

PERSONAL PROFILE

Dr. M A Harish Nayaka *M.Sc., PhD*

Associate Professor
Dept. of Sugar Technology
University of Mysore
Karnataka, India



PROFILE SUMMARY

An enthusiastic self-starter with strong leadership and communications skills. Proven academic and curricular achievements, and possess the right technical and soft skills required to propel the organization achieving its goals and objectives.

PERSONAL PARTICULARS

Name : Dr. M A Harish Nayaka
Address : Dept. of Sugar Technology, Sir. M Visvesvaraya Post Graduate Center, University of Mysore, Tubinakere Industrial Area, Mandya 571402.
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EDUCATION HISTORY

2009 : PhD (Biochemistry)
Central Food Technological Research Institute, Mysore, Karnataka, India (Degree awarded from University of Mysore, Karnataka, India)
Thesis Title : Studies on antioxidant and antimetastatic components from spices against cancer

THESIS SUMMARY

The research work explored the possibility of dietary antioxidants and antimetastatic polysaccharides from spices namely *Nigella sativa* (*N. Sativa*) and *Decalepis hamiltonii* (*D. hamiltonii*) that can effectively bring down oxidative stress and target galectin-3, a key molecule involved in cancer metastasis. The study revealed the presence of various antioxidant phenolic acids responsible for antioxidant activity in the water extracts of both *N. Sativa* and *D. hamiltonii*. *In vivo* antioxidant effects of both spice water extracts were evident in CCl₄ induced hepatotoxicity in female albino Wistar rats and 20-Methylcholanthrene induced cervical cancer models in Swiss albino mice. A potent galectin-3 inhibitory pectic polysaccharide isolated from *D. hamiltonii* reduced (88%) lung metastases induced by B₁₆F₁₀ mouse melanoma cells in Swiss albino mice. Overall research findings highlights the importance of spice (*N. Sativa* & *D. hamiltonii*) antioxidants in inhibiting oxidative stress mediated molecular and cellular damages that may lead to cancer and the role of potent antimetastatic polysaccharide from *D. hamiltonii* in preventing galectin-3 mediated cancer metastasis.

1999 : Qualified UGC-CSIR National Eligibility Test (Life Sciences)

1997-1999 : Master of Science (Chemistry, Specialization: Biochemistry)
Central College, Bangalore University, Karnataka, India.

1995-1997 : Bachelor of Science (Chemistry, Botany & Microbiology)
Government Science College, Bangalore University,

TEACHING/RESEARCH EXPERIENCE

18 Years 04 Months

SUBJECTS TAUGHT

Biochemistry

Amino acids and Proteins

Purification and Characterization of Proteins

Basic Organic/Physical Chemistry

Sugar Chemistry

Sucrose Chemistry

ACADEMIC/ADMINISTRATIVE EXPERIENCE

ACADEMIC

BOS in Sugar Technology - Member
2006-09; 2013-15

BOE in Sugar Technology - Member
2009-till date

BOE in Sugar Technology - Chairman
2011-12; 2018-19

ADMINISTRATIVE

Faculty Advisor of Sir M V Post Graduate Mens Hostel, University of Mysore, Mandya
June 2017 – October 2020

Course Coordinator (Department of Sugar Technology)
March 2018 – January 2019, August 2020 – till date

Course Coordinator (Department of Social work, PG Center, Mandya)
2017 - 2018

Chief Superintendent of Examinations (Outreach)

- 1) 07.11.2011 to 23.11.2011, IBM Pvt. Ltd., PESIT, Bangalore.
- 2) 10.07.2013 to 24.07.2013, KR Mangalam Institute of Management, New Delhi.
- 3) 18.06.2014 – 02.07.2014, International School of Business and Research, Chennai.
- 4) 18.06.2014 – 02.07.2014, Malnad Institute of Management Studies, Chikkamagaluru, Karnataka.

