

## Curriculum-Vitae

**Name:** Dr. Sweta Sharma

**Date & Place of Birth:** September 03, 1989, Allahabad, (U.P.)

**Nationality:** Indian

**Present Designation:** Assistant Professor

**Institution with Address:** Department of Applied Science and Humanities,  
Faculty of Engineering and Technology  
Khwaja Moinuddin Chishti Language University  
Lucknow 226013, India

**Mobile No.:** +918858334488(M)

**E mail:** swetasharma3989@gmail.com



### **Academic Qualifications:**

**M.Sc., Environmental Science**, University of Allahabad, I<sup>st</sup> Div, **75.83%**, **2013**

**B.Sc. (BZC)**, Ewing Christian College, University of Allahabad, I<sup>st</sup> Div, **63%**, **2010**

**Senior Secondary School Examination**, CBSE Board (PCM), I<sup>st</sup> Div **63%**, **2006**

**Secondary School Examination**, CBSE Board, I<sup>st</sup> Div **66%**, **2004**

D. Phil, titled *Compositional Investigation of Biological Samples by Spectroscopic Technique*, University of Allahabad, 2020

**UGC-JRF, Environmental Science**, 2015

**ASRB-NET, Environmental Science**, 2015

### **Publications:**

a. Papers in Journals: 26

b. Chapters published in books: 3

c. Papers published in Proceedings: 18

d. Papers presented in conference/symposium: 20

### **Workshop participation:**

X-ray Micro Imaging using Synchrotron Radiation as Source (XMISR), Theme meeting/Workshop on 14-16 Sep, 2017, RRCAT Indus-2, Indore.

### **Papers published in journals:**

- (1) Investigation of the manganese stress on wheat plant by attenuated total reflectance Fourier transform infrared spectroscopy, **Sweta Sharma** and K. N. Uttam, *Spectrosc. Lett.*, 49:520-528, 2016.
- (2) Label-free and rapid spectroscopic evaluation of ripening of *Syzygium cumini* fruit, **Sweta Sharma**, Shuchi Srivastava, Renu Singh, K. N. Uttam, *Spectroscopy Letters* 50:115-123, 2017.
- (3) Elemental investigation of the leaf and seed of Coriander plant by synchrotron radiation X-ray fluorescence spectroscopy, Abhi Sarika Bharti, **Sweta Sharma**, Nidhi Shukla, M.K. Tiwari and K.N.Uttam, *National Academy Science letters*, 40: 373-377, 2017.
- (4) Rapid analyses of stress of copper oxide nanoparticles on wheat plants at an early stage by laser induced fluorescence and attenuated total reflectance Fourier transform infrared spectroscopy, **Sweta Sharma** and K.N.Uttam, *Vibrational Spectroscopy*, 92: 135-150, 2017.
- (5) Simultaneous multielemental analysis of the leaf of *Moringa oleifera* by direct current arc optical emission spectroscopy, **Sweta Sharma**, Nidhi Shukla, Abhi Sarika Bharti, and K N Uttam, *National Academy Science letters*, 41: 65-68, 2018.
- (6) Early diagnostic of mercury stress on wheat seedlings using attenuated total reflection Fourier transform infrared spectroscopy, **Sweta Sharma** and K.N. Uttam, *Analytical Letters*, 51: 1544-1563, 2018.
- (7) Steady state and time resolved laser-induced fluorescence of garlic plants treated with titanium dioxide nanoparticles, Abhi Sarika Bharti, **Sweta Sharma**, Nidhi Shukla and K. N. Uttam, *Spectroscopy Letters*, 51: 45-54, 2018.
- (8) Early stage detection of stress due to copper on Maize (*Zea mays L.*) by infrared and fluorescence spectroscopy, **Sweta Sharma** and K.N. Uttam, *Journal of Applied Spectroscopy*, 85: 771-778, 2018.
- (9) Detection of vibrational spectroscopic biomarkers of the effect of gold nanoparticles on wheat seedlings using attenuated total reflectance Fourier transform infrared spectroscopy, **Sweta Sharma**, Rahul Uttam, Praveen Singh and K N Uttam, *Analytical Letters*, 51: 2271-2294, 2018.

