

Pharmaceutical analysis of Leonurus Cardiaca L.

Rami Raad Obaid, BS, Ghazaryan M. Arashaluys

Eurasia International University, Department of Pharmacy, Yerevan, Armenia

*rami2323raad@gmail.com , arshaluysghazaryan11@gmail.com

Introduction. Leonurus cardiaca L. (motherwort in English, Echte Herzgespann in German, agripaume in French) is a Lamiaceae family perennial herb. The plants can reach a height of one meter, with hollow aerial stalks emerging from the rhizomes. The leaves are palmately lobed and have stiff hairs on them. Flowers are pink and about 1 cm long, arranged in 10-20 clusters in the leaf axils of the last 10-15 knots. The herb, which originated in Asia and southeastern Europe, is now widely used for therapeutic purposes all over the world. L. cardiaca was a good candidate for developing alternative treatments in both traditional eastern and modern medicine because of its potential application in treating of a variety of cardiac disorders as well as female-specific afflictions. Apart from its traditional medical usage, motherwort is used as a seasoning in a variety of vegetable soup recipes, particularly lentil or split pea soups, or as a garnish (1).

Tachyarrhythmia, and a variety of other cardiac diseases have all been treated with L. cardiaca in traditional medicine, treatment of neurological, cardiac, and gynecological problems, as well as thyroid dysfunctions, are some of the other known therapeutic applications. Its antioxidant, antibacterial, and anti-inflammatory capabilities, as well as its therapeutic benefits on digestive diseases and bronchial asthma, are all supported by scientific research. In L. cardiaca, different classes of secondary metabolites have been discovered. Flavonoids (e.g., flavonols like quercetin and rutin, flavones like genkwanin and apigenin, and their glycosides), phenylethanoid glycosides (e.g., verbascoside and lavandulifolioside), iridoids (e.g., harpagide), labdane diterpenes (e.g., forskolin), etc (2) are present in the herb.

Motherwort contains monoterpenes, diterpenes, triterpenes, nitrogen-containing chemicals, phenylpropanoids, flavonoids, phenolic acids, volatile oils, sterols, and tannins, as well as volatile oils, sterols, and tannins. Internally,

preparations of the herb have traditionally been used to treat nervous heart issues and digestive problems. They've also been used externally in wounds and skin inflammations, as well as for bronchial asthma, climacteric symptoms, and amenorrhoea. The herb and its formulations have mildly negative chronotropic, hypotonic, and sedative effects. Its antibacterial, antioxidant, anti-inflammatory, and analgesic properties, as well as its effects on the heart and circulatory system, have all been proven in pharmacological tests. Clinical investigations have shown that it possesses with sedative and hypotensive properties (3).

Methods and materials:

Leonurus cardiaca herb was collected in Kotayk Province t.Tsaghkadzor, during the flowering period (June , 2021). The identification of plant was carried out at the Department of Pharmacognosy, plant herbs were deposited and are available at the Herbarium of the Institute of Botany, National Academy of Sciences of Armenia, Yerevan.

Crude drug was prepared previously by the special technique for examination by means of "Microscopical examination technique" based on article, (NPh XIII, ex. 2, p. 277-285). Tendering hot method was used. The grounded seeds were boiled in 5% of alkaline (NaOH) for 5 minutes. Than the solution was removed and the raw material was washed and left in water. Soaked pieces of seeds were placed between subjective glass and cover glass. In advance the plant was covered be water-glycerin mixture (1:1) drop. Examination was carried out by Microscope ISOBASE EW10X/20 lens.

Extractible materials were organic, biological active, low molecular and secondary metabolic products. Determination of extractible matter was carried out. The fixing method for determination of quantitative constituents of biological active substances (Pharmacopea XIII,1.5.3.0006.15. ex II, 2015) (4) was applied.

One gram of raw material was added to 50ml 50% alcohol solution. It was boiled 30 min on water bath connected with condenser. After cooling, it was filtrated,

measured the amount of liquid extract, then dried on water bath in porcelain bowl. Carefully collected powder of dry extract was weighted.

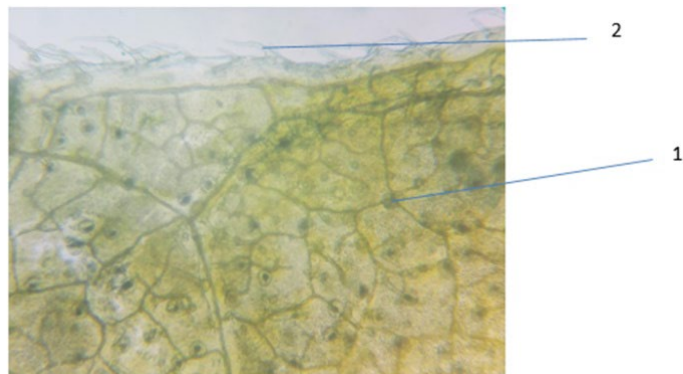
Just 3 grams of powdered plant was transferred to a weighing bottle. The sample was subjected to a temperature of 105° C for four hours followed by cooling in desiccators and weighted (Brazilian Pharmacopoeia V, 2010). The drying process was calculated from the point when the temperature in the drying shelf was equal to 105 °C. The operation was repeated twice, for 2 hours and 30 minutes. The results of three determinations were evaluated in terms of weight percentage of the samples amounts using the equation presented in the citation (Pharmacopea XIII,1.5.3.00067.15. ex II, 2015).

