

## The *Mona Lisa* Portrait: Leonardo's Personal and Political Tribute to Isabella Aragon Sforza, the Duchess of Milan

Jerzy K. Kulski<sup>1</sup>, PhD

### Abstract

The modern consensus clings to the traditional belief that Leonardo da Vinci's *Mona Lisa* in the Louvre Museum is Lisa Gherardini, the wife of the wealthy Florentine merchant, Francesco del Giocondo. However, this opinion is based on incorrect interpretations of limited historical information and contradictions rather than on any concrete evidence. Robert Payne, who wrote a biography on Leonardo da Vinci in 1978, probably provided the first serious suggestion that Isabella of Aragon, the Duchess Consort of Milan, was the *Mona Lisa*. He realised that Isabella of Aragon was the *Mona Lisa* when he saw a drawing of her in Milan in her early twenties that currently is held in the Hyde Collection at Glen Falls in New York. In this paper, I reflect on Robert Payne's findings and arguments and compare the style, look and chronology of many Renaissance versions of *Mona Lisa* with the facial characteristics of the Isabella Aragon Sforza's idealized portraits to support and further develop the Payne rationale that Leonardo da Vinci's *Mona Lisa* is a tribute to and an idealized representation of the widow Isabella of Aragon and not Lisa Gherardini del Giocondo.

**Keywords:** *Mona Lisa*, Leonardo da Vinci, Isabella Aragon Sforza, Lisa Gherardini, Renaissance, historical attribution, art and culture.

### 1. Introduction

The *Mona Lisa* by Leonardo da Vinci at the Louvre Museum in Paris is arguably the most famous and valuable hand-painted portrait in the world (Sassoon 2002, Harris 2013). The English title of the painting, *Mona Lisa*, comes from a description in 1550 by the Renaissance art historian Giorgio Vasari (1550), who wrote, "Leonardo undertook to paint, for Francesco del Giocondo, the portrait of Mona Lisa, his wife." Mona in Italian is a polite form of address originating as 'ma donna' – similar to 'madam' or 'my lady' in English; and 'mona' as the contraction of 'madonna'. The Italian name for the painting, *La Gioconda*, means jocund, happy or jovial, literally, 'the happy one' (Sassoon 2002). The French title *La Joconde* has the same meaning as the Italian title, 'the Smiling One'. And so, a dialectic ambiguity and an ironic historical coincidence exists between the name of Francesco del Giocondo and the use of 'The Smiling One' (*La Gioconda*) as a popular Italian and French title for the painting of *Mona Lisa*.

Leonardo da Vinci painted his *Mona Lisa* (Fig. 1A) more than 500 hundred years ago, and today we still do not know exactly when and why he painted it, nor do we know for whom and of whom. The majority of art historians in the 21st century maintain the long-held traditional opinion that the painting of *Mona Lisa* depicts Lisa del Giocondo of Florence (Vasari 1550, Boas 1940, Keele 1959, Zollner 1993, Harris 2013, The Mona Lisa Foundation 2016, Kemp & Pallanti 2017). However, not all scholars agree with this opinion because the evidence that Leonardo's painting at the Louvre is the wife of Francesco del Giocondo is highly suspect, circumstantial, based mainly on a misinterpretation of historical documents, and therefore with no direct proof to support the Lisa del Giocondo hypothesis (Payne 1978, Brown 1983, Sassoon 2002, Wood-Marsden 2016). Several other ladies of the Renaissance were suggested to be the real *Mona Lisa* (Sassoon 2002), but, in general, the two main contenders are Lisa Gherardini of Florence (Kemp & Pallanti 2017, The Mona Lisa Foundation 2016, Vasari 1550) and Isabella Aragon Sforza, Duchess of Milan and Bari, and Queen of Jerusalem (Payne 1978, D'Errico et al 1988, Schwartz 1988, 1994, Sassoon, 2002, Vogt-Luerssen 2010, Wood-Marsden 2016).

<sup>1</sup> School of Psychiatry and Clinical Neurosciences. The University of Western Australia. 35 Stirling Highway, Crawley, WA 6009, Australia

In this paper, I re-examine the propositions of Robert Payne (1978) that, (1) Leonardo may have painted the portrait of Mona Lisa del Giocondo; and (2) the *Mona Lisa* in the Louvre is a portrait of Isabella Aragon Sforza, the Duchess of Milan. Based on historical, chronological and pictorial evidence, a substantive rationale is presented as to why the portrait of *Mona Lisa* is both a political dedication to and an idealized representation of Isabella Aragon Sforza, the Duchess of Milan, rather than Lisa Gherardini of Florence.

## 2. The Long-held Tradition: Lisa Gherardini is Leonardo's *Mona Lisa*

Thirty-one years after Leonardo da Vinci had died in Amboise in France, the painter, architect and art historian, Giorgio Vasari (1550), wrote a glowing review about a portrait of *Mona Lisa* that he attributed to Leonardo da Vinci:

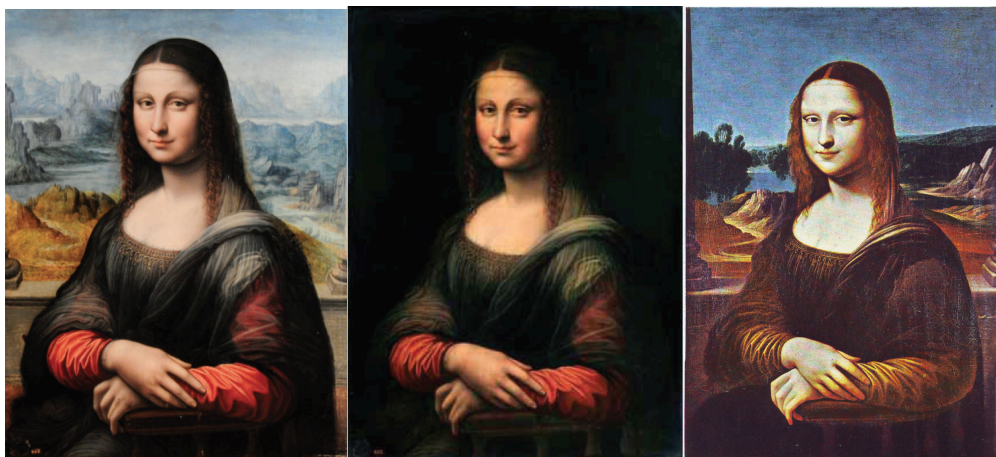
“Leonardo undertook to execute for Francesco del Giocondo the portrait of Mona Lisa, his wife, and after he had lingered over it for four years, he left it unfinished; and the work is today in the possession of King Francois of France, at Fontainebleau. Anyone wishing to see the degree to which art could imitate nature could readily perceive this from the head; since therein are counterfeited all those minutenesses that with subtlety are able to be painted: seeing that the eyes had that lustre and moistness which are always seen in the living creature, and around them were the lashes and all those rosy and pearly tints that demand the greatest delicacy of execution. The eyebrows, through his having shown the manner in which the hairs spring from the flesh, here more close and here more scanty, and curve according to the pores of the flesh, could not be more natural.”



A. Louvre

B. Isleworth

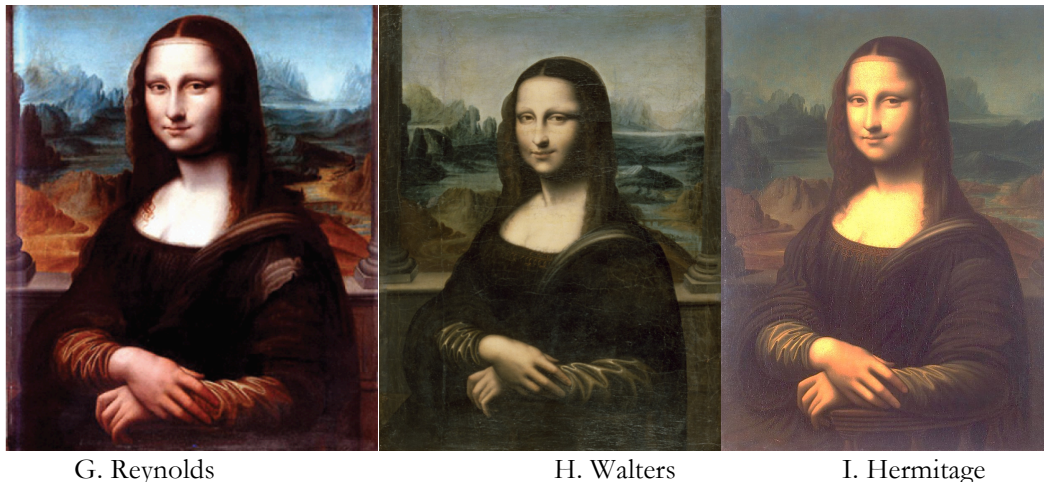
C. Switzerland



D. Prado restored

E. Prado, pre-restoration

F. Oslo



**Fig.1. Mona Lisa Gallery. See Table App. B1 for associated code.**

Keele (1959) in his essay of *The Genesis of Mona Lisa* provided a standard, universal account of how and why Leonardo da Vinci chose, painted and invested so much emotion into the 21-year old, third wife of Francesco del Gioconda, Lisa Gherardini, intermittently over a four-year period in Florence. Apparently, the portrait painting continued while Leonardo, “amongst other things went campaigning with Cesare Borgia, entered into problems of geology, mathematics, and anatomy, undertook his technically disastrous portrait of war, the Battle of Anghiari, and attempted the diversion of the River Arno behind Pisa.” *Mona Lisa* through all of this, ‘simply sat still, and by so doing entered the company of immortal women. Then she fades into the shades; the only uncertain trace of her suggests that she died a year or so later in the obscure town of Lagonegro.’ Keele (1959) attempted to answer some of his own most challenging questions as follows: “It is said by some that Leonardo undertook the portrait on his own initiative—that she was one of those persons he sought out as expressing some fascinating trait which he wished to portray. Be that as it may, at this time Leonardo was importuned by Isabella d'Este and other fair ladies for portraits, all of which he refused. Some reason impelled him to choose the relatively unknown wife of Francesco del Giocondo as his model; and it is certain that neither money nor fame supplied the incentive.” According to Keele (1959), *Mona Lisa* was chosen by Leonardo, “as possessing, above other women, some feature of over-ruling significance which attracted him. What was this feature?” Incredibly, it was her pregnancy. Keele (1959) concluded that: “nowhere do we see more clearly Leonardo revealing the subtle forces of nature at work on human flesh than in this pregnant figure of *Mona Lisa*. Here Leonardo created his ideal picture of motherhood, and painted into it the symbols of the genesis of Man and his Mother, Earth.” However, if the portrait is about motherhood, then Leonardo da Vinci should have chosen Isabella Aragon Sforza as his maternal symbol instead of Lisa Gherardini because he had more to do with the Duchess of Milan’s motherhood than he ever did with the wife of the rich merchant Francesco del Giocondo (Payne 1978).

