INTERNATIONAL JOURNAL OF PHARMACEUTICAL SCIENCES
[ISSN: 0975-4725; CODEN(USA): IJPS00]
Journal Homepage: https://www.ijpsjournal.com

Review Article

A Review on Formulation and Evaluation of Poly Herbal Syrup

M. Sakthivel*, S. Mohamed Halith, P. Nivetha, S. Parthiban, T. Porkkvi, K. Pounambal, D. Prajith

Dhanalakshmi Srinivasan College of Pharmacy, Thuraiyur Road, Perambalur 621212

ARTICLE INFO

Published: 10 Apr 2026
Keywords:
Bryophyllum pinnatum , Boerhaavia diffusa, Pharmacognosy, Phytochemistry, Medicinal plant, Pharmacological activities, Traditional uses
DOI:
10.5281/zenodo.19504360

ABSTRACT

In traditional system like Ayurveda, folk medicine, and other indigenous traditions, Bryophyllum pinnatum (Panputi) is a significant medicinal herb. The plant is well-known for its many medicinal uses and is a member of the crassulaceae family. The pharmacognostical traits, phytochemistry compound, and pharmacological action of Bryophyllum pinnatum are compiled in this paper. Numerous phytochemicals have been identified from various plant section including flavonoids, alkaloids, glycosides, triterpenoids, bufadienolides, and phenolic compounds. These bioactive such as hepatoprotective, anti-inflammatory, antibacterial, anti- ulcer, and anticancer properties. Traditionally, the plant has been used for treatment of wound, kidney stones, asthma, infection, and gastrointestinal disorder. The review highlights the therapeutic potential of Bryopyllum pinnatum and supports its importance as a valuable medicinal plant for the development of herbal formulations and future pharmacological research.

INTRODUCTION

Herbal medicines have been used for a long time to help prevent and treat many different illnesses. The rising interest in natural and plant-based therapies has spurred more research into herbal formulations because of their therapeutic benefits, cost-effectiveness, and relatively fewer side effects. Traditional systems of medicine such as Ayurveda, Siddha, and Unani employ various medicinal plants to create herbal remedies aimed at promoting human health and well-being. Polyherbal formulations use two or more medicinal plants together to get better results in treating health issues. Polyherbalism works by combining different herbs so that their active parts work together. This teamwork helps the medicine be more effective and makes it safer by lowering harmful effects. Because of these benefits, polyherbal formulations are commonly used in treating respiratory issues, digestive disorders, inflammation, and immune- related conditions. Herbal syrups are often chosen among different types of medicine because they are easy to take,

***Corresponding Author:** M. Sakthivel
Address: *Dhanalakshmi Srinivasan College of Pharmacy, Thuraiyur Road, Perambalur 621212.*
Email : msakthi00767@gmail.com
Relevant conflicts of interest/financial disclosures: The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

taste better, and patients are more likely to follow their treatment plan. Syrup forms are especially good for children and older adults who might find it hard to swallow pills or other solid medicines. So, it's important to properly create and test polyherbal syrups to make sure they stay stable, are of good quality, safe to use, and work well for their intended purpose.

CONCEPT OF MONOPHASIC LIQUID DOSAGE FORM :[3]

MONOPHASIC LIQUID DOSAGE FORM :

The monophasic liquid lozenge form is a homogeneous admixture of result made by dissolving the solute in the applicable detergent phase, which contain two or further factors in single phases. Another name for the monophasic result is the genuine result. saccharinity, panaceas, fusions, linctus and gargles, mouthwash, embrocation, nose drops, and observance drops are some of the different kinds of monophasic cure forms that can be used external or internally.

Advantages :

- Because it a liquid lozenge form, it can be fluently administered through any system (parenteral, oral, etc.).
- The drug is formerly in the form a result, its immersion rate is quicker than that of a solid lozenge form.
- Compared to other biphasic liquid lozenge forms (similar as suspense or conflation), the livery cure distribution is more accurate since it's homogenous.
- Compared to suspense or conflation the expression is yield is important simpler or quicker.

Disadvantages :[4]

- further grueling to store and carry than solid lozenge form. It must be kept in a dark, cool, position.
- Oxidation or hydrolysis lower the stability of this kind of dosage.as a result, their expiration date is shorter than that of solid lozenge form.
- There are several significant problems similar as microbial growth and rush.