In-Charge Director, Sir. MVPG Center, University of Mysore, Mandya

- 1) 22nd and 23rd July 2010 (Two Days)
- 2) 5.07.2012 (One day)
- 3) 13-14 & 16-17 March 2018 (Four Days)

RECOGNIZED Ph.D. GUIDE IN

- Sugar Technology
- Biochemistry
- Chemistry
- Food Science

No. of PhD degree Awarded - 3

No. of PhD students working - 2

MEMBERSHIP IN PROFESSIONAL BODIES:

- SISSTA - Life member
- SBC (India) - Life member
- Society for Sugar Research and Promotion - Life member

AWARDS/FELLOWSHIPS/RECOGNITIONS

- UGC - CSIR Junior Research Fellowship in Life Sciences (1999)
- Mysore University Teacher Research Fellowship
- UGC Research Award (2014-16)

RESEARCH INTERESTS AND ACCOMPLISHMENT

Our Laboratory is focused on developing spice enriched natural sweeteners and their biological activity evaluation. Developed spice enriched jaggery with enhanced biological activity. Scientifically established some of the medicinal properties attributed to jaggery in the traditional System of Indian medicine-“Ayurveda”. Screening of natural clarificants for jaggery colour improvement and the effect of natural sweeteners on protein, carbohydrate and lipid digestion enzymes are under way in addition to developing Probiotic natural sweeteners.

EXPERIMENTAL SKILLS ACQUIRED THROUGH RESEARCH

- Screening of antioxidant molecules from plants
- *In vitro/in vivo* antioxidant activity (CCl₄ Induced hepatotoxicity & 20-Methylcholanthrene induced cervical cancer in albino Wistar rats and Swiss albino mice, respectively)
- Protein - phenolics binding studies
- Protein (Lectin, ATPase, Soybean lipoxygenase, LDL etc) Purification (Column, Ion exchange, Gel permeation Chromatography)
- Culturing of animal cells (B16F10, MDA-MB-231)
- *In situ* culturing of EAT Cells
- Experimental animal handling (Mice, Rat and Rabbit)
- Induction of lung metastases in mice through tail vein injection
- Screening of Antimetastatic components (Galectin) from plants
- Electrophoretic techniques, Western blotting
- Enzyme Inhibition studies, ELISA
- Liver function tests
- Characterization of organic molecules (Isovanillin)
- Sensory Evaluation techniques

MAJOR ANALYTICAL INSTRUMENTS HANDLED

- UV-Visible Spectrophotometer
- Fluorescence Spectrophotometer
- Polarimeter
- HPLC
- GC
- NMR (2D)
- IR
- Mass
- SEM

PATENTS/PUBLICATIONS/PARTICIPATION IN CONFERENCES/SEMINARS

PATENTS

- **Mysore Annaiah Harish Nayaka.**, Shylaja Mallaiah Dharmesh & Belur Ramaswamy Iyengar Lokesh (2010). A process for the preparation of antioxidant from Black Cumin (*Nigella sativa*) seeds. Patent No. 243225. International Classification. A61K 35/78. Council of Scientific and Industrial Research, India [CFTRI].

