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De pulvere pro lupis occidendis: wolf poisoning in Southern Italy during the XIII century

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Abstract

In this study, we present some documents showing the official acknowledgement of the role of *luparius* in Southern Italy during the XIII century. *Luparii* were professional wolf-killers, prevalently coming from three regions of the Kingdom of Naples: Abruzzo, Terra di Lavoro, Apulia, but active throughout the kingdom. Different techniques were adopted by *luparii*, but one of the most widespread was the so called *pulvis*, a powder probably obtained from an unknown poisonous plant. Dioscorides and Galen reported that a plant named *akoniton* was used in the Mediterranean world to poison wild animals, and according to the XVI century physician Pietro Andrea Mattioli, *luparii* used the *Aconitum* to kill wolves. Historical sources show that the problems related to the identification of *Aconitum* was harshly debated among the botanists contemporary to Mattioli, and that *Doronicum pardalianches* L. and *Aconitum napellus* L. were the species most frequently proposed. However, in Southern Italy both plants are scarcely present, whereas cognate species are diffused, as *Doronicum columnae* Ten. and two subspecies of *Aconitum lycoctonum, A. lycoctonum* L. subsp. *neapolitanum* (Ten.) Nyman or *A. lycoctonum* L. subsp. *vulparia* (Rchb. ex Spreng.) Nyman.

Keywords: wolf hunting; luparius; XIII century; *pulvis*; *Aconitum*

Riassunto

In questo studio, presentiamo alcuni documenti che attestano il ruolo ufficiale dei lupari nell'Italia meridionale durante il XIII secolo. I lupari erano cacciatori di lupi, provenienti prevalentemente da tre regioni del Regno di Napoli: Abruzzo, Terra di Lavoro, Puglia, ma attivi in tutto il regno. Diverse erano le tecniche adottate dai lupari per uccidere i lupi, ma una delle più diffuse prevedeva l'uso della cosiddetta *pulvis*, una polvere ottenuta probabilmente da una pianta velenosa sconosciuta. Dioscoride e Galeno riportano che una pianta chiamata *akoniton* era usata nel mondo mediterraneo per avvelenare gli animali selvatici, e secondo il medico del XVI secolo Pietro Andrea Mattioli, i luparii usavano l'*aconitum* per uccidere i lupi. Le fonti storiche mostrano che i problemi relativi all'identificazione dell'*aconitum* furono aspramente dibattuti tra i botanici contemporanei a Mattioli, e che *Doronicum pardalianches* L. e *Aconitum napellus* L. furono le specie più frequentemente proposte. Tuttavia, nel Sud Italia entrambe le piante sono scarsamente presenti, mentre sono diffuse specie affini, come *Doronicum columnae* Ten e due sottospecie di *Aconitum lycoctonum*, *A. lycoctonum* L. subsp. *neapolitanum* (Ten.) Nyman e *A. lycoctonum* L. subsp. *vulparia* (Rchb. ex Spreng.) Nyman.

Parole chiave: cacciatori di lupi; lupari; XIII secolo; *pulvis*; *Aconitum*

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Introduction

The negative image of the wolf in many human cultures is undeniable, although reverence and admiration are also frequently expressed. From totemic animal and guide in the *Ver Sacrum* to unclean beast, from symbol of wilderness to personification of evil, the wolf has been the protagonist in bestiaries, fairy tales, as well as in manuals about farm conduction (de Clamorgan 1588). Early men and wolves had strict relationships, not only in terms of competition but also because they shared many aspects of their societies, from leadership hierarchies to common care and training of juveniles (Fritts et al. 2003). In the Mediterranean region human attitude toward the wolf had been relatively positive for very long times: Greek and Italic populations shared religious practices related to wolves as totemic animals and generally respected them, but, on the other

