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## EXAMINING THE CULTURE OF PLANT TISSUES

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### ABSTRACT

Muscular Dystrophy (MD) comprises a heterogeneous group of genetic disorders characterized by progressive muscle degeneration and weakness. Current therapeutic approaches often focus on alleviating symptoms, yet a curative strategy remains elusive. This abstract introduces a novel avenue for exploration—the "Polyherbal Formulation" for the treatment of Muscular Dystrophy. Rooted in the principles of traditional herbal medicine, this formulation harnesses the synergistic potential of multiple plant-derived compounds to address the intricate pathophysiology of MD.

The Polyherbal Formulation draws upon the rich diversity of bioactive compounds found in various medicinal herbs. These botanical constituents are selected for their potential to modulate inflammation, enhance muscle regeneration, and mitigate oxidative stress—key factors implicated in Muscular Dystrophy progression. By combining the therapeutic properties of multiple herbs, the Polyherbal Formulation aspires to provide a holistic and complementary approach to conventional treatments.

This abstract outlines the rationale behind the Polyherbal Formulation, emphasizing its potential to offer a multifaceted intervention in the complex landscape of Muscular Dystrophy. As interest in natural compounds and traditional medicine gains momentum, the Polyherbal Formulation opens avenues for further investigation, promising a new dimension in the pursuit of effective and holistic management for individuals affected by Muscular Dystrophy. Further research and clinical trials are warranted to elucidate the safety, efficacy, and translational potential of this innovative approach.

### BACKGROUND:

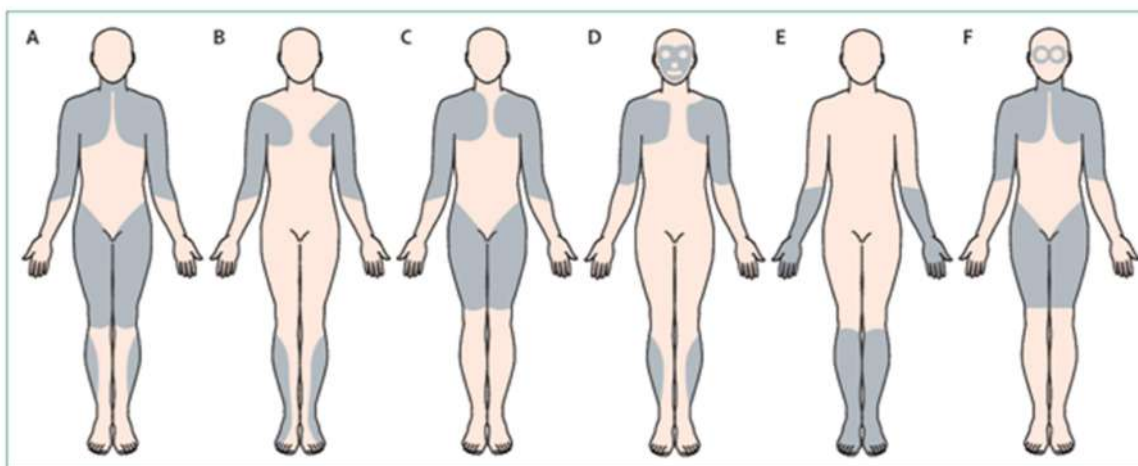
The term "muscular dystrophy" describes a class of hereditary disorders characterized by gradual weakness and degeneration of the skeletal or voluntary muscles, which govern movement. Out of every 3,500 live male births, 1 has Duchenne muscular dystrophy (DMD), the most frequent lethal X-linked recessive condition. Since the dystrophin gene is necessary for the proper structure and function of muscles, mutations in it are the main cause of this illness.

### TYPES OF MUSCULAR DYSTROPHIES

Type	Age at onset	Symptoms
Becker	adolescence to early adulthood	Symptoms are identical to Duchenne, but less severe
Congenital	birth	muscle weakness and joint deformities
Duchenne	2 to 6 years	muscle weakness and wasting; affects pelvis, upper arms, and upper legs; eventually involves all voluntary muscles
Distal	40 to 60 years	weakness and wasting of muscles of the hands, forearms, and lower legs

Emery-Dreifuss	childhood to early teens	Weakness and wasting of shoulder, upper arm, and shin muscles; joint deformities are common.
Facioscapulohumeral	childhood to early adults	Facial muscle weakness and weakness with some wasting of shoulders and upper arms.
Limb-Girdle	late childhood to middle age	Weakness and wasting, affecting shoulder girdle and pelvic girdle.
Myotonic	20 to 40 years	weakness of all muscle groups accompanied by delayed relaxation of muscles after contraction; affects face, feet, hands, and neck first;
Oculapharngeal	40 to 70years	Affect muscles of eyelids and weakening of throat muscles.

