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Education

- B. Sc. (Hons.) in Botany; from University of Kalyani in 1981. (result published in 1982)
- M.Sc. in Botany from the University of Kalyani in 1983. (result published in 1985)
- Ph. D. from the University of Calcutta in 1996.
  Thesis Title: Certain aspects of morphology, anatomy and palynology of some mangroves and their associates from Sundarbans, India.
  Thesis Adviser: Prof. M. Ghose, Agricultural & Ecological Research Unit Indian Statistical Institute, Kolkata.

Experience

Teaching Assignment

- Undertaken the Course work classes programmed for Research Fellows of this Unit (AERU), ISI. (Microscopy and Plant Micromorphology)
- B.Stat (Hons) 2nd year, sub-major course of Biological Sciences (Plant Physiology and Plant protection parts) taught for more than 15 years during the year 1989 – 2007 in the Indian Statistical Institute, Calcutta.
- Teaching assignmentin abroad for M.Sc 2nd semester class in the Department of Biological Resources, National Chiayi University, Taiwan, R.O.C.,on "Special topic on Plant anatomy", during January – June, 2008.

Foreign Assignment

- As Visiting Scientist for the period of six months (January 1 – June 30, 2008) in College of Sciences, Department of Biosciences, National Sun Yat-sen University, Kaohsiung, Taiwan, R.O.C.

Involvement in Research Projects

Intramural (Funded by ISI)

- Ecology and physiological studies on the mangroves of Sundarbans (Completed). (As Co-investigator).
- Studies on the ecology, conservation, propagation and utilization of palms with special reference to rattans (North-East Project) (completed). (As Co-investigator).
- Studies on genetic diversity of some degraded mangroves of Sundarbans ((initiated on 2008-09; completed on 2010-11). – As PI.
- Antioxidant scavenging and corresponding gene regulation in some mangroves of Sundarbans (initiated on 2011-12; completed 2013-14) – As PI.
- Generation and characterization of SSR marker for some mangroves of Sundarbans, India.(initiated April, 2014, finished 2017) – As PI.
- Biochemical and physiological portrayal of Darjeeling tea cultivars towards the selection of superior clones against abiotic stress, initiated 2018, continued till date

Extramural (Funded by other agencies)

- Project on Mangrove Study undertaken between ISI, Kolkata and Centre for Plant and Food Sciences (PAFS), University of Western Sydney, Australia (completed), As Co-PI.
- Project undertaken on Mangrove Seed Biology in relation to Sustain Conservation and Management in collaboration with Bidhan Chandra Krishi Vishva Bidyalaya, West Bengal, funded by the Ministry of Environment and Forest, Govt. of India (completed), As Co-PI.
- Project undertaken as PI on "Biochemical and physiological characterization of Darjeeling tea cultivars towards the selection of superior genotypes against abiotic stress" funded by Indian Tea Board (Completed).
- Project undertaken as PI on "Assessment of self-life of the processed tea

in relation to antioxidant ability", Funded by National Tea Research Foundation, Govt. of India. (completed).

Ph. D Thesis from the undertaken project work

- A Ph. D. Thesis has been submitted to the University of Kalyani and Awarded the Degree of Doctor of Philosophy (Science) on 8th September, 2014 by Dr. Nirjhar Dasgupta, a Project Assistant attached to the project entitled "Antioxidant scavenging and corresponding gene regulation in some mangroves of Sundarbans". The Thesis title is "Certain biochemical and molecular aspects of some Mangrove taxa from Indian Sundarbans towards efficient Salt management and sustainability". This thesis is an outcome of the above plan Project undertaken by Sauren Das during the year 2011-12, 2012-13 and 2013-14.
- Mr. Anjan Hazra, a Project Linked personnel, has enrolledhimself for Ph. D in the Department of Botany, University of Kalyani, under Joint supervision of Prof. Chandan Sengupta (Kalyani University) and myself. Mr. Hazra has cleared Pre-Ph. D seminar and his thesis entitled "On the molecular consideration of tea antioxidant quality and their shelf life assessment" submitted March, 2019 and awarded September 2019.

