

بِسْمِ اللّٰهِ الرَّحْمٰنِ الرَّحِیْمِ

﴿فَتَعَالَى اللّٰهُ الْحَقُّ لَوْ لَّا تَعَجَّلَ بِالْقُرْءَانِ مِنْ
قَبْلِ أَنْ يُقْضَىٰ إِلَيْكَ وَحْيُهُ وَقُل رَّبِّ زِدْنِي عِلْمًا﴾

سورة طه الآية 114

DEDICATION

This thesis is dedicate to my husband, Mohammed Abbo, for all of his love and support; to my mother for her great encouragement and love; to my son and daughters, and to my brother and sister for the understanding and encouragement.

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First of all thanks to Allah, without his blessing , help and guidance, this work could not have be done.

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Abstract

Commercial samples of gum *Acacia* (GA) from *Acacia Senegal* Var *senegal* , *Acacia seyal* var *seyal* , *Acacia tortilis* var. *radiana*, and *Acacia Mellefera* samples were used as emulsifiers using D-limonine oil model emulsions. Emulsion stability performance was evaluated by turbidity measurements, particle size distribution and visual observation are several days at room temperature and 60c Emulsion destabilization occurred, in the first day, with particle migration (creaming and sedimentation), particle size increase (coalescence) and particle aggregation (flocculation), and the destabilization rate increased as storage time increased. Creaming of all gums stabilized emulsions was observed in day 1 at room temperature. After subtraction from day 0, sedimentation rates showed that *Acacia Senegal* var. *Senegal* and *Acacia Mellefera* were more stable than other stabilized gum emulsions

The question intended to be answered in this study is to demonstrate weather the emulsifying property of acacia gums under investigation, is due solely to the protein content of the gum or to the whole molecular component present in the gum. In this study, different gum concentrations (1%, 2%, 3%, 4% and 5%) and different concentration of gum protein (0.05%, 0.1%, 0.15%, and 0.2%) were used to prepare D-lemonine oil flavor emulsions, by homogenizing method,

with *Acacia senegal*, var. *sengal*, *Acacia seyal* var. *seyal*, *Acacia Tortilis* var. *radiana*, and *Acacia Mellefera*. Observed emulsion stabilities were graphically represented from turbidity measurements, and droplet size distribution of the emulsion systems were also investigated by laser diffraction method

The results indicated that using different types of gums resulted in significant differences in emulsion stability (ES). It has been found that differences in ES may be ascribed to difference in protein content, at 5% gum concentration and 0.2% gum protein concentration, *Acacia senegal* var. *sengal* was found to be the best emulsifier for D-lemonine and showed the most stable emulsion than other gums.

استخدمت في هذا البحث عينات تجارية من صمغ الأكاشيا (الأكاشيا سنغال، صنف السنغال الأكاشيا سيال صنف السيال ، الأكاشيا تورتيلاز صنف الراديانا ، والأكاشيا مليفرا) كعوامل استحلاب لمستحلب الزيت الطيار ذو النكهة ((D-lemonine) كانموذج. تمت دراسة درجة ثبات المستحلب بواسطة قياسات العكورة، حجم القطيرة والملاحظة بالنظر وذلك خلال فترة تخزين امتدت لعدة ايام. بدأ اضمحلال الثبات منذ اليوم الأول في صورة ترسبات (creaming and sedimentation)، اذدياد حجم القطيرة (coalescence) وتجمع الجسيمات مع بعضها البعض (flocculation) مع ملاحظة تناسب زيادة معدل فقدان الثبات مع ازدياد فترة التخزين. أظهرت مقارنة معدل الترسيب بين اليوم الأول والأيام التالية اعطاء اصماغ الأكاشيا سنغال والأكاشيا ملفرا أعلى معدل ثبات مقارنة مع الأصماغ الأخرى.

اهتم هذا البحث بدراسة اثر مكونات لصمغ العربي علي فاعلية الصمغ كعامل استحلاب في تحضير مستحلب الصمغ العربي (اصناف مختلفة) مع الزيت الطيار ذو النكهة (D-lemonine). تم تحضير مستحلب الزيت مع محاليل اصماغ الأكاشيا سنغال صنف السنغال، الأكاشيا سيال صنف السيال، الأكاشيا تورتيلاز صنف الراديانا، والأكاشيا مليفرا ودراستها بطريقة التجانس. لمعرفة أثر المكون الكلي واثر محتوى البروتين للصمغ استخدمت تراكيز مختلفة (5% , 4% , 3% , 2% , 1%) للصمغ وتراكيز مختلفة لمحتوي البروتين (0.05% , 0.2% , 0.15% , and 0.1%) اثناء تحضير المستحلبات، وقد تمت حسابات درجة ثبات المستحلبات تجاه عامل الزمن من قياسات العكورة، كما تم ايضا مقارنة درجة الثبات من دراسة تباين وتوزيع حجم قطيرات المستحلبات باستخدام مطيافية حيود أشعة الليزر.

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أوضحت نتائج الدراسة أن هنالك تفاوت ملحوظ في درجة ثبات المستحلب باختلاف نوع الصمغ المستخدم، كما دلت النتائج علي أن التفاوت في درجة الثبات يمكن ارجاعه الي التفاوت في محتوى البروتين.

اوضحت النتائج ان صمغ الأكاشيا سنغال صنف السنغال هو افضل عامل استحلاب يعطي درجة ثبات عالية لمستحلب الزيت الطيار (D-lemonine) عند تركيز المكون الكلي (5%) وتركيز محتوى البروتين (0.2%) تحت ظروف التجارب التي اجريت علي المستحلبات.

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