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ACONITE – A POISON, OR A MEDICINE? ANCIENT AND EARLY BYZANTINE TESTIMONIES

Abstract. Aconite (*Aconitum napellus*) was one of the most notorious, poisonous plants in the ancient world. Its dangerous, lethal power – present in leaves, roots, stem, and tuber – was well known to the Greeks and the Romans from the earliest times. Evidence of this phenomenon is not only present in archaeological findings, but also in many writings – biographies, poems, legal codes, etc.

However, the most precise and detailed accounts come from treatises written by botanists, physicians and encyclopaedists, like Theophrastus, Nicander, Pliny the Elder, Dioscorides, or Galen, and by early Byzantine authors, Oribasius, Aetius of Amida, and Paul of Aegina. In their testimonies, one can find descriptions of aconite, its influence on the human body (and animals), and remedies for affected people.

In contrast, there are few passages from these sources that inform the readers about the healing properties of aconite. According to these fragments, carefully administered, aconite could be helpful in some therapies, but its use was extremely hazardous, as even a small part of the plant could kill a man.

Keywords: aconite, ancient medicine, Byzantine medicine, toxicology, Roman law, Byzantine law

Ever since prehistoric times people have been gathering knowledge about the influence of various substances on the human body. Unfortunately, many of these substances were harmful, some of them even fatal. Nevertheless (as Paracelsus, announced hundreds of years later, stating that, *Omnia sunt venena, nihil est sino veneno. Sola dosis facit venenum*¹), it was realised over time that proper

¹ This sentence was translated from the original German dialect used by Paracelsus into Latin by an anonymous translator in the 16th c., and is corrupted to some degree. However, it still keeps the original meaning of Paracelsus' thought. Cf. W.B. DEICHMANN, D. HENSCHLER, B. HOLMSTEDT, G. KEIL, *What is there that is not Poison? A Study of the Third Defense by Paracelsus*, *ATox* 58, 1986, p. 207–213.

handling of dangerous substances – and above all, their careful, precise dosage – could have beneficial effects (of course, it is now known that there are other factors that make a particular substance toxic in addition to just the dosage used/applied)².

Among the earliest known poisons were those produced by bacteria, fungi, plants and animals, all of which were in the natural environment surrounding human beings. Evidence of the intentional use of these substances by humans, especially against wild animals, goes back at least eight thousands years³.

Hemlock (*Conium maculatum* L.) is probably the best recognised of ancient poisonous plants. It was administered to Socrates (as well as other prisoners⁴) after he had been sentenced to death by the Athenians (399 BC)⁵. Given the fact that he was such a famous victim, as well as belonging to the most recognised and iconic scenes of classical history, it is regularly mentioned by specialists dealing with history or philosophy. However, researchers have given much less attention to another poisonous plant well-known to ancient peoples, aconite, which we would like to address here.

Aconite (*Aconitum napellus* L.), known in English under the names of monkshood and wolf's-bane, is a species belonging to the buttercup family (*Ranunculaceae*), and the aconite genus (*Aconitum*)⁶. It contains highly poisonous toxins, predominantly aconitine, which is present in its stem, roots, tubers, and leaves. According to modern studies, consumption of only 2mg of pure aconitine, or 1g of the plant itself, is enough to lead to a life-threatening condition. Moreover, the activation of aconitine poisoning appears not only after consumption, but also after dermal contact. In this case, it may impair the functioning of the nervous system, though this is unlikely to be fatal⁷.

We would like to focus analysis on the testimonies coming from the Graeco-Roman and early Byzantine culture (up to 7th c. AD) that consider the use of aconite, covering fields such as medicine and botany.

² A. NADLEWSKA, J.R. ŁADNY, M. WOJEWÓDZKA-ŻELEZNIKOWICZ, S.L. CZABAN, W. KOSIERKIEWICZ, A. SZYMAŃSKA, M. ŁUKASIK-GŁĘBOCKA, M. NASKRĘT, J. GÓRNY, *Trucizny – definicja, rodzaje, mechanizm działania*, PNM 9, 2010, p. 704–708. Cf. M. JONES-LEWIS, *Pharmacy*, [in:] *A Companion to Science, Technology, and Medicine in Ancient Greece and Rome*, vol. I, ed. G.L. IRBY, Malden-Oxford 2016 [= BCAW], p. 403.

³ E. NEPOVIMOVA, K. KUČA, *The History of Poisoning: from Ancient Times until Modern Era*, ATox 93, 2019, p. 11–12.

⁴ Cf. ANDOCIDES, *Orationes*, III, 10, ed. F. BLASS, C. FUHR, Stuttgartiae 1966.

⁵ DIOGENES LAERTIUS, *Vitae philosophorum*, II, 5, 42, vol. I, ed. M. MARCOVICH, Stuttgart–Leipzig 1999 [= BSGR].

⁶ A. SZWEYKOWSKA, J. SZWEYKOWSKI, *Botanika. Systematyka*, vol. II, Warszawa 2012, p. 366–368; T. LEWKOWICZ-MOSIEJ, *Rośliny lecznicze*, Warszawa 2012, p. 325–326.

⁷ T.Y.K. CHAN, *Aconite Poisoning*, CTox 47, 2009, p. 279–285; F. MORITZ, P. COMPAGNON, I. GUERY KALISZCZAK, Y. KALISZCZAK, V. CALISKAN, C. GIRAULT, *Severe Acute Poisoning with Homemade Aconitum napellus Capsules: Toxicokinetic and Clinical Data*, CTox 43, 2005, p. 873, 875.

Before coming to the core of our article, we will briefly depict the general role of aconite in the Greek, Roman, and Byzantine societies of the time. Our knowledge of how this plant's dangerous properties were applied in this cultural circle has been lost in the mists of time⁸, and modern researchers just assume that it was widespread in the Mediterranean area, and commonly used in practice⁹. It is well known that aconite was grown in the famous garden of King Attalus III of Pergamum (who reigned from 138 to 133 BC), who was extremely interested in toxicology, and became an expert in this matter¹⁰. Aconite was most often mentioned by the authors of our sources when the topic of poisoning was raised and the attempts to prevent it. Today, it is impossible to assess (not even approximately) how often Greeks and Romans attempted to commit poisoning, but it seems reasonable to conclude that, when they did, aconite was one of the most frequently used substances¹¹.

⁸ According to Greek mythology (well-known in Rome), aconite was created by foam from the mouth of the furious Cerberus, when he was forcibly driven out of the underworld by Heracles, cf. OVID, *Metamorphoses. Books 1–8*, VII, 406–419, trans. F.J. MILLER, rev. G.P. GOOLD, Cambridge Mass. 1977 [= LCL] (cetera: OVIDIUS, *Metamorphoses*); *Servii Grammatici in Vergili Bucolica et Georgica commentarii*, II, 152, rec. G. THILO, Lipsiae 1887. However, according to a different and less popular version, aconite was created from Prometheus' blood, cf. AUSONIUS, *Technopaegnon*, 8, 9–11, [in:] AUSONIUS, vol. I, trans. H.G.E. WHITE, Cambridge Mass. 1919 [= LCL, 96].