**TABLE 1: Forms of muscular dystrophies**



**FIGURE 1: Patterns of distribution of weakness (A) Duchenne and Becker muscular dystrophy. (B) Emery-Dreifuss muscular dystrophy. (C) Limb-Girdle muscular dystrophy. (D) Facioscapulohumeral muscular dystrophy. (E) Distal muscular dystrophy. (F) Oculapharngeal muscular dystrophy. Shading represents affected areas.**

There is currently no known medical treatment for muscular dystrophy that has any discernible effect. Certain Panch Karma procedures, yogic assistance, and the Rasayana group of herbo-mineral or gold-based medications are some of the Ayurvedic treatments that have demonstrated a clear protective effect and extended survival following muscular dystrophy. Ayurvedic resources known as rasayanas are

unique in that they boost enzymatic essence. Supporting the body's inherent ability to heal itself, ayurvedic treatment may aid with the symptoms of muscular dystrophy. Certain Rasayana drugs that are known to develop muscle may be able to reverse or slow down the progression of muscular dystrophy, according to studies conducted by Ayurvedic physicians.

## **OBJECTIVES:**

The Indian medical system known as Ayurveda may be able to lessen the disease's symptoms, such as weakness, by preventing the withering of muscular tissue. In Ayurveda, there are several herbs that help manage the condition of muscular dystrophy. These include ashwagandha, Commiphora mukul, Cyperus rotundus, Plumbago zeylanica, Emblica officinalis, Terminalia bellirica, Terminalia chebula, Piper longum, Carum copticum, Embelia ribes, Tribulus terrestris, Cuminum cyminum, Zingiber officinale, Safed musli, Kali musli, Semal Musli, Gokshur, Shatavari, Akarkara, Safed Behman, Jaiphal/Javitri, and Kesar.

## **METHODOLOGY:**

### **Ayurvedic herbal treatments for muscular dystrophy.**

For the ayurvedic therapy of muscular dystrophy, Ayurveda offers herbal treatments like Ashwagandha capsules, Yograj Guggul, and Atirasadi Churna and Balaswagandhadi Thailam. These herbal treatments are made with the highest-quality ingredients and adhere closely to Ayurvedic principles. These Ayurvedic herbal medicines are all vegetarian, natural, and 100% genuine. Preservatives, additives, and chemicals are absent from these. Because they have no negative side effects, they are safe to use.

### **Formulation of muscular dystrophy tablets**

After thoroughly combining the different active plant extracts, they were combined with the excipients, made into granules using the wet granulation method, and compacted into tablets.

## **MAIN FINDINGS:**

Traditional Ayurvedic treatments for ailments such as muscular dystrophy include Giloy, Arjuna, Ashwagandha, Bala, and Brahmi. An excellent ayurvedic herb for stress, endurance, and brain function is Withania somnifera. Withanolide, an anti-inflammatory compound found in it, causes a large amount of neuronal axon, dendritic, pre-, and post-synapse regeneration. Arjuna enhances the heart's pumping action, strengthens the heart's cardiac muscle, and

lowers LDL cholesterol. Since calcined coral is a naturally occurring source of high calcium, it is frequently used as a supplement in ayurveda medicine to treat a range of bone biochemical issues linked to calcium shortage. Praval bhasma is useful in preventing bone abnormalities and spinal contractures caused by a calcium deficiency.

### **ASHWAGANDHADI LEHYAM (*Withania Somnifera*):**

Used to treat neuromuscular disorders, general weakness, and exhaustion. Breathing issues, joint discomfort, arthritis, and back pain can all be helped by this mixture.

**Ingredients:** sugar, madhusnuhi, draksha, ghee, honey, ela, ashwagandha, sariva, jeera, and water for the infusion.

### **YOGORAJ GUGGUL:**

It has positive benefits for the heart, respiratory system, muscles, bones, joints, and nerves. It functions well as a muscle relaxant, anti-inflammatory, and anti-arthritis.