hand, in VI century BCE Solon's legislation instituted in Athens a five drachmae reward for each wolf killed. Romans did not use wolves for *venationes* nor hunted them, due to the religious importance that they assigned to this animal (Rissanen 2014). In IV century CE, Servius Marius Honoratus, in commenting Vergil's Georgics (Emmenessius 1680) stated: «constat enim luparios carnibus tinctis veneno lupos necare». This is one of the first citation of *luparii*, and their activity seems to be linked with the uses of poisonous substances since the beginning. During the following centuries, wolves were viewed as evil by the Catholic Church, becoming a negative symbol for thousands of years, and a serious problem for human activities (Boitani 1995, Rao 2018). An early written document is reported in the *Capitularia Regum Francorum* and refers to the year 813: it is allowed to hunt wolves, particularly the young ones, «cum pulvere et hamis, quam cum fossis et canibus» (Baluze 1772). To this purpose, in the Capitularium it is also stated that each Vicar (officials at the services of the Earl) had two *luparii* with him, who had to deliver the wolves' skins to the court, receiving a bushel of wheat (von Buri 1788).

Starting from the so-called Medieval Climate Anomaly (approximately 1100-1400 PE), many forests were converted to agricultural farms and livestock pastures, keeping territories also at elevations above 700 m (Mensing et al. 2016). The reduced amount of forest and uncultivated land led wolves to prey animals bred by man, causing conflictual relationships between farmers and wolves. Moreover, the reestablished central authority over rural territories allowed investments of large economical resources on wolf hunting (Rao 2018). Wolves were just considered as a pest to be destroyed, and rewards for their killing were offered in numerous European countries, such as Spain, France, Switzerland and Italy (Moriceau 2014). This new attitude is incisively shown by the importance acquired by the *luparius*, that became a professional killer of wolves paid by central Governments (Fig.1).

Based on a survey of historical sources, this study aims to put in evidence the professional status of *luparii* in Southern Italy during the XIII century, focusing on the role of the so-called *pulvis* in their hunting techniques, and suggesting a possible identification of the plant used for this preparation.

Materials and Methods

The most important sources for investigating the role of *luparii* during the 13th century were the *Historia diplomatica Friderici Secundi* edited by Huillard-Bréholles (1852), [https://books.google.it/books?id=Gh8r5pyhdz4C&hl=it], and the *Archivi della Cancelleria Angioina* (www.accademiapontaniana.it/pubblicazioni/).

This second bibliographic source, an immensely important and valuable tool for the study of European history, survived for about seven centuries until September 30, 1943, when, having been transferred the registers at San Paolo Belsito (Napoli) to

Figure 1: Wolf hunt with traps and arquebus, drawing by Jan van der Straet (Philips Galle, Venationes Ferarum, Avium, Piscium. Pugnae bestiariorum et mutuae bestiarum depictae, [Antwerp?], 1580.

preserve them from bombing during the Second World War, they were set on fire by the retreating German army (Jamison 1949). Today, we owe the recovery of their contents to the patient and incessant work of some scholars who, starting from 1950, have carried out a momentous work of reconstruction.

Results and Discussion

An early document mentioning wolf killers, *luparii*, from Southern Italy dates back to 1021 (Federici 1925), while numerous documents from the XIII century from the official Archives of the Kingdom attest the payment of *luparii*. Here we have chronologically reported the most detailed documents dealing with this topic.

1239 (October 14) – *It has come to our attention that in our park of Milazzo there are in great quantity foxes and wolves and they kill small animals, so that in a short time few of them will survive there, if you do not provide for them with some remedy. Therefore, we entrust to your devotion in advising immediately after reading this letter about a wolf powder that you undertake to find and so you order, as it is usual and as it must happen, the one [powder] that can kill only wolves and foxes and can plentifully increase the small animals and cannot*

destroy them. Nevertheless, let you endeavor and see to it that all game in your place of jurisdiction be protected, and about the powder against wolves let you that it be placed where it may be useful (Huillard-Bréholles 1859).

1239 (November 6) – *Ruggero di Petrasturmina has written about the imperial mandate to the Giustiziere of Abruzzo, so that he may search and find in the territories of his jurisdiction two men who know how to kill wolves with powder and send them to Riccardo di Montenegro, Giustiziere of the Terra di Lavoro, to place them in the wood of Patria [area of Lake Patria] to kill wolves and foxes* (Huillard-Bréholles 1859).