⁹ This was similar to other healing and poisonous plants. Ancient populations had very strong connections with nature and their environment. As a result, they had great awareness of the power of local plants, minerals and the substances produced by animals. The markets of ancient cities, in turn, abounded in plants (and the substances made from them) imported not only from nearby areas but also from distant lands. These substances were carefully prepared by experienced specialists (*rhizotómoi*, ριζοτόμοι), including poisonous (in controlled doses) species. In the Byzantine period, educated physicians also used many of these plants. Cf. J. SCARBOROUGH, *Drugs and Medicines in the Roman World*, Ex 38.2, 1996, p. 38–51; IDEM, *Herbs of the Field and Herbs of the Garden in Byzantine Medicinal Pharmacy*, [in:] *Byzantine Garden Culture*, ed. A. LITTLEWOOD, H. MAGUIRE, J. WOLSCHKE-BULMAHN, Washington DC 2002, p. 187; IDEM, *Drugs for an Emperor*, A.PAPhA 3.1, 2004, p. 4–5, 17; M. JONES-LEWIS, *Pharmacy...*, p. 410–411. It was related to aconite too, cf. H.S. PURI, *Uses of Aconites*, JATBA 21.7, 1974, p. 239.

¹⁰ PLUTARCH, *Demetrius*, 20, 2, [in:] PLUTARCH, *Lives*, vol. IX, trans. B. PERRIN, Cambridge Mass. 1920 [= LCL, 101]; cf. L. TOTELIN, *Botanizing Rulers and their Herbal Subjects: Plants and Political Power in Greek and Roman Literature*, *Phoe* 66.1–2, 2012, p. 126–131 (esp. 128); A. MAYOR, *Mithridates of Pontus and his Universal Antidote*, [in:] *History of Toxicology and Environmental Health. Toxicology in Antiquity*, vol. I, ed. P. WEXLER, Amsterdam 2014, p. 21; A. TOUWAIDE, *Murder, Execution, and Suicide in Ancient Greece and Rome*, [in:] *History of Toxicology and Environmental Health. Toxicology in Antiquity*, vol. II, ed. P. WEXLER, Amsterdam 2015, p. 3.

¹¹ D.B. KAUFMAN, *Poisons and Poisoning among the Romans*, CP 27.2, 1932, p. 162; L. CILLIERS, F. RETIEF, *Poisons, Poisoners, and Poisoning in Ancient Rome*, [in:] *History of Toxicology...*, vol. I, p. 128. Gregory TSOUCALAS and Markos SGANTZOS (*The Death of Cleopatra: Suicide by Snakebite or Poisoned by her Enemies?*, [in:] *History of Toxicology...*, vol. I, p. 19) speculate that aconite was one of the ingredients administered in 30 BC to Cleopatra VII, after her defeat by Octavian.

Aconite must have been used for criminal purposes (or, at least, people suspected its use) commonly enough that details of this phenomenon made their way into ancient literature. Ovid, for example, wrote in his *Metamorphoses* about stepmothers preparing it to kill their foster children¹². In one of Juvenal's *Satires* we can read, in turn, that aconite was employed as a substance to obtain an inheritance¹³. Obviously, in both cases we are dealing with literary hyperbole, but we can also hear the echoes of real incidents.

The actual threat of being poisoned by aconite is confirmed by the actions of legislators, which shows that they realized the danger and tried to prevent it. In Roman law, according to the *Digestae*, administration of *aconitum*, was punishable by death, even when it was not administered to intentionally murder a man:

Alio senatus consulto effectum est, ut pigmentarii, si cui temere cicutam salamandram aconitum pituocampas aut bubrostim mandragoram et id, quod lustramenti causa dederit cantharidas, poena teneantur huius legis¹⁴.

It is laid down by another *senatus consultum* that dealers in cosmetics are liable to the penalty of this law if they recklessly hand over to anyone hemlock, salamander, monkshood, pinegrubs, or a venomous beetle, mandragora, or, except for the purpose of purification, Spanish fly¹⁵.

The appetite to use aconite was subsequently seen in Byzantine legal collections, starting from *Eclogae*¹⁶. This suggests that the threat was still considered real in the centuries that followed¹⁷.

As for the testimonies of Greek, Roman, and Byzantine authors active in the fields of botany, toxicology, and medicine, the first one to describe aconite in a more detailed way (or at least the earliest whose words have survived to the present day) was Theophrastus (4th c. BC). As his description of this plant is the oldest known in the Greek language¹⁸, and had a strong influence on later descriptions,

¹² OVIDIUS, *Metamorphoses*, I, 147.

¹³ JUVENAL, *Satirae*, VI, 639, [in:] JUVENAL and PERSIUS, ed. S. MORTON BRAUND, Cambridge Mass. 2004 [= LCL, 91].

¹⁴ *Digesta Iustiniani Augusti*, 48, 8, 3, 3, rec. T. MOMMSEN, Berolini 1870.

¹⁵ English translation by Alan WATSON from *The Digest of Justinian*, vol. IV, ed. T. MOMMSEN, P. KRUEGER, trans. A. WATSON, Philadelphia 1985, p. 819.

¹⁶ *Appendix Eclogae*, 6, 22, [in:] *Fontes Minores III*, ed. L. BURGMANN, S. TROIANOS, Frankfurt am Main 1974.

¹⁷ Cf. *Prochiron Auctum*, 39, 219, ed. P. ZEPOS, Athens 1931; *Prochiron Legum vel Prochiron Calabriae*, 40, 13, ed. F. BRANDILEONE, V. PUNTONI, Roma 1895; *Basilica*, 60, 39, 3, vol. VIII, ed. H.J. SCHELTEMA, N. VAN DER WAL, Groningen 1988; *Synopsis basilicorum sive synopsis major*, 21, 2, 1, ed. P. ZEPOS, Athens 1931; *Nomocanon 2*, 1, 91, [in:] *Collectio Tripartita: Justinian on Religious and Ecclesiastical Affairs*, ed. B.H. STOLTE, N. VAN DER WAL, Groningen 1994.

¹⁸ It should be mentioned that there is no information dedicated to aconite in the whole *Corpus Hippocraticum*. The plant is not mentioned by the authors of Hippocratic treatises under the name

it is worth taking a closer look. According to Theophrastus, aconite¹⁹ grew on Crete and Zakynthos, but especially in the neighbourhood of Heraclea Pontica, where it had the strongest properties. In giving a more detailed description of this plant's characteristics (including its etymology), Theophrastus wrote that it prefers to grow on rocky terrain, has leaves similar to chicory, and roots the shape and colour of a shrimp. As for the toxic aspect of the plant, Theophrastus believed that it was present exclusively in the roots, and that the leaves and other parts of the plant were not dangerous. He also added that animals would not eat aconite²⁰. In (graphically) describing the effects of aconite and some of the methods of its use for criminal purposes²¹, Theophrastus interspersed the passages about its poisonous impact with poorly detailed information about its possible use in healing²². He concluded that it was difficult to understand the properties of aconite enough to use it effectively in therapy²³.

