

## ICAR-AINP ON SAP MAIN CENTRE, HIMACHAL PRADESH

### Research papers

1. Chandel RS, Chander R and Gupta PR. 1995. Host preference of defoliating beetle, *Brahmina coriacea* (Hope) (Coleoptera: Scarabaeidae). *Pest Management and Economic Zoology* 3(2): 111-114.
2. Chandel RS, Chander R and Gupta PR. 1995. Non edible oils as feeding deterrent to apple defoliating beetle (*Brahmina coriacea*). *Indian Journal of Agricultural Sciences* 65 (10): 778-779.
3. Chandel RS, Gupta PR and Chander R. 1995. Behaviour and biology of the defoliating beetle, *Brahmina coriacea* (Hope) (Coleoptera: Scarabaeidae) in Himachal Pradesh. *Journal of Soil Biology and Ecology* 15(1): 82-89.
4. Chandel RS, Kashyap NP and Chandel YS. 1996. White grubs survey on potato in Lahaul Valley of Himachal Pradesh. *Journal of Indian Potato Association* 23 (3&4): 168-169.
5. Chandel RS, Chander R and Verma TD. 1996. Evaluation of insecticidal properties of some oil cakes against *Brahmina coriacea* (Hope) white grubs. *Crop Research* 11(3): 391-393.
6. Sharma JK, Kashyap NP and Chandel RS. 1996. Diversity and density of defoliating beetles in Kullu valley of Himachal Pradesh. *Pest Management and Economic Zoology*, 4 (1-2): 25-29.
7. Chandel RS, Gupta PR and Thakur JR. 1997. Host preference and seasonal abundance of defoliating beetles infesting fruit trees in mid hills of Himachal Pradesh. *Journal of Soil Biology and Ecology* 17(2): 140-146.
8. Bhagat RM and Sharma P. 2000. Status of *Agrotis ipsilon* (Hufnagel) in Kangra valley of Himachal Prdaesh. *Insect Environment* 5(4): 166-167.
9. Chandel RS. 2000. Natural enemies of *Brahmina coriacea* (Hope) in Himachal Pradesh. *Insect Environment*, 6(2): 85.

10. Sharma PK and Bhagat RM. 2000. Comparative efficacy of various insecticides used as seed and soil treatments against cutworm *Agrotis ipsilon* (Hufnagel) infesting maize. *Journal of Entomological Research* 24(2): 51-53.
11. Chandel RS, Chandla VK and Sharma A. 2003. Population dynamics of potato white grubs in Shimla hills. *Journal of Indian Potato Association* 30 (1-2): 151-152.
12. Chandel RS, Chandla VK and Dhiman KR. 2005. Vulnerability of potato white grub to entomogenous fungi and nematodes. *Potato Journal* 32 (3-4): 193-194.
13. Chandel RS, Dhiman KR, Chandla VK and Kumar V. 2005. Vulnerability of potato white grubs to entomogenous fungi and nematodes. *Potato Journal* 32(3&4): 193-194.
14. Chandel YS and Mehta PK. 2005. Efficacy of some insecticides and entomopathogenic fungi against white grub complex infesting potato in Himachal Prdaesh. *Indian Journal of Ecology* 32(2): 194-199
15. Chandel YS, Kaur M and Mehta PK. 2005. Density of major micro arthropods inhabiting crop soil and their seasonal fluctuations in Himachal Pradesh. *Himachal Journal of Agricultural Research* 31(2): 72-78.
16. Chandla VK and Chandel RS. 2007. Integrated management of soil pests of potato in higher hills of Himachal Prdaesh. *National Academy Science Letters* 30 (7&8): 221-222
17. Chandel RS, Dhiman KR, Chandla VK and Desh Raj. 2008. Insect-pests of potato-I: Root and tuber eating pests. *Pestology* 32(2): 39-46.
18. Sood P, Mehta PK, Chandel RS and Chandel YS. 2009. Population dynamics of white grubs in the off season pea ecosystem and their management under temperate region of north-western Himalaya. *Journal of Insect Science* 22(4): 370-376.
19. Sood P, Chandel RS, Mehta PK and Chaoudhary A. 2010. Soil arthropods infesting kidney bean, *Phaseolus vulgaris* Linn. And their management under high altitude of north-western Himalaya. *Journal of Food Legumes* 23(1): 66-70.
20. Mehta PK, Chandel RS and Mathur YS. 2010. Status of white grubs in north-western Himalaya. *Journal of Insect Science* 23(1):1-14.
21. Sreedevi K, Chandel RS, Pathania M and Stanely J. 2014. Species distribution and larval diagnostic charactres of white grub species, *Holotrichia longipennis* (Blanchard), *H. sikkimensis* ( Brenske) and *H. rosettae* Frey. *Current Biotica* 8 (2):151-156.

