EPH - International Journal of Applied Science
ISSN (Online): 2208-2182
Volume 06 Issue 03-August-2020

DOI: https://doi.org/10.53555/eijas.v6i3.92

THE CONTENTS OF SOME CHEMICAL COMPOUNDS OF LEAVES AND STEMS OF SOME HERBAL PLANTS (THYMY, ROSEMARY, SALVIA, MARJORAM AND HYBRID TEA ROSE) AT AL-GABAL AL-AKHDER REGION ,LIBYA .

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Abstract:-

This study was carried out to determine the chemical composition of five different types of herbal plants collected from Al-Gabal Al-Khder region (Libya). Both of leaves and steams of each plant were selected during this investigation.
The samples collected during winter and spring (2013) and including (Thymy, Rosemary, Salvia, Marjoram and Hybrid tea rose). The total lipid content, Natural Fibers, total protein addition to the acidic Fibers were measured.
The obtained data showed that, the contents of total Protein, Natural fibers, acidic fibers and total Lipid contents of the leaves were (19%, 60.12 %, 14.2% and 6.70%) , respectively. While the contents of the studied compounds of steam samples were (6.53%, 51.2%, 38.4% and 3.84%), respectively. The study concluded that the leaves containing high values of the investigated compounds compared with the steams samples,

Keywords:-*Herbal Plants- Total protein-Total lipids-Neutral acids and Libya*

INTRODUCTION

North Africa includes Algeria, Egypt, Libya, Morocco, Mauritania and Tunisia [1]. The region consists of the biota of semi-closed Mediterranean and Red seas, with diverse ecosystems constituting About 10,000 vascular plant species [2]. It has arid, Semi-arid and a range of sub-climatic zones. The Mediterranean basin is one of the 25 internationally recognized biodiversity hot spots in the world and it has extraordinary plant diversity and species endemism. Morocco has the highest rate of species endemism EPH - International Journal of Applied Science | ISSN: 2208-2182in the region [3]. About 70% of plant species found in the wild have medicinal, aromatic and other uses. Over 10% of these have the potential for commercial exploitation as a source of drugs and pharmaceuticals [4 and 5]. Medicinal and aromatic plants are an important source of drugs in Libya. The country has a vast area and a variety of geographic conditions suitable for cultivation of aromatic and medicinal plants. There is scope for the establishment of small-scale phytochemical industries. There is a lack of R&D activities in the field of medicinal plants. As a result of over-exploitation, some plants have become rare and endangered. There is also an imminent threat of genetic erosion of medicinal plant species because of an increase in heavy grazing, human use and drought hazards. The economic constraints of the country mean that international assistance is needed for collection and conservation of the genetic resources of endangered species of medicinal value [1].

MATERIALS AND METHODS

Sampling:

Five different herbal plants samples were collected from Al-Gabel Al–Kadar Region during Winter-Spring 2012/2013 Seasons, The Samples including (Thyme, Rosemary, sage (salvia), Marjoram and Hybrid tea rose).

Chemical analysis of studied Herbal plants:

Determination of total protein:

Total nitrogen was determinate according to the modified micro-Kjeldahls method as described by [6]:

- An accurate weight (0.2 g) of the weight was placed in a digestion flask followed by addition of 25 ml conc. H_2SO_4.
- The flasks were placed in inclined position and heated gently for 10 min then samples were boiled vigorously and continued boiling for 2 hours, longer after samples became red.
- The flasks were left to cool and 1 ml of a mixture of $HCLO_4$. H_2SO_4 (1:1) V/V was added to each flask.
- Flasks were heated again until samples became clear.
- Flasks were left to cool and diluted to 100ml by distilled water.
- Total nitrogen was determined according to the modified Micro-Kjeldahl method as described by the [6].
- The nitrogen percent was calculated according to the following equation: 127

N% in the sample= ml of acid × normality- ml of KOH × normality × (0.014×100)/ weight of sample

The total protein contents were calculated using the conversion factor 6.25.

