

A Green Fairy in a Monastery Garden?

Peter R. Bindon, Australian Ethnography Institute

Jean-Paul Raynal, Arché-Logis / CDERAD, (Centre de Documentation et de Recherche archéologique Départemental), 43150 Laussonne, France

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Abstract

No one can deny that the beverage known as “absinthe” has a sinister reputation. It has been implicated in the deaths of many celebrities from the second half of the 1800s up until the present. But was absinthe the culprit? In this paper the authors describe their discovery of the plant that imparts the special bitterness to absinthe, and consider the likely explanations for it occurring in a monastery garden in a remote part of the Velay, an old province today part of the Auvergne-Rhône-Alpes Region of France. As no strictly applicable botanical indicators were discovered on the plants (flowers, fruits, etc.), the authors proceed to examine the possibility of identifying their specimens through a review of the known uses of the plants. The various uses of each species of the Artemisia family that are found in the region are discussed, along with the likelihood of each of these species being cultivated during the eighteenth century in an enclosed monastery garden. A short section offers an explanation for the undeserved reputation of the bittering herbs of the Artemisia family and provides a brief comment on the associated alcoholism that has proved destructive to excess consumption of absinthe. Finally, a seemingly satisfactory identification of the monastery herb is offered. Various botanical appendices are included to assist in clarifying some of the complexity of botanical nomenclature for the huge plant genus known as Artemisia (that includes sagebrush!)

Une Fée Verte dans le Jardin d’un Monastère ?

Peter R. Bindon, de l’Institut Ethnographique d’Australie

Et Jean-Paul Raynal, CDERAD, (Archéo-Logis, Centre de Documentation et de Recherche archéologique Départemental), Les Coustilles, 43150 Laussonne, Auvergne, France.

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Résumé

On ne peut nier que la liqueur « absinthe » a une sinistre réputation. Elle a notamment causé les décès de nombreux personnages célèbres, à partir de la seconde moitié du dix-neuvième siècle jusqu’à nos jours. Mais l’absinthe était-elle le vrai coupable ? Dans cet article, les auteurs décrivent leur découverte de la plante, du même nom, qui produit l’amertume si particulière que procure la liqueur absinthe et examinent les explications probables liées à sa

production dans un jardin de monastère d'un coin reculé de l'Auvergne. Du moment qu'aucun indicateur botanique rigoureusement applicable (fleurs, fruits, etc.) n'a été découvert sur les plantes, les auteurs examinent la possibilité d'identifier leurs spécimens en passant en revue les utilisations connues de ces plantes. Les différents usages de toutes les espèces de la famille Artemisia, qui se trouvent dans la région, sont passés en revue, ainsi que la probabilité de chacune de ces espèces d'avoir pu être cultivée tout au long du dix-huitième siècle dans un jardin clos. Une courte section offre une explication de la réputation imméritée des herbes amères de la famille des Astéracées et fournit un bref commentaire sur l'alcoolisme associé qui s'est avéré destructeur en cas d'excès de consommation. Enfin, une identification apparemment satisfaisante de l'herbe du monastère est donnée. Plusieurs annexes botaniques sont incluses afin d'aider à clarifier la complexité de la nomenclature botanique de cette plante dont le nom savant est Artemisia (appartenant à une très vaste famille qui comprend également l'armoïse ou herbe de Saint-Jean !)

¿Una Hada Verde en un Jardín del Monasterio?

Peter R. Bindon, Instituto de Etnografía de Australia

Jean-Paul Raynal, CDERAD, (Centro de Documentación Departamental e Investigación Arqueológica), y Achaeo-Logis, les Coustilles, Laussonne, Auvergne, Francia.

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Resumen

Nadie puede negar que la bebida conocida como "absenta" tiene una reputación siniestra. Se ha implicado en la muerte de muchas celebridades desde la segunda mitad de los años 1800 hasta el presente. ¿Pero fue absenta la culpable? En este artículo, los autores describen su descubrimiento de la planta que imparte la amargura especial a la absenta, y consideran las posibles explicaciones que ocurren en un jardín del monasterio en una parte remota de la Auvernia francesa. Como no se descubrieron indicadores botánicos estrictamente aplicables en las plantas (flores, frutas, etc.), los autores procedieron a examinar la posibilidad de identificar sus especímenes a través de una revisión de los usos conocidos de las plantas. Se discuten los diversos usos de cada una de las especies de la familia Artemisia que se encuentran en la región, junto con la probabilidad de que cada una de estas especies fuese cultivada durante el siglo XVIII en un jardín cerrado del monasterio. Una breve sección ofrece una explicación de la reputación innecesaria de las hierbas amargas de la familia Artemisia y proporciona un breve comentario sobre el alcoholismo asociado que ha demostrado ser destructivo por el consumo excesivo de absenta. Finalmente, se ofrece una identificación aparentemente satisfactoria de la hierba del monasterio. Se incluyen varios apéndices botánicos para ayudar a aclarar algo de la complejidad de la nomenclatura botánica para el enorme género de plantas conocido como Artemisia (¡que incluye la artemisa!)

Uma Fada Verde em um Jardim de Mosteiro?