22. Chandel RS, Kalia M, Soni S, Mehta PK. 2015. Occurrence of entomopathogenic fungus *Beauveria bassiana* (Bals.) against potato white grubs in Himachal Pradesh. *Himachal Journal of Agricultural Research* 41(2): 151-155.
23. Pathania M, Chandel RS, Verma KS and Mehta PK. 2015. Diversity and population dynamics of phytophagous scarabaeid beetles (Coleoptera: Scarabaeidae) in different landscapes of Himachal Pradesh, India. *Arthropods* 4 (2): 46-68.
24. Pathania M, Chandel RS, Verma KS and Mehta PK. 2015. Studies on the preliminary ecology of invasive phytophagous Indian Scarabaeidae of north western Himalaya. *Science, Technology and Arts Research Journal* 4(2):127-138.
25. Chandel RS, Pathania M, Verma KS, Bhattacharyya B, Vashisth S and Kumar V. 2015. The ecology and control of potato white grubs of India. *Potato Research* 58:147-164.
26. Kalia, M, Chandel RS, Soni S, Mehta PK. 2016. Production and application of *Beauveria bassiana* (Bals.) against potato white grubs, *Brahmina coriacea* (Hope) in Himachal Pradesh. *Biopesticides International* 12(1): 19-24.
27. Pathania M and Chandel RS. 2017. Life history strategy and behaviour of white grub, *Brahmina coriacea* (Hope) (Coleoptera: Scarabaeidae: Melolonthinae) an invasive pest of potato and apple agro-ecosystem in north western India. *Oriental Insects* 51(1): 46-69.
28. Pathania M, Chandel RS, Verma KS and Mehta, PK. 2017. Seasonal life cycle of *Holotrichia longipennis* (Blanchard) (Coleoptera: Scarabaeidae: Melolonthinae): a serious foliage and root feeding pest in India. *Phytoparasitica* 44: 615-629.
29. Soni S, Mehta PK, Chandel RS and Kalia Monika 2017. Mass production and field evaluation of *Beauveria brongniartii* (Saccardo) against *Brahmina coriacea* (Hope) white grubs in potato. *Potato Journal*: 44 (1): 45-51
30. Soni S, Mehta PK and Chandel RS. 2018. Susceptibility of white grub, *Brahmina coriacea* (Hope) infesting potato to local strains of *Beauveria brongniartii* (Saccardo) in Himachal Pradesh. *Journal of Biological Control* 32(1): 41-47.
31. Vashisth S, Chandel YS and Chandel RS. 2018. Biological control potential of north-west Himalayan strains of Heterorhabditid nematodes against the turnip moth, *Agrotis segetum* (Denis & Chiffermuller) (Lepidoptera: Noctuidae). *Egyptian Journal of biological Pest Control* 28: 37 <https://doi.org/10.1186/s41938-018-0040-5>