Review & Editorial work

- Member of the International Editorial Board, Annals of Tropical Research, Philippine.
- Worked as Associate Editor of Research Journal of Botany (Acad. Journals Inc., USA).
- Editorial member of the Special issue of the Journal 'Palaeo3 " – an Elsevier Publication on the selected papers presented in INQUA Congress, 2007; Cairns, Australia.
- Working as Associate Editor of Open Journal of Forestry
- Regular reviewer of several Research Journals of Internationally repute such as, Trees, Plant Molecular Biology & Physiology (Springer), Journal of Torrey Botanical Society, USA, American Journal of Botany -American Botanical Society, American Journal of Plant Science (Academic Journals Inc., USA)., Plant Science Today, African Journal of Plant Ecology (Wiley-Blackwell), Quaternary International (Elsevier), Pedosphere (Elsevier).

Research Publications: Peer reviewed/SCI journals (Out of 48 publications, first or corresponding author in 45 papers)

1. Jian-Wei Liu, Shau-Fu Li, Chin-Ting Wu, Iván A. Valdespino , Jia-Fang Ho, Yeh-Hua Wu, Ho-Ming Chang, Te-Yu Guu1, Mei-Fang Kao, Clive Chesson, **Sauren Das**, Hank Oppenheimer, Ane Bakutis, Peter Saenger, Noris Salazar Allen, Jean W. H. Yong, Bayu Adjie, Ruth Kiew, Nalini Nadkarni,Chun-Lin Huang, Peter Chesson, and Chiou-Rong Sheue. (2020). Gigantic chloroplasts, including bizonoplasts, are common in shade-adapted species of the ancient vascular plant family *Selaginellaceae* ***American Journal of Botany*** 107(4): 1–15.[impact factor – 3.05].
2. Hazra, Anjan, Dasgupta Nirjhar, Saha Gargi, Sengupta Chandan and Das Sauren. (2020). Temporal depletion of packaged tea antioxidant quality under commercial storage condition. ***Journal of Food Science and Technology*** (Springer). DOI: 10.1007/s13197-020-04300-0
3. Banerjee Adrita, Hazra Anjan, Das Sauren and Sengupta Chandan (2020). Groundwater inhabited *Bacillus* and *Paenibacillus* strains alleviate arsenic-induced phytotoxicity of rice plant. ***International Journal of Phytoremediation.*** DOI: 10.1080/15226514.2020.1725871 (Taylor & Francis)
4. Hazra, Anjan, Dasgupta Nirjhar, Kumar Rakesh, Sengupta Chandan and Das Sauren. (2020). miRNA precursor-derived SSR marker-mediated genotyping of tea (Camellia sinensis) cultivars with varying health benefit traits. ***Pant Breeding***. (DOI: 10.1111/pbr.12803). (Spronger)
5. Hazra, Anjan, Saha Srutakirti, Rakesh Kumar, Choubey Mritunjoy, Sengupta Chandan and Das Sauren. (2020). Efficacy of several QTL and miRNA-SSR markers towards health benefit traits in an elite Darjeeling tea cultivar. ***Journal of microbiology, biotechnology and food science***, 9(4): 700 – 704. doi: 10.15414/jmbfs.2020.9.4.700-704
6. Karmakar, N. C., Hazra, A and Das, S. (2019). Bidens pilosa L.: exclusive report of vivipary in a non-mangrove taxa from Eastern Himalayas. ***Plant Species Biology*** (Willey). (DOI:10.1111/1442-1984.12237). [Impact factor: 1.673].
7. Hazra, A., Dasgupta, N., Sengupta, C., & Das, S. (2019). MIPS: Functional dynamics in evolutionary pathways of plant kingdom. ***Genomics*** (Elsevier). (In press: doi.org/10.1016/j.ygeno.2019.01.004).[Impact factor: 3.27].
8. Hazra, A., Dasgupta, N., Sengupta, C., Kumar, R., & Das, S. (2018). On some biochemical physiognomies of two common Darjeeling tea cultivars in relation to blister blight disease. ***Archives of Phytopathology and Plant Protection***, 51(17-18), 915-926. (Taylor and Francis).
9. Phukan M, Savapondit D, Hazra A, **Das S**, Pramanik P (2018) Algorithmic derivation of CO2 assimilation based on some physiological parameters of tea bushes in North-East India ***Ecological Indicators***(Elsevier) 91: 77–83 [Impact factor: 3.898].