- (10) Effect of manganese stress on the mineral content of the leaves of wheat seedlings by use of X-ray fluorescence excited by synchrotron radiation, **Sweta Sharma**, Abhi Sarika Bharti, M. K. Tiwari and K. N. Uttam, *Spectroscopy Letters*, 51: 302-310, 2018.
- (11) Nondestructive and Rapid Probing of the Biochemical Response of Arsenic Stress on the Leaves of Wheat Seedlings using Attenuated Total Reflectance Fourier Transform Infrared Spectroscopy, **Sweta Sharma** and K.N. Uttam, *Analytical Letters*, 52: 268-287, 2019.
- (12) Label Free Mapping of the Biochemicals in Tomato Fruit by Confocal Raman Microspectroscopy, **Sweta Sharma**, Rahul Uttam, Abhi Sarika Bharti, Nidhi Shukla, K. N. Uttam, *National Academy Science letters*, 2019, <https://doi.org/10.1007/s40009-018-0747-6>.
- (13) Non-destructive and rapid interrogation of biochemical response of the leaves of wheat seedlings towards Al<sub>2</sub>O<sub>3</sub> nanoparticles stress using attenuated total reflectance Fourier transform infrared spectroscopy, **Sweta Sharma**, K.N. Uttam, *Vibrational Spectroscopy*, 100: 142-151, 2019.
- (14) Interaction of zinc oxide and copper oxide nanoparticles with the chlorophyll: a fluorescence quenching study, **Sweta Sharma**, Rahul Uttam, Abhi Sarika Bharti and K.N. Uttam, *Analytical Letters*, 52: 1539-1557, 2019.
- (15) Non-invasive monitoring of biochemical response of wheat seedlings towards titanium dioxide nanoparticles treatment using attenuated total reflectance Fourier transform infrared and laser induced fluorescence spectroscopy, **Sweta Sharma** and K.N. Uttam, *Analytical Letters*, 52: 1629-1652, 2019.
- (16) Non-destructive phenotyping of chili pepper ripening using spectroscopic probes: A potential approach for shelf-life measurement, **Sweta Sharma**, Abhi Sarika Bharti, Renu Singh, and K. N. Uttam, *Analytical Letters*, 52; 1590-1613, 2019.
- (17) Prompt screening of the alterations in biochemical and mineral profile of wheat plants treated with chromium using attenuated total reflectance Fourier transform infrared spectroscopy and X-ray fluorescence excited by synchrotron radiation, **Sweta Sharma**, A. K. Singh, M. K. Tiwari, and K. N. Uttam, *Analytical Letters*, 53; 482-508, 2019.
- (18) Elemental assessment of the leaf and seed of Rauwolfia serpentina (Sarpagandha) by direct current arc optical emission spectroscopy, Abhi Sarika Bharti, **Sweta Sharma**, K. N. Uttam, *Natl. Acad. Sci. Lett.*, 43:361–365, 2020.