This absurd explanation by Keele (1959) is but only one such example of the traditional mythologizing of the obscure Lisa Gherardini as Leonardo’s *Mona Lisa* in the Louvre. Another example is the submission by Zollner (1993). This mythology is so ingrained in the zeitgeist and art culture that the curators, art experts and board members of the Louvre and other institutions dare not consider anybody else, nobody other than Lisa Gherardini is the *Mona Lisa*. This mythologizing still continues unabated; Kemp & Pallanti (2017) assume with no convincing or detailed supportive evidence that Francesco del Giocondo’s wife is undoubtedly Leonardo’s *Mona Lisa*.

The main criticism of Vasari’s (1550) narrative and his description about the *Mona Lisa* is that he never actually saw the painting and therefore his account must have been second hand, like many of his other descriptions in *The Lives of the Most Excellent Painters, Sculptors and Architects*. There is no description of Leonardo’s unique mountainous background that is a feature of the *Mona Lisa* portrait that profoundly signifies something about her and her history. Vasari’s (1550) description of *Mona Lisa*’s eyebrows seems to describe a different painting because the *Mona Lisa* at the Louvre has no discernable eyebrows that ‘spring from the flesh’. On the other hand, the paintings of the *Mona Lisa* at the Prado Museum in Madrid and elsewhere (Fig. 1, App. B-table B1) have a *Mona Lisa* with discernable eyebrows (Lorusso & Natali, 2015). So the question remains, what painting of *Mona Lisa* was Vasari (1550) actually referring to?

The same question can be asked of all the other limited or contradictory evidence that is raised continuously in support of the mythology that the *Mona Lisa* in the Louvre Museum is Lisa Gherardini. The questionable evidence includes a note written by Agostino Vespucci in October of 1503 in a book edition of the ancient Roman philosopher Cicero that states that his friend Leonardo was at that time working on a painting of Lisa del Giocondo (Wood-Marsden 2016). A reasonable response to Vespucci's note is that Leonardo da Vinci was painting the portrait of a Florentine lady by the name of Lisa del Giocondo in 1503, but that this portrait is not the painting in the Louvre. And this is the main issue; there is no actual evidence that the painting of *Mona Lisa* in the Louvre is Lisa del Giocondo – none at all. The fact that Leonardo had started to or was contracted to produce a portrait in about 1503 is no proof or guarantee that this is the same *Mona Lisa* at the Louvre Museum (Wood-Marsden 2016). At best, Lisa del Giocondo is just another one of his many Madonna portraits commissioned at about that time.

Leonardo's long-time assistant Salai, when he died in Milan in 1524, owned a portrait named *la Joconda* that was listed in the inventory of his estate, a painting appraised at 100 scudi and bequeathed to him by Leonardo (Shell & Sironi 1991). No description was provided about the painting other than the title, so we do not know whether it is a Leonardo original or if it was a copy done by Salai or one of Leonardo's other assistants. The point here is that there were a number of different versions of the painting known as the *Jocanda* or the *Mona Lisa* that the contemporaries of Leonardo and later historians had neither documented properly nor left behind definite attributions. There are various issues surrounding the dating of Leonardo's painting of the *Mona Lisa*, the presence and absence of flanking columns (Fig. 1), the uncertainty concerning the person who commissioned it and the fate of the painting around the time of Leonardo's death. Lisa del Giocondo possibly was one or other of the many Madonnas that Leonardo painted at that time, but we do not really know. Although de Beatis saw a Leonardo portrait, "one of certain Florentine woman, done from life, at the instance of the late Magnificent Giuliano de' Medici..." nowhere in his travel diary did he document that it was the *Giocondo* or the *Mona Lisa* that is now in the Louvre (Zollner 1993, see note 9, p 18).

### 3. *Mona Lisa* and Isabella Aragon, the Duchess of Milan

Isabella Aragon Sforza (Fig. 2) was born in Naples in 1470, the daughter of Ippolita Maria Sforza and Afonso II, Prince of Naples and Duke of Calabria, and the granddaughter of the King of Naples, Ferdinand I. She was married at 19 years of age to her first cousin, Gian Galeazzo II Maria Sforza, the powerless Duke of Milan, who was usurped and probably murdered in 1494 by their conniving uncle Ludovico il Moro Sforza. Leonardo da Vinci and his acolyte Giovanni Boltraffio were her friends and supporters for at least ten years from the time when they attended to her marriage spectacular in February of 1489 until their departure from Milan in December of 1499 (Kulski 2017). She ended her days as the widowed Duchess of Bari, due to the nefarious and Machiavellian actions of her uncle Ludovico il Moro Sforza (Ady 1907, Azzolini 2013, Payne 1978, Vaglianti 1960). Her surviving daughter, Bona Sforza, married the king of Poland in 1518 and died in Bari in 1557 (Vaglianti 1960).

The painting by the Master of Pala Sforzesca in c. 1490-4 (Fig. 3) shows the young duke of Milan, Gian Galeazzo Sforza, on his knees in prayer dressed in his heraldic red and green colors facing his wife Isabella of Aragon identified by her heraldic red and yellow (golden) colors receiving blessings from the Virgin and Child in the presence of Four Saints and Twelve Devotees (Spring et al 2011, Porzio 1998). Gian, Isabella, the Virgin and almost all the devotees with the Leonardesque facial features are depicted with the distinctive reddish (copper) colored hair of the Sforza and Aragon families. Kneeling behind Isabella is Gian's half-sister, Caterina Sforza, in her green and yellow dress embroidered by her emblemic motive of the X-cross or saltire (Kulski 2017) that Leonardo da Vinci also used in his portrait of the *Lady with the Ermine* (Fig. 4A). Also, compare this relatively modest altarpiece of Gian and Isabella (Fig. 3) to the more luxuriant version by the Master of the Pala Sforzesca of the usurper Ludovico Sforza and his wife, Beatrice d'Este (App. A7-fig. A7D).



Fig. 2. Portrait of Isabella of Aragon by Antonio Campi for an illustration in his published Cremona Fedilissima Citta, 1585. Copy at the Library of Congress, Washington DC.

<http://www.zeno.org/Kunstwerke/B/Campi,+Antonio%3A+Illustration+für+Campis+»Cremona+fedilissima«+%5B10%5D>



Fig. 3. Master of the Pala Sforzesca. *The Virgin and Child with Four Saints and Twelve Devotees* (NG 4444). c. 1490-5. National Gallery, London, not on display. (Spring et al 2011).

<https://www.nationalgalleryimages.co.uk/imagedetails.aspx?q=NG4444&ng=NG4444&frm=1>

Isabella of Aragon, the Duchess of Milan, was suggested to be the *Mona Lisa* in the Louvre by Payne (1978), and then later by D'Errico et al (1988), Schwartz (1988, 1994) and Vogt-Luerssen (2010). Robert Payne (1978) realised, with the help of Pedretti's (1976) observations, that Isabella of Aragon was *Mona Lisa* when he saw a drawing (cartoon) of her (Fig. 5A) at the age of about 20 years prepared with silver-point (or charcoal) on tinted paper that is

