



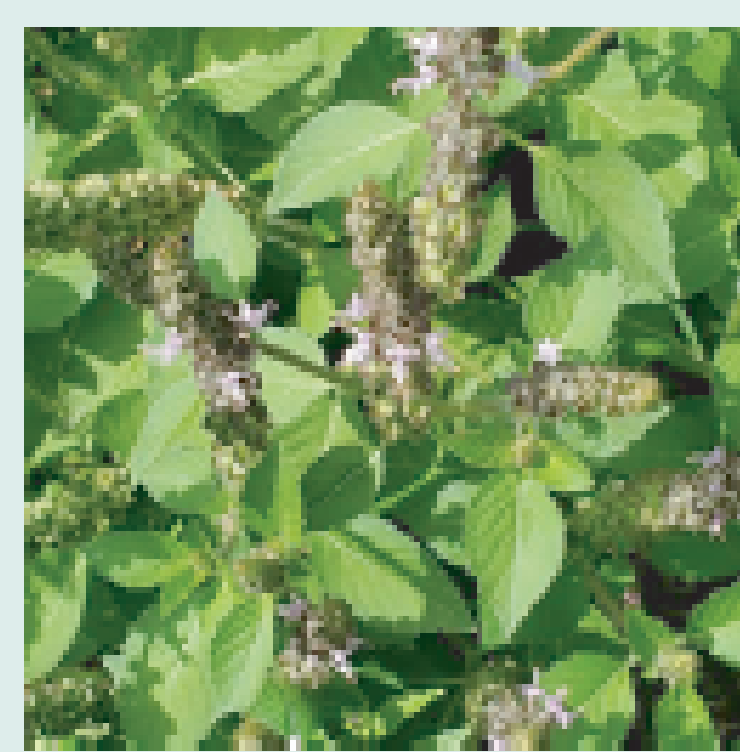
Abstract

Essential oil based nano-formulations are need of the time as the efficacy and stability of such formulations have valuable applications in the field of medicine and cosmetic research. Hence, in present study, the essential oil from *Ocimum tenuiflorum* plant was extracted by hydro-distillation method. The compositional ingredients used to formulate o/w nanoemulsion by low energy spontaneous method. The physical characteristics of the emulsion were evaluated by analyzing pH, viscosity, conductivity and surface tension. The droplet size and zeta potential of the nanoemulsion was analyzed by using a Zetasizer. The essential oil was then added in the prepared nanoemulsion in different concentrations, resulting in the formation of 5 samples (F1 to F5). The samples showed significant antioxidant activity as tested by DPPH method. Mosquito repellency tests of these essential oil loaded nanoemulsions showed that the activity increase with increasing e. oil concentration with 100 % repellency for F5. The results of the present study suggested that the prepared formulation can be used as an important ingredient to formulate green mosquito repellent products.

