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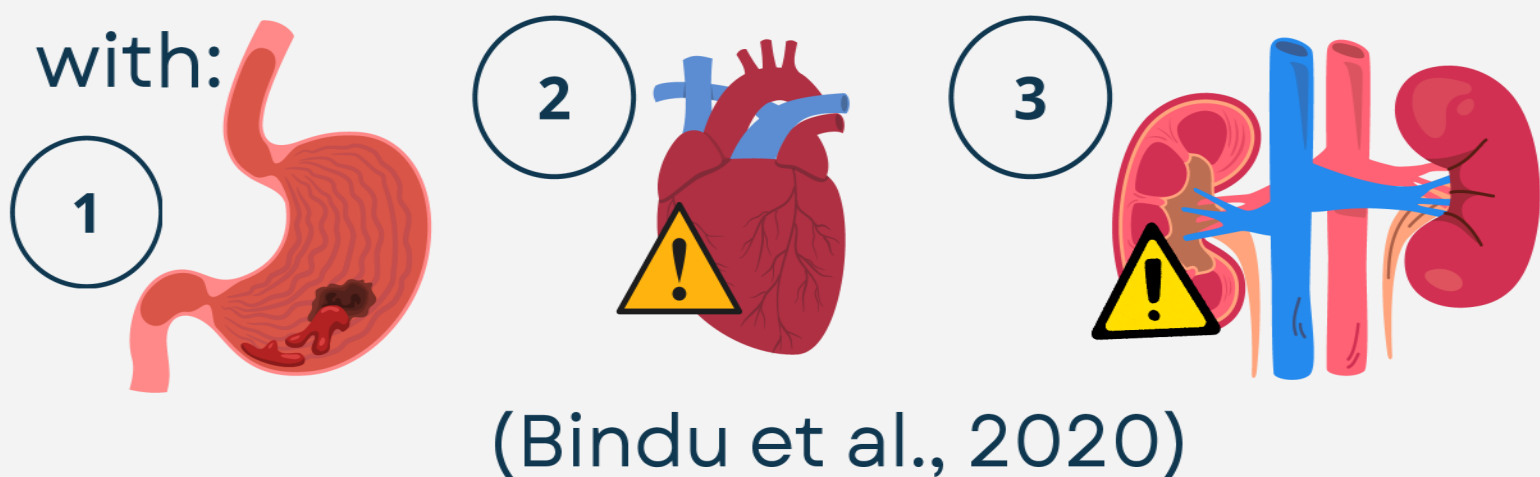
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BACKGROUNDS

The long term use of oral administration NSAIDs & corticosteroids is associated with:



(Bindu et al., 2020)

Topical drug delivery offers safer alternative by targeting the site of inflammation directly, minimizing systemic exposure. (Fitrianingsih et al., 2022).



- Traditionally used in Lombok Timur as wound treatment (Wirasisya et al., 2018).
- Rich in chalcones like 4-hydroxyderricin and xanthoangelol
- Demonstrated potential anti-inflammatory and antioxidant activity (Wahyuni et al., 2024)



Nanoemulgel

with better permeation, spreadability, and contact duration (Donthi et al., 2023; Tanuku et al., 2024)

- large molecules
- limited skin permeation

OBJECTIVE

The aims of this study is to form a nanoemulsion of *Angelica keiskei* ethanolic extract and optimize the gelling agent to produce a nanoemulgel for topical preparation

METHODS

1 EXTRACTION

Angelica keiskei herb extracted using 96% ethanol by sonication method

2 NANOEMULSION PREPARATION

Prepared using low-energy emulsification. Extra Virgin Olive Oil (EVOO) as oil phase, Tween 80-Propilen glikol as surfactant-co surfactant

3 NANOEMULGEL OPTIMIZATION

Conducted using Simplex Lattice Design (SLD) with Carbomer 940 and Na-CMC as variables, while pH, spreadability, and adhesiveness as evaluation parameters

Material	Concentration (%)
Na-CMC	0.5-1.75
Carbomer 940	0.25-1.5
TEA	0.5
Aquadest	ad 50
Nanoemulsions	50

4 OPTIMUM FORMULA VERIFICATION

using One-sample t-test (p-value > 0.05)

5 NANOEMULGEL CHARACTERIZATION

Including organoleptic, average globule size, polydispersity index, viscosity, pH, spreadability, adhesiveness, and FTIR spectra of the optimum formula.

RESULTS

1 EXTRACTION



Angelica keiskei ethanolic extract's yeild percentage: 27.82%

2 NANOEMULSION PREPARATION



- Transmittance (%) 90.55 ± 0.101
- Viscosity (cPs) 1968 ± 0.000
- pH 8.20 ± 0.000
- Emulsion Type Oil-in-Water (O/W)

