



EDELWEISS PUBLICATIONS
OPEN ACCESS

<https://doi.org/10.33805/2638-8073.112>
Volume 2 Issue 1 | PDF 112 | Pages 3

Edelweiss: Psychiatry

Open Access

Review Article

ISSN: 2638-8073

Blue Nile Flower Rituals from the Perspective of Transpersonal Psychology - The Role of Nuciferine and its Putative Value as an Antipsychotic Drug

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Citation: Keppel Hesselink JM. Blue Nile flower rituals from the perspective of transpersonal psychology- the role of nuciferine and its putative value as an antipsychotic drug (2018) Edelweiss Psyi Open Access 1: 22-24

Received: Nov 08, 2018

Accepted: Nov 12, 2018

Published: Nov 19, 2018

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Abstract

Pharmaco- or psycho-active compounds in traditional medicines or in plants used during neoshamanic rituals can sometimes lead to the (re-) discovery of new drugs for chronic pain, anxiety, depression or schizophrenia. Neoshamanic rituals fulfill the needs for healing and transformation of a number of people, who are partly dissatisfied with the absence of certain healing aspects in western medicine. A recent neoshamanic ritual is based on the administration of a resin from the Blue Nile Flower (*Nymphaea caerulea*), also referred to as Blue Lotus or Sacred Blue Lily of the Nile). This extract contains a number of alkaloids such as aporphine and nuciferine, although the quality of commercial available extracts is highly variable. We will discuss the biological effects of nuciferine, a compound which may be of value for the treatment of psychiatric disorders, and discuss the use of Blue Nile Flower in rituals from a transpersonal psychological perspective. Nuciferine has an enriched pharmacological profile, with affinities for a number of serotonergic and dopaminergic receptors. Nuciferine and its derivatives might lead to a new family of atypical antipsychotic compounds. Furthermore, a recent identified mechanism of action related to its anti-inflammatory activity, suggest this molecule might also play a role in the treatment of depression and posttraumatic stress disorder.

Keywords: Lotus, Blue Nile Flower, Schizophrenia, Antipsychotics, Rediscovery, Depression.

Introduction

Recently new neoshamanic rituals are developed in various European countries and the USA, based on the use of psychoactive extracts from plants, such as ayahuasca, peyote, iboga, Salvia divinorum and mushrooms, or based on amphibian secretions, such as in Kambo. These plants and animals may hold a promise for medicine and psychiatry, as some of its components may have important therapeutic value. The rituals developed in Europe and the USA may point in the direction of what putative value the plants have, especially in the fields of psychiatry, for instance for the treatment of substance abuse, anxiety, depression and schizophrenia.

The relevance of these rituals for the user can be described from the perspective of transpersonal psychology and psychiatry. Transpersonal psychology is not widely known. Its fundamentals can be identified in text of the 1960s, and it was meant to open a new chapter in psychological studies, adding perspectives that were missing in the psychodynamic, behavioristic and humanistic approaches. Transpersonal psychology has long been in the limbo zone of psychology, but there are clear signs that its significance is increasing during the last decades.

The broad introduction of 'mindfulness' can be seen as such sign, but more concrete is the publication of a new handbook recently in this field [1]. The writer of this article specializes in the repositioning of old drugs in new indications, such as phenytoin in neuropathic pain, and identified-rediscovered-dermorphin as a potential important analgesic for terminal cancer patients. Dermorphin is a neuroactive peptide first used in neoshamanic rituals, where a special secretion of a frog was administered, called Kambo [2-4].

The writer was subsequently offered the opportunity to attend a neoshamanic ritual in the Netherlands, where a tea from the Blue Nile Flower (*Nymphaea caerulea*) was served. This flower has been characterized in the past as the sacred narcotic lily of the Nile [5] Such rituals based on certain pharmacoactive plants or animals (frogs, toads) are starting to become increasingly popular, also due to its neoshamanic structure. It is therefore important to understand the essence of these rituals from a transpersonal psychological perspective. We will further discuss in some detail the pharmacological properties of one of the active ingredients of the *Nymphaea caerulea*, nuciferine.

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The ethnobotany of the Blue Nile Flower (*Nymphaea caerulea*)

Up to the 80s of last century, the general opinion of ethnobotanists, pharmacologists, and anthropologists was that the plants of the family Nymphaeaceae did not have any unusual pharmacological and chemical properties. [5] This was found by Emboden (1978) to be a wrong assumption. [5] He identified the use of certain *Nymphaea* species in the Ancient culture of the Mayans, and quoted a poem from that culture, praising the 'precious aquatic flowers' and the 'flowers that cause vertigo, the beautiful narcotic flowers' [5]. The *Nymphaea caerulea* was also indigenous in ancient times in Egypt and archeologist as early as already in 1875 claim the flower was offered by the dead to a main God of the Egyptians, Osiris [6]. The proto Sungod Atum rose from the water lily, rooted in chaos (the God Nun). The death and resurrection of Osiris is also symbolized in the blue water lily. Subsequently the flower remained mysterious and magical, and garlands of it were reserved for priests and kings only.