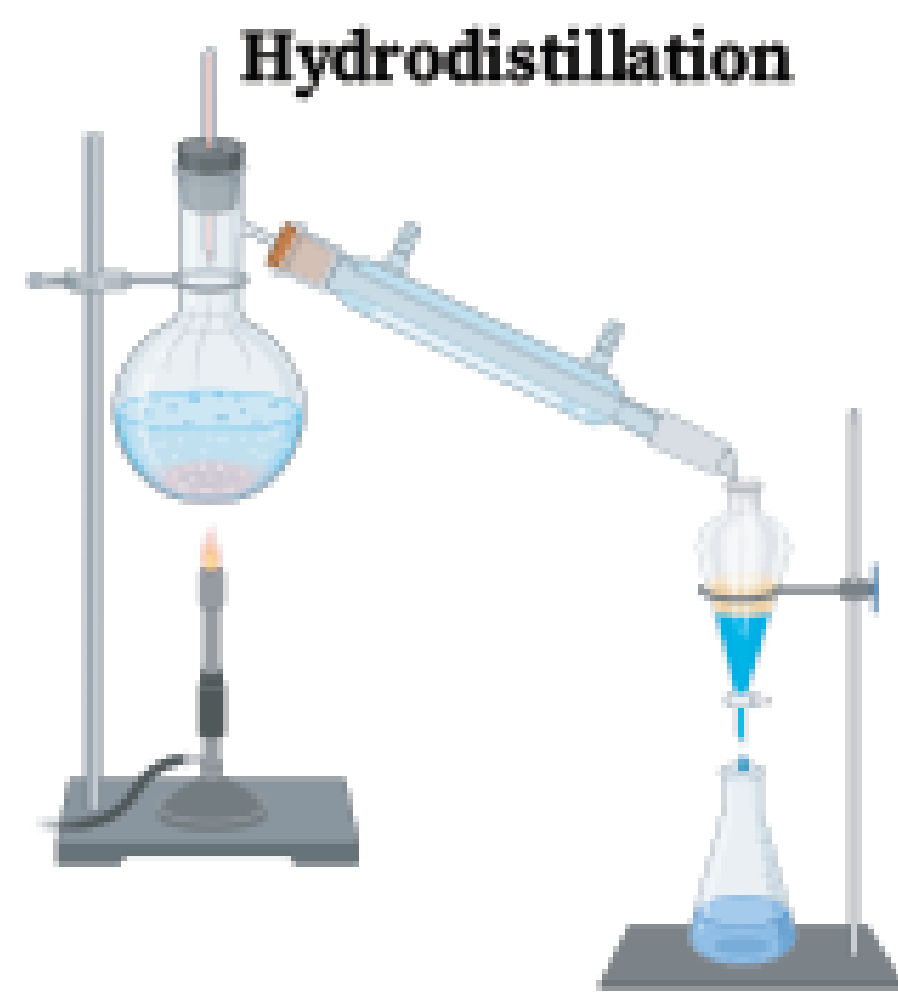
APPLICATIONS

Potential applications for Mosquito repellency, antioxidant, antimicrobial and larvicidal activity.