SYRUP :[5,6]

The syrup is an aqueous solution containing sugar, either with or without pharmaceutical components. The sugar content of the syrup is high, at 66.7% w/w as per I.P. The solution, which is 85% w/v as per U.S.P, is heated to prepare it. It is warmed to the right temperature and then kept in a dry, cool place in a tightly closed container to keep out moisture and unwanted particles. A thick liquid made from a sugar solution is called syrup. Concentrated sucrose solutions that are viscous and sweet are known as synthetic sucrose syrup.

Simple syrup

When mixed with 100 milliliters of water, it contains 66.7% sucrose by weight. That cough medication is delivered as a thick sweet syrup. A sweet syrup is made by adding sugar to it.

A nearly saturated water solution of sugar, like sucrose, with or without added flavor or medicine, is known as syrup.

The syrup is referred to as medicated syrup when it contains additional therapeutic ingredients. When it's concentrated, it has a texture like molasses. Flavored syrup is used to add taste and is not meant to be used for medicine, but it includes ingredients that give it flavor. It's important that the sugar level gets close to but doesn't reach the maximum it can hold. For many microbes, sucrose is a great nutrient in diluted solution. Conversely,

its concentrated solution slows their growth. When the temperature changes, a saturated solution can make some of the sucrose form crystals.

Difference between syrup IP and syrup USP [7]

Table:1

Sr. No	Feature	Syrup IP	Syrup USP
1	Pharmacopeia	Indian pharmacopeia	United States pharmacopeia
2	Sugar concentration	66.7% w/w sucrose	85% w/v sucrose
3	Preparation basic	Weight by weight	Weight by volume
4	Solvent	Purified water	Purified water
5	Uses	Standard syrup base used in INDIA	Standard syrup base used in USA
6	Preservative action	High sugar concentration prevents microbial growth	High sugar concentration act as preservative

QUALITY CONTROL TEST FOR SYRUP :

1. Clean and Purified Vehicle (Water) :

Water is the main vehicle used in the preparation of syrups. It must be cleaned and purified to remove microorganisms and particulate matter. In making medicines, the water is cleaned and made very pure before it is used. Quality control professionals routinely test the water to ensure its purity and safety. The prepared syrup is filtered again before bottling to ensure product quality.

2. Light Transmittance Meter :

A light transmittance meter is a tool that helps check the colour quality of syrup by measuring how much light goes through a sample of syrup. The amount of light that passes through is checked against standard numbers for various syrup quality levels. During the test, the sample should be free from bubbles or cloudiness, and the test bottle should be clean and free from fingerprints, as these factors can reduce light transmission and affect the result.

3. Visual Inspection :

Visual inspection is a key part of ensuring quality in syrup making. During this process, both the ingredients and the final product are thoroughly checked for purity and appearance. The way the product looks matters a lot because it can affect how patients feel about it and whether they stick to their treatment. So, the syrup needs to look clear, have a nice colour, and appear stylish.

4. pH Measurement :

pH measurement is an important part of checking the quality of syrups. It helps ensure the product stays safe and stable. The pH indicates the acidity or alkalinity of the syrup. Two usual ways are used to check the pH level. The first way is to use pH paper. You put the paper into the sample, and then you check the colour it turns to. You compare that colour with a chart that shows what each colour means. The second way is using a pH meter, which is an electronic tool that gives a more accurate measurement of pH by using a glass electrode.

5. Physical Stability in Syrup :

Physical stability is crucial to ensure that syrups maintain their quality during storage. A stable syrup should not show microbial growth or sugar crystallization. The syrup needs to stay clear, and every ingredient should dissolve fully in the mixture. In addition, the syrup should have a good taste and smell so that patients are more likely to take it.

6. Sucrose Concentration :

The amount of sucrose in the syrup is a key part of making sure the product is good quality. If there is too much sugar, it can cause crystals to form, but if there is not enough sugar, it might allow bad bacteria to grow. Therefore, the amount of sucrose must be carefully controlled and analyzed. Analytical methods such as High-Performance Liquid Chromatography (HPLC) and UV spectroscopy are frequently employed to measure sucrose concentration.