Peter R. Bindon, Australian Ethnography Institute

Jean-Paul Raynal, CDERAD, (Centre de Documentation et de Recherche archéologique Départemental), and Achaeo-Logis, les Coustilles, Laussonne, Auvergne, France

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Sumário

Ninguém pode negar que a bebida conhecida como "absinto" tem uma reputação sinistra. Ela já foi implicada nas mortes de muitas celebridades desde a segunda metade do século XIX até o presente. Mas foi absinto o culpado? Neste artigo, os autores descrevem sua descoberta da planta que dá o amargor especial ao absinto, e consideram as prováveis explicações para isso ocorrer no jardim de um mosteiro em uma parte remota da Auvergne francesa. Como não foram encontrados indicadores botânicos estritamente aplicáveis nas plantas (flores, frutos, etc.), os autores passaram então a examinar a possibilidade de identificar seus espécimes através de uma revisão dos usos conhecidos das plantas. Os vários usos de cada espécie da família Artemísia que são encontrados na região são discutidos, juntamente com a possibilidade de cada uma dessas espécies terem sido cultivadas durante o século XIX no jardim de um mosteiro fechado. Uma seção curta oferece uma explicação para a reputação não merecida das ervas amargas da família Artemísia, e fornece um breve comentário sobre sua associação com o alcoolismo que provou ser destrutivo para o consumo excessivo de absinto. Finalmente, uma identificação aparentemente satisfatória da erva do mosteiro é oferecida. Vários apêndices botânicos estão incluídos para ajudar a esclarecer um pouco da complexidade da nomenclatura botânica para o enorme gênero de plantas conhecidas como Artemísia - que inclui o "arbusto sábio"!

Eine Grüne Fee in einem Klostergarten?

Peter R. Bindon, Ethnographisches Institut von Australien

Jean-Paul Raynal, CDERAD, (Centre de Documentation et de Recherche archéologique Départemental), und Achaeo-Logis, les Coustilles, Laussonne, Auvergne, Frankreich

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Zusammenfassung

Man kann nicht leugnen, dass dem Getränk „Absinth“ einen unheimlichen Ruf zugesprochen wird. Es wurde in Verbindung gebracht mit dem Tod vieler berühmter Personen von der zweiten Hälfte des 19. Jh. bis in unserer heutigen Zeit. Aber war tatsächlich dieses Getränk der Übeltäter?

In dieser Abhandlung beschreiben die Autoren ihre Forschungsergebnisse bezüglich der Pflanze, die dem Absinth ihre besondere Bitterkeit verleiht und prüfen glaubhafte Erklärungen für ihr Vorkommen in einem Klostergarten, gelegen irgendwo in einem abgeschiedenen Teil der französischen Auvergne. Sie können auch keinen genau zutreffenden botanischen Indikator für dieser Pflanze (Blumen, Früchte usw.) entdecken,

daher versuchen sie ihre Proben anhand einer Untersuchung ihrer bekannten Anwendungen zu identifizieren.

Die vielen Anwendungsmöglichkeiten für jede einzelnen Spezies der Gattung *Artemisia*, die in dieser Gegend wächst, werden hier besprochen. Man nimmt auch an, dass wahrscheinlich jeder Spezies dieser Pflanze damals im 19. Jh. in einem umschlossenen Klostergarten angebaut wurde.

Ein kurzer Abschnitt bespricht eine mögliche Erklärung für den unverdienten Ruf ihrer bitteren Kräuter und bietet eine kurze Darlegung für den damit verbundenen Alkoholismus und seine zerstörerischen Wirkung, was zur übertriebenen Genuss des Absinths führte. Zum Schluss wird eine ziemlich befriedigende Identifikation dieses Klosterkrautes angeboten. Viele botanische Erklärungen sind als Anhang beigefügt; diese sind ein Hilfsmittel zur Erläuterung der komplexen botanischen Fachbezeichnungen für diese sehr große Pflanzengattung der *Artemisia* (einschließlich des Wüstenbeifußes).



Artemisia in the ruins of Chartreuse de Bonnefoy, June 2016. (Authors.)

Introduction

“The Green Fairy” is a colloquial name for the liquor known as “absinthe,” which is typically coloured green; often quite a lurid shade of green. But it is not the only bright green liquor that can be found in the region of France where absinthe is found. Verveine is another brilliant green coloured alcoholic liquor that is flavoured with an infusion of the plant that is commonly known as lemon verbena (*Aloysia citriodora*). Chartreuse, a related liquor, is usually coloured a yellowish green which is far more subdued than many of the brands of

absinthe and verveine. At one time, we speculated that the choice of this colour for any of these liquors may have had a relationship with the alchemical notions concerning this hue. Solvents for the element gold were sometimes known as the “Green Lion” or the “Green Dragon,” and the crystalline green gemstone known as emerald was thought to represent the spiritual aspect of a substance. We were unable to find any evidence one way or the other for these notions in our research. Not until chemical synthesis of dyes and pigments could either of these alcoholic liquors have been coloured green safely. In antiquity, green pigments are relatively uncommon, although it is possible to find green used in paintings in ancient Egypt, often used to colour the god of resurrection Osiris, and in later Greek works the compound known as verdigris was used to produce a green pigment. As these pigments were produced from minerals or compounds that are generally thought to be poisonous¹ their use fell by the wayside until the chemical concoctions were found during the late eighteenth and early nineteenth centuries. One of the aims of one form of alchemical research led towards a higher spiritual or perhaps even paranormal state that could be reached by a researcher into this form of alchemy. Perhaps it was the alleged psychotropic effects produced on individuals consuming these liquors (in excess as shown below) that led to the choice of green for their colouration; but this is pure speculation on our part.