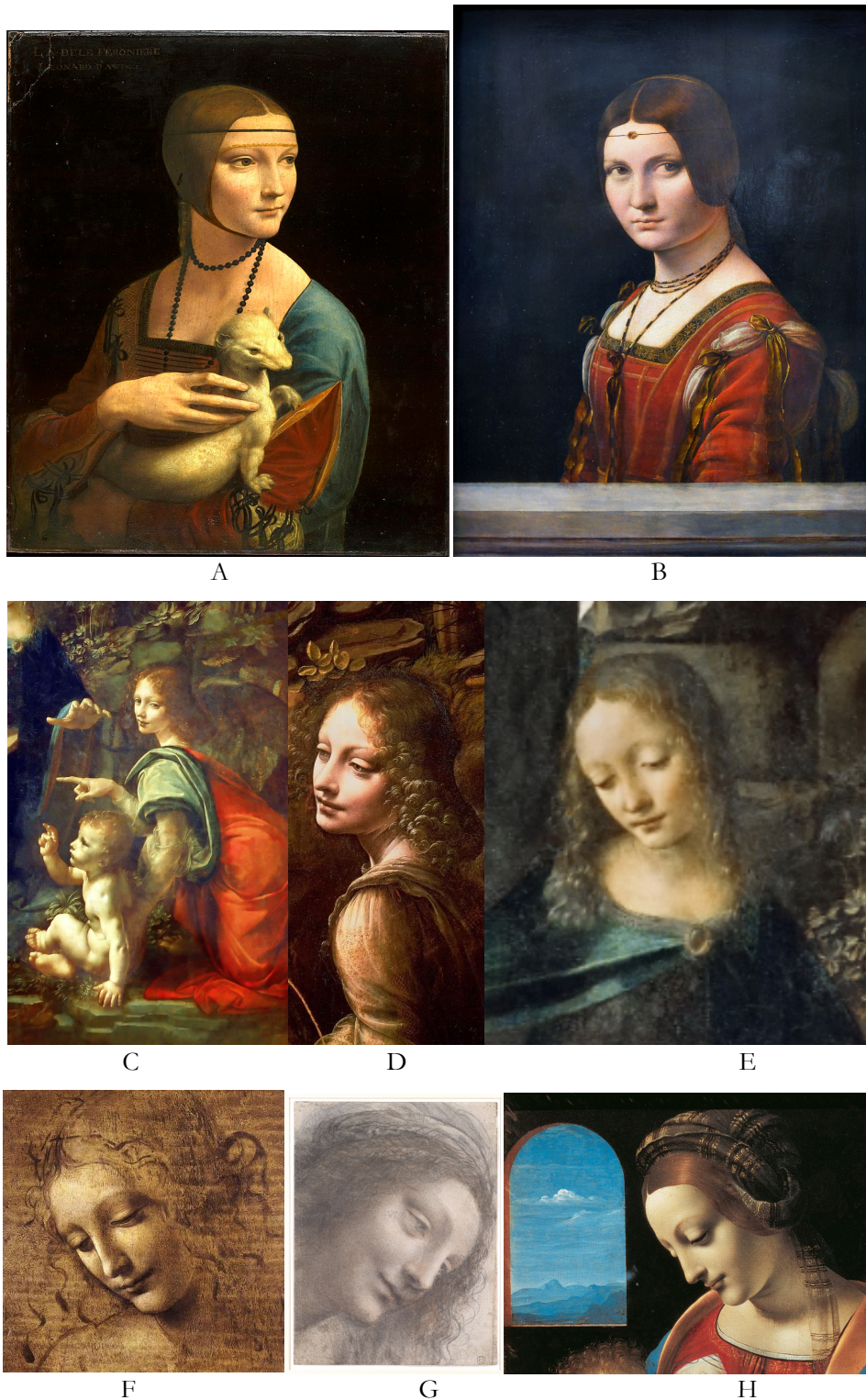
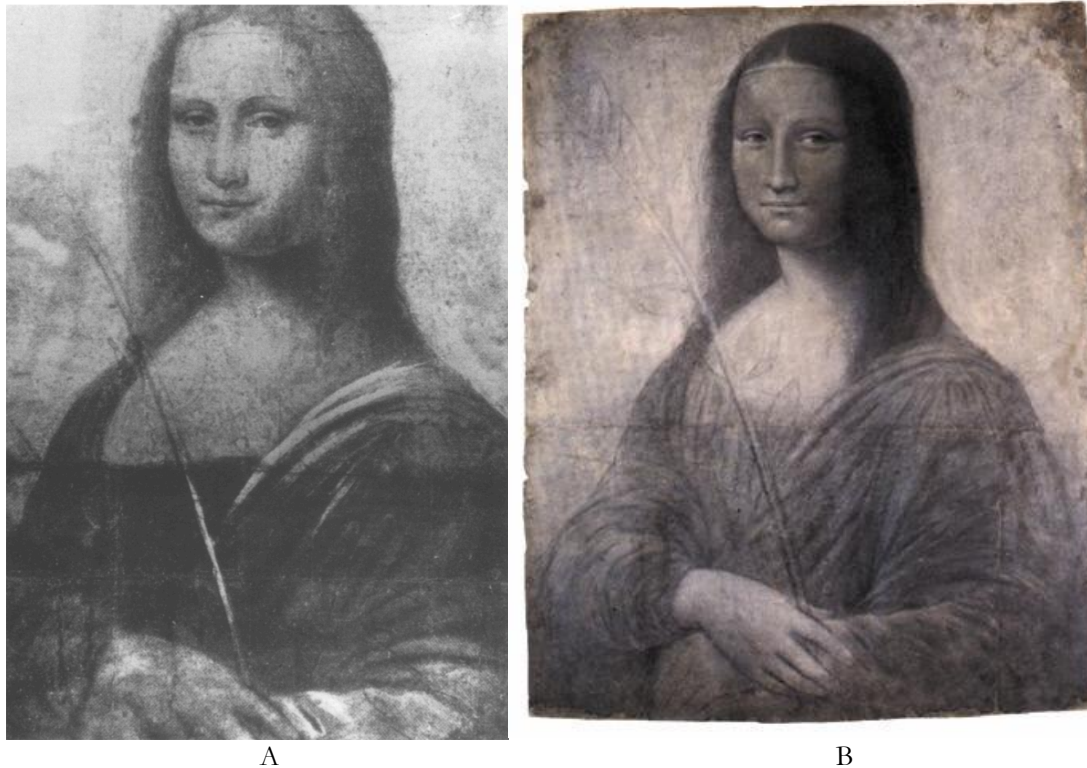


Fig. 4. Leonardo's *Mona Lisa* precursors: A, *Lady with the Ermine* (1490); B, *La Belle Ferronniere* (1490); C-D *Virgin on the Rocks*, details (1484 - 1490); F & G, drawings; H, *Madonna Litta* (1490). Image source: Web Gallery of Art.

held in the Hyde Collection at Glen Falls in New York (Kettlewell 1981). There are two versions of the Hyde Collection portrait of the young Isabella of Aragon, one is the 1889 photograph of the portrait before its restoration (Fig. 5A) and the other is the restored version after the photograph was taken (Fig. 5B) to make Isabella of Aragon look more like Leonardo's *Mona Lisa* (Schwartz 1988, 1994). Moreover, the Cartoon of Isabella of Aragon was drawn in silver-point using a method that Leonardo abandoned long before he left Milan in 1499 (Schwartz 1988).



**Fig 5. (A) Photograph of a silver-pen and charcoal drawing of Isabella of Aragon, Duchess of Milan, in the Hyde Collection, NY, before its restoration after 1889. (B) The restoration of (A) in the Hyde Collection, NY, possibly restored to look more alike to Leonardo's *Mona Lisa*.**

Of the *Mona Lisa* drawing in the Hyde Collection (Fig. 5A), Payne (1978) says, “she is about eighteen, with rounded cheeks, resolute, hopeful” and “in its original state was a full and rounded work, ready to be pricked out and transferred to the panel.” Furthermore, Payne (1978) believed that Leonardo's painting in the Louvre that is known as *La Belle Ferronniere* (Fig. 4B) is the portrait of Isabella of Aragon, and shows an earlier version of her as the *Mona Lisa*: “she appears in red and gold, the heraldic colours of Aragon... Above all, we see the similarity in the eyes, which are large and luminous, tender and probing, and there is a familiar inward curving of the flesh where the eyes meet the cheek. This is not so powerful or memorable a portrait as the *Mona Lisa*. A certain brooding petulance darkens the picture, which was called *La Belle Ferronniere* because a cataloguer at Fontainebleau imagined it was a portrait of one of the mistresses of Francis I. There is no reason to doubt that it is, except for the hair, entirely the work of Leonardo. It may have been intended as a gift to her father, the Duke of Calabria. The *Mona Lisa* breathes power and authority, even though power and authority have been taken from her.” (p 146).

Payne (1978) summarised his discoveries and rationale as follows:

“The claim that Isabella is the *Mona Lisa* depends on the curious fact that Leonardo depicted her three times in the same attitude over a period of ten years, first as a young virgin, then as a woman of the world, and then in the Louvre painting as a widow, for that dark veil can only mean that she has been widowed. If the *Mona Lisa* was painted in about 1498, then it would fit perfectly into the time scheme provided by the two earlier pictures. Suddenly, everything falls into place, and we begin to see in that face, so wise and so ravishing, something we had only half suspected, a certain austere Spanishness, grief for vanished glories, the knowledge of being born to high estate. She is descended from kings, and she knows it.

Her mother was a Sforza, her father would inherit the throne of Naples, and she herself would rule for many years over the duchy of Bari. Enthroned among the mountains, separated from the world, she gazes out at a world she knows only too well with all its load of suffering and murder; and in her sombre gaze there is defiance at all the evil spells the world can cast on her.” (p 146).

#### 4. The case against Isabella Aragon Sforza as *Mona Lisa*

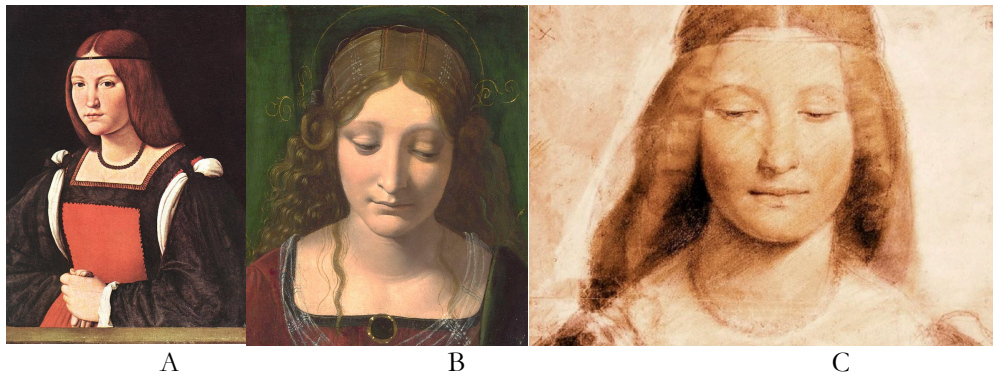
The credentialed scholars at The Mona Lisa Foundation (2012) on the Internet disagree with Robert Payne’s (1978) theory about Isabella Aragon Sforza and continue to propagate the traditional mythology that Leonardo’s *Mona Lisa* is indeed Mona Lisa del Giocondo of Florence.

