Research Article

Formulation and quality evaluation of Coriander Triphala tablet

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ABSTRACT

Background: Coriander Triphala is one of the famous drugs in traditional medicine which is consisted of Terminalia chebula, T. bellirica, Phyllanthus emblica, Coriandrum sativum, almond oil and honey. Traditional dosage forms should be converted to modern forms for better acceptance and suitable characteristics and stability. Objective: In the present investigation, the traditional form of Coriander Triphala was converted to film coated tablet and quality control of the tablet was performed. Methods: The fruits of T. chebula, T. bellirica, Ph. emblica, C. sativum in equal proportions along with almond oil and honey in different proportions were used for tablet formulation with other excipients. Sixteen formulations were made and after pre-formulation studies, twelve of them were selected for making tablet. Prepared tablets went through primary quality control tests such as weight variation, friability, hardness and disintegration time. Finally, the best formulation was coated by green colored water soluble material and its physicochemical characteristics were determined. Results: Among different formulations, the tablet consisted of 98 mg of each species, 14 mg almond oil, 148 mg honey along with lactose, Avicel PH-102, croscarmellose sodium, PVP K30, magnesium stearate and silicone dioxide was the best one. Weight variation, hardness, disintegration time, total tannins content as pyrogallol were found 1225 mg ± 5%, 20 kp, 25 min and 64.19 mg/tablet, respectively. Over 90 % of tannins were released after 60 min during dissolution test. Conclusion: The formulated tablet with suitable characteristics is a good substitution for traditional form and could be produced in industrial scale after complementary clinical trial studies.
1. Introduction

Plants have been widely used as medicine to treat diseases in the traditional systems from the ancient times throughout the world [1]. Therapeutic effects of many of medicinal plants have been documented so far. However, consumption of traditional formulations is inconvenient to the patients especially due to inappropriate taste and appearance [2]. Hence, many attempts have been performed to prepare new formulations in order to improve patient compliance and acceptability. During last decades, awareness of herbal formulations has been increased, but information about quality control parameters which are available for allopathic formulations is not available for majority of herbal products; therefore, it is necessary to develop different herbal formulations and their evaluations [3]. In Iranian traditional medicine, many natural prescriptions are used for treatment of various diseases. Coriander Triphala is an Iranian traditional formulation (semi-solid form) consisting of fruits of Terminalia chebula (three kinds of fruits: unripe, adult and fully matured fruits), T. bellirica, Phyllanthus emblica and Coriandrum sativum along with almond oil and honey. It is widely prescribed as a purgative, gastrointestinal and mental tonic [4-6].

Terminalia chebula Retz. is a plant species belonging to Combretaceae family. Three types of T. chebula fruits exist with different stages of maturity: small myrobalan: the unripe fruit, yellow myrobalan: the adult stage of the fruit after the development of seed, and large myrobalan: the fully matured fruit [7, 8]. All of these fruits are used in traditional medicine for different purposes. The fruits are rich in tannins which are pyrogallol type such as chebulic acid, chebulagic acid, corilagin and gallic acid [9]. This plant has been extensively used in traditional medicine systems especially in Iranian traditional medicine, Ayurveda, Unani and Homoeopathic medicine and has become a cynosure of modern medicine. It is mainly used in treatment of constipation, diarrhea, ulcers, gastroenteritis, asthma, cough, dyspnea, dyspepsia, hemorrhoids, skin diseases, memory loss and depression [10].

Terminalia bellirica (Gaertn.) Roxb. is another constituent of Coriander Triphala which mainly consists of tannins components such as gallic acid, ellagic acid, methyl gallate, ethyl gallate, chebulagic acid and hexahydroxydiphenic acid ester. Plant fruits are laxative, astringent, anthelmintic, antipyretic and are useful in hepatitis, bronchitis, asthma, dyspepsia, diarrhea and cough and also are used as hair tonic [11, 12].

