QUANTITATIVE ESTIMATION OF TOTAL PHENOLIC CONTENTS OF THE ESSENTIAL OIL- “ANVILLEA GARCINI” THROUGH THE HYDRODISTILATION

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ABSTRACT
A detailed investigation was carried out utilizing Anvillea garcini an essential oil plant. This plant was collected from the southern Iran (Bandar Abbas) and collected plant was subjected to the standard hydro distillation method for the extraction of essential oil. Further, extracted essential oil was experimented and observed the total phenol content through following the standard procedures and utilized the total phenolics reagent, fulin–ciocalteau and gallic acid standard curve were determined that, the essential oil of Anvillea garcini containing a significant amount of phenolic compounds was clearly observed and recorded in this research work.

KEYWORDS: Anvillea garcini, Hydrodistillation, Essential oil, Phenolic compounds.

INTRUDUCTION
The natural resources-obtained plants materials are ever-remedial or ever-acceptable medicines for various diseases in the ayurvedic field/world. The small genus Anvilleae garcini (tribe Inulea, subtribe Inulinae, family Compositae) is a plant and placed in the Inula grou.¹ By utilizing this small plant, a reinvestigation of a sample collected in the south of Iran (40 km North of the Persian Gulf) gave,² belong to the Asteraceae family. This family is well marked in their characteristics and cannot be confused with any other. It is popularized that, a
large majority of the plants belonging to this family are herbaceous while trees and shrubs are comparatively rare.\textsuperscript{[3]}

However, this plants \textit{Anvillea garcini} (Figure 1) were widely used by several researchers for the folk medicine as excellent heating, for the treatment of dysentery, gastrointestinal disorders and has been reported to have hypoglycemic activity.\textsuperscript{[4, 5]} Further, if we glance once in the history, the medicinal plants have a long history of use by human beings for cure of various ailments as enlisted in\textsuperscript{[6, 7, 8]} research articles published by reputed American journals. However, as it is understood that, most of the medicinal plants are of great importance to the health of individuals and respected communities in the world. Moreover, the medicinal values of these plants lie in some chemical substances that produce a definite physiological, biological and other action on the human body. The most important of these bioactive constituents of plants are alkaloids, tannins, flavonoids, and phenolic compounds.\textsuperscript{[9]} Over the past 20 years, there has been a lot of interest in the investigation of natural materials as sources of new antibacterial, antifungal and anti-micro-organisms-toxic producing agents. Among these the antibacterial agents are very hurdles and dangerous in the various way as mentioned in several research articles. Further, many reports showed the effectiveness of traditional herbs against microorganisms, as a result, plants are one of the bedrocks for modern medicine to attain new principles.\textsuperscript{[10]} In this direction, keeping in the mind, the importance of phenolic compounds and its utilization for various purposes in the field of medicinal, pharmaceutical, \textit{etc} industry. Hence, a detailed research work was carried out to understand the total phenolic content through different extracts from traditional medicinal plants have been tested utilizing the essential oil plant \textit{Anvillea garcini}.

![Figure 1 Anvillea garcini](image)

**Reagents and chemicals:** The chemicals used in this experiment \textit{i.e}, gallic acid, folin–ciocalteau reagent, methanol, sodium carbonate were purchased from the Merck, Germany.
Collection of samples: All parts of the plant *A. garcini* were collected in May 2013 in southern Iran (Bandar Abbas). Further, samples of plants were identified and plants collected at room temperature (25°C) were dried in shade area and experiment was carried out in the Herbal Medicine Research Center, Bandar Abbas, Iran.

Extraction of essential oil: All parts of the plant *A. garcini* were extracted by hydro distillation method for 3.5 hrs using a clevenger-type apparatus. The extracted essential oil was dried over anhydrous sodium sulphate and the purified oil was filled in small vials, which is tightly sealed and stored in a refrigerator (4°C) until further analysis.[11]

Measurement of total phenolics: Total phenolic contents of the essential oil were determined by spectrophotometrically according to the Folin-Ciocalteu colorimetric method.[12] The prepared essential oil (500 µl) was mixed with 5 ml of Folin-Ciocalteau reagent (previously diluted 10-fold with distilled water) and allowed to stand at 25°C for 15 minutes. A 4 ml sodium bicarbonate solution (10.59 g/L) was added to the mixture. After 15 minutes at 25°C absorbance was measured at 765 nm using a UV-visible spectrophotometer. Total phenolics were quantified by calibration curve obtained from measuring the absorbance of a known concentration of gallic acid standard (25-150 µg/ml in 50% methanol). The concentrations are expressed as milligrams of gallic acid equivalents (GAE) per 100g of dry weight.[13] The total phenolic content of gallic acid was determined by a standard curve. Experiments was performed three times and data obtained was recorded and statistically analyzed with ± SD (standard deviation) determined as per the procedure.

RESULT AND DISCUSSION
The data obtained through quantitative estimation of total phenolic compounds through overall the total phenol reagent, Fulin-Ciocalteu essential oil and Gallic standard curve is recorded and presented in the Table-1and same is presented in Figure-2. The researchers earlier have reported in the plant that, the phenolic compounds due to their antioxidant activities and free radical scavenging abilities are widely distributed in plants.[14] Therefore, which have gained much attention and potentially have beneficial implications for human health.[15] Hence, observed research data is clearly showed that, the total phenolic plant was significantly and it is due chemical composition, myristicin the most component constituent of the essential oil in A.garcini plant. Hence, the observed research data of total phenolics from the essential oil A. *garcini* will be generate a avenue in
the future and utilize it for several purposes in the field of yurvedic, pharmaceutical, medicinal, etc.

**Table 1: Total phenolic content of essential oil *Anvillea garcini***

<table>
<thead>
<tr>
<th>Plant</th>
<th>Total phenolic content (mgGAE/g DW)</th>
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<tr>
<td><em>A. garcini</em></td>
<td>0.0011 ± 0.0009</td>
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![Graph showing total phenolic content of essential oil *Anvillea garcini*](image)

**Figure 2: Total phenolic content (mgGAE/g DW) of essential oil *Anvillea garcini***

**ACKNOWLEDGEMENTS**

The first author wishes to express sincere thanks to the Faculty and Chairman (Head of the Department), Department of Studies in agriculture Science, Islamic Azad University, Darab, Fars, IRAN and Herbal Medicine Research Center, Bandar abbas, Iran for extending the laboratory facilities to carry out the research work.

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