

Dr Birendra Kumar

Chief Scientist & Nodal

Seed Quality Lab on MAPs,
Plant Breeding & Genetic Resource Conservation Division,
CSIR-CIMAP, P.O. CIMAP, Lucknow-2206015,
Uttar Pradesh, India

Date of Birth: 07-11-1967 (Seventh November Nineteen Sixty-Seven)

Email: b.kumar@cimap.res.in; birendrak67@rediffmail.com; birendrak67@gmail.com

Mobile Number: +91 80049 44535, +91 94500 95841

Permanent Address: House No.: 4/558, Sector-4, Vikas Nagar, P.O. Vikas Nagar, Lucknow-226022, U.P.



Education Qualification:

Sl. No.	Degree/Certificate	Year of Passing	University/Institute	Subject
1.	B.Sc.	1987	Allahabad University	Botany, Zoology, Chemistry
2.	M.Sc.	1989	Allahabad University	Botany, IInd Position
3.	Ph.D.	2008	Lucknow University & CSIR-CIMAP	Botany Ph.D. Thesis Title: "Study on genetic architecture of opium poppy (<i>Papaver somniferum</i> L.) in relevance to yield improvement".

Academic/Research Experience/Employment:

Sl. No.	From	To	Name of Organization	Position held
1.	August 1995	August 2000	CSIR-CIMAP, Lucknow	Scientist-B
2.	August 2000	August 2004	CSIR-CIMAP, Lucknow	Scientist-C
3.	August 2004	August 2008	CSIR-CIMAP, Lucknow	Scientist-E1
4.	August 2008	August 2013	CSIR-CIMAP, Lucknow	Principal Scientist (Sci.-EII)
5.	August 2013	August 2019	CSIR-CIMAP, Lucknow	Senior Principal Scientist (Sci.-F)
6.	August 2019	Continued	CSIR-CIMAP, Lucknow	Chief Scientist (Sci.-G)

Area of Specialization: Crop improvement through plant breeding approaches and development of seed quality standards in Medicinal and Aromatic Plants.

Google Scholar Citation: https://scholar.google.lt/citations?hl=en&user=SwuR_iwAAAAJ;
Citations: 762; h-index: 15; i10-index: 26

Honours/ Awards/Recognitions received:

- ❖ **Life Time Award** for outstanding contribution in the field of Genetics & Crop Improvement given by S&T, SIRI, Thorrur, Mahabubabad, **Telangana** (11-12th November, 2017).
- ❖ **Distinguished Scientist Award** for outstanding contribution in the field of Genetics & Crop Improvement given by S&T, SIRI, Warangal, **Telangana** (9-10th September, 2017).
- ❖ **IBS Fellow** (Fellow of the Indian Botanical Society) in recognition of his outstanding achievements and contributions to the field of Medicinal and Aromatic Plants.
- ❖ **SAB Fellow** (Fellow of Society for Applied Biotechnology) in recognition of his outstanding achievements and contributions to the field of agricultural biotechnology given by Society for Applied Biotechnology, **Tamil Nadu** (November, 2014).
- ❖ **I S S Fellow** (Fellow of Indian Society for Spices) for R & D Contributions in the field of Spices, Medicinal and Aromatic Plants. Indian Society for Spices, Kozhikode, (2013), **Kerala**.
- ❖ **Fellow of ISCON (FNRS)**, BHU, Varanasi (1998).
- ❖ **Menthol mint CSIR Technology Award** (1999) for development of high yielding varieties Himalaya and Kosi as one of the team members.
- ❖ **CIMAP Day Award 2005** for significant contribution towards enabling CIMAP to achieve EOAI-SOM Award 2003 – 2005 for the development and dissemination of legendary variety KOSI of *Mentha arvensis* as one of the team members.
- ❖ **Golden Peacock Eco - Innovation Award 2008** for carrying out a holistic green path for better health under a visionary leadership as one of the team members.
- ❖ **CSIR Award for S & T Innovation for Rural Development** for the year 2008 is conferred jointly on Central Salt & Marine Research Institute (CSMCRI), Bhavnagar for "Innovation in the area of Salt for Rural Development" and Central Institute of Medicinal and Aromatic Plants (CIMAP), Lucknow for "Bio-village strategy for Agri-business of Medicinal and Aromatic Plants" as one of the team members.
- ❖ **Member of Management Council of CIMAP** (2007-2009) nominated by DG, CSIR, New Delhi.
- ❖ **Member of Editorial Board** of *Journal of Medicinal and Aromatic Plant Sciences*, *Journal of Research in Agriculture*, *Journal of Research in Biology*, *Journal of Plant Development Science*, *Journal of Research in Plant Sciences*, *MAPs Dew* and *Aus Boond* (published by Director, CSIR-CIMAP, Lucknow).

- ❖ **Member**, Variety Releases Committee of the CSIR-CIMAP (2015-2018).
- ❖ **Member** committee of Recruitment for scientific and technical staff in CSIR-CIMAP, CSIR-CDRI, CSIR-IHBT, CAPE, etc.
- ❖ **Member** committee for Selection and Assessment of JRF/SRF/RA and Project Assistant in CSIR-CIMAP.
- ❖ **External Examiner of PG/UG students** in Allahabad University, Mahatma Gandhi Central University East Champaran, BBAU Lucknow and Lucknow University.
- ❖ **Ph.D. Guide** for CSIR-JNU Ph. D. programme and AcSIR academy.
- ❖ **Ph.D. Examiner** recognized by BBAU, AcSIR Academy, AMITY University, Allahabad University, Mahatma Gandhi Central University, etc.
- ❖ **Member of Advisory Committee** of International Society for Conservation of Natural Resources (ISCON), Department of Botany, B.H.U., Varanasi, U.P.

Life Member of the following Professional Bodies, Societies and Academies:

- i. **The National Academy of Sciences**, Allahabad
- ii. **Indian Society of Genetics and Plant Breeding**, New Delhi
- iii. **Indian Society of Plant Genetic Resources**, New Delhi
- iv. **Indian Society of Plant Breeders**, Coimbatore
- v. **Indian Society for Species**, Calicut
- vi. **Indian Science Congress Association**, Kolkata
- vii. **Crop Improvement Society of India**, Ludhiana
- viii. **Indian Society of Seed Technology**, New Delhi
- ix. **The Indian Botanical Society**
- x. **Horticultural Society of India**, New Delhi
- xi. **Essential Oil Association of India**, Ghaziabad
- xii. **National Academy of Biological Sciences**, Chennai
- xiii. **Medicinal and Aromatic Plants Association of India**, Anand
- xiv. **Medicinal and Aromatic Plants Society of India**, Lucknow
- xv. **Society of Ethno-botany**, Lucknow
- xvi. **MASU, Tamil Nadu Agricultural University**, Coimbatore
- xvii. **International Society for Conservation of Natural Resources**, Varanasi

Publications (* Corresponding Author)

Original Research Papers

1. Mehdi J, Husain D, Srivastava A, Gupta N, Shanker, Talha M, Lal RK, **Birendra Kumar**, Gupta AK. 2023. The genetic diversity and chemical profiling of natural populations of Indian *Cannabis Industrial Crops and Products* **203**:117187. <https://doi.org/10.1016/j.indcrop.2023.117187>.
2. Ghosh D, Chaudhary N, Shanker K, **Birendra Kumar**, Narendra Kumar. 2023. Monoecious *Cannabis sativa* L. discloses the organ-specific variation in glandular trichomes,

