversion and Biorefinery*. doi.org/10.1007/s13399-023-04242-5 **(Impact Factor: 4.00) (Q2)**
8. Konala Akhila, Dakuri Ramakanth Lingala Lakshman Rao, **Kirtiraj K. Gaikwad* (2023)** UV-blocking biodegradable film based on flaxseed mucilage/pectin impregnated with titanium dioxide and calcium chloride for food packaging applications. *International Journal of Biological Macromolecules*. Doi: 10.1016/j.ijbiomac.2023.124335 **(Impact Factor: 8.02) (Q1)**
9. Princy Kathait, Pramod Omre, Pardeep Kumar, **Kirtiraj K. Gaikwad* (2023)** Development of a PVA-starch antioxidant film incorporating beetroot stem waste extract for active food packaging. *Journal of Polymers and the Environment*. Doi: 10.1007/s10924-023-02840-y **(Impact Factor: 4.70) (Q1)**
10. Ram Kumar Deshmukh, Lokesh Kumar, **Kirtiraj K. Gaikwad* (2023)** Halloysite nanotubes for food packaging application: A review. *Applied Clay Science*. 234: 106856. <https://doi.org/10.1016/j.clay.2023.106856> **(Impact Factor: 5.90) (Q1)**
11. Lokesh Kumar, **Kirtiraj K. Gaikwad* (2023)** Advanced food packaging systems for space exploration missions. *Life Sciences in Space Research*. 27: 7-14 <https://doi.org/10.1016/j.lssr.2023.01.005> **(Impact Factor: 2.73) (Q2)**
12. Avinash Kumar, Dakuri Ramakanth, Konala Akhila, **Kirtiraj K. Gaikwad* (2023)** Influence of halloysite nanotubes/microfibrillated cellulose on pine leaves waste based ethylene scavenging composite paper for food packaging applications. *Applied Clay Science*. <https://doi.org/10.1016/j.clay.2022.106726> **(Impact Factor: 5.90) (Q1)**
13. Harshi Singhi, Lokesh Kumar, Preetam Sarkar, **Kirtiraj K. Gaikwad* (2023)** Chitosan based antioxidant biofilm with waste *Citrus limetta* pomace extract and impregnated with halloysite nanotubes for food packaging. *Journal of Food Measurement and Characterization*. DOI : 10.1007/s11694-023-01825-8 **(Impact Factor: 3.00) (Q2)**
14. Anushikha, **Kirtiraj K. Gaikwad* (2023)** Lignin as a UV blocking, antioxidant, and antimicrobial agent for food packaging applications. *Biomass Conversion and Biorefinery*. DOI : 10.1007/s13399-022-03707-3 **(Impact Factor: 4.00) (Q2)**

15. Manoj Sathwane, Monika Chhajed, Chhavi Verma, **Kirtiraj K. Gaikwad***, Pradip K. Maji (**2022**) Synergistic effect of hybrid hydroxylated boron nitride and cellulose nanocrystals for enhancing the thermal, mechanical, and hydrophobic properties of the composite film. *Polymer Composites*. <https://doi.org/10.1002/pc.27112> (**Impact Factor: 3.53**) (**Q2**)
16. Ruchika Zalpouri, Manpreet Singh, Preetinder Kaur, Amrit Kaur, **Kirtiraj K. Gaikwad**, Ashutosh Singh (**2023**) Drying kinetics, physicochemical and thermal analysis of onion puree dried using a refractance window dryer. *Processes* 11(3): 700; <https://doi.org/10.3390/pr11030700> (**Impact Factor: 3.35**) (**Q2**)
17. Pardeep Kumar, Lokesh Kumar, Rohit Tanwar, Suman Singh, **Kirtiraj K. Gaikwad*** (**2023**) Active edible coating based on guar gum with mint extract and antibrowning agents for ber (*Ziziphus mauritiana*) fruits preservation. *Journal of Food Measurement and Characterization* <https://doi.org/10.1007/s11694-022-01609-6> (**Impact Factor: 3.00**) (**Q2**)
18. Deepika, Lokesh Kumar, **Kirtiraj K. Gaikwad*** (**2023**) Carbon dots for food packaging applications. *Sustainable Food Technology*, 1(2), 185-199 DOI: 10.1039/d2fb00020b