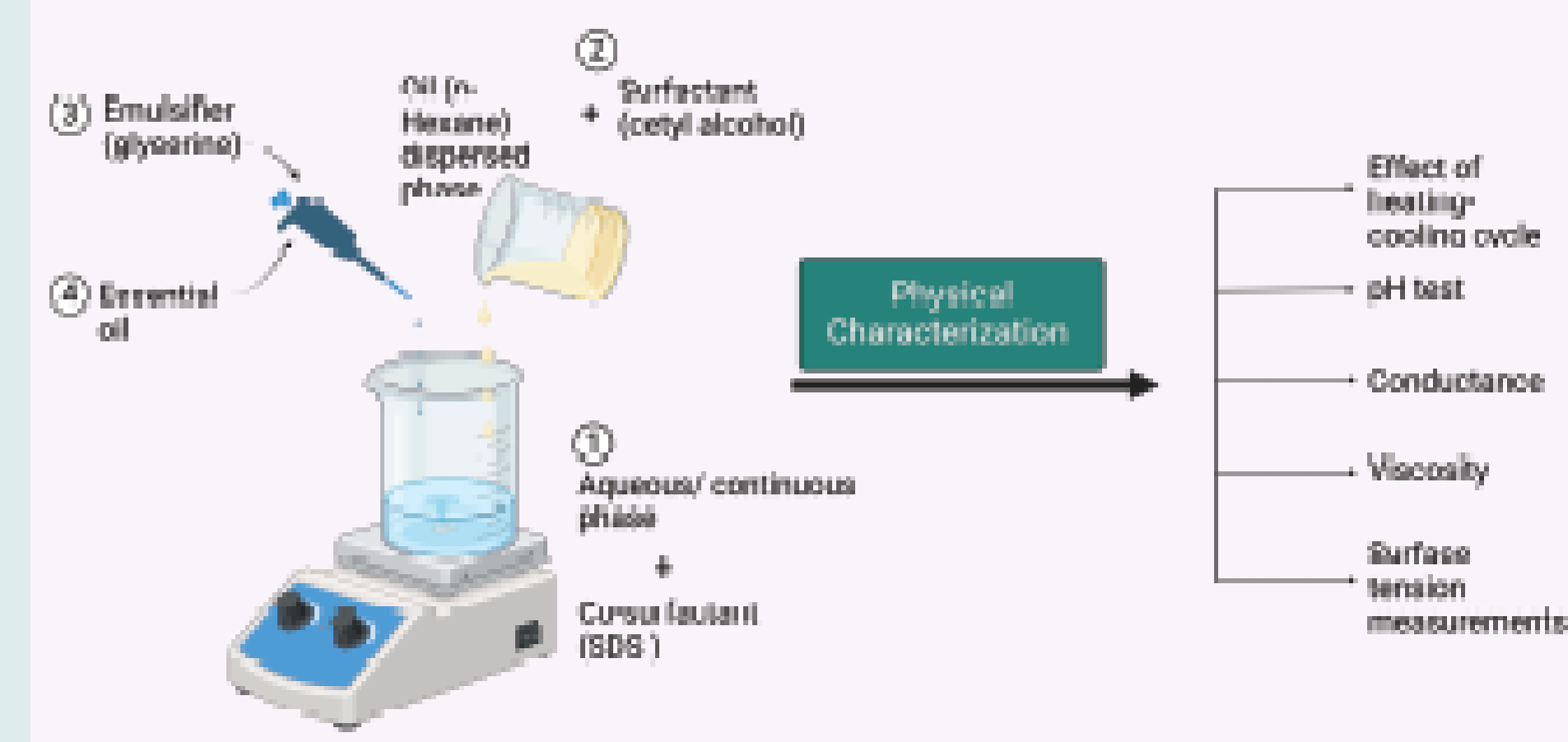
Plant



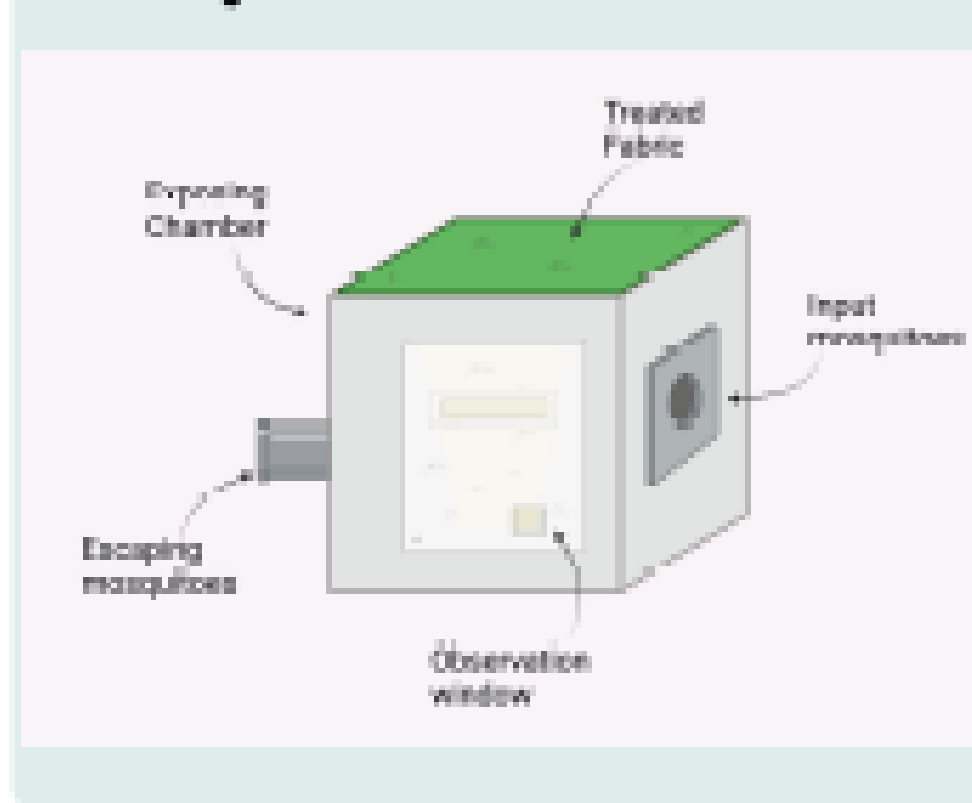
Hydrodistillation



Formulation and analysis of physical parameters



Mosquitoes' repellent activity of nanoemulsion