Determination of the total lipid contents:

The crude lipid content in the samples was determined according to the procedure described by [6] where as a known weight of the sample (5gm) was finally grinded and extracted with petroleum ether (b.p.60-80 $C^{o)}$ using Soxhlet apparatus. The solvent was then removed and the percentage of total lipids was calculated.

Determination of Neutral detergent fiber (NDF) and acid detergent fiber (ADF): Neutral detergent fiber and acid detergent fiber of sample were analyzed according to the method described by [7].

RESULTS AND DISCUSSION

Total Protein:

Total Protein in Leaves of Herbal Plants:

The Total Protein in Leaves were fluctuated between (11.93%-19%) where, the high value was found in leaves of *Thyme*, on the other side the low value was found in *Rosemary* and the total protein in the other leaves were (12, 13.42 and 16%) in the following plants *Salvia, Hybrid tea rose* and *Marjoram*, respectively (Tables :1-5 and Figs :1-5).

By comparing the present results with those reported by **[**8] which found the following contents (0.904 –1.68 mg/ml), (0.656 –1.65 mg/ml) in Leaves and Stems, there is agreement between the both results. Also the data were agreement with these recorded by [9], where the total protein contents in his study were (14.46%).

Total Protein in Stems of the studied herbal plants:

The high value of total protein in Stems of the studied plants was recorded in *Rosemary* (9.70%), and the low value was found in *Salvia* (4.92%). While the total protein contents in the other plants were (6.10, 6.53and 7.39%) in the Stems of *Hybrid tea rose, Thyme and Marjoram*, respectively (Tables 1-5 and Figs 1-5).

By comparing the total protein content in Stems and leaves, in this study can say that, the leaves have high values. The present data are higher that reported in the Stems (0.65-1.65%) which found in [8] study. The protein compounds are very important to human body to product ATP, also they are sources of nitrogen atoms and its compounds, and also have many function of human activity.

Neutral Detergent fiber (N.D.F):
Neutral detergent fiber (N.D.F) of the leaves of studied herbal plants in tables (1-5) and figs (1-5). Showed that the higher amount of N.D.T was detected in *Salvia* (73.7%) followed by *Marjoram*, *Rosemary*, *Hybrid tea rose* and *Thyme* (71.2, 70.4, 69.12 and 60.12%), respectively. The amounts of Neutral detergent fiber were (40.79, 45, 51.2, 55.1 and 60.1%) for Stems of *Marjoram*, *Hybrid tea rose*, *Rosemary* and *Salvia*, respectively. It clear from that data there is no large different between Leaves and Stems contents.

Acid Detergent fiber (A.D.F):
The higher amount of acid detergent fiber was found in Stems of *Marjoram* (49.7%) followed by Stems of *Hybrid tea rose*, *Thyme*, *Salvia* and *Rosemary* (45.8, 38.4, 31.3 and 31%), respectively, while A.D.F content in leaves were (4.0, 4.9, 5.6, 8.5 and 14.2%) for *Salvia*, *Marjoram*, *Hybrid tea rose*, *Rosemary* and *Thyme*, respectively; (tables 1-5 and figs 1-5).

Total lipids:
Total lipids in leaves:
Tables (1-5) and figs (1-5), showed the higher amount of total lipids was found in leaves of *Hybrid tea rose* (11.85%) and the low amount was in found leaves of *Thyme* (6.70%) followed by (7.91, 9.20 and 10.3%) for *Marjoram*, *Rosemary* and *Salvia*, respectively.

Total Lipid in Stems of herbal plants:
The total lipid in stems were fluctuated between (4.21 and 2.11%) where, the high value was found in Stems of *Rosemary*; the low value was found in *Marjoram* and the total lipids in the other Stems were 3.12, 3.73 and 3.84 in the following plants *Hybrid tea rose*, *Salvia* and *Thyme*, respectively. The present data are harmony or less than the results found in [10] study, where the total lipids contents in *Thyme* was (1.55%) .But lower that found in *salvia* leaves (31%) in [8] study. The lipids are very important biochemical compounds, because our give a large amount of energy for human body, as example the palmetic acid give 9791 K.Jol.

Table (1): Chemical composition of leaves and Stems of *Thyme* plant.