**Ingredients:** Elettaria cardamomum (Cardamom), Pluchea lanceolata (Rasana), Zingiber officinale (Sonth), Piper nigrum (black pepper), Cinnamomum zeylanica (Dalchini), Vetiveria zizanioides (Khus), Abies webbiana (Talisa patra), Cinnamomum tamala (Tejpatta), Commiphora mukul (Guggul), Cyperus rotundus (Mustak), Plumbago zeylanica (Chitrak), Emblica officinalis (Amla), Piper longum (Pippali), Trachyspermum roxburghianum (Ajmod), Cuminum cyminum (Jeera), Piper cubeba (Kabachini), Elettaria cardamomum

### **KALYANAKGHRITA:**

Kalyanaghruta is well-known for treating issues with various other systems, including psychiatric ones.

**Ingredients** include ghee, Citrullus colocynthis, or Visala. Prunus avium Elavaluka, Hemidesmus Indicus Sariva, and

Amomum subulatum Bhadra ela Valeriana wallichii, or Nata Solanum indicum, Brihati, Cedrus deodara, or Devadaru aristata Daruharidra Berberis, Desmodium gangeticum-Shalaparl, Haridra: Turmeric Prishniparni-Picta Uraria Saussurea lappa, Kushta Prunus puddum, Padmaka Jasminum sambac, Malati Nymphaea stellata, or Utpala Santalum's album Hima Up to 12 grams of triphala are reported to contain the following herbs: Amla Emblica officinalis, Terminalia bellirica, Terminalia chebula, and Bibhitaki.

## **KUMARKALYAN RASA:**

An herbal-mineral ayurvedic mixture called Kumar Kalyan Ras is used to treat heart-related conditions in children.

**Ingredients:** Aloe vera juice extract (Kumari Rasa); purified mercury (Shuddha Parada); purified and processed mica (Abhrak Bhasma); pearl (Calx) preparation (Mukta Bhasma); iron preparation (Loha Bhasma); gold preparation (Swara Bhasma); and copper-iron pyrite (Makshika Bhasma).

## **BALARISHTA:**

Ayurvedic liquid medication called balarishta is mostly utilized for neurological ailments.

**Ingredients:** Bala (Sida cordifolia), Dhataki (Woodfordia fruticosa), Payasya (Ipomea digitata), Eranda (Ricinus communis), Rasna (Pluchea lanceolata), Cardamom, Prasarini (Paederia foetida), Clove Usheera (Vetiveria zizanioides), Gokshura (Tribulus terrestris), and Eranda (Ricinus communis) are the ingredients.

## **ASHWAGANDHARISHTA:**

Ayurvedic liquid ashwagandharishta is typically used to treat melancholy and sexual dysfunctions. Ashwagandha's anti-stress, anticancer, anti-inflammatory, and anti-arthritis qualities come from a variety of steroidal lactones, saponins, and alkaloids.

**Ingredients:** glycerine Ashwagandha, Musli, Manjistha, Mulethi, Haridara, Trikatu, Chandan, Buch, Sarvia, Chaturjat,

Bidari, Nishoth, Priyangu, Dhataki, and Jaggery are the constituent ingredients of Ashwagandharisht.

## **MAMSAGNI RASAYANA:**

Provides strength to the weakened muscles. increases Mamsagni at the level of muscle tissue. beneficial for neuromuscular diseases.

**Ingredients:** Yogic Muktasana, Pawan Muktasana, Anuvastana Vasti, and Til-Masha Pinda Sweda.

## **SUKUMAR GUGGAL RASAYANA:**

Designed to provide weak muscles more strength, this supplement increases the activation of satellite cells, which aids in muscle regeneration.

## **BALASWAGANDHADI THAILAM:**

Ayurvedic oil is used to cure fever, joint, muscle, and bone weakness, among other conditions.

**Ingredients:** Dadhimastu curd, Rasna Alpinia officinarum, Raktachandana Pterocarpus santalinus, Manjishta Rubia cordifolia, Bala Sida cordifolia, Aswagandha Withania somnifera, Laksha Lacifer lacca, Tila Taila Sesamum indicum, Usira Vettiveria zizanioides, Musta Cyperus rotundus, Kushta Sassurea lappa, Madhuka Madhuca indica, Choraka Angelica glauca, Sveta Sariva Hemidesmus indicus, Durva Cynodon dactylon, Aquillaria agallocha, or Agarar Cedrus deodara Devadaru, Curcuma longa Haridra, Padma kesara Nelumbo nucifera, Satahua Apium graveolens, Kumuda Nymphaea alba, and Renuka Vitex negundo.