32. Chandel RS, Rana A, Sanjta S and Mehta PK. 2018. Potential of entomopathogens in managing potato white grubs in Himachal Pradesh. *Indian Journal of Ecology* 45 (1): 210-213
33. Joshi MJ, Verma KS and Chandel RS. 2019. Feeding inhibition with bioformulations in cutworms *Agrotis ipsilon* (Hufnagel). *Indian Journal of Entomology* 82(1): 134-138.
34. Chandel RS, Kumar Rahul, Verma KS and Baloda AS. 2019. Biology of greasy cutworm, *Agrotis segetum* Schiff. (Lepidoptera: Noctuidae) on potato in Himachal Pradesh. *Potato Journal* 46 (2): 101-106
35. Chandel RS, Soni S, Vashisth S, Pathania M, Mehta PK, Rana A, Bhatnagar A and Agrawal VK. 2019. The potential of entomopathogens in biological control of white grubs. *International Journal of Pest Management* 65(4) 348-362.
36. Koranga R, Chandel RS and Mehta Vasu. 2020. Laboratory bioassay of soil insecticides against grubs of *Brahmina coriacea* (Hope) (Scarabaeidae: Coleoptera) in Himachal Pradesh. *Pesticide Research Journal* 32(2): 340-345.
37. Sanjta S, Mehta PK and Chandel RS. 2020. Interaction effects of entomopathogenic nematodes and insecticides for the management of grubs of *Holotrichia longipennis* and *Brahmina coriacea*. *Journal of Environmental Biology* 41: 637-643.
38. Rana A, Chandel RS and Verma KS. 2020. Efficacy of insecticides as seed treatment for the management of white grubs. *Himachal Journal of Agricultural Research* 46 (2): 169-172
39. Joshi MJ, Rana A, Raj P, Kaushal S, Inamdar AG, Verma KS and Chandel RS. 2020. The potency of chemical insecticides in management of cutworm, *Agrotis ipsilon* Hufnagel (Noctuidae: Lepidoptera): A review. *Journal of Entomology and Zoology Studies* 8(3): 307-311.
40. Rimpay and Verma K S. 2020. Toxicity of some insecticides against *Agrotis* spp. infesting cabbage. *Indian Journal of Entomology* 82(1): 139-142.
41. Chandel RS, Vshisth S, Soni S, Kumar and Kumar V. 2020. The Potato tuber moth, *Phthorimaea operculella* Zeller in India: Biology, ecology and control. *Potato Research* 63: 15-39.
42. Chandel RS, Verma KS, Baloda1 AS and Sreedevi K. 2021. White grubs in India. *Indian Journal of Entomology* 83 (1): 109-113.

43. Chandel RS, Verma KS, Rana A, Sanjta S, Badiyala A, Vashisth S, Kumar R and Baloda A. 2021. Biology and management of cutworms in India. *Oriental Insects* 56 (2): 245-270.
44. Rana A, Chandel RS, Sharma KD, Chandel SS and Verma KS. 2021. Phylogenetic analysis of *Melolontha* and *Polyphylla* beetles (Scarabaeidae: Coleoptera) from north-western Himalaya, India. *Phytoparasitica* 50: 71–82.
45. Rana A, Chandel RS, Verma KS and Joshi MJ. 2021. Termites in important crops and their management. *Indian Journal of Entomology* DoI No.: 10.5958/0974-8172.2021.00001.8
46. Chandel Y, Chandel RS, Verma KS and Rana A. 2021. New records of Scarabaeid beetles from Himachal Pradesh. *National Academy Science Letters* 45(1): 31-34
47. Joshi MJ, Verma KS, Chandel RS, Inamdar AG, Kaushal S and Rana A. 2021. Efficacy of bioformulations against cutworm *Agrotis ipsilon* Hufnagel in potato. *Indian Journal of Entomology* 83(3): 454-458
48. Koranga R, Chandel RS and Mehta Vasu. 2021. Effect of insecticides on oviposition of *Brahmina coriacea* (Hope). *Indian Journal of Entomology* 84(4): 816-818.
49. Koranga R, Chandel RS and Mehta Vasu. 2021. Laboratory evaluation of some insecticides against adults of *Brahmina coriacea* (Hope). *Indian Journal of Entomology* 10.5958/0974-8172.2021.00084.5
50. Verma KS, Joshi M and Chandel RS, 2021. Threshold temperature and cumulative energy requirement for the development of cutworm, *Agrotis ipsilon* Hufnagel. *Journal of Agrometereology* 23 (2): 260-263.
51. Rana A, Chandel RS and Verma KS. 2021. Morphological description and identification of *Melolontha cuprescens*, *Melolontha furcicauda* and *Melolontha indica* (Coleoptera: Scarabaeidae): serious root feeding and defoliating pests in India. *Phytoparasitica* 50(2): 281-305
52. Chandel RS, Sumit Vashisth and Verma KS. 2022. White grubs in potato and their control. *Indian Horticulture* 67: 40-43
53. Joshi MJ, Verma KS and Chandel RS. 2022. Potency of indigenous natural products against *Agrotis ipsilon* Hufnagel (Lepidoptera: Noctuidae). *International Journal of Tropical Insect Science* (Accepted)