10. Hazra, Anjan, Dasgupta, Nirjhar, Sengupta, Chandan and**Das, Sauren.** 2018.Next generation crop improvement program: Progress and prospect in tea (*Camellia sinensis* (L.) O. Kuntze). ***Annals of Agrarian Science***16 (2): 128-135 (Elsevier).
11. Hazra A, Nandy P, Sengupta C, **Das S** (2018) MIPS sequences: a promising molecular consideration in angiosperm phylogeny and systematics. ***Biotechnologia*** 99(1): 5–12.
12. Dasgupta, N, Nandy, P, Sengupta, C and **Das, S.** 2018. Assessment of genetic variation of three mangroves from Indian Sundarbans using RAPDand ISSR markers in relation to their adaptability***Journal of Forestry Research,***29:301-310**(Springer)** [impact factor – 0.658]. DOI 10.1007/s11676-017-0467-7.
13. Dasgupta Nirjhar, Hazra Anjan, Bhattacharya Sabyasachi and **Das Sauren**. 2017.Molecular markers assisted DNA polymorphism: Implications in mangrove research. ***Plant Science Today***. 4(4): 166-171.doi: 10.14719/pst.2017.4.4.349.
14. Hazra, Anjan, Dasgupta, Nirjhar, Sengupta, Chandan and **Das Sauren**. 2017. Computational Characterization of MIPS in *Camellia sinensis* and it's Phylogenetic Implication. ***Int. J. Cell Sci. and Mol. Biol***. 2(5): 1 – 6.
15. Hazra, Anjan, Dasgupta, Nirjhar, Sengupta, Chandan and **Das Sauren.** 2017.Extrapolative microRNA precursor based SSR mining from tea EST database in respectto agronomic traits**.** ***BMC Research Notes***.**(Springer Nature)**10:261. DOI 10.1186/s13104-017-2577-x.
16. Dasgupta Nirjhar, Hazra Anjan, Bhattacharya Sabyasachi and **Das Sauren**. 2017. In Silico screening of Putative miRNAs and theirTargets from a Common Mangrove Bruguiera gymnorrhiza. ***Int. J. Cell Sci. and Mo. Biol.*** 2(1): 1 – 15.
17. Hazra Anjan, Saha Jhinuk, Dasgupta Nirjhar, Sengupta Chandan, Mohan Kumar Padmanabhan and **Das Sauren**. 2017. Health-Benefit Assets of Different Indian Processed Teas: A Comparative Approach. ***Am. J. Plant Science.***8: 1607-1623.
18. Dasgupta Nirjhar, Nandy Paramita, Sengupta Chandan and **Das Sauren**. 2017. Occurrence of secondary metabolites and free radical scavenging ability towards better adaptability of some mangrove species in elevated salinity of Indian Sundarbans. ***Annals of Trop. Res.*** 39(1): 12 – 40.(Philippines).
19. Dasgupta, N, Nandy, P, Sengupta, C and **Das, S.** 2015. RAPD and ISSR marker mediated genetic polymorphism of two mangroves Bruguiera gymnorrhiza and Heritiera fomes from Indian Sundarbans in relation to their sustainability. ***Physiol. Mol. Biol. Plants*** 21(3):375 – 384**.(Springer).**[impact factor – 1.351]
20. Dasgupta, N, Chowdhury, P and **Das, S.** 2015. Comparative Adaptability Assessment oftwo Mangroves from Indian Sundarbans: Some Biochemical Appearances.***Natural Science,*** 7: 519-534. (SCIRP Publishing).[impact factor – 0.92]
21. Sheue C. R., J. F. Ho, A. W. Yao, Y. H. Wu, J. W. Liu, **S. Das**, C. C. Tsai, H. A. Chu, P. Chesson and M. S. B. Ku. 2015. A variation on chloroplast development: the bizonoplast and photosynthetic efficiency in the deep shade plant *Selaginella erythropus*. ***American Journal of Botany,*** 102: 500-511.[impact factor – 3.05]