The first known Greek author who not only stated that aconite was poisonous, but also described how it affected the human body in detail was Nicander (2nd c. BC)²⁴. Although the beginning of his account is in an artful, literary style, in further verses the narration becomes factual and full of details, while the style becomes more reminiscent of modern clinical reports. Moreover, it must be emphasized that it is the most precise description of the effects of aconitine made in ancient and Byzantine times.

of *akóniton*, or under any other, synonymic, term familiar to us. While, in our opinion, this is very surprising, as there are many botanical substances present in the *Corpus*, and aconite was a common plant in Greece and its environs, Hippocratic medicine was primarily focused on helping patients in a non-invasive way, in accordance with the Latin sentence: *Primum non nocere*. It is possible that aconite, which has a very strong impact on the human body, was acknowledged to be too dangerous to use in any therapy.

¹⁹ In her commentary to Theophrastus' description of *akóniton*, Suzanne AMIGUES (*Commentaire*, [in:] THÉOPHRASTE, *Recherches sur les plantes*, vol. V, *Livre IX*, trans. S. AMIGUES, Paris 2006, p. 199–200) wrote that *L'identification de l'akoniton présente des difficultés multiples et si graves que l'on ne peut pas prétendre à une certitude sur tous les points*. According to the Author the term *akóniton* should be translated as *jusquiame blanche* or *jusquiame dorée*, which means that she identifies it as white henbane (*Hyoscyamus albus* L.) or golden henbane (*Hyoscyamus aureus* L.).

²⁰ THEOPHRASTUS, *Enquiry into Plants*, IX, 16, 4, [in:] THEOPHRASTUS, *Enquiry into Plants and Minor Works*, ed. A. HORT, Cambridge Mass. 1926 (cetera: THEOPHRASTUS, *Historia plantarum*). One may find a very similar description in PLINY THE ELDER (*Natural History*, VI, 1, 4; XXVII, 2, 4; 9, vol. I–IX, trans. H. RACKHAM, W.H.S. JONES, D.E. EICHHOLZ, Cambridge Mass. 1938–1963 [= LCL] [cetera: PLINIUS, *Historia naturalis*]). Cf. *Strabonis geographica*, XII, 3, 7, vol. I–III, ed. A. MEINEKE, Graz 1969.

²¹ Alain TOUWAIDE (*Murder, Execution...*, p. 5) doubts that it is possible to prepare the poison in such a way that it kills a certain time after its administration.

²² THEOPHRASTUS, *Historia plantarum*, IX, 16, 5.

²³ THEOPHRASTUS, *Historia plantarum*, IX, 16, 7.

²⁴ It is worth noticing some possible connections between Nicander and King Attalus III, cf. J.-M. JACQUES, *Notice*, [in:] NICANDRE, *Oeuvres*, vol. II, trans. J.-M. JACQUES, Paris 2002, p. XIX.

According to Nicander's words, consumption of aconite (which he also, balefully, described as a "woman killer", τὸ θηλυφόνον²⁵) firstly produces a feeling of bitterness and astringency in the oral cavity²⁶. Then a person feels a shortness of breath and pain in the upper part of the abdomen²⁷ and their eyes start watering²⁸, with gases accumulating in the abdomen²⁹. They feel hard throbbing in their temples³⁰ and a severe pain in the head occurs³¹; eyesight deteriorates and the person starts to see double³², before losing consciousness³³.

In a further part of Nicander's account, he gives a long list of antidotes for aconite, from which we may gather that the situation of a person who consumes it is not altogether hopeless. One recommended measure is a mixture of lime³⁴, yellowish wine³⁵ and a sprig of silvermound (*Artemisia schmidtiana* Maxim.), or horehound (*Marrubium vulgare* L.)³⁶. Another one blends a sprout of *Daphne* (L.) with rue (*Ruta graveolens* L.)³⁷ and honey, in which one should put a piece of burning iron or slag, or, alternatively, gold or silver³⁸. Another mixes the leaves of yellow bugle (*Ajuga chamaepitys* Schreb.) – or a shrivelled branch of oregano (*Origanum*

²⁵ NICANDRE, *Les alexipharmques*, 41, [in:] NICANDRE, *Oeuvres*, vol. III, trans. J.-M. JACQUES, Paris 2007 (cetera: NICANDER, *Alexipharmaca*).

²⁶ NICANDER, *Alexipharmaca*, 16–17.

²⁷ NICANDER, *Alexipharmaca*, 17–22.

²⁸ NICANDER, *Alexipharmaca*, 24–25.

²⁹ NICANDER, *Alexipharmaca*, 25–26.

³⁰ NICANDER, *Alexipharmaca*, 27–28.

³¹ NICANDER, *Alexipharmaca*, 27.

³² NICANDER, *Alexipharmaca*, 28–29.

³³ NICANDER, *Alexipharmaca*, 30–35. The accuracy of Nicander's stated symptoms is worth comparing with contemporary medical case reports, cf. F. MORITZ, P. COMPAGNON, I. GUERY KALISZCZAK, Y. KALISZCZAK, V. CALISKAN, C. GIRAULT, *Severe Acute Poisoning...*, p. 874–875.

³⁴ Not the fruit, but the calcium-containing inorganic mineral.

³⁵ Yellow wines could be either sweet, or dry. Due to the method of production (e.g., the method of maturation), some of them, were rather expensive. They were employed in certain medical treatments, but, according to Galen, white (not yellow) dry ones remained the most therapeutically useful wines. Cf. M. KOKOSZKO, K. JAGUSIAK, *Galen on Wine, or Some Traces of Preference*, PZH 2020, special issue, p. 18–20.

³⁶ NICANDER, *Alexipharmaca*, 43–47.

³⁷ Rue was widely regarded as an antidote to aconite. Cf. ATHENAEUS, *The Learned Banqueters*, III, 85 a–b, vol. I–VIII, ed. S. DOUGLAS OLSON, Cambridge Mass. 2006–2012 [= LCL] where an anecdote about Clearchus, the tyrant of Heraclea Pontica (5th/4th c. BC) is quoted. He is said to have poisoned people using aconite. Eventually, his remaining subjects started to eat rue as a protection against the poison.

³⁸ NICANDER, *Alexipharmaca*, 49 c–54. This is an interesting case of a remedy combining the organic components of plant origin with metals. A similar (although general) formulation concerning the healing properties of drinks in which heated iron was immersed, can be found e.g. in PLINIUS (*Historia naturalis*, XXXIV, 44, 151). Cf. J. LASKARIS, *Metals in Medicine: from Telephus to Galen*, [in:] *Popular Medicine in Graeco-Roman Antiquity: Explorations*, ed. W.V. HARRIS, Leiden–Boston 2016 [= CSCT, 42], p. 147–160.

vulgare L.), or a fresh branch of *Polycnemum* L. – to a very sweet wine³⁹. According to Nicander, the ground root of red mulberry (*Morus rubra* L.) mixed with wine, and cooked with honey is also helpful⁴⁰. Another effective remedy is a greasy broth made from chicken or beef, boiled until the meat is overcooked⁴¹.