54. Rana A, Chandel RS and Verma KS. 2022. Relative toxicity of soil insecticides against *Polyphylla* grubs (Scarabaeidae: Coleoptera). *Pesticide Research Journal* 34(1): 31-34
55. Shiwani, Verma KS and Chandel RS. 2022. Feeding inhibition of natural products against *Agrotis segetum* (Denis & Schiffermuller). *Himachal Journal of Agricultural Research* 48(1): 135-138.
56. Rana A, Chandel RS and Verma KS. 2022. Biology and morphological description of *Polyphylla sikkimensis* (Scarabaeidae: Coleoptera): a serious root feeding pest. *Biologia* 1-16.
57. Rana A, Chandel YS and Chandel, RS. 2022. Effect of soil sterilants on nematodes, microarthropods and soil mycoflora in tomato under protected conditions. *Pesticide Research Journal* 34(2): 122-129.
58. Chandel RS, Kalpana HS, Verma KS Rana A, Baloda AS. 2023. Biology of *Holotrichia longipennis* and *Holotrichia sikkimensis* (Coleoptera: Scarabaeide) in north-western Himalaya, India and morphological description of their immature stages. *Biologia* (Accepted)
59. Thakur A, Chandel RS, Karthik R, Guleria N. 2023. Biodiversity and identification of potato white grubs in high hills of Himachal Pradesh. *Potato Journal* (Accepted)

### Popular articles

1. Chandel RS and Kashyap NP. 1997. About white grubs and their management. *Farmer & Parliament* XXXVII (10): 29-30.
2. Chandel RS. 2007. Potato pests and their management. In: *A Manual on Potato Production*. Eds. N.P. Singh; M. Sankaran and Jai Prakash. ICAR Research Complex for NEH Region, Tripura: 47-58.
3. Mehta PK, Patial A and Chandel RS. 2007. *Safed Gidar Ki Samasya Evam Samadhan*. *Parvatiya Khetibari* 27 (3): 18-20.
4. Chandel RS, Dhiman KR, Chandla VK, Kumar V. 2007. Integrated pest management in potato. In: *Entomology: Novel Approaches in Entomology*. Eds. PC Jain and MC Bhargava. New India Publishing Agency, New Delhi: 377-398.
5. Chandel RS, Verma KS, Pathania M and Sharma PC. 2011. *Himachal Pradesh me Aloo ke Pramukh keet tatha unka ekikrit niyantran*. *Parvateeya Khetibaadi* 32(1): 15-17.

6. Chandel RS and Pathania M. 2011. Diagnostic symptoms and assessment of losses due to insect-pests in potato. In: *Advances in diagnosis of arthropod damage and assessment of losses*. (Eds: Saini, R.K; Mrig, K.K. and Sharma, S.S.). Department of Entomology, HAU, Hissar: 145-148.
7. Chandel RS, Verma KS, Pathania M and Sharma PC. 2012. *Himachal Pradesh Mein Aloo Ke Pramukh Keet Tatha Unka Ekeekrit Niyanttran*. *Parvatiya Khetibari* 32(1): 15-17.
8. Chandel RS, Chandla VK, Verma KS and Pathania M. 2013. Insect pests of potato in India: Biology and Management. In: Giordanengo P, Vincent C and Alyokhin A (ed.) *Insect Pests of Potato: Global Perspectives on Biology and Management*, Academic Press Elsevier Inc. pp 227-270.
9. Chandel RS, Rana A, Mehta PK and Vashisth S. 2018. *Kaise karein Himachal Pradesh mein Kurmula Keet se phaslon ka bachav?* *Parvatiya Khetibari* 38 (1-2): 7-9.
10. Chandel RS, Rana A, Verma KS, Sanjta S and Baloda AS. 2020. *Katua keet ka akikrit prabandhan*. *Parvatiya Khetibari* 40(3): 5-6