- cannabinoids content and antioxidant potential. *Journal of Applied Research on Medicinal and Aromatic Plants*: 100476 <https://doi.org/10.1016/j.jarmap.2023.100476>.
3. Pandey V, Mishra D, Yadav R, Siddiqui A, Hiremath C, **Birendra Kumar**, Shaker K, Singh AK, Singh S, Khare P. 2023. Phyto-exclusion of Pb and Cd by different genotypes of *Abdrographis paniculata* (Burm. F.) Nees: A novel approach for safe cultivation. *Industrial Crops and Products* **191**: 115977 (1-12). <https://doi.org/10.1016/j.indcrop.2021.114488>.
 4. Prasad P, Srivastava A, Singh V, Kushwaha HK, Kishor R, Aftab N, Gupta N, Shanker K, Lal RK, **Birendra Kumar***. 2022. Genetic diversity analysis of Prishniparni, *Uraria picta* Desv.: A *Dashmoola* ingredient, to realize high yielding accessions. *The Nucleus*. <https://doi.org/10.1007/s13237-022-00402-6>.
 5. Mahendran G, Verma N, Singh M, Shanker K, Banerjee S, **Birendra Kumar**, Rahman L. 2022. Elicitation enhances swerchirin and 1, 2, 5, 6- tetrahydroxyxanthone production in hairy root cultures of *Swertia chirayita* (Roxb.) H. Karst. *Industrial Crops and Products* **177**: 114488 (1-9). <https://doi.org/10.1016/j.indcrop.2021.114488>.
 6. Prasad P, Aftab N, Kishor R, Kushwaha HK, Singh V, Srivastava A, Shanker K, Lal RK, **Birendra Kumar*** 2022. Quantification of genetic variability and stable genotype selection over the years in the germplasm of critically endangered Prishanparni (*Uraria picta* Desv.). *Environmental Geochemistry and Health*. <https://doi.org/10.1007/s.10653-021-01198-1>.
 7. Singh R, Kishor R, Singh V, Singh V, Prasad P, Aulakh NS, Tiwari UK, **Birendra Kumar*** 2022. Radio-frequency (RF) room temperature plasma treatment of sweet basil seeds (*Ocimum basilicum* L.) for germination potential enhancement by immaculation. *Journal of Applied Research on Medicinal and Aromatic Plants* **26**: 100350 (1-12). <https://doi.org/10.1016/j.jarmap.2021.100350>.
 8. Prasad P, Singh V, Aftab N, Gupta A, Kishor R, Kushwaha HK, Singh V, Verma RS, **Birendra Kumar*** 2021. Gamma irradiation-induced variability in morpho-agronomic and oil quality traits of *Mentha piperita* L. *International Journal of Radiation Biology* **97**(5):1-10.
 9. Gupta A, Singh V, Prasad P, Kumar M, Srivastava A, Singh V, Luqman S, **Birendra Kumar*** 2021. Influence of potassium and sodium chloride on germination behavior, biochemical changes and enzyme activity in two varieties of *Ocimum tenuiflorum* L. *Journal of Essential Oil-Bearing Plants* **24**(1): 110-119.
 10. **Birendra Kumar***, Zaidi S, Singh V, Venkatesha KT, Ram G, Gupta AK, Kumar N, Samad A 2020. Seed germination behaviour of *Cannabis sativa* L. under different temperature regimes. *Journal of Plant Development Sciences* **12**(5): 277-281.
 11. Prasad P, Kishor R, Gupta A, Saxena V, Zaidi S, Kushwaha HK, Singh V, Verma RS, **Birendra Kumar*** 2020. Genetic variability and character association among morphometric traits and essential oil constituents in eight half sib seed progenies in peppermint (*Mentha piperita* L.). *Trends in Phytochemical Research* **4**:143-152.

12. Verma PPS, Aftab N, Singh V, Shanker K, **Birendra Kumar*** 2020. Survival, performance and adaptation of *Swertia chirayita* genotypes at western Himalayan zone of Uttarakhand. *Journal of Medicinal and Aromatic Plant Sciences* **42**(3-4): 220-228.
13. Nilofer, Singh AK, Singh N, **Birendra Kumar**, Singh S. 2020. Effect of seed heteromorphism and seed collection time on germination of the medicinal plant *Centella asiatica* (L.) Urban in sub-tropical plains of north India. *Journal of Medicinal and Aromatic Plant Sciences* **42**(3-4): 229-233.
14. **Birendra Kumar***, Priyanka Prasad, Jafar Mehdi, Akancha Gupta, K. Shanker, Manju Singh, Rajni Gautam, Hemant Kumar Yadav. 2020. Morpho-metric and molecular characterization of *Uraria picta*- a medicinal plant. *Journal of Applied Research on Medicinal and Aromatic Plants* doi: 10.1016/j.jarmap.2020.100242.
15. Singh R, Prasad P, Mohan R, Verma M K, **Birendra Kumar*** 2019. Radio-frequency cold plasma treatment enhances seed germination and seedling growth in variety CIM-Saumya of sweet basil (*Ocimum basilicum* L.). *Journal of Applied Research on Medicinal and Aromatic Plants* **12**:78-81.
16. Singh M, Mohan R, Mishra S, Goyal N, Shanker K, Gupta N, **Birendra Kumar*** 2019. Ultra performance liquid chromatography coupled with principal component and cluster analysis of *Swertia chirayita* for adulteration check. *Journal of Pharmaceutical and Biomedical Analysis* **164**: 302–308.
17. Prasad P, Mehdi J, Mohan R, Goyal N, Luqman S, Khare P, **Birendra Kumar*** 2018. Effect of potassium chloride-induced stress on germination potential of *Artemisia annua* L. varieties. *Journal of Applied Research on Medicinal and Aromatic Plants* **9**: 110-116.
18. Srivastava AK, Saroj A, Kumar A, Khaliq A, **Birendra Kumar**, Singh SC, Samad A 2017. New record of *Uraria* Blossom Blight caused by *Colletotrichum siamense* in India. *Plant Disease* **101**(5):836.
19. Sana TS, **Birendra Kumar**, Shasany AK, Samad A 2017. Molecular identification of *Chilli leaf curl India virus* along with betasatellite molecule causing leaf curl disease of menthol mint (*Mentha arvensis* var. Kosi) in India. *Journal of General Plant Pathology* **83**:333–336.
20. Bharti H, Ponnuchamy M, **Birendra Kumar** 2016. Evaluation of sulphuric acid application in breaking dormancy of *Sida cordifolia* seeds--An Ayurvedic medicinal plant. *Seed Research* **44**(2): 133-136.
21. Sinha G, Mali H, Ram G, Srivastava DK, **Birendra Kumar*** 2016. Impact of salt stress on different varieties of Palmarosa during seed germination. *Journal of Essential Oil-Bearing Plants* **19**(4): 1025-1030.
22. **Birendra Kumar**, Yadav R, Singh SC, Singh HP. 2016. Seed germination behaviour of *Withania* spp. under different temperature regimes. *Journal of Crop Improvement* **30**(3): 287-292.
23. Yaseen M, **Birendra Kumar**, Ram D, Singh M, Anand S, Yadav HK, Samad A. 2015. Agro morphological, chemical and genetic variability studies for yield assessment in clary sage (*Salvia sclarea* L.). *Industrial Crops and Products* **77**: 640-647.

24. Mali H, **Birendra Kumar***, Srivastava DK, Ram G, Singh HP. 2015. Varietal difference for salt tolerance during seed germination in Palmarosa (*Cymbopogon martinii*). *Journal of Essential Oil-Bearing Plants* **18** (5): 1242-1245.
25. **Birendra Kumar**, Kumar U, Yadav HK. 2015. Identification of EST–SSRs and molecular diversity analysis in *Mentha piperita*. *The Crop Journal* **3** (4): 335-342.
26. **Birendra Kumar**, Gupta E, Yadav R, Singh SC, Lal RK. 2014. Effect of temperatures on seed germination potential in holy basil (*Ocimum tenuiflorum* L.). *Seed Technology* **36**(1): 75-79.
27. **Birendra Kumar**. Mali H, Gupta E. 2014. Genetic variability, character association and path analysis for economic traits in menthofuran rich half sib seed progenies of *Mentha piperita* L. *BioMed Research International* Volume 2015, <http://dx.doi.org/10.1155/2014/150830.7>.
28. **Birendra Kumar**, Yadav R, Gupta E, Singh HP, Samad A. 2014. Varietal differences for salt tolerance during seed germination of *Artemisia annua* L. at different temperature regimes. *Journal of Crop Improvement* **28**(4):454-464.
29. **Birendra Kumar**, Shukla AK, Samad A. 2014. Development and characterization of menthofuran-rich inter-specific hybrid peppermint variety CIMAP Patra. *Molecular Breeding* **34**(2):717-724.
30. Ekta Gupta, **Birendra Kumar***, Srivastava DK, Lal RK. 2014. Assessment of compatible substrate for varietal germination potential of Palmarosa seed. *Journal of Essential Oil-Bearing Plants* **17** (5):1034-1039.
31. **Birendra Kumar**, Singh VR, Ram G, Singh HP. 2014. Genetic combining ability estimates for inheritance of economic traits in opium poppy (*Papaver somniferum* L.). In proceedings of the international symposium on Papaver (Ed. A. Mathe). *Acta Horticulturae* **1036**, ISHS May, 2014:43-50.
32. Saudan Singh, Singh AK, **Birendra Kumar**. 2014. Effect of moisture regimes and field practices on germination and establishment of opium poppy (*Papaver somniferum* L.). In proceedings of the international symposium on Papaver (Ed. A. Mathe). *Acta Horticulturae* **1036**, ISHS May, 2014:169-173.
33. Saeed, S.T., Khan A, **Birendra Kumar**, Ajayakumar PV, Samad A. 2014. First report of *Chilli Leaf curl India virus* Infecting *Mentha spicata* (Neera) in India. *Plant Disease* **98**:164.
34. Misra HO, Lal RK, AK Gupta, **Birendra Kumar**, Misra AN, Sarkar S, Gupta V, Singh S, Gupta P, Zaim M, Singh VR. 2013. Genetic variability, character association and path analysis for economic traits in Bishop's weed [*Ammi visnaga* (L.) Lam]. *Industrial Crops and Products* **49**: 593-597.
35. **Birendra Kumar**, Gupta Ekta, Mali H, Singh HP, Akash M. 2013. Constant and alternating temperature effects on seed germination potential in *Artemisia annua* L. *Journal of Crop Improvement* **27**(6):636-642.