The *Artemisia* Plant Family

We were first introduced to mountainous members of the *Artemisia* plant family by a French ethnologist and anthropologist, Roger de Bayle des Hermens, during a most enjoyable lunch in his home, during which we consumed several herbs and vegetables that he had collected from nearby forests. When the meal ended we were served a digestive he called *arquebuse*. Roger informed us that it was made by infusing the plant called by that name in sugared alcohol of a certain degree and allowing it to steep for some weeks. Since that occasion, we have tasted similar liquors in the French Haute-Loire department, part of the old Velay and Vivarais provinces situated south of the Auvergne Province, both part of the Auvergne-Rhône-Alpes Region. The liquors there are made with the plant species used by de Bayle, or another similar species from the same genus.

Following this gastronomic experience, other plants of the *Artemisia* family came to our attention on several occasions and for different reasons. As archaeologists and ethnographers, we have, over the last few years, visited the monastic ruins Chartreuse de Bonnefoy in the French Ardèche department. One of us, Fr. Bindon, has a particular interest in human interactions with plants and this extends to the plants found in monastic gardens and used in monastic pharmacopeia. A first visit to the abbey ruins concluded with an introduction to edible and useful plants presented by the late Christian Giroux, an ethnobotanist with a considerable knowledge of regional plants. Unfortunately, we were not able to have a full discussion with him regarding the local plants on that occasion. On a later visit to the ruins, Elodie Blanc, who had written on the history of the Bonnefoy monastery (Blanc 2000), introduced Fr. Bindon to an *Artemisia* growing amongst the ruins of the cloister walls. This species had a mild taste, an aroma reminiscent of camphor, lacked the reddish stems of *Artemisia vulgaris*, a common and widespread species in the region and was not immediately recognisable.² At first sight, the plant appeared to be an *Artemisia* species

¹ Compounds of copper, including verdigris, an atmospheric oxidation product formed on copper or brass, the mineral malachite as well as arsenic had been used to produce green pigments. None of these compounds are safe to ingest.

² Most recently, samples of the unidentified plant were collected for our study by Emmanuelle Defive from the University of Claremont-Ferrand.

not previously recorded for the area, so researching its specific name and geographical origin became a quest, the results of which are reported on below.



General view of the Chartreuse de Bonnefoy near the source of the Veyradeyre River, July 2016. (Authors.)

The monastery known as Chartreuse de Bonnefoy is located in the mountains about 4,300 feet (1310 meters) above sea level. The site has a southerly aspect in a sheltered valley and, although subject to the harsh winters of the region, has a relatively mild microclimate. The monastery is in the border area between the diocese of Viviers Bonnefoy and the diocese of Le Puy. It was founded at an uncertain date between 1156 and 1179 by Carthusian monks and William Jordan, Lord of Fay and Mézenc, but its early history is presently unclear (Blanc 2000).

Since it has a direct association with the main monastery of the Carthusian Order, the Grande Chartreuse situated in the Chartreuse Mountains in the commune of Saint-Pierre-de-Chartreuse, Isère, it was at first thought that perhaps the mystery plant had some association with the famous Chartreuse liqueur made since 1737 by the Carthusian Monks. The ingredients and manufacturing methodologies of Chartreuse are set out in a secret manuscript given to the monks by François Annibal d'Estrées in 1605 (Stewart 2013). It now seems that the *Artemisia* found in the ruins of the abbey at Bonnefoy was not brought to that site to be used in the production of this liquor. The date of the demise of the Chartreuse de Bonnefoy monastery during the eighteenth century, and the religious turmoil with which it has been associated before and after that time, along with the history of the production of Chartreuse liquor published by the principal monastery, are inconsistent with the historical events that took place at the abbey of Bonnefoy.

Relatively recently, portions of the library of our lunch host, Roger de Bayle des Hermans, came to be lodged in the library at the Archéo-Logis/CDERAD, at Laussonne. Amongst the books is *Flore D'Auvergne*, by Le Frère Héribaude-Joseph, in which the occurrence of five (probably four, see Appendix 1) species of *Artemisia* is noted: *Artemisia campestris*, *A.*

camphorata, *A. absinthium*, *A. vulgaris*, and *A. selengensis*.³ We expected that, if the mystery plant was endemic to the area and not imported, the Artemisia at Chartreuse de Bonnefoy should be one of Héribaud-Joseph's species; but, which one?