1240 (March 31) – *Concerning the finding of the powder for the elimination of the wolves following our mandate, we have understood what you have done, and we have instructed Thomas of Aquinas, our faithful Count of Acerra, to send you immediately the same powder in abundance; I also send you two men instructed in the preparation of the powder and in the killing of wolves, who, when they come to you, will show you the necessary expenses* (Huillard-Bréholles 1859).

1270 – *Charles I of Anjou with his constitution of 1270 formed the* «Luparii pro occidendis lupis in Aratriis Regiis», *most of which were in Puglia and not far from Lucera* (Lombardi 1748).

1278 – *Immunity for some luparii, who kill wolves with powder to defend us. Immunity for Sora Valley luparii, who kill wolves with powder in the royal forests* (Orefice De Angelis 1967).

1278 (March 14) – *We wrote to the* Secretum *of the Principato, of Terra di Lavoro and Abruzzo. Having to kill the wolves with powder through our* defensa *of Terra di Lavoro and other places outside the same* defensa *in which the luparii Iacobo di Cassano and Guglielmo di Nusco had been useful for a greater convenience of the wild animals that exist in the same* defensa *and also of our animals and the animals of private citizens. Our Highness has given an estimate of the expenses for our curia... we send ... expenses at the rate of fifteen gold tarì per month for each of them (luparii) from the moment they began to perform the same service and from before until they continuously performed the same service for the entire month of April* (Mazzoleni 1964).

1279 – *Granting immunity to 20 men of the Sora Valley who are named luparii because they went hunting for wolves and foxes* (Mazzoleni 1969)

1291 (November 20) – *In November 20, two ounces of gold for two months were given to Rainaldo de Dominicis, Pietro de Blasio, Domenico di Giovanni and Basidio da Balsorana who had to go to the forests of S. Gervasio and Lagopesole to kill wolves* «cum pulvere». *On the 27th the pay of 15 tarì per month is paid to Tommaso di Giovanni and Onofrio di Nicola sent to the forest of Orta in Capitanata. The luparii for all the time of service had exemption from any collection or*

bounty that could be imposed on the inhabitants of their countries (Cubellis 1996).

1292 (August 24) – *order to the Giustizieri of Principato and Abruzzo, because they search, everyone in the own province, four luparii* «pro occidendis lupis cum pulvere in forestis ubi animalia araciarum curie in pascuis morantur» (Schipa 1890, Palmieri 1987).
-*...the mentioned Charles Martel, Vicar General of the Kingdom in the absence of his parent, ordered to the Giustiziere of Principato ultra, to find four luparii and send them in the royal forests to kill wolves, with a certain powder* (Camera 1860).

1292 (November 20) – *Having reported Ughetto de Palafredis, master of the royal marescallia and of the races in Puglia, that a certain number of mares, foals and other animals had been devoured by wolves, which appeared in great multitude in those places, it is ordered from Naples on November 20, to call in Puglia Rainaldo de Dominicis, Pietro de Blasio, Domenico de Iohanne and Casidio de Valletorana, destined to kill the wolves* «cum pulvere» *in the forests of San Gervasio and Lagopesole, to destroy them, and to the Giustiziere of Basilicata to pay to the luparii for two months two ounces of gold* (Palmieri 1999).

1292 (November 27) – *it is approved the payment of fifteen tarì for a month to Tommaso di Giovanni and Onofrio de Nicola, both of Balsorana, sent to kill with powder other wolves in the forest of Orte in Capitanata. To the luparii, for the duration of their service, was granted exemption from any grant or collection or bounty that could be imposed on the inhabitants of their countries* (Schipa 1890).
- *The king approves the payments made by the treasurer to Colino de Berro for the expenses of Anastasia, daughter and heir of the late Guido de Montfort, for six ounces of gold, to Tommaso di Giovanni and Onofrio de Nicola, both of Balsorana, who were sent to Capitanata to kill wolves* «cum pulvere» *for a month* (Palmieri 1999).

