I J R B A T, Issue (X) Vol (III) Sept 2022: 188-192 e-ISSN 2347 – 517X
A Double-Blind Peer Reviewed & Refereed Journal OPEN ACCESS Original Article

INTERNATIONAL JOURNAL OF RESEARCHES IN BIOSCIENCES, AGRICULTURE AND TECHNOLOGY

Anatomy of Reproductive System in Japanese Quail, *Coturnix coturnix japonica*, Embryo

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Communicated :28.05.2022 Revision: 31.05.2022 & 30.06.2022 Accepted: 06.08.2022 Published: 30.09.2022

ABSTRACT:
Extraction is the process for the separation of natural products from various organs/parts of the plans. One can select a particular technique for effective extraction of a particular natural component from the plant organ. The extraction process depends on the constituent occurring in the plant. The extraction of the bio-molecules is very important as far as the pharmaceutical, agrochemical and cosmetic industries are considered. Thus, for qualitative and quantitative estimation of natural products (phytochemicals) present in the plant material, the extraction and isolation is the first and essential step.*Moringaoleifera* is a fast-growing and drought resistant tree of the family Moringaceae. All parts of the *Moringa* tree such as leaves, seeds, roots and flowers are suitable for human and animal consumption. It has numerous applications in cooking throughout its regional distribution. Addition of moringa to the snacks can add nutritive value to the snacks. It is used as vegetables and as a traditional herbal medicine. It is also used for water purification.The leaves, which are rich in protein, minerals, β-carotene and antioxidant compounds are used not only for human and animal nutrition but also in traditional medicines. Considering the importance of the plant in the medical field, its extraction study is undertaken The aim of this study is to optimize different parameters for effective extraction of the bioactive phytochemical components (Natural Products)from the Moringaoleifera plant with the help of Microwave Assisted Extraction Technique. The outcome of this study will be helpful for further standardization of the methods in pharmaceutical and herbal study.

Keywords: - *Moringaoleifera*, extraction, phytochemicals, Microwave Assisted Extraction,menstrum, natural products, marc.

INTRODUCTION:

Extraction: The plant organs such as seed, root, stem, bark, leaves, flower, fruit, and seed contain active natural products (phytoconstituents). These active phytoconstituents include alkaloids, glycosides, tannins, resins, steroids, oils, phenols, and flavonoids. Extraction is a technique which is used for separation of the chemical components from the various parts/organs of the plant. The chemical component is dissolved into specifically selected solvent or mixture of solvents called as menstrum. The other un-dissolved material is known as marc. Extraction is essential for obtaining remedial portion of dosage form from the plant raw material. The bioactive component is obtained in its pure form i. e. it must be free from unwanted inert content.The extraction is performed to determine qualitative composition of the contents and to find each component quantitatively.The bioavailability and pharmacological activities of the components extracted is also determined. Drying, grinding, screening, selection of solvent and extraction are the steps in the process. The efficiency of the extraction process depends on various factors such as Nature of the solvent, Particle size, Temperature, P^H, Solvent-solute ratio, and Time of Extraction. There are different methods of extraction. These methods includePercolation, Infusion, Maceration, Soxhlet Extraction, Supercritical Fluid Extraction(SCFE), Counter Current Extraction(CCE), Ultrasonic Assisted Extraction(UAE) and Microwave Assisted Extraction(MAE). Among these methods researchers have selected the recent and effective Microwave Assisted Extraction(MAE) method for extraction of natural products from leaves of *Moringaoleifera.*

MATERIALS AND METHODS

Researcher collected fresh leaves of *M. oleifera* from Kolhapur region farms. The collected plant leaves were cleaned properly and dried at room temperature under roof in absence of direct sunlight. Herbarium was prepared and authentication was done. The authentication was done by faculty of Botany in the K. B. P. College, Islampur. The effect of different parameters such as type of solvent, particle size of the plant material, solvent-solute ratio, and time was studied. Here the solvent used for extraction is methanol in its pure form. This solvent is excellent for high recovery of biologically active components. It is cheap and widely used in drug industry. The collected *M. oleifera* leaves (sample) were dried at room temperature. After complete drying, they were subjected to grinding to convert into powder form. Then the material in powdered form was screened with the help of sieves having mesh number of 44, 30, 18, and 10. Powder from each sieve was isolated from one another and was stored in the well labelled dry plastic container.

Solvent/solute ratio:Solvent/solute ratio in ml/g is as shown in the table 2

Extraction Time:

For effective extraction, four time periods were followed at room temperature. With the help of time factor, extraction and dispersion duration was studied. Time of extraction was finalized as – 5, 10 and 15 minutes.

During experimental procedure, 10 g of plant leaves sample was taken into 500 cm^3 round bottom flask. Then methanol was added as per the solvent/solute ratio i. e. 50 cm^3 (I),100cm^3 (II),and250 cm^3 (III). Then each sample was extracted for 5 minutes, 10 minutes and 15 minutes. The extraction process was performed in presence of microwave at 100 W. After extraction, whole content was filtered and concentrated under vacuum using rota evaporator below 60 ^oC. It was dried, scrapped off and its weight was taken. Then its yield was calculated.