36. **Birendra Kumar**, Verma SK, Ram G, Singh HP. 2012. Temperature relations for seed germination potential and seedling vigor in Palmarosa (*Cymbopogon martinii*). *Journal of Crop Improvement* **26**(6):791-801.
37. **Birendra Kumar**. 2012. Prediction of germination potential in seeds of Indian Basil (*Ocimum basilicum* L.). *Journal of Crop Improvement* **26**(4):532-539.
38. **Birendra Kumar**, Patra NK. 2012. Inheritance pattern and genetics of yield and component traits in opium poppy (*Papaver somniferum* L.). *Industrial Crops and Products* **36** (1):445-448.
39. **Birendra Kumar**, Verma SK, Singh HP. 2011. Effect of temperature on seed germination parameters in Kalmegh (*Andrographis paniculata*). *Industrial Crops and Products* **34**(1):1241-1244.
40. Verma SK, **Birendra Kumar***, Ram G, Singh HP, Lal RK. 2010. Varietal effect on germination parameter at controlled and uncontrolled temperature in Palmarosa (*Cymbopogon martinii*). *Industrial Crops and Products* **32**(3): 696-699.
41. **Birendra Kumar**, Patra NK. 2010. Gene frequency-based estimation of natural outcrossing in opium poppy (*Papaver somniferum* L.). *Molecular Breeding* **26** (4):619-629.
42. **Birendra Kumar**, Patra NK. 2010. Genetical analysis of capsule and its associated economic traits in opium poppy (*Papaver somniferum* L.). *Journal of Heredity* **105** (5): 657-660.
43. **Birendra Kumar**, Verma AK, Ram G, Singh HP, Lal RK. 2010. Seed germination of five elite genotypes of *Papaver somniferum*. *Journal of Tropical Medicinal Plants* **11** (1): 107-112.
44. **Birendra Kumar**, Singh HP, Patra NK. 2010. Inheritance of quantitative and qualitative traits in opium poppy (*Papaver somniferum* L.). *Communications in Biometry and Crop Science* **5**(1): 11-18.
45. **Birendra Kumar**, Verma AK, Ram G, Singh HP, Lal RK. 2009. Genotype-independent Germination-testing procedure for Isabgol. *Journal of New Seeds* **10**(3): 196 – 205.
46. **Birendra Kumar**, Gupta AK, Verma AK, Dubey A. 2008. Comparative seed germination of *Tagetes minuta*. *Journal of Tropical Medicinal Plants* **9** (1): 149 – 151.
47. **Birendra Kumar**, Gupta AK, Verma AK, Saini RK, Khanuja SPS. 2008. Comparative germination kinetics and efficiency in Marigold (*Tagetes erecta* L.) accessions over storage. *Journal of Medicinal and Aromatic Plant Sciences* **30** (2): 142 – 145.
48. **Birendra Kumar**, Singh HP, Patra NK. 2008. Stability analysis for essential oil yield and quality traits in Japanese mint. *Indian Journal of Horticulture* **65** (2): 245 - 247.
49. **Birendra Kumar**, Singh HP, Verma AK, Misra HO, Patra NK. 2008. Combining ability analysis in relation to heterosis in opium poppy (*Papaver somniferum* L.). *Journal of Medicinal and Aromatic Plant Sciences* **30** (1): 83 – 87.
50. **Birendra Kumar**, Verma AK, Singh HP, H.O. Misra HO, Lal RK. 2008. Genetic divergence and correlation in *Chlorophytum borivilianum*. *Journal of New Seeds* **9**(4): 321 - 329.

51. Shukla RS, Alam M, **Birendra Kumar**, Singh VP. 2008. Multiple disease resistance in menthol mint genotypes. *Current Science* **95**(7):836 – 838.
52. **Birendra Kumar**, Singh HP, Ambresh Kumar Verma, Patra NK. 2007. Genetic studies in opium poppy for Designing Breeding Strategies. (A Research paper in Hindi Language). *Journal of Medicinal and Aromatic Plant Sciences* **29** (3): 139 -143.
53. **Birendra Kumar**, Verma AK, Singh HP, H.O. Misra HO, Kalra A. 2007. Correlation and path coefficients analysis in *Chlorophytum borivilianum*. *Journal of Tropical Medicinal Plants* **8** (2): 286 -290.
54. **Birendra Kumar**, Singh HP, Patra NK. 2007. Phenotypic stability in Japanese mint (*Mentha arvensis* L.). *Crop Improvement* **34** (1): 95 - 99.
55. Patra NK, Kandpal (Bajpai) A, **Birendra Kumar** 2006. Cytogenetical assessment of *Papaver somniferum* - *P. setigerum* hybrids for estimated linkage and recombination. *The Nucleus* **49** (1, 2): 59 – 64.
56. Ram P, **Birendra Kumar**, Naqvi AA, Verma RS, Patra NK 2005. Post harvest storage effect on quantity and quality of rose scented geranium (*Pelargonium* sp. cv. ‘Bourbon’) oil in Uttaranchal. *Flavour and Fragrance Journal* (UK) **20** (6): 666 - 668.
57. Singh AK, Raina VK, Naqvi AA, Patra NK, **Birendra Kumar**, Ram P, Khanuja SPS 2005. Essential oil composition and chemo-arrays of menthol mint (*Mentha arvensis* L. f. piperascens Malinvaud ex. Holmes) cultivars. *Flavour and Fragrance Journal* (UK) **20** (3): 302 -305.
58. **Birendra Kumar**, Singh HP, Yogesh Kumar, Patra NK 2005. Analysis of characters associated with high oil yield and menthol content potential in menthol mint (*Mentha arvensis* L.) genotypes. *Journal of Medicinal and Aromatic Plant Sciences* **27**(3):435 – 438.
59. Patra NK, **Birendra Kumar** 2005. Study of genetic variations in open-pollinated seed progenies (OPSPs) of *Mentha arvensis* cv. Shivalik-88. *Journal of Medicinal and Aromatic Plant Sciences* **27**(3):539 -544. (A Research paper in Hindi Language).
60. **Birendra Kumar**, Khanuja SPS, Patra NK 2004. Study of genetic variation in open pollinated seed progenies of *Mentha piperita* cv. Kukrail. *Journal of Medicinal and Aromatic Plant Sciences* **26** (1): 84 - 88 (A Research paper in Hindi Language).
61. **Birendra Kumar**, Mohd. Yaseen, Patra NK, Srivastava HK, Naqvi AA, Ram P 2004. Chemotypic variation in the morphologically homogenous gene pool of Indian Basil. *Indian Perfumer* **48**(3): 289 - 297.
62. Ram P, **Birendra Kumar**, Negi MS, Mohd. Yaseen, Singh VR, Patra NK 2004. Impact of plantlet age and planting time on yield of transplanted menthol mint. *Indian Perfumer* **48**(3): 299-303.
63. Ram P, Patra NK, **Birendra Kumar**, Verma RS 2004. Productivity of rose-scented geranium (*Pelargonium graveolens* L.) under different planting methods in Tarai of Uttaranchal. *Indian Journal of Horticulture* **61**(3): 256-258.

64. Ram P, **Birendra Kumar**, Srivastava N, Verma RS, Sashidhara KV, Patra NK 2004. Productivity and quality assessment of different chemo-types of geranium under tarai of Uttaranchal. *Journal of Medicinal and Aromatic Plant Sciences* **26**(3): 482 – 485
65. Singh HP, Patra NK, Kalra A, Singh HB, **Birendra Kumar**, Singh SP, Singh AK 2002. Genetic distance in coriander (*Coriandrum sativum* L.) for essential oil yield and yield traits. *Journal of Spices and Aromatic Crops* **11**(2):101-105.
66. Patra NK, Singh VR, Ram P, **Birendra Kumar** 2002. Yield appraisal of menthol mint (*Mentha arvensis* L.) varieties under late transplanted cropping programme. *Indian Perfumer* **46**(1):21-33.
67. Ram Govind, Garg SN, **Birendra Kumar**, Patra NK 2002. Growth performances of *Hyssopus officinalis* in Indian plains. *Indian perfumer* **46**(2): 119-121.
68. Ram P, Patra NK, **Birendra Kumar**, Verma RS, Srivastava Neeraj 2002. Integrated nutrient management in rose scented geranium (*Pelargonium graveolens*) under tarai condition of Uttaranchal. *Journal of Medicinal and Aromatic Plant Sciences* **25**(1): 50-53.
69. Ram P, **Birendra Kumar**, M. Yaseen, Patra NK, Negi MS. 2001. Economic viability of menthol mint (*Mentha arvensis* L.) based cropping systems in Uttar Pradesh. A survey report. *Indian Perfumer* **45**(3): 147-152.
70. Ram P, **Birendra Kumar**, Patra NK, Garg SN, Negi MS, Naqvi AA. 2001. *Tagetes minuta* L. - Effect of post harvest storage of herb on oil under *Tarai* conditions of Uttaranchal. *Indian Perfumer* **45**(3):153-157.
71. Ram P, **Birendra Kumar**, Kothari SK, Mohd. Yaseen, Rajput DK. 2000. Productivity of Java citronella based inter-cropping systems as affected by fertility levels under *tarai* region of Uttar Pradesh. *Journal of Medicinal and Aromatic Plant Sciences* **22**(1B): 494-498.
72. Yaseen M, Taj-ud-din, **Birendra Kumar**, Sushil Kumar 2000. Economic evaluation of menthol mint varieties under row spacing in north Indian plains. *Journal of Medicinal and Aromatic Plant Sciences* **22**(1B): 805-807.
73. Ram P, **Birendra Kumar**, Singh Aparbal, Mohd Yaseen, Kothari SK 1999. Response of marigold (*Tagetes minuta* L.) to irrigation and nitrogen fertilization under foot hills of tarai region of Uttar Pradesh. *Journal of Medicinal and Aromatic Plant Sciences* **21**(2):361-366.
74. **Birendra Kumar**, Ram P, Sharma S, Vinay Ranjan 1999. Status of menthol mint (*Mentha arvensis*) cultivation in India: A survey report on Haryana and Punjab. *Indian Perfumer* **43**(2):83-87.
75. Ram P, Patra NK, Singh HB, Singh HP, Ram M, **Birendra Kumar**, Sushil Kumar 1998. Effect of planting date and spacing on yield and major yield components of *Tagetes minuta*. *Journal of Medicinal and Aromatic Plant Sciences* **20**(3):742-745.
76. Ram P, Patra NK, **Birendra Kumar**, Singh HB, Sushil Kumar 1998. Productivity and economic viability in early and late planted Japanese mint (*Mentha arvensis* L.). *Indian Perfumer* **42**(4):211-215.