As can be seen, during the XIII century the activity of *luparii* was diffused from Campania to Sicily and was strictly connected with the use of *pulvis*, a powder containing highly toxic substances, but, to the best of our knowledge, no official document gives any detail about the composition of this powder. Poison hunting is reported at every latitude and seems to be an early acquisition of human communities, probably dating back to more than 20.000 years ago (Osborn 2016). Early hunters applied animal- or plant-based poisons on spears and arrows, but toxic plants were also managed to prepare traps to kill predatory mammals like wolves and foxes throughout Europe. Plants like *Anamirta coccolus* in South-East Asia, and lichens like *Letharia vulpina* have been used in Scandinavia for this purpose (Svanberg and Ståhlberg 2018), but in the Mediterranean Region wolfsbane (*Aconitum* spp.) was one of the plants of choice species since the Classic era (Cilliers and Retief 2000). Indeed, *Aconitum* spp. are worldwide known as a source of a potent venom (Borgia et al. 2017), due to the presence of a suite of alkaloids responsible

for cardiac and neurotoxic action (Nyirimigabo et al. 2014). The genus *Aconitum* (Ranunculaceae) comprises more than 300 hundred species, distributed throughout arctic regions and mountain environments of all continents, except Australia. According to recent research, the genus *Aconitum* originated 24.7 Mya (Park et al. 2020), and consists of different subgenera, among which *Aconitum* L. subgen. *Aconitum*, is the largest one, including 22 species native to Europe (Boroń et al. 2020). The name ἀκόνιτον (akoniton) occurs in medical literature of classical antiquity, particularly in the works dealing with toxicological matters. It would derive from *Akone*, a toponym assigned to more than one locality of Pontus, or ἀκονᾶν (akonàn), a term that defines whetstone, or also from the Greek verb ἐγκονέω (enkonèo) 'I accelerate', because aconitum accelerates death. Finally, other scholars link *akoniton* to ἄκον (àkon) and ἀκή (akè), the Greek words denoting an arrow or a point, because these plants were applied to arrowheads, as previously described (Reichenbach 1820).

The chapter on a*koniton* in the Medical Matter of Dioscorides (Gunther 1959), focuses on its toxicity to animals, and two types of *akoniton* are described, whose botanical identification has been a matter of controversy for centuries. The first *akoniton* is named by Dioscorides as παρδαλιαγχές or leopard's bane, but also κυνοκτόνον (kynoktonon), dog killer, and is briefly described as a small plant, with three or four leaves with scarce hairs, similar to those of cyclamen, and a root with a shape resembling the tail of a scorpion. The second one, ἀκόνιτον ἕτερον (akoniton eteron), is morphologically completely different from the former, being taller and with leaves like those of *Platanus*, and, according to Dioscorides, it was particularly diffused on Vestini Mounts (Abruzzo, Southern Italy). Galen in *De simplicium medicamentorum temperamentis ac facultatibus* (Kühn 1821-1833) reports that the *akoniton* is also called λυκοκτόνον (lykoktonon), wolf-killer, whilst Nicander describes a complex symptomatology due to *akoniton* intoxication, centered on abdominal effects (stomach and abdominal pains) coupled with head heaviness, blurred visions, and stupefaction (Skaltsa et al. 1997).

Although more than 257 plants are mentioned in the *Corpus Hippocraticum* (Riddle 2013) and more than 500 species are named in the works of Theophrastus (Irwin and Irby-Massie 2016) and Dioscorides (Staub et al. 2016), botanical descriptions in these texts are either entirely absent or lacking, if we consider them from a "modern" point of view. In Greece, the collection of plants in the wild, and thus their identification, was a professional activity carried out by expert herbalists, called ῥιζοτόμοι (rhizotomoi) (Roze 1898), whose key role in the trade of plant species had been progressively consolidated in Attica over the centuries, to the point of giving rise to a guild recognized as such in 5th Century BPE in Athens (Samama 2006). We know that Sophocles wrote a tragedy, which has not come down to us, entitled Οἱ ῥιζοτόμοι (oi rhizotomoi), and that Theophrastus considered both ῥιζοτόμοι and φαρμακοπῶλαι (farmacopolai, sellers of

