The Economic Importance Of The Extracted F: brous From The roots Of Thymelaea Hirsuta (L.) Enol.

THYMELLAEACEAE

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ABSTRACT

The Fibrous of Thymelaea hirsuta (L.) Endl. have been extracted From the epidermal root hairs. Morphological, physical and Chemical properties of the fibers were investigated. The present results revealed that the fibers have no economical value at present.

INTRODUCTION

The general morphology features of Thymelaea hirsuta (L.) is as indicated in the flora of Libya (Jafri, 1977) .it has a wide geographical range of distribution mostly along the coastal.

Area of Libya This species has been thought of as a fibrous producing plant that might have some economical importance and thus could be used for various industrial purposes.

Accordingly, it becomes interesting and worth studying the percent production and properties of its fibers. This study, therefore, is considered desirable to investigate the value of the extracted fibers of the Thymelaea hirsuta (L.) Endi. Hence the main concern of this paper is to examine the morphological, physical and chemical properties of the extracted fibers of Thymelaea hirsuta (L.) and its possible uses in industrial purposes.

MATERIALS AND METHODS

The investigation was carried out on specimens collected from three different populations: Yefren, Zuwarah and Sirt. The specimens were then cleaned and weighed Roots. were chopped longitudinally and extracted fibrous were then examined microscopically physically and chemically. Voucher specimens are deposited at the national Herbarium (ULT) . A1-Fattah Univ. Tripoli Libya

RESULTS

The external features of the fibers appear as folder ribbon. Physical properties of the fibers including length Colour brightness strength and percent elongation were all presented (Table. l) Both length and strength were measured while the fibers were fresh, however, upon dry conditions, the length and strength were much less.

(Table I) Physical properties of the fibers

Physical Properties	Results
Length	4-2mm
Colour	White
Brightness	Medium
Strength	5Kg
Percent elongation	%3.5

Chemical properties of the extracted fibers have been tested by adding different acids, alkalis and oxidizing agents, The effect of such chemicals on the nature of the fibers was variable, i.e. concentrated sulphuric acid (H_2 SO_4) dissolves the fibers, concentrated hydrochloric acid (HCL) changes the Colour of the fibers from white into brown colour, while concentrated nitric acid (HNO) changes the colour into yellow, acetic acid (CH COOH), on the other hand showed no effect at all. Such acids in dilute state, have no effect neither on the nature nor on the Colour of the fibrous. Both alkalis (hot and cold) and oxidizing agents showed no effect even on the nature and Colour of the fibers.

Chemical analysis of the fibers indicated the basic chemical components as well as their percentage (Table II).

Cellulose was the main chemical component of the fibers with a percentage of 62.3%.

It is also worth mentioning that percentage of fibers weight in relation to that of the roots and entire plant

body has been calculated and found to 5- 7% and 2-3% respectively the present study showed that **Thymelaea hirsuta (L.)** has some irritating effect on the human skin.

(Table II) Chemical components of fibrous and their percentage.

Components	Percentage
Cellulose	62.3
Legnin	7.3
Water	19.4
Ash	1.4
Pectin, lipids and Inorganic salts	9.1

DISCUSSION

The roots of Thymelaea hirusata (L.) were used as a source of fibers in an attempt to use it in various industrial purposes.

(Textile threads). The fibers were extracted from the epidermal root hairs and examined microscopically physically and chemically.

Physical properties indicated that the fibers of this species has no economical values.

The weight percent of the fibers as compared to that of the roots and entire plant body is meaning less.

This study revealed, however that species has some sort of irritating effects on human skin. The Authors, EL-Gadi et-al (1977), Heckere; et-al (1979), Evans et-al

(1983), Jafri (1977) and Rizk et-al (1984) pointed out the toxicity of Thymelaeaceae to live stocks.

While the present study showed that the fibers of Thymelaea hirsuta (L.) endl. have no industrial values, yet further investigation may reveal the importance of this species in other fields.

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الأهمية الاقتصادية لنبات المثتان في صناعة النسيج

ملخص الورقة العلمية باللغة العربية

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تهتم هذ الدراسة بإمكانية الاستفادة من نبات «المثتان»، واسمه العلمي Thymelaea hirsuta (L.) في استخراج بعض الألياف النسيجية المستخدمة في صناعة الحبال، وقد أُجريتْ هذه الدراسة من تجميع عيّنات للنبات المذكور من بعض المناطق بالجماهيرية، وتم التأكد من تعريف النبات وتوثيقه علميًّا بمعشبة كلية العلوم، وأجريت عليه الدراسات المعملية والمجهرية بقسم النسيج بمركز البحوث الصناعية، لمعرفة مركباته، وتحديد خواصه، وقوة الشد في الألياف النسيجية الناتجة منه.

وعند دراسة السعرات المأخوذة من الغلاف الخارجي لجذور النبات — وهي رطبة — اتضح أنها تمتاز بنعومة، وتظهر هذه الألياف تحت المجهر على شكل أشرطة، بها بعض النتوءات البسيطة، وعند تحليلها كيميائيا وُجد أنها تشبه الألياف اللحائية، من حيث احتوائها على مادة اللجنين، وتتراوح نسبة الألياف المستخلصة من جذور النبات بحوالي (5-7%) من وزن الجذر، ومن (2-3%) من وزن الشجيرة الكاملة، ووُجدَ أن الألياف تتميز ببعض الخواص الفيزيائية، فاللون أبيض، واللمعان متوسط، وطولها يتراوح من (2-4 مم)، وهي رطبة، كما أنها تفقد بعض الخواص عندما تجفّ، أما قوة الشدّ

فتصل إلى (5 كم)، ونسبة الاستطالة تصل إلى (3.5%)، كما تتميز ببعض الخواص الكيميائية، التي وُجِد أن تأثير الأحماض عليها يختلف باختلاف نوع الحامض وتركيزه ودرجته، وبالنسبة للقلويات فلا تتأثر بها، سواء كانت باردة أو ساخنة على حَدٍّ سواء.

من خلال التجارب التي أجريت يتضح لنا أن ألياف نبات «المثنان» المستخرجة من الجذور ملائمة جدًّا لصناعة الحبال، حيث إنها ذات طول جيد ومناسب، ولها مقاومة شد عالية، واستطالة معقولة، كما أنها ناعمة الملمس، ومتفاوتة السُّمْك، إلا أن هناك بعض الصعوبات، كسرعة جفافه، وعدم توفره في الطبيعة بكميات اقتصادية، وتتفتت أليافه بسهولة، كما تظهر بعض السُّمِّية للنبات بما يسببه من تهيج للجلد، كما أن توفر البدائل الصناعية كمادة «البولي بروليين» – المستخدمة في صناعة الحبال – تجعلنا نستبعد النبات المذكور في التطبيق العملي في هذا المجال، ونوصي بالاستفادة منه في بعض الصناعات الأخرى، كالورق مثلا.