METHODOLOGY

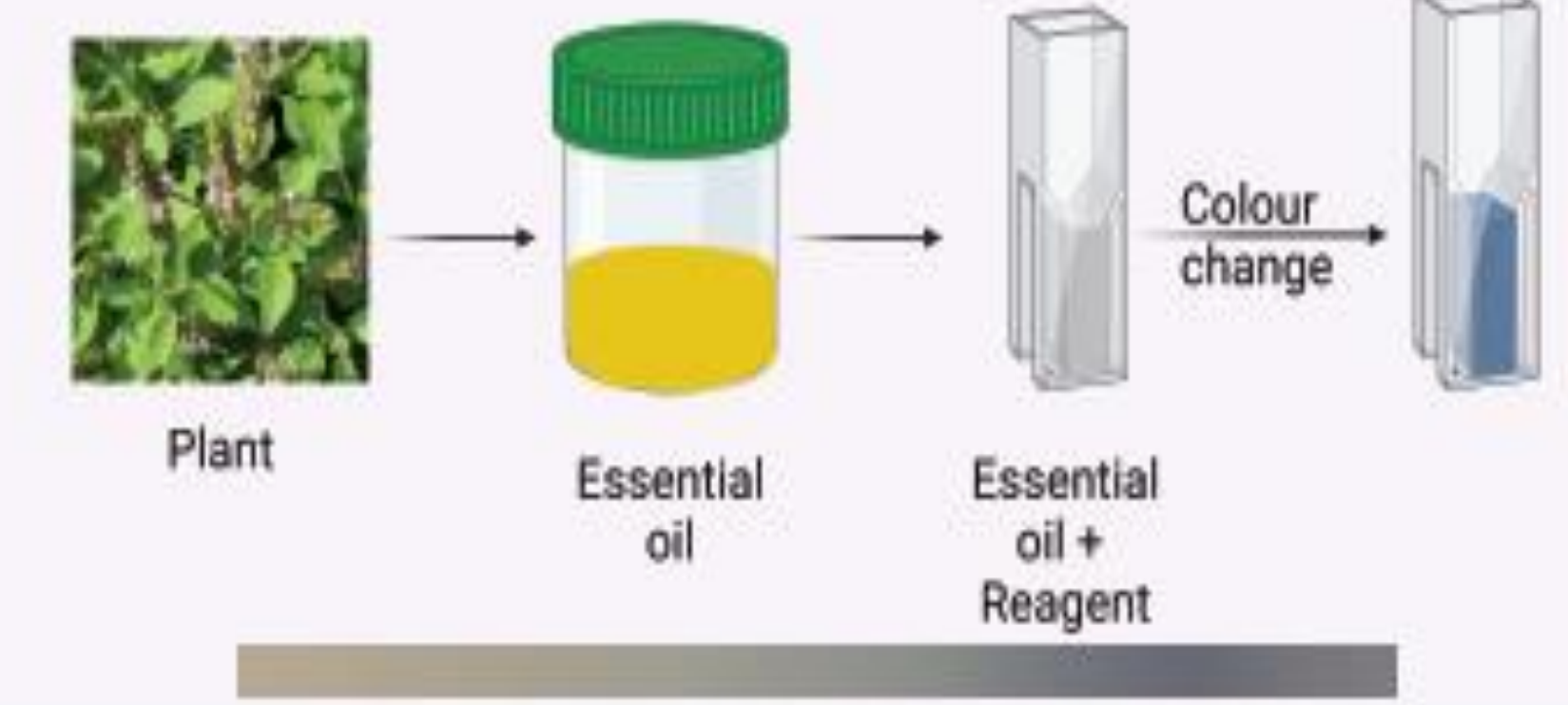
GCMS



Zetasizer



Total phenolic contents of essential oil



RESULTS

The yield of essential oil

0.09 ± 0.01 percent