Phyllanthus emblica L. (Phyllanthaceae) is one of the most common medicinal herb used in traditional medicine. It has been used as medicine and nutritious tonic, containing tannins, vital amino acids and vitamins. It is considered as a source of vitamin C and minerals. The fruits have been utilized for management of various diseases such as diabetes, hyperlipidemia, CNS disorders and opthalmic diseases from the ancient time [13].

Coriandrum sativum L. (Apiaceae) is one of the oldest spices in the world. The use of this plant dated back to around 1550 BC. The seeds were used in many prescriptions as carminative agent and for the treatment of fever, diarrhea, vomiting, indigestion, memory loss and also as a tonic. The most important constituents of the fruits are the essential and fatty oils [14].

According to Iranian traditional medicine prescriptions, herbal powder of Coriander Triphala (equal proportion of each six plants) is mixed with almond oil and then, honey is added to the mixture. The last product is a semi solid
dosage form with astringent and bitter taste which has low acceptability by the patients; therefore, transforming the traditional form to a modern dosage form is necessary. Tablet is one of the most acceptable dosage form among patients. Moreover, tablet is the most favorite dosage forms among manufacturers due to high stability, easier transportation and storage [15, 16]. Manufacturing of tablets should be followed by quality control tests to ensure consistent efficacy and safety as well. In the present investigation, Coriander Triphala semi solid traditional form was formulated as a film coated tablet and its characteristics were evaluated.

2. Methods

2.1. Plant materials

All required herbs were purchased from local markets in Tehran, Iran. They were identified in Traditional Medicine and Materia Medica Research Center (TMRC), Shahid Beheshti University of Medical Sciences, Tehran, Iran and their specimens were deposited at TMRC Herbarium for further reference (No. HMS 537-HMS 542, for T. bellirica, Ph. Emblica, T. chebula (small myrobalan), T. chebula (yellow myrobalan), C. sativum and T. chebula (large myrobalan), respectively). Honey and almond oil were prepared from Honey Taj and Tuba companies, Iran, respectively.

2.2. Chemicals

Lactose was purchased from Armor Co. (France). Avicel PH-101 and -102 were prepared from FM (Ireland). Croscarmellose sodium was from Hiranya cellulose product Co. (India). Magnesium stearate was from Sun Here Co. (China) and colloidal silicon dioxide was prepared from Evonik (Germany). Folin-Ciocalteu and hide powder were from Merck (Germany) and Sigma (USA), respectively. Other chemicals and solvents were provided from Merck (Germany).

2.3. Instrumentation

The hardness of the tablets was determined using a hardness tester (Model TB H28, Erweka, Germany). Friability tester, disintegrator and dissolution tester were from Noavaran Co., Iran. The tablets were pressed with single-punch tablet machine (Noavaran Co., Iran).

2.4. Physicochemical analysis of crude herbs

Quality control assessments were performed for each herbal sample. Total ash, loss on drying, alcohol and water soluble extractives were determined and evaluated according to pharmacopeia [17]. Total tannins content for Triphala plants and essential oil content for C. sativum were measured [17, 18].

2.5. Pre-formulation studies

According to traditional prescriptions, equal proportions of each the six plants should be powdered. Almond oil is added to T. chebula, T. bellerica and Ph. emblica powders (Triphala powder). Then the powder is mixed with coriander and honey, respectively. The usual dosage of this formulation in Iranian traditional clinics is 1.5-2 g/day.

In this experiment, the equal proportion of herbal materials along with different amounts of almond oil, honey and different excipients were used to prepare sixteen formulations. The amount of active constituents in each tablet was considered 750 mg. All species in equal portion were powdered. Triphala powders were mixed and almond oil was added to the mixture. Then C. sativum powder was added. Honey and PVP K30 were used in different portions to make granules. The granules were dried and passed via sieve 14. Lactose, Avicel PH-101 and -102,
colloidal silicone dioxide, croscarmellose sodium and magnesium stearate were added to granules (Table 1). Then, the flowability of formulations was determined on the basis of Carr’s index, Hausner ratio and angle of repose and those formulations with good flowability characteristics were selected for making tablet [19, 20].

