

efficacy of these products using bioinformatics tools. Thus her work is an amalgamation of both basic and advanced sciences harnessing the advantages of ancient and modern technologies.

(b) Summarize the most significant work of nominee on which the recommendation is based: (within 50 words): Dr. Neha Sharma has filed provisional patent draft for award in the Indian Patent Agency (Intellectual Property Office Building Dwarka Delhi) and the application number is 202011011891. It is also based on formulation of synergistic combination of *Cynodon dactylon* with *Citrus limon* as potent antimicrobial agent against biofilm caused by uropathogenic microorganism. This invention relates to the field of formulation helpful for Multi-drug Resistant (MDR) microorganism with special reference to urinary tract infection.

(c) Impact of contributions in the field concerned (basic or applied):

Nominee is working in the field of exploring plant products for the treatment of resistant microbes and thus contributing in enriching the database of alternate natural medicines. Her contribution is acknowledged by the scientific world in the form of published research and review articles in peer-reviewed reputed journals across the globe and awards received by her from scientific societies. She along with her research group, which includes one Ph. D scholar, 2 M.Sc. dissertation students and 7 B. Tech students are working in a multidisciplinary project involving the knowledge of natural sciences, biotechnology and bioinformatics and is working to formulate a nanocosmeceutical..

9. Whether the achievements have already been recognized, if so give full particulars such as the agency/ organization which gave the award, purpose and year of award:

- x Received **“Young Biotechnologist Award”** in National conference organized by Dr. M.P.S. group of Institutions in association with Academy of Environment and Life Sciences on 23-24 February, 2019, at Dr. Ambedkar University, Agra. India.
- x Received **“Young Scientist Award 2018”** by International foundation for Environment and Ecology on the occasion of 9th International Congress of Environment Research held on 8th -10th Feb,2018 at Amity University Madhya Pradesh, Gwalior, India.
- x Received **“Young Scientist of the year 2015”** by International foundation for Environment and Ecology on the occasion of 2nd International conference on Environment and Ecology held on 7th March,2016 at Bhartiya University, Coimbatore, Tamilnadu, India.

Above mentioned awards were based on her contribution in the field of natural sciences and continuous innovation in research.

10. List of peer reviewed publications in indexed journals giving list of authors name of journal, journal impact factor, year of publication, volume and page numbers.

1. **Neha Sharma*** and Rajesh Singh Tomar. Prediction of Allergic Response of Goat

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Vol.10- Issue 60. June 2020. ISSN: 0976 ±0997. Indexed in web of science IF:3.56.

2. Rajesh Singh Tomar, **Neha Sharma** * and 6 K X F K L . D X V K L N characterisation of R Q D asparaginase extracellular enzyme producing bacteria from L Q G X V W U L D OpuV R h e d O n V D P International Journal of Pharmaceutical Sciences and Research. IJPSR, 2019; Vol. 10(11): 4937-4941. E-ISSN: 0975-8232; P- ISSN: 2320-5148 4937, Volume 10, Issue 11 (Impact factor 1.81) (inclusion in web of science).
3. Rajesh Singh Tomar, **Neha Sharma**. ³ 3 U H O L P L Q D U \ 6 F U H H Q L Q t h r o u g h O n e H G L D Variable at a Time 0 H W K R G p u b l i s h e d i n International Journal of Scientific & Technology Research (ISSN 2277-8616) volume 8, issue 08, pp.1726-1728, august 2019. (Impact factor 3.023 SJIF) (UGC and Scopus approved)
4. Rajesh Singh Tomar, **Neha Sharma** and Sharmistha Banerjee. "Pre optimization and one factor analysis of media composition for Response surface methodology" published in Journal of Current Science (ISSN No- 9726-001X) Vol 20, S S H F L D O , V V X H ³ Q G & R Q I H April 2019 Impact factor-5.97 (UGC Approved)
5. **Neha Sharma**, Shuchi Kaushik Rajesh Singh Tomar. "Prediction of the allergic response of extracellular amylase producing bacteria through in-silico method" published in International Journal of Research in Pharmaceutical sciences. (ISSN:0975- 7538) Vol 10 No 2 (2019) pp .1185-1189 April 2019. Impact Factor - 0.35
6. Rajsh Singh Tomar, **Neha Sharma** ³ \$ Q W L P L F U R E L D O (I I L F D F \ R I & \ Q D G special reference W R X U L Q D U \ W U D F W - 1 0 5 , p u b l i s h e d i n I n t e r n a t i o n a l j o u r n a l of scientific research and review. Vol. 8 Issue 4, pp. 137-150. April 2019 Impact Factor - 6.1 (SJIF) (UCG approved)
7. **Neha Sharma** ' 6 5 D W K R U H ³ \$ Q W L C i t e s W h e n U p d e d E x t r a c t I n H u m a n R I pathogenic bacteria with V S H F L D O U H I H U H Q F H W R 8 U L Q 2 4 7 1 5 2 7 , U D F published in International Journal of Scientific Research in Biological Sciences, Vol.5, Issue.2, pp.14-17, Apr-2018. (UGC approved)
8. **Neha Sharma**, \$ 0 - D Q D 1 L Y H G L W D 3 D W K D N & K D U X 6 L Q J K study on antimicrobial effects of ethanolic extract of Psidium guajava leaves on bacteria isolated from urinary tract infection with special reference to Escherichia coli and Staphylococcus aureus´ , 6 6 1 -2691, published in International Journal of Biotechnology and Biochemistry, Vol 13, Number 2 (2017)pp.183-189. (UGC approved)

