

DEDICATION

*To the experiences we never
expected,
and the paths that were
redirected.*

*To the family and friends we
found along the way.*

*"When it looks impossible, look deeper, and
then fight like you can win."*

- Rost, Horizon Forbidden West.

DECLARATION

The thesis entitled “**Characterization and Conservation of Some Potential Tea Germplasm in the Darjeeling District of West Bengal, India**” has been prepared under the supervision of Dr. Chandra Ghosh. I declare that no part of the thesis has been forwarded for any other degree or diploma and is an original work solely for the degree of Doctor of Philosophy in Tea Science.



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This is to certify that the work recorded in the thesis entitled **“Characterization and Conservation of Some Potential Tea Germplasm in the Darjeeling District of West Bengal, India”** submitted by **Priyanka Das** in partial fulfillment of the requirements for the degree of Doctor of Philosophy in Tea Science submitted to the University of North Bengal, is the faithful and bonafide research work carried out under my supervision and guidance. The results of the investigation reported in the thesis have not so far been submitted for any other degree or diploma. The assistance and help received from various sources during the course of investigation have been duly acknowledged.

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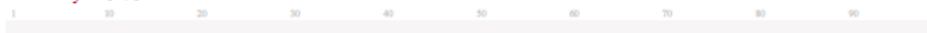
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submitted by **Priyanka Das** has been carried out following the
University guidelines and is approved by the members present in
the meeting of the Departmental Research Committee of Tea
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As I present this thesis, my mind travels back to Darjeeling's misty hilly tea garden, where this journey began. The lush tea gardens nestled in the shadow of the Himalayas, the fragrance of fresh leaves, and the serenity of nature's embrace have been the backdrop to my research, inspiring me at every step.

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“गुरुर्ब्रह्मागुरुर्विष्णुःगुरुर्देवोमहेश्वरः।

गुरुःसाक्षात्परंब्रह्मतस्मैश्रीगुरवेनमः॥”

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Finally, as I conclude, I wish to highlight the taxonomic significance of tea research, which holds promise not only for scientific understanding but also for preserving biodiversity and enhancing tea cultivation practices. It is a field ripe with potential, and I am honoured to contribute.

Lastly, I must express how deeply I will miss the lab-this sacred space where ideas took root and blossomed into discoveries, where countless hours were dedicated to exploring the unknown and pushing the boundaries of knowledge. It was more than just a place of work; it became a second home, a sanctuary of learning, collaboration, and personal growth. The bonds forged here, the tight-scheduled experiments, the shared triumphs and setbacks—all these moments will remain etched in my memory as some of my life's most meaningful and formative experiences.

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And

I wish to sign off with a reflection on the words of Robert Frost

“The woods are lovely, dark and deep,

But I have promises to keep,

And miles to go before I sleep,

And miles to go before I sleep”

Thank you

Preface

The journey into tea germplasm characterization and conservation is a delicate dance between tradition and innovation, where the roots of ancient agriculture intertwine with the future of sustainability. As climate change, habitat loss, and the ever-growing thirst for tea—an elixir steeped in heritage—cast long shadows over our fields, the call to protect and cherish the genetic diversity within tea species becomes more urgent. This preface beckons us to delve into the mysteries of phenotypic and genotypic diversity within tea germplasm, for it is within this knowledge that we find the keys to refining cultivation, nurturing biodiversity, and fortifying tea crops against the unpredictable storms of our changing world.

At the core of this quest lies the art of germplasm characterization, a process that unfolds like a meticulous tapestry, weaving together morphological, biochemical, and agronomic threads. Through careful study and documentation, we craft a living archive—a repository of tea's finest traits, from pest resistance and drought tolerance to the subtle notes that define its flavor. This endeavour reaches beyond the mere improvement of tea production; it is a guardianship of genetic treasures, a pledge to preserve the agricultural legacy passed down through generations.

Yet, no tale of preservation is complete without the theme of conservation—a commitment to the enduring stewardship of these genetic jewels. The importance of conservation strategies in safeguarding the genetic integrity of tea germplasm cannot be overstated. Whether through in situ practices within native landscapes or ex situ methods like seed banks and tissue cultures, these strategies ensure that the rich diversity of tea species is shielded from the brink of extinction. As educators, it is our duty to instill an understanding of these practices, nurturing a new generation of agronomists and environmentalists who will carry the torch of tea biodiversity forward.

In essence, the study of tea germplasm characterization and conservation transcends the realm of academia; it is a responsibility, a calling that resonates with the rhythms of ecological balance and economic vitality. As educators, we are entrusted with the privilege of imparting wisdom and cultivating a deep appreciation for the intricate symphony of our agricultural ecosystems. By championing these efforts, we are not merely preserving tea plants but embracing a holistic vision of biodiversity, one that honors the profound connections between agriculture, culture, and the earth itself. Through collaboration, creativity, and unwavering dedication, we hold the power to secure a sustainable future for tea cultivation, while celebrating the timeless traditions that make this beloved brew so much more than a simple drink.

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