4.1. Apart from the Vasari (1550) passage in his book, the other most often quoted evidence used against Isabella Aragon Sforza being the *Mona Lisa* are the few obscure entries in the travel diary of Antonio de Beatis, who was the secretary to Cardinal Luigi of Aragon, a cousin of Isabella Aragon Sforza (The Mona Lisa Foundation 2012): “On October 10, 1517, more than thirty years before Vasari published his account of the *Mona Lisa*, Cardinal Luigi of Aragon, Antonio de Beatis and their entourage visited “Messer Leonardo Vinci of Florence ... the most outstanding painter of our day ... ” then living out his last years in exile at Cloux in Amboise, in the Loire Valley. There, Leonardo showed them three pictures, all three of them “... perfettissimi ... ” or completely perfect; finished. In the margin of the entry, de Beatis added later “... bellissimi ...” – “... they [the pictures] are beautiful ...”. According to him, one of the paintings that Leonardo offered for viewing was: “one of a certain Florentine woman, done from life, at the instance of the late Magnificent Giuliano de Medici...”. The following day, October 11, de Beatis was at Blois Castle and commented further about yet another portrait, this time of a certain lady of Lombardy, along with a passing reference to a certain ‘Signora Gualanda’.

4.2. These and other weak inferences by The Mona Lisa Foundation (2012) somehow are meant to correlate perfectly with de Beatis’s account of him seeing Leonardo’s *Mona Lisa*, a portrait identified by him to be that “of a certain Florentine woman” and another one “of a certain lady of Lombardy”, and then, by a miraculous extension that one or other of them must be the wife of Francesco del Giocondo (Zollner 1993, see note 9). Yet, all these assumptions are patently false because nowhere in the Antonio de Beatis account did he write that he had seen the real *Mona Lisa* painting (Zollner 1993, see note 9). He and Cardinal Luigi might have been shown any one of the many Florentine or Lombardy madonnas in Leonardo’s collection without them ever seeing the final version of the *Mona Lisa* that is now in the Louvre. Perhaps, Leonardo was too sensitive about his infatuation with Isabella Aragon Sforza to want to show her to this group of tourists associated with the church because it was too private and personal. Perhaps, he didn’t like cardinal Luigi because of the allegation against him in 1510 that he ordered the murder of his own sister, Giovanna d’ Aragona, the Duchess of Amalfi and two of her children (Luckyj 2011). Alternatively, Leonardo might not have had the *Mona Lisa* with him in Amboise in October of 1517. She already might have been in the bedroom of King Francis I in the Palace of Fontainebleau or in the hands of Salai back at his home in Milan (Shell and Sironi 1991).

4.3. The main objection by the Mona Lisa Foundation (2012) website to Isabella Aragon Sforza being the real *Mona Lisa* is that, “...the theory pre-supposes that Leonardo painted her portrait in the 1490s, during his first Milanese period. However, the painting has been officially dated later.” On the contrary, to be plausible, the theory that Isabella Aragon Sforza is *Mona Lisa* does not require Leonardo to have painted that particular portrait of her in the 1490s, it only needs to acknowledge that he knew her face and that he had a few precursor drawings or portraits of her that he took with him to Florence in 1500. Leonardo da Vinci had a photographic memory and he knew Isabella Aragon Sforza, the Duchess of Milan, so well after serving her loyally for more than 10 years in Milan during the 1490s that he could paint her portrait from memory at any time of his life after 1500. She was permanently imprinted in his brain, and he and his assistants already had many precursor portraits of her (Fig. 3 to 6) before he left Milan. He even might have used his own face to morph with that of the Isabella Aragon Sforza, the Duchess of Milan (Schwartz 1988, 1994). The following conclusion by The Mona Lisa Foundation (2016) that, “She was not recognized in Leonardo’s portrait, and in any event, was Neapolitan, not Florentine. She, also, is likely not the subject of the Louvre portrait” is shamefully absurd and misleading. None of these superficial or incorrect objections provided by The Mona Lisa Foundation (2016) are justified because their historical evidence is a misinterpretation that has nothing whatsoever to do with Leonardo’s painting of *Mona Lisa* in the Louvre.





**Fig. 6. Isabella de Aragon 1489 to 1494 by Giovanni Boltraffio. (A), Castello Sforzesco Museum, Milan; (B), detail of head, National Gallery London, (C) detail head, Pinacoteca Ambrosia, Milan. Image source: Web Gallery of Art.**

4.4. The *Mona Lisa* Foundation (2016) also failed to provide a convincing explanation as to why Leonardo da Vinci painted two portraits of Lisa Gherardini, the Isleworth and the Louvre portraits (Fig. 1), showing her with a biological age difference of about 10 or 11 years. This 10-year age difference would make sense only if both portraits were meant to represent the Duchess of Milan, Isabella Aragon Sforza, but no sense if it is Lisa Gherardini of Florence. If the earlier Isleworth *Mona Lisa* was ten years younger than the Louvre *Mona Lisa*, then Leonardo must have painted her portrait first in 1493 while he was still in Milan - suggesting that she was indeed the Duchess of Milan and not the Florentine merchant's wife. If Lisa Gherardini was born in 1479 (the date provided by The *Mona Lisa* Foundation, 2016), then she was 24 years old in 1503 and only 14 years old in 1493. In comparison, Isabella Aragon Sforza having been born 9 years earlier was 23 years old in 1493 and 33 years old in 1503, ages that are both far more compatible with the two respective portraits.

Brown (1983) realized the Louvre *Mona Lisa* was not a portrait of Lisa Gherardini when he concluded: "The provenance of *Mona Lisa* indicates that it did not belong to the sitter or her husband. Freud claimed that the artist kept the portrait because he became enamored of the lady. Vasari was closer to the truth when he implied that the painting remained with Leonardo because it was unfinished when he left Florence. There is a further and, perhaps, more cogent explanation for the fact that the portrait was never delivered: it did not resemble the sitter. It may be that her husband rejected it as an unsatisfactory likeness. If it seems incredible that anyone would refuse to accept the *Mona Lisa*, we need only recall that at this time another Florentine merchant quarreled with Michelangelo over the price of the *Donitondo*. In *Mona Lisa* Francesco del Giocondo's wife was immortalized as a paragon of feminine grace and loveliness", and "Leonardo's painting was an outgrowth of ideas which originated in Milan a decade before it was created." (p116).

## 5. The Case for Isabella Aragon Sforza as *Mona Lisa*

The theory that Isabella of Aragon is the *Mona Lisa* in the Louvre Museum is compelling given the identification of a *Mona Lisa*-like Cartoon drawn by Leonardo (Fig. 5A) when they were together in Milan between 1489 and 1499 ((Payne 1978, Schwartz, 1988, 1994). Leonardo's last version of *Mona Lisa* (Fig. 1A) after 1500 could be his idealised portrait of Isabella Aragon Sforza using his previous drawings and his memory of her face that was imprinted in his brain after they had separated and left Milan. According to Schwarz (1988, 1994), based on her overlapping computer comparisons between Leonardo's *Mona Lisa* and his *Self-Portrait*, Leonardo used his own face to remodel, juxtapose and change the original painting of Isabella Aragon Sforza into one with a few facial features of his own. His final version of *Mona Lisa* presumably was motivated by his desire to place Isabella of Aragon back in the Duchy of Milan together with the Larian Triangle of Lombardy in the background, the beautiful regions of Lake Como, La Grigna mountains and the bridge over the Adda River near Lecco, locations that he loved and where he probably wanted her to reside while he still remained in her service; and so he created an image of her in the environment of his own fantasy world (Schwartz 1994, Kulski 2017).

The ten reasons that *Mona Lisa* is the portrait of Isabella Aragon Sforza as the former Duchess Consort of Milan either from Leonardo's memory of her after 1500 or from direct sittings with her between 1489 and 1499 are the following:

5.1. The pattern of the golden medallions embroidered into the bodice (blouse) of her dress (Fig. 7) reveal her royal status. The golden concentric circles are the ducal chains, symbols of her and her husband's office in Milan (Fig. 7 & Fig. 8A), and the hanging golden cross of Jerusalem (+) symbolizes her status as the Queen of Jerusalem (Fig. 9). Leonardo definitely would not have used the heraldic design of the golden Cross of Jerusalem (+) on the dress of the wife of a silk merchant in Florence. For more detail, see the following section: *Mona Lisa's Embroidery and Colors Symbolizes Her High Royal Status*.



Fig 7. A and B, a chain of golden interlocking ducal rings above an interlinking chain of Jerusalem crosses (+) on the neckline of (A) the Prado *Mona Lisa*, and (B) the Louvre *Mona Lisa*. C. The ducal chains around the neck of the duke of Milan, Gian Galeazzo Sforza, in green chest armor, and his uncle the Duke of Bari, Ludovico Il Moro Sforza, in the blue chest armor. The image is a detail from an illumination by Birago of the Sforziada Book of Hours held in the French National Library in Paris.

5.2. Red hair was a distinctive feature of Isabella Aragon Sforza in all of her known portraits (Fig. 3 & 6). We do not know the hair colour of Lisa Gherardini, but we might presume that the odds are against it being a copper red.

5.3. The red hair, the high and noble brow, the strong straight nose, the enigmatic smile, the hooded eyes, and the drooping eyelids (Table 1) are typical of Isabella Aragon Sforza in her portrait profiles on state coins and official medallions (Fig. 2 and 3) that Leonardo subtly rendered into his portrait of *Mona Lisa*.