The lily further gave birth to the four sons of the Falcon God Horus, and Emboden (1981) suggested the Blue Nile Flower was used already in a shamanic context before the rise of the pharaohs [6]. Chapter 81 of the famous Egyptian book of death deals with the transformation of an Egyptian (Ani) who wishes to be reborn in life via a transformation into the Blue Nile Flower. The same flower is said to also gave life to the son of Ptah, a mysterious magical God from the Egyptian pantheon. Emboden speaks of shamanic transformations, and this is underlined by an ancient Egyptian vignette of a human head springing from a blue water lily in a pool of water in the papyrus [6].

There are more pictures of transformations of Gods via the blue water lily, as Emboden pointed out. Furthermore, at many places in the old Egyptian buildings, graves or papyri, the blue water lily is depicted together with other plants with narcotic properties, such as the opium poppy, suggesting their use together or separately as magical potions. In a picture of the 18th dynasty for instance, the God Horus is presented as healer, receiving a jar with blue water lily. It was in 1822 when the blue water lily was rediscovered in the west as a plant containing psycho-active compounds, by a French physician from Paris, who suggested that a preparation of the blue water lily could replace opiates as a narcotic.

In 1912 another French physician wrote: 'La decoction de la fleur est narcotique', the tea of the flowers of the blue water lily has sedative properties. This, according to Emboden, is the first publication where the flower of the blue water lily of ancient Egypt is implicated as the base for a sedative preparation [6]. Sometimes the *Nymphaea caerulea* is referred to as Blue Lotus, which in essence is not correct, the plant is not a Lotus but a Lily. The suggested spiritual-neoshamanic effects of the plant are recently described as: 'The Blue Lotus is connected to the expansion of the higher mind. It eases the spirit out of the body and assists it forward towards its highest potential in the realm of Spirit. It offers one of the highest vibrations of any flower. It is the symbol of the victory of the spirit over the senses, of intelligence and wisdom, of knowledge' [7]. This description directs illustrates the recent transpersonal context of the use of this plant.

Nuciferine and its potential value for Psychiatry

Water lilies are known for their production of aporphines, alkaloids with a quinoline alkaloids structure, such as apomorphine, nymphaeine, nymphaline, nupharine, alfa- and beta-nupharidine. In **figure 1** the structures of the 3 main alkaloids from the water lily are depicted, the 2-ring quinoline scaffold is recognizable in all.

Nuciferine was already reported in 1972 to have antipsychotic properties, comparable to chlorpromazine, although the structure of the molecule is quite different [8]. Nuciferine has also earlier been isolated from the Indian lotus, the *Nelumbo nucifera*, a plant used in an Ayurvedic pharmacopoeia for the treatment of certain mental disorders. In the Chinese pharmacopoeia, the preparation Tangzhiqing tablet also contains nuciferine [9].

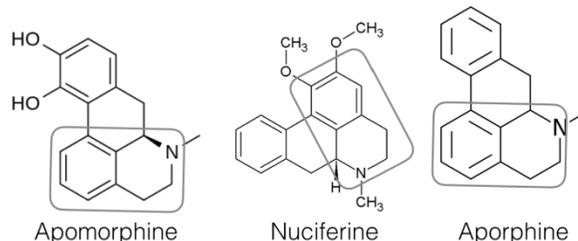


Figure 1: Psychoactive aporphines from the Blue Nile Flower all based on the quinoline structure as highlighted.

The first extraction from the Lotus, *Nelumbo nucifera*, explains the given name, nuciferine. In animal models nuciferine in a dose-range of 25-50 mg/ kg BW, administered intraperitoneally induced marked sedation, and higher doses led to cataleptic behavior. Nuciferine further potentiated the sleep inducing effects of a barbiturate, and inhibited amphetamine toxicity and stereotypical responses. It potentiated sub-analgesic dosages of morphine, and sub-anticonvulsive dosages of phenytoin. These results suggested for Bhattachary et al (1978) that nuciferine behaves as a DA-receptor antagonist, like other neuroleptics [10].

More recently Farrell et al (2016) described the results of the Psychoactive Drug Screening Program of the National Institute of Mental Health related to nuciferine [11]. This study confirmed the potential value of nuciferine for the treatment of schizophrenia, and the authors concluded that predicted molecular profile similar to antipsychotic compounds. Its receptor profile can be described as 'dirty' or 'enriched': nuciferine shares a receptor profile a bit similar to aripiprazole-like antipsychotic drugs. Nuciferine is an antagonist at number of serotonergic receptors: 5-HT_{2A}, 5-HT_{2C}, and 5-HT_{2B}, an inverse agonist at 5-HT₇, a partial agonist at the D₂, D₅ and 5-HT₆ receptors, an agonist at 5-HT_{1A} and D₄ receptors, and a general dopaminergic compound via the inhibition of the dopamine transporter [11].