Chemical composition content %	Leaves of *Thyme*	Stems of *Thyme*
Total Protein	**19.00**	**6.53**
Neutral detergent fibre	**60.12**	**51.2**
acid detergent fibre	**14.2**	**38.4**
Total lipids	**6.70**	**3.84**

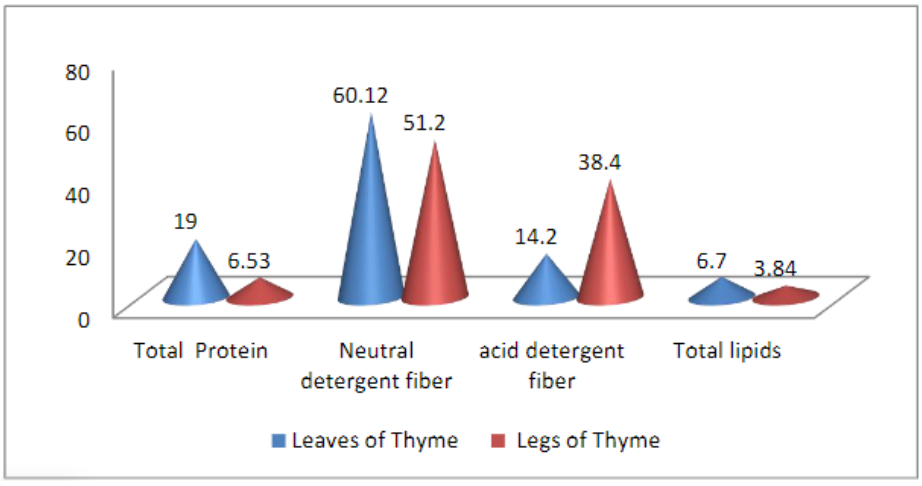

Figure (1): Chemical composition of Leaves and Stems (Legs) of *Thyme* (%)

Table (2): Chemical composition of Leaves and Stems of *Rosemary* Plant.

Chemical composition content %	Leaves of *Rosemary*	Stems of *Rosemary*
Total Protein	**11.93**	**9.70**
Neutral detergent fiber	**70.4**	**55.1**
acid detergent fiber	**8.5**	**31.0**
Total lipids	**9.20**	**4.21**

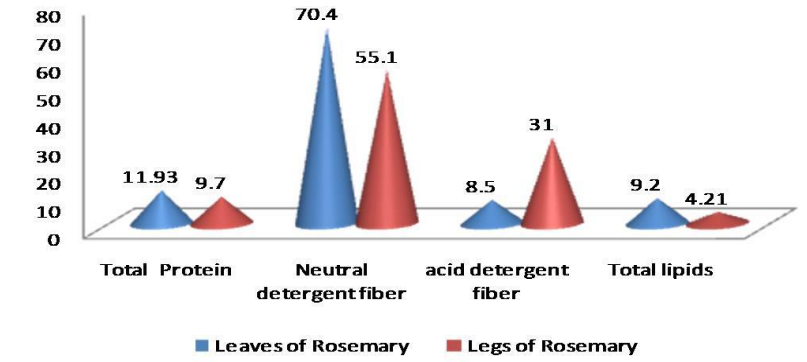

Figure (2): Chemical composition of Leaves and Stems (Legs) of Rosemary (%).

Table (3): Chemical composition of Leaves and Stems of *Salvia* Plant.

Chemical composition content %	Leaves of *Salvia*	Stems of *Salvia*
Total Protein	**12.0**	**4.92**
Neutral detergent fiber	**73.7**	**60.1**
acid detergent fiber	**4.0**	**31.3**
Total lipids	**10.3**	**3.73**