- (19) Non-Destructive Assessment of the Impact of Selenium Treatment on the Biochemical Profile of the Leaves of Wheat Seedlings by Attenuated Total Reflectance Fourier Transform Infrared Spectroscopy, **Sweta Sharma** and K. N. Uttam, *Analytical Letters*, 53: 1794-1811, 2020.
- (20) Interaction of Chlorophyll with Titanium Dioxide and Iron Oxide Nanoparticles: A Temperature Dependent Fluorescence Quenching Study, **Sweta Sharma**, Rahul Uttam and K.N. Uttam, *Analytical Letters*, 53: 1851-1870, 2020.
- (21) Potential of the Direct Current Arc Optical Emission Spectroscopy for the Determination of Elements in Naturally Mature Gram Seed, **Sweta Sharma**, Aishwary Awasthi, Aradhana Tripathi, Chhavi Baran, Aarti Jaiswal, Rahul Uttam, Abhi Sarika Bharti, Renu Singh and K. N. Uttam, *International Journal of Experimental Spectroscopic Techniques*, DOI: 10.35840/2631-505X/8527.
- (22) Investigating the Carotenogenesis Process in Papaya Fruits during Maturity and Ripening by Non-Destructive Spectroscopic Probes, Aradhana Tripathi, Chhavi Baran, Aarti Jaiswal, Aishwary Awasthi, Rahul Uttam, **Sweta Sharma**, Abhi Sarika Bharti, Renu Singh and K. N. Uttam, *Analytical Letters*, 50:2903-2920, 2020.
- (23) Colorimetric and Surface Enhanced Raman Scattering (SERS) Detection of Metal Ions in Aqueous Medium Using Sensitive, Robust and Novel Pectin Functionalized Silver Nanoparticles, **Sweta Sharma**, Aarti Jaiswal and K. N. Uttam, *Analytical Letters*, 53:2355-2378, 2020.
- (24) Phytochemical Screening of the Different Cultivars of Ixora Flowers by Non-Destructive, Label-Free, and Rapid Spectroscopic Techniques, **Sweta Sharma**, Chhavi Baran, Aradhana Tripathi, Aishwary Awasthi, Aarti Jaiswal, Rahul Uttam, Abhi Sarika Bharti, Renu Singh and K. N. Uttam, *Analytical Letters*, 2020, <https://doi.org/10.1080/00032719.2020.1855440>.
- (25) Synthesis of Sensitive and Robust Lignin Capped Silver Nanoparticles for the Determination of Cobalt(II), Chromium(III), and Manganese(II) Ions by Colorimetry and Manganese(II) Ions by Surface-Enhanced Raman Scattering (SERS) in Aqueous Media, **Sweta Sharma**, Aarti Jaiswal and K. N. Uttam, *Analytical Letters*, 2020, <https://doi.org/10.1080/00032719.2020.1837855>.

(26) Non-destructive and Label Free Assessment of the Elemental Profile of Foliar by Synchrotron Radiation Induced Energy Dispersive X-Ray Fluorescence Spectroscopy, Abhi Sarika Bharti, **Sweta Sharma**, A.K.Singh, M.K. Tiwari, and K.N.Uttam, Journal of Applied Spectroscopy, Accepted, 2020.

### **Chapters published in books:**

(1). Confocal Raman Microspectroscopy: an advance technique for the biochemical investigation of vegetable sample (carrot root), Nidhi Shukla, **Sweta Sharma**, Abhi Sarika Bharti and K.N. Uttam, Recent Trends in Atomic, Molecular and Optical Physics Ed: D P Singh, Luminous Books, Varanasi, India, pp1-10 (2016), ISBN 978-93-85149-24-5

(2). Potential of direct current arc optical emission spectroscopy for the investigation of vegetables: Beta vulgaris (Beet Root), Abhi Sarika Bharti, Nidhi Shukla, **Sweta Sharma**, and K N Uttam, Recent Trends in Atomic, Molecular and Optical Physics Ed: D P Singh, Luminous Books, Varanasi, India, pp11-20 (2016), ISBN 978-93-85149-24-5

(3). Potential of Chlorophyll Fluorescence for the Monitoring Plant Tissues (Fruit, Shoot, Leaf, & Seed), **Sweta Sharma**, Abhi Sarika Bharti, Nidhi Shukla and K.N. Uttam, Recent Trends in Atomic, Molecular and Optical Physics Ed: D P Singh, Luminous Books, Varanasi, India, pp21-42 (2016), ISBN 978-93-85149-24-5

### **Paper Published in Proceedings:**

(1). Laser Induced Fluorescence Study of *Syzygium cumini*

**Sweta Sharma**, Shuchi Srivastava, Renu Singh and K. N. Uttam, Presented in DAE-BRNS, National Laser Symposium (NLS-23) at Sri Venkateshwara University, Tirupati, Andhra Pradesh (December 3-6, 2014), ISBN: 9788190332156 CP-09-14

