

Curriculum Vitae

Dr. Shashwat Singh

M.Sc., NET, Ph.D.

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Institute of Plant Protection
Department of Entomology
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Date of birth: 02.08.1990

Nationality: Indian

Research Expertise

Insect Ecology; Insect Behaviour; Behavioural Ecology & Evolution;
Reproductive Biology; Biocontrol

Research Interests

Population dynamics; Response of Predators to biotic and abiotic factors
Tri-trophic interactions; Sexual conflict; Reproductive and mating
strategies of organisms Maternal provisioning/strategies/effect; Biocontrol

Brief account of research done during

My doctoral work, entitled, "Dynamics of Oviposition in Aphidophagous ladybird beetles" was focused on reproductive strategies with special emphasis on oviposition. During the tenure I came to know that ladybirds are able to perceive prey and mate at a distance and modulate their reproductive behaviour accordingly. Among the abiotic factors, the constant

and fluctuating temperature significantly affect the reproductive and developmental attributes. Ladybird mother was also found to govern offspring phenotype according to her body size and age to maintain balance with the ephemeral aphid colony. Being a polyandrous species, the differential utilization of sperm was also seen and it is a function of mating interval and order. Cannibalism or egg consumption also play significant role in life history of ladybirds with some cost and benefits. Currently I am engaged in the biocontrol of insect pests of citrus crop in the agricultural field of Israel.

Professional appointments

- Aug 2019 - till date **Postdoctoral Research Fellow** at Institute of Plant Protection, Department of Entomology, Agricultural Research Organization, the Volcani Center, Rishon Lezion, Israel (with Dr. Roy Kaspi).
- Nov 2017- Mar 2018 **Senior Research Fellow** at Ladybird Research Laboratory, Department of Zoology, University of Lucknow, Lucknow, India (with Prof. Dr. Omkar).
- Nov 2014- Nov 2016 **Junior Research Fellow** at Ladybird Research Laboratory, Department of Zoology, University of Lucknow, Lucknow, India (with Prof. Dr. Omkar).
- Sep 2013 - Sep 2014 **Project Fellow** at Ladybird Research Laboratory, Department of Zoology, University of Lucknow, Lucknow, India (PI: Prof. Dr. Omkar).

Education

- Aug 2019 – till date** **Postdoc**, Agricultural Research Organization, the Volcani Center, Israel. Title: Investigation of insecticides' compatibility with natural enemies (the endoparasitoid *Anagyrus vladimiri*, and the predatory beetle *Rodolia cardinalis*) Mentor: Dr. Roy Kaspi
- Sep 2012 – Jul 2018** **Ph.D.** University of Lucknow, India. Thesis title: Dynamics of oviposition in aphidophagous ladybird beetles. Advisor: Prof. Dr. Omkar (FNASc).
- 2012** **M.Sc.** from University of Lucknow, Lucknow, India.

2010 – 2012	Masters in Zoology University of Lucknow, Lucknow, India (71.41%).
2010	B.Sc. from University of Lucknow, Lucknow, India.
2007 – 2010	Bachelor in Biology University of Lucknow, Lucknow, India. Subjects: Zoology, Botany Chemistry (66.83%).
2007	Secondary High School SGRR Public School, Hardoi, India. Subjects: Physics, Chemistry, Biology, English, Hindi (82.00%).
2005	High School MVM, Hardoi, India. Subjects: Hindi, English, Science, Social Science, Mathematics (76.20%).