Unravelling the botanical names of the Artemisia genus is a nightmare, not least because botanical names are subject to frequent revision and change as new information about species and genera is collected with a resulting obsolescence of names used in older literature. A further difficulty is that the physical characteristics used to determine the identification of a plant are significantly effected by growing conditions that may favor certain physical attributes giving rise to a confusing visual analysis – exposure often shortens growth, impoverished soil limits leaf size, etc. Consequently, botanists may consider one or another characteristic of a specimen at hand to be diagnostic and requiring (or deserving of) description at the species level, while in fact, the difference between it and another example growing in different conditions may not be significant at all. It will not be until there is a concerted effort to separate the Artemisias by genetic methodologies that satisfactory descriptions will be arrived at. As an example of the confusion that can arise in the minds of botanists, Appendix 2 gives the synonymy for the various species used traditionally to manufacture *génépi* (further discussed below). The table in Appendix 2 shows that species that are most widespread geographically seem to accumulate more synonymous descriptions than those growing in a restricted habitat zone, probably because of the sheer number of botanists working on a regional basis. Recent genetic studies have simplified some of the more problematic differences within Artemisia, but we await the transference of this data into field manuals.

Gaining some insight into the plants by beginning with their common names is equally fraught with danger. Botanist David J. Mabberley (1997, 57) suggested that the Artemisia genus contains upward of 400 species spread through the temperate regions of the northern hemisphere; consequently, they have lived in close association with humans for many millennia and, during that time, have accumulated a plethora of common names.

One source of information that could shed light on the identity of the Chartreuse de Bonnefoy Artemisia is to consider the likely use of the plant. Monastic gardens are known to have contained and do contain a number of useful plants, particularly those dedicated to culinary use, from which to make herbal medicines, or to prepare beverages, and there is a possibility that the plant was used in a psychotropic manner (Wright 2002; Berton 2001, etc.).

First, we intend to discuss the reputation of Artemisias as being psychotropic herbs, and then we will briefly comment on the other uses as listed above.

Psychotropic Potential

Was the Chartreuse de Bonnefoy Artemisia being used in the manufacture of a tea or infusion in wine to cure lethargy or provide mental stimulus? In India, the aroma of an Artemisia is used to help people avoid lethargies and yawning in religious ceremonies (Marjapuria 1989, 239), so one expects to find a particularly effective and stimulating chemical compound present in some Artemisia species that might provide these physical effects. In fact, there are a wide range of particularly useful chemical compounds in

³ Notes on these species are provided in Appendix 1.

Artemisia species; *A. annua*, also known as sweet wormwood, contains artemisinin, an efficacious antimalarial, and the plant is cultivated commercially in China to produce a most useful pharmaceutical drug. Another species, present in the French Mezanc region, and also particularly in the Haute-Loire region, mentioned by Heribaud-Joseph in his *Flore D'Auvergne*, is *A. absinthium*. A particularly interesting chemical compound found in this plant is thujone, present in many other Artemisias and other plant species like the conifer genus *Thuja*, (from whence the name derives), some junipers, oregano, common sage, tansy, and various species of *mentha* (mint). Some of these species have been used since antiquity to flavour beverages, notably the liqueur Absinthe (discussed below). Thujone has been erroneously linked to drug dependency, but there is no good evidence that differentiates between alcoholism and an addiction to thujone and/or its chemical relatives – if such an addiction exists (Stewart 2013, 200 – 203; Deans et al. 2002, chap. 3; see further discussion below).

Culinary Use

Only one Artemisia has culinary importance, and that is *A. dracunculus*, (*A. dracunculus* var. *sativa* according to some botanists), commonly known as tarragon or estragon, but *A. vulgaris*, a mugwort, has also been used medicinally and as a culinary herb.⁴ The leaves of tarragon are used principally with vinegar, for flavouring fish dishes. Two varieties are known: one has the informal name of “French tarragon,” and is the best for culinary use and which must be propagated vegetatively; and the other is “Russian tarragon,” which is probably close to a wild tarragon that has not been selected by humans for having desirable culinary characteristics. As the remains of a series of ponds in which fish were cultivated for consumption for religious reasons can still be seen amongst the ruins of the abbey of Chartreuse de Bonnefoy, it was tempting to assume that the mystery Artemisia might have been a culinary species used to enhance dishes made with fish taken from the monastery’s ponds. Unfortunately, this result was rendered unlikely, firstly because of the necessity for tarragon to be propagated vegetatively to ensure its survival in herb gardens from year to year, and secondly because the mystery species had growth habits and physical characteristics vastly different from the culinary Tarragon.

Medicinal “Simples”

Written accounts of Artemisia use in the production of herbal medicines or “simples” extend back about 5000 years, being found in texts from Egypt and Sumer, but there is little doubt that plants were used medicinally by humans further back in human prehistory. About 2000 years ago, we find several species of Artemisia mentioned in Book 3 of *De Materia Medica*, written between 50 and 70 AD by Pedanius Dioscorides, a Roman physician of Greek origin. After the appearance of that book, numerous herbals and botanical commentaries mention the genus Artemisia, including Pliny the Elder’s *Naturalis Historia*, circa AD 77–79; the *Capitulaire de Villis*, a charter of Charlemagne which dates back to sometime between the years 771 and 800,⁵ the Benedictine nun Hildegard von Bingen’s *Causae et Curae* and *Physica*, probably written around 1150 AD, and an increasing number of more modern authors continuing into the present (e.g. Stary 1992; Chiej 1982; Forey et al. 1989; etc.).

⁴ *A. vulgaris* has reddish stems in the Haute-Loire region, whereas our mystery species has green or grey-green stems.