11. List of patents granted (attach appropriate details on grant and patent)

- (a) Number of Indian patents with details on each patent: NA
- (b) Number of international patents with brief details on each patent: NA
- (c) List of any patents applied for: 01

12. **Details of any commercialization of technology/ies developed: NA**

13. **List of any books/chapters/reviews published:**

- a. 2 UJDQLF) DUPLQJ & KDOOHQLQ \$RTUXDW HPL (FRO \ VROHOXW global. DOI10.4018/978-1-5225-6111-8.
- b. 'HWULPHQWDO ,PSDFW RI 3ODVWLF 2XWFRPH RQ \$JU published in Hand book of Research on environmental and human impacts of plastic pollution. IGI global DOI: 10.4018/978-1-5225-9452-9.ch007
- c. 1DQRS DUWLFOHV 0HWKRG RI 3URGXFWLRQ DQG)XW NANOBIO TECHNOLOGY: Concepts and Applications in Health, Agriculture, and Environment. Apple academic press.
- d. 0LFURELDO OLQNDJHV LQ WKH KHDN and Book of Microbiology and Plant Health Panoply and Their Applications.

Book: One

- 1. Antioxidant and antimicrobial activity of phytoextract published by Lab Lambert. ISBN: 978-620-2-56369

14. **Overseas visits: NA**

15. **Whether the nominee is a fellow of Indian National Science Academy/Indian Academy of Sciences/ National Academy of Sciences and others (give details): NA**

16. **Brief Research Proposal of the nominee as part of Award (Not Exceeding 5 Pages) with following details:**

- x **Project Title:** Evaluation of anti-diarrheal ayurvedic formulation of Psidium guajava Thymol species and Curcuma longa Clinical and Experimental Study
- x **Area of Research:** Biotechnology and Microbiology
- x **Introduction/Background to the research problem:** Natural products from plants are being used in pharmaceutical preparations either as pure compounds or as extracts. World Health Organization (WHO) has estimated that 2.5 billion episodes of diarrhea in children younger than five years of age are reported every year in developing countries, which is responsible for 1.5 million deaths every

year.(WHO and UNICEF,2009). Despite the traditional use of this plant, some studies have reported for its anti-oxidative (Lu et al,2010), antibacterial (Ndhlala et al,2010), anticonvulsant (Kastrue et al, 2000), and anti-inflammatory (Ghosh et al,2010) activities.

Several types of bacteria can enter your body through contaminated food or water and cause diarrhea. Common bacteria that cause diarrhea include *Campylobacter*, *Escherichia coli*, *Salmonella* and *Shigella* 58% of all deaths in children aged 5 ±4 years due to infectious diseases in India, infectious diarrhea accounts for nearly 18% (Morris, 2011). The present treatment of diarrhea has been associated with a number of shortcomings such as patient dissatisfaction with the use of oral rehydration therapy (ORT), (Santosham, 2010) emergence of drug resistance due to excessive use of antibiotics (Dham, 2003).