2022

19. Srutee Rout, Srushti Tambe, Ram Kumar Deshmukh, **Kirtiraj K. Gaikwad** et al., (**2022**) Recent trends in the application of essential oils: The next generation of food preservation and food packaging. *Trends in Food Science & Technology*. <https://doi.org/10.1016/j.tifs.2022.10.012> (**Impact Factor: 16**) (**Q1**)
20. Ram Deshmukh, Pardeep Kumar, Rohit Tanwar, **Kirtiraj K. Gaikwad*** (**2022**) Pectin-Polyvinylpyrrolidone Based Antimicrobial and Antioxidant Nanocomposite Film Impregnated with Titania Nanoparticles and Bael Shell Extract. *Food and Bioprocess Technology*. <https://doi.org/10.1007/s11947-022-02922-0> (**Impact Factor: 5.58**) (**Q1**)
21. Praveen Kumar Kunam, Dakuri Ramakanth, Konala Akhila, **Kirtiraj K. Gaikwad*** (**2022**) Bio-based materials for barrier coatings on paper packaging. *Biomass Conversion and Biorefinery*. <https://doi.org/10.1007/s13399-022-03241-2> (**Impact Factor: 4.00**) (**Q1**)
22. Afreen Sultana, Md Wasim Siddiqui, **Kirtiraj K. Gaikwad*** (**2022**) Synthesis of zeolitic imidazolate framework-8 composite as ethylene scavenger for fruits and vegetable preservation and packaging. *Biomass Conversion and Biorefinery*. <https://doi.org/10.1007/s13399-022-03066-z> (**Impact Factor: 4.00**) (**Q2**)
23. Lokesh Kumar, Ram Deshmukh, and **Kirtiraj K. Gaikwad*** (**2022**) Antimicrobial packaging film from cactus (*Cylindropuntia fulgida*) mucilage and gelatine. *International Journal of Biological Macromolecules* (**Impact Factor: 8.02**) (**Q1**)
24. Ram Deshmukh, Konala Akhila, Dakuri Ramakanth, **Kirtiraj K. Gaikwad*** (**2022**) Guar gum/carboxymethyl cellulose-based antioxidant film incorporated with halloysite nanotubes and litchi shell waste extract for active packaging. *International Journal of Biological Macromolecules*. 201:1-13 (**Impact Factor: 8.02**) (**Q1**)
25. Avinash Kumar, Ram Deshmukh, **Kirtiraj K. Gaikwad*** (**2022**) Quality preservation in banana fruits packed in pine needle and halloysite nanotube-based ethylene gas scavenging paper during storage. *Biomass Conversion and Biorefinery*. <https://doi.org/10.1007/s13399-022-02708-6> (**Impact Factor: 4.00**) (**Q2**)
26. Dakuri Ramakanth, Konala Akhila, **Kirtiraj K. Gaikwad***, Pradip Maji (**2022**) UV-activated oxygen scavenging system based on natural rubber latex from *Hevea brasiliensis* for active packaging applications. *Industrial Crops & Products*. <https://doi.org/10.1016/j.indcrop.2022.114658> (**Impact Factor: 6.44**) (**Q1**)
27. **Kirtiraj K. Gaikwad**, Ram K Deshmukh, Youn Suk Lee (**2022**) Natural phenolic compound coated oxygen scavenging active polyolefin film for preserving the quality of fish cake *Biomass Conversion and Biorefinery*. <https://doi.org/10.1007/s13399-022-02678-9> (**Impact Factor: 4.00**) (**Q2**)
28. Ram Kumar Deshmukh, **Kirtiraj K. Gaikwad*** (**2022**) Natural antimicrobial and antioxidant compounds for active food packaging applications. *Biomass Conversion and Biorefinery*. Doi: 10.1007/s13399-022-02623-w (**Impact Factor: 4.00**) (**Q2**)
29. Konala Akhila, Dakuri Ramakanth, **Kirtiraj K. Gaikwad*** (**2022**) Development of novel gallic acid and cellulose acetate coated paper as pH-responsive oxygen indicator for intelligent food packaging. *Journal of Coatings Technology and Research*. DOI : 10.1007/s11998-022-00622-0 (**Impact Factor: 2.38**) (**Q2**)

30. Aakash Upadhyay, Pardeep Kumar Saurabh Kumar, **Kirtiraj K. Gaikwad* (2022)** Ethylene scavenging film based on corn starch-gum acacia impregnated with sepiolite clay and its effect on quality of fresh broccoli florets. Food Bioscience. 46:101556 (**Impact Factor: 5.31**) (**Q1**)
31. Afreen Sultana, Ajay Kathuria, **Kirtiraj K. Gaikwad* (2022)** Metal-organic frameworks for active food packaging. A review. Environmental Chemistry Letters. <https://doi.org/10.1007/s10311-022-01387-z> (**Impact Factor: 13.61**) (**Q1**)
32. Shashank Saini, S. Kardam, A. Kadam, Vivek Kumar, **Kirtiraj K. Gaikwad (2022)** Green and energy-efficient extraction of cellulose nano-fibrils from rice straw and its coating to improve functional properties of rice straw paperboard made via refiner mechanical pulping. Progress in Organic Coatings 165: 106747 (**Impact Factor: 6.20**) (**Q1**)
33. Srivastava, P., Ramakanth, D., Akhila, K., & **Kirtiraj K. Gaikwad* (2022)** Package design as a branding tool in the cosmetic industry: consumers' perception vs. reality. SN Business & Economics, 2(6) 58 <https://doi.org/10.1007/s43546-022-00222-5>
34. Ram Deshmukh, Hakim Lokman, Konala Akhila, Dakuri Ramakanth, **Kirtiraj K. Gaikwad* (2022)** Nano clays and its composites for food packaging applications. International Nano Letter. <https://doi.org/10.1007/s40089-022-00388-8>