Research articles

1. **Singh S, Mishra G, Omkar (2021)** Mating status of coexisting conspecific individuals modulate reproduction in a ladybird, *Menochilus sexmaculatus*. **Animal Biology** (DOI: 10.1163/15707563-bja10015) (**IF. 1.475**).
2. **Singh S, Mishra G, Omkar (2021)** Maternal body size and age govern reproduction and offspring phenotype in the ladybird, *Menochilus sexmaculatus*. **Canadian Journal of Zoology**, 99 (2): 97-105 (**IF. 1.597**).
3. **Singh S, Mishra G, Omkar (2020)** Ladybird, *Menochilus sexmaculatus* (Fabricius) can survive on oophagy but with altered fitness than aphidophagy. **Current Science**, **108(10)**: 1602-1608, (**IF. 1.102**).
4. **Singh S, Mishra G, Omkar (2019)** Oviposition in aphidophagous ladybirds: Effect of prey availability and conspecific egg presence. **International Journal of Tropical Insect Science**, **39**: 107-114 (**IF. 0.774**).
5. Dubey A, **Singh S, Omkar, Mishra G (2018)** Paternity success in ladybirds: Function of mating interval and order. **Journal of Ethology**, 36: 151-159 (**IF. 1.270**).
6. **Singh S, Mishra G, Omkar (2018)** Plasticity in reproductive output and development in response to thermal variation in ladybird beetle, *Menochilus sexmaculatus*. **Journal of Thermal Biology**, 71: 180-188 (**IF. 2.902**).
7. **Singh S, Mishra G, Omkar (2016)** Perceived prey quantity modulates oviposition in ladybird, *Menochilus sexmaculatus*. **Journal of Ethology**, 34: 59-64 (**IF. 1.270**).

Book chapter

1. **Singh S, Singh P, Mishra G, Omkar (2022)** Sexual coercion. In: Reproductive Strategies in Insects, (Eds, Omkar & G. Mishra), pp. 183-204. CRC Press, Taylor & Francis Group, Boca Raton London New York (DOI: 10.1201/9781003043195).

Presentations

1. **Singh S, Mishra G, Omkar (2018)** Egg: Consumption and laying in aphidophagous ladybird beetles. *International Symposium on Current Trends in Biological Sciences organized by the Department of Zoology, University of Lucknow, Lucknow, India* (Oral).
2. **Singh S, Mishra G, Omkar (2017)** Effect of prey availability and conspecific egg presence on oviposition in aphidophagous ladybirds. *International Conference on Functional Biology and Molecular Interactions: Applications in Health and Agriculture organized by the Department of Biochemistry, University of Lucknow, Lucknow, India* (Poster).
3. **Singh S, Mishra G, Omkar (2017)** Plasticity of reproductive output and development in response to thermal variation in ladybird, *Menochilus sexmaculatus*. *65th Annual meeting, The Entomological Society of America, Denver, Colorado, USA* (Poster).
4. **Singh S, Mishra G, Omkar (2017)** Reproductive share dynamics: Function of Mother's age and body size in an aphidophagous ladybird, *Menochilus sexmaculatus* (Fabricius) (Coleoptera: Coccinellidae). *International Conference in Zoological Sciences organized by the Department of Zoology and Environmental Sciences, Punjabi University, Patiala, India* (Poster).
5. **Singh S, Mishra G, Omkar (2016)** Maternal provisioning of trophic eggs not universal in ladybirds. *International Conference on Entomology, organized by the Department of Zoology and Environmental Sciences in collaboration with Association of Entomologists, Punjabi University, Patiala, India* (Poster).
6. **Singh S, Dubey A, Omkar, Mishra G (2016)** Paternity: Mating interval and order decides sperm use in the ladybird, *Menochilus sexmaculatus*. *International Conference on Entomology, organized by the Department of Zoology and Environmental Sciences in collaboration with Association of Entomologists, Punjabi University, Patiala, India* (Poster).

Membership

Life Member of the **Association of Entomologist**, Department of Zoology & Environmental Sciences, Punjabi University, Patiala-147002, Punjab, India.

Awards

UGC- BSR (Basic Science Research) Fellowship (University Grants Commission, New Delhi, India): **Nov 2014 – March 2018** UGC provides BSR fellowship to the meritorious students in the field of science. (Overall grant amount = ~23003.38800 USD).

CSIR-UGC NET: **Dec 2018**, Awarded Lectureship eligibility, Exam conducted jointly by CSIR (Council of Scientific and Industrial Research) and UGC (University Grants Commission) New Delhi, India.

Postdoctoral Fellowship: **Aug 2019**, Agricultural Research Organization, the Volcani Center, Israel (~28,875.03 USD per year)

Best Research Paper Award: 2016-2017, University of Lucknow, Lucknow, India.

Best Research Paper Award: 2017-2018, University of Lucknow, Lucknow, India.