Table 1. Different formulations of Coriander Triphala tablet

| No. | Herbal material | Almond oil | Honey | PVP K30 | Lactose | Avicel PH-101 | Avicel PH-102 | SiO₂ | CCS | MgSt | Weight (mg) |
|-----|----------------|------------|-------|---------|---------|---------------|---------------|------|-----|------|-------------|
| F1  | 630            | 20         | 100   | 80      | 350     | -             | -             | 10   | -   | 10   | 1200        |
| F2  | 696            | 14         | 40    | 80      | 350     | -             | -             | 10   | -   | 10   | 1200        |
| F3  | 546            | 13         | 191   | 80      | 350     | -             | -             | 10   | -   | 10   | 1200        |
| F4  | 546            | 13         | 191   | 80      | 350     | -             | -             | 10   | 30  | 10   | 1230        |
| F5  | 546            | 13         | 191   | 80      | 350     | -             | -             | 10   | 50  | 10   | 1250        |
| F6  | 546            | 13         | 191   | 80      | 350     | -             | -             | 10   | 50  | 10   | 1250        |
| F7  | 546            | 13         | 191   | 80      | -       | -             | 310           | 10   | 40  | 10   | 1200        |
| F8  | 630            | 20         | 100   | 80      | 280     | -             | -             | -    | 70  | 10   | 1200        |
| F9  | 630            | 20         | 100   | 45      | 315     | -             | -             | 10   | 70  | 10   | 1200        |
| F10 | 630            | 20         | 100   | -       | 315     | -             | -             | 10   | 70  | 10   | 1155        |

\[ a \]: PVP K30; Polyvinylpyrrolidone K30; \[ b \]: SiO₂: colloidal silicon dioxide; \[ c \]: CCS: Croscarmellose sodium; \[ d \]: Magnesium stearate; \[ e \]: 30 mg intragranular and 20 mg extragranular; \[ f \]: 20 mg intragranular and 30 mg extragranular

2.6. Preparation of Coriander Triphala tablets

Regarding the pre-formulation studies, best formulations (F1-6, F11-16) were pressed by concave, oval, single-punch tablet machine. Then physical properties of tablets were evaluated. Considering the results, the more suitable formulation (16) was selected. To improve the appearance of the tablet, protect the components, especially essential oil of C. sativum from degradation and evaporation during storage and to cover the unpleasant taste, smell and color, the tablets were coated using a ready-to-use water soluble film coating powder with green color (concentration 20 % in water). Film coating process was performed by using coating machine.

2.7. Quality control of Coriander Triphala tablets

The prepared tablets (core and coated tablets) underwent various physicochemical tests and pharmaceutical parameters, including
appearance, diameter, thickness, weight variation, friability, disintegration time, hardness, assay of total tannins and dissolution behavior according to USP [21].

2.8. Assay of total tannins as pyrogallol in tablets
Since tannins are the main constituent in tablet ingredients, the content of total tannins as pyrogallol was assessed in tablets according to BP [17]. Briefly, ten tablets were powdered. To 100 mg of the drug powder in a 100 mL volumetric flask, 80 mL of water was added and heated for 30 min. Then the mixture was diluted to 100 mL with water. Two mL of this solution was mixed with 1 mL of Folin-Ciocalteu reagent and 10 mL of water and diluted to 25 mL with 29% solution of sodium carbonate. After 30 min in dark place, the absorbance was measured at 760 nm using water as the compensation liquid. This absorption is related to total phenols. For quantitation of tannins, the content of polyphenols not adsorbed by hide powder were determined as following: to 10 mL of the extract, 100 mg of hide powder was added and shaken vigorously for 60 min. The mixture was filtered and the above-mentioned process was performed on the mixture. The difference between two measured absorbance is related to the tannins. Total tannins content of Coriander Triphala tablet was determined by using calibration curve of pyrogallol as standard material.