PUBLICATIONS

1. Muneer Saif Hasan Ahmed, **Harish Nayaka M A**, Yaaser Q. Almulaiky and Sam Al-Dalali (2021). Comparative phytochemical screening and biological activity of “Lyophilized sugarcane juice, vacuum pan and open pan jaggery” for methanolic extract. **Research Journal of Agricultural Sciences**, 12, 391-398.
2. Muneer Saif Hasan Ahmed, **Harish Nayaka M A**, Yaaser Q. Almulaiky and Sam Al-Dalali (2021). Evaluation of phytochemical screening and Biological activity of lyophilized sugarcane juice, vacuum and open pan jaggery for aqueous extracts. **Journal of Advanced Scientific Research**, 12, 81-91.
3. C. Vinutha, **M. A. Harish Nayaka**, G. Sowmyashree and Dinesh Kumar (2021). Decalepis hamiltonii (Wight & Arn) fortified jaggery: Its physico-chemical characterization and studies on its in vitro biological activities. **International Journal of Current Microbiology and Applied Sciences**, 10, 1510-1529.
4. Vasantkumar Maruti Koraddi, C. Vinutha, Dinesh Kumar, S. N. Swamy Gowda and **M. A. Harish Nayaka** (2021). Comparative evaluation of physico-chemical and sensory characteristics of sugarcane (*Saccharum officinarum* L.) and palmyra palm (*Borassus flabellifer* L.) liquid sweeteners. **Journal of Experimental Zoology of India**, 24, 711-718.
5. Vasantkumar Maruti Koraddi, Sneha Thothiyana Chinnappa, M P Manohar and **M A Harish Nayaka** (2021). Physico-chemical and microbial viability characteristics of probiotic (*Lactobacillus acidophilus* and *Lactobacillus brevis*) sugarcane refined sugar syrup. **Journal of Experimental Zoology of India**, 24, 685-694.

6. Vinutha Chandrakanth., **Harish Nayaka Mysore Annaiah.**, Sudarshan Shivalingaiah., Lava Chikkappaiah (2019). Cardamom [*Elettaria cardamomum* (L.) Maton] - Fortified Jaggery: Its Physicochemical Characterization and *In Vitro* Antioxidant Capacity. **Sugar Tech.**, 21, 388-397.
7. **Harish Nayaka M A**, Lava Chikkappaiah, Venkatesh K S, Gunashree B S, Sudarshan S. Evaluation of bioactivity of Jaggery prepared using plant mucilage as clarificant (2018). **Asian Journal of Pharmaceutical and Clinical Research**, 11, 295-299.
8. **Harish Nayaka M A**, Lava Chikkappaiah, Manohar M P, Gunashree B S, Vasant Kumar M Koraddi (2018). Storage studies of jaggery prepared using aloe vera, purslane and Malabar spinach mucilage clarificants. **International Journal of Biosciences**, 13, 196-205.
9. Sathisha, U. V. and Mallikarjuna, S. E. and **Harish Nayaka, M. A.** and Shylaja, M. Dharmesh (2017) Antimetastatic pectic polysaccharide from *Decalepis hamiltonii*; galectin-3 inhibition and immune-modulation. **Clinical and Experimental Metastasis**, 34, 141-154.
10. Lava Chikkappaiah, **Harish Nayaka M A**, Mahadevaiah, Venkatesh K S and Dinesh Kumar (2017). Properties of spray dried liquid jaggery powder prepared using plant mucilage clarificants. **International Research Journal of Biological Sciences**, 6, 15-22.
11. Lava Chikkappaiah, **Harish Nayaka M A**, Mahadevaiah and Prashanth Kumar G M (2017). Preparation of plant mucilage clarificants and their effect on jaggery processing of sugarcane variety Co 86032. **International Journal of Pharmacy and Pharmaceutical Sciences**, 9, 32-36.
12. Lava Chikkappaiah, **Harish Nayaka M A**, Manohar M P, and Santhosh C (2017). Properties of liquid jaggery prepared using plant mucilage as clarificants. **International Journal of Recent Scientific Research**, 8, 19590-19595.
13. Lava Chikkappaiah, **Harish Nayaka M A**, Manohar M P, Vinutha C and Prashanth kumar G M (2017). Effect of plant mucilage clarificants on physical and chemical properties of jaggery. **International Journal of Recent Scientific Research**, 8, 20663-20669.
14. S. Sudarshan, **M. A. Harish Nayaka**, C. Vinutha, S. Pradeep and D. Rajanna (2017). Screening of sugarcane genotypes for internode borer (*Chilo sacchariphagus indicus*) infestation levels and physico-chemical properties of sugarcane juice extracted from infested cane varieties. **Journal of Experimental Zoology, India**, 20, 1313-1317.
15. **M A Harish Nayaka**, S Sudarshan, S N Swamy Gowda, C Vinutha and M P Manohar (2017). Comparative determination of antioxidant activity in sugarcane