77. Ram P, Patra NK, **Birendra Kumar**, Singh HB, Sushil Kumar 1998. Transplanted mint as a suitable component for traditional crop rotation in northern India. *Trop. Agric. (Trinidad)* **75**(4): 473-476.

Variety Registration Papers

78. Sushil Kumar, Patra NK, Singh HP, Kalra A, Singh HB, Ram P, Singh VR, Mengi N, Singh VP, Ram M, Kambod Singh, Singh A, Khanuja SPS, Shasany AK, Naqvi AA, **Birendra Kumar**, Singh M, Shukla RS, Rajput DK, SinghJP, Tanveer H 1999. Kosi - an early maturing variety requiring late planting of *Mentha arvensis*. *Journal of Medicinal and Aromatic Plant Sciences* **21**(1):56-58.
79. Patra NK, Sushil Kumar, Khanuja SPS, Shasany AK, Darokar MP, Kalra A, Ram P, Singh HB, Singh HP, Singh VR, **Birendra Kumar**, Tanveer H, Mengi N, Rajput DK, Negi MS, Tyagi NK, Singh VP, Singh Anand, Singh JP, Naqvi AA. 2001. Ranisahiba - a variety with impressive flower and essential oil yield of kannauj damask rose. *Journal of Medicinal and Aromatic Plant Sciences* **23**(2):122-124.
80. Patra NK, Sushil Kumar, Khanuja SPS, Shasany AK, Darokar MP, Kalra A, Ram P, Singh HB, Singh HP, Singh VR, **Birendra Kumar**, Mengi N, Tanveer H, Singh VP, Singh JP, Naqvi AA. 2001. Jal Pallavi-water logging tolerant Java citronella (*Cymbopogon winterianus*). *Journal of Medicinal and Aromatic Plant Sciences* **23**(2):125-128.
81. Patra NK, Sushil Kumar, Khanuja SPS, Shasany AK, Kalra A, Singh HB, Singh HP, Tanveer H, Singh VR, **Birendra Kumar**, Mengi N, Negi MS, Singh VP, Singh JP, Naqvi AA. 2001. Neerkalka - an interspecific hybrid variety of *Mentha arvensis* and *M. spicata* for commercial cultivation of spearmint. *Journal of Medicinal and Aromatic Plant Sciences* **23**(2):129-132.
82. Patra NK, Sushil Kumar, Kalra A, Ram P, Singh HB, Singh HP, Singh VR, **Birendra Kumar**, Dhawan OP, Tanveer H, Mengi N, Negi MS, Tyagi NK, Singh VP, Singh JP, Naqvi AA. 2001. Vaishnavi - the first genotypes with shy stigma allowing viable seed formation exclusively through self-pollination in the cross-pollinated plant palmarosa. *Journal of Medicinal and Aromatic Plant Sciences* **23**(2):133-136.
83. Patra NK, Sushil Kumar, Khanuja SPS, Shasany AK, Darokar MP, Kalra A, Ram P, Singh HB, Singh HP, Singh VR, **Birendra Kumar**, Tanveer H, Mengi N, Rajput DK, Negi MS, Tyagi NK, Singh VP, Singh JP, Naqvi AA. 2001. Chirharit - a high yielding lemongrass variety with frost resistance, stay-green habit and new chromosomal ploidy status. *Journal of Medicinal and Aromatic Plant Sciences* **23**(2):137-140.
84. Patra NK, Sushil Kumar, Khanuja SPS, Shasany AK, Kalra A, Ram P, Singh HB, Singh HP, Singh VR, **Birendra Kumar**, Tanveer H, Mengi N, Rajput DK, Negi MS, Tyagi NK, Singh VP, Singh JP, Naqvi AA. 2001. Damroo-a seed producing menthol mint variety (*Mentha arvensis*). *Journal of Medicinal and Aromatic Plant Sciences* **23**(2):141-145.
85. Yaseen M, Sattar A, Patra NK, Naqvi AA, **Birendra Kumar**, Singh K, Anwar M, Singh A, Patra DD, Shasany AK, Dwivedi S, Khanuja SPS 2005. CIM-Chandni: A new variety of

- clarysage (*Salvia sclarea*) suited to northern Indian plains. *J. Med. Arom. Pl. Sci.* **27** (1-):118 – 121.
86. Khanuja SPS, Patra NK, Shasany AK, **Birendra Kumar**, Gupta S, Gupta MK, Upadhyay RK, Priya TP, Singh AK, Darokar MP, Singh AK, Tomar VKS, Bahl JR, Lal RK, Naqvi AA 2005. High menthofuran chemotype ‘CIM – Indus’ of *Mentha x piperita*. *J. Med. Arom. Pl. Sci.* **27**(4): 721- 726.
87. Chauhan HS, Bahl JR, Khanuja SPS, Kalra A, Gupta AK, Shasany AK, Darokar MP, Mathavan RE, Singh HP, Singh SP, Patra DD, Singh HN, Singh J, Gupta ML, Singh A, Lal RK, Bansal RP, Dhawan OP, Singh AK, **Birendra Kumar**, Garg SN. 2006. A high rhizome and oil yielding variety ‘CIM- Balya’ of vach (*Acorus calamus*). *J. Med. Arom. Pl. Sci.* **28** (4): 632 – 634.
88. Darokar MP, Khanuja SPS, Gupta AK, Sushil Kumar, Gupta MM, Singh AK, Shasany AK, Raju BV, Mishra PK, Rehman L, Kalra A, Verma RK, Mishra S, Gangwar A, Mishra HO, Chauhan HS, Singh S, Bahl JR, **Birendra Kumar**, Lal RK, Singh AK, Krishna A, Bansal RP, Tandon S, Dhawan OP. 2007. ‘CIM-Jagriti’ a variety of brahmi (*Bacopa monnieri*) with high herbage and bacoside- A yield potential. *J. Med. Arom. Pl. Sci.* **29** (1): 90 – 93.
89. Lal RK, Khanuja SPS, Chandra R, Misra HO, Singh A, Patra NK, **Birendra Kumar**, Shasany AK, Chauhan HS, Gupta MM, Darokar MP, Gupta AK, Bahl JR, Kalra A, Gupta ML, Ram D, Dwivedi S, Ram M, Singh M, Bansal RP, Krishna A, Singh HN, Dhawan OP, Garg SN, Yadav A, Alam M. 2007. CIM-Jeeva: High yielding variety of Java citronella (*Cymbopogon winterianus*) with enhanced field establishment capacity. *J. Med. Arom. Pl. Sci.* **29** (3): 172-174.
90. Lal RK, Khanuja SPS, Chandra R, Misra HO, Singh A, Patra NK, **Birendra Kumar**, Shasany AK, Chauhan HS, Darokar MP, Gupta AK, Bahl JR, Kalra A, Singh HN, Dhawan OP, Yadav A, Alam M, Gupta ML, Singh AK, Pandey R. 2007. Registration of a new variety CIM-Sujal of Fennel (*Foeniculum vulgare* Miller.): A high yielding variety with better anethol content. *J. Med. Arom. Pl. Sci.* **29** (4): 234-235.
91. Lal RK, Chandra R, Chauhan HS, Misra HO, Singh AK, Srikrishna, Shankar H, Singh HP, Singh SP, **Birendra Kumar**, Yadav A, Shasany AK, Dhawan SS, Gupta AK. 2010. A high yielding variety of lemongrass (*Cymbopogon khasianus*) ‘CIM- Suwarna’ suitable for water stress/rainfed/marginal land conditions. *J. Med. Arom. Pl. Sci.* **32**(1): 61-63.
92. Lal RK, Chandra R, Ram M, Ram D, Yadav A, Shanker H, Misra HO, Kalra A, **Birendra Kumar**, Gupta AK. 2010. Registration of high oil yielding variety “CIMAP Harsh” of Palmarosa *Cymbopogon martinii* var. motia. *J. Med. Arom. Pl. Sci.* **32**(2): 148-149.
93. Lal RK, Chandra R, Misra HO, Shankar H, Lal C, Singh AK, Srikrishna, Kalra A, **Birendra Kumar**, Yadav A, Singh HP, Krishna A, Singh HN, Dhawan SS, Gupta AK. 2010. Registration of a new released high yielding variety ‘CIMAP-Sammohak’ of chamomile (*Chamomilla recutita* L. Rauschert). *J. Med. Arom. Pl. Sci.* **32**(4): 480-482.
94. Lal RK, Chandra R, Gupta MM, Singh AK, Singh M, Verma RK, Misra HO, Kalra A, Gupta AK, Lal C, Singh HP, **Birendra Kumar**, Singh HN, Shankar H, Dhawan OP, Krishna A,