2021

35. Lokesh Kumar, Dakuri Ramakanth, Konala Akhila, **Kirtiraj K. Gaikwad* (2021)** Edible films and coatings for food packaging applications: a review. Environmental Chemistry Letters <https://doi.org/10.1007/s10311-021-01339-z> (**Impact Factor: 13.02**) (**Q1**)
36. Vidhi Gupta, Rakhi Yadav, Rohit Tanwar, **Kirtiraj K. Gaikwad* (2021)**. κ -Carrageenan-based bio-nanocomposite film reinforced with cellulose nanocrystals derived from amla pomace for food packaging. Biomass Conversion and Biorefinery DOI: <https://doi.org/10.1007/s13399-021-02028-1> (**Impact Factor: 4.00**) (**Q2**)
37. Jitendra Kumar, Konala Akhila, **Kirtiraj K. Gaikwad* (2021)**. Recent developments in intelligent packaging systems for food processing industry: a review. Food Processing and Technology 12: 895.
38. Avinash Kumar, Vidhi Gupta, **Kirtiraj K. Gaikwad*(2021)** Microfibrillated cellulose from pine cone: extraction, properties, and characterization. Biomass Conversion and Biorefinery. <https://doi.org/10.1007/s13399-021-01794-2> (**Impact Factor: 4.00**) (**Q2**)
39. Pardeep Kumar, Rohit Tanwar, Vidhi Gupta, Aakash Upadhyay, Anil Kumar, **Kirtiraj K. Gaikwad* (2021)** Pineapple peel extract incorporated poly(vinyl alcohol)-corn starch film for active food packaging: Preparation, characterization, and antioxidant activity. International Journal of Biological Macromolecules. <https://doi.org/10.1016/j.ijbiomac.2021.07.136> (**Impact Factor: 8.02**) (**Q1**)
40. Rohit Tanwar, Vidhi Gupta, Pardeep Kumar, Kumar A, **Kirtiraj K. Gaikwad* (2021)** Development and characterization of PVA-starch incorporated with coconut shell extract and sepiolite clay as an antioxidant film for active food packaging applications. International Journal of Biological Macromolecules. 185: 451-461 <https://doi.org/10.1016/j.ijbiomac.2021.06.179> (**Impact Factor: 6.95**) (**Q1**)
41. Avinash Kumar, Vidhi Gupta, S. Saini, **Kirtiraj K. Gaikwad* (2021)** Pine needles lignocellulosic ethylene scavenging paper impregnated with nanozeolite for active packaging applications. Industrial Crops and Products. 170: 113752 doi: <https://doi.org/10.1016/j.indcrop.2021.113752> (**Impact Factor: 6.44**) (**Q1**)
42. Shashank Saini, A. A. Kadam, V. Kumar, **Kirtiraj K. Gaikwad, D. Dutt (2021)** Conversion of rice straw into disposable food-serving bowl via refiner mechanical pulping: an environmentally benign approach to mitigate stubble burning and plastic pollution. Biomass Conversion and Biorefinery. <https://doi.org/10.1007/s13399-021-01728-y> (**Impact Factor: 4.00**) (**Q2**)
43. Dakuri Ramakanth, Suman Singh, P. K. Maji, Youn Suk Lee, **Kirtiraj K. Gaikwad* (2021)** Advanced packaging for distribution and storage of COVID-19 vaccines: a review. Environmental Chemistry Letters. doi:<https://doi.org/10.1007/s10311-021-01256-1> (**Impact Factor: 13.02**) (**Q1**)
44. Vidhi Gupta, Dakuri Ramakanth, Chhavi Verma, P. K. Maji, **Kirtiraj K. Gaikwad* (2021)** Isolation and characterization of cellulose nanocrystals from amla (Phyllanthus Emblica) pomace. Biomass Conversion and Biorefinery <https://doi.org/10.1007/s13399-021-01852-9> (**Impact Factor: 4.00**) (**Q2**)
45. Ajit Kumar, Dakuri Ramakanth., Avinash Kumar, Lee, Y. S., **Kirtiraj K. Gaikwad* (2021)**. Active packaging technologies for clean label food products: a review. Journal of Food Measurement and Characterization, 1-11.<https://doi.org/10.1007/s11694-021-01024-3> (**Impact Factor: 3.00**) (**Q2**)

46. Ashish Kadam, Suman Singh, **Kirtiraj K. Gaikwad*** (2021) Chitosan-based antioxidant films incorporated with pine needle (*Cedrus deodara*) extract for active food packaging applications. Food Control.124: 107877. Doi: 10.1016/j.foodcont.2021.107877 **(Impact Factor: 6.65) (Q1)**
47. Pragya Gupta, Akanksha Pandey, **Kirtiraj K. Gaikwad**, Sunanda Roy, Pradip Maji (2021) Role of rheological premonitory of hydrogel based on cellulose nanofibers and polymethylsilsesquioxane on the physical properties of corresponding aerogel. Polymer Engineering and Science. Doi: 10.1002/pen.25671 **(Impact Factor: 2.54) (Q2)**