2.9. Dissolution test of Coriander Triphala tablet
Dissolution test was performed on six tablets. The USP apparatus 2 (paddle) at a speed of 100 rpm, with 900 ml distilled water as the dissolution medium at 37 ºC was used and the samples were analyzed after 30, 45 and 60 min. The percentage of released total tannins was determined using 5 ml filtered portions of the samples.

2.10. Stability assessment of Coriander Triphala tablets
Laboratory accelerated stability test was performed on Coriander Triphala film coated tablets. Fifty tablets were packed in a polyethylene container and kept at 40 ºC ± 2 temperature and 75 % ± 5 humidity for 6 months. Then the tablets characteristics were determined [22].

Table 2. Results of quality control tests of Coriander Triphala tablet constituents

| Name                     | Test   | Total Ash % | Loss on Drying % | Alcohol soluble extractive % | Water soluble extractive % | Total tannins as pyrogallol % | Essential oil % |
|--------------------------|--------|-------------|------------------|------------------------------|---------------------------|-------------------------------|-----------------|
| *Terminalia chebula*     | (Small myrobalan) | 2.54        | 3.49             | -                           | 44.01                      | 26.72                         | -               |
| *Terminalia chebula*     | (Yellow myrobalan) | 2.68        | 2.66             | (NMT 10)                     | 50.97                      | 26.14                         | -               |
| *Terminalia chebula*     | (Large myrobalan)  | 2.75        | 3.02             | (NMT 10)                     | 61.07                      | 24.00                         | -               |
| *Terminalia bellirica*   |        | 2.85        | 2.47             | (NMT 5)                      | 51.99                      | 11.02                         | -               |
| *Phyllanthus emblica*    |        | 3.62        | 2.81             | (NMT 10)                     | 53.39                      | 7.00                          | -               |
| *Coriandrum sativum*     |        | 6.16        | 2.62             | (NMT 10)                     | 0.4 %                      | (NLT 0.3 %)                   | -               |

*Acceptable range according to British Pharmacopoeia; There is no monograph for small myrobalan in Pharmacopoeias.
3. Results

The results of physicochemical analysis of crude herbs have been reported in Table 2. All plants showed acceptable physicochemical characteristics according to British Pharmacopoeia [17].

In Iranian traditional texts, the percentage of almond oil and honey has not been determined. Almond oil should be added to Triphala powders in minimum concentration just in amount to change the powder color. The amount of honey is different in prescriptions and its exact percentage is also unclear; therefore, during recent study, in all formulations, proportion of six herbals was considered equal and the concentrations of almond oil and honey have been changed to obtain 750 mg of natural ingredients. In the first formulation, due to high amount of almond oil, the finished product was oily. Moreover, disintegration time was found over 60 min. In order to overcome these problems, oil and honey concentrations were reduced but honey reduction, resulted low hardness and compressibility which cause some problems during coating. In the next process, oil reduction and honey addition were applied but due to honey rising, disintegration time was increased. So, the usage of a disintegrant such as croscarmellose sodium was necessary [23]. It was added to the formulations in different quantities as intra- and extragranular excipient (F4, 5, 6), but no reasonable disintegration time obtained. Accordingly, it was decided to change lactose with Avicel which had not only binder, diluent and lubricant effects but also had disintegrant property. However granule formation was not reasonable along with weak flowability characteristic (F7). Thus, Avicel was replaced by lactose, SiO2 omitted and croscarmellose sodium percentage was increased which resulted low flowability (F8). In the next step, it was decided to decrease PVP K30 and honey (F9) and in F10, PVP K30 was omitted. But in the two last formulations weak granules obtained and flowability was not suitable. Accordingly, honey and PVP K30 were increased again, however Avicel PH-102 was used instead of lactose, SiO2 was increased and magnesium stearate decreased (F11). This formulation was good but the tablet weight was high which induced pressure on the pressing machine. In the next formulation (F12), croscarmellose sodium was deleted and Avicel PH-101 as an intragranular disintegrator was added but disintegration time was again high. So, croscarmellose sodium was added but the weight was increased (F13). Then the weight was decreased by reduction of PVP K30 and croscarmellose sodium but it showed no satisfactory results (F14). During the next formulation, Avicel PH-101 and croscarmellose decreased but low compressibility was found (F15). Finally, in order to obtain good compressibility, Avicel PH-101 was omitted and 60 mg lactose was added to the formulation (F16) which resulted completely suitable formulation regarding to physical properties such as disintegration time, friability, hardness and compressibility. It was good enough for coating process. Physical properties of different tablet formulations have been summarized in Table 3.