medicinal plants) mostly as charlatans, although they were able to provide useful information (Scarborough 2006). In most cases, the ability to recognize and name plants, as well as the knowledge of the territories and habitats in which they were found, was a skill not fully possessed by most of those who practiced the medical arts, although they made constant use of plant products for the treatment of diseases. This ability to identify plants in the wild was also a prerogative of specific populations to whom was credited deep knowledge regarding poisons and drugs of animal and vegetable origin: with regard to the Italic Peninsula, the Marsi, coming from Abruzzo, were also consulted by Galen, for their knowledge about medicines and antidotes (Nutton 1985), whereas in the rest of the Mediterranean Region Psylli, Nasamoni and Palaeotebani played the same role of contact point between the civilized world and the secrets of Nature (Cilliers and Retief 2000).
The identification of the two a*koniton* species described by Dioscorides was attempted by the most prominent XVI-XVII Century botanists; the first species was attributed to *Paris* by Fuchs, *Tora by* Gessner, *Doronicum* by Dodonaeus (Palmer 1985). In the same years, Giacomo Antonio Cortusio, a Paduan botanist, administered *Doronicum* roots to different animals, demonstrating it had lethal effects (Palmer, 1985).

Nowadays, the prevailing attributions of the two Dioscoride's *akoniton* respectively point toward *Doronicum pardalianches* L., and *Aconitum napellus* L. or *A. lycoctonum* L. (Been 1992). The genus *Doronicum* L. is a member of the tribe Senecioneae, Asteraceae, which comprises 26 species growing from Asia to Europe and North Africa, growing in forests and on rocky places from the sea level up to 5000 m (Fernández 2003). In Southern Italy, the presence of *D. pardalianches* is presently not attested, whereas *D. columnae* Ten. is found, a species prevalently growing on rocky and shady places from 500 to 2000 m. *A. napellus* has a distribution confined to Northern Italy, whilst *A. lycoctonum* L. subsp. *neapolitanum* (Ten.) Nyman (Fig. 2) and *A. lycoctonum* L. subsp. *vulparia* (Rchb. ex Spreng.) Nyman are recorded over the entire Italian territory, except Apulia, Sicily and Sardinia (Pignatti 2019).

Figure 2: Specimen of *Aconitum lycoctonum* L. subsp. *neapolitanum* (Ten.) Nyman collected by Michele Tenore at Piano di Verteglia, Terminio, Montella (Campania region, Italy). Courtesy of the Herbarium Neapolitanum, Orto Botanico di Napoli.

According to Mattioli (1548) «Quello [*aconitum*] della prima spetie, (Fig. 3) che ammazza i leopardi, et le panthere, ho più volte ricolte io in su'l Trentino, ove nasce copiosamente: et di questa spetie è quello, che usano alcuni in terra di Roma, et nel Reame di Napoli, che non fanno altra arte, che ammazzare i lupi, et vendonne spesse volte le radici in su'l ponte di Santo Agnolo à chi ne vuole: imperoche queste radici ammazzano subito i lupi». It is well known that Mattioli was doubtful about the