## **ATIRASADI CHURNA:**

Several herbs are used to create the recipe for Atirasadi Churna.

**Ingredients:** Safed Musli (Chlorophytum borivillianum), Kali Musli (Curculigo orchoides), Semal Musli (Salmalia malabarica), Gokshur (Tribulus terrestris), Shatavari (Asparagus racemosus), Ashwagandha (Withania somnifera), Akarkara (Anacyclus pyrethrum), Vidari kand (Pueraria

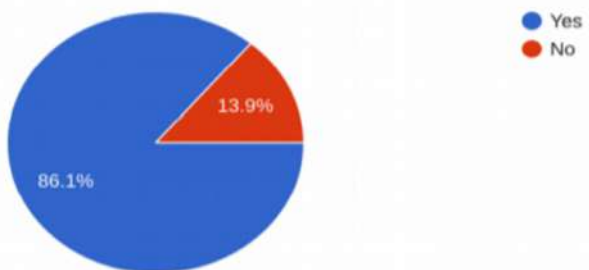
tuberosa), Varahi kand (*Dioscorea bulbifera*), Safed Behman (*Centaurea behen*), Jaiphal/ Javitri (*Myristica fragrans*), Taalmakhana (*Hygrophila spinosa*).

**BALCHATURBHADRA CHURNA + PRAVALPISHTI + KUKKUTANDATWAK BHASMA, FULVIA**

Ayurvedic medicines such as BALCHATURBHADRA CHURNA + PRAVALPISHTI + KUKKUTANDATWAK BHASMA, FULVIA, and many more are effective in treating and relieving the severity of DMD without causing any short- or long-term negative effects.

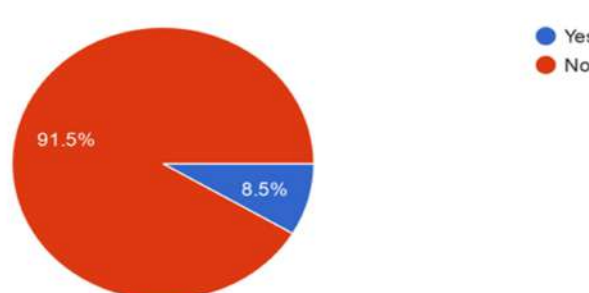
As herbal therapy is treated as the best source of treatment now a day, a survey has been conducted to evaluate its pros and cons. So, the responses of the survey make us to gain the complete knowledge and awareness on the herbal products.

**FIGURE 2:**



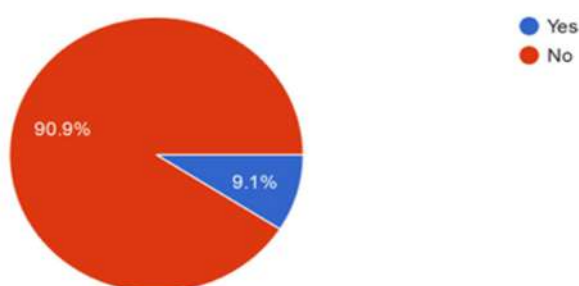
Based on the survey conducted the results Fig 2 shows that more than 50% of total population use the herbal products. As plants have been the basis for medical treatments through much of human history and such traditional medicine is still widely practiced today.

**FIGURE 3:**



Based on the survey conducted Fig 3 shows nearly 90% of the people have not met with any adverse effects or reactions with the herbal products and also the main aspect for the development of these herbal products is they are free from side effects and coming to the 10% people those met with the effects are those mild effects are common and they depend upon the type of product and the nature of the person used them.

**FIGURE 4:**





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Fig 4 shows that herbal treatment didn't effect modern medicine treatment

Following above figures shows that herbal formulation can be safe.

These are the following steps to aware people

- Since allopathic medications come with a lot of side effects awareness should be created among people by launching camps and distributing trial samples among the citizens and also increases the marketing standards. More advertisement of herbal products could reach out awareness to everyone
- Social media is the best way to show case the importance of herbal products by which people are educated on the importance of the natural products we have around and their uses
- Digital media and conventionally used media can be gigantic source to create awareness regarding the advantages involved in using an herbal product.

**CONCLUSION:** Thus, herbal medicinal products as "safe" as they are derived from "natural" source and safety of formulation that herbal formulation can be for muscular dystrophy

## **FUTURE PERSPECTIVES:**

Future is in the phase of increasing demand and fast-growing market of herbal medicines and other herbal healthcare products, in both developing and developed countries of the world.

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