⁵ Chapter 70 of the *Capitulaire de Villis* contains a list of 90 plants and fruit trees including *Abrotanum* (i.e. *Artemisia abrotanum*) and another plant of great interest in the Auvergne, *Ameum*, (*Meum athamanticum* Jacq., the famed “cistre.”)

Wormwood was a popular pharmaceutical ingredient, based on the knowledge that it was effective at treating stomach disorders and intestinal parasites.

An extract from the *Complete Herbal* (1653) by the English botanist, herbalist, physician, and astrologer Nicholas Culpeper, will serve to demonstrate that many of the properties of the Artemisias were familiar to herbalists.

The juice of the large leaves of wormwood, which grow from the root, before the stalk appears, is the best against the dropsy and jaundice, for it opens obstructions, and works powerfully by urine. It is good in all agues, in decoction or infusion, in water, ale, wine, or in the juice only; but its infusion in wine or ale is an easy, and as good a preparation as any. The infusion, drank morning and evening for some time, helps hysterics, obstructions of the spleen, and weakness of the stomach. Its oil, taken on sugar, and drank after, kills worms, resists poison, and is good for the liver and jaundice. The root has a slow bitterness, which affects not the head and eyes, like the leaves, hence the root should be accounted among the best stomachics (Culpeper 1652, 394).

Doubtless, a range of herbalist's writings was familiar to religious communities. During the time that the abbey of Chartreuse de Bonnefoy was flourishing, and, even more recently, monasteries served as medical clinics and even as hospitals. The monastery at Chartreuse de Bonnefoy almost certainly owned a library of manuscripts and published books extolling the virtues and describing the properties and uses of various Artemisia species. As quite a few of them contain compounds used in medicine, this characteristic was not of special importance in determining the species name. The only factor that was of interest in the medical sense is that the plant was probably a garden plant rather than one cultivated widely – say in a field – which is what would be required if the plant was used in the manufacture of large quantities of a product.

At this point it seemed as though the mystery Artemisia may have been cultivated at the monastery and used medicinally.

Beverages

“Wormwood is the bitterest herb known, but it is very wholesome and used to be in much request by brewers for use instead of hops.” (Culpeper 1652)

We have previously given grounds for discounting the Chartreuse de Bonnefoy plant as being the species of Artemisia used in the manufacture of Chartreuse (*A. abrotanum*⁶). In addition, an examination of what is known of the list of numerous botanicals in Chartreuse liquor reveals no trace of any of the Artemisia species, although as the actual recipe of the modern liquor is secret, there is no certainty attached to this statement. This seems to confirm that any link between our mystery plant and the beverage Chartreuse can be discarded.

What has been interesting to explore is the range of Artemisia species used in the artisanal liqueurs and spirits produced in the area around Mont Mézenc, namely Arquebuse and

⁶ The main Artemisia used in the manufacture of Chartreuse is *A. abrotanum*, a European species forming a small bushy shrub that flowers irregularly and sparsely and is widely cultivated by gardeners. It has a strong camphor-like odor, and historically was used as an air freshener or strewing herb with insect repelling characteristics. It bears the intriguing common name ‘our Lord’s wood.’

Génépi. We here ignore Izzara, an Artemisia flavoured liqueur produced in the French Pyrenees, or Northern Basque Country. Like the Chartreuse family of liqueurs, Izzara too, is modified Génépi (discussed below). We acknowledge the use of Artemisia species in producing aromatised or flavoured wines, notably Vermouth⁷, which departed from its medicinal origins to become an aperitif in its own in the mid- to late-eighteenth century. The practice of consuming for medicinal purposes, wines flavored with wormwood has been recorded for India around 1500 BCE; China at least as early as the Shang and Western Zhou dynasties about 1250 – 1000 BCE; at a similar time in ancient Egypt; ancient Greece from around 400 BCE, etc. (McGovern 2010; and earlier references).

Liqueurs – Arquebuse

The Artemisia species commonly known as Arquebuse (*A. abrotanum*), is present in the Velay-Vivarais area and has a long history of usage in the manufacture of several liqueurs. However, unlike others of the genus, this species is not recorded as being used in traditional medicines, as for example *A. vulgaris*, which is one of the 27 “*herbes de la Saint-Jean*” having a number of uses in traditional medicine, among which was its use in banishing malevolent spirits. Moreover, *A. abrotanum* is physically dissimilar to the species growing in the ruined garden of the monastery of Chartreuse de Bonnefoy, so *A. abrotanum* can be excluded from the likely species on our identity list.

It has not been possible to discover exactly which Artemisia species was used by de Bayle to produce his Arquebuse, but recipes for this concoction exist.⁸ These all involve steeping (or macerating) sprigs of an Artemisia in alcohol and resting the infusion for several weeks before preparing the liqueur for final consumption by adding sugar dissolved in distilled water. It is worth noting that artisanal Arquebuse is vastly different from the distilled spirit known as “Hermitage Arquebuse,” derived from the maceration of up to 33 different botanicals, including sage, gentian, lime (Tilleuil), and numerous others followed by distillation of the resulting solution.⁹

Perhaps the monastery was making Arquebuse as a digestive liqueur using the Artemisia growing in the garden. However, prior to proposing a name for our unknown Artemisia species possibly used by the monks to make Arquebuse, the botanics used in the manufacture of Génépi, the second of the liquors mentioned above, require comment.