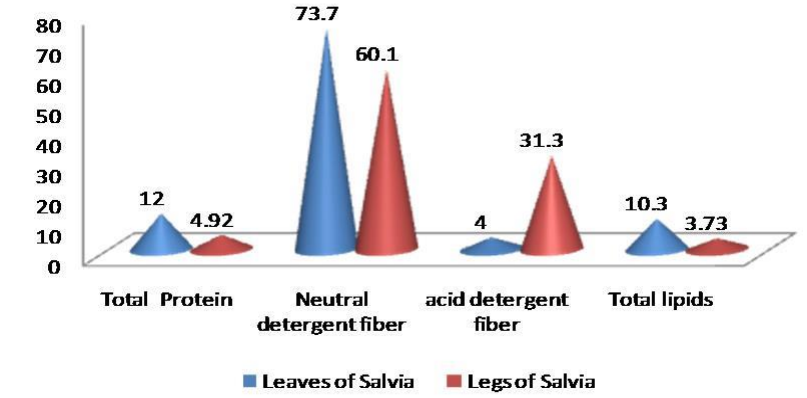

Figure (3): Chemical composition of Leaves and Stems (Legs) of *Salvia* (%).

Table (4): Chemical composition of Leaves and Stems of *Marjoram* Plant

Chemical composition content %	Leaves of *Marjoram*	Stems of *Marjoram*
Total Protein	16.0	7.39
Neutral detergent fiber	71.2	40.79
acid detergent fiber	4.9	49.7
Total lipids	7.91	2.11

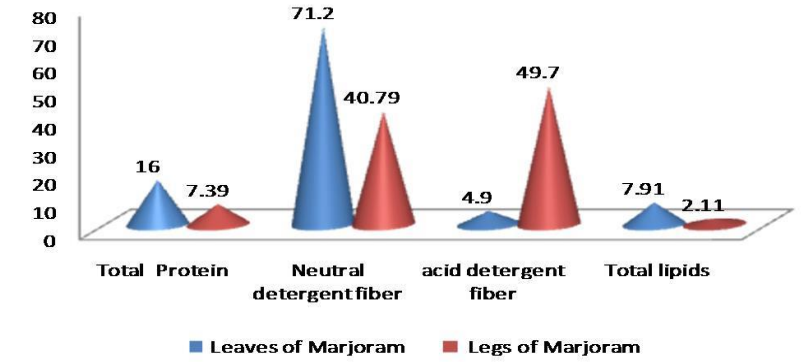

Figure (4): Chemical composition of Leaves and Stems (Legs) of *Marjoram* (%).

Table (5): Chemical composition of Leaves and Stems of *Hybrid Tea Rose*

Chemical composition content %	Leaves of *Hybrid tea rose*	Stems of *Hybrid tea rose*
Total Protein	**13.42**	**6.10**
Neutral detergent fiber	**69.12**	**45.00**
acid detergent fiber	**5.6**	**45.8**
Total lipids	**11.85**	**3.12**

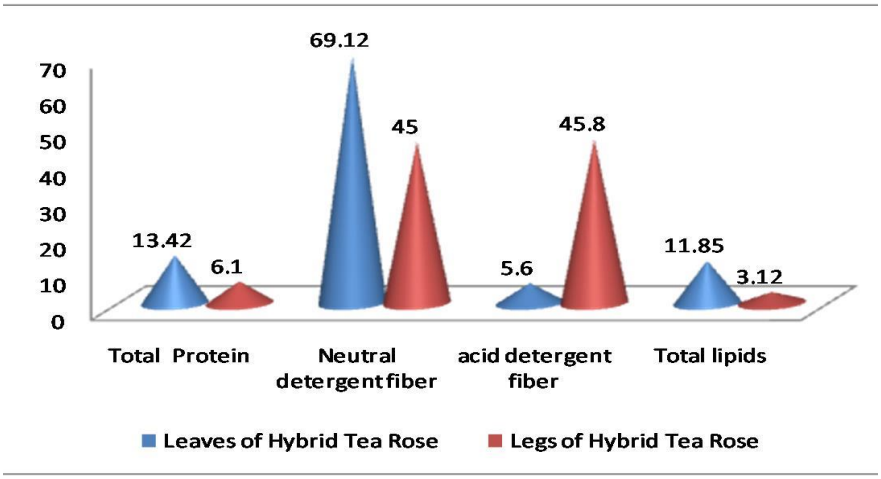

Figure (5): Chemical composition of Leaves and Stems (Legs) of *Hybrid tea rose* (%).

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