WWW.IJRPR.COM

International Journal of Research Publication and Reviews

Journal homepage: www.ijrpr.com ISSN 2582-7421

The Herbal Drug Aconite NAP Effective Against Immunomodulatory Effect

Abesh Das[1]; Arka Guin[2]; Swapnadeep Sen[3]; Ananya Chandra [4]; Dr. Samaresh Mondal[5]

[1]Kolkata Institute of Pharmaceutical Science.
[2]Guru Nanak Institute of Pharmaceutical Science & Technology.
[3]Dr. Harisingh Gour Central University.
[4]Guru Nanak Institute of Pharmaceutical Science & Technology.
[5]Kolkata Institute of Pharmaceutical Science.

ABSTRACT

The goal of the current investigation was to examine Aconitum napellus's (Ranunculaceae) neuroprotective qualities. According to the Ayurvedic shodhana method, the plant purification was carried out with either water or cow or goat milk. An assessment of A. napellus's neuroprotective potential was conducted on Sprague Dawley (SD) rats that had diabetic neuropathy brought on by streptozotocin. Assessment criteria included body mass, blood sugar, oral glucose tolerance test, motor coordination test, hyperalgesia, cold allodynia, locomotor activity, oxidative biomarkers (TBARS, reduced glutathione, catalase, and superoxide dismutase), and sciatic nerve histomorphology. The MTT test was employed in the in vitro research using the human neuroblastoma cell line SHSY-5Y to evaluate the antiproliferative efficacy of various extracts. The results indicate that the chloroform extract treated with goat milk contains a lower amount of aconitine ($p < 0.05$ when compared to the diabetic control group). The results of the in vitro study demonstrate A. napellus's effective neuroprotective function. This implies that more research on A. napellus's role in diabetic pathophysiology is necessary.

Keywords: Aconite Naellus, Neuroprotective, TBARS, MTT test, Histromorphology.

Introduction

A feeling of dread, anxiety, and physical and mental suffering. The most common symptom of aconite is fear, or restlessness, both mental and physical. Fever and an abrupt, forceful, and acute invasion necessitate it. refuses to be contacted. Abrupt and severe loss of power. problems and stress brought on by being in dry, chilly weather, a draft of cold air, checking one's perspiration, as well as complaints from extremely hot weather, particularly with regard to gastrointestinal issues, etc. Inflammatory fevers are the first treatment for inflammations. Muscular tissues and serous membranes were significantly impacted. Internal parts burning; numbness, coldness, and tingling.

Influenza. Arterial tension; several symptoms can be attributed to mental, emotional, and physical strain. When administering Aconite, keep in mind that the drug just disrupts function; there is no proof that it can alter tissue; instead, its effects are transient and lack periodicity. Its scope is limited to the early stages of acute illness and should end when pathological change occurs. Congestion occurs in hyperaemia before exudation does. The flu (Influenzin).

Figure 1: Picture of plant Aconite nap.

A feeling of dread, anxiety, and physical and mental suffering. The most common symptom of aconite is fear, or restlessness, both mental and physical. Fever and an abrupt, forceful, and acute invasion necessitate it. refuses to be contacted. Abrupt and severe loss of power. problems and stress brought on by being in dry, chilly weather, a draft of cold air, checking one's perspiration, as well as complaints from extremely hot weather, particularly with regard to gastrointestinal issues, etc. Inflammatory fevers are the first treatment for inflammations. Muscular tissues and serous membranes are noticeably affected

Internal parts burning; numbness, coldness, and tingling. Influenza. Arterial tension; several symptoms can be attributed to mental, emotional, and physical strain. When prescribing Aconite, keep in mind that it just disrupts function; there is no proof that it can alter tissue; instead, its effects are transient and lack periodicity. Its scope is limited to the early stages of acute illness and should end when pathological change occurs. Congestion occurs in hyperemia before exudation does. The flu (Influenzin)

Biological Classification

Scientific Name	*Aconitum napellus*
Family	Ranunculaceae
Native	Western and Central Europe
Herbaceous perennial plant	1 m (3 ft 3 in) tall, with hairless stems and leaves.
Cultivation	*Aconitum napellus* is grown in gardens in temperate zones for its spiky inflorescences that are showy in mid-autumn
Flowers	The flowers are dark purple to bluish-purple, narrow oblong helmet-shaped, 1–2 cm (0.39–0.79 in) tall.
Synonyms	Aconite

Table 1: Biological Classification.