The majority of antidotes recommend either sweet wine or honey or both together. This corresponds with the information given earlier by Theophrastus, who had written that peasants attempted to heal someone who had eaten aconite with honey and wine⁴². However, the manner in which he described it shows that he did not believe in the effectiveness of this folk remedy, and informed his readers about it only to show that this behaviour existed in his time. This tradition has, even if not well-regarded by scientists like Theophrastus, survived the centuries, and was probably widely known, and not just among specialists. We can find clear evidence of this in a fragment from Macrobius' *Saturnalia*, written in the 5th c. AD⁴³. Perhaps, the explanation of this is very simple, as sweet substances were used to cover the bitterness of the medicine, as was done in many different mixtures commonly employed in ancient therapies.

Scribonius Largus (1st c. AD), who is chronologically the next author to describe aconite, and the first known to have written about it in Latin, followed closely Nicander's testimony. He also highlighted the bitter and astringent taste of the plant⁴⁴ and discussed the reaction of the human body after its consumption in detail. Among the symptoms he lists there are: sweating, headache and vertigo, stomach ache, and flatulence⁴⁵. Scribonius Largus also noticed bruising on the joints and even on whole limbs⁴⁶. As for the remedies recommended after eating aconite, in line with Nicander, he wrote about drinking wine with a large amount of rue, or a greasy chicken broth, but also wine boiled with St. John's wort (*Hypericum perforatum* L.)⁴⁷. Finally, he advised drinking a liquid in which one had put iron slag, but, unlike Nicander, he wrote about vinegar mixed with honey⁴⁸.

³⁹ NICANDER, *Alexipharmaca*, 55–58.

⁴⁰ NICANDER, *Alexipharmaca*, 69–71.

⁴¹ NICANDER, *Alexipharmaca*, 59–63. Nicander's testimony was discussed by H. SKALTSIA, S. PHILIANOS, G. PAPAPHILIPPOU (*L'aconit chez Nicandre et de nos jours*, RHP 85.316, 1997, p. 405–410).

⁴² THEOPHRASTUS, *Historia plantarum*, IX, 16, 5; J. SCARBOROUGH, *Theophrastus on Herbs and Herbal Remedies*, JHB 11.2, 1978, p. 375–376.

⁴³ MACROBIUS, *Saturnalia*, VII, 6, 5, vol. I–III, ed. R.A. KASTER, Cambridge Mass. 2011 [= LCL, 510–512].

⁴⁴ SCRIBONIO LARGO, *Ricette mediche*, 188, trans. S. SCONOCCHIA, Berlin 2020 [= CMLat] (cetera: SCRIBONIO LARGUS, *Compositiones*).

⁴⁵ SCRIBONIO LARGUS, *Compositiones*, 188.

⁴⁶ SCRIBONIO LARGUS, *Compositiones*, 188.

⁴⁷ SCRIBONIO LARGUS, *Compositiones*, 188.

⁴⁸ SCRIBONIO LARGUS, *Compositiones*, 188.

A number of dubious remedies for aconite poisoning – on whose lethal impact he informed clearly and vividly⁴⁹ – were given by Pliny the Elder (1st c. AD). We can find among them, for example, simple garlic (*Allium sativum* L.)⁵⁰, ground leaves of rue in wine⁵¹, milk (without specifying what kind exactly) blended with balsamic oil⁵², a plant called *aizoum*, which can be identified as goldmoss stonecrop (*Sedum acre* L.)⁵³, and a broth made from old cockerel⁵⁴, a broth made from tripe⁵⁵, and warm sheep's milk⁵⁶. The information is short and without many important details, such as the method of preparation, or dosage.

Although, as we mentioned above, Theophrastus made some undetailed observation about the therapeutic use of this plant in folk medicine, there is no (similarly or more detailed) information in preserved Graeco-Roman texts over the next four centuries until Pliny's testimony. Here one can also find fragments devoted to the beneficial action of aconite. In Pliny's work we read that it had long been known that aconite in heated wine can neutralize the effects of scorpion venom⁵⁷, and that it is used in (once again unspecified) treating eye diseases⁵⁸.

A little later in the same century, Dioscorides gave us another description of aconite. He was the first known Greek author to use the term *akóniton* (ἀκόνιτον) for two different plants, clearly explaining that they should not be mistaken for each other⁵⁹. The first of them he called *akóniton pardalianchés* (παρδαλιαγχές), while the second – *akóniton lykóktónon* (λυκοκτόνον). One can observe that the author of *De materia medica* stayed very close to earlier description of *akóniton/aconitum*, and the origins of his information on the structure of both plants⁶⁰ date back to Theophrastus' times. Despite these features being described in a very similar way by Dioscorides, he surprisingly differentiated two species. This strongly influenced later authors, as he was held in high regard in the field of botany. Until then, authors writing about the plant known under the name of *akóniton* were not aware – or do not appear to have been aware – that they might be describing

⁴⁹ PLINIUS, *Historia naturalis*, VI, 1, 4; XXVII, 2, 4–5.

⁵⁰ PLINIUS, *Historia naturalis*, XX, 23, 50.

⁵¹ PLINIUS, *Historia naturalis*, XX, 51, 132.

⁵² PLINIUS, *Historia naturalis*, XXIII, 47, 92. Oils were considered a good antidote and, more broadly, a beneficial substance for the digestive system, cf. J. DYBAŁA, M. KOKOSZKO, *Lecznice działanie olei roślinnych na podstawie De materia medica Dioskuridesa*, [in:] *Lek roślinny*, vol. VI, red. B. PŁONKA-SYROKA, A. SYROKA, Wrocław 2017, p. 86–87.

⁵³ PLINIUS, *Historia naturalis*, XXV, 103, 162.

⁵⁴ PLINIUS, *Historia naturalis*, XXIX, 33, 103.

⁵⁵ PLINIUS, *Historia naturalis*, XXVIII, 45, 161.

⁵⁶ PLINIUS, *Historia naturalis*, XXIX, 33, 105.

⁵⁷ PLINIUS, *Historia naturalis*, XXVII, 2, 5.

⁵⁸ PLINIUS, *Historia naturalis*, XXVII, 2, 9.

⁵⁹ *Pedanii Dioscuridis Anazarbei de materia medica libri V*, IV, 77, vol. I–III, ed. M. WELLMANN, Berolini 1906–1914 (cetera: DIOSCORIDES, *De materia medica*).

⁶⁰ DIOSCORIDES, *De materia medica*, IV, 76–77.

more than one species, even when its description looks different in two or more passages of their treatises⁶¹.

Dioscorides did not mention the extremely dangerous impact of aconite on humans, but he did mention that it kills animals. On the other hand, he did supply interesting information about the use of one aconite (identified today as yellow monkshood, or healing wolfsbane, *Aconitum anthora* L., or leopard's bane, a representative of a genus of plants called *Doronicum* L., probably *Doronicum pardalianches* L., or *Doronicum orientale* Hoffm.) in healing. Interestingly, he focused mainly on that species, devoting very little space to wolf's-bane. According to his words, *akóniton*-leopard's bane is used in ophthalmology, acting as a painkiller⁶². This statement is similar to that of Pliny's, but clearly explains the reason for the use of the plant described. Unfortunately, apart from this one short fragment, Dioscorides did not provide any other, more detailed, information on therapies with aconite as a medicine⁶³.

⁶¹ Cf., for example, PLINY's long description (*Historia naturalis*, XXVII, 1, 1 – 2, 10), in which some details are similar to Theophrastus', while other (especially about the appearance of the plant) are completely different.