7. By Using HPLC :

Using HPLC, which stands for High Performance Liquid Chromatography, is a dependable way to check for sucrose in syrup. It can tell if sucrose is present and measure how much is there. In this method, the sample is tested, and the peaks that are found are checked against known sucrose peaks to make sure that sucrose is present. The area under the peak is also used to determine the amount of sucrose present in the sample.

8. By Using UV Spectrometer :[8]

Using a UV spectrometer, another way to find out how much sucrose is in syrup is by doing UV spectroscopy. This method is based on the Beer–Lambert law, which relates the absorbance of light to the concentration of a substance in solution. By checking how much light is absorbed at a certain wavelength and using values that show how much light sucrose absorbs, you can figure out how much sucrose is in the sample.

HERBAL MEDICINAL PLANT:[9]

The study of medicines made from plants and the use of healing herbs is called herbal medicine or herbalism. For most of human history, this has served as the foundation for medical treatments; this form of traditional medicine is still widely used today. Many chemicals made from plants are used in modern medicine as the basis for medicines that are supported by scientific evidence. There are not many good clinical studies or official guidelines about the purity or correct amount to use, even though some people in herbal medicine might use modern ways to test how well plants and natural medicines work. Minerals, shells, various animal parts, fungi, and bee products are sometimes included in the scope of herbal therapy.

Phytotherapy and phytomedicine are other names for herbal medicine. Para herbalism is a type of alternative and not scientifically supported practice that uses raw plant or animal extracts as untested medicines or ways to improve health. In standard pharmacology, herbalism differs from plant-derived medications in that it does not isolate or standardize biologically active compounds; instead, it is based on the unproven theory that preserving different substances from a particular source with less processing is safer or more effective. Most typically, herbal food supplements are classified as phytotherapy.

***Bryophyllum pinnatum* : [10]**

Bryophyllum pinnatum is one of the most important medicinal plants in the family Crassulaceae. It is also known as *Bryophyllum pinnatum* and is commonly called the "love plant," miracle leaf, life plant, and other names. This plant, which is commonly used in traditional medicine across Nigeria, is known in the local area as the “never die plant.” Traditional healers often utilize this herb, with its components including alkaloids, flavonoids, glycosides, steroids, bufadienolides, and organic acids, among other substances. It is also used in ayurvedic medicine to treat bleeding disorders, ulcers, and diarrhea. common health issues include abscesses, insect

bites, colds, asthma, skin problems, and high blood pressure. primary chemical.

It is a perennial herb that can grow up to a maximum height of about one meter. The youngest stems are shaped like cylinders; they are juicy and a bright red colour. It can be found all over the world, especially in rainforests. Ittastes sour and astringent. Ash had the lowest nutrient value, while carbohydrate levels were the highest in both fresh and dried *Bryophyllum pinnatum* leaves.

In both fresh and dried samples, the amount of lead and zinc is low, while theamount of calcium and potassium is high. Due to the presence of several chemical components, the plant *Bryophyllum pinnatum* is capable of being used to treat various ailments. The leaves of *Bryophyllum pinnatum* display several pharmacological properties, such as anti-inflammatory, anti-diabetic, anti-nociceptive, anti-hypertensive, and neuroprotective effects.

Bryophyllum pinnatum makes leaves that are fresh, simple, or complex. At the end of the stalk, there are branches with clusters of bell-shaped parts. The plant makes fruits that are covered with a thin membrane and are paper-like, having four thin sections inside. Some of Bryophyllum's pharmacological actions are discussed in this review. shaped, drooping flowers.

Figure: 1 *Bryophyllum pinnatum*

Plant Profile : [11]

Kingdom: plantae – plants

Subkingdom: tracheobionta – vascular plants

Division: spermatophyta – seed plants

Subdivision: magnoliophyte – flowering plants

Class: magnoliopsida – dicotyledons

Subclass: rosidae Order: rosales

Family: crassulaceae – stonecrop

Geneus: Bryophyllum

Species: Bryopyllum pinnatum [linn] Oken.