2020

48. Gaurav Singh, Suman Singh, Bijender Kumar, **Kirtiraj K. Gaikwad***(2020) Active oxygen barrier chitosan films containing gallic acid-based oxygen scavenger. Journal of Food Measurement & Characterization. Doi: 10.1007/s11694-020-00669-w **(Impact Factor: 3.00) (Q2)**
49. Suman Singh, Pradip K Maji, Youn Suk Lee, **Kirtiraj K Gaikwad***(2020) Applications of gaseous chlorine dioxide for antimicrobial food packaging: a review. Environmental Chemistry Letters. <https://doi.org/10.1007/s10311-020-01085-8> **(Impact Factor: 13.02) (Q1)**
50. Kumar, B.; Priyadarshi, R.;.....**Gaikwad, K.K.**; Kim, J.; Kumar, A.; Negi, Y.S. (2020) Nanoporous sodium carboxymethyl cellulose-*g*-poly (Sodium Acrylate)/FeCl₃ hydrogel beads: synthesis and characterization. Gels 6 (4): 49. Doi: 10.3390/gels6040049 **(Impact Factor: 4.70) (Q1)**
51. **Kirtiraj K. Gaikwad.**, Singh, S., Shin, J., Lee, Y.S., (2020) Novel polyisoprene-based UV-activated oxygen scavenging films and their applications in packaging of beef jerky. LWT -Food Science and Technology. 117:108643. Doi: [10.1016/j.lwt.2019.108643](https://doi.org/10.1016/j.lwt.2019.108643). **(Impact Factor: 6.05) (Q1)**
52. **Kirtiraj K. Gaikwad**, Singh, Suman, Yuvraj Singh Negi (2020) Ethylene scavengers for active packaging of fresh food produce. Environmental Chemistry Letters. 18: 269-284. Doi.10.1007/s10311-019-00938-1 **(Impact Factor: 13.02) (Q1)**
53. **Kirtiraj K. Gaikwad***, Singh, Suman, Yuvraj Singh Negi, Youn Suk Lee (2020) The effect of trans-polyisoprene/LDPE based active films on oxidative stability in roasted peanuts. Journal of Food Measurement & Characterization. 14:1857-1864. Doi.10.1007/s11694-020-00433-0. **(Impact Factor: 3.00) (Q2)**

2019

54. Suman Singh, **Kirtiraj K. Gaikwad**, Youn Suk Lee (2019) Development and application of a pyrogallol acid-based oxygen scavenging packaging system for shelf life extension of peeled garlic. Scientia Horticulturae. 256:108548 Doi.10.1016/j.scienta.2019.108548 **(Impact Factor: 4.34) (Q1)**
55. **Kirtiraj K. Gaikwad**, Suman Singh, Abdellah Ajji (2019) Moisture absorbers for food packaging applications. Environmental Chemistry Letters. 17 (2)609–628 Doi.10.1007/s10311-018-0810-z **(Impact Factor: 13.02) (Q1)**
56. Suman Singh, **Kirtiraj K. Gaikwad**, Youn Suk Lee (2019) Temperature-controlling system for fresh produce during distribution and transportation. Journal of Thermal Analysis and Calorimetry. Doi: 10.1007/s10973-019-08658-y **(Impact Factor: 4.75) (Q1)**

2018

57. **Kirtiraj K. Gaikwad**, Suman Singh, Youn Suk Lee (2018) Antimicrobial and improved barrier properties of natural phenolic compound-coated polymeric films for active packaging applications. Journal of Coatings Technology and Research. 16: 147–157. Doi. 10.1007/s11998-018-0109-9 **(Impact Factor: 2.38) (Q2)**
58. Suman Singh, **Kirtiraj K. Gaikwad**, Youn Suk Lee (2018) Temperature-sensitive smart packaging for monitoring the shelf life of fresh beef. Journal of Food Engineering. 234:42-49. doi: 10.1016/j.jfoodeng.2018.04.014. **ScienceDirect top 25 most downloaded articles. (Impact Factor: 6.20) (Q1)**
59. **Kirtiraj K. Gaikwad**, Suman Singh, Youn Suk Lee (2018) High adsorption of ethylene by alkali-treated halloysite nanotubes for food packaging applications. Environmental Chemistry Letters. 16:1055–1062 Doi. 10.1007/s10311-018-0718-7 **(Impact Factor: 13.02) (Q1)**

60. Suman Singh, **Kirtiraj K. Gaikwad**, Myungho Lee, Youn Suk Lee (2018) Thermally buffered corrugated packaging for preserving the postharvest freshness of mushrooms (*Agaricus bisporus*). Journal of Food Engineering. 218:11-19. Doi: 10.1016/j.jfoodeng.2017.07.013 (**Impact Factor: 6.20**) (**Q1**)
61. **Kirtiraj K. Gaikwad**, Suman Singh, Youn Suk Lee (2018) Oxygen scavenging films in food packaging. Environmental Chemistry Letters. 16:523–538 Doi 10.1007/s10311-018-0705-z (**Impact Factor: 13.02**) (**Q1**)
62. Suman Singh, Myungho Lee, **Kirtiraj K. Gaikwad**, Youn Suk Lee (2018) Antibacterial and amine scavenging properties of silver-silica composite for post-harvest storage of fresh fish. Food and Bioproducts Processing. 107: 61-69 Doi: 10.1016/j.fbp.2017.10.009 (**Impact Factor: 5.10**) (**Q1**)
63. Suman Singh, **Kirtiraj K. Gaikwad**, Youn Suk Lee (2018) Anthocyanin – a natural dye for smart food packaging systems. Korean Journal of Packaging Science & Technology. 24 (3) 167-180 <https://doi.org/10.20909/kopast.2018.24.3.167>
64. Suman Singh, **Kirtiraj K. Gaikwad**, Youn Suk Lee (2018) Phase change materials for advanced cooling packaging. Environmental Chemistry Letters. Doi. 10.1007/s10311-018-0726-7 (**Impact Factor: 13.02**) (**Q1**)