Figure 2: Aconite plant roots picture.

Geographical Distribution

The species that gardeners usually use can tolerate some shade and do well in well-drained, evenly moist, "humus-rich" garden soils, such as those found in many related Helleborus and Delphinium plants. Certain plants, like Aconitum noveboracense, need more precise growing conditions than others that are used in gardens. Like the allied Clematis, the majority of Aconitum species prefer to have their roots kept cool and damp and their leaves mostly

exposed to light. Aconitum species can be multiplied by seeds or by dividing the root, though caution must be used to prevent leaving portions of the root where animals could become ill from it.

Wearing disposable gloves for protection is recommended while handling any part of these plants.[4] Compared to the closely related delphinium plants, aconitum plants usually live far longer and devote less energy to flower generation. Consequently, they are not considered "heavy feeders"—unlike gardeners' delphiniums, which require a greater amount of fertilizer than most other flowering plants. Like other members of the Papaveraceae and Ranunculaceae families, they are averse to root disturbance. Like most other members of the Ranunculaceae family, seeds that are not planted right away after harvesting should be kept damp and packed in vermiculite to prevent problems with viability and dormancy.

"Gold Nugget" seeds from the German seed company Jelitto are advertised as having a coating that allows the seed to germinate right away, avoiding the double dormancy defect (from the perspective of a typical gardener) that Aconitum and many other species in the Ranunculaceae genera use as a reproductive strategy. On the other hand, seeds that are not planted right away or that are not packed with moisture are said to take up to two years to germinate. They are also known to have very variable germination rates in terms of the amount of time needed to germinate each seed and to lose their viability quite quickly (see Adonis, for example). These problems are common to numerous Ranunculaceae species, including Pulsatilla (pasqueflower).

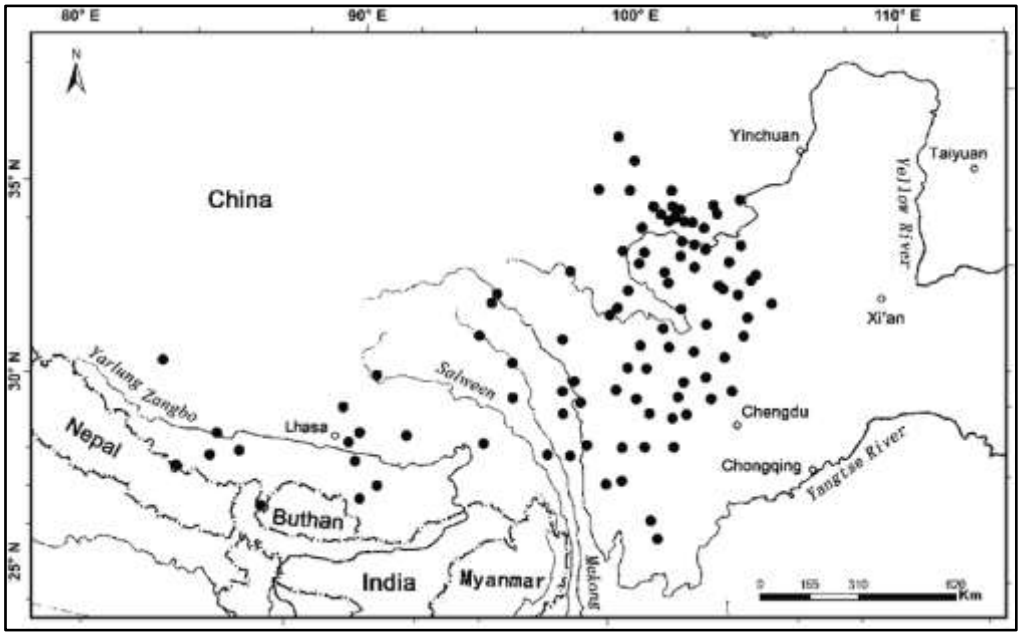

Figure 3: Geographical distribution of aconite Chemical Constituents of Aconite nap