(2). Investigation of Building Material by Laser Induced Breakdown Spectroscopy

Abhi Sarika Bharti, Nidhi Shukla, **Sweta Sharma**, Shuchi Srivastava, Renu Singh and K. N. Uttam, Presented in National Laser Symposium (NLS-23) S.V. University, Tirupati. 3-6 Dec (2014), ISBN: 9788190332156 CP-09-15

(3). Laser induced fluorescence study of heavy metal (copper) stress on *Zea mays*

**Sweta Sharma** and K.N. Uttam, National Laser Symposium (NLS-24), National Laser Symposium (NLS-24), RRCAT, Indore, 2-5 Dec, 2015, ISBN: 978-81-903321-6-3 Article:CP-10.1

**(4).** Study of the Chlorophyll Fluorescence Quenching Induced by Gold Nanoparticles

**Sweta Sharma**, Rahul Uttam, Renu Singh, Praveen Singh and K.N. Uttam, National Laser Symposium (NLS-24), RRCAT, Indore, 2-5 Dec, 2015, ISBN: 978-81-903321-6-3 Article:CP-9.27

**(5).** Simultaneous detection of essential and trace metal in the *Allium cepa* (Onion) using laserinduced breakdown spectroscopy

Abhi Sarika Bharti, Nidhi Shukla, **Sweta Sharma**, Shuchi Srivastava and K. N. Uttam, Proceedings of National Laser Symposium (NLS-5) KIIT, Bhubneshwar, 20-23 Dec (2016), ISBN: 978-81-903321-7-0 Identifier: CP-9.3

**(6).** Investigation of Biochemicals in the Green *Capsicum annuum* by FT-Raman Spectroscopy

Nidhi Shukla, Abhi Sarika Bharti, **Sweta Sharma**, Neha Ojha, M.N. Deo and K. N. Uttam, Proceedings of National Laser Symposium (NLS-5) KIIT, Bhubneshwar, 20-23 Dec (2016), ISBN: 978-81-903321-7-0 Identifier: CP-10.2

**(7).** Laser induced fluorescence measurements of the quenching of chlorophyll fluorescence induced by silver nanoparticles

**Sweta Sharma**, Abhishek Bhardwaj, R. Gopal, and K.N. Uttam, Proceedings of National Laser Symposium (NLS-5) KIIT, Bhubneshwar, 20-23 Dec (2016), ISBN: 978-81-903321-7-0 Identifier: CP-10.3

**(8).** Mapping of the Biochemical in Tomato Fruit by Confocal Raman Spectroscopy

**Sweta Sharma**, Rahul Uttam, Nidhi Shukla, Abhi Sarika Bharti and K.N.Uttam, Proceedings of National Laser Symposium (NLS-5) KIIT, Bhubneshwar, 20-23 Dec (2016), ISBN: 978-81-903321-7-0 Identifier: CP-9.15

**(9).** Molecular dynamics of interaction between chlorophyll and zinc oxide nanopartilces: A steady state fluorescence quenching study

**Sweta Sharma** and K.N. Uttam, Proceedings of National Laser Symposium (NLS-5) KIIT, Bhubneshwar, 20-23 Dec (2016), ISBN: 978-81-903321-7-0 Identifier: CP-10.4

**(10)** Determination of the Nutrients and Trace Metal in Mentha Piperita by Laser Induced Breakdown Spectroscopy

Abhi Sarika Bharti, Nidhi Shukla, **Sweta Sharma** and K. N. Uttam, Proceedings of National Laser Symposium (NLS-26), BARC, Mumbai, 20-23 Dec, 2017, CP-09.35

(11) Synthesis, Structural and Optical Properties of Manganese Oxide Nanoparticles