The coated tablets were light green in color, with mild odor of C. sativum. Assay of total tannins as pyrogallol showed 64.36 and 64.19 mg/tab in core and coated tablet, respectively. Assessment of dissolution behavior of tablets in 30, 45 and 60 min showed after 60 min 91.5 % of tannins were released which is in agreement with USP criteria (NLT 75 % in 60 min) (Table 4).

Physicochemical characteristics of Coriander Triphala tablets have been shown in Table 5. The stability studies demonstrated no significant changes in tablets attributes.
Table 3. The results of physical characteristics of different formulation of Coriander Triphala

| No. | Physical characteristics                                      |
|-----|-------------------------------------------------------------|
| F1  | Oily, good hardness, high disintegration time               |
| F2  | Oily, moderate hardness and compressibility                 |
| F3  | Good hardness, high disintegration time                     |
| F4  | Good hardness, high disintegration time                     |
| F5  | Good hardness, high disintegration time                     |
| F6  | Good hardness, high disintegration time                     |
| F11 | Good compressibility and disintegration time, high weight   |
| F12 | Good compressibility, high disintegration time              |
| F13 | Good compressibility and disintegration time, high weight   |
| F14 | Good compressibility and disintegration time, induced pressure on instrument |
| F15 | Moderate compressibility, good disintegration time          |
| F16 | Good compressibility, hardness, disintegration time and friability, suitable for coating |

Table 4. Dissolution behavior of Coriander Triphala tablet

| Sample no. | Percentage of total tannins as pyrogallol release |
|------------|---------------------------------------------------|
|            | Core                                            | Coated tablet |
|            | 30 min | 45 min | 60 min | 30 min | 45 min | 60 min |
| 1          | 71.2   | 90.1   | 96.3   | 65.3   | 88.6   | 94.1   |
| 2          | 68.3   | 92.3   | 97.4   | 63.07  | 89.2   | 93.2   |
| 3          | 68.5   | 95.1   | 93.2   | 63.51  | 86.5   | 89.3   |
| 4          | 72.5   | 89.3   | 93.6   | 66.2   | 85.4   | 91.3   |
| 5          | 70.9   | 88.2   | 95.4   | 65.2   | 85.9   | 92.6   |
| 6          | 73.5   | 89.2   | 95.8   | 63.5   | 87.3   | 88.3   |
| Mean ± SD  | 70.8 ± 2.1 | 90.7 ± 2.6 | 95.2 ± 1.6 | 64.5 ± 1.3 | 87.2 ± 1.5 | 91.5 ± 2.3 |

Table 5. Physicochemical characteristics of Coriander Triphala tablets

| Test                        | core                                | coated tablet                  |
|-----------------------------|-------------------------------------|--------------------------------|
| Appearance                  | Oval, biconvex, brown tablet         | Oval, biconvex, light green tablet |
| Weight variation            | 1192 mg ± 5 %                       | 1225 mg ± 5 %                  |
| Thickness                   | 6.96 mm ± 5 %                       | 7.00 mm ± 5 %                  |
| Length                      | 20.19 ± 2 %                         | 20.20 ± 2 %                    |
| Diameter                    | 9.67 ± 2 %                          | 9.70 ± 2 %                     |
| Disintegration time         | 19 min                              | 25 min                         |
| Dissolution, 60 min         | 95.2 %                              | 91.5 %                         |
| Hardness                    | 18 kp                               | 20 kp                          |
| Assay of total tannins as pyrogallol | 64.36 mg/tab                       | 64.19 mg/tab                   |