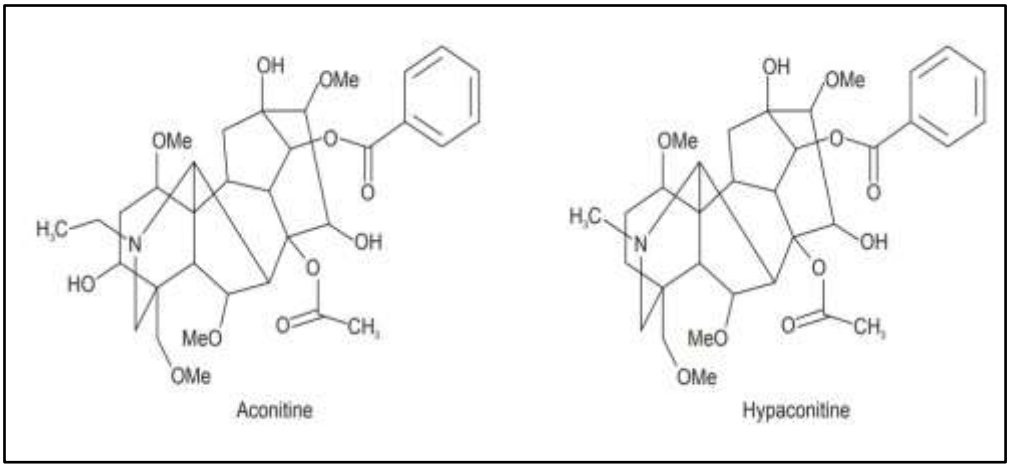

Figure 4: Chemical Constituents of Aconite nap.

Remedy

This cure has been compared to a storm that suddenly arises and dissipates or to a storm in a person's vitality. It causes turbulence in the flow of blood. Symptoms appear out of the blue in the middle of the night following exposure to a chilly, dry breeze, extremely hot weather, or a terrifying event. Quickly following exposure to wind, fear, or shock are inflammations. The texts typically have a lot of mention of fear, which might be very present in very acute situations or completely lacking in less serious ones.

Aconite is mostly prescribed for usage at home to cure colds in their early stages. It is helpful for the initial stages of acute inflammation, including fever, croup, colds, influenza, earaches, vomiting, diarrhea, and travel-related symptoms.

Mental/Emotional symptoms

An Aconite state can be triggered by having been in a near-death experience. When treating illnesses brought on by traumatic events like fires, earthquakes, and accidents, it can be extremely helpful. Fear and terror following any traumatic event. Anxious impatience, unbearable mental agitation, and excruciating tossing around may occur. Deflated pupils following a shock, hands and limbs quivering, speech wavering, and incoherent and wobbly. complaints that have been there ever since a particular event or occasion, namely fear or an unexpected run-in with death. Attacks of panic include trembling, shaking, and the desire to flee, as well as tingling and numbness in the arms or fingers.

Physical symptoms

Fever and Thirst: The onset of inflammation does not always coincide with a fever, but if it does, the face may flush or appear pale. The skin is typically dry and heated. Heatwaves and cold snaps can happen. Sweating may occur on exposed areas of the body as the fever starts in the head and moves down.

Colds and Sore Throat: Sudden onset of symptoms after exposure to dry, cold wind.

Croup that comes on suddenly after exposure to dry, cold wind. They wake around midnight with great fear, a hoarse barking cough and clutching at the larynx.

Diarrhea: after exposure to cold winds or intense summer heat with restlessness and anxiety

Eye Injuries: For the shocked feeling and sudden inflammation that follows an injury to the eye.

Hemorrhages are sudden and profuse with bright red blood from anywhere in the body and accompanied by great fear of death and nervous excitability.

Headache: Congestive headache that is worse from motion. Similar to Bryonia but with sudden onset.

Pain: The pain is burning, sharp, stabbing and accompanied by restlessness, anxiety and thirst. They cannot bear the pain or to be touched or covered. Numbness, tingling, prickling formication.

Sleep: Sleep disturbances after a fright or shock; anxiety and fear, tossing about restlessly, nightmares, fear of dark, ghosts, agoraphobia.

Urination: Inflamed bladder and anxious desire to urinate or retention of urine cause by shock.

Source

Vegetable kingdom is Aconitum napellus' primary supply. It's an indigenous species of flowering plant from western and central Europe, once native to Asia and North America under the genus Aconitum of the family Ranunculaceae. With perpendicular, tapering tuberous roots, it is a perennial herb. The stem is up to two meters tall, erect, spherical, smooth, and somewhat hairy above. The undersides of the alternating, long-stalk leaves are hairy. They are separated into three or five segments, each further divided, with the lower lobed more deeply than the top. Dark-violet in color, the flowers bloom from May to July. They are racemose and stalked. Petaloid sepals five: the lower two are rectangular oval, the upper two are nearly hemispherical, and the two laterals are roundish and hairy within. The upper sepals are helmet-shaped and beaked.