Chemical Constituents : [12]

- Flavonoid glycosides
- Anthocyanins
- Coumarins
- Bufadienolides {cardiac glycosides}
- Phenolic acids and megastigmane
- Sterols, triterpenes, phenanthrenes
- Organic salts
- Fatty acids

***Boerhaavia diffusa* : [13]**

Boerhaavia L. The family Nyctaginaceae includes a genus with 40 species that are found in tropical and subtropical areas. These plants grow naturally in many different types of land environments, such as forest clearings, empty land, farmed grasslands, and agricultural areas. India, Brazil, Africa, Australia, China, Egypt, Pakistan, Sudan, Sri Lanka, the United States, Iran, and other Middle Eastern nations are among the tropical and subtropical regions where the plant thrives as a weed. According to reports, six of these species of Boerhaavia are mentioned. diffusa, b. chinensis, b.

erecta, b. repens, b. rependa and b. rubicunda occur in India.

The Atharvaveda referred to b. The plant is called Punarnava, which means "one that rejuvenates the old body," because the top part of the plant dries up in the summer and grows again during the rainy season. The plant was named after a famous Dutch surgeon from the 18th century called Hermann Boerhaave. A preparation made from the entire plant of 'Punarnava', which is officially recognized by the Indian Pharmacopoeia. diffusa, either fresh or dried. b. Diffusa l is a plant that grows year after year. It spreads along the ground with branches that can reach up to 1 meter in length. These branches can lie flat on the ground or stand upright. The stems are round, can be hard or fleshy, and are thick at the points where the leaves connect.

They are covered in hair and often have a purple color. The leaves are shaped like oval or rounded shapes, sometimes with a heart-like base, and their edges can be smooth, wavy, or have small waves; they can be as big as 5.5 centimeters long and 3.3 centimeters wide; each leaf is a single piece, thick, fleshy, and covered with fine hairs, growing in pairs that are not even; the top side is green and smooth, while the bottom side is usually white and hairless. In the development of the inflorescence, the calyx and corolla are replaced by a short, narrow, tubular perianth that is funnel-shaped at the top and constricted above the ovary; the flowers are small, subcapitate, and occur in groups of 4 to 10 within small bracteolate umbels, forming axillary and terminal panicles; they are hermaphrodite, pedicellate, and have a pink or pinkish-red color. The five tiny, sharp lobes are present. There are two or three somewhat long stamens. Peltate is the stigma. The fruit is detachable, shaped like an egg or oval, slightly longer than wide, covered with fine hairs, has five ribs, and small glands. It is also sticky along the ribs and is a type of achene fruit.

Figure: 2 Boerhaavia diffusa

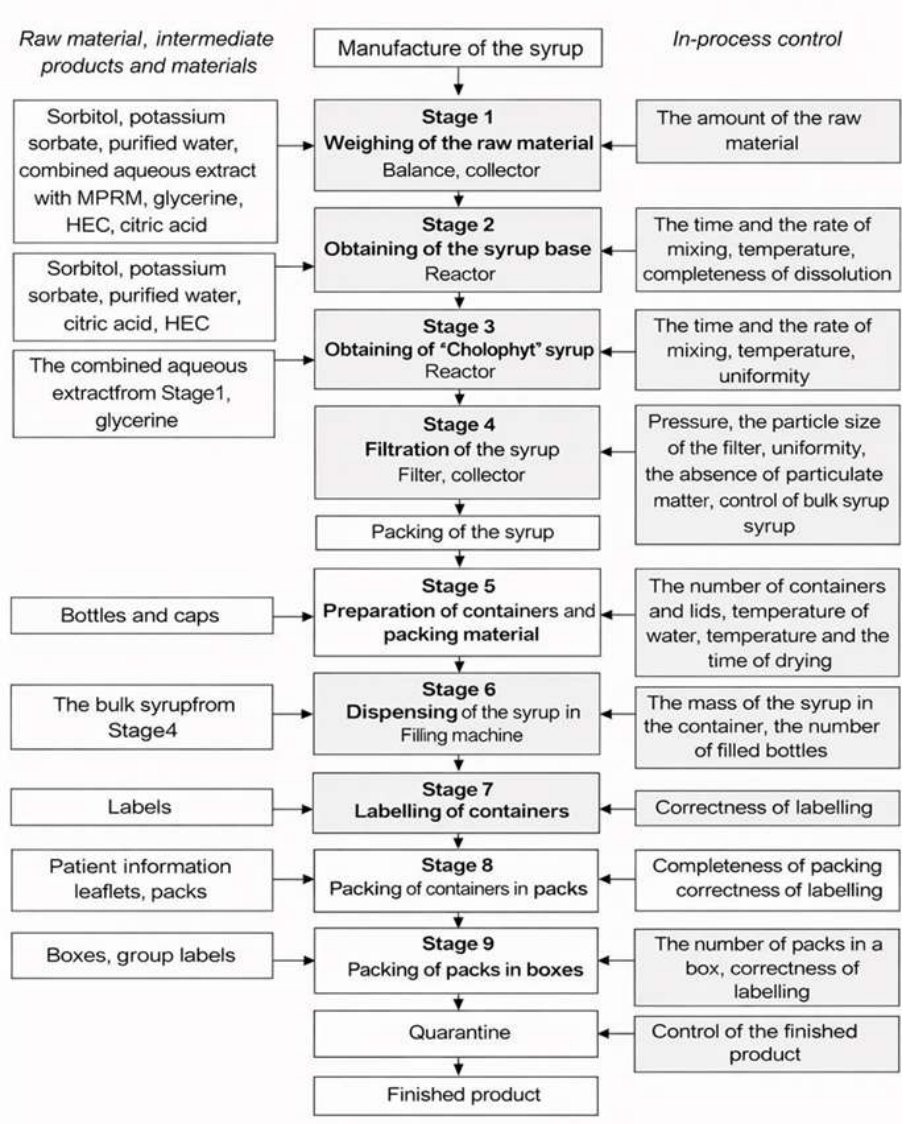
Chemical Constituents : [14]