### **Book chapters**

1. Chandel RS, Mehta PK and Kumar S. 2009. White Grubs: Polyphagous pests of national importance. Pp45-58. In: Proceedings of Symposium on Forest Insect pests and Disease management in Himalaya, January 10-11, 2008. HFRI Shimla.

### **Bulletins**

2. Misra SS and Chandel RS. 2003. Potato white grubs in India. Technical Bulletin No. 60. Central Potato Research Institute, Shimla: 47p.
3. Mehta PK, Chandel RS and Mathur YS. 2008. Phytophagous white grubs of Himachal Pradesh. Technical Bulletin, CSKHPKV Palampur, p13.
4. Chandel RS, Mehta PK, Sanjta S, Sharma M, Rana A and Agrawal VK. 2017. *Himachal Pradesh Mein Kurmula Keet ka Samekit Parbandhan*. Technical Bulletin, Department of Entomology, CSK HPKV Palampur: 6p.
5. Sreedevi K, Agrawal VK, Chandel RS and Baloda AS. 2017. Diversity and distribution of white grubs (Coleoptera: Scarabaeidae) in India. Technical Bulletin, All India Network Project on Soil Arthropod Pests, Rajasthan Agricultural Research Institute, Jaipur: 32p.
6. Chandel RS, Verma KS, Sanjta S, Rana A and Baloda AS. 2018. *Kaise Karen faslon ka kurmula keet se bachav*. Departemnt of Entomology, CSK HPKV, Palampur, 4p

7. Verma KS, Chandel RS, Sanjta S, Rana A, Mehta PK and Baloda AS. 2018. *Himachal Pradesh mein Katua keet ki samasya evum samadhan*. Extension Bulletin, Department of Entomology, CSK HPKV, Palampur 6p.
8. Chandel RS, Verma KS, Baloda AS, Sanjta S and Rana A. 2019. The ecology and management of termites in India. Technical Bulletin, Department of Entomology, CSK HPKV, Palampur 14p.
9. Chandel RS, Verma KS, Sanjta S, Rana A, Thakur H and Baloda AS. 2021. Bioecology, distribution and management of cutworms in India. Technical Bulletin, Department of Entomology, CSKHPKV Palampur, 40p.

### **Books/ Souvenir**

1. Agarwal VK, Chandel RS, Bhatnagar A and Verma KS. 2015. *Souvenir. 18<sup>th</sup> Group Meeting of AINP on Soil Arthropod Pests*. AINP on Soil Arthropod Pests, Durgapura, Jaipur.
2. Chandel RS, Mehta PK, Sharma PC and Pathania M. 2016. *Insect Pests of Vegetable Crops*. Kalyani Publishers, New Delhi: 424p.
3. Chandel RS and Vashisth S. 2021. *Pests of fruit and plantation crops*. Kalyani Publishers, Ludhiana. 250p.