2017

65. **Kirtiraj K. Gaikwad**, Suman Singh, Youn Suk Lee (2017) A pyrogallol-coated modified LDPE film as an oxygen scavenging film for active packaging materials. Progress in Organic Coatings.111:186-195. Doi 10.1016/j.porgcoat.2017.05.016. **ScienceDirect top 25 most downloaded articles.** (**Impact Factor: 6.20**) (**Q1**)
66. Suman Singh, **Kirtiraj K. Gaikwad**, Myungho Lee, Youn Suk Lee (2017) Microwave-assisted micro-encapsulation of phase change material using zein for smart food packaging applications. Journal of Thermal Analysis and Calorimetry. 131 (3)2187–2195 DOI: 10.1007/s10973-017-6768-4 (**Impact Factor: 4.75**) (**Q1**)
67. **Kirtiraj K. Gaikwad**, Suman Singh, Youn Suk Lee (2017) A new pyrogallol coated oxygen scavenging film and their effect on oxidative stability of soybean oil under different storage conditions. Food Science and Biotechnology 26(6) 1535–1543. Doi 10.1007/s10068-017-0232-x (**Impact Factor: 3.21**) (**Q2**)
68. Suman Singh, **Kirtiraj K. Gaikwad**, Youn Suk Lee (2017) Antimicrobial and antioxidant properties of polyvinyl alcohol biocomposite films containing seaweed extracted cellulose nano-crystal and basil leaves extract. International Journal of Biological Macromolecules. 107, 1879-1887. Doi: 10.1016/j.ijbiomac.2017.10.057 (**Impact Factor: 8.02**) (**Q1**)
69. Suman Singh, **Kirtiraj K. Gaikwad**, Youn Suk Lee (2017) Temperature regulating material for advanced food packaging- Review. Journal of Food Measurement & Characterization. 12(1) 588–601 Doi: 10.1007/s11694-017-9672-5 (**Impact Factor: 3.00**) (**Q2**)
70. Suman Singh, **Kirtiraj K. Gaikwad**, Youn Suk Lee (2017) Microwave-assisted step reduced extraction of seaweed (*Gelidium aceroso*) cellulose nanocrystals. International Journal of Biological Macromolecules. 99: 506–510. Doi 10.1016/j.ijbiomac.2017.03.004 (**Impact Factor: 8.02**) (**Q1**)
71. **Kirtiraj K. Gaikwad**, Seong Min Lee, Youn Suk Lee (2017) Development of antimicrobial polyolefin films containing lauroyl arginate and their use in the packaging of strawberries. Journal of Food Measurement & Characterization. 11:1706–1716. Doi 10.1007/s11694-017-9551-0 (**Impact Factor: 3.00**) (**Q2**)
72. **Kirtiraj K. Gaikwad**, Youn Suk Lee (2017) Current scenario of gas scavenging systems used in active packaging – A review. Journal of Packaging Science and Technology. 23(2) 109-117. Doi 10.20909/kopast.2017.23.2.109.
73. **Kirtiraj K. Gaikwad**, Youn Suk Lee (2017) Effect of storage conditions on the absorption kinetics of non-metallic oxygen scavenger suitable for moist food packaging. Journal of Food Measurement & Characterization. 11(3) 965–971. Doi 10.1007/s11694-017-9470-0 (**Impact Factor: 3.00**) (**Q2**)

2016

74. Byung J. Ahn, **Kirtiraj K. Gaikwad**, Youn Suk Lee (2016) Characterization and properties of LDPE film with gallic-acid-based oxygen scavenging system useful as a functional packaging material. Journal of Applied Polymer Science 133: 44138. Doi 10.1002/app.44138 (**Impact Factor: 3.12**) (**Q2**)
75. **Kirtiraj K. Gaikwad**, Jin Yong Lee, Youn Suk Lee (2016) Development of polyvinyl alcohol and apple pomace bio-composite film with antioxidant properties for active food packaging application. Journal of Food Science and Technology. 53(3):1608- 1619. Doi 10.1007/s13197-015-2104-9 (**Impact Factor: 3.70**) (**Q2**)

76. **Kirtiraj K. Gaikwad**, Youn Suk Lee **(2016)** Novel natural phenolic compound-based oxygen scavenging system for active packaging applications. *Journal of Food Measurement & Characterization*. 10 (3): 533–538. Doi 10.1007/s11694-016-9332-1 **(Impact Factor: 3.00) (Q2)**
77. **Kirtiraj K. Gaikwad**, Suman Singh, Youn Suk Lee **(2016)** Functional corrugated board with organic and inorganic materials in food packaging application: A Review. *Journal of Packaging Science and Technology* 22 (3) 49-58. Doi 10.20909/kopast.2016.22.3.49
78. Suman Singh, **Kirtiraj K. Gaikwad**, P.K. Omre, Youn Suk Lee **(2016)** Process development for stabilization of sugar cane juice using response surface methodology. *Journal of Food Measurement & Characterization*. 10:727–737. Doi 10.1007/s11694-016-9357-5_ **(Impact Factor: 3.00) (Q2)**