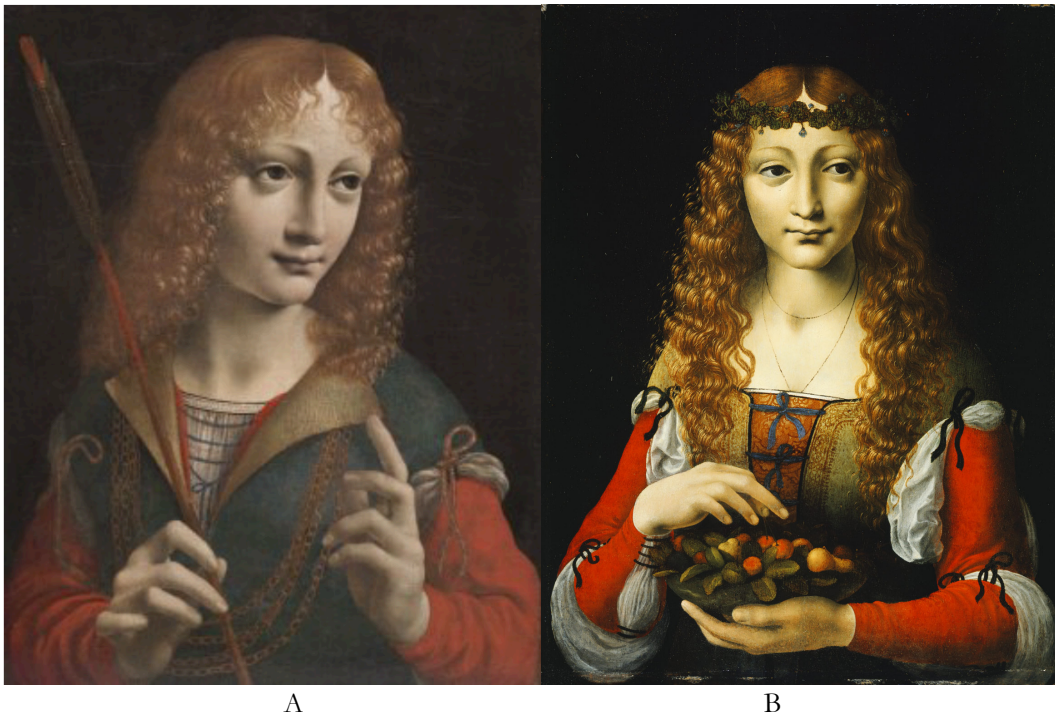
---

**Table 1. The facial characteristics shared between *Mona Lisa* and Isabella Aragon Sforza look-alikes**


---

Oval/ triangular shaped face  
 Red hair  
 Brown Eyes  
 High, noble, flawless brow  
 High hairline with central part  
 Strong, straight, turned down nose  
 Hooded eyes  
 Drooping eyelids  
 High nasal bridge or standard nasal base  
 Tip of the nose turned down giving the end of the nose a distinctive V shape  
 Nasal tip angle of  $> 90$  degrees  
 Short and narrow philtrum between the nose and upper lip  
 Enigmatic smile or ambiguous shaped mouth  
 Closed turned-up lips with the shadowy dimples at each end  
 Absence of distinct naso-labial folds  
 Solid curvi-triangular shaped jaw

---



**Fig. 8. (A) The young duke of Milan, Gian Galeazzo Sforza, in heraldic red and green with his ducal chains hanging over his chest and with the arrow of St. Sebastian in his hand (1483), contemplates his engagement to his cousin, (B) Isabella of Aragon, Princess of Naples (1489). (A), the *Portrait of a Youth as Saint Sebastian 1483* at the Cleveland Museum of Art is attributed to Giovanni Ambrogio de' Predisi, and (B), the *Girl with Cherries* at the Metropolitan Museum of Art in New York is attributed to Marco d'Oggiono 1491-95. Image source: Web Gallery of Art.**

5.4. The facial features in the portraits of Isabella Aragon Sforza by Giovanni Boltraffio before 1500 (Fig. 6 & App.A-figA1), Bernardino Luini (Fig. 9 & App.A-figA2) after 1500, and other Leonardeschi painters (App.B-table B2 & Porzio 1998) show strong similarities to *Mona Lisa's* face and her red hair.



**Fig. 9. Bernardino Luini. Portrait of a Lady. c. 1525. National Gallery of Art, Washington. Image source: Web Gallery of Art.**

5.5. The simplicity of *Mona Lisa*'s dark-green dress suggests that she was in mourning (Fig. 1). The fold of her hands and the ring-less fingers represent a virtuous widow with an enigmatic smile still faithful to the memory of her recently deceased husband, the young duke of Milan, Gian Galazzio Sforza, possibly murdered by their sinister uncle, Ludovico il Moro Sforza, the regent ruler of Milan. If the portrait was meant to be that of Lisa Gherardini who was recently married to one of the richest silk merchants in Florence then surely Leonardo would have portrayed her as a much happier and wealthier *Mona* with rings on her fingers and the marriage symbols of wealth, with pearls around her neck and baubles, flowers, and diamond pins in her hair. Instead, *Mona Lisa* wears a black mourning veil on her head and with her right hand resting on her left with no wedding ring like an enlightened nun or widow who has lost a husband. *Mona Lisa* simply does not look like a recently married wealthy young woman or one about to be married to a very wealthy silk merchant in Florence. It's not the sort of portrait that you hang in your viewing room labeled with a 'just married' sign.

5.6. The enigmatic expression of *Mona Lisa* reflects the duchess of Milan's own perplexing description of herself after 1500 that she signed at the bottom of her letters as "unique in disgrace by her own hand, Y(Isabella)" (Zutshi 2006). Leonardo beautifully captured her ironic self-deprecation in her proud, but slightly bewildered and saddened expression.

5.7. It is clear from the intimacy of the portrait that *Mona Lisa* is somebody who Leonardo da Vinci knew very well; her history, foibles and life, warts and all. He knew Isabella Aragon Sforza for at least 11 years, from the first day she arrived in Milan in January of 1489 to be married to the young duke of Milan until the day that she left Milan in December of 1499. Leonardo and his circle painted her portraits, helped to prepare her wedding celebrations, her marriage anniversaries, the festivals to honour and celebrate the birth of her children, and he lived in the same apartments as her for the last three years of their stay in Milan (Payne 1978). Moreover, Leonardo's portrait of *Mona Lisa* is so detailed that medical experts have used it to diagnose her with various pathologies including lipoma, Bell's palsy, hyperlipidemia, familial hypercholesterolemia, xanthomastosis, strabismus, ptosis (drooping eye lids), Wallerian degeneration, paralysis of the lower lip, ablation of dental enamel and front tooth loss (Table 2). In contrast, Leonardo probably had little knowledge or interest in Lisa Gherardini's medical condition in Florence in 1503, other than giving her a clean bill of health in order to encourage the rapid completion of a wedding portrait for her husband, Francesco del Giocondo.

Why would he bother with a detailed medical portrait of somebody like Lisa Gherardini who he hardly knew? If she was to be a portrait requested by his father, Piero, the notary, for his wealthy and influential client, the Florentine silk merchant named Francesco del Giocondo, then Leonardo may have balked at the task because he had so many other more important things to do with his life in Florence between 1503 and 1507 (Keele 1959, Payne 1978, Bambach 2003, Kulski 2017).

**Table 2. *Mona Lisa's* Medical Diagnoses**

Medical diagnosis	References
Pregnancy	Keele (1959)
Masculine supraorbital ridge	Schwartz (1988)
Bell's palsy & wallerian degeneration	Adour (1989)
Mouth & dental pathology	Borkowski (1992)
Xanthelasma, lipoma, hyperlipidemia	Dequeker et al (2004)
Hyperlipidemia, hypercholesterolaemia & premature arterosclerosis	Ose (2008)
Bell's palsy & pregnancy	Maloney (2011)
Strabismus	Mims (2012)
Eye pathology: conjunctivitis, nevus, xanthelasma, ulceration	Santos-Bueso et al (2012)
Primary Biliary Cholangitis	Ashrafian (2016)
Hypothyroidism and pregnancy	Mehra and Campbell (2018)

5.8. The mountains, lakes and valleys in the portrait behind *Mona Lisa's* head are meant to tell us where she once resided (Fig. 1). There is a clear political and historical message about the person and the landscape in the portrait of *Mona Lisa* (who definitely is not Lisa Gherardini in Florence). The territories behind *Mona Lisa* were stolen from her by the collusion between the German Emperor, Maximilian I, and the Duke of Bari, Ludovico II Moro Sforza (Ady 1907). The territories are representative of the Lombardian northern pre-alps, the Larian Triangle in and around Lake Como, Lecco and the Adda River where Leonardo loved to travel and explore the beauty of nature (Bambach 2003). This is the dramatic and spectacular part of the Duchy of Milan, the same Duchy that Ludovico Sforza with the help of the Holy Roman Emperor Maximilian I, who lived beyond the Alps, usurped from the rightful Duchess of Milan, Isabella Aragon Sforza, and her son, Francesco II Sforza (Ady 1907, Payne 1978). Leonardo returned her to her lost Duchy, looking regal, yet resigned, trying to keep up a brave face with her enigmatic smile, compared to the brewing storm and the enormous and sinister odds stacking up against her in the background. When we know how to interpret the pictorial cues we can see that *Mona Lisa* is indeed the former Duchess of Milan, Isabella Aragon Sforza, and that she is rightfully back in her Duchy to be located there forever in the portrait (Schwartz 1988, 1994).