Research Project

Sep 2013 – Sep 2014 Project Fellow in Biocontrol of Insect Pests under Center of Excellence scheme (Coordinator Prof. Omkar, Dept. of Zoology, University of Lucknow, India). **Funded by** Department of Higher Education, Government of Uttar Pradesh, India (Overall grant amount = ~206865.00000 USD).

Technical skills

Animal Handling: Live insect, mouse, fish, crustacean handling, dissections of invertebrate and vertebrates.

Experimental designing: Behavioral observation, making different sets for crosses etc.

Polyhouse/Green house culture: Plant culture to infest and reproduce aphids, its maintenance.

Molecular techniques: DNA extraction from tissue and blood, gel electrophoresis (PAGE, agarose).

Visualization techniques: Histological preparation and light microscopy.

Classroom Experience

Assisted faculty member at undergraduate and postgraduate level: Demonstration of dissections and other experiments.

Conferences/Workshop/Webinar participations and volunteer activity

1. Webinar on “**COVID-19 and Environmental Linkage**” (2020) Organized by Department of Environmental Science Babasaheb Bhimrao Ambedkar University in Collaboration with Society of Environmental Sustainability & Springer Nature, India.
2. Webinar on “**The Challenges and Scientific Advances of SARS – COV 2**” (2020) Organized by Department of Microbiology, Assam University in Collaboration with Springer Nature & Society of Environmental Sustainability, India.
3. Talk on “**The Generation and Distribution of Biodiversity in the East Himalaya, from Trees to Birds**” by **Prof. Trevor D. Price (2020)** in a Webinar Organized by Zoological and Environmental Society, Department of Zoology and Environmental Sciences, Punjabi University, Patiala, India.
4. Talk on “**Evolutionary Biology in the Lab and Beyond**” by **Prof. Amitabh Joshi (2020)** in a Webinar organized by Zoological and Environmental Society, Department of Zoology and Environmental Sciences, Punjabi University, Patiala, India.
5. International Webinar on “**Forensic Entomology and Its Relevance in Legal Proceedings**” (2020) Organized by the Department of Zoology, University of Lucknow, Lucknow, India.
6. One Day Awareness Workshop on “**Science of Keeping Bee’s**” (2019) Organized by Department of Zoology, Isabella Thoburn College, Lucknow Supported by Royal Honey and Bee Farming Society, Lucknow, India.
7. Author Workshop (2017) Organized by Springer Nature & Tagore Library, University of Lucknow, Lucknow, India.

8. National Symposium on “**Recent Advances in Zoological Research**” (2016) Organized by Department of Zoology, University of Lucknow, Lucknow, India.
9. Three Days Training Workshop on “**Recent Techniques in Cell & Molecular Biology**” (2014) Organized by Department of Zoology, University of Lucknow, Lucknow, India.
10. One Day Training Programme on “**Biodiversity & Its Conservation**” (2014) Organized by Department of Zoology, University of Lucknow, Lucknow sponsored by Uttar Pradesh State Biodiversity Board, Lucknow, India.
11. National Seminar on “**Environmental Degradation and Aquaculture**” (2013) Organized by: Post- Graduate Department of Zoology, B.S.N.V.P.G. College, Lucknow in collaboration with Applied and Natural Science Foundation, Haridwar, U.K., India.
12. Participated in Indo-US Symposium on “**Impact of Early Life Adversity On Developing Brain**” (2013) Organized by Biochemistry Foundation & Indian Academy of Neuroscience (IAN), India.
13. Work shop on “**Education & Employability: Opportunities & Challenges**” (2013) Organized by IQAC, University of Lucknow, Lucknow, India.
14. Participated in 22nd All India Congress of Zoology and national seminar on “**Recent Advances in Biological Sciences: Biodiversity and Human Welfare**” (2011) Organized by University of Lucknow & Zoological society of India, Bodh Gaya, India.
15. Participated in “**International Biodiversity Day, Campaign on Awareness Creation Theme: Forestry and Bio-diversity**” (2011) Organized by University of Lucknow & Directorate of Environment U.P., India.
16. Participated in National Children’s Science Congress and awarded as child Scientist under the Focal Theme: **Food System - Towards Nutrition for All (2003)** Programme of NCSTC NETWORK, Organized by VICAS, DST Govt. of India, CST-UP, DST-UP Govt. of U.P., India.

Languages

Hindi (Mother tongue)

English