- Bansal K, Rizavi H, Bansal RP, Chauhan HS, Singh S, Zaim M, Bahl JR, Paday R. 2011. Registration of a high yielding variety 'CIMAP-Madhu' of stevia (*Stevia rebaudiana* Bert.). *Journal of Medicinal and Aromatic Plant Sciences* **33**(1): 77-80.
95. Lal RK, Chandra R, Misra HO, Shankar K, Singh AK, Dhawan OP, Gupta AK, **Birendra Kumar**, Gupta MM, Verma RK, Alam M, Singh SK, Kalra A, Singh HP, Chauhan HS, Singh HN. 2011. Registration of a high yielding variety 'CIMAP Ajay' morphine rich in concentrate of poppy straw of opium poppy (*Papaver somniferum* L.). *Journal of Medicinal and Aromatic Plant Sciences* **33**(2): 204-208.
96. Lal RK, Chandra R, Chauhan HS, Misra HO, Sangwan RS, Gupta, MM, Verma RK, Singh AK, Yadav AK, Dhawan OP, Kalra A, Bahl JR, Singh HP, Gupta AK, Rai SK, Birendra Kumar, Dubey B, Jhang T, Singh S, Singh VR, Pandey R, Bagchi GD, Sarkar S, Singh S 2012. Registration of a new high yielding variety "CIMAP-Pratap" of Ashwagandha [*Withania somnifera* (L.) Dunal] suitable for cultivation in drought prone areas of India. *Journal of Medicinal and Aromatic Plant Sciences* **34**(3&4): 178-182.
97. VR Singh, RK Lal, CS Chanotiya, SS Dhawan, P Gupta, S Srivastava, N Singh, RK Upadhyay, RC Padalia, RS Verma, KT Venkatesha, S Singh, RK Verma, S Tandon, S Kumar, **Birendra Kumar**, AD Nannaware, A Chauhan, R Chandra, T Chaturvedi, V Kumar, A Yadav, R Maurya, S Shukla, A Mishra, S Singh 2019. CIM-Utkrish: A high essential oil yielding variety of patchouli (*Pogostemon cablin* (Blanco) Benth) with a unique aroma suitable for cultivation under North Indian conditions. *Journal of Medicinal and Aromatic Plant Sciences* **41**(1-4):79-85.
98. Venkatesha KT, Singh VR, Padalia RC, Upadhyay RK, Chauhan A, Tiwari AK, Singh S, Bhatt G, Divya, Pandey P, Cerma RS, Mall M, Shukla AK, Chanotiya CS, Kumar S, **Birendra Kumar**, Gupta AK, Verma RK, Samad A, Kumar P, Rawat MC 2020. CIM-Unnati: An essential oil rich variety of menthol mint (*Mentha arvensis* L.) *Journal of Medicinal and Aromatic Plant Sciences* **42**(1-2): 73-79.

Review Papers:

1. Patra NK, **Birendra Kumar**, Ram P, Srivastava HK. 2001. Scope of genetic improvement in mints-A review. *Indian Perfumer* **45**(4):279-289.
2. Patra NK, **Birendra Kumar**, Shukla K, Ram P and Srivastava HK 2003. Problems and issues of agrotechnology transfer in menthol mint: A case study with variety 'Kosi'. In: Proceeding of First National Interactive Meet on Medicinal and Aromatic Plants- Scope and Opportunities in Research and Business of Medicinal and Aromatic Plants. Mathur AK, Dwivedi S, Patra DD, Bagchi GC, Sangwan NS, Sharma A, Khanuja SPS (Eds), CIMAP, Lucknow pp-440-443.
3. Patra NK, **Birendra Kumar** 2004. Improved varieties and genetic research in medicinal and aromatic plants (MAPs). In: Proceeding of Second National Interactive Meet on Medicinal and Aromatic Plants- Scope and Opportunities in Research and Business of Medicinal and

- Aromatic Plants. Kumar A, Mathur AK, Sharma A, Singh AK, Khanuja SPS (Eds), CIMAP, Lucknow pp.: **53-61**.
4. Singh SC, Gupta E, Yadav R, Bagchi GD, Ram G, **Birendra Kumar** 2013. Species diversity amongst aquatic, semi-aquatic and wetlands of Lucknow districts, U.P., India. In: Souvenir of *Water and Biodiversity*, published by U.P. State Biodiversity Board, Lucknow, Pp.37-48.
 5. Ranjan V, Singh L, **Birendra Kumar**, Singh SC 2014. Medicinal tress of Andaman and Nicobar Islands. In: Souvenir of *International day for biological diversity: Island Biodiversity*, published by U.P. State Biodiversity Board, Lucknow, Pp.99-104.
 6. **Birendra Kumar**, Mali H, Ram G, Sinha G, Prasad P, Samad A, Singh SC. 2015. Sustainable use of aroma agro biodiversity for aroma industry and social upliftment of growers. In: Souvenir of *International Day for Biological Diversity: Biodiversity for Sustainable Development*, Uttar Pradesh State Biodiversity Board, Lucknow, 22May, pp. 8-11.
 7. **Birendra Kumar**, Ram TC, Prasad P, Verma MK, Ram G, Samad A, Lal RK, Gupta S, Singh SC. 2016. Sustainable use and conservation of Basil's diversity in Upper Gangetic Plains of Uttar Pradesh. In: Souvenir of *International Day for Biological Diversity: Biodiversity for Sustainable Development*, Uttar Pradesh State Biodiversity Board, Lucknow, 22May, pp. 8-11

Book Chapters

1. Patra NK, **Birendra Kumar** 2006. Spearmint. In: Handbook of herbs and spices Peter KV (Ed.), *Woodhead Publishing Limited*, Cambridge, England. Volume **3**, pp.: **502 -519**.
2. Yadav SS, Samad A, **Birendra Kumar**. 2003. The epidemiology and management of emerging diseases of *Cannabis sativa*: An overview. In: Compendium of Medicinal and Aromatic Plants Diseases, Pandey R, Raj K, Mondal G, Mawar R, Kalra A, Singh HB (Eds.), *Indian Phytopathological Society, Division of Plant Pathology, ICAR-Indian Agricultural Research Institute*, New Delhi-110012, India. pp.: 132-147. ISBN Number: 978-93-94678-03-3.

Popular Articles

Hindi

1. Ram P, **Birendra Kumar**, Singh HB, Sushil Kumar 1998. Mentha utpadan ki unnat praudyogiki apnakar labh kamayein. *Kisan Bharti* **29**(4):5-9.
2. Ram P, **Birendra Kumar**, Singh HB, Sushil Kumar. 1998. Java citronella ki kheti karke aisey labh kamayein. *Kisan Bharti* **29**(6):5-7.
3. Ram P, **Birendra Kumar**, Singh HB, Patra NK, Sushil Kumar 1998. Ropan dwara Mentha ugayein, Vyavharik phasal na gavayein. *Kisan Bharati* **29**(8):13-15.