5.9. Leonardo da Vinci's *Mona Lisa* should be renamed the '*Duchess Isabella*' because it is both a political and historical portrait – a dedication and a tribute in honor of the Duchess of Milan, Isabella of Aragon, for her bravery and spirit to stand up to the foulness thrown at her during her tenure in the Duchy of Milan (Kulski 2017). To better understand Leonardo da Vinci and the *Mona Lisa*, the portrait should be seen in the context of two letters that Isabella of Aragon wrote, one to her father in Naples in 1493 when she was under house arrest in Pavia (Hare 1911), and the other to the Spanish king Ferdinand I in 1500 when she was in exile on the island of Ischia (Zutshi 2006). Translated English copies of the letters are presented in App. C1 & C2.

5.10. Finally, we can say that Isabella Aragon Sforza also was a Lisa, a shortened version for Isabella, and the real *Mona Lisa* displayed at the Louvre, even if the people at the Museum are still not willing to admit it.

Schwartz (1995) used computer-aided techniques and comparative morphing algorithms to show that there were two *Mona Lisas* painted by Leonardo da Vinci on the same panel and that they were both different versions of Isabella Aragon Sforza painted more than ten years apart. He first created a drawing of Isabella Aragon Sforza in 1489 or 1490 as St. Lucia with a palm branch (Fig. 5A) and then more than ten-years later he painted over her first image using his memory of her facial features and himself as an added model for the new version of *Mona Lisa*. Because these two images were on the same panel, Schwartz (1995) dismissed *Mona Lisa Gherardini* as the model for *Mona Lisa*, believing that Vasari (1550) had based his incorrect conclusion on rumors. Leonardo may have started a painting of Lisa Gherardini in 1503, but for whatever reason, four years later, he aborted it and then painted over it with his preferred version of Isabella Aragon Sforza, the former Duchess of Milan, who was still on his mind, pestering him.

Possibly, the original patron, the sitter or Leonardo, himself, didn't like what was produced, and so, Leonardo did not waste any more time on the original portrait of the merchant's wife. Instead, he painted over it with his imprinted vision of Isabella Aragon Sforza while using the reflection of his face in a mirror as a guide for the corrected proportions. Maybe, Leonardo was nostalgic about his time in Milan, and remembering the tragedy of Isabella Aragon Sforza's life, he wanted to right an awful wrong and place her back in Milan and Lombardy, and have her unique image on a small wooden panel with him for the remainder of his life, as his own personal icon to always remember her by. It is likely that the painting of the *Mona Lisa* is based on his drawings and memory of Isabella Aragon Sforza when he last saw her in Milan during the period of 1497 and 1499, when she was a widow with three children and before they parted to go their separate ways in 1500. Isabella Aragon Sforza was one of only a few women who Leonardo wrote about in his notebooks. He excitedly made notes and drawings in his folios as a reminder of his important tasks for her: "Hydraulics: To make water rise and remain upon the ascent! For the bath of the **duchess Isabella**; a Spring. Made for the stove or bath of the **duchess Isabella**; 'a' is in this position because the screw does not turn with its socket. Water raised by the force of the wind. This syringe has to have two valves, one to the pipe, which draws the water and the other to that which ejects it. Method of making water rise to a height. In this way one will make water rise through the whole house by means of conduit pipes. KEY OF THE BATH OF **THE DUCHESS**. Show all the ways of unlocking and releasing. Put them together in their chapter. BATH: To warm the water of the stove of **the duchess** add three parts of warm water to four parts of cold water." (Richter 1880).

### 6. *Mona Lisa's* Embroidery and Colors Symbolize Her Royal Status

The embroidery and color of the dress in all the portraits of the *Mona Lisa* including the Louvre version are important symbols of her status; the golden interlocking rings of the ducal chain of the Duchy of Milan and Bari and the interlinking of Jerusalem crosses around her neck (Fig. 7A & B). The interlocking rings of ducal chains around the neck are refined versions of those of her husband Gian Galeazzo Sforza, the Duke of Milan, and her uncle, Ludovico il Moro Sforza, that are evident in their portraits for the *Sforziada Book of Hours* (Fig. 7C). The green dress of the *Mona Lisa* (Fig. 7A & 7B) connects directly with her husband's ducal chain and green chest armor in Fig. 7C and his green vest in Fig. 8A. The portrait of Isabella of Aragon (*Mona Lisa*) with a palm branch in Fig. 5A is like a mirror image of Gian Galeazzo Sforza with the Martyr's arrow in Fig. 8A; and the other two portraits of Gian holding his symbolic arrow (App. A1-figA1d & A1e). The emblematic colors of Gian Galeazzo Sforza (red and green) and of Isabella from the House of Aragon (red and yellow or gold) in Fig. 3 are clearly recreated in the colored illuminations of the *Sforziada Book of Hours* (Glori 2015). In contrast, it was Bernardino Luini who added the Jerusalem (+) cross around the neck of Isabella Aragon Sforza, in his grand portrait of her as the Duchess of Bari, wearing her symbolic colours of a dark brown and yellow (Fig. 9), the same colors that Leonardo used for the beads around the neck of the *La Belle Ferronniere* (Fig. 4B). Isabella Aragon Sforza inherited the Brienne title of Queen of the Kingdom of Jerusalem from her deceased father (Alphonso II) and brother (Ferdinand II) in 1496. Her grandfather, King Ferdinand I, inherited the King of Jerusalem when he married Isabella of Clermont, Princess of Taranto, who brought him the fiefs that she inherited from her French born father, Tristan of Clermont (Vogt-Leuerssen 2010). Bernardino Luini adopted the distinctive facial features shared between Isabella Aragon Sforza and the *Mona Lisa* as his iconic symbol of female spiritual and physical beauty and he never wavered from the cause of telling her story and that of Gian Galeazzo Sforza and Leonardo da Vinci over and over again in many of his allegorical and pictorial tales. Lorusso & Natali (2015), in their detailed comparison of various versions of the *Mona Lisa* portraits, missed this very important symbolic connection of the heraldic embroidery pointing to *Mona Lisa's* royal status by simply dismissing these golden patterns as 'gala (trimming)' and interwoven 'cloverleaf'. The three interlinking rings in the center of the clover leaves in the Louvre *Mona Lisa* (Lorusso & Natali 2015) are also significant because they probably allude to the Borromeo rings that interconnected the Visconti/Sforza/Borromeo families together into a powerful family triad that are depicted also in an illumination of Isabella Aragon Sforza's *Book of Hours* in the Poland National Library, Warsaw (Glori 2015, Wozniak 2014).

It seems most unlikely that Leonardo da Vinci would have added these elaborate symbolic patterns of ducal and royal status to the blouse of Lisa Gherardini even if she were of noble Florentine birth and not just a rich merchant's wife. And yet, the art historians and experts continue to support Vasari (1550) that, "Leonardo undertook to execute for Francesco del Giocondo the portrait of Mona Lisa, his wife, and after he had lingered over it for four years, he left it unfinished." Vasari (1550) held a Florentine provincial bias and not a Milanese one, despite the overwhelming pictorial evidence provided to him and to other art historians by Leonardo and his circle of painters (App. B-tableB2 & Porzio 1998).

Their paintings essentially should challenge our contemporary experts and historians with the following vexing question: Why would the Leonardeschi from Milan and Lombardy (App. B-tableB2) continually create images in the 1490s of a Florentine merchant's wife (Porzio 1998, Spring et al 2011) when they had their own princess from the kingdom of Naples living with them in Pavia, Milan and Lombardy; a red-haired Milanese Madonna who was involved in great human tragedy, drama, loss, sacrifice, crucifixion, betrayal and a strong family love; Isabella Aragon Sforza, the Duchess Consort of Milan and 'suo iure' Duchess of Bari, Princess of Rossano and Queen of Jerusalem, who regarded herself as, "unique in disgrace by her own hand, Y(Isabella)?" Why would the Leonardeschi need to favor an obscure Florentine over their very own legendary princess of Milan and Lombardy? The simple answer is that they neither knew nor cared about the Florentine *Mona Lisa*, and instead, their own *Mona Lisa*, the Duchess of Milan (1489 to 1500), fully occupied their pictorial *zeitgeist* (Porzio 1998).

### 7. Many *Mona Lisa* and Isabella Aragon Sforza Look-alike Portraits

The faces of *Mona Lisa* (Fig. 1) and Isabella Aragon Sforza (Fig. 2, 4 & 5) in their various portraits are very similar to each other and yet retain a distinctive look. They all have red hair and similar facial characteristics. In all of the nine versions of the *Mona Lisa* in Fig. 1, she wears a black veil and a greenish-black dress with essentially the same embroidery (Lorusso & Natali 2015). The reason for so many versions of the iconic portraits of *Mona Lisa* is understandable if she is the legendary Isabella Aragon Sforza, the Duchess of Milan, because she was famous and controversial during her own lifetime (Payne 1978). On the other hand, Lisa Gherardini is famous only because Vasari (1550) mixed her up with the real *Mona Lisa*, Isabella Aragon Sforza, who died in 1524.