Abhishek Shukla, Abhishek K. Bhardwaj, **Sweta Sharma**, K. N. Uttam and R. Gopal, Proceedings of National Laser Symposium (NLS-26), BARC, Mumbai, 20-23 Dec, 2017, CP-06.01

(12) Molecular Dynamics of Interaction between Chlorophyll and Copper oxide Nanoparticles: A Steady State Fluorescence Quenching Study

**Sweta Sharma**, Rahul Uttam, Renu Singh and K.N. Uttam, Proceedings of National Laser Symposium (NLS-26), BARC, Mumbai, 20-23 Dec, 2017, CP-10.23

(13) Non-destructive, label free evaluation of biochemical profile associated with the growth and ripening process in the exocarp of jamun fruit by Confocal Raman spectroscopy

**Sweta Sharma**, Abhi Sarika Bharti, and K.N. Uttam, Proceedings of National Laser Symposium (NLS-26), BARC, Mumbai, 20-23 Dec, 2017, CP-10.14

(14) Non-destructive, label free evaluation of biochemical signatures of fleshy layers of the onion bulb by FT-Raman spectroscopy

Abhi Sarika Bharti, **Sweta Sharma**, Nidhi Shukla, M.N. Deo and K. N. Uttam, Proceedings of National Laser Symposium (NLS-27), RRCAT, Indore, 03-06 Dec, 2018

(15) Nondestructive label free evaluation of spectral signature of ripening process of mesocarp of mango fruit using confocal Raman microspectroscopy

**Sweta Sharma**, Abhi Sarika Bharti, Rahul Uttam, Renu Singh, and K N Uttam, Proceedings of National Laser Symposium (NLS-27), RRCAT, Indore, 03-06 Dec, 2018

(16) Laser induced fluorescence investigation of the interaction of chlorophyll with titanium dioxide nanoparticles: a temperature dependent fluorescence quenching study

**Sweta Sharma**, Rahul Uttam and K. N. Uttam, Proceedings of National Laser Symposium (NLS-27), RRCAT, Indore, 03-06 Dec, 2018

(17) Potential of surface enhanced Raman scattering spectroscopy for the detection of heavy metal ions using Silver nanoparticles functionalized with pectin

**Sweta Sharma**, Aarti Jaiswal, and K N Uttam, Proceedings of 28<sup>th</sup> National Laser Symposium (NLS-28), VIT, Chennai, January 8-12, 2020. Article ID: CP-09-15.

(18) Non-destructive evaluation of biomolecular indices of the ripening of papaya fruits by confocal Raman microspectroscopy

Aradhana Tripathi, Chhavi Baran, **Sweta Sharma**, Abhi Sarika Bharti and K N Uttam, Proceedings of 28<sup>th</sup> National Laser Symposium (NLS-28), VIT, Chennai, January 8-12, 2020. Article ID: CP-10-13.

### **Paper presented in conferences, symposia and seminar**

(1). Laser Induced Fluorescence Study of *Syzygium cumini*

**Sweta Sharma**, Shuchi Srivastava, Renu Singh and K. N. Uttam, Presented in DAE-BRNS, National Laser Symposium (NLS-23) at Sri Venkateshwara University, Tirupati, Andhra Pradesh (December 3-6, 2014), ISBN: 9788190332156 CP-09-14

(2). Detection of Phytochemicals in *Syzygium cumini* (Jamun) by FTIR Spectroscopy

**Sweta Sharma**, Abhi Sarika Bharti, Nidhi Shukla, Shuchi Srivastava, Renu Singh and K. N. Uttam, Presented in 102<sup>nd</sup> Indian Science Congress Association held at University of Mumbai, Mumbai (January 3-7, 2015), BP-01, Abstract booklet pp-211

(3). Spectroscopic Detection of Metabolites in *Syzygium cumini* (jamun) Fruit

**Sweta Sharma**, Shuchi Srivastava, Renu Singh and K. N. Uttam, Presented in International Conference on Frontiers of Spectroscopy organized by Physics Department, Banaras Hindu University, Varanasi (January 10-12, 2015), PP-22, Abstract booklet pp-150-151