⁶² DIOSCORIDES, *De materia medica*, IV, 76.

⁶³ On the characteristics of *akóniton* given by Dioscorides cf. J.M. RIDDLE, *Dioscorides on Pharmacy and Medicine*, Austin 1985, p. 65–66. The Author attempts to identify the plant from the 77th chapter of the 4th book of *De materia medica* as *Aconitum lycoctonum* Auct., but with some uncertainty. In their translation of the treatise, Tess A. OSBALDESTON and Robert P.A. WOOD are cautious, and use the term *aconitum* in both the 76th and 77th chapters. However, at the same time, they suggest that the species from the former chapter could be identified as *Aconitum pardalianches* Fuchs, *Solanum quadrifolium bacciferum* Bauhin, *Paris quadrifolia* L., *Aconitum napellus* L., *Aconitum variable*, and *Aconitum pyramidale*, while the species from the latter could be identified as *Aconitum luteum*, *Aconitum lycoctonum* Fuchs, L., *Aconitum pyrenaicum*, and *Aconitum vulparia* (cf. DIOSCORIDES, *De materia medica: being an Herbal with Many Other Medicinal Materials. Written in Greek in the First Century of the Common Era*, ed., trans. T.A. OSBALDESTON, R.P.A. WOOD, Johannesburg 2000, p. 628). The Spanish translator of *De materia medica* (DIOSCORIDES, *Plantas y remedios medicinales*, vol. IV–V, trans. M.G. VALDÉS, Madrid 1998, p. 61), translates the term from the 76th chapter as *acónite amarillo*, and identifies it as *Aconitum anthora* L., while the plant from 77th chapter, *otro acónito*, is identified as *Aconitum napellus* L. Cf. *Diccionario griego-español*, vol. I, ed. F.R. ADRA-DOS, Madrid 1989, p. 121; *LSJ*, p. 52. In the new, revisited translation of Dioscorides' treatise by Lily Y. BECK (PEDANIUS DIOSCORIDES OF ANAZARBUS, *De materia medica*, trans. L.Y. BECK, Hildesheim 2020, p. 280–281), the plant from the 77th chapter is identified as “*Aconitum napellus* L. (*Another kind of leopard's bane*) *Wolfsbane*”, while the plant from the 76th chapter as “*Doronicum pardalianches* Jacq., *Leopard's bane*”. L.Y. BECK consistently translates the term *akóniton* as leopard's bane, for example in the cases described by us in the following paragraph and in footnotes 63, 64, 65, and 66. However, in the Greek text, only the term *akóniton* exists, without specification. The taxonomic name of this plant is *Doronicum pardalianches* L., which is not synonymic with *Doronicum pardalianches* Jacq. Cf. also D. FAUSTI, *La botanica medica di età imperiale. Piante narcotiche dal quarto libro di Dioscoride*, [in:] *Περί φαρτῶν Trattati greci di botanica in Occidente e in Oriente*, ed. M.F. FERRINI, G. GIGLIONI, Macerata 2020, p. 56, where the author writes about *Doronicum pardalianches* (*aconito*), and *Aconitum napellus* (*aconito napello*).

In his *De materia medica*, he provided more information about antidotes to *akóniton*. Unfortunately, this time he was less precise, and he did not write about which species he had in mind. He wrote that people who have consumed the plant should take (not in one treatment, but separately) Mecca balsam (*Alhagi mauro-rum* L.)⁶⁴; the bark of mulberry tree root boiled with water⁶⁵; fresh milk⁶⁶; and some wine⁶⁷.

If we omit the overly general passage of Plutarch (1st–2nd c. AD), who mentioned a man healed of unspecified oedema through the use of aconite⁶⁸, chronologically, the next author writing on our plant in detail was Galen (2nd–3rd c. AD). Like Dioscorides, he believed that there were two different species known as *akóniton*, which he named in the same way as Dioscorides⁶⁹. Therefore, Galen's description of these plants is not original and remains very similar to earlier ones known from *De materia medica* and other treatises. What is important though is that, save two passages in his works where he does clearly distinguish these two species of *akóniton*, most of the time when he mentioned this name he did not specify which one he was describing⁷⁰.

As for the details of Galen's testimony, he noted that *akóniton pardalianchés* had astringent properties⁷¹ and that the plant (without specifying, which species exactly) is one of the ingredients in an ointment used against hair loss⁷². Moreover, *akóniton* was, according to Galen, an ingredient of a medicine helpful in healing wounds, and a substance with cleansing properties⁷³. These remarks are original contributions on the subject. The rest of his remarks follow those of his predecessors. Namely, he wrote, for example, that after eating *akóniton* one must drink

⁶⁴ DIOSCORIDES, *De materia medica*, I, 19.

⁶⁵ DIOSCORIDES, *De materia medica*, I, 126.

⁶⁶ DIOSCORIDES, *De materia medica*, II, 70.

⁶⁷ DIOSCORIDES, *De materia medica*, V, 6.

⁶⁸ PLUTARCH, *Crassus*, 33, 8–9, [in:] PLUTARCH, *Lives*, vol. III, trans. B. PERRIN, Cambridge Mass. 1916 [= LCL, 65].

⁶⁹ *Galenii de simplicium medicamentorum temperamentis ac facultatibus libri XI*, 820, 9–17, [in:] *Claudii Galeni opera omnia*, vol. XI–XII, ed. C.G. KÜHN, Lipsiae 1826–1827 (cetera: GALENUS, *De simplicium medicamentorum temperamentis ac facultatibus*). Cf. *Oribasii collectionum medicarum reliquiae*, XI, 25–26, vol. I–IV, ed. I. RAEDER, Lipsiae–Berolini 1928–1933 [= CMG] (cetera: ORIBASIIUS, *Collectiones medicae*).

⁷⁰ For example, *Galenii In Hippocratis sextum librum epidemiarum commentaria I–VI*, 337, 11, ed. E. WENKEBACH, Leipzig 1940; *Galenii De antidotis libri II*, 139, [in:] *Claudii Galeni opera omnia*, vol. XIV, ed. C.G. KÜHN, Lipsiae 1827 (cetera: GALENUS, *De antidotis*).

⁷¹ GALENUS, *De simplicium medicamentorum temperamentis ac facultatibus*, 820, 9 (XI KÜHN). Cf. ORIBASIIUS, *Collectiones medicae*, XV, 1:1, 38–39.

⁷² *Galenii De compositione medicamentorum secundum locos*, 740, 13 – 741, 2, [in:] *Claudii Galeni opera omnia*, vol. XII–XIII, ed. C.G. KÜHN, Lipsiae 1826–1827 (cetera: GALENUS, *De compositione medicamentorum secundum locos*).

⁷³ GALENUS, *De simplicium medicamentorum temperamentis ac facultatibus*, 755, 16 – 756, 3 (XI KÜHN). Cf. ORIBASIIUS, *Collectiones medicae*, XIV, 57.

a large quantity of wine with rue, or a greasy chicken broth⁷⁴, and he also wrote that *akóniton* was used in certain therapies, recommending it in the treatment of gout, and joint pain⁷⁵.