The receptor profile of nuciferine has thus some resemblances with one of the most successful antipsychotic drugs clozapine. The use of clozapine however is limited due to its serious adverse events. It is therefore of great importance to further evaluating the value of nuciferine as the basis for finding new atypical antipsychotic drugs. Recently, various blue lotus flower preparations have become available, such as extracts, resins, dried leaves, oils, powders, and even electronic cigarette refill liquids [12]. The quality however is not always reliable; in some extracts nuciferine is absent, in others it is present up to a concentration of 4300 ng/g [12]. The same holds true for aporphine in these extracts.

Recently new data suggest a new and quite interesting Mechanism of Action (MOA) of nuciferine, via the inhibition of slow inflammation, most probably via its activating role on one or more of the Peroxisome Proliferator-Activated Receptors (PPAR) and via downregulating amongst others the TLR4-NF-κB signaling pathway [13-14]. This opens a whole new chapter of putative indications for this molecule, from neuropathic pain up to fibromyalgia. Furthermore, given the new interest in the role of inflammation in the central nervous system in



depression, nuciferine might also have value as a new antidepressant and perhaps in the treatment of Posttraumatic Stress Disorder [15].

Neoshamanic rituals

Neoshamanic ritual based on pharmacologically active plants (referred to as 'sacred plant teachers') are contemporary creations inspired by the rituals of indigenous people. In the Netherlands and other European countries, as well as in the USA, such rituals grew more popular at the end of last century. Initially the rituals were based on ayahuasca, an Amazonian tea based on a mix of two different plants, leading to an intense transpersonal experience, also with clear impact on our brainwaves, as we showed in a previous study [16]. Ayahuasca rituals in the Netherlands have been organized initially by various groups, among which the Santo Daime church and the Foundation Friends of the Forests. Meanwhile many different 'plant teachers' are used as a basis for such neoshamanic rituals, from cacao up to iboga. While some pharmacologically active plants are very mild related to their induced effects, such as the tincture of the *Nymphaea caerulea*, cacao and Kratom, other plants, such as iboga, mushrooms and peyote induce much stronger effects. In a neoshamanic ritual relative small group, mostly 10-30 people gather together in a meditative atmosphere.

Mostly each participant is smudged before entering the ritual space, and after an opening ceremony, the ritual starts with drinking the plant-concoctions. Mostly the ritual moves between periods of silence and periods of music, the music mainly of shamanic nature (rattles, drum, didgeridoo) (see figure 2). During the attended *Nymphaea caerulea* ritual, cacao was also taken, as well as rapé, a micronized powder of the *Nicotiana rustica*, which is taken as sniff. In the Neoshamanic community there is much know-how about the use of certain plants, and the effects as communicated by organizers and participants, may be of importance, to point out possible medical use. The use of a tea based on *Nymphaea caerulea* is said to induce deep tranquility and centeredness. As such, this further supports the putative value of for instance the component nuciferine for various psychiatric disorders.

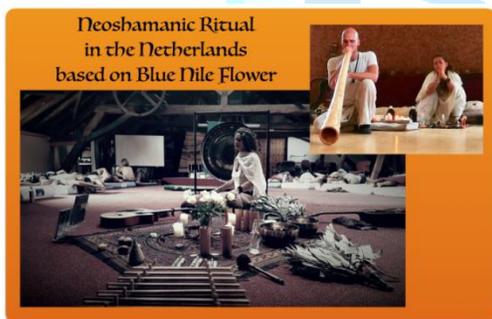


Figure 2: A Blue Nile Flower ritual in the Netherlands: various shamanic elements can be identified, such as shamanic instruments and leave-rattles.

Conclusion

Due to the increase of interest in neoshamanic rituals in the West, certain extracts of plants and amphibians are explored for their effects on transpersonal states of consciousness. Such rituals have a double significance: first the participants experience healing and transformation during such ritual, and secondly, the experiences may also suggest new therapeutic values for the used preparations. Previously we re-discovered dermorphine as a non-opioid analgesic in the secretion of an Amazonian frog, Kambo, used in contemporary healing rituals. The interest in dermorphine waned after 1985, although clinical studies supported its further use, especially in cancer pain.

By participating in a recent neoshamanic ritual based on *Nymphaea caerulea* its relaxing and centering effects were clear for many participants. One of the main pharmacologically active components of the Sacred Blue Lily of the Nile is nuciferine. Although this compound has been known for years, no clinical trial ever evaluated its potential as a therapy for schizophrenia, anxiety or depression. Its mechanism of action however clearly suggests putative value in the treatment of a number of psychiatric disorders. Recent neoshamanic rituals have not only great value for participants, given the various transpersonal experiences of healing and transformation; it may also suggest new therapies, as we have seen in the case of the Sacred Blue Lily of the Nile and its bioactive component nuciferine.

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