- juice of internode borer resistant varieties. **Biochemical and cellular Archives**, 17, 373-377.
16. **M A Harish Nayaka**, C Vinutha, S Sudarshan and M P Manohar (2015). Physico-chemical, antioxidant and sensory attributes of ginger (*Zingiber officinale*) enriched jaggery of different sugarcane varieties. **Sugar Tech.**, 17, 305-313.
 17. **Harish M A Nayaka**, Vinutha Chandrakanth, Praphu M S Lingaiah and Sudarshan Shivalingaiah (2015). Antilipoxygenase and antihelmintic activity of ginger (*Zingiber officinale*) enriched cane jaggery. **Research Journal of Recent Sciences**, 4, 62-66.
 18. **Harish Nayaka, M.A.**, Vinutha, C., Prabhu, M.S.L and Pradeep, S (2014). Antilipoxygenase and antihelmintic activity of cardamom (*Elettaria cardamomum* [L] Maton) enriched cane jaggery. **International Journal of Recent Scientific Research**, 5, 518-521.
 19. Vinutha, C., Sudarshan, S., Pradeep, S and **Harish Nayaka M.A** (2014). Antioxidant activity of Sugarcane jaggery with neem (*Azadirachta indica*) leaf extract. **International Journal of Recent Scientific Research**, 5, 99-101.
 20. M.P. Manohar, **M.A. Harish Nayaka**, Mahadevaiah (2014). Studies on phenolic content and polyphenol oxidase activity of sugarcane varieties with reference to sugar processing. **Sugar Tech**, 16, 385-391.
 21. Jayarooma, P., Vasanth Kumar, G., Renuka, N., **Harish Nayaka, M A** and Ajay Kumar, K (2013). Evaluation of New Pyrazole derivatives for their biological activity: Structure-Activity relationship. **International Journal of PharmTech Research**, 5, 264-270
 22. M. Govindaraju, G. Vasanth Kumar, G. Pavithra, **M.A. Harish Nayaka**, B.N. Mylarappa, K. Ajay Kumar (2012). Evaluation of New Tetra Substituted Pyrazolines for Their Antimicrobial and Antioxidant Activity; Structure-Activity Relationship. **IOSR Journal of Pharmacy and Biological Sciences**, 2, 30-34
 23. Belagihalli M. Srikanta, **Mysore A. Harish Nayaka**, Shylaja M. Dharmesh (2011). Inhibition of *Helicobacter pylori* growth and its cytotoxicity by 2-hydroxy 4-methoxy benzaldehyde of *Decalepis hamiltonii* (Wight & Arn); a new functional attribute. **Biochemie**, 93, 678-688.
 24. **M.A. Harish Nayaka**, U.V. Sathisha and Shylaja M. Dharmesh (2010) Cytoprotective and antioxidant activity of free, conjugated and insoluble-bound phenolic acids from swallow root (*Decalepis hamiltonii*). **Food Chemistry**, 119, 1307-1312.
 25. K. B. Umesha, K. M. L. Rai, **M. A. Harish Nayaka** (2009). Antioxidant and Antimicrobial Activity of 5-methyl-2-(5-methyl-1,3,2 diphenyl-1H-pyrazole-4-

carbonyl)-2,4-dihydro-pyrazol-3-one. **International Journal of Biomedical Science**, 5, 359-368.