Macroscopically

Macroscopically, the roots are tuberous and can be found alone or in groups of two or more. A side branch or branches connects the younger, smoother roots to the older, severely wrinkled roots. The base of an aerial stem or the remnants of the bud with several thin, wiry rootlets—the scars left by these—are joined to the obconical crown of each root, which is typically between 4 and 10 cm long and 1 and 3.5 cm wide. Internally, young roots are yellowish-white, whereas old roots are brown. Its exterior is a deep shade of brown. Short, horny, or mealy fracture.

Figure 5: Macroscopically image of Aconite nap.

Microscopically

Microscopic diarch radial bundles may be seen in the cross section close to the root tip. As one moves upward, these bundles gradually change into tetrarch, pentarch, and occasionally octarch. The tiny area that makes up the root cortex is surrounded on the outside by a layer or layers of brownish cells called the metaderm. Cellulosic parenchyma with pits represents cortical cells. A pericycle made up of one to twenty layers of parenchyma cells is surrounded by brownish, longitudinally elongated rectangular cells that make up the endodermis. There are sporadic sclerids in the pericycle and cortex. Within the pericycle are five to eight bundles of main phloem that alternate with the cambium's angles. The metaphloem is a wide strip of parenchyma cells that is densely packed with simple and compound starch grains, ranging in diameter from 2 to 6 to 15 to 20 µ. This area is embedded with numerous islets of sieve tissues; the cambium, which is stellate in transverse section and is located in the upper part of the root, is made up of rectangular prismatic cells that enclose, at each angle, a wedge-shaped group of parenchymatous medullary ray cells, on the inner margin of which is a small primary xylem with spiral vessels; the wedge is flanked on either side by a small group of secondary xylem, primarily composed of reticulate and pitted vessels; further groups of secondary xylem are dispersed along the cambium. There are no discernible medullary rays, and the pith is made of cellulose parenchyma.

Figure 6: Microscopically picture of the plant Aconite nap.

Parts used

When the plant first started to flower, the entire root system was gathered. Compared to herbs or leaves, the pharmacological strength of the root is more stronger and more consistent. Typically, a root's strength is nine times greater than a leaf's. The root has been incorporated as a result. The potency of herbs found in the wild is higher than that of those grown in gardens.

Mechanism of Action

There might not be a single system, tissue, or organ in the body that this cure cannot affect. Nonetheless, it mostly affects the brain, blood, serous and mucous membranes, the cardiovascular system, and the cerebro-spinal nerve system.

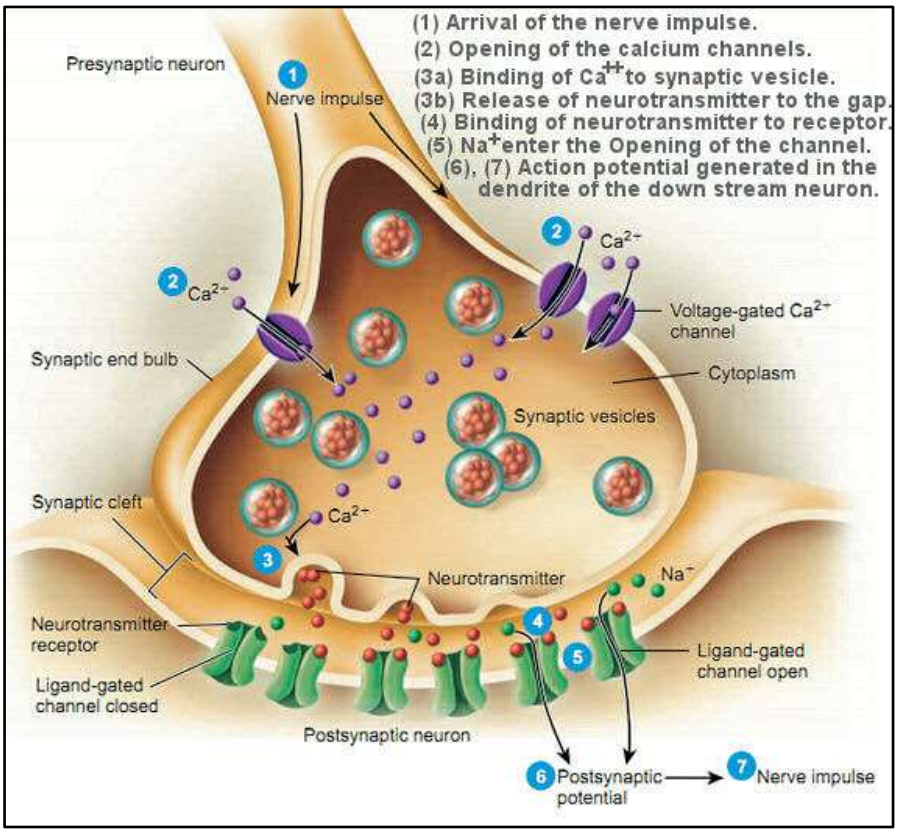

Figure 7: Mechanical action of Aconite nap.