(4). Spectral Signature of Ripening in the Fruit and Seed of *Mangifera indica* (Mango)

**Sweta Sharma**, Abhi Sarika Bharti, Nidhi Shukla, Neha Ojha, Renu Singh and K. N. Uttam Presented in International Conference on Frontiers of Spectroscopy organized by Physics Department, Banaras Hindu University, Varanasi (January 10-12, 2015), PP- 65, Abstract booklet pp-182

(5). Study of biochemical changes in relation to ripening of the orange by laser induced fluorescence spectroscopy, **Sweta Sharma**, and K. N. Uttam, Presented in the National Seminar on Science and Technology for Human Development organized by Allahabad Chapter of 'The Indian Science Congress Association', Department of Chemistry, University of Allahabad, Allahabad (March 14-15, 2015), BOT-1, Abstract booklet pp-64

(6). Laser induced fluorescence study of heavy metal (copper) stress on *Zea mays*



**Sweta Sharma** and K.N. Uttam, presented in the DAE-BRNS, National Laser Symposium (NLS-24) at Raja Ramanna Centre for Advanced Technology, Indore, Madhya Pradesh (December 2-5, 2014), ISBN: 978-81-903321-6-3, CP-10.1

(7). Study of the Chlorophyll Fluorescence Quenching Induced by Copper Nanoparticles

**Sweta Sharma**, Rahul Uttam, Renu Singh, S.Kumar and K.N. Uttam, presented in the International Conference on Light Quanta: Modern Perspectives & Applications at Physics Department, University of Allahabad, Allahabad (December 14-16, 2015), P.B. 95, Abstract booklet pp-107

(8). Spectroscopic study of stress response of *Triticum asitivum* towards heavy metal: Mn

**Sweta Sharma** and K.N. Uttam, presented in the International Conference on Light Quanta: Modern Perspectives & Applications at Physics Department, University of Allahabad, Allahabad (December 14-16, 2015), O.B. 27, Abstract booklet pp-45

(9). Spectroscopic study of the chromium stress on chemical composition of the leaves of *Sorghum bicolor*, **Sweta Sharma** and K.N. Uttam, presented in the International Conference On Advances in Light Technologies and Spectroscopy of Materials at Department of Physics, University of Lucknow (January 16-18, 2016), PP-32, Abstract booklet pp-137

(10). Spectroscopic Study of Interaction of the Chlorophyll and Zinc Oxide Nanoparticles

**Sweta Sharma**, Rahul Uttam and K.N. Uttam, presented in the International Conference On Advances in Light Technologies and Spectroscopy of Materials at Department of Physics, University of Lucknow (January 16-18, 2016), PP-87, Abstract booklet pp-192

(11). Application of advanced spectroscopic techniques for the investigation of manganese stress on wheat plants, **Sweta Sharma**, M.K. Tiwari, and K.N. Uttam, presented in the national seminar on science and technology for the indigenous development at chemistry Department, University of Allahabad, Allahabad

(12). Spectroscopic investigation of nanoparticle stress on cereal crop: a case study of CuO NPs on wheat seedlings, **Sweta Sharma** and K. N. Uttam, presented in the DAE-BRNS Symposia on Condensed Matter Physics under Extreme Conditions at Bhabha Atomic Research Centre, Trombay, Mumbai (April 13-16, 2016), pp- 103

(13). Non-destructive spectroscopic investigation of the copper stress on Maize (*Zea mays L.*)

**Sweta Sharma** and K.N. Uttam, presented in the National Seminar on Science and Technology for National Development, organized by Allahabad Chapter, Indian Science Congress Association, Department of Chemistry, University of Allahabad, February 11-13, 2017, PP-B15, Abstract booklet pp-90

(14). Molecular dynamics of interaction between chlorophyll and zinc oxide nanoparticles: A steady state fluorescence quenching study, **Sweta Sharma** and K N Uttam, presented in the National Laser Symposium (NLS-5) KIIT, Bhubneshwar, 20-23 Dec (2016) Article: CP-10.4