BOOK CHAPTERS

8. Shefali Tripathi, **Kirtiraj K. Gaikwad (2023)** Recent trends in films and gases for modified atmosphere packaging of agriculture produce, "Novel Packaging Systems for Fruits and Vegetables" 2022, CRC Press, Taylor & Francis Group, USA. ISBN: 9781774914960

7. Ram Kumar Deshmukh, **Kirtiraj K. Gaikwad (2023)** Natural antioxidants for active packaging for fresh-cut fruits. "Novel Packaging Systems for Fruits and Vegetables" 2022, CRC Press, Taylor & Francis Group, USA ISBN: 9781774914960

6. Konala Akhila, **Kirtiraj K. Gaikwad (2023)** New smart packaging technologies for monitoring quality of agriculture produce "Novel Packaging Systems for Fruits and Vegetables" 2022, CRC Press, Taylor & Francis Group, USA ISBN: 9781774914960

5. Lokesh Kumar, **Kirtiraj K. Gaikwad (2023)** Active edible coatings and films for the preservation of quality of agricultural produce. "Novel Packaging Systems for Fruits and Vegetables" 2022, CRC Press, Taylor & Francis Group, USA. ISBN: 9781774914960

4. Pragya Srivastava¹, Dakuri Ramakanth², **Kirtiraj K. Gaikwad (2023)** Package designing aspects for marketing of fruits and vegetables, "Novel Packaging Systems for Fruits and Vegetables" 2022, CRC Press, Taylor & Francis Group, USA ISBN: 9781774914960

3. **Kirtiraj K. Gaikwad**, Suman Singh, PK Omre, Sandhya Madan Mohan. Active and intelligent packaging: Innovations for the future Chapter in *Food Processing and Technology: new emerging areas*. Shree publishers and distributor, New Delhi. PP: 10-21. **ISBN: 978-81-8329-717-2**.

2. Suman Singh, **Kirtiraj K. Gaikwad**, PK More. Food Packaging Development Chapter in *Food Processing and Technology: new emerging areas*. Shree publishers and distributor, New Delhi. PP: 10-21. **ISBN: 978-81-8329-717-2**.

1. Suman Singh, **Kirtiraj Gaikwad**, PK Omre, Food sovereignty as a way to achieve food security Chapter in *Extension for agriculture & rural development*. BioTech Books, New Delhi. PP-133-138. **ISBN: 978-8-176223386**.

CONFERENCE ABSTRACTS / PRESENTATION

1. **Gaikwad, K. K. Lee, YS 2017**, Oxygen scavenging films based on pyrogallol coating for active packaging applications. 8th The Shelf Life International Meeting (SLIM 2017) held on Nov 1-3, 2017 in **Bangkok, Thailand**.
2. **Gaikwad, K. K. Lee, YS 2016**, Ceramic as a potential material for advance food packaging applications 48th Annual conference of Korean society of packaging science & technology held on Oct 29-31, 2016 at **Jeju, South Korea**
3. **Gaikwad, K. K. Lee, YS 2016**, Novel natural phenolic compound-based oxygen scavenging system for active food packaging applications. In the IAFP 2016 Annual Meeting. IAFP. **St. Louis, USA**.
4. **Gaikwad, K.K. Lee, YS 2015**, Development of oxygen scavenging functional film for lipid containing food packaging. Proceeding of Innovation in Food Packaging, Food Safety and Shelf life, 15-17 September, **Munich, Germany**.

5. S. Singh, **K.K. Gaikwad 2015**, Optimization of process parameters for stabilization of sugarcane juice. Proceeding of Innovation in Food Packaging, Food Safety and Shelf life, 15-17 September, **Munich, Germany**
6. **K.K. Gaikwad 2015**, Advances in functional food packaging technology. Proceeding of 5th Euro-Global Summit and Expo on food & beverages June 16-18, **Alicante, Spain**.
7. **Kirtiraj Gaikwad**, Suman Singh and P.K. Omre **2014**, Modified atmospheric packaging of blackberry fruits with the use of chlorine dioxide gas & its effect on antioxidant & phenolic properties, Proceeding of National seminar on nation resource management in G.B.P.U.A & T India. Theme –IV PP: 239-245
8. Suman Singh, **Kirtiraj K. Gaikwad**, P K Omre, Anwesha Sarkar, A.E. Kate **2014**, Food Packaging Development, Proceeding of an International Interactive Seminar On food processing industry new Bundelkhand University Jhansi on July 7-8 2014.
9. **Kirtiraj K. Gaikwad**, Suman Singh, P K Omre, Sandhya Madan Mohan **2014**, Active & Intelligent Packaging: innovations for the future, proceeding of an international interactive seminar on the food processing industry new entrepreneurial opportunity with sustainable business patterns at Institute of Food Technology, Bundelkhand University Jhansi on July 7-8 2014
10. Suman Singh, PK Omre, **Kirtiraj Gaikwad**, Sandya Mohan **2014** Managing environmental sustainability in Indian food & drinks Industries Proceedings of the All India seminar on Emerging technology for sustainable resource management March 13-14, 2014 Pantnagar, India.
11. Suman Singh, P K Omre, **Kirtiraj Gaikwad 2014** Spoilage of sugar cane juice -A problem in Sugarcane Industries Proceedings of the 48th Annual Convention of Indian Society of Agricultural Engineers (ISAE) and Symposium on Engineering Interventions in Conservation Agriculture February, 21-23, 2014 Udaipur, India.
12. **Kirtiraj Gaikwad**, M Siddiq, Susan Selke, **2013**, Effect of Chlorine Dioxide Package System (PET & PLA material) on Antioxidant Capacity, Total Phenolic and Color of blackberry fruits, Proceedings of the International Conference on food Processing and Technology, 2013, **Kansas City, USA**.
13. **Kirtiraj Gaikwad**, Suman Singh **2012**, Microwave in sterilization technology, Proceedings of the International Conference on Agriculture, Food Sciences and Environmental Technology for Sustainable Global Development (AFSET 2012) at Jawaharlal Nehru University, Delhi, India.
14. **Kirtiraj K. Gaikwad 2012** Food sovereignty as a way to achieve food security. Proceedings of the International symposium Agricultural communication and sustainable rural development from information to knowledge to wisdom at G.B. Pant University of Agriculture & Technology Pantnagar, Uttarakhand, India.
15. **Kirtiraj Gaikwad**, Pratik Bagde **2007**, Quality assessment of Gulucha (Milk product). Proceedings of the Indian Convention of Food Scientists and Technologists (ICFST 2007), at IIT Kharagpur, India.
16. **Kirtiraj Gaikwad 2006**, Realization the potential of Nano Biotechnology. Proceedings of the Convention of Food Scientists and Technologists (ICFST 2006) in N.G. Ranga Agri. University Hyderabad, India.

