Research Article

Astropharmacology of Antiepileptic terpenoids of *Nigellia Sativa*

Luv Kush*

Department of Pharmaceutical Sciences and Applied Chemistry, Sardar Bhagwan Singh Post Graduate Institute of Biomedical Sciences and Research, Balawala,Dehradun-248161, Uttarakhand. India

ABSTRACT

The ethnopharmacology of natural products[1-5] have reputable history *Nigellia sativa* is a potent medicinal plant of family Ranunculaceae. Traditionally the seeds of this plant are known as kalonji or shoneez, having multiple bioactivities for the treatments of various aliments. The chemotherapeutical, pharmacodynamical, nutraceutical and determatological bioactivities of seeds have validated by several modern publications. The antipetitmal activity of terpenoids was rationalized astropharmacologically by cosmobiological planetary attributions.

Key words: *Nigellia sativa*, Bioactivity, Terpenoids, Astropharmacology, Ancient remedies, Antipetitmal.

Corresponding Author: Dr. Luv Kush, Department of Pharmaceutical Sciences and Applied Chemistry, Academic Advisor, Sardar Bhagwan Singh Post Graduate Institute of Biomedical Sciences and Research, Balawala,Dehradun-248161, Uttarakhand, India.
Email ID-luvdevraj@gmail.com.

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INTRODUCTION

Nigella sativa is a herb of family Renunculaceae . The seeds of this plant are known as kalonji or shoneez which are extensively used in Unani medicine [6-8], originated in Greece and advanced by Arabs. This system authenticated that kalonji treats almost all the aliments of the human body. The medicinal corp of this plant is harvested in north India (Punjab, Bihar, Himachal and Assam) [9]. It is potent medicinal plant of ancient remedies useful in Chinese, Ayurveda and Unani systems [10]. The scientific literature and reviews revealed multiple bioactivities of this plant[11-14]. The chemotherapeutical[15-17] [anti-microbial, anti-fungal, anti-parastical, anti-helminth, anti-viral and anti-tumor], pharmaco-dynamical [18,23] [anti- asthmastic, anti-diabetic, anti-hypertensive, anti-inflamatory, anti-anxiety, anti-spasmoeytic, anti-urolithic, anti- nociceptive, anti-epileptic, anti-hyperlipidermic, gastroprotective, hepato-protective, neuroprotective, pulmonary protective and nephro-protective] nutraceutical [12]. [anti-aging and immuno-modultory] and detmatological[13] [anti psoriasis, anti acne, anti-vitiligo, anti-vulgaris and radioprotective] have attracted phytopharmarmacologists for the extensive research. The chief chemical constituents [24,30] of this herb are thymoquinone, thymohydroquinone, dihydrothymoquinone, thymol, nigellimine, nigellice, etc .

The multiplicity of the bioactivities [30] posed a problem that how come terpenoidal bioactive chemical structure can be therapeutically so diversified. The astropharmacological [31,33]

perspective was attempted for the innovative look at bioactivity profile. The antipetitmal activity of terpenoidal structures [34,36] was selected for this study.

Epilepsy [37] is malfunctioning of nerves in the brain. It is common neurological disorder, characterized by seizures and behavioral spell in which neurons signal abnormally. Physiologically neurons generated electrochemical impulses that act on glands, muscles and other neurons to trigger normal human behavior, thoughts and actions. This normal pattern is disturbed in epilepsy, causing behavioral erraticness, convulsions, muscle spasms and loss of consciousness. The recurrent seizures involve cholinergic, gabaergic and glutamatergic neurotransmitters of the central nervous system. The release of extcitatory amino acids [38] e.g. glutamic acid and aspartic acid cause hypersynchrnous neuronal activity, whereas inhibitory amino acids eg. glycine and GABA modulate antiepileptic action. The monoterpenoids and phenylproponoids act as anticonvulants by enhancing action of GABA [39].

THEORETICAL METHODOLOGY

The organic structures of the natural products are under the umbrella of royal planets-Sun and Moon. They represent hydrogen and carbon respectively. The heteroatoms oxygen and nitrogen account for acidic and basic natures of phytochemicals and biomolecules [40,41].