Liqueurs - Génépi

Unlike Arquebuse, which is not produced by direct distillation but by steeping or maceration, Génépi is a spirit and is a product of a distillery. Distillation was an art first carried out by

⁷ Vermouth is sometimes flavoured with *A. absinthium*, but more commonly with *A. pontica* which contains less thujone than the former species. See below.

⁸ Ingredients for 2 liters of Arquebuse: 15 branches arquebus, 1 liter of alcohol at 90 degrees, 1 cup (250 g) of sugar, 1 liter distilled water. Method: Between August and October, cut 15 branches arquebus and wash. Put 5 whole branches (stem + leaves) and leaves stripped from the other 10 branches into a bottle containing 1 liter of alcohol at 90 degrees. Allow 6 to 8 months of maceration without opening the bottle. Filter the now greenish liquid and add the distilled water in which the sugar has been dissolved. Let the liquor rest for a further 2 weeks, turning the bottles every second day to ensure the sugar dissolves. Drink as a digestive in moderation.

⁹ Traditionally, spirits are simple distilled alcohol containing flavourings but no sugar. Liqueurs may be the production of distillation too but are bottled with sugar.

alchemists and monks in monasteries, since these were the only scholars capable of reading and understanding treatises on distillation. By the year 800, monks in monasteries were producing substantial amounts of distilled and fermented liquors (Standen 1963).

The principal *Artemisia* species used in producing Génépi are *Artemisia genipi*, *A. rupestris*, and *A. umbelliformis*. Other species used to a lesser extent include *A. glacialis*, *A. pontica*, and *A. borealis*, and two others of lesser importance. As intimated previously, sorting a likely candidate from this short list is not a simple task, and it is more than likely that our mystery species is not included in this list because all of these species of *Artemisia* prefer habitats different from that of Chartreuse de Bonnefoy's walled garden. With the exception of *A. pontica*, which in any case has a very distinct leaf and branch structure, the species used for making Génépi are relatively low-growing (to about 16 inches, or 40 centimeters) and prefer high mountainous localities, sunny exposures, and open environments without competition from tall-growing vegetation. The synonymy of these eight species is provided in Appendix 2. None of these species satisfies the requirements that would identify our Chartreuse de Bonnefoy species.

Liqueurs - Others

The most notorious and perhaps the most celebrated member of the *Artemisia* genus used to flavour liqueurs and spirits is *Artemisia absinthium*.¹⁰ Known by numerous common names, *A. absinthium* is native to temperate regions of Eurasia and Northern Africa, being grown as an ornamental plant in gardens and on a commercial scale for use in flavouring the spirit absinthe, as well as other spirits and wines including bitters and vermouth. In the Middle Ages, it was used to spice mead. In eighteenth century England, one or another species of wormwood was sometimes used instead of hops in beer making, adding bitterness and protection from microbial activity (Stewart, 2000).

The exact origins of the famous and infamous spirit (a liquor not a liqueur) Absinthe, with the delightful common name "la fée verte" (the green fairy) are not known (Standen 1963). What is widely known is that this spirit was formerly maligned and misunderstood. To be a true absinthe, the spirit must contain extracts from grand wormwood (*A. absinthium*), sweet fennel, calamus root, *Angelica*, and green anise, though most varieties also contain other botanicals as well. The primary source of an active ingredient in the drink absinthe has always been thought to derive from the chemicals released from *Artemisia absinthium*, namely thujone, although other ingredients, notably calamus root, have been shown to have psychedelic properties. The alcohol also has pharmacological effects. Most recipes for absinthe to which we have had access (some are industrial secrets) describe the preparation of the initial stage as the maceration of *Artemisia absinthium* leaves and the other botanicals in alcohol at 85 percent.

Rumors of absinthe's dangers are greatly exaggerated. The spirit does contain a compound called thujone that could cause seizures and death at very high doses, but the actual amount of thujone contained in absinthe spirits and other liquors is actually quite low. Stories of absinthe causing hallucinations and wild behavior among France's bohemian set in the late

¹⁰ *A. absinthium* L., Griesbach, M. (1931). "Wormwood, Common". Botanical.com – A Modern Herbal. Archived from the original on 28 May 2010. Retrieved 2010-07-12. For an indication of the confusion surrounding the name of this species, see Appendix 2.

nineteenth century are mostly false and probably are related more to the high alcohol content of absinthe (70 to 80 percent) and excess consumption than to thujone poisoning. Nevertheless, absinthe was banned in Europe and many countries around the world in the early 1900s. A psychiatrist, Dr. Valentin Magnan, even went so far as to blame absinthe for what he saw as a collapse of French culture. He set out to prove through scientific experiment that absinthe was a dangerous drug by conducting experiments on animals using highly concentrated thujone and wormwood oil. He saw that mice that ingested high concentrations of thujone had convulsions and died; he gave a dog a vial of wormwood oil and watched it go crazy – the experiment that gave rise to the myth that absinthe causes hallucinations – it doesn't!

