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Chemopharmacophoric Aphrodisiophore

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Abstract:

Aphrodisiac drugs are the pleasure – oriented pharmaceuticals and have value in sex – therapeutics. We made an attempt to apply new concept of chemobiological mimicry to aphrodisiac chemistry by comparing with endogenous, neurotransmitters and androgens. Dopamine, Norepinephrine, Serotonin and Testosterone were taken as the structural standards for rationalizing the selection of chemobiologic mimetics to design chemopharmacophoric aphrodisiophore [CA]. This may be useful in imparting aphrodisiacal specificity at receptor levels and promoting bioenergetic sexual synergy.

1. Introduction

The remarkable growth of aphrodisiac formulations in the recent years for improving the pleasure of love life claimed therapeutical benefits. People are searching such formulative potions at about 80,000 websites of internet. Aphrodisiacs^{1,2} inspire erotic thoughts and desires through triggering the brain neurochemicals. The marketed aphrodisiac formulations³ of botanical and synthetic nature were analyzed at chemobiological level for ascertaining structural mimicry.

2. Theoretical Methodology

The aphrodisiac herbology^{4,7} and synthetic drugs⁸ have notable chemical structures. They are molecular mimics of neurotransmitters and hormones, therefore, structural standards for deriving the chemobiologic entities were selected from two categories.

- Neurotransmitters – Dopamine norepinephrine, serotonin
- Hormones – androgen- Testosterone

The sexual interest, desire, libido, fantasy, imagination and pleasure are interlocked in the chemistries of neurochemicals, hormones and bioenergetics. Their biological influences involve three types of tropisms – neurotropism, hormonal tropism and bioergotropism.

The aphrodisiological structures of the natural products and synthetic compounds were studied. The botanical structures belong to alkaloids, terpenoids, flavonoids, steroids, saponins, glycosides, cordyceps and aromatic aminoacids, whereas the synthetic products⁸ (useful in impotence/erectile dysfunction)⁹ have heterocyclics

Triazole, imidazole, piperazine indole with acidic and basic functions. The basic framework of chemically oriented aphrodisiophore lies in structural mimicry at chemobiological level^{10,11}.

3. Discussion and Result

The chemical basis of CA needs pertinent bioactions of the chemobiologic mimics. They are enumerated below.

- Testosterone booster = libido enhancer
- Antioxidant = anti-aging
- Anti-stress = adaptogenic
- Love promoter = releases love chemicals
- Pleasure-enhancer = liberates pleasure chemicals
- Blood flow enhancer = enriches blood flow to genitals

The four types of mimics were identified which have aphrodisiacal complementarity. They are

Androgenic mimicry = Testosterone

Catecholic mimicry = Dopamine Norepinephrine

Phenylethylamine mimicry = Dopamine Norepinephrine

Indolyl mimicry = Serotonin

3.1. Androgenic Mimicry¹²⁻¹⁵

Panaxapogenin Ecdysteroids, curculigol, curculigenin, androstenol, withaferin A Mesterolone sitminoside, simarolide, Quassinoids (partial), Diogenin, Protodiosin and Glycyrrhizic acid have structural resemblance with androgen at nuclear level. It is assumed that natural aphrodisiacs having such mimicry, may act as substrates for testosterone boosting by direct or indirect actions as listed below:

- Direct stimulation of the Leydig cells in the testes
- Stimulation of the pituitary to produce more LH
- Reduction of estradiol levels through competitive receptor binding (anti-estrogens) or decreased production of aromatase enzyme.
- Increase production of enzymes responsible for the biosynthesis of testosterone.

The indirect actions are also capable of impacting testosterone levels

- Reducing prolactin
- Stimulating oxytocin
- Stimulating noradrenaline.

3.2. Catecholic Mimicry

The bioflavonoids having the chrome nuclear structure have catecholic/phenolic functions. Butein, Butrin, Epicatechin, Leucodelphindin, Licochalcone B, Paradol, Resveratrol¹⁵ and Rutin are supportive examples. Their antioxidative and anti-ageing bioactions promote physiological youthfulness.

3.3. Phenylethylamine Mimicry

The alkaloids eg Apomorphine mimics dopaminergic features. It is vasodilatory, No donor and PDE inhibitor⁹. All this is favorable for blood flow to penile vasculature.

3.4. Indolyl Mimicry

Yohimbine intensifies libido, parasympathetic activity and blood flow to erectile tissue. It also acts as anti-anxiety. The indolylamine moiety partially mimics serotonin.

Cordyceps¹⁶ have an exceptional non-mimetic structure and behaves as fortifier of aphrodisiac potential. They empower internal energy of body, enhance immunity, protect from free radical damage and act as anti-physical stress structure.

The synthetic-pharmaceutical^{17,18} are leodopa, Trazodone, Bupropion, Fenfluramine, Fluoxetine and Paroxetine. They partially mimic amphetamine and catechol chemistry of the neurotransmitters. The propyl chain, 6-membered heterocyclic (preferably piperazine piperidine) and strong electron attracting groups induce the structural deviation from the chemobiological mimicry, but this is useful as their antidepressive bioactions, synergize the aphrodisiac efficacy.

4. Conclusion

The hormonal tropism, prostate secretion, activation of love chemicals and blood flow to the genitals are the physiological determinants of sexual competency. Therefore suggested chemopharmacophoric aphrodisiac of four chemobiomimetic features

- Catecholic
- Phenylethylamine
- Androgenic
- Indolyl amine

Should meet the basic essentials of aphrodisiacs. Hopefully this model may help in developing love-inspiring and pleasure enhancing pharmaceuticals.

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