22. Dasgupta, N, Sengupta, C and **Das, S.** 2014. Role of secondary metabolites and radical scavenging aptitude for better adaptability of mangroves in varying salinity of Sundarbans, India. ***Annals of Tropical Res.*** 36(2): 1 – 22 (Philippines).
23. **Das, Sauren**. 2014. Palaeo-palynology of late quaternary peat deposit from Lower Bengal Basin, India: A palaoecological approach. ***Quaternary International***325: 197-204 **(Elsevier)**. [impact factor – 2.383]
24. Dasgupta, N., Nandy, P., Sengupta, C and **Das, S**. 2014. Salinity mediated biochemical changes towards differential adaptability of three mangroves from Indian Sundarbans. ***Journal of Plant Biochem. Biotech.*** 23(1):31–41. **(Springer)**. [impact factor – 1.352]
25. **Das, Sauren,** Sheue, Chiou-Rong and Yang, Yuen-Po. 2013. Leaf micromorphology and Leaf glandular hair ontogeny of *Myoporum bontioides* A. Gray. ***Fedes Repertorium***, 124: 50 – 60. (**WILEY**-VCH Verlag GmbH & Co.). [impact factor – 0.4]
26. Chi-Chu Tsaia, Shu-Ju Li, Y u-Yen Su, Jean W. H. Yong, Peter Saenger, Peter Chesson, **Sauren Das**, Glenn Wightman, Yuen-Po Yang, Ho-Yi Liu, Chiou-Rong Sheue. 2012.Molecular phylogeny and evidence for natural hybridization and historical introgression between Ceriops species (Rhizophoraceae).***Biochemical Systematics and Ecology*****,** 43: 178-191. **(Elsevier).**[impact factor 1.199]
27. Dasgupta, N., Nandy, P., Sengupta, C and **Das, S**. 2012. Salinity impact on the precarious mangroves: a biochemical study on some taxa from Indian Sundarbans. ***Am. Jour. Plant Physiol.*** 7 (2): 53-69. (Academic Journals Inc., USA). [impact factor – 1.08]
28. Dasgupta, N., Nandy, P., Sengupta, C and **Das, S**. 2012. Protein and enzyme regulations towards salt tolerance of some Indian mangroves in relation to adaptation. ***Trees: Struc. and Func.*** 26 (2): 377-391.**(Springer).**[impact factor - 1.706]
29. Dasgupta, N., Nandy, P., and **Das, S.** 2011. Photosynthesis and antioxidative enzyme activities in five Indian mangroves with respect to their adaptability. ***Acta Physiologiae Plantarum*****,** 33: 803-810. **(Springer).**[impact factor – 1.563]
30. Dasgupta, N., Nandy, P., Tewari, C. and **Das, S.** 2010. Salinity imposed changes of some isozymes and total leaf protein expression in five mangroves from two different habitats**.** ***Journal of Plant Interactions***5(3):211-221. **(Taylor & Francis)**.
31. Nandy (Datta), P., Dasgupta, N and **Das, S.** 2009. Differential expression of physiological and biochemical characters of some Indian mangroves towards salt tolerance**.** ***Physiol. and Molecular Biol. of Plants***15(2):151-160. **(Springer)**. [[impact factor – 1.351]
32. **Das, S.** 2009. Palaeoecology of the lower Bengal basin, Calcutta, India during the Holocene period. ***Fedes Repertorium***120(5-6):333 – 342. (**WILEY-VCH** Verlag GmbH & Co.).[impact factor – 0.4]
33. Gupta, S, Ghosh, A., Maity, S, and **Das, S.** 2008. Pollen morphology and their viability of some Indian mangroves. ***Annals of Tropical Res.***30 (1):60 – 71. (Philippines).