Toxicity of Aconite Preparations

All ancient records highlight the terrible toxicity of Aconitum. Shakespeare emphasized the herb's strength in Romeo and Juliet, claiming that Romeo used this poison to end his own life. Furthermore, the witches' cry for the "tooth of the wolf" in Macbeth alludes to monastic life. Because arrows coated in the poison kill wolves, some species are also referred to as "wolfsbane." All Roman home gardens were forbidden from cultivating this plant under the rule of Emperor Trajan (98–117 AD). The author Ovid summed up one of the most notable works that discussed the function of this plant in ancient Roman civilization. He called aconite the "poison of the stepmother."

Wolfsbane is the primary component in Wolfsbane Potion, and Prof. Severus Snape warned Harry Potter about its toxicity during their first Hogwarts Potions lesson.

Numerous cases of aconitum poisoning have been reported globally in recent years. Few occurrences occurred in India or Europe, with the majority of cases occurring in the Far East.

More than 600 cases of aconitum poisoning were documented in China up until 2006. From 1990 to 1999, 17 instances were documented in Taiwan. However, following the publicity campaigns from 1996 to 1998, the yearly incidence of herb-induced aconitine poisoning in the New Territories East of Hong Kong considerably dropped to 0.17 per 100,000 people.

Generally speaking, oral use of Aconitum pills or decoctions causes Aconitum poisoning. Only 14 cases of poisoning with topical administration of aconite formulations have been published until 2011, indicating the rarity of toxicity through skin penetration. Due to hot water scorching or herpes zoster infection, the epidermis and dermis at the application areas were already injured in the two fatal cases. The sufferers applied their own homemade aconite tincture, and one used raw.

Conclusion

Forever and ever, aconite will be a strange herb. It is comparable to Janus from Greek mythology, who has two faces: one promotes healing while the other brings about death. Despite its lengthy history of use, doubts and misunderstandings over its true nature persisted. Practitioners of TCM, Kampo, and Ayurveda have extensively researched this plant and developed numerous methods to lessen its toxicity. In recent decades, serious clinical investigations have begun in China with the goal of determining the full medicinal potential of aconite. These studies revealed the effectiveness of SFI and qili-qiangxin capsules in the treatment of cardiac conditions. Although there have been no documented clinical trials, aconite has been utilized for millennia in Ayurvedic and homeopathic medicine systems. Small experiments conducted by Kampo medicine practitioners revealed strong analgesic effects of aconite. Even with these efforts, official aconite usage is still relatively new worldwide. It is advised to carry out further clinical trials with the available Aconitum sp. on various populations.