4. Ram P, **Birendra Kumar**, Singh HB, Sushil Kumar 1998. Aushadhiya paudhon ka janswasthya mein yogdan. In: Proceeding of the paryavaran sanksharan, pradooshan niyantran evam swasthya nayein ayam. Edited by Dr Jay Raj Bihari, held under the auspices of ITRC, Lucknow on 27-28 Feb., 1998 pp. 150-156.
5. **Birendra Kumar**, Ram P, Singh HB 1998. Vanaushadhiyan: Manav swasthya ke liye ek vardan. *Vigyan Vani* **4**:67-69.
6. Ram P, **Birendra Kumar**, Sushil Kumar 1999. Menthol mint utpadan mein kranti. *Krishi Chayanika* **20**(3):4-8 & 25.
7. Govind Ram, **Birendra Kumar**. 1999. Tulsi ka aushadhiya evam dharmik mahatva. *Sugandha* **1**:18-19.
8. Ram P, **Birendra Kumar** 1999. Japani pudhina se menthol mint bananey tak ki romanchak safar gatha. *Sugandha* **1**:54-55.
9. Mohd Yaseen, **Birendra Kumar**, Ram P, Taj-ud-ddin. 1999. Bulgarian Clary-sage ki Bharat yatra. *Sugandha* **1**:59-60.
10. **Birendra Kumar**, Ram P, Singh HB, Patra NK, Sushil Kumar 2000. Gulab sugandhit geranium, ab Uttar Bharat mein. *Kisan Bharti* **31** (4):5-6 & 18
11. **Birendra Kumar**, Ram P, Singh HB, Sushil Kumar 2000. Bhumi usar kee, phasal nagadee ki. *Purvanchal Kheti* **10**(1):5-8.
12. **Birendra Kumar**, Ram P. 2000. Jab badhatee abadee, ghatate rojgar ne kiya kamal, tab aya smaran shakti ka khyal *Sugandha* **2**: 30-31.
13. Ram Ujagir, **Birendra Kumar** 2000. Adarak ek-gun anek. *Sugandha* **2**:45-46.
14. Govind Ram, **Birendra Kumar**, Patra NK 2000. Shatpushpa (saunf): Manav sahelee ke roop mein. *Sugandha* **2**: 54-56.
15. **Birendra Kumar**, Ram P, Singh HB, Johri JK 2001. Sugandhit paudhey evam manav swasthya. *Gyan Vigyan* **12**: 15-16.
16. Ram P, **Birendra Kumar**, Patra NK, Singh JP 2001. Tarai kee oar jangli genda ke badatey kadam *Kisan Bharti* **33**(3): 37-38.
17. **Birendra Kumar**, Patra NK, Anup Kumar 2002. Kapur: Ek dharmik evam aushadhiya paudha, *Sugandha* **4**:21-22.
18. Govind Ram, **Birendra Kumar**, Ram Ujagir, Patra NK 2002. Swasthya evam saundarya-wardhak - Menhadde. *Sugandha* **4**:32.
19. Anup Kumar, **Birendra Kumar** 2002. Jaiphal-Javitree, masaley hee naheen aushadhi bhee. *Sugandha* **4**: 33-35.
20. Govind Ram, **Birendra Kumar**, Kalra A, Patra NK, Khanuja SPS 2003. Sheet kaleen mausamee phoolon ka aushadheeya mahatva. *Pushpamalika*. Published by Pushpa Pradarshani Samiti, Nagar Nigam, Lucknow. **pp.** 23-25.
21. **Birendra Kumar**, Patra NK, Bahl JR 2003. Padap evam paryavaran sanraksharn. *Pushpamalika*. Published by Pushpa Pradarshani Samiti, Nagar Nigam, Lucknow. **pp.** 46-47.

22. **Birendra Kumar**, Patra N K, Ram P. 2003. Aavshyakta jaivik kheti kee: Ek sameekshaa *Gyan Vigyan* **17**(Sept.): 38-39.
23. **Birendra Kumar**, Bahl JR, Patra NK 2005. Mahatvapoorna aushdhiya paudhey: Viluptikaran kee oar. *Pushpamalika*. Published by Pushpa Pradarshini Samiti, Nagar Nigam, Lucknow, pp:
24. Patra NK, **Birendra Kumar**, Singh AK.2005. Kissa Kosi ka. *Aus boond* **1** (1): 10-11.
25. **Birendra Kumar**, Patra NK, Lal RK. 2005. Tulsi tere naam anek. *Aus boond* **1**(1): 18-19.

26. Patra NK, **Birendra Kumar** 2004. Aushdeey evam sagandh paudho (MAPs) mai gunsootra gunta star ka adhyayan kahaa aur kaise kiyaa jay. *Sugandha* **6**: 49-52.
27. Tiwari DK, **Birendra Kumar**, Yogesh Kumar, Patra NK. 2004. Padap prajnan ke pramukh uddeshya evam sambhavnayain. *Sugandha* **6**: 53-54.
28. Ram G, **Birendra Kumar**, Kalra A, Ujagir R. 2004. Swashya evam saundarya roop mai amalataas. *Sugandha*. **6**: 43-44.
29. **Birendra Kumar** and Patra NK. 2006. Geranium kee kataee karo tab aaswan suvidha taiyar ho jab. *Aus boond* **2** (1): 32-33.
30. **Birendra Kumar**, Bahl JR and Patra NK. 2006. Aushdhiya paudhon kaa mahatva. *Pushpamalika*.
31. **Birendra Kumar**, Patra NK. 2006. Vilupt hote paudhey: Dhyan kee aavasyakata. *Aus boond* **2** (3): 40 - 42.
32. Ram G, **Birendra Kumar**, Ujagir R, Kalra A. 2006. Masaley aushdheeya bhee. *Sugandha* **7 & 8**: 27 – 28.
33. Srivastava AK, Srivastava NK, Verma AK, **Birendra Kumar**, Patra NK. 2006. Aushdheeya paudhon dwara kainser kee rokatham. *Sugandha* **7 & 8**: 17 – 18.
34. **Birendra Kumar**, Verma AK, Kalra A. 2007. Vilupt hote paudhey: Aconite Dhyan kee aavasyakata. *Aus boond* **3** (2): 39 - 40.
35. **Birendra Kumar**, Verma AK, Kalra A. 2007. Vilupt hote paudhey: Podophyllum -Dhyan kee aavasyakata. *Aus boond* **3** (3): 47- 49.
36. **Birendra Kumar**, Verma AK, Singh J. 2008. Apane liye enhen bachaayen: Jatamansi - Dhyan kee aavasyakata. *Aus boond* **4** (1): 43 – 44.
37. Singh S., Singh M, Singh AK, **Birendra Kumar**, Patra DD. 2008. Bhoomi se nunatam chherchhar: Mrida sanrakshan ke upay. *Aus boond* **4**(1): 37-41.
38. Singh SC, Singh J., Jain SP, **Birendra Kumar**.2008. Ham Paanch: Pesticidal padhey. *Aus boond* **4** (1): 33 – 35.
39. **Birendra Kumar**, Verma AK, Singh J. 2008. Apane liye enhen bachaayen: Kutki (*Picrorhiza kurrooa*)- Dhyan kee aavasyakata. *Aus boond* **4** (2): 33 – 35.
40. **Birendra Kumar**, Verma A.K., Singh J. 2008. Bhartiya Rhubarb (Revandchini) - Dhyan kee aavasyakata. *Aus boond* **4** (3): 29 – 30.
41. **Birendra Kumar**, Singh J, Singh SC. 2009. Apane liye enhen bachaayen: Mishmiteeta (*Coptis teeta*) - Dhyan kee aavasyakata. *Aus boond* **5** (1): in press.

English

42. **Birendra Kumar**, Ranjan Vinay, Anup Kumar, Sharma A 1998. Biodiversity, conservation and evolution of plants- A symposium report. *Journal of Medicinal Aromatic Plant Sciences* **20**(1):101-105.
43. Ram P, **Birendra Kumar** 1998. Scope for commercial cultivation of aromatic plants in Bastar areas. *Indian Farming* **48**(6):33-35.
44. Ram P, **Birendra Kumar**, Singh HB, Sushil Kumar 1998. Grow mints for higher profit. *Indian Farmer's Digest* **31**(12):19-20
45. Patra NK, **Birendra Kumar**, Singh AK. 2005. 'Kosi': the mint success story. *Map dew* **1** (1):10-11.
46. **Birendra Kumar**, Patra NK, Lal RK. 2005. Basils: the diversity of names. *Map dew* **1**(1): 18-19.
47. **Birendra Kumar** and Patra NK (2006). Harvest geranium when distillation is ready to go. *Map dew* **2** (1): 31-32.
48. **Birendra Kumar**, Patra NK. 2006. Endangered Plants: Needing our attention. *Map dew* **2** (3): 40 – 41.
49. **Birendra Kumar**, Verma AK, Kalra A. 2007. Endangered Plants: Aconite Needing our attention. *Map dew* **3** (2): 43 – 44.
50. **Birendra Kumar**, Verma AK, Kalra A. 2007. Save them for your sake: Podophyllum - needing attention. *Map dew* **3** (3): 49 – 51.
51. **Birendra Kumar**, Verma AK, Singh J. 2008. Save them for your sake: Jatamansi - needing attention. *Map dew* **4** (1): 43 – 44.
52. Singh S., Singh M, Singh AK, **Birendra Kumar**, Patra DD. 2008. Let us not disturb soil too much: Conservation tillage. *Map dew* **4** (1): 37 – 41.
53. Singh SC, Singh J., Jain SP, **Birendra Kumar**.2008.The famous five: Pesticidal plants. *Map dew* **4** (1): 33 – 35.
54. **Birendra Kumar**, Verma AK, Singh J. 2008. Save them for your sake: Kutki (*Picrorhiza kurrooa*) - needing attention. *Map dew* **4** (2): 33 – 35.
55. **Birendra Kumar**, Verma AK, Singh J. 2008. Save them for your sake: Indian Rhubarb (*Revandchini*) - needing attention. *Map dew* **4** (3): 29 – 30.
56. **Birendra Kumar**, Singh J, Singh SC. 2009. Save them for your sake Mishmiteeta (*Coptis teeta*) - needing attention. *Map dew* **5** (1): in press.

