INDIAN INSTITUTE OF TECHNOLOGY GUWAHATI
SHORT ABSTRACT OF THESIS

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Thesis Title: Investigating the spectroscopic properties of Mammeigin from *Mesua ferrea* in micro-heterogenous systems

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SHORT ABSTRACT

Mesua ferrea L. (Calophyllaceae), a medicinal plant abundant in Northeast (NE) India is a vast reservoir of phytochemicals. Mammeigin (MMG) is a neoflavonoid isolated from M. ferrea seed oil with high yield and purity. MMG is non-polar like several bioactive compounds, and its aqueous solubility was enhanced in surfactant micelles and Hen Egg-White lysozyme (HEWL) aggregates. The role of charges on the interaction with MMG was investigated in anionic Sodium dodecyl sulphate (SDS), cationic Cetyltrimethylammonium bromide (CTAB), and neutral Tween 20 (T20) using UV-Visible spectroscopy. The stability of MMG was enhanced at low ionic surfactant concentrations in the presence of sodium chloride at its physiological concentration. The interaction of MMG with HEWL aggregates was found to exist at pH 2 and pH 9, but not pH 5. This study provides insights for developing formulations and better molecular carriers. Furthermore, the application of MMG as acid-base pH indicator was explored in the surfactant systems. At alkaline pH, a stable and bright yellow color was developed by MMG in CTAB micelles. Similarly, the effect of specific ions was investigated in the surfactant systems and the sensitivity of MMG to fluoride ions in CTAB was observed in the range of 2.4-200 mM NaF.