4. Discussion

Triphala is a popular formulation in traditional medicine containing the fruits of *T. chebula*, *T. bellirica* and *Ph. emblica* that is used as a single form or in combination with other species for different diseases. Coriander Triphala which is mixture of Triphala, *C. sativum* fruits, almond oil and honey, is used in Iranian traditional medicine from ancient’s times [4, 5]. In this investigation, the traditional formulation has been converted to tablet form in order to better acceptance, more efficacy and stability. This
formulation contains honey, causing some problems during formulation. The results showed that increasing honey concentration induced higher disintegration time. In fact, honey as one of the active ingredients, played a binder role in the formulation as well. However, in order to obtain suitable granules, it was also necessary to use other binder (PVP K30) in the formulation. The honey percentage was very important because it not only induced high disintegration time of the tablets but also it increased drying time of granules. Thus in the case of honey presence in a formulation, usage of disintegrators such as croscarmellose sodium is an obligation. Less honey percentage in the tablet formulation decreases drying time of granules. High drying time causes waste of time and also produces a carcinogen substance namely hydroxy methyl furfural (HMF) due to honey degradation.

In the other hand, almond oil concentration should be noticed to prevent forming oily formulations which is not appropriate. Different formulations of Coriander Triphala demonstrated Avicel was the better diluent compared to lactose which gave adequate compressibility but a few amount of lactose as intra-granular binder was required. Finally, Coriander Triphala tablet was formulated by using natural ingredients along with lactose, Avicel PH-102, magnesium stearate, silicon dioxide, croscarmellose sodium and PVP K30. Coriander Triphala contains C. sativum fruits which is rich in essential oil. Due to volatile characteristics of these secondary metabolites, it is necessary to protect them from degradation and evaporation. In order to protect tablet ingredients especially volatile ones, the tablets were coated using water soluble film coating material. Tablet coating not only increases the stability but also the tablet has more acceptable appearance.

Since tannins are the major chemical components in Coriander Triphala tablet constituents [9-13], it was logical to evaluate the prepared tablets respect to tannins content; therefore, these chemical constituents were considered as marker for assay and dissolution studies of the tablets. The results showed that tablets contained remarkable amount of tannins and these chemicals were released from tablets during 60 min (acceptance level: minimum 75 %). All physicochemical properties of prepared tablets were in agreement with USP requirements for coated tablets [21].

Tablets are prepared by using three methods of direct compression, dry granulation and wet granulation. Direct compression and dry granulation are more common in herbal formulations due to easier process and no usage of temperature which may cause decomposing of chemical constituents [24, 25]. For example, during a study, Triphala tablets were prepared by slugging method during a dry granulation process [2]; but in Coriander Triphala tablets, due to honey in the formulation, the usage of wet granulation process and drying in 40°C was an obligation. During another study on formulation of Triphalaguggulka tablets which is a mixture of Triphala with Commiphora mukul and Ficus benjamina, three types of tablet preparation were compared and it was proved that direct compression was preferable method regarding physicochemical properties of tablets [24]. During another research on different formulations of Triphala, wet granulation and direct compression techniques using Triphala powder and its extract were compared. Different excipients were used for preparing Triphala tablets and it was found that direct compression method was better than wet granulation and co-crystallized lactose-microcrystalline cellulose and alcoholic PVP proved to be the best diluent.
and binder, respectively. This study also demonstrated the tablets of Triphala powder had high friability compared to tablet of Triphala extract and the last one was preferred [3]. However, in the recent study, despite of using Triphala powder in the preparation of Coriander Triphala tablet, the tablets had reasonable hardness and friability which was due to PVP K30 and honey in the formulation.

5. Conclusion
The formulated Coriander Triphala film coated tablet containing lactose, Avicel PH-102, croscarmellose sodium, PVP K30, silicon dioxide and magnesium stearate showed reasonable physicochemical characteristics with appropriate tannins release behavior. It was stable during accelerated stability process and it could be a good candidate for industrial production after complementary studies especially adequate clinical trials.