Technical Bulletins

1. Sushil Kumar, Ram P, Ram M, Patra NK, Singh HB, Garg SN, Dwivedi S, **Birendra Kumar**, Kahol AP 1998. Cultivation of the South American marigold (*Tagetes minuta*) in

- India for the *Tagetes* oil. CIMAP Farm Bulletin No. **007** published by Director, CIMAP, Lucknow.
2. Khanuja SPS, Kalra A, Patra NK, Singh S, Dwivedi S, Bahl JR, Sashany AK, **Birendra Kumar**, Tandon S, Agarwal K K, Naqvi A A, Tripathy AK, Bagchi G D, Singh H N, Gupta M L, Tomar V KS, Lal R K 2004. *Mentha piperita* cultivation. Farm Bulletin, Sharma A, Kumar V S, Tewari R, Kumar A, Singhal N (Eds), Published by Director, CIMAP, Lucknow, India, ISBN No.: 81 – 86943 – 49 -8.
 3. Khanuja SPS, Singh AK, Patra NK, Singh HP, **Birendra Kumar**, Tomar VKS, Kalra A, Tandon S, 2004. Sugandh gulab kee unnat krishi (in Hindi), Farm bulletin. Eds. Sharma A, Kumar VS, Singhal N. published by Director, CIMAP, Lucknow, India, ISBN No.: 81 – 86943 – 54 - 4.
 4. Khanuja SPS, Singh AK, Patra NK, **Birendra Kumar**, Singh HP, Tomar VKS, Kalra A, Tandon S, 2004. Damask rose cultivation, Farm bulletin. Eds. Sharma A, Kumar A, Tiwari R, Singh J, Kumar VS published by Director, CIMAP, Lucknow, India, ISBN No.: 81 – 86943 – 53 - 6.
 5. Khanuja SPS, Singh S, Kalra A, Gupta AK, Tandon S, Singh HN, Tiwari R, Shrivatava S, Singh HP, **Birendra Kumar**, Singh SC, 2008. Lemongrass (sagandh tel) ki unnat kheti (in Hindi), Farm bulletin published by Director, CIMAP, Lucknow, India, ISBN No. : 81-86943 – 43 - 9.
 6. Khanuja SPS, Misra HO, Kalra A, Singh HN, Tiwari R, 2008. Ashwagandha ki unnat kheti (in Hindi), Farm bulletin Hindi Translation by Shrivatava S, Singh HP, Singh SC, **Birendra Kumar**, published by Director, CIMAP, Lucknow, India, ISBN No.: 81-86943 -75 -7.
 7. Khanuja SPS, Kalra A, Patra DD, Tandon S, Singh HN, Singh AK, Singh S, Tiwari R, 2008. Menthol mint ki unnat kheti (in Hindi), Farm bulletin Hindi Translation by Shrivatava S, Singh HP, Singh SC, **Birendra Kumar**, published by Director, CIMAP, Lucknow, India, ISBN No.: 81- 86943 - 44 -7.
 8. **Birendra Kumar**, Misra HO, Shanker K, Verma SK, Singh S, Singh HN, Singh SC, Kumar S, Singh AK. 2011. Ashwagandha utpaadan praudyogiki evam praamanikaran (in Hindi), published by Director, CIMAP, Lucknow, India, pp.1-23.

Contribution as Principal Plant Breeder in the development of high yielding varieties (3 in numbers) of MAPs:

- i. An inter-specific menthofuran rich hybrid variety **CIMAP-Patra** of *Mentha piperita* (*M. arvensis* x *M piperita*),
 - ii. An inter-specific hybrid spearmint variety **CIM-Mohak** (*M. arvensis* x *M. spicata*) and
 - iii. A menthol rich, sucker producing and erect growth habit peppermint variety **CIM-Suras**
- as **Principal Plant Breeder/Principal Investigator** has been developed and released. CIM-Patra is a unique and first inter-specific hybrid variety of *M. arvensis* x *M. piperita*

in the world having high menthofuran content and licensed to AM Todd Co. Ltd. for commercial cultivation (*CSIR News Letter 2010: Vol.60 (23&24): pp. 277*).

Contribution as Active Team Member of Plant Breeder in the development of high yielding varieties (29 in numbers) of MAPs:

Menthol mint (Kosi): Half-sib progeny selection in the variety Kalka; Early maturing, oil yield (190kg/ha), oil content (0.75%), menthol content (65-75%), this variety covers more than 80% cultivated area of menthol mint,

Menthol mint (Damroo): Clonal Selection; first seed producing variety, propagated by suckers and seeds, oil yield (200kg/ha), oil content (0.6%),

Menthol mint (CIM-Unnati): Clonal Selection; early maturing, essential oil yield (190kg/ha), oil content (1.4%), menthol content (75%),

Peppermint (CIM-Indus): Clonal Selections in OPSPs; Erectoid growth habit, first peppermint chemovar having high (20-25%) menthofuran content, oil yield (72kg/ha),

Lemongrass (CIM- Suwarna): Clonal Selection; 180kg oil/ha; 0.8% oil content; 85-88% citral content; fast growing suitable for dry/marginal land,

Lemongrass (Chirharit): Clonal Selection; Frost resistant stay-green habit, Tetraploid, oil yield (261kg/ha/year), oil content (0.6%),

Java citronella (Jal Pallavi): Clonal Selection; Additional capability of growing in water logged situation, Oil yield (385kg/ha/year), oil content (0.8%),

Java citronella (CIM-Jeeva): Mutation Breeding; Semi erect; yellowish green leaves; light purple stem; plant survival 90%, Yield potential: 294 and 255 kg oil/ha/year, Oil content (%): 1.22 and 1.28 at Lucknow and Pantnagar, respectively.

Palmarosa (CIMAP-Harsh): Composite variety; 200kg oil/ha; 0.8% oil content; 85-89% geraniol.

Clarysage (CIM-Chandni): Clonal Selection in OPSPs; early maturing, white pettaled flower, flower spike yield (170q/ha), essential oil yield (19.9kg/ha) with high linalool (26.2%) and linalyl acetate (52.4%).

Clarysage (CIM-Harit): Clonal Selections in OPSPs; early maturing, pale green bracteates, flower spike yield (180q/ha), essential oil yield (20kg/ha), Linalool (20-29%), Linalyl acetate (46-50%), seeds also yielding 28-30% fatty oil rich in Omega-3 fatty acid (45.7%).

Damask rose (Ranisahiba): Clonal Selection in Half-sib progeny of Kannauj rose, Profuse flowering ability and synchronous growth habit; high oil content potential (0.06%), flower yield (40q/ha).

Sweet Basil (CIM-Sharada): Clonal Selection in Half-sib progeny; An early maturing, methyl chavicol rich and high essential oil yielding strain of basil suitable for rain-fed conditions (*Ocimum basilicum*).

Sweet Basil (CIM-Surabhi): Clonal Selection in Half-sib progeny; A linalool rich, high essential oil yielding variety of sweet basil (*Ocimum basilicum*).

Sweet Basil (CIM-Snigdha): Clonal Selection in Half-sib progeny; A methyl cinnamate rich and high essential oil yielding variety of basil (*Ocimum basilicum*).

Lemon scented Basil (CIM Jyoti): Half sib selection; 150kg oil/ha; 0.9% oil content; 68-75% citral content.

Chamomile (CIMAP-Sammohak): Mutation breeding; 7.53q dry flower/ha; 6.63kg blue oil/ha; 0.9% oil content (dry flower); 12.98% chamzulene.

Chamomile (CIM-Ujwala): Mutation Breeding; dry flower yield (7.0-7.50q/ha), oil yield (6.0-6.5kg/ha), matricaria acid methyl ester content (76-80%).

Patchouli (CIM-Utkrisht): Intensive Breeding; Dark green with light purple tinged, dry herb yield (63q/ha), oil yield on dry weight (110kg/ha), oil content (1.70%), patchouli alcohol (43%).

Vetiver (CIM-Smriddhi): Cloline Breeding; A high root yielding (35q/ha), oil yield (35kg/ha) khusilal rich (31%), Khusol (19%).

Pili Satavar (CIM-Sunahari): Half-sib family selection; dry root yield (97.5q/ha), saponin content (11.0%).

Brahmi (CIM-Jagriti): Clonal Selection; Thick green stem; small sized leaf; prostrate-semi erect; Dry herb yield: 41q/ha; Bacoside-A yield: 85kg/ha.

Vach (CIM-Balya): Clonal Selection; Erect; broad and light green leaves; Typical, cylindrical and light cream rhizomes; Dry rhizome yield: 9-11 t/ha; Oil content (%): 0.60-0.65.

Fennel (CIM-Sujal): Clonal Selection; Erect; dark green leaves; seed yield: 9.73q/ha; oil content: 2.35%; oil yield: 22.87kg/ha; anethol content (75-80%); fencione content: 8.08%.

