

## PERSONAL PROFILE

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

Assistant Professor

Dept. of Sugar Technology

University of Mysore

Karnataka, India



### ***PROFILE SUMMARY***

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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***

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Name : Dr. M A Harish Nayaka

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### ***EDUCATION HISTORY***

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**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 CCl<sub>4</sub> 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 B<sub>16</sub>F<sub>10</sub> 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 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

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11 Years

### SUBJECTS TAUGHT

- Biochemistry
  - Amino acids and Proteins
  - Purification and Characterization of Proteins
- Basic Organic Chemistry
  - Stereochemistry and Spectroscopy (IR, NMR and Mass)
- Sugar Chemistry
  - Sucrose Chemistry

## RECOGNIZED Ph.D. GUIDE IN

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- Sugar Technology
- Biochemistry
- Chemistry
- Food Science

## MEMBERSHIP IN PROFESSIONAL BODIES:

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- SISSTA - Life member
- SBC (India) - Life member

## RESEARCH INTERESTS AND ACCOMPLISHMENT

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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”. The effect of natural sweeteners on protein, carbohydrate and lipid digestion enzymes are under way in addition to the development of Probiotic natural sweeteners.

## EXPERIMENTAL SKILLS ACQUIRED THROUGH RESEARCH

- Screening of antioxidant molecules from plants
- *In vitro/in vivo* antioxidant activity (CCl<sub>4</sub> 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

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##### 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. **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.
2. Vinutha, C., Sudarshan, S., Pradeep, S and **Harish Nayaka M.A** (2014). Antioxidant activity of Sugarcane jiggery with neem (*Azadirachta indica*) leaf extract. **International Journal of Recent Scientific Research**, 5, 99-101.
3. 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.
4. Jayaroopa, 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
5. 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

6. 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.
7. **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.
8. 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-1*H*-pyrazole-4-carbonyl)-2,4-dihydro-pyrazol-3-one. **International Journal of Biomedical Science**, 5, 359-368.
9. 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<sup>+</sup>, K<sup>+</sup>-ATPase/*H. pylori* Inhibition and Anti-oxidative Mechanism. **eCAM**, 1-13.
10. **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.
11. **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.
12. 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.
13. 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.
14. 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.
15. 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.

16.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**

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), 70<sup>th</sup> 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, 22<sup>nd</sup> 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. 5<sup>th</sup> 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*). 10<sup>th</sup> 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, 13<sup>th</sup> 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 & **Harish Nayaka M A (2013)**. Polyphenol Oxidase enzyme activity in sugarcane and its inhibition under factory process conditions. SISSTA, 43, 387-389.
10. **Workshop:** Participated in an International workshop on “Functional Glycomics”, 2<sup>nd</sup> and 3<sup>rd</sup> February 2011, School of Biological Sciences, Central University of Kerala, Kasaragod
11. **Invited Talk:** 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.