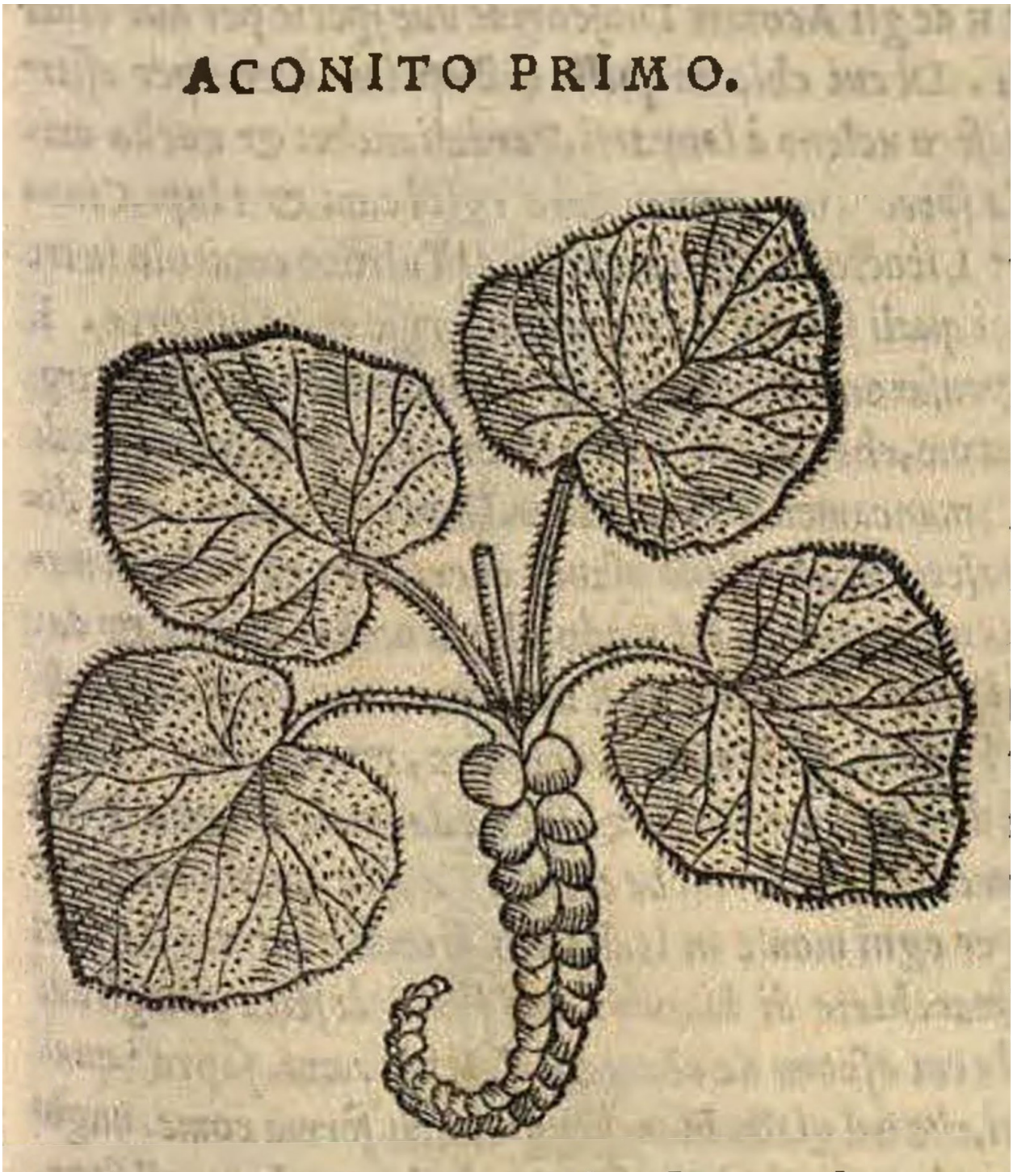

Figure 3: Drawings of "aconito primo". In: Mattioli, M.P., *I discorsi di M. Pietro Matthioli sanese, […]*, Appresso Vincenzo Valgrisi, Venetia, 1563.

recognition of the plant and only the experimental evidence of the poisoning action of *Doronicum* presented by Cortusio convinced him that this was the correct identification (Palmer 1985). However, the comment of Mattioli represents an explicit link between the activity of the *luparii* and a plant species. In recent times, Cuozzo (2005) hypothesized that the powder prepared to kill wolves by Thomas I d'Aquino Count of Acerra under request of Frederick II, could be identified with gunpowder. Conversely, the evidence presented in this research shows that the so called *pulvis* was obtained from a plant, independently of its identification. Moreover, the statement of Mattioli suggests that the high reputation of *luparii* from Southern Italy survived at least until his time. Indeed, in 1585 the Duke of Ferrara called to court many *luparii* from the Kingdom of Naples and, to pay them for several years, a 1500 scudi tax was imposed on grazing livestock (Frizzi 1796). The *luparii* survived in some mountain regions of Southern Italy, such as the territory of Matese, between Campania and Molise, up to the second half of XX century (Guacci 2007). Over the centuries, they adopted new, very effective strategies against wolves, that led the species to near extinction. The new hunting techniques were the result of a combined utilization of traps and firearms, but no mention of a powder based on a poisonous plant has been reported, although lethal poisons like strychnine and arsenic were occasionally used (Guacci 2007). Probably, the gradual loss of traditional knowledge about wild plants and their activity, affecting many Italian rural communities, led to the progressive disappearance of the practice.

Author contributions

Both authors equally contributed to the design and implementation of the research, to the analysis of the results and to the writing of the manuscript.

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