Vedic medicine[40] accounts the epilepsy due to tridosha related to food habits gleaned from 2nd and 6th houses where moon's adversity occurs through configurational aspects and interactions with other planets.The astrological attributes participate in epileptogenesis [42,43] are briefed below:

Aries (Zodiacal sign) rules the brain. Sun, Mars Mercury and Saturn and Rahu are medically related to healthiness of CNS. Their malefic astro aspects cause CNS disorders. The horoscopial combinations implicated in etiology of epilepsy are:

- Moon, Sun, Mars in Ist or 8th houses aspected malefic (Saturn or Rahu)
- Rahu in ascendant and moon in sixth house
- Mercury and venus in 6th house associated with Rahu or Ketu.
- Sun and venus in ascendant opposing Saturn.
- Afflicterd moon and mercury.
- Moon, Mars and Saturn in 8th house.
- Moon in malefic house with Rahu, Ketu, Saturn or Mars.

- Moon is the significator of emotions and consciousness Moon in 6th, 8th and 12th with evil influence of Rahu toxify emotions and consciousness which promote disorders of mind and consciousness, related to epilepsy. The chemical pharmacology of antipetitmal terpenoids[44,48] is summarized in table-1.

Table-1: Antipetitmal profile of Monoterpenoids

Terpenoids	Molecular formula	Antipetitmal Activity Dose (mg/kg)	Molecular Weights
Thymoquinone	$C_{10}H_{12}O_2$	40	164
Thymol	$C_{10}H_{14}O$	25	150
Benzoquinone	$C_6H_4O_2$	80	180
α-Terpineol	$C_{10}H_{18}O$	100-400	154
Terpinen-4-ol	$C_{10}H_{18}O$	25-200	154
(-) Isopulegol	$C_{10}H_{18}O$	100-400	154
Limonene	$C_{10}H_{16}$	200	136

The transformation of chemical pharmacology of monoterpenoids into astropharmacology[41] in given in table-2.

DISCUSSION AND RESULT

CNS depressant biomolecules should cross blood barrier to reach at site of action. Amazingly hydrogen is the key element in governance of aqueous (hydrophilic) and non-aqueous

(hydrophobic) behaviors of biomolecules. Astrologically hydrogen is ruled by Leo sign (Sun vibrations) is non aqueous, as alkyl, aryl, and acyclic groups have solar dominance. The carbon ruled by (moon vibrations) reduces solar influence by bonding with oxygen and nitrogen. It imparts ionic nature of acid- base behavior promoting (hydrophilic) property. The solar and lunar ranges of terpnoids have hydrogens between 12 to 18 and carbons between 8 to 12 respectively. Pharmacokinetically they are significant because the solar prominence of hydrogens enhance hydrophobicity, absorption and bioavailability.

Thymoquinone has methyl and isopropyl groups which characterize solar imparted hydrophobicity to cross blood-brain-barrier to reach at the site of action in CNS. The antiepletic dose 40mg/kg proves that increase beyond twelve hydrogens or odd atomic numbers except thymol decrease potency. The absence of grandmal and psychomotor epilepsy in the monoterpenoidal structures is due to lack of aryl group of phormacophoric nature. It has almost equal solar and lunar ratio The biological polymorphism of single bioactive natural product cannot be rationalized purely by scientific validations. The versatile bioactivities of biomolecule implied that chemical similarity does not mean biological similarity in vivo. An astropharmacological concept combines cosmological synergism with clinical diversity of bioactive chemical conformation. The possible occult explaination may be based on astropharmacological bioactive shape, composed of Sun-Moon=Solar –lunar =leo-cancer signs contents .Possibly It assumes the multidimensional changes at conformational level in vivo at different tissues.

CONCLUSION

The botanical diversity of natural kingdom has extraordinary biosynthetic variations in chemical structures. The therapeutical biomolecules of natural origin are composed of carbons, hydrogens, nitrogens and oxygens. Astrologically Sun (Leo) and Moon (Cancer) govern these elements. The Solar and lunar lights have profound effect on natural products. Antipetitmal activity explained by absence of aryl group in monoterpenoidal structures. In other words Sun (hydrogen) - Moon (carbon) contents are structurally diluted.

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Table-2: Astropharmacological Elementenkresis of Antiepileptic Monoterpenoids

Structural Standards	Number of Carbon Atoms Moon	Number of Hydrogen Atoms Sun	Number of Oxygen Atoms Moon	Number of Even Atomic numbers	Number of Odd atomic number
Thymoquinone	10	12	02	12	12
Benzoquinone	06	04	02	08	04
Thymol	10	14	01	11	14
α-Terpineol	10	18	01	11	18
Terpinen-4-ol	10	18	01	11	18

Limonene	10	16	0	10	18
Iso pulegol	10	18	01	10	18

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