Early Byzantine physicians Oribasius (4th c.), Aetius of Amida (6th c.), and Paul of Aegina (7th c.)⁷⁶ remained strongly under the influence of Hippocratic and Galenic tradition and usually composed their medical treatises based on previous works when writing about aconite. They also followed the descriptions of their predecessors, that is Dioscorides and Galen. Therefore they described *akóniton* as two different species, and provided information on its toxicity⁷⁷. They also wrote that wine with rue is a good remedy for people poisoned by aconitine⁷⁸; that the plant is used in medicine as a painkiller⁷⁹, and that the juice of the plant is an ingredient of a medicine used in preventing hair loss⁸⁰.

To summarise, since ancient Greek, Roman, and early Byzantine sources, medical, botanical, encyclopaedic, legal and those belonging to belles-lettres contain numerous fragments devoted to *akóniton/aconitum*, its strength and the effects of its consumption, it is reasonable to place *akóniton/aconitum* among the best known and most often used poisonous plants in ancient and medieval times, and – in a broader sense – among the best known and the most notoriously toxic substances in general.

Nevertheless, both folk remedies and professional medicine considered the beneficial effects of aconite on the human body. Some are vague from our perspective and seems unrealistic, but others, especially analgesic, are recognised by modern medicine as one of the effects of aconitine contained in aconite (though it must be stressed that 20th-century medicine eschewed the use of this plant, as it was considered too dangerous and powerful⁸¹). Unfortunately, the descriptions

⁷⁴ GALENUS, *De antidotis*, 139 (XIV KÜHN).

⁷⁵ GALENUS, *De compositione medicamentorum secundum locos*, 359, 9–18 (XIII KÜHN).

⁷⁶ Another early Byzantine medical author, Alexander of Tralles (6th/7th c. AD), did not mention aconite at all.

⁷⁷ ORIBASIIUS, *Collectiones medicae*, XI, 25–26; *Oribasii eclogae medicamentorum*, 127, [in:] *Oribasii Collectionum medicarum reliquiae*, vol. IV, *Libri XLIX–L, libri incerti, eclogae medicamentorum*, ed. J. RAEDER, Leipzig–Berlin 1933 [= CMG]; *Aetii Amideni libri medicinales I–VIII*, I, 18, ed. A. OLIVIERI, Lipsiae–Berolini 1935–1950 [= CMG, 8] (cetera: AETIUS AMIDENUS, *Iatricorum libri*); PAULUS AEGINETA, V, 46, vol. I–II, ed. I.L. HEIBERG, Lipsiae–Berolini 1921–1924.

⁷⁸ AETIUS AMIDENUS, *Iatricorum libri*, I, 321.

⁷⁹ ORIBASIIUS, *Collectiones medicae*, XIV, 57.

⁸⁰ AETIUS AMIDENUS, *Iatricorum libri*, VI, 64.

⁸¹ During the 19th century, aconite became a valued drug in pharmacy in the Western world. One of the most popular forms of aconite-based medicine was a tincture acting as a painkiller. During this period, however, other drugs proved more effective with fewer problems of extraction, preparation, quantification, and potential risk of overdose. Because of all these difficulties and the serious danger of a fatal overdose, 20th century Western medicine (but not folk remedies!) has gradually rejected its use. Cf. M.G. JAUREGUI, *The Biological Assay of Aconite*, JAPhA 16.11, 1927, p. 1045; A. BEEN, *Aconitum: Genus of Powerful and Sensational Plants*, PhH 34.1, 1992, p. 37–38. However, during

found in the sources do not give us many details about the methods of therapeutic use of aconite, its dosage, and the precise results of such therapies. Moreover, in the analysed sources, the authors failed to specify one very important aspect, namely, what part of the plant they recommended exactly. This is especially disappointing as we do know that different parts of the plant have different properties and influences on the human body.

Excellent descriptions of the role of aconite in ancient and Byzantine societies were given by Chi-Jung Tai from Kaohsiung Medical University, Taiwan, and his international team. They wrote that *it has been and will remain a mysterious herb. It is like Janus in Greek mythology with two faces, one supports healing and the other leads to death. Its long history of use did not eliminate suspicion and confusion about its true nature*⁸².

Bibliography

Primary Sources

Aetii Amideni libri medicinales I–VIII, ed. A. OLIVIERI, Lipsiae–Berolini 1935–1950 [= *Corpus Medicorum Graecorum*, 8].

ANDOCIDES, *Orationes*, ed. F. BLASS, C. FUHR, Stutgardiae 1966.

Appendix Eclogae, [in:] *Fontes Minores III*, ed. L. BURGMANN, S. TROIANOS, Frankfurt am Main 1974.

ATHENAEUS, *The Learned Banqueters*, vol. I–VIII, ed. S. DOUGLAS OLSON, Cambridge Mass. 2006–2012 [= *Loeb Classical Library*], https://doi.org/10.4159/DLCL.atheneus_grammariar-learned_banqueters.2007

AUSONIUS, *Technopaegnon*, [in:] AUSONIUS, vol. I, trans. H.G.E. WHITE, Cambridge Mass. 1919 [= *Loeb Classical Library*, 96], <https://doi.org/10.4159/DLCL.ausonius-technopaegnon.1919>

Basilica, vol. I–VIII, ed. H. J. SCHELTEMA, N. VAN DER WAL, Groningen 1955–1988.

The Digest of Justinian, vol. IV, ed. T. MOMMSEN, P. KRUEGER, trans. A. WATSON, Philadelphia 1985.

the 20th and at the beginning of the 21st century, interest in use of aconite in therapies has grown. Some of the pharmacological activities of aconite and aconitine, such as aconitine-induced arrhythmias, neuroprotective properties, or anti-inflammatory activity have been studied in research works by scientists from many scientific centers. Among the latest research was an unsuccessful experiment with aconite as a potential medicine for patients with COVID-19. Cf. M.K. SINGH, M. VINOD, S.K. IYER, G. KHARE, G. SHARWAN, Y.K. LAROKAR, *Aconite: a Pharmacological Update*, *IJRPhS* 3.2, 2012, p. 242–246; A. SHOAB, H.H. SIDDIQUI, R.K. DIXIT, S. SIDDIQUI, B. DEEN, A. KHAN, S.H. ALROKAYAN, H.A. KHAN, P. AHMAD, *Neuroprotective Effects of Dried Tubers of Aconitum napellus*, *PI* 9.3, 2020, art. 356; M. TAKACS, M. FRASS, G. WALDERF, P. FIBERT, M. ROTTENSTEINER, W. GLÜCK, P. LECHLEITNER, M. OBERBAUM, I. LEISSERI, K. CHANDAK, P. PANHOFFER, P. WEIERMAYER, *Adjunctive Homeopathic Treatment of Hospitalized COVID-19 Patients (COVIHOM): A Retrospective Case Series*, *CTCP* 44, 2021, p. 1–11.

⁸² C.-J. TAI, M. EL-SHAZLY, T.-Y. WU, K.-T. LEE, D. CSUPOR, J. HOHMANN, F.-R. CHANG, Y.-C. WU, *Clinical Aspects of Aconitum Preparations*, *PIM* 81, 2015, p. 1025.

