

# UNIVERSITY OF NORTH BENGAL

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## CERTIFICATE

I certify that **Mr. DIBAKAR ROY** has prepared the thesis entitled "**MODIFICATION OF VEGETABLE OILS AS A POTENTIAL BASE OIL AND A MULTIFUNCTIONAL LUBE OIL ADDITIVE**", for the award of Ph.D. Degree of the University of North Bengal, under my guidance. He has carried out the research work at the Department of Chemistry, University of North Bengal. No part of this thesis has formed the basis for the award of any degree or fellowship previously.

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3c98b426-557a-4846-9316-acc92e7bfe36  
9c122ea5-83c5-48fb-b21f-4cbb7d264724  
397a7ff7-a784-4cdc-ab06-fb9357f0667c  
[https://en.wikipedia.org/wiki/Linseed\\_oil](https://en.wikipedia.org/wiki/Linseed_oil)  
<https://www.machinerylubrication.com/Read/31107/oil-lubricant-additives>  
<https://math.stackexchange.com/questions/3103227/when-is-the-sum-and-difference-of-two-projection-matrices-p-1-and-p-2-a-proj>  
<https://ir.nbu.ac.in/bitstream/123456789/2628/21/Full%20Thesis%20of%20Koushik%20Dey.pdf>  
<https://ir.nbu.ac.in/bitstream/123456789/1830/23/Thesis%20final.pdf>  
<http://14.139.211.59/bitstream/123456789/2760/22/Full%20thesis%20of%20Moumita%20Das.pdf>  
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<https://link.springer.com/article/10.1007/s40090-014-0007-7>  
[https://www.researchgate.net/publication/320388066\\_Castor\\_Oil\\_Based\\_Multifunctional\\_Greener\\_Additives\\_for\\_Lubricating\\_Oil](https://www.researchgate.net/publication/320388066_Castor_Oil_Based_Multifunctional_Greener_Additives_for_Lubricating_Oil)

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