TEACHING ENGAGEMENTS (Master and PhD level Courses)

Subject	Subject Code	Class	Semester
Smart Packaging	PPN-552	M.Tech (Packaging Technology)	Spring
Food and Pharma Packaging	PPN-558	M.Tech (Packaging Technology)	Spring
Packaging Principles, Processes, and Sustainability	PPN-541	M.Tech (Packaging Technology)	Autumn
Packaging Materials	PPN-543	M.Tech (Packaging Technology)	Autumn
Packaging Design	PPN 546	M.Tech (Packaging Technology)	Spring

PhD and M. Tech Supervision

PhD Thesis Supervision	
1	Shashank Saini: Environmentally benign conversion of rice straw into value-added products, 2022, (Co-Supervisor: Vivek Kumar, IIT Delhi); Status: Awarded
2	Avinash Kumar: Development of active sustainable ethylene scavenging packaging material based on pine needles biomass, 2022, (Co-Supervisor: Prof SP Singh); Status: Awarded
3	Himanshu Kumar: Active antioxidant food packaging films, 2017- Present (Co-Supervisor: Prof YS Negi); Status: Ongoing
4.	Aaditya Pandey: Membrane technology for food packaging application, 2019-Present. (Co-Supervisor: Prof Abhijit Maiti); Status: Ongoing
5	Ramakanth Dakuri: Active packaging for lipid-based food, 2020- Present; (Co-Supervisor: Prof Pradip K Maji); Status: Ongoing
6	Akhila Konala: Smart Packaging System for Food. 2020- Present, Status: Ongoing
7	Ram Kumar Deshmukh: Active Antioxidant Packaging for food applications, 2022-Present, Status: Ongoing
8	Shefali Tripathi: Active High barrier and antimicrobial packaging for food applications, 2022- Present Status: Ongoing
9	Laxmi Sapkal: Edible ink for packaging applications, (Part Time), 2022- Present Status: Ongoing
10	Prachi Jain: Edible oxygen scavenging system for active food packaging, 2023- Present, Status: Ongoing

M.Tech Thesis Supervision

1	Lokman Hakim: Novel catechu-based edible ink for food screen printing and packaging application, 2023
2	Bittu Pridhvi Kumar: Non-metallic oxygen scavenging systems for food packaging applications", 2023
3	Praveen Kunam: sustainable hydrophobic coating based on Natural rubber latex and butyl stearate for Development of water resistant paper for Packaging applications, 2023
4	Mahesh Vishnoi: marketing strategy for paper and packaging industry with changing environment 2023
5	Anushikha: Development and characterization guar gum film reinforced with litchi shell derived micro-fibrillated cellulose and halloysite nanotube for active antioxidant packaging2023
7	Lokesh Kumar: Plant based plastic for packaging applications, 2022
8	Jitendra Kumar: Development of temperature indicating label based on thermochromic ink for hot food package distribution, 2022
9	Pragya Srivastava: Towards Sustainable Packaging: Minimalistic approach in cosmetic package design as a branding tool, 2022
10	Pardeep Kumar: Plant-based antimicrobial agents for active food packaging applications, 2021
11	Rohit Tanwar: Active antioxidant films based on biopolymers for advanced food packaging applications, 2021
12	Aakash Upadhyay: Ethylene Scavenging based clay materials for active packaging applications, 2021
13	Rakhi Yadav: Biodegradable plastic for food packaging, 2021.
14	Gaurav Singh: Development and characterization of active barrier films for packaging applications2020 (Co-supervisor Prof. Yuvraj Singh Negi)
15	Abhishek Sharma: Development of oxygen & leakage indicator for food safety & security 2020(Co-supervisor Prof. Yuvraj Singh Negi)
16	Dau Dayal Kaushik Temperature regulating packaging for food applications 2020 (Co-supervisor Prof. Yuvraj Singh Negi)
17	Kapil Kumar Preparation and characterization of functional antimicrobial-coated paper using pine needles extract for food packaging applications 2020 (Co-supervisor Prof. Yuvraj Singh Negi)