34. Ghosh, A., S. Gupta, S. Maity and **S. Das**. 2008. Study of Floral Morphology of Some Indian Mangroves in Relation to Pollination. ***Res. J. Bot.*****3(1):** 9 – 16. (Academic Journals Inc., USA).

35. Nandy (Datta), P., **Das, S.,** M. Ghose, and R. Spooner-Hart2007.Effects of Salinity on Photosynthesis, Leaf Anatomy, Ion Accumulation and Photosynthetic Nitrogen Use Efficiency In Five Indian Mangroves. ***Wetland Ecology and management***15: 347 – 357. **(Springer)**[impact factor – 1.407]

36. Nandy (Datta), P**., Das, S.,** Philip Groom, Elizabeth Kabanoff,Ghose, M. and Robert Spooner-Hart. 2007. On the physiological responses of *Avicennia marina* (Forsk.) Vierh. From Sydney, Australia in different salinity conditions. ***Res.Journal of Botany***.2(1):33 – 40. (Academic Journals Inc., USA).

37. Ghose, M., Gupta, A., Das, S.K., **Das, S**., Bhattacharya, K., and Roy, D. 2006. Soil characteristics governing the distribution of rattans (canes) in Cachar, Assam, Northeast India. ***Journal of Bamboo and Rattan.***5(3&4): 127-132. **(Springer)** [impact factor – 0.31]

38. Nandy (Datta), P., M. Ghose, R. Spooner-Hartand **Das, S.** 2006. Is *Heritiera fomes* less adapted to the present conditions of the Indian Sundarban compared to other mangrove species? ***Annals of Tropical Research****,* 28(2):76 – 91. (Philippines).

39. Nandy (Datta), P**., Das, S.** and Ghose, M. 2005. Relation of leaf micromorphology with photosynthesis and water efflux in some Indian mangroves. ***Acta Botanica Croatica***: 64 (2): 331– 340. (**University of Zagreb, Croetia**). [impact factor – 0.839]

40. Das, S. and Ghose, M. 2003. Seed structure and germination of some Indian mangroves – a taxonomic interest. ***Taiwania*****,**48(4): 287 – 298. [impact factor – 0.67]

41. Goswami, A., Chatterjee, M., Muhkerjee, A., Bhattacharya, A. **Das, S.** and Chattopadhyaya, D. 2003. Study of human olfactory sensory system in response to various odorants in different dilutions on eastern Indian population. ***J. Ecophysiol. Occup. Health.*****3:** 206 – 210.

42. Das, S. 2002. On the ontogeny of stomata and glandular hairs in some Indian mangroves. ***Acta Botanica Croatica***61(2):199 – 205. (**University of Zagreb, Croatia)**. [impact factor – 0.839]

43. Ghosh, S. S., **Das, S.** and Ghose, M. 2002. On the biology of *Nypa fruticans* (Thunb.) Wurmb. – an endangered mangrove palm of Sundarbans (India). ***Advances in Plant Sciences***.15(1):71 – 78.

44. Das, S., Ghose, M and Paria, N. 2001. Seedling morphology of some mangroves of Sundarbans: A taxonomic approach. ***Fedes Repertorium*****, 112(5&6):** 357 – 369. (**WILEY-VCH** Verlag GmbH & Co.).[impact factor – 0.4]

45. Das, S. 2001. Seedling morphology of three mangrove species and their taxonomic implications. ***Journal of Plant Biology***, 44(2): 92 – 96. **(Springer).** [impact factor – 1.687]

46. Das, S. 1999. Leaf anatomy: an adaptive feature of some mangroves of Sundarbans, West Bengal. ***Journal of Plant Biology***. **42(2):** 109 – 116.