- Flavonoids
- Alkaloids
- Steroids
- Triterpenoids
- Lipids
- Lignins
- Carbohydrates
- Proteins
- Glycoproteins
- Punarnavine
- Ursolic Acid

Pharmacological Activity :

- Diuretic activity
- Hepatoprotective activity
- Neuroprotective activity
- Fibrinolytic activity
- Anti nociceptive activity

MATERIAL AND METHOD : [15]



RESULT AND DISCUSSION :

The review talks about how important *Bryophyllum pinnatum* and *Boerhaavia diffusa* are for their medicinal uses, especially in traditional medicine systems like Ayurveda. These plants have different active chemical compounds like flavonoids, alkaloids, glycosides, triterpenoids, steroids, and phenolic compounds that help them work as medicines. Because these compounds are present, the plants have various health benefits like reducing inflammation, protecting the liver, fighting bacteria, helping the body remove extra fluids, protecting the brain, and easing pain. The study also highlights the value of herbal formulations, such as herbal syrups, which are single-phase liquid forms of medicine. These syrups offer benefits like even mixing of the active ingredients, better taste, and easier acceptance by patients. To make sure the formulation is safe, good quality, and works well, it's important to do proper quality checks. These checks include measuring the pH, looking at it visually, testing the sucrose levels, and checking how stable it is over time. These medicinal plants have a lot of promise for creating useful herbal medicines, but more scientific research and real-world testing are needed to prove how well they work.

CONCLUSION

In conclusion, this review highlights the therapeutic importance of the medicinal plants *Bryophyllum pinnatum* and *Boerhaavia diffusa* and their potential role in the development of herbal formulations. Both plants are rich in various phytochemical constituents such as flavonoids, alkaloids, glycosides, triterpenoids, and phenolic compounds, which are responsible for their wide range of pharmacological activities. Traditionally, these plants have been used in various systems of medicine for the treatment of conditions such as inflammation, infections, kidney disorders, respiratory problems, and gastrointestinal diseases. Their proven biological activities, including hepatoprotective, anti-inflammatory, diuretic, neuroprotective, and antimicrobial effects, support their significance as valuable medicinal herbs.

Furthermore, the formulation of herbal syrups as monophasic liquid dosage forms provides advantages such as improved patient compliance, better palatability, and easier administration, especially for children and elderly patients. Proper quality control measures such as pH determination, visual inspection, sucrose concentration analysis, and stability testing are essential to ensure the safety, stability, and effectiveness of the formulation. Overall, the integration of traditional herbal knowledge with modern pharmaceutical evaluation can contribute to the development of safe and effective herbal medicines, and further scientific studies and clinical investigations are recommended to validate their therapeutic potential.