- Digesta Iustiniani Augusti*, rec. T. MOMMSEN, Berolini 1870.
- DIOGENES LAERTIUS, *Vitae philosophorum*, vol. I, ed. M. MARCOVICH, Stuttgart–Leipzig 1999 [= Bibliotheca scriptorum Graecorum et Romanorum Teubneriana].
- DIOSCORIDES, *De materia medica: being an Herbal with Many Other Medicinal Materials. Written in Greek in the First Century of the Common Era*, ed., trans. T.A. OSBALDESTON, R.P.A. WOOD, Johannesburg 2000.
- DIOSCÓRIDES, *Plantas y remedios medicinales*, vol. IV–V, trans. M.G. VALDÉS, Madrid 1998.
- Galenii De antidotis libri II*, [in:] *Claudii Galeni opera omnia*, vol. XIV, ed. C.G. KÜHN, Lipsiae 1827.
- Galenii De compositione medicamentorum secundum locos*, [in:] *Claudii Galeni opera omnia*, vol. XII–XIII, ed. C.G. KÜHN, Lipsiae 1826–1827.
- Galenii De simplicium medicamentorum temperamentis ac facultatibus libri XI*, [in:] *Claudii Galeni opera omnia*, vol. XI–XII, ed. C.G. KÜHN, Lipsiae 1826–1827.
- Galenii In Hippocratis sextum librum epidemiarum commentaria I–VI*, ed. E. WENKEBACH, Leipzig 1940.
- JUVENAL, *Satirae*, [in:] JUVENAL and PERSIUS, ed. S. MORTON BRAUND, Cambridge Mass. 2004 [= Loeb Classical Library, 91], <https://doi.org/10.4159/DLCL.juvenal-satires.2004>
- MACROBIUS, *Saturnalia*, vol. I–III, ed. R.A. KASTER, Cambridge Mass. 2011 [= Loeb Classical Library, 510–512], <https://doi.org/10.4159/DLCL.macrobius-saturnalia.2011>
- NICANDRE, *Les alexipharmques*, [in:] NICANDRE, *Oeuvres*, vol. II, trans. J.-M. JACQUES, Paris 2002.
- NICANDRE, *Les alexipharmques*, [in:] NICANDRE, *Oeuvres*, vol. III, trans. J.-M. JACQUES, Paris 2007.
- Nomocanon*, [in:] *Collectio Tripartita: Justinian on Religious and Ecclesiastical Affairs*, ed. B.H. STOLTE, N. VAN DER WAL, Groningen 1994.
- Oribasii collectionum medicarum reliquiae*, vol. I–IV, ed. I. RAEDER, Lipsiae–Berolini 1928–1933 [= Corpus Medicorum Graecorum].
- Oribasii eclogae medicamentorum*, [in:] *Oribasii Collectionum medicarum reliquiae*, vol. IV, *Libri XLIX–L, libri incerti, eclogae medicamentorum*, ed. J. RAEDER, Leipzig–Berlin 1933 [= Corpus Medicorum Graecorum].
- OVID, *Metamorphoses. Books 1–8*, trans. F.J. MILLER, rev. G.P. GOOLD, Cambridge Mass. 1977 [= Loeb Classical Library].
- PAULUS AEGINETA, vol. I–II, ed. I.L. HEIBERG, Lipsiae–Berolini 1921–1924.
- Pedanii Dioscuridis Anazarbei de materia medica libri V*, vol. I–III, ed. M. WELLMANN, Berolini 1906–1914.
- PEDANIUS DIOSCORIDES OF ANAZARBUS, *De materia medica*, trans. L.Y. BECK, Hildesheim 2020.
- PLINY THE ELDER, *Natural History*, vol. I–IX, trans. H. RACKHAM, W.H.S. JONES, D.E. EICHHOLZ, Cambridge Mass. 1938–1963 [= Loeb Classical Library], https://doi.org/10.4159/DLCL.pliny_elder-natural_history.1938
- PLUTARCH, *Crassus*, [in:] PLUTARCH, *Lives*, vol. III, trans. B. PERRIN, Cambridge Mass. 1916 [= Loeb Classical Library, 65].
- PLUTARCH, *Demetrius*, [in:] PLUTARCH, *Lives*, vol. IX, trans. B. PERRIN, Cambridge Mass. 1920 [= Loeb Classical Library, 101].
- Prochiron Auctum*, ed. P. ZEPOS, Athens 1931.
- Prochiron Legum vel Prochiron Calabriae*, ed. F. BRANDILEONE, V. PUNTONI, Roma 1895.
- SCRIBONIO LARGO, *Ricette mediche*, trans. S. SCONOCCHIA, Berlin 2020 [= Corpus medicorum Latinorum].

- Servii Grammatici in Vergili Bucolica et Georgica commentarii*, rec. G. THILO, Lipsiae 1887.
- Strabonis geographica*, vol. I–III, ed. A. MEINEKE, Graz 1969.
- Synopsis basilicorum sive synopsis major*, ed. P. ZEPOS, Athens 1931.
- THÉOPHRASTE, *Recherches sur les plantes*, vol. V, *Livre IX*, trans. S. AMIGUES, Paris 2006.
- THEOPHRASTUS, *Enquiry into Plants*, [in:] THEOPHRASTUS, *Enquiry into Plants and Minor Works*, ed. A. HORT, Cambridge Mass. 1926.

Secondary Literature

- AMIGUES S., *Commentaire*, [in:] THÉOPHRASTE, *Recherches sur les plantes*, vol. V, *Livre IX*, trans. S. AMIGUES, Paris 2006, p. 65–242.
- BEEN A., *Aconitum: Genus of Powerful and Sensational Plants*, “Pharmacy in History” 34.1, 1992, p. 35–39.
- CHAN T.Y.K., *Aconite Poisoning*, “Clinical Toxicology” 47, 2009, p. 279–285, <https://doi.org/10.1080/15563650902904407>
- CILLIERS L., RETIEF F., *Poisons, Poisoners, and Poisoning in Ancient Rome*, [in:] *History of Toxicology and Environmental Health. Toxicology in Antiquity*, vol. I, ed. P. WEXLER, Amsterdam 2014, p. 127–137, <https://doi.org/10.1016/B978-0-12-800045-8.00013-7>
- DEICHMANN W.B., HENSCHLER D., HOLMSTEDT B., KEIL G., *What is there that is not Poison? A Study of the Third Defense by Paracelsus*, “Archives of Toxicology” 58, 1986, p. 207–213, <https://doi.org/10.1007/BF00297107>
- Diccionario griego-español*, vol. I, ed. F.R. ADRADOS, Madrid 1989.
- DYBAŁA J., KOKOSZKO M., *Lecznicze działanie olei roślinnych na podstawie De materia medica Dioskoridesa*, [in:] *Lek roślinny*, vol. VI, red. B. PŁONKA-SYROKA, A. SYROKA, Wrocław 2017, p. 81–93.
- FAUSTI D., *La botanica medica di età imperiale. Piante narcotiche dal quarto libro di Dioscoride*, [in:] *Περὶ φαρῶν Trattati greci di botanica in Occidente e in Oriente*, ed. M.F. FERRINI, G. GIGLIONI, Macerata 2020, p. 43–73.
- JACQUES J.-M., *Notice*, [in:] NICANDRE, *Oeuvres*, vol. II, trans. J.-M. JACQUES, Paris 2002.
- JAUREGUI M.G., *The Biological Assay of Aconite*, “Journal of the American Pharmaceutical Association” 16.11, 1927, p. 1045–1052, <https://doi.org/10.1002/jps.3080161106>
- JONES-LEWIS M., *Pharmacy*, [in:] *A Companion to Science, Technology, and Medicine in Ancient Greece and Rome*, vol. I, ed. G.L. IRBY, Malden–Oxford 2016 [= Blackwell Companions to the Ancient World], p. 402–417, <https://doi.org/10.1002/9781118373057.ch25>
- KAUFMAN D.B., *Poisons and Poisoning among the Romans*, “Classical Philology” 27.2, 1932, p. 156–167, <https://doi.org/10.1086/361458>
- KOKOSZKO M., JAGUSIAK K., *Galen on Wine, or Some Traces of Preference*, “Piotrkowskie Zeszyty Historyczne” 2020, special issue, p. 9–28.
- LASKARIS J., *Metals in Medicine: from Telephus to Galen*, [in:] *Popular Medicine in Graeco-Roman Antiquity: Explorations*, ed. W.V. HARRIS, Leiden–Boston 2016 [= Columbia Studies in the Classical Tradition, 42], p. 147–160, https://doi.org/10.1163/9789004326040_007
- LEWKOWICZ-MOSIĘJ T., *Rośliny lecznicze*, Warszawa 2012.
- LIDDELL H.G., SCOTT R., JONES H.S. et al., *A Greek-English Lexicon*, Oxford 1996.