Total phenolic contents

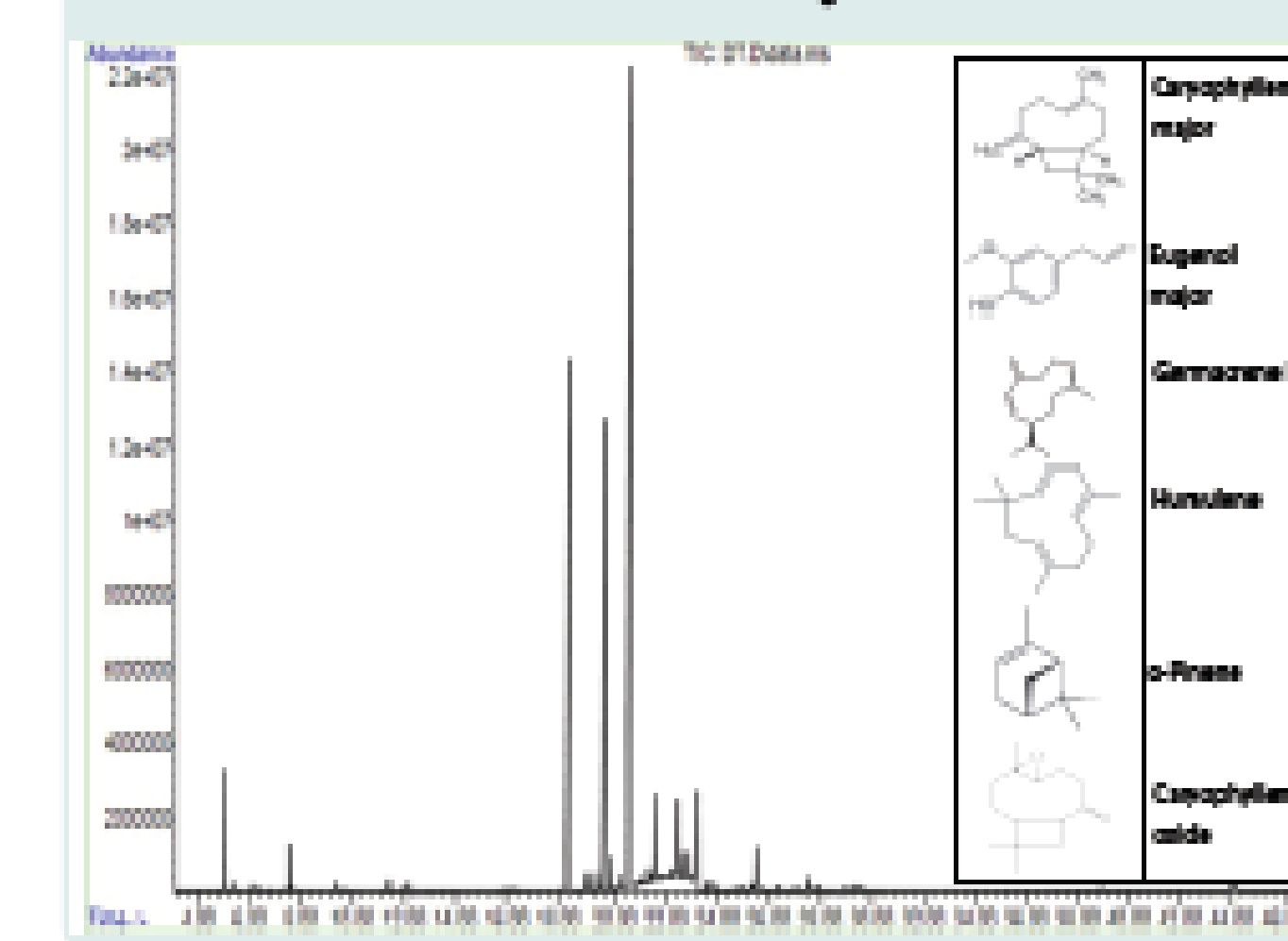
246.3 ± 1.15 mg equivalents of gallic acid per gram dry weight of the plant that proved the presence of phenolics or phenolics like compounds

Nanoformulation

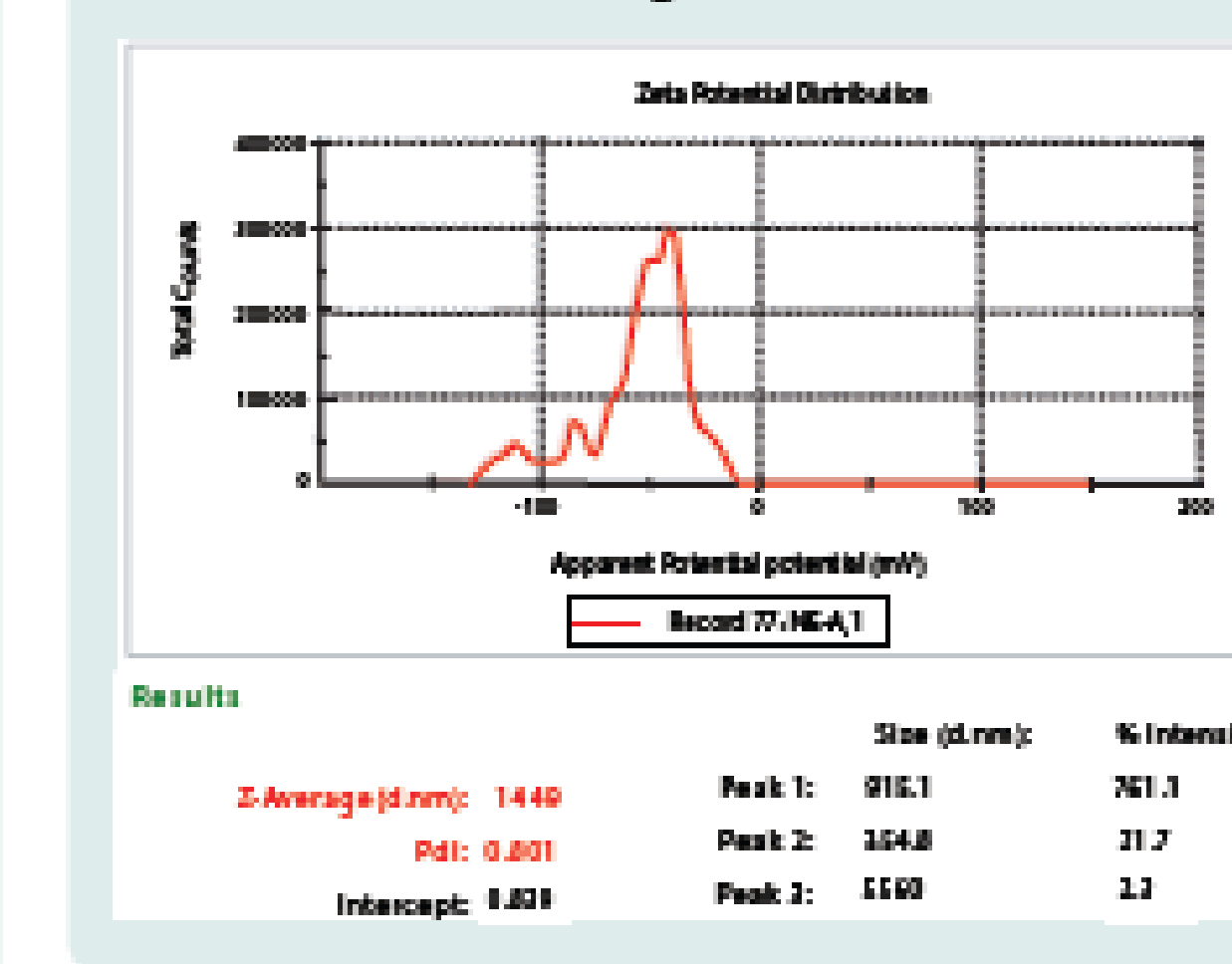


Test	Results
Visual inspection	Positive with stable emulsion
Conductivity	0.02 ± 0 μS
pH	7.19 ± 0.03
Viscosity	Relative viscosity = 2.778 ± 0.004 kg/m.s
Surface Tension	30.564 ± 0.002 Nm ⁻¹