In regard to the *Mona Lisa* precursor portraits, when Brown (1983) compared the *Mona Lisa* (Fig. 1A) to the *Lady with the Ermine* (Fig. 4B) and to the *Girl with Cherries* (Fig. 8B) he concluded that, "the basic concept underlying *Mona Lisa* is already present in the pupil's picture, dating from the previous decade." Brown (1983) believed that Leonardo's *Mona Lisa* was already an idealized design concept long before the painter met Lisa Gherardini in Florence in 1503: "The explanations for *Mona Lisa's* strange appearance, cited previously, fail to account for the fact that, as an idealized portrait, the painting is not isolated but belongs to a series of experiments begun earlier. Precedents in the work of Leonardo's Milanese circle during the years before the creation of *Mona Lisa* suggest that that painting was conceived and begun as an image which never corresponded to the way the sitter looked in life." (p.104)

The precursor *Mona Lisa* or Isabella Aragon Sforza portraits (Fig. 5) from Milan influenced Raphael who had been to Leonardo's workshop in Florence between 1504 and 1506. He copied and promptly used many elements of the precursor *Mona Lisa* portrait's composition and format in several of his works, most notably *Portrait of a Woman*, *Lady with Unicorn*, the *Vice-Queen of Naples* (or *Portrait of Isabella de Requesens*), and *Terranuova Madonna* (Fig. 10). There are strong facial similarities between the *Mona Lisa* of the Louvre (Fig. 1A) and the known or suspected images of Isabella Aragon Sforza (Fig. 5 & 6) and her daughter Bona Sforza, Queen of Poland (App. A4-figA4), as well as Leonardo paintings such as *Virgin on the Rocks*, *La Belle Ferronniere*, *Lady with the Ermine* (Fig. 4) and even *St. John the Baptist* and his own self-portraits (App. A5-figA5). Bernardino Luini's portrait of Isabella Aragon Sforza as the Princess of Naples and the Queen of Jerusalem (the title that she inherited from her deceased brother in 1496 while she was still in Milan) known as *Portrait of a Lady* is particularly striking (Fig. 9). She has the iconic red hair and all the facial characteristics of *Mona Lisa* (Table 1) and is similar in appearance to his *Mary Magdalene in the Allegory of Modesty and Vanity* (App. A2-figA2a) where she wears the heraldic red and green colors of her deceased husband Gian Galeazzo Sforza, also seen in his series on *Salome* and the *Beheading of John the Baptist* (App. A3-figA3). Francesco Melzi, in 1516 to 1520, possibly with some help from Leonardo da Vinci, recreated his own young and idealized *Mona Lisa* with the lustrous red-hair in his series of striking paintings of *Flora/Columbina/Pomona* (App. A6-figA6). These three paintings may represent Isabella Aragon Sforza as a young *Flora* with lustrous orange/red hair, the goddess of the Spring season and sexual love, ready to have babies with her young duke. Similar versions probably were painted by Leonardo and his assistants for Isabella's wedding festivals in January/February of 1489 and her legendary eulogistic *Feast of Paradise* in January of 1490 when she was twenty-years of age (Payne 1978, Bambach 2003, Kulski 2017).

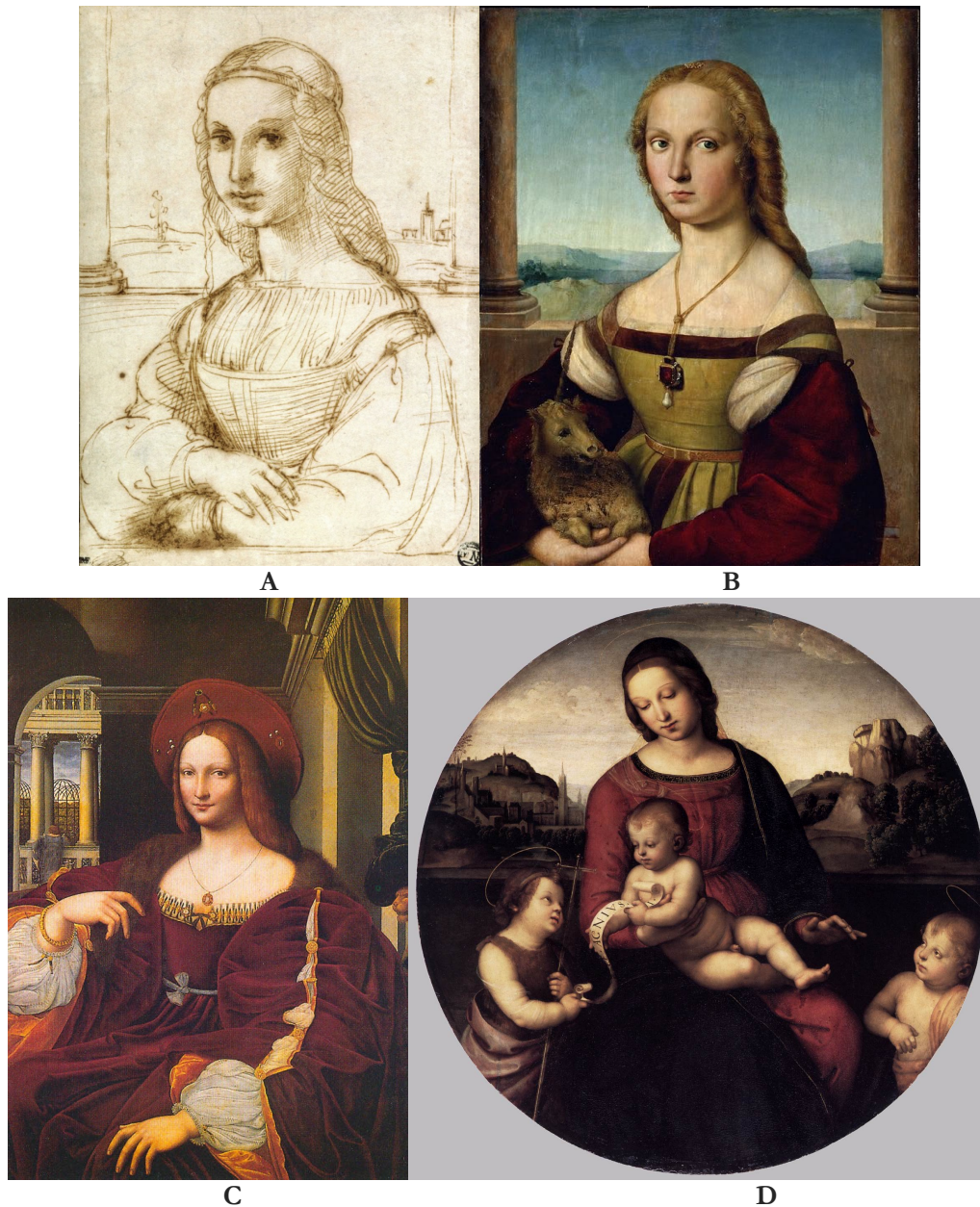


Fig. 10. Raphael's *Mona Lisa* look-alikes. A, *Portrait of a Woman*, 1505-06. Musée du Louvre, Paris, B, *Lady with a Unicorn*. c. 1505. Galleria Borghese, Rome. C, *Portrait of Dona Isabel de Requesens, Vice-Queen of Naples*. 1518, Louvre, Paris. D, *Terranuova Madonnac*. 1505. Staatliche Museen, Berlin. Image source: Raffaello. Web Gallery of Art. Web Gallery of Art.

If Leonardo da Vinci and his acolytes, such as Predis, Luini, Boltraffio, d'Oggiono, Salai, Melzi, da Sesto, Napoletano, Giampietrino, Bernardino dei Conti, and Solario (Poerzio 1998), used the facial features of the Duchess of Milan (Fig. 2 to 6) for their idealized portraits of the Madonna or Mona why would these Milanese portrait painters bother to choose the Florentine, Lisa Gherardini, as their pictorial muse? This regional difference in regard to the *Mona Lisa* might explain why there is an overabundance of the Isabella Aragon Sforza/Mona Lisa look-alikes produced by the Lombardy Leonardeschi between 1489 and 1530s (Porzio 1998, Voght-Luerssen 1999, 2010) rather than in Tuscany or elsewhere. In contrast to establishing the image of Isabella de Aragon in female portraiture, Leonardo and the Leonardeschi never greatly favored nor mass-produced the image of Beatrice d'Este who had her own distinctive look ((App. A7-figA7) and, as the wife of Ludovico Sforza, was Duchess of Milan from May of 1495 until her death in January, 1497. Perhaps her reign was too short or could it be because she usurped her cousin Isabella de Aragon as the legitimate Duchess of Milan (Ady 1907, Payne 1978) and so did not warrant the poetic sentiment and respect to be a Lombardy painter's pictorial muse.



## 8. The Shape of Mona Lisa's Nose: A Medical Portrait

Leonardo da Vinci provided *Mona Lisa* with a classically iconic straight nose, such as those that we see on the Greek-shaped nose of Venus de Milo, Marilyn Monroe or the Byzantine religious icons (App. A8-figA8). In fact, Leonardo's idealized large forehead with the straight nose connection, a type seen in Fig. 2, is characteristic of many of his angels and *Monas* (Fig. 4) and even his men like *John the Baptist* and *Salvator Mundi* (App. A5-figA5). It is similar to the nose that Francesco Melzi added to his portrait of Leonardo da Vinci (App. A5-figA5b), and that we see in the portraits and medallions of Isabella Aragon Sforza (Fig. 2 & 3). It is a nose that Isabella Aragon Sforza shares with her daughter Bona (App. A4-figA4), Queen of Poland, and the noses on the beautifully sculpted busts by Francesco Laurana of her mother, Ippolita Maria Sforzia (1446-1484), and her aunt, Battista Sforza (1446-1472), who was the Duchess of Urbino and wife of Federico da Montefeltro (App. A9-figA9).

