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Review Article

A REVIEW ON HERBAL PLANTS WITH SKELETAL MUSCLE RELAXANT ACTIVITY

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ABSTRACT

Nature affords us a rich source of plants with medicinal qualities that can lead the path to endless medication discoveries. Skeletal muscle relaxants are used to treat muscle spasm and stiffness. Muscle strain, which is a partial tear of a muscle, or sprain, which is a partial or whole rupture of a ligament, are frequently linked to muscle spasm, which is an abrupt involuntary contraction of one or more muscle groups. Many herbs as goods systematically in an effort to identify a viable substitute. The information was gathered for this review article in order to list the medicinal plants with skeletal muscle relaxant properties, the bioactive extract that is involved, the plant models that are used to evaluate the plants, and the potential therapeutic effects of the plants.

Keywords: Skeletal muscle relaxant, Herbs, Common names, Extract part, Mechanism of action, Benefits

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INTRODUCTION

In the Indian subcontinent, medicinal plants are a valuable source of income. We are blessed by nature with an abundance of plants, and many various kinds of plants may be seen growing throughout the nation. All three levels of biodiversity-species variety, genetic diversity, and habitat diversity-are abundant in India. Thousands of species are known to have therapeutic potential in India, and using various sections of various medicinal plants to treat particular illnesses has been popular since ancient times. Because it is more culturally acceptable, more compatible with the human body, and has less adverse effects, herbal medicine continues to be the primary source of healthcare for 75–80% of the population, mostly in developing nations. Nonetheless, their use in the developed world has significantly increased in recent years. These days, the careless use of commercial antimicrobial medications, which are frequently used to treat infectious diseases, has led to the development of multiple drug resistance [1, 2].

About 40% of a person's weight is made up of skeletal muscles, which are vital to overall health. Maintaining your posture and carrying out your daily activities are controlled by your skeletal muscles. They support vital biological processes such energy metabolism, core temperature management, nutrient sensing, and organ and bone protection. Age-related declines in muscle function lead to a reduction in mobility. This can lead to fall-related injuries, disability, loss of independence, and a significant rise in mortality among the elderly. The progressive loss of muscle mass and function in the aged and chronically ill as a result of muscular fiber atrophy and loss is referred to as sarcopenia. It has a major impact on total mortality, long-term care needs, impairment, and loss of freedom. Sarcopenia is a complex illness whose origin is poorly understood. A class of illnesses known as MSDs mostly affects the connective tissues, muscles, joints, and bones. These illnesses rank among the most costly and incapacitating conditions in the US and are frequently reported to cause pain and loss of function [3, 4].

Benefits of herbal muscle relaxants

There are many advantages of herbal over traditional pharmaceutical muscle relaxants, particularly for those looking for a natural or medicinal approach to pain relief.

- **Fewer side effects**

Many plant-based remedies have weaker side effects than synthetic muscle relaxants, especially those that lead to lethargy, dizziness, or abuse with continued use.

- **Dual benefits for the body and mind**

Some herbs can reduce muscle tension and soothe the nervous system. This is particularly important for tight muscles from habitual stress, where a holistic approach will treat both muscles and the mind.

- **Natural source**

If the medicine is from nature, it may be viewed as relatively safer, especially when taking herbs for prolonged periods, than synthetic drugs that can build up toxicity within the body over time.

- **Reduced dependence**

The pharmacological relaxants typically produce habituation and withdrawal symptoms, while herbal relaxants have less potential for leading to these disorders.

- **Holistic healing**

Herbs are often utilized within traditional medicine systems that treat the patient and not just part of the illness. This means they will often offer other health benefits besides simply relieving muscle tension, like increased immunity, improved sleep, or relieved inflammation.

- **Availability and affordability**

Herbal products and natural remedies are often more available and affordable than prescription medications and are therefore accessible for larger segments of the population.

- **Encouragement for health-promoting lifestyle changes**

Several herbs that serve as muscle relaxants also have antioxidant and anti-inflammatory effects, and thus provide strength and endurance benefits to muscle recovery and muscle health after exertion or injury.

Future perspective of herbal skeletal muscle relaxants

There is a positive view of herbal skeletal muscle relaxants, especially in light of the preference for natural and safer forms of medications in comparison to using synthetic drugs. Compatibly, consumer consciousness is growing, particularly toward the side effects of conventional muscle relaxants (sedation, risk for dependence, and hepatotoxicity), and the offered treatments of herbal medicine are gaining attention in their therapeutic potential and holistic approach. One important area of opportunity is scientific validation through understanding through rigorous research. While there are many herbs

recognized across human history for treatment of muscle relaxation, a limited number of herbs have been studied from a pharmacological perspective through the research process. Future research needs to determine in clinical trials within a controlled and reproducible experiment, research to assess pharmacodynamics dynamics, and long-term safety studies to provide good evidence addressing the muscle relaxant treatment efficacy of herbs. Another area of direction needs to include elucidating and separating active ingredients for each herbal product. The identification of a defined bioactive compound connected with the muscle relaxant effect will contribute to standardized products that may provide optimal dose and activity. Another major opportunity is advancing formulation technologies in combination with the active ingredient of a herbal product to help improve bioavailability, stability, and target delivery of efficacy of the herbal dosages. Potential examples include the role of nanotechnology, encapsulation, and polyherbal combinations to provide the desired therapeutic dosages. As herbal products advance into the marketplace, increased regulation is needed for quality control, safety, and labelling. Creating worldwide standards for herbal skeletal muscle relaxants could bring these agents more fully into clinical practice. Moving forward, interdisciplinary teamwork involving botanists, pharmacologists, clinicians, and traditional medicine clinicians will be critical to translate the knowledge of herbal therapy into evidence-based practice.

Table 1: List of herbal plants have activity on skeletal muscle relaxant

Name of the plant	Common name	Family	Extract used	Part used
Allium macrostemon [5]	Chinese garlic	Amarylliadaceae	Aqueous	Bulbs
Anemarrhena asphodeloides [6]	Anemarrhena rhizome	Liliaceae	Aqueous	Leaves
Aniba riparia [7]	St. John's wort	Lauraceae	Ethanolic	Unripe fruit
Areca catechu [8]	Betel nut	Arecaceae	Dichloromethane, Ethanolic	Areca nut
Bacopa monnierilinn [9]	Brahmi	scrophulariaceae	Methanolic	Aerial part
Bupleurumfalcatum [10]	Chinese thoroughwax	Apiaceae	Methanolic	Fruit
Camellia sinensis [11]	Tea plant	Theaceae	Aqueous	Leaves
Casimiroaedulis [12]	White spoute	Rutaceae	Hydroalcholic	Leaves
Cecropiaglazioui [13]	Embauba	cecropiaceae	Aqueous	Leaves
Centellaasiatica [14]	Indian pennywort	Apiaceae	Ethanolic	Leaves
Cissampelossympodialis [15]	Abuta	Menispermaceae	Ethanolic extract	Leaves
Clitoriaternatea [16]	Butterfly-pea	Fabaceae	Methanolic	Plant powder
Coleus forskohlii [17]	Coleous	Lamiaceae	Aqueous	leaves
Convolvulus pluricaulis	Shankhpushpi	Convolvulaceae	Ethanolic	Whole plant
Crocus sativuslinn [19]	Saffron	Iridaceace	Aqueous, Ethanolic	Petals
Curcuma longa [20]	Turmeric	zingiberacea	Aqueous	Root (rhizome)
Cayratia japonica [21]	Bush killer	Vitaceae	Methanolic	Whole plant and fruits
Echiumamoenum	Red feathers	Boraginaceae	Aqueous	dried flowers
Emblica officinalis [22]	Amla	Euphorbiaceae	Aqueous	Fruit
Evening primerose oil [23]	Evening star/sun drop	Onagraceae	Hydroalcholic	Seeds
Galphimiaglauca [24]	Rain of gold	malphigiacea	Methanolic	Whole plant
Gastrodiaelata [25]	Tian ma	orchidaceae	Ethanolic	Rhizome
Gentianakochiana [26]	Trumpet gentian	Gentianaceae	Diethylether	Aerial parts
Humuluslupulus [27]	Hop	Cannabaceae	CO_2	flowers
Hypericumperforatumlinn [28]	Goatweed	Hypericacaceae	Aqueous-ethanolic	Aerial part
Hypericumreflexum [29]	Hypericum	Hypericaceae)	Methanolic	Aerial part
Inula japonica [30]	Elecampane roots	Asteraceae	Alcholic	Flower, root
Japanese valerian Roots [31]	Kesso root	Valerianaceae	Ehanolic	Roots
Kielmeyera coriacea [32]	Brazil	Clusiacea	Ethanolic	Stems
Lafoensiapacari A [33]	Didal	Lythraceae	Hydroalcholic	Stem bark
Lepidiummeyenii [34]	Maca	Brassicaceae	Aqueous	Hypocotyls
Lobelia inflate [35]	Indian tobacco	Campanulaceae	Methanolic	Leaves
Magnolia officinalis [36]	Beaver tree	Magnoliaceae	Aqueous	Magnoliaceae Bark
Marsileaminuta [37]	Dwarf waterclover	Marsileaceae	Ethanolic	Whole plant
Mimosa pudica [38]	Humble plant	Mimosaceae	Aqueous	Leaves
Mitragynaspeciosa [39]	Kratom	Rubiaceae	Ethanolic	Whole plant
Myristica fragran [40]	Nutmeg	Myristicaceae	N-Hexane	Seeds
Nelumbonucifera Gaertn [41]	Indian lotus	Nymphacaceae	Ethanolic	Flower
Ocoteaduckei [42]	Sweetweed	-lauraceae	Hydroalcoholic	Whole plant
Paullinia cupan [43]	Guarana	Sapindaceae	Methanolic	Seeds
Perillafrutescents [44]	Shiso	Labiatae	Aqueous	Leaves
Plantagoasiatica [45]	Asian plantain eng	Plantaginaceae	Petroleum ether	SEEDS
Polygala tenuifolia [46]	Snakeroot	Polygalaceae	Aqueous	Roots
Psoraleacorylifolia [47]	Bawchi	Leguminosae	Alcoholic	Seeds
Radix puerariae [48]	Kudzu root	Leguminaceae	Ethanolic	Whole plant
Rhazyastricta [49]	Senhwar	Apocynaceae	Aqueous	Leaves
Rhizoma acoritatarinowii [50]	Sweet flag	Araceae	Ethyl acetate	roots
Rhodiolarosea [51]	Roseroot	Crassulaceae	Hydroalcholic	Leaves
Salvia elegan Vahl [52]	Pineapple sage	Lamiaceae	Hydroalcoholic	Aerial parts
SchinusmolleL [53]	Brazilian peppertree	Anacardiaceae	Hexanic	Leaves
Securidacalongepedunculata [54]	Violet tree	polygalaceae	Aqueous	Roots
Siphocampylus verticillatus [55]	Mufumbo	Campanulaceae	Hydroalcoholic	Aerial part
Sphaeranthus Indicus [56]	Sanskrit	Asteraceae	Hydroalcholic	flower
Valerianawallichii [57]	Valerian	Valerianaceae	Aqueous, Methanolic, ethanolic	Rhizome
Withaniasominiferalinn [58]	Indian ginseng	Solanaceae	Methanolic	Roots
Tabebuiaavellanedae [59]	Moreton bay chestnut	Bignoniaceae	Ethanolic	Bark, leaves
Tinaspora cardifolia [60]	Giloe	Menispermaceae	Aqueous	Whole plant
Trichiliacatigua [61]	Catuaba	Erythroxylaceae	Hydroalcholic	Root
Trigonellafoneum-graecum [62]	Fenugreek	Leguminosae	Ethanolic and petroleum ether	Seeds
Thymus pubescences [63]	Firefly thyme	Lamiaceae	Methanolic	Root
Zizyphus Officinal [64]	Amla	Rhamnaceae	Alcoholic	Rhizome
Zingiber officinale [65]	Ginger	zingiberaceae	Hydroalcoholic	Rhizome

Mechanism action of skeletal muscle relaxants [66]

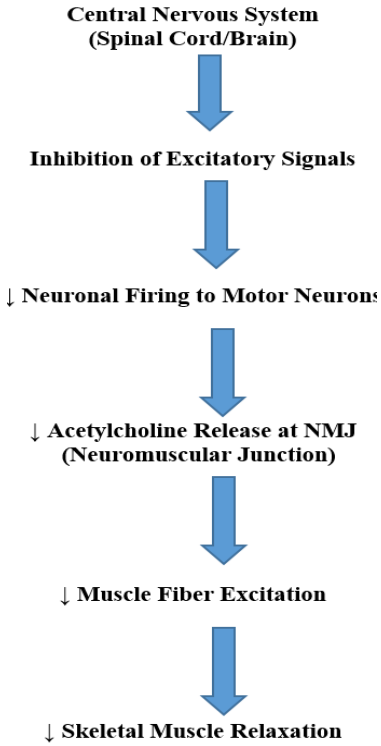

Fig. 1: Flow diagram of mechanism action of skeletal muscle relaxants

CONCLUSION

To relieve discomfort, inflammation, and muscle stiffness, an ever-growing segment of the population is discovering herbal therapies. Many have come to believe that herbs, because they are "natural," are safe. The truth is, herbs can present mild to severe adverse effects (including toxicity, allergies, and interactions with other medicines and medications). There are numerous herbal plants with good systematically in an attempt to discover substitutes such as medicinal and therapeutic effects. In this article, in order to list the medicinal plants with skeletal muscle-relaxant effects, the bioactive extract that is involved, the plant models that are used to evaluate the plants, and the potential for therapeutic effects of the plants.

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AUTHORS CONTRIBUTIONS

All authors have contributed equally

CONFLICT OF INTERESTS

There are no conflicts of interest.

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