INVITED TALKS AND LECTURES

Sr No	Date	Invited by	Event	Lecture topic	Place
13	24/5/2023	International Association of Packaging Research Institutes (IAPRI)	31st IAPRI Members' conference,	Latest research & developments in the area of food packaging"	New Mumbai
12	28/03/2023	Central Pollution Control Board, Pune Regional office	Workshop on Alternative to single use plastic (sup), Pune	R & D Initiatives for development of alternatives to plastic	Pune
11	23/03/2023	DIT University Dehradun	DITU SPE TECHFEST-2023	Waste to Worth: Waste Utilization from Uttarakhand State for Fabrication of Value Added Products	Dehradun
10	3/03/2023	IIT Jammu	CPCB Sponsored Training Program on Hazardous Substances/Solid Waste/BioMedical/Electronic/Plastic Waste Management	Plastic Waste Management Rule (2016 and 2022)	Jammu
9	12/01/2023	Aligarh Muslim University	International Webinar on "Emerging Trends in Food Processing and Preservation"	Breakthroughs in Sustainable & Active Food Packaging Through Sustainable Engineering	Virtual
8	27/12/2023	Amity University, Noida	High-End Workshop on "Non-Thermal Processing of Plant-Based Foods for Extending the Shelf Life"	"Sustainable Packaging for Plant based Food"	Noida
7	14/12/2022	Central Pollution Control Board	Workshop on Alternatives to Single Use Plastic	R & D Initiatives for development of alternatives to plastic	Delhi
6	19/12/2022	Mahatma Gandhi Institute for Rural Industrialization, Wardha	Training program for Hand	Sustainable packaging solutions	Wardha
5	17/12/2022	International Council for Circular Economy	Himalayan Circular Economy Forum (#HCEF2022)	Plastics and Packaging: A Circular Approach	Dehradun
4	23/11/2022	PAPEREX, South India	PAPEREX, South India	Paper based Packaging Solutions	Chennai
3	25/22/2022	ICAR-National Dairy Research Institute Karnal	National Training Program on Innovations in Processing and Packaging of Dairy and Food Products and Opportunities for Entrepreneurship Development and Start-ups	Breakthroughs in sustainable & active food Packaging through sustainable engineering	Karnal
2	05/06/2022	The Institution of Engineers (India)	Seminar on the occasion of World Environment Day	Sustainable packaging	Saharanpur
1	21/05/2019	Central Pulp & Paper Research Institute Saharanpur	Training program on Paper based food grade package testing	Next Generation Paper Based Packaging For Food Products	Saharanpur

INTERNATIONAL RESEARCH EXPOSURE

Sr No	Country Visited	Period	Purpose
1	Canada	2018-2019	Postdoctoral fellowship (PDF)
2	Thailand	November 2017	Presentation at 8 th Shelf Life International Meeting 2017, Bangkok
3	USA	June 2017	IFT annual meeting 2017, Las Vegas
4	Spain	November 2016	Empack 2016, Madrid (Packaging trade show)
5	USA	July 2016	Presentation at IAFP annual meeting at St Louis
6	Japan	May 2016	Research project meet at University of Narita
7	Germany	September 2015	Presentation at innovation in food packaging, shelf life and food safety conference at Munich
8	Switzerland	September 2015	Visited the University of Zurich for research collaboration
9	China	January 2015	Industrial visit Rising Packaging & Printing Management, Shanghai
10	South Korea	2014-2017	Doctoral Degree (PhD: Packaging)
11	USA	2011-2013	Master Degree (MS: Packaging)

TRAINING PROGRAMS CONDUCTED FOR INDUSTRIES/ORGANIZATION

- Korea International Cooperation Agency (KOICA), South Korea**
Conducted two days' laboratory session for Lebanon delegates on packaging materials testing's (Paper and plastic) on 1st and 2nd December 2016.
- Korea International Cooperation Agency (KOICA), South Korea.**
Conducted two days training program for Lebanon delegates on evaluation and testing of packaging material used for fresh produce packaging on 10-11th March 2016.
- Center for Incubation & Business Acceleration (CIBA), Goa, India**
Conducted four days training program on Advance packaging technology of Meat & Meat product, Spices, RTE products 28th Jan-1st Feb 2014.
- Jabil Circuits, Pune, India.**
Conducted two days Training program on Packaging Materials, Testing & Quality control and laboratory testing 7-8 Feb 2014.

MEMBERSHIP & ASSOCIATION

- 1 . Institute of Packaging Professional (**IoPP**), Chicago, USA. (**ID #82941**)
2. Society of Chemical Industries (**SCI**), London, UK. (**ID #71860**)
3. International Association of Food Protection (**IAFP**), USA. (**ID #45085**)
4. American Society for Testing and Materials International (**ASTM**), USA. (**ID#1817555**)
- 5 . International Society of Food Engineering (**ISFE**), USA. (**ID #1514**)
6. Association of Food Scientist & Technologist (**AFSTI**) India. (**ID # 2/R037/15/ZON**)
7. Michigan State University Packaging Alumni Association (MSU-PAA), USA.