REFERENCES

1. Tiwari, J. A review on pharmaceutical liquid dosage forms. National journal of pharmaceutical sciences, (2024); 4 (2),49-51.
2. Sakthivel, M., Prathap, B., Mahendhiran, R., Arivananthan, M., &Naveetha, M . Review about liquid dosage form. International journal of research in pharmacy and pharmaceutical sciences, (2021); 6(5),24-30.
3. kalaskar, s., lagad, T.J., khedkar, A, D., Yogesh, N &lagad, R, D. A review on formulation and evaluation of liquid dosage form. International journal of novel research and development, (2024);9(10).
4. kalaskar, s., lagad, T.J, khedkar. A, D., Yogesh, N& lagad, R, D. A review on formulation and evaluation of liquid dosage form. International journal of novel research and development , (2024);9(10).
5. Chaudhari, A.B., umakant, V.S., & khedkar, A ;A review on types of syrup. International journal for research trends . (2024).
6. Kumar ‘p., Mishra, A.M., Kumar, P., Kumar, C., kumar, N. Preparation and evaluation of syrup: A review. The pharmaceutical and chemical journal, (2025);12(2),117-122.https;//doi.org/10.5281/zenoda.15606787 .
7. Swarnalatha.K.M., Harshika.A., Tiwariya.V.L., & Madhavi.N. dry syrup A comprehensive life sciences pharma research, (2023) 13(1),39-of review. International journal 46.https://doi.org/10.22376/jjpr.2023.1.p39-46
8. Chaudhari, A.B., Umakant, V.S., & khedkar, A; . A review on types of syrup. International journal for research trends (2021)
9. Chithra, S.R., Vattakkeel, B., & Suju, E.N,. A review on pharmacological activity of bryophyluum pinnatum linn. American journal of pharmacy and health research,(2020) 8(2).
10. Tanti Nayak, M. Thirumavalavan. A review of the plant boerhavia diffusa: its chemistry, pharmacology and therapeutical potential.

The journal of phytopharmacology, (2014) 5(2), 83-92. https://www.phytopharmacologyassn.com/

11. Nagaratan A, & Prakash T. Hegde . A comprehensive review on parnabeega [*Bryophyllum pinnatum* (lam). oken]. Journal of medicinal plant studies,(2015) 3(4), 166-171 https;//www.plants.com
12. Gharate, M., & Kasture, V., Evaluation of anti-inflammatory, analgesic, antipyretic and antiulcer activity of punarvasava: an ayurvedic formulation of boerhavia diffusa. Oral pharmacol Exp Med, (2012) 15, (3), 121-126. https;//doi.org/10.1007/s13199-012-0177-9
13. Rajesh Kumar, S Gautam, KD Singh, P. Kumar, Nilufar Haque, Vibha Yadav, R Kumar, rp Diwaker, Rishikant, & SB Kumar. Pharmacological properties of borehavia diffusa; A review. International journal of chemical studies, (2018). 6(4),72-80.https;//www.chemijourna.com/archives/?year=2018&vol=6&issue=4&article=12(special issue-1, internation conference on food security and sustainable agriculture, Thailand,23-26 December 2018.
14. Priyanka Yadav, Arun Kumar Misra, & Harpreet singh, a brief review on chemistry and biological activities of *Bryophyllum pinnatum* (lam) Oken family; Crassulaceae. Oriental journal of chemistry, (2021). 37(2), https;//doi.org/10.13005/ojc/370202
15. Shambhu, P.P., Rinto, B.B.S., Garima, S., &Sujit, KA review article on the popular medicinal plant inAyurveda-Punarnava(Boerhaavia diffusa). International Journal of AYUSH, .(2024). 13(12), 53-63.https://ijayush.in/
16. Salumiyan,S.Irchhaiya,R.,Singh,N.,Alok,S., Chanchan,D.K.,&Bijaliya,R.KMorphology,phytochemistry and traditional uses of *Bryophyllum pinnatum* -A review.International Journal of life sciences and Review, .(2019). 5(7),97-103.https://doi.org/(ISSN:2394-9864)

HOW TO CITE: M. Sakthivel, S. Mohamed Halith, P. Nivetha, S. Parthiban, T. Porkkvi, K. Pounambal, D. Prajith, A Review on Formulation and Evaluation of Poly Herbal Syrup, Int. J. of Pharm. Sci., 2026, Vol 4, Issue 4, 1708-1716. https://doi.org/10.5281/zenodo.19504360