Hitesh Kumar

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PERSONAL DETAILS

Gender: Male

Date of birth: Jan. 30, 1981

Nationality: India

Tel: +91-9817299188

Address: Assistant Professor, Department of Botany, Sardar Patel University, Mandi- Himachal Pradesh, India

EDUCATION

Nov. 2004 — Jan. 2013 **Panjab University, Chandigarh**

Plant Biotechnology (Ph.D.)

Dissertation: Molecular basis of stevioside biosynthesis in *Stevia rebaudiana* (Bertoni), a source of non-calorific sweetener (Research work was being carried out at Biotechnology Division, CSIR-Institute of Himalayan Bioresource Technology, Palampur, India).

Ph.D. advisors: Dr Sanjay Kumar and Dr Kashmir Singh

Jun. 2001 — Nov. 2003 **Himachal Pradesh University, Shimla**

Botany (M.S.)

Thesis: Effect of phytohormones on the plant growth and development

Thesis advisor: Dr Shanti Swaroop Sharma

Mar. 1999 — Apr. 2001 **Himachal Pradesh University, Shimla**

Basic Sciences (B.S.)

RESEARCH

The regulation mechanism of steviol glycosides (SGs) biosynthesis is my research focus. We identified and functionally characterized nine full-length genes out of thirteen genes involved in SGs biosynthesis. During the course of work, aprotocol for efficient isolation of RNA was developed. Stem, root and older leaves were shown to exhibit lower Stevioside and Rebaudioside A content. Upstream regulatory elements of seven genes involved in SGs biosynthesis were cloned and analyzed. Several putative regulatory motifs were identified in these upstream

sequences related to light, low-temperature, drought, ABA, gibberrilins, cytokinin, auxin, signal transduction, root specific regulation, leaf specificity, cell division and biotic factors. Gene expression analysis showed a high expression in 3rd node leaf as compared to stem, root and leaves at other node positions. Gene expression and SGs content analysis in leaves at different nodes identified *SrDXR*, *SrKO* and *SrNCYPR* as possible regulatory genes in SGs biosynthesis. Gene expression of many genes was higher in response to light as compared to dark. Phytohormones such as Methyl Jasmonate, GA_3 and Kinetin were found to modulate the expression of the genes of SGs biosynthesis pathway.

PUBLICATIONS

- Sanjay Ghawana, Asosii Paul, **Hitesh Kumar**, Arun Kumar, Harsharan Singh, Pradeep K. Bhardwaj, Arti Rani, Ravi Shankar Singh, Jyoti Raizada, Kashmir Singh, Sanjay Kumar (2011) An RNA isolation system for plant tissues rich in secondary metabolites. **BMC Research Notes** 4:85

- **Hitesh Kumar**, Kiran Kaul, Suphla Gupta-Bajpai, Vijay K. Kaul, Sanjay Kumar (2012) A comprehensive analysis of fifteen genes of steviol glycosides biosynthesis pathway in *Stevia rebaudiana* (Bertoni). **Gene** 492(1):276-284.

- **Hitesh Kumar**, Kashmir Singh, Sanjay Kumar (2012) *2C-methyl-D-erythritol 2,4-cyclodiphosphate synthase* from *Stevia rebaudiana* Bertoni is a functional gene.**Molecular Biology Reports** 39(12):10971-10978

- **Hitesh Kumar**, Sanjay Kumar (2013) A functional (*E*)-*4-hydroxy-3- methylbut-2-enyl diphosphate reductase* exhibits diurnal regulation of expression in *Stevia rebaudiana* (Bertoni) Gene 527(1):332–338

- **Hitesh Kumar** and Sanjay Kumar(2013)Molecular basis of steviol glycosides biosynthesis in *Stevia rebaudiana* Bertoni, a source of non-calorific sweetener. *Proceedings of 7th EUSTAS Stevia symposium*, J.M.C. Geuns (Editor) Euprint, Heverlee, pp. 43-74.

- **Hitesh Kumar**, Rajesh Kumar, Pallavi Mahajan, Ravi Shankar, Sanjay Kumar (2015). Organ specific transcriptome analysis identifies the regulation of glycosides biosynthesis in*Stevia rebaudiana* Bertoni. *Proceedings of 8th EUSTAS Stevia symposium*, J.M.C. Geuns (Editor) Euprint, Heverlee, pp. 82-99.

- **Hitesh Kumar** and Sanjay Kumar (2014)*Stevia rebaudiana*: A Source of Natural Non-calorific Sweetener" In: *Recent Progress in Medicinal Plants Vol 42*. J.N. Govil (Editor) Studium Press LLC, USA.

- **Hitesh Kumar** and Sanjay Kumar(2017)Comparative organ-specific transcriptome analysis of *Stevia rebaudiana* (Bertoni) Bertoni, a source of natural non-calorific sweetener. *Proceedings of Revolutionizing Next Generation sequencing (2nd Edition) symposium*, Antwerp, Belgium.

PATENTS

1. Bhardwaj P.K., Kumar A., Kishor A., Ghawana S., Rani A., Singh K., Singh H., Singh R.S., **Kumar H.**, Sood P., Dutt S., Kumar S., Ahuja P.S. (2017) Method of cloning stable stress tolerant superoxide dismutase using universal primers. **European Patent EP-2268661-B1** (Granted).
2. Bhardwaj P.K., Kumar A., Kishor A., Ghawana S., Rani A., Singh K., Singh H., Singh R.S., **Kumar H.**, Sood P., Dutt S., Kumar S., Ahuja P.S. (2015) Method of cloning stable stress tolerant superoxide dismutase using universal primers. **USA Patent US 9212350 B2** (Granted).

AWARDS/FELLOWSHIPS

- Awarded 'Junior Research Fellowship' and 'Senior Research fellowship' (Jul. 2004) by Indian Council of Medical Research.
- Qualified 'Graduate Aptitude Test in Engineering' (Feb. 2003) conducted jointly by the Indian Institute of Science and seven Indian Institutes of Technology.
- Qualified 'National Eligibility Test' twice (Dec. 2003 and Jun. 2004) conducted jointly by Council of Scientific and Industrial Research-University Grants Commission, eligible for Junior Research Fellowship and Assistant Professorship.
- Qualified 'National Eligibility Test' (Sep. 2010) conducted by Indian Council of Agricultural Research, eligible for Assistant Professorship.

PROFESSIONAL RECOGNITIONS

- Invitedspeaker for the EUSTAS 7th Stevia Symposium organized by European Stevia Association during June 24-26, 2013 at Ecole d'Ingénieur de Purpan-Toulouse, France.
- Invited speaker for the EUSTAS 8th Stevia Symposium organized by European Stevia Association during January 27-28, 2015 at University of Bonn, Germany.
- Invited speaker for the *Proceedings of Revolutionizing Next Generation sequencing (2nd Edition) symposium*, Antwerp, Belgium.