Adhesion of the organism to the host surface is a crucial early step in colonization of the human gastrointestinal tract by bacteria in all diarrheal infections caused by pathogenic *E. coli*(Torres et al,2005) The efficacy of guava leaf decoction in inhibiting the bacterial colonization to HEp-2 cells has been reported.(Birdi,2010). Lectins in guava were shown to bind to *E. coli*, preventing its adhesion to the intestinal wall and thus preventing infection (Rodriguez et al, 2001). In the last three decades pharmacological industries have produced a number of new antibiotics, resistance to these drugs by microorganisms has increased. In general, bacteria have the genetic ability to transmit and acquire resistance to drugs, which are utilized as therapeutic agents (Gislene et al, 2000).

For a long period of time, plants have been a valuable source of natural products for maintaining human health. The use of plant extracts and photochemical, both with known antimicrobial properties can be of great significance in therapeutic treatments (Seenivasan et al., 2006). Currently, Poor scientific justifications are available on formulation of anti-diarrheal ayurvedic therefore meticulous studies are required with safety profile.

x **Objectives:** The proposed work will comprise of studies on phytochemical and antimicrobial properties of crude plant extracts. It will include:

1. The isolation and identification of diarrheal causing bacteria.
2. Evaluation of their susceptibility against antibiotics.
3. Antibacterial screening of crude plant extract against infectious microorganisms (*Campylobacter*, *Escherichia coli*, *Salmonella*, *Staphylococcus*, *Yersinia* and *Shigella*).
4. Phytochemical analysis of plant used in above study (*Psidium guajava*, *Thymol species* and *Curcuma longa*).
5. Characterization of the compound extracted from the plant.
6. Antioxidant activity of above extracted plant.
7. Synergistic effect of polyherbal combination of above extracted plant.

8. Evaluate anti-diarrheal activity and toxicity of combination of plants extract.

x **Working hypothesis:** It is hypothesized that synergistic effect of polyherbal combination of Psidium guajava Thymol species and Curcuma longa may be a safe, ecofriendly and non toxic as a anti-diarrheal formulation.

x **Detailed Methodology:**

- 1. Isolation and identification of microorganisms from collected samples-** First the microorganism present infected patients would be cultured in the nutrient broth and the morphology of organisms like shape, size and surface characteristics of bacteria would be studied with the help of light microscope. Gram staining procedure would be used to differentiate between gram positive and gram negative organisms. Further identification would be done by use of selective agar medium and biochemical testing. The bacteria ZRXOG EHLGHQWLILHG DFFRUGLQJ WR WKH FUL Bacteriology.
- 2. Susceptibility test against antibiotics-** All bacterial strains would be subjected to antibiotic sensitivity tests by the Kirby- %DXHU ¶V GLVF GLIIXVLRQ PHW
- 3. Collection of plant material-** Plant material would be collected from the field. (Sharma *et al.*, 2009)
- 4. Antimicrobial activity test against isolated micro organisms-** Antimicrobial activities would be tested against micro organisms affecting Urinary Track. (Akharaiyi *et al.*, 2012)
- 5. Phytochemical analysis of plant-** Phytochemical analysis of the extracts would be carried out. By this analysis, the presence of several phytochemicals like phenolics, alkaloids, flavonoids, tannins, saponins, steroids and glycosides would be tested. (Gama *et al.*, 2014)
- 6. Extraction of compound from plants-** Dried plant material (10g) would be finely JURXQG DQG H[WUDFWWHG ZLWK 'LVWLOOHG :DWHU The extract would be kept in oven at 50°C for 1hrs to evaporate excess ethanol and water. The residues (both ethanolic and aqueous extract) will suspend in DMSO to give 100 mg residue/ml by following procedure described. (Demetrio *et al.*, 2015)
- 7. Purification and characterization of the extracted plant compound-** Purification of the phytoactive component would be done by thin layer (TLC) and column chromatography and characterization would be done by UV-Vis, FTIR, GC-MS & NMR techniques (Atta, 2009).
- 8. Toxicity** of the phytochemical compound will be tested on human cell lines (Jeong *et al.*,

2006).

9. **Antioxidant activity** of phytochemical compound will be tested. (Gama *et al.*, 2014).