26. Siddaraju MN, **Harish Nayaka MA** and Shylaja MD (2009). Gastroprotective Effect of Ginger Rhizome (*Zingiber officinale*) Extract: Role of Gallic Acid and Cinnamic Acid in H⁺, K⁺-ATPase/*H. pylori* Inhibition and Anti-oxidative Mechanism. **eCAM**, 1-13.
27. **M.A. Harish Nayaka**, U.V. Sathisha, M.P. Manohar, K.B. Chandrashekar, Shylaja M. Dharmesh (2009). Cytoprotective and antioxidant activity studies of jaggery sugar. **Food Chemistry**, 115, 113-118.
28. **M. A. Harish Nayaka**, U. V. Sathisha, K. B. Chandrashekar, M. P. Manohar, Shylaja M Dharmesh (2008). Evaluation of antioxidant activity of bound phenolics of sugarcane under *in vitro* conditions. **Sugar Tech**, 10, 302-307.
29. J Rajesha, **M.A. Harish Nayaka**, Basavaraj Madhusudhan, MD Shylaja, M Karuna Kumar, GA Ravi Shankar (2008). Antioxidant potential of secoisolariciresinol diglucoside isolated from different fractions of flaxseeds. **Seed Science and Biotechnology**, 2, 83-88.
30. K. S. Nagesh, **M. A. Harish Nayaka**, Shylaja M Dharmesh, C. Shanthamma, T. Pullaiah (2008). *In vitro* propagation and antioxidant activity of *Curculigo orchioides*. **Tropical Journal of Medicinal Plants**, 9, 404-410.
31. Sathisha UV, Jayaram S, **Harish Nayaka M.A.**, Dharmesh SM (2007). Inhibition of galectin-3 mediated cellular interactions by pectic polysaccharides from dietary sources. **Glycoconjugate Journal**, 24, 497-507.
32. Naik Y, Jayaram S, **Harish Nayaka M.A.**, Lakshman, Dharmesh SM (2007). Gastroprotective effect of swallow root (*Decalepis hamiltonii*) extract: possible involvement of H⁽⁺⁾-K⁽⁺⁾-ATPase inhibition and antioxidative mechanism. **Journal of Ethnopharmacology**, 112, 173-9.
33. G. Suresh Kumar, **Harish Nayaka**, Shylaja M. Dharmesh, P.V. Salimath (2006). Free and bound phenolic antioxidants in amla (*Emblica officinalis*) and turmeric (*Curcuma longa*). **Journal of Food Composition and Analysis**, 19, 446-452.

PARTICIPATION IN CONFERENCES/SEMINARS

1. **Harish Nayaka M.A.**, Lokesh B.R and Shylaja M Dharmesh. Water soluble antioxidants from black cumin (*Nigella sativa*). Society of biological chemists (India), 70th Annual Meeting, 27-29 December, 2001, Hyderabad, India.

2. Yougendra Nayak, **Harish Nayaka M.A.**, Siddaraju M.N and Shylaja M Dharmesh. Cancer preventive activity of swallow root (*Decalepis hamiltonii*). Indian Association for Cancer Research, 22nd Annual Convention and International Symposium on Recent Advances in Cancer Causes and Control, January 10-12, **2003**, Thiruvananthapuram, Kerala, India.
3. **Harish Nayaka M.A.**, Siddaraju M.N and Shylaja M Dharmesh. Multi-Potent antioxidant components of *Decalepis hamiltonii* (Swallow root). International Conference on Role of Free Radicals and Anti-Oxidants in Health and Disease & II Annual Conference of SFRR-India, February 10-12, **2003**, Lucknow, India.
4. Siddaraju M.N., **Harish Nayaka M.A.**, Smitha J and Shylaja M Dharmesh. Cytoprotective effect of spice antioxidants. 5th International Food Convention, 5-8 December **2003**, Mysore, India.
5. Siddaraju M.N., **Harish Nayaka M.A.**, Smitha J and Shylaja M Dharmesh. Potential ulcer preventive components in aqueous extract of swallow root (*Decalepis hamiltonii*). 10th Congress of Federation of Asian & Oceanian Biochemists and Molecular Biologists, 7-11 December **2003**, Bangalore, India.
6. Smitha J., Sathisha U.V., **Harish Nayaka M.A.**, Siddaraju M.N and Shylaja M Dharmesh. Galectin-3, a potential tool to evaluate dietary antimetastatic compounds. Indo-Australian Symposium on Biomaterials and Bioengineering, 13th February **2004**, MAHE, Manipal, India.
7. Sathisha U.V., Smitha J., **Harish Nayaka M.A** and Shylaja M Dharmesh. Galectin Inhibitory Polysaccharides from dietary sources. XIX Carbohydrate Conference, 1-3 December **2004**, Dehra Dun, India.
8. Jagadish R.L., Rana V.S and **Harish Nayaka M. A.** Antioxidant activity in methanolic extract of banana (*Musa paradisiaca*) pseudostem. National Conference on Chemical Sciences for Industry and Society, January 06-08, **2006**, Kuvempu University, Shimoga, Karnataka, India.
9. Manohar M P, Mahadevaiah and **Harish Nayaka M A (2013)**. Polyphenol Oxidase enzyme activity in sugarcane and its inhibition under factory process conditions. SISSTA, 43, 387-389.
10. "Sugar Industry Cogeneration: A sustainable Source of Renewable Energy" 25.01.**2014**, University of Mysore, Mysore.
11. "Trends of Modernization - Princely state of Mysore: 1881-1947" 29-30th May **2014**, Sir. M V Post Graduate center, UOM, Mandya.