Springer). [impact factor – 1.687]

47. **Das, S.** and Ghose, M. 1999. Major inorganic elements in the leaves of some mangroves from Sundarbans (West Bengal) and Bhitarkanika (Orissa) – a comparative approach. ***Acta Botanica Indica***, **27:** 139 – 143.
48. **Das, S**. and Ghose, M. 1997. Development of stomata and leaf hair in some mangroves ***Phytomorphology,***47(4): 389 – 394. (International Journal of Plant morphology, Scientific Publishers). [impact factor – 0.31]
49. **Das, S**. and Ghose, M. 1996. Anatomy of leaves of some mangroves and their associates from Sundarbans (West Bengal). ***Phytomorphology,***46(2): 139 – 150. (International Journal of Plant morphology, Scientific Publishers). [impact factor – 0.31]
50. **Das, S.** and Ghose, M. 1996. Studies of inorganic elements in the leaves of halophytes from Sundarbans, West Bengal. ***Bangladesh J. Bot.***25(2): 231 – 233. [impact factor – 0.39]
51. Ghose, M and **Das, S.** 1995. Structural characteristics of vessel elements in stems of some mangroves. ***Indian Botanical Contactor,*****12:** 125 – 136.
52. **Das, S.** and Ghose, M. 1993. Morphology of stomata and leaf hairs of some halophytes from Sundarbans, West Bengal. ***Phytomorphology,***43(1&2): 59 – 70. (International Journal of Plant morphology, Scientific Publishers). [impact factor – 0.31]
53. **Das, S.** and Paria, N. 1992. Stomatal structure of some Indian orchids with reference to taxonomy. ***Bangladesh J. Bot.***21(1): 65 – 72. [impact factor – 0.39]
54. **Das, S.** and Ghose, M. 1990. Pollen morphology of some mangrove plants of Sundarbans, West Bengal. ***J. Natl. Bot. Soc.***44: 59 – 75.
55. **Das. S**. and Pal, A. 1989. Allergenic pollen producing plants of the Jalpaiguri area with reference to aeropalynology. ***Environment and Ecology,***7(3): 642 – 653.

Book chapter/proceedings/Abstract volume

i. Sauren Das, Anjan Hazra, Nirjhar Dasgupta, Biswajit Bera and Chandan sengupta. 2020. Tea: A Worthwhile, Popular Beverage Crop Since Time Immemorial. In ***Agronomic Crop****s*. Springer.
ii. Dasgupta, N and **Das, S.** 2015. RAPD and ISSR marker mediated genetic polymorphism of five true Mangrove species from Indian Sundarbans in relation to their sustainability. Proc. 3rd International Conference on India Biodiversity Meet. 16 – 18 November, 2015.
iii. Dasgupta, N and **Das, S.** 2014.Molecular marker assisted polymorphic expressions of genomic DNA in five true mangroves from India Sundarbans in relation to their sustainability. 2nd International Symposium on India Biodiversity Meet - 2014, 21-23 November, 2014, Indian Statistical Institute, Kolkata, India.
iv. Dasgupta, N., Nandy, P and **Das, S.** 2013.Salt Stress: A Biochemical and Physiological Adaptation of Some Indian Halophytes of Sundarbans. In: *Molecular stress physiology of plants* (G. R. Rout and A. B. Das eds.). Springer. ISBN 978-81-322-0806-8.
v. **Sauren Das.** 2012.Salinity Dependent Photosynthetic Response and Regulation

of Some Enzymes in Halophytes from Indian Sundarbans. *In*: Applied Photosynthesis (M. Najafpour ed.), InTech Publisher, Croatia; ISBN: 978-953-51-0061-4, 300-322; 422p.

vi. **Sauren Das.** 2012. Palaeo-palynology of late quaternary peat deposit from Lower Bengal Basin, India: A palaoecological approach. Accepted for Abstract vol. in the joint meeting of 13th International Palynological Congress and 9th International Organisation of Palaeobotany Conference, to be held on August 23-30 2012, at Chuo University in Tokyo, Japan.