10. **Antimicrobial activity** of phytochemical compound. (Akharaiyi *et al.*, 2012).

11. **Neutral red uptake assay for *in vitro* allergy.** (Edziri *et al.*, 2011).

x **Expected outcome:** The expected outcome or the applications of the present proposed research work would be as following-

- 1.The extracted compound produced by plant would be non toxic cheap and eco- friendly so it could be replace the use of harmful chemical ointment.
- 2.It would be open the door and stimulate the research in the field of natural substance production in terms of herbal.
- 3.This study may result in formulation and rational development of the anti-diarrheal formulations containing natural ingredients which are less or not toxic thus safe to use by any age group.
- 4.It would differentiate the allergic and non allergic compounds and help to pharmacological industries to produce non allergic antimicrobial compound.

References:

1. Akharaiyi FC., Boboye B. and Adetuyi FC., Antibacterial, Phytochemical and Antioxidant Activities of the Leaf Extracts of *Gliricidia sepium* and *Spathodea campanulata*, *World Applied Sciences Journal* 16 (4): 523-530, 2012
2. Atta, HM. An antifungal agent produced by *Streptomyces olivaceiscleroticus* *World Appl. Sci. J.*, 6(11): 1495-1505, 2009.
3. Birdi T, Daswani P, Brijesh S, Tetali P, Natu A, Antia N. Newer insights into the mechanism of action of *Psidium guajava* L. leaves in infectious diarrhoea. *BMC Complement Altern Med.* 2010;10:33.
4. Demetrio L., Valle J., Jeannie I., Andrade, Juliana JM., Esperanza C., Cabrera, Windell L., Antibacterial activities of ethanol extracts of Philippine medicinal plants against multidrug-resistant bacteria, *Asian Pac J Trop Biomed*(7): 532-540, 2015.
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6. Edziri H., Mastouri M., Mahjoub A., Anthonissen R., Mertens B., Cammaerts S., Gevaert L., Verschaeve L., Toxic and mutagenic properties of extracts from Tunisian traditional medicinal plants investigated by the neutral red uptake, VITOTOX and alkaline comet assays, *South African Journal of Botany* 77 (2011) 703-710.

7. Gama, Marcelo G., Luiz C., Abreu, Jose Armando, Phytochemical screening and antioxidant activity of ethanol extract of *Tithonia diversifolia* (Hemsl) A. Gray dry flowers Robson Miranda, Asian Pacific Journal of Tropical Biomedicine 2014.
8. Ghosh S, Das Sarma M, Patra A, Hazra B. Anti-inflammatory and anticancer compounds isolated from *Ventilago madraspatana* Gaertn., *Rubia cordifolia* Linn. and *Lantana camara* Linn. J Pharm Pharmacol. 2010;62:1158-66.
9. Gislene GF., Locatelli NJ., Paulo CF., Giuliana LS.. Antibacterial activity of plant extracts and phytochemicals on antibiotic resistant bacteria. Braz. J. Microbiol., 31: 247-256, 2000.
10. Jeong SY., Shin HJ., Kim TS., Lee HS., Park SK., Kim HM., Streptokordin, a New Cytotoxic Compound of the Methylpyridine Class from a Marine-derived *Streptomyces* sp. KORDI-3238, J. Antibio., 59(4), 234-240, (2006).
11. Kastrue VS, Deshmukh VK, Chopde CT. Anticonvulsant and behavioral action of triterpene isolated from *Rubia cordifolia* Linn. Indian J Exp Biol. 2000; 38:675-80.
12. Lu Y, Hu R, Dai Z, Pan Y. Preparative separation of anti-oxidative constituents from *Rubia cordifolia* by column-switching counter-current chromatography. J Sep Sci. 2010;33:2200-5.
13. Morris SK, Bassani DG, Awasthi S, Kumar R, Shet A, Suraweera W, et al. MDS Collaborators. Diarrhea, pneumonia, and infectious disease mortality in children aged 5 to 14 years in India. PLoS One. 2011.
14. Ndhlala AR, Finnie JF, Van Staden J. Plant composition, pharmacological properties and mutagenic evaluation of a commercial Zulu herbal mixture: *Imbiza ephuzwato*. J Ethnopharmacol. 2011;133:663.
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16. Santosham M, Chandran A, Fitzwater S, Fischer-Walker C, Baqui AH, Black R. Progress and barriers for the control of diarrheal disease. Lancet. 2010; 376:63-7.
17. Seenivasan, P., Manickam J. and Savarimuthu I., In vitro antibacterial activity of some plant essential oils. BMC Complem. Altern. M., 6: 39, 2006
18. Sharma A., Chandraker S., Patel V K., Ramteke P., Antibacterial Activity of Medicinal Plants against Pathogens causing Complicated Urinary Tract Infections, Indian Journal of Pharmaceutical Science 2009.
19. Torres AG, Zhou X, Kaper JB. Adherence of diarrheagenic *Escherichia coli* strains to epithelial cells. Infect Immun. 2005;73:18-29.