### **Awards/Honours/Recognitions**

1. Bir Singh Aasi Memorial All India Best Publication Award for the publication entitled ‘The ecology and control of potato white grubs of India’ by RS Chandel, Mandeep Pathania, KS Verma, Badal Bhattacharya, Sumit Vashisth and Vinod Kumar in *Potato Research* 58:147-164, by the Society for Advancement of Human and Nature (SADHNA) Dr YS Parmar, UHF Nauni, Solan HP, dated 28<sup>th</sup> February, 2016.
2. Best Poster award for the poster entitled ‘Susceptibility of white grub, *Brahmina coriacea* (Hope) infesting potato to local strains of *Beauveria brongniartii* (Saccardo) in Himachal Pradesh’ authored by Saurbh Soni, PK Mehta and RS Chandel in Fifth National Conference on Biological Control: Integrating Recent Advances in Pest and Disease Management held at NBAIR Bengaluru w.e.f. 9 - 11 February, 2017.
3. First prize for poster presentation for paper entitled “Residues of fipronil 0.3 per cent used against termites, *Odontotermes obesus* and *Microtermes obesi*” authored by KS Verma, PC Sharma, RS Chandel and Manishkumar Joshi during National Workshop on “Pesticide Residue: Management and Techniques for Food Safety and Security”, held at Navsari Agricultural University, Navasari, Gujarat w.e.f. 25-26<sup>th</sup> February, 2019.
4. Best Poster Award (third) for the paper entitled ‘Comparative susceptibility of *Brahmina coriacea* (Hope) grubs to local isolates of *Beauveria brongniartii* (Saccardo) Petch in Himachal Pradesh’ authored by RS Chandel, Monika Kalia, PK Mehta and Suman Sanjta in *Global Potato Conclave 2020: Roadmap for a better world*, held at Gandhinagar, Gujarat w.e.f. 28-31 January, 2020.

5. Best Poster Presentation Award for research paper entitled 'Potentiation of entomopathogens with sub lethal doses of insecticides' by Suman Sanjta, PK Mehta, RS Chandel and KS Verma in 6<sup>th</sup> National conference in Biological Control: Innovative approaches for green India held at Bengaluru w.e.f. 3-5 March, 2021 (online).

### **M.Sc. Thesis on soil arthropod pests**

1. Viji CP. 1998. Biology of cutworm (*Agrotis ipsilon*) of maize and its control with some new products. M.Sc. Thesis, Department of Entomology, CSKHPKV Palampur.
2. Patial Anjana. 2001. Management of white grubs in maize. M.Sc. Thesis, Department of Entomology, CSKHPKV Palampur.
3. Kumar P. 2006. Evaluation of insecticides against cutworms *Agrotis segetum* Denis and Schiff. M.Sc. Thesis, Department of Entomology, CSKHPKV Palampur.
4. Kapoor Shilpa. 2007. Biocontrol of cutworm (*Agrotis segetum* Denis and Schiff) through entomopathogenic nematodes. M.Sc. Thesis, Department of Entomology, CSKHPKV Palampur.
5. Pathania Vishal. 2011. Distribution and biology of cutworms infesting potato in Himachal Pradesh. M.Sc. Thesis, Department of Entomology, CSKHPKV Palampur.
6. Sharma Nikhil. 2012. Bioefficacy of new insecticides and baits against cutworm *Agrotis segetum* (Denis and Schiffermuller). M.Sc. Thesis, Department of Entomology, CSKHPKV Palampur.
7. Gupta Surabhi. 2012. Distribution and abundance of *Brahmina coriacea* (Hope) in Himachal Pradesh. M.Sc. Thesis, Department of Entomology, CSKHPKV Palampur.
8. Yadav Anu. 2015. Biology of *Anomala lineatopennis* Blanchard and evaluation of insecticides. M.Sc. Thesis, Department of Entomology, CSKHPKV Palampur.
9. Kalpana HS. 2015. Bioecology of *Holotrichia longipennis* Blanchard and *Holotrichia sikkimensis* Brenke in Himachal Pradesh. M.Sc. Thesis, Department of Entomology, CSKHPKV Palampur.
10. Soni Saurbh. 2015. Evaluation of local isolates of *Beauveria brongniartii* (Saccardo) against *Brahmina coriacea* in potato. M.Sc. Thesis, Department of Entomology, CSKHPKV Palampur.
11. Rimpay. 2016. Evaluation of novel insecticides against cutworms infesting cabbage in Himachal Pradesh. M.Sc. Thesis, Department of Entomology, CSKHPKV Palampur.
12. Kumar Balvir. 2018. Studies on white grub fauna of Chuhar valley of Himachal Pradesh. M.Sc. Thesis, Department of Entomology, CSKHPKV Palampur.
13. Koranga Radha. 2018. Evaluation of some insecticides for the control of *Brahmina coriacea* (Hope) in Himachal Pradesh. M.Sc. Thesis, Department of Entomology, CSKHPKV Palampur.