vii. **Das, S**. and Dasgupta, N 2012. Salinity imposed biochemical changes towards efficient adaptation of some mangroves of Sundarbans, India. Accepted for abstract vol. in the MMM3 Conference (Meeting on Mangrove ecology, functioning and Management – MMM3), Galle, Sri Lanka during 2 – 6 July, 2012.

viii. Dasgupta, N and **Das, S**. 2012. Feasibility of reverse adaptation: Physiological and biochemical approach for two mangroves from Sundarbans, India. Accepted for abstract vol. in the MMM3 Conference (Meeting on Mangrove ecology, functioning and Management – MMM3), Galle, Sri Lanka during 2 – 6 July, 2012.

ix. Nirjhar Dasgupta and **Sauren Das**. 2011. Biochemical adaptive efficiency of two mangrove species from Indian Sundarbans. 15th ADNAT Convention – Symposium on Genomics and Biodiversity: held at CCMB, Hyderabad, India during 23-25 February, 2011.

x. Nirjhar Dasgupta and **Sauren Das**. 2010. Depleted navigation of the River Ganges and its Detrimental Impact on Indian Sundarbans. Abstract volume of Indo-US Science and Technology Forum (IUSSTF) Workshop on Sedimentation, Erosion, Flooding, and Ecological Health of Rivers (WS-Ecological Health of Rivers-8-2010) held at the Indian Statistical Institute, Kolkata (Calcutta), India. 1-3 November, 2010.

xi. **Sauren Das**, Mo-Shih Tang, Yuen-Po Yangand Chiou-Rong Sheue. 2008. The Micromorphology of Papillose Structure on Abaxial Leaf Surface of Daphniphyllaceae. *Proceedings of International botany symposium,* Nov. 6-7, 2008*,* Chiayi National University, Taiwan, R.O.C.

xii. **S. Das.** 2007. Palaeoecology of the lower Bengal basin, Calcutta, India during the Quaternary period. *Abstract vol. of XVII International Congress of Quaternary Research* (INQUA Congress, 2007) Cairns, Australia.

xiii. P. Nandy and **S. Das.** 2007. Differential expression of physiological and biochemical defense mechanisms of some Indian mangroves towards salt tolerance. *Abstract vol. of International Conference on Biodiversity: Issues & Concern.* Organized by Biological Sciences Division, Indian Statistical Institute.

xiv. **S. Das.** 2005. *Heritiera fomes*: An endangered species in western Sundarbans and probable causes for its degradation. *Proc. Natl. Symp. Coastal Resources and Sustainable Management: Issues & Strategies,* pp. 321-328.

xv. **S. Das.** 2001. Seed morphology and germination pattern of some mangroves of Sundarbans, India. *Trees: Structure and Function* (an abstract volume of special issue on International mangrove Symposium, Tokyo, 2001). (Springer)

xvi. M. Ghose and **S. Das.** 1999. Structural characteristics of vessel elements in some mangroves of Sundarbans with special reference to habitat. In: *Sundarbans Mangals* (Eds. D. N. Guha Bakshi, P. Sanyal abd K. R. Naskar), Naya prakesh, Calcutta.

xvii. K. N. Bhattacharya, **S. Das.** T. S. Gupta and S. Chanda. 1987. Incidence of air-borne pollen in the atmosphere of Jalpaiguri, West Bengal. *In*: Atmospheric Biopollution, (Ed. N. Chandra) Environmental Publication, Karad, Maharashtra, 37 – 42.

Research Domain and Field of Interest

Mangroves represent a heterogeneous plant community grown in the intertidal saline marshes. Salt tolerance strategies, being the essence of my work points to the survival strategy of dominant taxa of the Sundarbans forest. Remarkable elevation in the substrate salinity imparts toxic effect on some economically important taxa leading to declined germination, growth rate and survival. Special emphasis was given on these species in view of their in-situ and/or ex-situ conservation. Underneath is a brief account.