15. Any other information in support of the nomination:

- x Got **“Certificate of Achievement”** by Research foundation of India and appointed as a chapter head of Gwalior, MP, India on 14th September 2019.
- x Got **" Tokan of Appreciation"** by Research foundation of India on the occasion of 2nd International Conference on "Innovative Research in Science, Technology and Management" sponsored by WFST held on 20th-21st April 2019 at Modi Institute of management and technology, Kota, Rajasthan, India.
- x Got **“Young Biotechnologist Award”** in National conference organized by Dr. M.P.S. group of Institutions in association with Academy of Environment and Life Sciences on 23-24 February, 2019, at Dr. Ambedkar University, Agra. India.
- x Got **“Young Scientist Award 2018”** on the occasion of 9th International Congress of Environment Research held on 8th -10th Feb, 2018 at Amity University Madhya Pradesh, Gwalior, India.
- x *** Junior Scientist of the year 2015** on the occasion of 2nd International conference on Environment and Ecology held on 7th March, 2016 at Bhartiya University, Coimbatore, Tamilnadu, India.

Certified that information given in the above proforma, is correct. I recommend her for consideration for the "Janaki Ammal-National Women Bioscientist Award 2020" of the Department of Biotechnology, Ministry of Science & Technology, Government of India.

Date: 21/9/2020

Place: Gwalior

Neha

(Signature of the Nominee)

Rajesh Jain


(Signature of Sponsor)

Name & Address with Seal

Rajesh Jain

Registrar

Amity University Madhya

Pradesh, Maharajpura,

Gwalior – 474005 (M.P.)



Neha

PROFORMA FOR NOMINATIONS FOR
JANAKI AMMAL-NATIONAL WOMEN BIOSCIENTIST AWARD 2020

1. **Name of the scientist being nominated:** Dr. Neha Sharma

2. **Date, Place of Birth & age on 30.09.2020** :16/05/1983, Gwalior (M.P.) Age: 37 year 4 month 15 days

3. **Present position/ designation:** Assistant Professor

4. **Addresses with Tel/Fax/E-Mail:** Amity Institute of Biotechnology, Amity University Madhya Pradesh, Gwalior.

Email: nsharama2@gwa.amity.edu

5. **Academic Qualifications of nominee (from Bachelor's degree onwards):**

Degree	Subject	University/institution	Year	Class/CGPA
B.Sc.	Botany Zoology, Chemistry English Hindi	Guru Ghasi Das University, Bilaspur (C.G.)	2003	First class (67 %)
M.Sc.	Biotechnology	Jiwaji University, Gwalior (M.P.)	2005	First class (70.5 %)
Ph.D.	Biotechnology	Jiwaji University, Gwalior (M.P.)	2009	NA

6. **Positions held (in chronological order):**

Sl.No.	Period	Place of Employment	Designation	Scale of Pay
1	July 2009- October 2018	Govt. K.R.G.P.G. (Autonomous college)	Guest Faculty as per MP govt rules	Fixed (12000/)
2	November 2018- continue	Amity Institute of Biotechnology, Amity University Madhya Pradesh	Assistant Professor	Fixed (35050/)

7. **Nominee's field of specialization:** Biotechnology and Microbiology

8. (a) **Summarize the most significant research contributions made by the nominee during last 5 years (within 300 words):** Dr. Neha Sharma has published several good research publications in the last five years focused on the antimicrobial properties of the plant products, enhancing the potential of antimicrobial agents using advanced approach for media formulation and checking the anti-allergic