An average sized monk living at Chartreuse de Bonnefoy would need to have consumed two bottles of Absinthe at one event to feel its toxic effects, which in fact are similar to those of other toxins like alcohol. In other words, they would have died of alcoholic poisoning long before they consumed enough thujone to be poisoned. Although some governments still regulate the amount of thujone that may be present in the finished product, absinthe is legal today in Europe and many places around the world. It seems bizarre that while the thujone content of absinthe is regulated, many culinary plants, including sage, are extraordinarily high in thujone but are not regulated at all.

So, despite the differences between the mystery plant of the abbey of Chartreuse de Bonnefoy and the standard descriptions of *Artemisia absinthium*, we arrive at the conclusion that the identity of the plant seen at the Chartreuse de Bonnefoy and collected for us by a co-worker¹¹ is indeed *A. absinthium*. However, its relative scarcity at the ruins suggests that it was used medicinally, rather than in any other way. This use is well known and documented throughout history and is in line with the activities that were commonly undertaken in monasteries since the late Middle Ages. The monks at Chartreuse de Bonnefoy certainly had a fairy at the bottom of their garden, but it seems unlikely that they drank her elixir.



1615. La Chartreuse de BONNEFOY (XII^e et XVIII^e siècles) sur la route du Mézenc au Gerbier
Ruines imposantes, entourées de magnifiques et sombres forêts

View of the Chartreuse de Bonnefoy at the beginning of the 20th century. (Authors.)

¹¹ Emmanuelle Defive

Appendix 1

Comments on the species of *Artemisia* recognised by Héribaude-Joseph in the Auvergne

- Héribaude-Joseph suggests that *Artemisia campestris* grows in open sites on dry sandy soils throughout the Boreal Region, but in fact, this description can be altered to the Temperate and Boreal Forests.
- The name *Artemisia camphorata* is a synonym of *Artemisia alba* Turra; it grows in the Dept. of Puy de Dôme, on lower limestones of Puy Saint-Romain, on the right bank of l Allier at Vic-le-Comte, and thereabouts and on calcareous soils in the Cantal. This species was cultivated widely in Germany during the 16th century, (Wyk et al, 2004)
- *Artemisia absinthium*, which Héribaude-Joseph states is used principally as a tonic and a vermifuge, [perhaps steeped in wine or spirits of wine (Brandy)] is widespread in cultivated gardens throughout the Auvergne - and in many other parts of the Massif Central.
- According to Héribaude-Joseph, *Artemisia vulgaris* is common in roadside habitats regionally; despite its particularly strong and bitter taste, he proposes its use in tonics and stimulants.
- *Artemisia selengensis* [Turez]; Héribaude-Joseph identifies this species as identical with *A. verlotorum* Lamotte and claims that it is the widespread species, originating from Siberia, commonly found in gardens, cemeteries, amongst rubble and debris and always in the vicinity of habitations. He further claims after Lamotte, that this aromatic species is the true Armoise of the ancients! (An old synonym for this species is *A. frigida*, however, *A. selengensis* is currently thought to be a synonym of *A. vulgaris* – giving emphasis to our earlier claim that the species in this genus are horribly mixed.)
- It is quite surprising that Héribaude-Joseph makes no mention of the *Artemisia* commonly and regularly used as a culinary herb, *A. dracunculus*, Tarragon, which then as now, is planted annually in kitchen gardens convenient for use by the chef!

Appendix 2

Table 1

Plant names describing species preferred for manufacture of Genipi.

Those marked ☐ are the most favoured, others are known to have been used but are less important

Name	Relationship
<i>Artemisia genipi</i>	
<i>Artemisia genipi</i> Weber ex Stechm.	Preferred name
<i>Artemisia genipi</i> Stechm.	Authority
<i>Artemisia laciniata</i> f. <i>dissecta</i> Pamp.	Synonym
<i>Absinthium tanacetifolium</i> (L.) Gaertn.	
<i>Artemisia genipi</i> subsp. <i>genipi</i>	
<i>Artemisia rupestris</i> Vill.	
<i>Artemisia serreana</i> Pamp.	

Name	Relationship
<i>Artemisia mirabilis</i> Rouy	
<i>Artemisia mertensiana</i> Wallr.	
<i>Artemisia sylvatica</i> Ledeb.	
<i>Artemisia racemosa</i> Miégev.	
<i>Artemisia orthobotrys</i> Kitag.	
<i>Artemisia tanacetifolia</i> All.	
<i>Artemisia macrophylla</i> Fisch. ex Besser	
<i>Artemisia bocconeii</i> All.	
<i>Artemisia spicata</i> (Baumg.) Wulfen ex Jacq.	
<i>Artemisia rupestris</i>	
<i>Artemisia rupestris</i> L.	Preferred / Authority
<i>Artemisia rupestris</i> var. <i>rupestris</i>	Synonym
<i>Artemisia rupestris</i> subsp. <i>rupestris</i> L.	
<i>Artemisia rupestris</i> subsp. <i>woodii</i> Neilson	
<i>Absinthium viridiflorum</i> var. <i>rupestre</i> (L.) Besser	
<i>Artemisia umbelliformis</i>	
<i>Artemisia umbelliformis</i> Lam.	Preferred / Authority
<i>Artemisia umbelliformis</i> subsp. <i>gabriellae</i> Vigo	Synonym
<i>Absinthium laxum</i> Lam.	
<i>Absinthium mutellina</i> Steud.	
<i>Artemisia wulfenii</i> Schleich.	
<i>Artemisia oligantha</i> Miégev.	
<i>Artemisia gabriellae</i> Braun-Blanq.	
<i>Artemisia rupestris</i> All.	
<i>Artemisia laxa</i> (Lam.) Fritsch	
<i>Artemisia mutellina</i> Vill.	
<i>Artemisia delphinensis</i> Besser	
<i>Artemisia laxiflora</i> St.-Lag.	
<i>Artemisia spicata</i>	
<i>Artemisia genipi</i> Weber ex Stechm.	Preferred
<i>Artemisia genipi</i> Stechm.	Authority
<i>Artemisia laciniata</i> f. <i>dissecta</i> Pamp.	Synonym
<i>Absinthium tanacetifolium</i> (L.) Gaertn.	
<i>Artemisia genipi</i> subsp. <i>genipi</i>	
<i>Artemisia rupestris</i> Vill.	