Author contributions
R. C. and H. H. designed and supervised the project. K. M. and H. K. involved in tablet formulation. F. T. and L. A. performed quality control tests.

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Conflict of Interest
The authors declare that there is no conflict of interest.

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Formulation and quality …

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مقاله تحقیقاتی

فرمولاسیون و کنترل کیفیت قرص اطریفل گشنیزی

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چکیده

مقدمه: اطریفل گشنیزی یکی از داروهای پرمصرف در طب سنتی است که شامل هلیله، بلیله، آمله، تخم گشنیز، روغن بادام و عسل است. فرم‌های دارویی سنتی جهت بهبود خصوصیات، پایداری و نیز پذیرش بهتر باید به فرم‌های جدید تبدیل شوند. هدف: در تحقیق حاضر، قرص فرمول اطریفل گشنیزی به قرص روکشدار تبدیل شده و کنترل کیفیت آن انجام شد. روش بررسی: مواد: هلیله سیاه، هلیله زرد، هلیله کابلی، بلیله، آمله و کشی در مقادیر مشابه همراه با روغن بادام، عسل و سایر اکسیپیان‌ها در مقادیر مختلف برای فرمولاسیون قرص مورد استفاده قرار گرفتند. نتایج: در میان فرمول‌های مختلف، قرص حاوی 98 میلی گرم از هر گیاه، 14 میلی گرم روغن بادام، 148 میلی گرم عسل همراه لاکتوز، PH-102، کراس کارملوز سدیم، پلی وینیل پیرولیدون K30، منیزیم استئارات و سیلیکون دی کاسید بهترین آنها بود. مقدار وزن سختی زمان باز شدن، تانه‌های تام بر حسب پی کلرول به ترتیب 1248 میلی گرم، 40 کیلو پوند و 25 دقیقه و 64/2 میلی گرم در قرص بودند. نتیجه‌گیری: قرص فرموله شده با خصوصیات فیزیک شیمیایی مناسب جایگزین خوبی برای قرص سنتی می‌باشد و می‌تواند پیش از طی آزمون‌های بالینی در مقیاس صنعتی تولید شود.

اطلاعات مقاله

گزارشگان: اطریفل گشنیزی
قرص
فرمولاسیون
طب سنتی ایران
کنترل کیفیت

اطلاعات مقاله

چکیده

مقدمه: فرمول اطریفل گشنیزی یکی از داروهای پرمصرف در طب سنتی است که شامل هلیله، بلیله، آمله، تخم گشنیز، روغن بادام و عسل است. فرم‌های دارویی سنتی جهت بهبود خصوصیات، پایداری و نیز پذیرش بهتر باید به فرم‌های جدید تبدیل شوند. هدف: در تحقیق حاضر، قرص فرمول اطریفل گشنیزی به قرص روکشدار تبدیل شده و کنترل کیفیت آن انجام شد. روش بررسی: مواد: هلیله سیاه، هلیله زرد، هلیله کابلی، بلیله، آمله و کشی در مقادیر مشابه همراه با روغن بادام، عسل و سایر اکسیپیان‌ها در مقادیر مختلف برای فرمولاسیون قرص مورد استفاده قرار گرفتند. نتایج: در میان فرمول‌های مختلف، قرص حاوی 98 میلی گرم از هر گیاه، 14 میلی گرم روغن بادام، 148 میلی گرم عسل همراه لاکتوز، PH-102، کراس کارملوز سدیم، پلی وینیل پیرولیدون K30، منیزیم استئارات و سیلیکون دی کاسید بهترین آنها بود. مقدار وزن سختی زمان باز شدن، تانه‌های تام بر حسب پی کلرول به ترتیب 1248 میلی گرم، 40 کیلو پوند و 25 دقیقه و 64/2 میلی گرم در قرص بودند. نتیجه‌گیری: قرص فرموله شده با خصوصیات فیزیک شیمیایی مناسب جایگزین خوبی برای قرص سنتی می‌باشد و می‌تواند پیش از طی آزمون‌های بالینی در مقیاس صنعتی تولید شود.