14. Ahad Abdul. 2019. Population build-up and management of paddy black beetle, *Heteronychus loideres* Redt. M.Sc. Thesis, Department of Entomology, CSKHPKV Palampur.
15. Singh Kawartej. 2019. Management of cutworms, *Agrotis* spp. in maize. M.Sc. Thesis, Department of Entomology, CSKHPKV Palampur.
16. Joshi MK. 2019. Efficacy of bioformulations against cutworms, *Agrotis* spp. (Lepidoptera Noctuidae). M.Sc. Thesis, Department of Entomology, CSKHPKV Palampur.
17. Gupta RK. 2019. Bioecology and management of *Maladera insanabilis* (Brenske) in Himachal Pradesh. M.Sc. Thesis, Department of Entomology, CSKHPKV Palampur.
18. Chandel Yamini. 2021. Studies on phytophagous white grubs of Mandi district of Himachal Pradesh. M.Sc. Thesis, Department of Entomology, CSKHPKV Palampur.
19. Sharma Shiwani. 2021. Effect of natural products on the growth and development of *Agrotis segetum* (Denis & Schiffermuller). M.Sc. Thesis, Department of Entomology, CSKHPKV Palampur.

#### **Ph.D Thesis on soil arthropod pests**

1. Kalia Monika. 2013. Characterization and evaluation of entomopathogenic fungi associated with white grubs in Himachal Pradesh. Ph.D Thesis, Department of Entomology, CSKHPKV Palampur.
2. Pathania M. 2014. Studies on phytophagous white grubs of Himachal Pradesh. Ph.D Thesis, Department of Entomology, CSKHPKV Palampur.
3. Kumar Swaroop. 2016. Bioecology of white grubs in relation to physico-chemical properties of soil. PhD Thesis, Department of Entomology, CSKHPKV Palampur.
4. Sanjta Suman. 2018. Potential of entomopathogens in integrated control of white grubs in Himachal Pradesh. PhD Thesis, Department of Entomology, CSKHPKV Palampur.
5. Rana Abhishek. 2021. Bioecology and management of *Melolontha* spp. (Scarabaeidae: Coleoptera) in Himachal Pradesh. PhD Thesis, Department of Entomology, CSKHPKV Palampur.

#### **Collaborations and Training**

- Dr. Jan Sobotnik, Associate Professor, Czech University of Life Sciences, Prague, Czech Republic, visited CSKHPKV Palampur for a period of 10 days w.e.f. 16<sup>th</sup> September, 2021 to 26<sup>th</sup> September, 2021. Dr. Jan along with the lab members did sampling of the termites and termite associated arthropods at Dhaulakuan, Palampur, Bajaura and Manali. A guest lecture was also organized for the students of CSKHPKV Palampur on “Ecology of termites” on 22<sup>nd</sup> September 2021. White grub laboratory of Department of Entomology along with Dr Jan Sobotnik is working on the chemo-ecology of some termite species of north western Himalaya.
- Mr. Himanshu Thakur, Ph.D student from Department of Entomology, CSKHPKV Palampur visited Keladi Shivappa Nayaka University of Agricultural and Horticultural

Sciences, Shivamogga w.e.f. 28-02-2022 to 12-03-2022, to learn, taxonomy of termites from Dr CM Kalleshwaraswamy, Associate Professor, Department of Entomology, Keladi Shivappa Nayaka University of Agricultural and Horticultural Sciences, Shivamogga.

- Dr Singaravelu from ICAR-SBI Coimbatore visited the Department of Entomology and conducted laboratory experiments for testing the efficacy of *Bt* formulations against grubs of *B. coriacea* and *H. longipennis* during September, 2022.
- Mr. Himanshu Thakur, Ph. D. scholar attended research training on “DNA sequencing techniques in termites” at Okinawa Institute of Science and Technology, Okinawa, Japan in December 2022.
- Taxonomy and species diversity work on termitophiles was carried out in the Department of Entomology, CSKHPKV, Palampur in collaboration with Dr. Taisuke Kanao Asstt. Prof. Yamagata University, Japan during November 2022.