Reference

1. Ding JY, Liu XX, Xiong DM, Ye LM, Chao RB. Simultaneous determination of thirteen aminoalcohol-diterpenoid alkaloids in the lateral roots of Aconitum carmichaeli by solid-phase extraction-liquid chromatography- tandem mass spectrometry. Planta Med 2014; 80: 723–731
2. Moog FP, Karenberg A. Toxicology in the old testament. Did the high priest acimus die of acute aconitine poisoning? Adverse Drug React Toxicol Rev 2002; 21: 151–156
3. Nyirimigabo E, Xu Y, Li Y, Wang Y, Agyemang K, Zhang Y. A review on phytochemistry, pharmacology and toxicology studies of Aconitum. J Pharm Pharmacol 2015; 67: 1–19
4. Chan TY. Aconite poisoning. Clin Toxicol (Phila) 2009; 47: 279–285
5. Singhuber J, Zhu M, Prinz S, Kopp B. Aconitum in traditional Chinesemedicine: a valuable drug or an unpredictable risk? J Ethnopharmacol 2009; 126: 18–30
6. Gaillard Y, Pepin G. Poisoning by plant material: review of human cases and analytical determination of main toxins by high-performance liquid chromatography-(tandem) mass spectrometry. J Chromatogr B Biomed Sci Appl 1999; 733: 181–229
7. SunWX, Song FR, Cui M, Liu SY. Simultaneous determination of lipo-alkaloids extracted from Aconitum Carmichael using electrospray ionization mass spectrometry and multiple tandem mass spectrometry. Planta Med 1999; 65: 432–436
8. Borcsa B, Csupor D, Forgo P, Widowitz U, Bauer R, Hohmann J. Aconitum lipo-alkaloids-semisynthetic products of the traditional medicine. Nat Prod Commun 2011; 6: 527–536
9. Plenert B, Prasa D, Hentschel H, Deters M. Plant exposures reported to the poisons information centre Erfurt from 2001–2010. Planta Med 2012; 78: 401–408
10. Bonnici K, Stanworth D, Simmonds MSJ, Mukherjee E, Ferner RE. Flowers of evil. Lancet 2010; 376: 1616
11. Qi Y, Li S, Pi Z, Song F, Lin N, Liu S, Liu Z. Chemical profiling of Wu-tou decoction by UPLC-Q-TOF-MS. Talanta 2014; 118: 21–29
12. Zheng Q, Zhao Y,Wang J, Liu T, Zhang B, Gong M, Li J, Liu H, Han B, Zhang Y, Song X, Li Y, Xiao X. Spectrum-effect relationships between UPLC fingerprints and bioactivities of crude secondary roots of Aconitum carmichaelii Debeaux (Fuzi) and its three processed products on mitochondrial growth coupled with canonical correlation analysis. J Ethnopharmacol 2014; 153: 615–623
13. Song JZ, Han QB, Qiao CF, But PP, Xu HX. Development and validation of a rapid capillary zone electrophoresis method for the determination of aconite alkaloids in aconite roots. Phytochem Anal 2010; 21: 137–143
14. Zhang J, Huang ZH, Qiu XH, Yang YM, Zhu da Y, Xu W. Neutral fragment filtering for rapid identification of new diester-diterpenoid alkaloids in roots of Aconitum Carmichael by ultra-high-pressure liquid chromatography coupled with linear ion trap-orbitrap mass spectrometry. PLoS One 2012; 7: e52352
15. Song L, Zhang H, Liu X, Zhao ZL, Chen SL,Wang ZT, Xu HX. Rapid determination of yunaconitine and related alkaloids in aconites and aconitecontaining drugs by ultra high-performance liquid chromatographytandemmass spectrometry. Biomed Chromatogr 2012; 26: 1567–1574

16. Zhang Q, Wang CH, Ma YM, Zhu EY, Wang ZT. UPLC-ESI/MS determination of 17 active constituents in two categorized formulas of traditional Chinese medicine, Sanhuang Xiexin Tang and Fuzi Xiexin Tang: application in comparing the differences in decoctions and macerations. Biomed Chromatogr 2013; 27: 1079–1088

17. Csupor D, Borcsa B, Heydel B, Hohmann J, Zupko I, Ma Y, Widowitz U, Bauer R. Comparison of a specific HPLC determination of toxic aconite alkaloids in processed radix aconiti with a titration method of total alkaloids. Pharm Biol 2011; 49: 1097–1101

18. Csupor D,Wenzig EM, Zupko I,Woelkart K, Hohmann J, Bauer R. Qualitative and quantitative analysis of aconitine-type and lipo-alkaloids of Aconitum carmichaelii roots. J Chromatogr A 2009; 1216: 2079–2086

19. Sun GB, Sun H, Meng XB, Hu J, Zhang Q, Liu B, Wang M, Xu HB, Sun XB. Aconitine-induced Ca2+ overload causes arrhythmia and triggers apoptosis through p38 MAPK signaling pathway in rats. Toxicol Appl Pharmacol 2014; 279: 8–22

20. Li X, Jiang J, Shi S, Bligh SWA, Li Y, Jiang Y, Huang D, Ke Y,Wang S. A RG-II type polysaccharide purified from Aconitum coreanum alleviates lipopolysaccharide- induced inflammation by inhibiting the NF-κB signal pathway. PLoS One 2014; 9: e99697.

21. Park KH, ParkM, Choi SE, Jeong MS, Kwon JH, Oh MH, Choi HK, Seo SJ, Lee MW. The anti-oxidative and anti-inflammatory effects of caffeoyl derivatives from the roots of Aconitumkoreanum R. Raymond. Biol Pharm Bull 2009; 32: 2029–2033