RESULT AND DISCUSSION

The present study revealed that particle size 18 and 10 shows better extraction yield than other particle size. Also extraction time and solvent/solute ratio determines extraction yield. This method showed maximum yield i.e.2.11 g. In this MAE method, for 5 minutes extraction time, MO/MAE/B/I/5 has shown minimum percentage yield of 03.97 % w/w and MO/MAE/D/III/5 has confirmed maximum percentage yield of 13.72 % w/w. For 10 minute extraction time, MO/MAE/B/I/10 has shown 04.90 % w/w i.e. lowest percentage yieldand MO/MAE/D/III/10 has shown highest percentage yield i.e. 19.12 % w/w. For 15 minutes extraction time, MO/MAE/B/I/15 has shown lowest percentage yield i. e. 04.40 % w/w while MO/MAE/D/III/15 has shown 21.16 % w/w which is highest percentage yield.

CONCLUSION:

Thus, for effective extraction of natural products from *M. oleifera* leaves, this Microwave Assisted Extraction Method is effective and can be used safely.

CONFLICT OF INTEREST

Author declares no conflict of interest about the present study.

ACKNOWLEDGEMENT

My special thanks goes to Ashutosh P. Kamble for his support in the experimental work, faculties in Department of Botany and Chemistry, K. B. P. College, Islampur. Authoralso thanks Mr. Milind S. Jadhav, Kameri, District Sangli, owner of the *M. oleifera*agriculture land(farm).

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Table 1: Code of particle size

Sr. No.	Particle Size	Code
1	44	A
2	30	B
3	18	C
4	10	D

Table 2: Solvent/solute ratio

Sr. No.	Solvent/solute ratio	Code
1	05:1	I
2	10:1	II
3	25:1	III

Table 3: Percentage yield of natural products from *M. oleifera* leaves by Microwave Assisted Extraction method at different parameters

Batch No.	**Batch Code**	**Particle Size**	**Solvent/solute ratio**	**Extraction Time**	**Yield (Grams)**	**Percentage Yield**
1	MO/MAE/A/I/5	44	5:1	5	0.4902	04.90 %
2	MO/MAE/B/I/5	30	5:1	5	0.3975	03.97 %
3	MO/MAE/C/I/5	18	5:1	5	0.5236	05.23 %
4	MO/MAE/D/I/5	10	5:1	5	0.4523	04.52 %
5	MO/MAE/A/II/5	44	10:1	5	1.0234	10.2 %
6	MO/MAE/B/II/5	30	10:1	5	1.402	14.02 %
7	MO/MAE/C/II/5	18	110:1	5	1.2102	12.10 %
8	MO/MAE/D/II/5	10	10:1	5	1.1502	11.50 %
9	MO/MAE/A/III/5	44	25:1	5	1.1488	11.48 %
10	MO/MAE/B/III/5	30	25:1	5	1.2378	12.37 %
11	MO/MAE/C/III/5	18	25:1	5	1.3190	13.19 %
12	MO/MAE/D/III/5	10	25:1	5	1.3720	13.72 %
13	MO/MAE/A/I/10	44	5:1	10	0.5102	05.10 %
14	MO/MAE/B/I/10	30	5:1	10	0.4902	04.90 %
15	MO/MAE/C/I/10	18	5:1	10	0.5990	05.99 %
16	MO/MAE/D/I/10	10	5:1	10	0.4905	04.90 %
17	MO/MAE/A/II/10	44	10:1	10	1.2410	12.41 %
18	MO/MAE/B/II/10	30	10:1	10	1.2002	12.00 %
19	MO/MAE/C/II/10	18	10:1	10	1.4810	14.81 %
20	MO/MAE/D/II/10	10	10:1	10	1.3419	13.41 %
21	MO/MAE/A/III/10	44	25:1	10	1.5009	15.00 %
22	MO/MAE/B/III/10	30	25:1	10	1.6090	16.09 %
23	MO/MAE/C/III/10	18	25:1	10	1.8602	18.60 %
24	MO/MAE/D/III/10	10	25:1	10	1.9123	19.12 %

25	MO/MAE/A/I/15	44	5:1	15	0.4502	04.50 %
26	MO/MAE/B/I/15	30	5:1	15	0.4402	04.40 %
27	MO/MAE/C/I/15	18	5:1	15	0.5082	05.08 %
28	MO/MAE/D/I/15	10	5:1	15	0.4906	04.90 %
29	MO/MAE/A/II/15	44	10:1	15	1.0020	10.02 %
30	MO/MAE/B/II/15	30	10:1	15	0.9902	09.90 %
31	MO/MAE/C/II/15	18	10:1	15	1.2149	12.14 %
32	MO/MAE/D/II/15	10	10:1	15	1.0962	10.96 %
33	MO/MAE/A/III/15	44	25:1	15	1.7703	17.70 %
34	MO/MAE/B/III/15	30	25:1	15	1.8909	18.90 %
35	MO/MAE/C/III/15	18	25:1	15	1.9876	19.87 %
36	MO/MAE/D/III/15	10	25:1	15	2.1163	21.16 %