- MAYOR A., *Mithridates of Pontus and his Universal Antidote*, [in:] *History of Toxicology and Environmental Health. Toxicology in Antiquity*, vol. I, ed. P. WEXLER, Amsterdam 2014, p. 21–34, <https://doi.org/10.1016/B978-0-12-800045-8.00004-6>
- MORITZ F., COMPAGNON P., GUERY KALISZCZAK I., KALISZCZAK Y., CALISKAN V., GIRAULT C., *Severe Acute Poisoning with Homemade Aconitum napellus Capsules: Toxicokinetic and Clinical Data*, “Clinical Toxicology” 43, 2005, p. 873–876, <https://doi.org/10.1080/15563650500357594>
- NADLEWSKA A., ŁADNY J.R., WOJEWÓDZKA-ŻELEZNIAKOWICZ M., CZABAN S.L., KOSIERKIEWICZ W., SZYMAŃSKA A., ŁUKASIK-GŁĘBOCKA M., NASKRĘT M., GÓRNY J., *Trucizny – definicja, rodzaje, mechanizm działania*, “Postępy Nauk Medycznych” 9, 2010, p. 704–708.
- NEPOVIMOVA E., KUČA K., *The History of Poisoning: from Ancient Times until Modern Era*, “Archives of Toxicology” 93, 2019, p. 11–24, <https://doi.org/10.1007/s00204-018-2290-0>
- PURI H.S., *Uses of Aconites*, “Journal d’agriculture tropicale et de botanique appliquée” 21.7, 1974, p. 239–246, <https://doi.org/10.3406/jatba.1974.3168>
- RIDDLE J.M., *Dioscorides on Pharmacy and Medicine*, Austin 1985, <https://doi.org/10.7560/715448>
- SCARBOROUGH J., *Drugs and Medicines in the Roman World*, “Expedition” 38.2, 1996, p. 38–51.
- SCARBOROUGH J., *Drugs for an Emperor*, “Amphora. A Publication of the American Philological Association” 3.1, 2004, p. 4–5, 17.
- SCARBOROUGH J., *Herbs of the Field and Herbs of the Garden in Byzantine Medicinal Pharmacy*, [in:] *Byzantine Garden Culture*, ed. A. LITTLEWOOD, H. MAGUIRE, J. WOLSCHKE-BULMAHN, Washington DC 2002, p. 177–188.
- SCARBOROUGH J., *Theophrastus on Herbals and Herbal Remedies*, “Journal of the History of Biology” 11.2, 1978, p. 353–385, <https://doi.org/10.1007/BF00389304>
- SHOAIB A., SIDDIQUI H.H., DIXIT R.K., SIDDIQUI S., DEEN B., KHAN A., ALROKAYAN S.H., KHAN H.A., AHMAD P., *Neuroprotective Effects of Dried Tubers of Aconitum napellus*, “Plants” 9.3, 2020, art. 356, <https://doi.org/10.3390/plants9030356>
- SINGH M.K., VINOD M., IYER S.K., KHARE G., SHARWAN G., LAROKAR Y.K., *Aconite: a Pharmacological Update*, “International Journal of Research in Pharmaceutical Sciences” 3.2, 2012, p. 242–246.
- SKALTSAS H., PHILLIANOS S., PAPAPHILIPPOU G., *L’aconit chez Nicandre et de nos jours*, “Revue d’histoire de la pharmacie” 85.316, 1997, p. 405–410, <https://doi.org/10.3406/pharm.1997.4893>
- SZWEYKOWSKA A., SZWEYKOWSKI J., *Botanika. Systematyka*, vol. II, Warszawa 2012.
- TAI C.-J., EL-SHAZLY M., WU T.-Y., LEE K.-T., CSUPOR D., HOHMANN J., CHANG F.-R., WU Y.-C., *Clinical Aspects of Aconitum Preparations*, “Planta Medica” 81, 2015, p. 1017–1028, <https://doi.org/10.1055/s-0035-1546183>
- TAKACS M., FRASS M., WALDERF G., FIBERT P., ROTTENSTEINER M., GLÜCK W., LECHLEITNER P., OBERBAUM M., LEISSERI I., CHANDAK K., PANHOFFER P., WEIERMAYER P., *Adjunctive Homeopathic Treatment of Hospitalized COVID-19 Patients (COVIHOM): A Retrospective Case Series*, “Complementary Therapies in Clinical Practice” 44, 2021, p. 1–11, <https://doi.org/10.1016/j.ctcp.2021.101415>
- TOTELIN L., *Botanizing Rulers and their Herbal Subjects: Plants and Political Power in Greek and Roman Literature*, “Phoenix” 66.1–2, 2012, p. 122–144, <https://doi.org/10.1353/phx.2012.0013>
- TOUWAIDE A., *Murder, Execution, and Suicide in Ancient Greece and Rome*, [in:] *History of Toxicology and Environmental Health. Toxicology in Antiquity*, vol. II, ed. P. WEXLER, Amsterdam 2015, p. 1–8, <https://doi.org/10.1016/B978-0-12-801506-3.00001-7>

TSOUICALAS G., SGANTZOS M., *The Death of Cleopatra: Suicide by Snakebite or Poisoned by her Enemies?*, [in:] *History of Toxicology and Environmental Health. Toxicology in Antiquity*, vol. I, ed. P. WEXLER, Amsterdam 2014, p. 11–20, <https://doi.org/10.1016/B978-0-12-800045-8.00002-2>

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