Fig. 11 shows two photographs of the skull of Isabella Aragon Sforza, provided by Professor Gino Fornaciari and his team of researchers from their archaeological autopsies and studies of the mummified remains of the Aragonese royal family in the Abbey of Saint Domenico Maggiore in Naples (D'Errico et al 1988, Lanzirrotti et al 2014). Although we can compare the photographs of Isabella of Aragon's skull (Fig. 11) directly with the shape of the heads provided in the idealized paintings (Fig. 1 to 6 & 8 to 10), considerable leeway must be given with such imprecise comparisons. Nevertheless, it is evident that the shape of the surviving skull (Fig. 11A) is consistent with the overall shape of *Mona Lisa's* head in Fig. 1A. The profile of the skull (Fig. 11B) shows a large forehead, a concave nasal profile, a slight indentation at the join between the nose and the forehead, large cheekbones and no prognathism, similar to the expected profile of *Mona Lisa* that can be deduced from Leonardo's drawings and paintings in Fig. 4. The profile of the skull (Fig. 11B) also has a striking resemblance to the Duchess of Milan, Isabella Aragon Sforza, in Fig. 2. If Isabella Aragon Sforza is not Leonardo's *Mona Lisa* then it would be interesting to know whether Lisa Gherardini's skull has retained the remnants of a Greek-shaped nose, a large forehead and the other anatomical features of Isabella of Aragon's skull. The alignment and computer comparison of the skull of Isabella of Aragon (Fig. 11) with the face of *Mona Lisa* (Fig. 1) and Leonardo's *Self-Portrait*, similarly to the studies of Schwartz (1988, 1994), might reveal some interesting overlapping characteristics between the skull, various portraits, and Leonardo's techniques of portraiture and his precision in the use of Vitruvian proportions.



**Fig. 11.** The skull of Isabella Aragon Sforza, Duchess of Milan, and Duchess of Bari. The images were obtained with permission from Professor Gino Fornaciari (D'Errico et al. 1988, Lanzirrotti et al 2014).

A large medical literature about *Mona Lisa's* chronic illnesses (Table 2) generally assumes that she is the Florentine merchant's wife Lisa Gherardini. Yet, not all physicians and scientists are in agreement about her diseases. Adour (1989) proposed that *Mona Lisa's* famous smile was the result of Bell's palsy with the facial muscle contracture when the facial nerve has undergone partial Wallerian degeneration/regenerated as a consequence of a recent pregnancy. In 2004, rheumatologists and endocrinologists suggested that skin lesions such as xanthelasma and hand swellings visible in the portrait are indicative of a lipid disorder and potential heart disease (Dequeker et al 2004, Ose 2008).

However, Mehra and Campbell (2018) contradicted the previous diagnoses and suggested that, "The enigma of the *Mona Lisa* can be resolved by a simple medical diagnosis of a hypothyroidism-related illness that could have been the result of a peripartum thyroiditis accentuated by the living conditions of the Renaissance. In many ways, it is the allure of the imperfections of disease that give this masterpiece its mysterious reality and charm." They believed that *Mona Lisa's* thinning hair, yellow skin, and possible goiter is visual evidence of hypothyroidism, and the more likely diagnosis if Lisa Gherardini lived to be 63 years of age. On the other hand, if *Mona Lisa* was Isabella Aragon Sforza then a genetically inherited hyperlipidemia and premature atherosclerosis diagnosis is still plausible. Isabella died of dropsy and heart failure at the age of 54 years (Vaglianti 1960) and anthropological autopsies performed on her grandfather, King Ferdinand I, revealed that he did indeed have atherosclerosis (Gaeta et al 2013). Isabella's eldest daughter, Bona Sforza, the Queen of Poland, also grew obese with age, and based on her portraits (App. A4-figA4) appears to have been afflicted with obesity and hyperlipidemia.

There is little or no rational explanation for Leonardo to paint a medical portrait of Lisa Gherardini, with whom he had little contact or interests. On the other hand, Leonardo had considerable contact and interests with Isabella Aragon Sforza and had many more reasons to paint her ailments than that of Lisa Gherardini. Leonardo da Vinci and Isabella Aragon Sforza met for almost ten years at the court of Milan, Pavia and Vigevano, sharing the art, literature and science of the Renaissance period. Leonardo was instrumental in creating her and her husband's entertainments, festivities and the construction of her private pavilions, bathrooms and the architecture of her indoor and outdoor gardens (Payne 1978). Leonardo must have noticed features in Duchess Isabella's face and hands that he believed were the symptoms of a developing pathology that could lead to obesity and heart problems.

When Isabella Aragon Sforza died at fifty-four years of age in 1524, five-years after Leonardo da Vinci's death in May of 1519, her body was interred in a sarcophagus of an overhanging burial chamber of the Aragonese royal family overlooking the monumental sacristy in the Abbey of Saint Domenico Maggiore in Naples. Since about 1993, archaeological pathologists (Fornaciari 2006) have studied her remains and those of at least 31 Renaissance mummies of the Aragonese royal family and other Neapolitans of noble birth interred in the Abbey and they postulated at least 20 diagnoses including identifying infectious, metabolic and neoplastic diseases. Lanzirotti et al(2014) described the decomposed state of Isabella's body as, 'completely skeletonized, only hair, disarticulated bones and clothes were found in her sarcophagus. Her body stature was calculated to be 166 cm long. All bones showed a dark greenish discoloration attributed to metallic oxides, which leached from her crown and other metallic objects found in her sarcophagus. Analysis of a black patina found on her teeth...using energy dispersive scanning electron microscopy showed this to be high in mercury ...'.(p. 206). The archaeological autopsy revealed that Isabella of Aragon was self-medicating herself with mercury probably to treat parasitic infections. This treatment blackened the enamel on her teeth, which she scraped off to leave her teeth white and bare of enamel, while mercury poisoning led to heart failure and her death (D'Errico et al 1988). Furthermore, paleoserological tests revealed that she and her grandfather, King Ferdinand I of Naples, were both infected by the protozoan parasite zoonotic visceral leishmaniasis that is widespread in the Mediterranean (Lanzirotti et al 2014). Although there was no skeletal evidence that Isabella Aragon or her grandfather had syphilis, a stepsibling of Isabella's, María of Aragon, had deep ulcerated syphilitic lesions on her lower limbs (Fornaciari 2006). The severely obese King Ferdinand I had a colorectal tumor (Ottini et al 2011) and atherosclerosis of the common carotid arteries, evidence of severe heart disease (Gaeta et al 2013).

The archaeological medical researchers could not connect Isabella Aragon Sforza's skeletal remains directly to the hypothyroidism, familial hyperlipidemia, premature atherosclerosis, diabetes or heart disease diagnosed in *Mona Lisa's* medical portraiture (Table 2). Instead, they provided a photograph of Isabella Aragon Sforza's metallic green skull (Fig. 11 & D'Errico et al 1988, Lanzirotti et al 2014), a vital clue and an anatomical body part that Leonardo did not neglect as seen in his beautiful drawings and sculptures of skulls (Missinne 2014). And so, if Leonardo da Vinci's portrait of *Mona Lisa* is in fact Isabella Aragon Sforza, the Duchess of Milan, and not the Florentine, Lisa Gherardini, then we conclude our argument here by reflecting on her enigmatic and metallic green skull (Fig. 11) smiling back at us ironically to let us know that she indeed was an unique and legendary figure of the Renaissance period.

## 9. Conclusion

For more than 500 years there has been a strong association between the Duchess of Milan, Isabella Aragon Sforza, and Leonardo da Vinci's *Mona Lisa*, and yet the consensus of art historians and experts over five centuries have preferred to accept the mythology created by Vasari (1550) that Leonardo's portrait represents Lisa Gherardini of Florence. Steinitz (1961) wrote the following description on what Bishop Paolo Giovio (1554) in his Como Museum wrote under Isabella's portrait that is highly reminiscent of the *Mona Lisa* portrait,

“This pale face and somber bearing had Signora Isabella of Aragon when she remained widow after the death of her husband Duke Gio. Galeazzo Sforza. This woman deserves a place among the illustrious men, because contrary to the weakness of her sex she maintained a virile spirit in the adversities of her life. This woman had a generous and masculine mind, befitting her Royal blood. She is worthy of honor and praise...”

To paraphrase William Shakespeare's *Hamlet*:

“Alas, poor *Mona Lisa*, we accept you, but not for who you really were.”

## References

- Adour, K. K. (1989). Mona Lisa Syndrome: Solving the Enigma of the Gioconda Smile. *Ann. Otol. Rhinol. Laryngol.*, 98, 196-199.
- Ady, C. M. (1907). *A history of Milan, under the House of Sforza*. Edward Armstrong (editor). New York: G. P. Putnam's Sons. London: Methuen & Co. 1907.  
[https://archive.org/stream/historyofmilanun017956mbp/historyofmilanun017956mbp\\_djvu.txt](https://archive.org/stream/historyofmilanun017956mbp/historyofmilanun017956mbp_djvu.txt)
- Ashrafiān, H. (2016). Leonardo da Vinci's Mona Lisa: medical differentials and primary biliary cholangitis. *Acta Gastroenterol. Belg.*, 79(3), 375-379.
- Azzolini, M. (2013). *The duke and the stars: astrology and politics in renaissance Milan*, Cambridge, Mass., Harvard University Press.
- Bambach, C. C., ed. (2003). *Documented Chronology of Leonardo's Life and Work*. In, *Leonardo da Vinci. Master Draftsman*. The Metropolitan Museum Of Art, New Haven, London & New York, Yale University Press.
- Boas, G. (1940). The Mona Lisa in the history of taste. *J. Hist. Ideas*, 1, 207-224. doi:10.2307/2707333.
- Borkowski, J. E. (1992). Mona Lisa: the enigma of the smile. *J. Forensic Sci.*, 37, 1706-1711.
- Brown, D. A. (1983). Leonardo and the Idealized Portrait in Milan. *Arte Lombarda, Nuova Serie*, No. 67 (4), *Atti del Convegno: Umanesimo problemi aperti* 8, 102-116.
- Dequeker, J., Muls, E., & Leenders, K. (2004). Xanthelasma and lipoma in Leonardo da Vinci's Mona Lisa. *Isr. Med. Assoc. J.*, 6,505-506.
- D'Errico, F., Villa, F., & Fornaciari, G. (1988). Dental esthetics of an Italian Renaissance noble-woman, