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Hordenine: Pharmacological, phytochemical, pharmacokinetic and analytical review of the literature

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Abstract

We planned to extensively evaluate the phytochemical, pharmacological, pharmacokinetic, and analytical effects of hordenine. Hordenine is a typical tertiary amine, *i.e.*, N-dimethyltryptamine, which is a principal alkaloid of barley (*Hordeum vulgare* L.) and belongs to the family, Poaceae. Synonyms were 4-(2-(dimethylamino) ethyl) phenol, 4-[2-(dimethylamino) ethyl] phenol, and anhaline. The molecular formula is C₁₀H₁₅NO. Its chemical structure is the same as stimulants which are in bitter orange. A systematic review of literature search through PubMed, Pubchem, and ScienceDirect electronic databases was conducted for relevant studies reported after 1956 on the effects of hordenine on gastrointestinal disorders, acute lung injury, hyperprolactinemia diabetes, diabetes-related complications, weight loss, and physical fitness, potential roles in skeletal muscle, *Pseudomonas aeruginosa* infections, chronic bacterial infections, antinociceptive, antimicrobial activities, as a sensing inhibitor, beer marker, dopamine D2 receptor agonist, *etc.*, and isolation. A summation of 88 studies was reviewed. There was sturdy evidence for protecting against lipopolysaccharide-induced acute lung injury, analgesic potential, hyperprolactinemia, a significant decrease of DRD2 (dopamine D2 receptor) expression level, FDA's dietary supplement, the potential for controlling nosocomial pathogens, blend of hordenine and insulin (In) outstandingly reduced fasting (f) and postprandial (pp) blood glucose level, a natural product upregulation of *in vitro* translation, serves as a competitive inhibition on signal molecules, Excellent effect on skeletal muscle health by the activation of β, the 2-adrenergic receptor by increasing cAMP signaling acts as an inhibitor of hyperpigmentation. Many studies were conducted on hordenine and have much scope to work on other pharmacological activities like anticancer, hepatoprotective, wound healing, *etc.*

1. Introduction

Hordenine is found in mature leaves, bark, and flowers of *Panicum meliaceum* and belongs to the family Poaceae (Ram Rastogi *et al.*, 1960). Also seen in algae, cacti, and some species of grass. Other sources of hordenine are *Acacia spirorbis*, *Ariocarpus scapharostus*, *Aspergillus glaucus*, *Azureocereus ayacuchensis*, *Boletus zelleri*, *Cannabis sativa*, *Cereus jacamaru*, *Combretum zeyheri*, *Corphantha bumamma*, *Corphantha calipensis*, *Corphantha grenwoodii*, *Corphantha radians*, *Corphantha vivipara* (Grundon *et al.*, 2007), *Dolchothele surculosa*, *Mammillaria elongate*, *Obregonia denegrii*, *Pelecypora aselliformis*, *Desmodium trifolium*, *Solisia pectinate*, *Trichocereus pachanoi*, *Turbincarpus pseudomacrolele* (Saxton *et al.*, 2007).

Hordenine has sources like southern African succulents, *i.e.*, carrion flowers and starfish flowers from the genus of *Stapelia*. Red marine algae-like *Mastocarpus stellatus*. Hordenine is available in more

quantities in many types of cacti, as hallucinogenic properties are peyote (*Lophophora williamsii*), San Pedro cactus (*Trichocereus pachanoi*), and Peruvian torch cactus (*Trichocereus peruvianus*). Hordenine is common in the Amaryllidaceae, *ex*: Crimean snowdrop (*Galanthus plicatus*) and *Eremurus fuscus*, *Eremurus lutesus* (Cheryll *et al.*, 2012). Hordenine is included in many dietary supplements used for athletic performance and weight loss.

Hordenine crystallizes efficiently in colorless prisms and melting points, 117-118°C; b. p.173-174. It sublimes at 140-150°C. It is freely solubilized in H₂O, alcohol, ether, and chloroform. It is powerful alkaline and liberates NH₃ from its salts (Manske *et al.*, 1953). The molecular weight is 165.23. Based on physical and chemical properties and chiefly available in many sources and have much scope to work on many activities. So, decided to do a review priority, to doing research on some activities.

2. Materials and Methods

In September 2021, a systematic review was conducted by literature search through PubMed, Pub Chem, and Science Direct electronic databases by using the text word "Hordenine". All these databases explored titles and abstracts for original research articles in the English language from inception to September 2021.

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