Three grams of the powder was transferred into the porcelain crucibles which were previously calcined, cooled and weighed. The samples were charred in a muffle furnace at 450 °C for 6 hours. After cooling in a desiccator, they were weighed on an analytical scale. This procedure was repeated twice, for 4 hours and 2 hours. The amount of ash was calculated using methods of Pharmacopeia. (Pharmacopea XIII,1.5.3.0006.15. ex II, 2015).

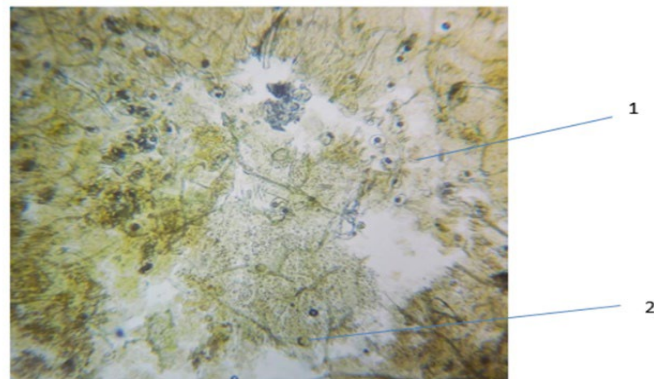
Results and discussion:

In contemporary Pharmacognostic analysis application of the raw material identification microscopical method is valued very highly. Particularly, more than two major distinguishing features carried out in that fields. In order to obtain the objective evaluation of the main anatomical distinguishing features of raw material during the investigation *Leonurus Cardiac* L. is supposed to be collected during fruiting period.

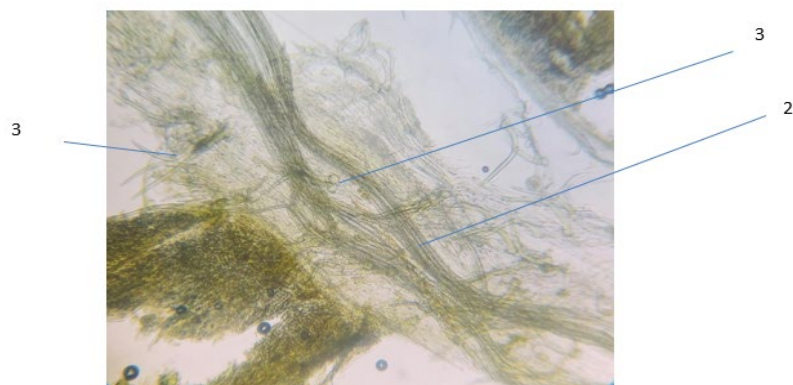
The leaves microscopic slides are presented by the pictures 1,2:



Picture 1. Upper surface of epidermis. *1. Essential oil glands, 2. Covering trichomes.*



Picture 2. Lower surface of epidermis. *1. Headed trichomes, 2. Vascular tissue, 3. Simple trichomes.*



Picture 3. Features of leaves. *1. Essential oil glands, 2. Stomata.*

Microscopical examination of upper surface of leave showed than epidermal cells with sinuous sidewalls are situated in the higher density on the underside. The vascular tissue was well visible, especially along the central vein. Vessels were spirally and annularly thickened. Numerous various trichomes were marked. Headed trichomes were 1-2 cell stalk with 1-2 cell large or small spherical head. Covering trichomes were uniseriate, whole or fragmented.

Three-five celled simple trichomes were noticeable. The trichomes at the places of attachment were dilated, the walls were noticeably thickened, the surface of the hair was warty.

Table 1 Commodity indicators of Leonurus (% , $X \pm S_E$)

<i>Commodity indicators</i>	<i>Extractable matter</i>	<i>Total ash</i>	<i>Moisure</i>
<i>Dry raw material</i>	16.45%± 0,05	7.67% ± 0,02	11.33% ± 0,12

Conclusions

Anatomical - distinctive features of Leonurus as the raw material of Armenian flora have been revealed and identified.

Within the framework of preliminary standardization, commodity indicators of raw material were approved. Total ash was equal to $7.67 \pm 0.02\%$, humidity - $11.33 \pm 0.12\%$.

Alcohol extract of medicinal raw materials contained 16.45% of extractible matter.

References

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