Name	Relationship
<i>Artemisia serreana</i> Pamp.	
<i>Artemisia mirabilis</i> Rouy	
<i>Artemisia mertensiana</i> Wallr.	
<i>Artemisia sylvatica</i> Ledeb.	
<i>Artemisia racemosa</i> Miégev.	
<i>Artemisia orthobotrys</i> Kitag.	
<i>Artemisia tanacetifolia</i> All.	
<i>Artemisia macrophylla</i> Fisch. ex Besser	
<i>Artemisia bocconeii</i> All.	
<i>Artemisia spicata</i> (Baumg.) Wulfen ex Jacq.	
<i>Artemisia mutellina</i>	
Name	Relationship
<i>Artemisia mutellina</i>	Preferred
<i>Artemisia mutellina</i> Vill.	Authority
<i>Artemisia glacialis</i>	
Name	Relationship
<i>Artemisia glacialis</i> L.	Preferred
<i>Artemisia pontica</i>	
<i>Artemisia pontica</i> L.	Preferred / Authority
<i>Artemisia borealis</i>	
<i>Artemisia borealis</i> Pall.	Preferred / Authority
<i>A. borealis</i> has been divided into at least 10 sub-species, forms and varieties by various botanists	
<i>Artemisia campestris</i> ssp. <i>borealis</i> (Pall.) H.M. Hall & Clem.	Also recognised as a valid name
<i>Artemisia campestris</i> has been divided into at least 4 sub-species by various botanists	
<i>Artemisia desertorum</i> var. <i>pallasiana</i> (Besser) Pamp.	Synonym
<i>Artemisia desertorum</i> var. <i>hookeriana</i> Besser	
<i>Artemisia canadensis</i> f. <i>pumila</i> J.Rousseau	
Along with forma ' <i>pumila</i> ' 4 other forms of <i>A. canadensis</i> are recognised by some botanists	
<i>Oligosporus borealis</i> (Pall.) Poljakov	
<i>Absinthium boreale</i> Besser	
<i>Artemisia commutata</i> var. <i>hookeriana</i> (Besser) Besser	

Name	Relationship
<i>Artemisia groenlandica</i> Wormsk.	
<i>Artemisia violacea</i> Ledeb.	
<i>Artemisia peucedanifolia</i> Juss. ex DC.	
<i>Artemisia remosa</i> Sugaw.	
<i>Artemisia vermiculata</i> Schangin ex DC.	
<i>Artemisia nana</i> Gaudin	
<i>Artemisia allionii</i> Nyman	
<i>Artemisia desertorum</i> Besser ex Hook.f.	
<i>Artemisia helvetica</i> Schleich.	
<i>Artemisia gelida</i> Ledeb.	
<i>Artemisia norica</i> Leyb.	
<i>Artemisia stelleri</i> Steven ex Ledeb.	
<i>Artemisia camtschatica</i> Ledeb.	

Table 2

Nomenclatural variants and authors (abbreviated) for the plant known formally as *Artemisia absinthium*.L.

Family: *Compositae* Tribe: *Anthemideae* Genus: *Artemisia* Rank: species

***Artemisia absinthium* L. accepted name**

Absinthium bipedale Gilib. nom. inval.

Absinthium majus Garsault nom. inval.

Absinthium officinale Brot.

Absinthium officinale Lam.*Absinthium majus* Geoffr.

Absinthium vulgare (L.) Lam.

Artemisia absinthia St.-Lag.

Artemisia absinthium var. *absinthium*

Artemisia absinthium var. *insipida* Stechm.

Artemisia arborescens f. *rehan* (Chiov.) Chiov.

Artemisia arborescens var. *cupaniana* Chiov.

Artemisia baldaccii Degen

Artemisia doonense Royle

Artemisia inodora Mill.

Artemisia kulbadica Boiss. & Buhse

Artemisia pendula Salisb.

Artemisia rehan Chiov.

Artemisia rhaetica Brügger

<http://compositae.landcareresearch.co.nz/?Page=NameDetails&NameId=AE97CE9A-B6F9-442A-87E6-8F29A9074155>. Retrieved February 8, 2019.

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