Stevia (CIMAP-Madhu): Half sib mating followed by clonal selection; 43q dry herbs/ha; 12.57% stevioside; 5.80 rebaudioside.

Opium poppy (CIMAP-Ajay): Hybridization; 9.5q seeds/ha; 8.50q straw/ha; 1.024% morphine, 0.055% codeine and 0.21% thebane in CPS (conc. Poppy straw).

Kewanch (CIM-Nirom): Mutation Breeding; hair less and high yielding pods.

Ashwagandha (CIMAP-Chetak): Half sib selection; Nagori type; 11.77q dry roots/ha; 0.40% total withanolide; 1.223% withaferine content in leaves.

Ashwagandha (CIMAP-Pratap): Half sib selection; 34.8q dry roots/ha; 0.31% total withanolide; 0.72% withaferine content in leaves.

Ashwagandha (CIM-Pushti): Inter-specific hybridization between Nagouri and Kashmiri; Withanolide-A content (0.713mg/g dry weight basis), Aithanolide-B content (0.460mg/g dry weight basis), root yield (9.0-10.0q/ha), leaf blight tolerant with good root textural quality have been developed and released for commercial cultivation.

Indian and Foreign Patents Granted

1. Sushil Kumar, Patra NK, Singh HP, Kalra A, Singh HB, Ram P, Singh VR, Mengi N, Singh VP, Ram M, Shukla RS, Singh K, Singh A, Khanuja SPS, Shasany AK, Naqvi AA, **Birendra Kumar**, Rajput DK, Ram R, Singh JP, Kumar V, Tanveer H, Sharma SR. Kosi high menthol mint plant *Mentha arvensis* US Patent No.:**PP12,426** dated 26 February, 2002.
2. Patra NK, Sushil Kumar, Khanuja SPS, Shasany AK, Kalra A, Singh HB, Singh HP, Tanveer H, Singh VR, Mengi N, Rajput DK, Negi MS, Tyagi NK, Ram P, Singh VP, Singh A, **Birendra Kumar**, Singh JP, Kumar V, Sharma SR. Novel, high yielding stable *Mentha arvensis* plant named Damroo US Patent No. **PP12,791** dated, July 23, 2002.
3. Patra NK, Kumar S, Kalra A, Singh HB, Singh HP, Mengi N, Khanuja SPS, Shasany AK, Darokar MP, Singh VR, Tanveer H, Naqvi A, Ram P, Singh VP, Singh K, Rajput DK, **Birendra Kumar**, Kumar V, Singh JP, Ram R, Sharma SR. Jal Pallavi, water logging tolerant *Cymbopogon winterianus* US Patent No. **PP12,997** dated September 24, 2002.
4. Patra NK, Sushil Kumar, Khanuja SPS, Shasany AK, Kalra A, Singh HB, Singh HP, Tanveer H, Singh VR, Mengi N, Rajput DK, Negi MS, Tyagi NK, Ram P, Singh VP, Singh A, **Birendra Kumar**, Singh JP, Kumar V, Sharma SR. High yielding stable plant of *Rosa damascena* called 'Ranisahiba' US Patent No. **PP13,203** dated Nov. 12, 2002.
5. Patra NK, Sushil Kumar, Khanuja SPS, Shasany AK, Kalra, A Singh HB, Singh HP, Tanveer H, Singh VR, Mengi N, Rajput DK, Negi MS, Tyagi NK, Ram P, Singh VP, Singh A, **Birendra Kumar**, Singh JP, Kumar V, Sharma SR. High yielding and stable plant of *Cymbopogon flexuosus* called 'Chirharit' US Patent No. **PP13,336** dated Dec. 10, 2002.
6. Khanuja SPS, Patra NK, Shasany AK, **Birendra Kumar**, Gupta Soni, Gupta MK, Upadhyay RK, Priya TP, Singh AK, Darokar MP, Singh AK, Tomar VKS, Bahl JR, Lal RK, Naqvi AA. A mint plant named 'CIM-Indus', a menthofuran rich peppermint (*Mentha piperita*) variety US Patent No. **PP16,474** dated April 4, 2006.

Sponsored Project Handled as a Principal Investigator/Co-PI/Active Member

1. Asheesh Concentrates International LLP, Mumbai industry sponsored project entitled "Identification and selection of THC and CBD, cannabinoid terpene and THCa rich strain/line/genotype of *Cannabis* spp.". (GAP-430; Project duration: 3 years; Project cost: **138.115** lakhs). Position: **Principal Investigator**.
2. NMPB sponsored project entitled "*Ex-situ* conservation and QPM production of medicinal and medicinally important aromatic plants (M & MIAPS) in ganga grams of Pryagraj, U.P. (GAP-506; Project duration: 3 years; Project cost: **31.25** lakhs). Position: **Principal Investigator**.
3. NMPB sponsored project entitled "Inventorization of medicinal and medicinally important aromatic plants (M & MIAPs) and its conservation in selected four Ganga Grams of Kanpur Nagar district of Uttar Pradesh". (GAP-368; Project duration: 3 years; Project cost: **23.628** lakhs). Position: **Principal Investigator**.

4. NMPB sponsored project entitled “Conservation and genetic improvement of Prishnparni (*Uraria picta*)-a critically endangered Dashmool drug”. (GAP-356; Project duration: 3 years; Project cost: **27.954** lakhs). Position: **Principal Investigator**.
5. NMPB sponsored project entitled “Identification of *Swertia chirayita* genotype (s)/strain (s) performing well under lower Himalayan altitude of Uttarakhand”. (GAP-340; Project duration: 3 years; Project cost: **27.45** lakhs). Position: **Principal Investigator**.
6. UPCST sponsored project entitled “Seed storage impact on longevity in Palmarosa (*Cymbopogon martinii*) seed”. (GAP-288; Project duration: 2 years; Project cost: **5.44** lakhs). Position: **Principal Investigator**.
7. UPSBB sponsored project entitled “Inventorization of aromatic plant species, their status and assessment of area under cultivation of essential oil bearing crops in five districts of upper Gangetic plains”. (GAP-275; Project duration: 2 years; Project cost: **12.95** lakhs). Position: **Principal Investigator**.
8. UPCST sponsored project entitled “Optimization of seed rate for commercial cultivation of seed propagated Palmarosa (*Cymbopogon martinii*) crops”. (GAP-200; Project duration: 2 years; Project Cost: **4.08** lakhs). **Position: Principal Investigator**
9. NMPB sponsored project entitled “Morpho-anatomical and quality attributes characterization in *Sida cordifolia* L. for high root biomass yielding genotypes”. (GAP-507; Project duration: 3 years; Project Cost: **33.94** lakhs). **Position: Co-Principal Investigator**.
10. NMPB sponsored project entitled “Dissemination of Vetiver (*Chrysopogon zizanioides*) agro-technologies in flood prone and contaminated area of Ganga River of Uttar Pradesh”. (GAP-369; Project duration: 3 years; Project Cost: 55.506 lakhs). **Position: Co-Principal Investigator**.
11. NMPB sponsored project entitled “Assessment of hazardous metals (As, Cd and Pb) translocation and accumulation in Kalmegh (*Andrographis paniculata*): Implication of genotype selection for minimal risk to human health”. (GAP-390; Project duration: 3 years; Project Cost: 38.206 lakhs). **Position: Co-Principal Investigator**.
12. DBT sponsored project entitled “Molecular, epidemiological and diversity analysis of Begomovirus(es) of Mentha towards development of diagnostics for better management”. (GAP- 233; Project duration: 3 years; Project cost: **28.30** lakhs). Position: **Co-Principal Investigator**.
13. NMPB Sponsored “Quality planting material production to six important medicinal plants”. (GAP-123; Project duration: 3 years; Project cost: **20.00** lakhs). **Position: Co-Principal Investigator**.
14. Ministry of Finance, Revenue Department sponsored project entitled “Improvement of latex-less and low alkaloid variety of *Papaver somniferum* L. towards development of phenotypically distinct variety for commercial exploitation as nutritive seed crop”. (GAP-421; Project duration: 5 years; Project cost: **238.0** lakhs). Position: **Active Member**.

15. DBT Sponsored project entitled “Field demonstration of improved agrotechnology of rose (*Rosa damascena*) and pyrethrum (*Chrysanthemum cinerariifolium*) in Uttaranchal”. (GAP-55; Project duration: 3 years; Project cost: **12.00** lakhs). **Position: Active Member**
16. DBT sponsored project entitled “Organization of training-cum-demonstration programme for popularization of improved varieties of menthol mint developed by CIMAP among the SC/ST communities of lucknow district”. (GAP-35; Project duration: 2 years; Project Cost: **22.00** lakhs). **Position: Active Member.**

Number of paper presented in seminar/symposia: 10

Number of poster presented in seminar/symposia: 36

Number of abstracts published in seminar/symposia: 65

Number of M.Sc./M.Tech. Dissertations guided: 20

Number of PhDs supervised: 06 (Continuing), 01(continuing) as Co-supervision

(Birendra Kumar)