- Preparation of a detailed monograph on the phenotypic characteristics of mangroves based on micromorphology and palynological studies.
- Dispersal mechanism of propagules and germination patterns were documented in view of salt adaptation of these plants.
- Studies on ecophysiological behavior and metabolic shifts in highly saline regimes of the Sundarbans vegetation. Spatial and temporal measurements of photosynthesis, water efflux, stomatal conductance and osmotic potential were taken in different microclimates. Interactive effect of salinity and irradiance on carbon assimilation and water management strategy was considered to explain the physio-chemical adaptability towards sustainability in physiologically dry substrate.
- Biochemical characteristics like occurrence of polyphenolics, free amino acids, epicuticular wax, isozymes and inorganic nutrients provided with an idea towards salt tolerance.
- Salinity imposed increment of antioxidants (both enzymatic and non-enzymatic) facilitate ROS scavenging which are inevitable byproduct during photoinhibiton.Incidence of antioxidants (both enzymatic and secondary metabolites) were estimated (both quantitative and qualitatively) as they are responsible for ROS scavenging mechanism which in turn, impose sustainability of a species in abiotic stress.
- Genetic polymorphic expression is an essential phenomenon for a plant's sustainability in environmental stress. Prior to improvise any proper conservation strategies it is important to consider intraspecific and intragenic diversity in a population. Some economically important mangroves, which are drastically declining from the Indian part of the Sundarbans, are being

emphasized for polymorphism study using genetic marker and PCR technique.

Tea is widely used beverage across the world.Ecophysiology of the commercially-grown tea plant is much climate specific.Environmental dynamics, those impose adverse effects on tea plants and reduce the normal growth and yield of *Camellia sinensis* refer as abiotic stress.To combat with abiotic stress, plants have evolved effective cell protective mechanisms for retarding cell damaging processes. Physio-biochemical characterization of high altitude habitat plants like tea (in high UV radiation) seems to be meaningfultowards the selection of competent clones particularly in the present predicted threat of global climate change.

- As ROS have bi-phasic role both as toxic and participation in key signaling events, plant cells require to maintain a homeostasis between ROS concentrations in cell and scavenging mechanism. Determination of antioxidative secondary metabolites and activity of some antioxidative enzymes in relation to radical scavenging ability of different clones of Darjeeling tea cultivars *in situ* condition could be used as biochemical marker towards the selection of comparative vigor clones against predicted climatic changes among the 28-30 clones cultivated in Darjeeling region. Selection of tea clones cultivated in Darjeeling through the characterization of different antioxidative enzymes and the understanding developed from the study should help not only for plant survival in the threat of predicted climate change but also for aroma enhancement in tea plants cultivated at non-conventional sites.
- Presently stress biology of plant system and its changed metabolic shift to cope with the abiotic stress that imposed by climatic change is most focused research arena. All beneficial assets of tea have been credited to the strong anti-oxidative activity those have defensive potential against free radical-induced oxidative stress. A number of secondary metabolites were traced from tea time to time and have been recognized as pivotal bioactivities towards efficient antioxidating agents. Oxidative damage by ROS leads to some chronic diseases. Even though the cell can circumvent free radicals by internal antioxidants but endogenous antioxidant defenses are not always sufficient to counteract ROS completely. Therefore, diet-derived antioxidants including phenols and flavonoids appear to be important in protecting against many chronic diseases. Tea, undoubtedly, is a good source for dietary antioxidants. Investigation will be made in the context of retention of the antioxidant ability of the processed tea (Black, green, oolong and white) after packaging in the tea processing unit. Antioxidative ability reduces over the time during preservation. Assessment of the vital property along with incidence of antioxidative secondary metabolites at definite interval would provide the self-life of the processed tea. The research would be beneficial for both the tea producer and end user as well.

Presently I am associated with Dr. Sabyasachi Bhattacharya, Associate Professor, AERU,

ISI Kolkata and Dr. Nirjhar Dasgupta, a National Postdoctoral Fellow, funded by SERB. In connection with a project, entitled " Cataloging Mangroves of Indian Sundarbans using DNA Barcode".This study aims to provide a DNA barcode based diversity and phylogenetic relationship based comprehensive model of the Mangrove species of Indian Sundarbans forest.