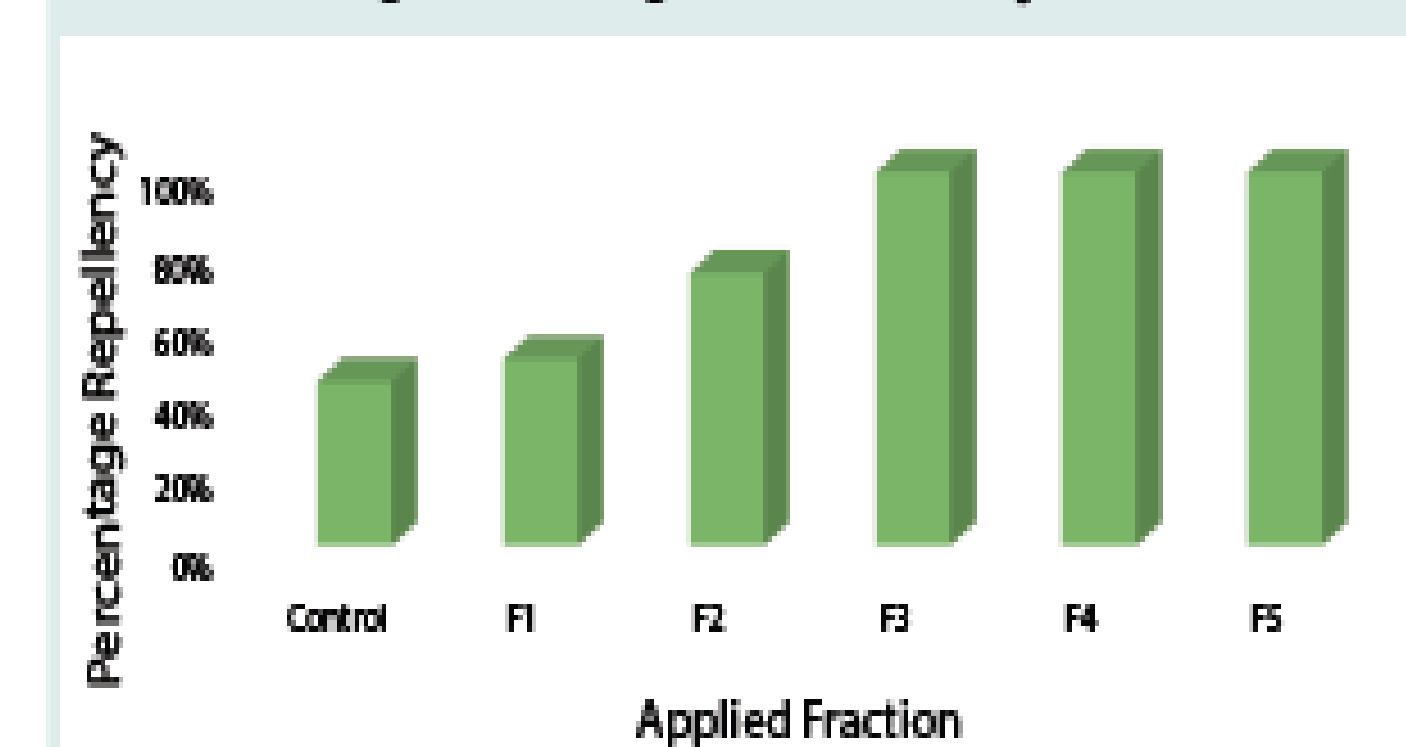
GC-MS analysis



Zeta potential



Mosquitoes Repellent activity



CONCLUSION

The study successfully developed essential oil-based nanoemulsions with *Ocimum tenuiflorum* e. oil, which suggested promising physical characteristics and stability. The nanoemulsions possessed substantial antioxidant activity and were excellent mosquito repellents, with 100% repellency at higher oil concentrations. Therefore, nano-formulation is preferred for mosquito repellent as it improves the efficacy and durability of essential oils, resulting in improved dispersion and enhanced mosquito repellency at higher essential oil concentrations.

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