12. Participated in a three days International Conference on “ Importance of Herbal Medicine in the Era of globalization – A live Demonstration organized by Department of Chemistry on December 21st to 23rd of **2016**, Kuvempu University, Shivamogga 577203, Karnataka, India
13. **Harish Nayaka M A**, Sudarshan S, Swamy Gowda, Vinutha C and Manohar M P (**2017**). Comparative determination of antioxidant activity in sugarcane juice of internode borer resistant varieties. National Conference on Food based approaches for translational Nutrition, April 12th and 13th 2017, University of Mysore, Mysore, Karnataka, India.
14. Vinutha C, **Harish Nayaka M A**, Muneer Saif Hasan Ahmed, Lava c and Manohar M P (**2017**). *Decalepis hamiltonii* (Wight and Arn.) fortified jaggery: Evaluation for Physico-chemical, sensory and biological properties. National Conference on Food based approaches for translational Nutrition, April 12th and 13th 2017, University of Mysore, Mysore, Karnataka, India.
15. Vinutha C, Harish Nayaka MA, Jagadeesh B R and Manohar M P (2017). Cardamom (*Elettaria cardamomum* [L.] Maton) enriched jaggery: characterization of physicochemical properties, *In vitro* antioxidant activity and sensory evaluation. International Conference on Environment, Health and Policy Nexus, July 27th and 28th 2017, Jagadguru Sri Shivarathreshwara University, Mysuru, Karnataka, India.

WORKSHOP:

- a) Participated in an International workshop on “Functional Glycomics”, 2nd and 3rd February **2011**, School of Biological Sciences, Central University of Kerala, Kasaragod
- b) National workshop on “DNA barcoding – concept and application”, 18th -19th Dec **2014**, University College, Mangalore.
- c) National workshop on “Interfacing Innovation and IPR for diffusion of Technology”, 19th January **2015**, ATME College of Engineering, Mysore.
- d) National workshop on “NMR Spectroscopy: Application to biomolecules (NMRSAB-2015)”, 9th and 10th January, **2015**, JNTUA College of Engineering, Ananthapuramu.
- e) Participated in the UGC sponsored 1-week workshop on ICT from 7th to 13th March **2017** at UGC-Human Resource Development Center, University of Mysore, Mysore, Karnataka, India.
- f) UGC-Sponsored 2-Day **Workshop for Academic Administrators**, 23rd & 24th March **2018**.

INVITED TALKS:

1. Role of dietary components in preventing cancer initiation and metastasis. National Conference on Chemical Sciences for Industry and Society, January 06-08, 2006, Kuvempu University, Shimoga, Karnataka, India.
2. Lecture on "Radio Carbon Dating", 27th March **2013**, Sarada Vilas College, Mysore.

Date:

Place: Mandya

Dr. M A Harish Nayaka