3 NANOEMULGEL OPTIMIZATION

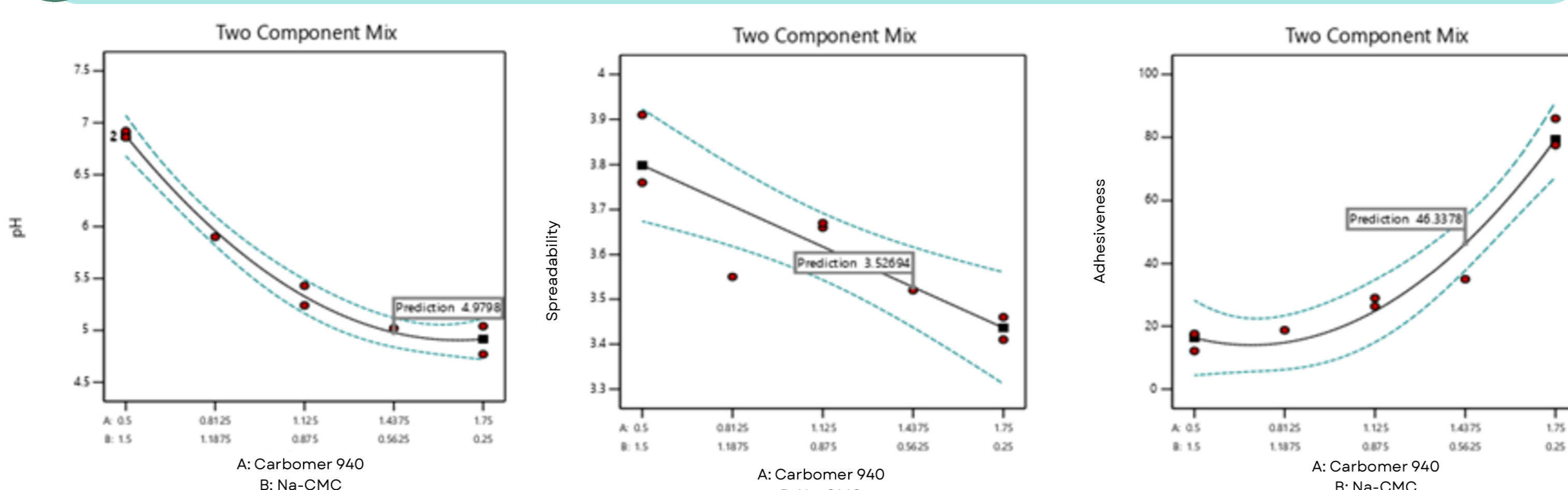


Fig 1. The two component mix of respons parameter (pH, spreadability, ada adhesiveness)

Table 1. Design Expert's Predicted Optimum Formulation

Carbomer 940 (%)	Na-CMC (%)	pH	Spreadability (cm)	Adhesiveness (s)	Desirability
1.401	0.599	5.006	3.538	43.199	1

4 OPTIMUM FORMULA VERIFICATION

There was no significant differences between the overall response data of the experimental formulation and the predicted formulation data from the software (p > 0.05).

5 NANOEMULGEL CHARACTERIZATION

Organoleptic	clear yellowish gel with particular odor
Average globule size	19.8 ± 0.3 nm
Pdl	0.602 ± 0.039
Viscosity	425.200 ± 1.732 cPs
pH	5.15 ± 0.22
Spreadability	3.54 ± 0.02 cm
Adhesiveness	44.47 ± 0.94 s

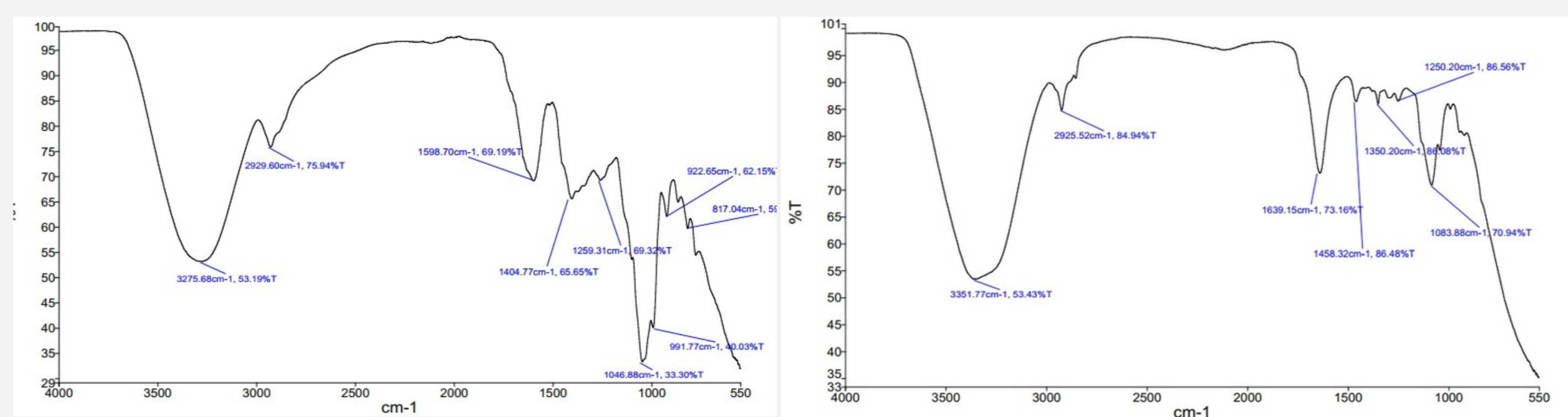


Fig 2. The FTIR spectra of *Angelica keiskei* extract (left) and Nanoemulgel (right)

CONCLUSION

The optimum nanoemulgel formulation of *Angelica keiskei* extract was successfully developed using 1.401% Carbomer 940 and 0.599% Na-CMC as gelling agents and exhibit desirable physical characteristics.

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