(15). Investigation of spectral signatures of the ripening of chilli fruit by laser induced fluorescence spectroscopy, **Sweta Sharma**, Renu Singh and K. N. Uttam, presented in the International Conference on Emerging Materials & Applications, February 20-22, 2017, PP-91, Abstract booklet pp-97

(16) Non-destructive and rapid probing of biochemical response of arsenic stress on the leaves of wheat seedlings using attenuated total reflectance Fourier transform infrared spectroscopy, **Sweta Sharma** and K N Uttam, presented in the ISCA Allahabad Chapter during 24-25 Feb, 2018.

(17) Investigation of the effect of manganese stress on the mineral content of the leaves of wheat seedling by synchrotron radiation X-ray fluorescence spectroscopy, **Sweta Sharma**, Abhi Sarika Bharti, M.K. Tiwari And K.N.Uttam, presented in the 2<sup>nd</sup> Meghnad Saha Memorial International Symposium-cum-Workshop on Laser Induced Breakdown Spectroscopy-2018, Department of Physics, University of Allahabad, Allahabad, 19-21 Feb 2018.

(18) Non-destructive and rapid interrogation of biochemical response of the leaves of wheat seedlings towards Al<sub>2</sub>O<sub>3</sub> nanoparticles stress at an early stage using attenuated total reflectance Fourier transform infrared spectroscopy, **Sweta Sharma** and K.N.Uttam, presented in the 7th International Conference on Perspectives in Vibrational Spectroscopy-2018, Bhabha Atomic research Centre, Mumbai, 25-29 Nov, 2018.

(19) Prompt screening of the alterations in biochemical and mineral profile of wheat plants stressed with chromium using attenuated total reflectance Fourier transform infrared spectroscopy and X-ray fluorescence excited by synchrotron radiation, **Sweta Sharma** and K. N. Uttam, Presented in National Seminar in Future India: Science and technology, Organized by

Allahabad Chapter, Indian Science Congress, Department of Chemistry, University of Allahabad, February 22-24, 2019, Abstract no. B 18.

**(20)** Detection of Vibrational Spectroscopic Biomarkers of the Effect of Gold Nanoparticles on Wheat Seedlings Using Attenuated Total Reflectance Fourier Transform Infrared Spectroscopy, **Sweta Sharma**, Rahul Uttam, Praveen Singh and K. N. Uttam, Presented in The Indian Science Congress Association (Allahabad Chapter), 14<sup>th</sup> National Conference on Science & Technology: Rural Development, DSMNRU, Lucknow, February 8-9, 2020. Abstract No. : 100.

### **Awards:**

**(1)** Dr. Murli Manohar Joshi best paper presentation for “Application of advanced spectroscopic techniques for the investigation of manganese stress on wheat plants, Sweta Sharma, M.K. Tiwari, and K.N. Uttam, presented in the national seminar on science and technology for the indigenous development at chemistry Department, University of Allahabad, Allahabad”, 2016

**(2)** Best paper presentation for “Non-destructive spectroscopic investigation of the copper stress on Maize (*Zea mays L.*)” Sweta Sharma and K.N. Uttam, presented in the National Seminar on Science and Technology for National Development, organized by Allahabad Chapter, Indian Science Congress Association, Department of Chemistry, University of Allahabad, February 11-13, 2017

**(3)** Best paper presentation for “Detection of Vibrational Spectroscopic Biomarkers of the Effect of Gold Nanoparticles on Wheat Seedlings Using Attenuated Total Reflectance Fourier Transform Infrared Spectroscopy” Sweta Sharma, Rahul Uttam, Praveen Singh and K. N. Uttam, Presented in The Indian Science Congress Association (Allahabad Chapter), 14<sup>th</sup> National Conference on Science & Technology: Rural Development, organized by DSMNRU, Lucknow, February 8-9, 2020.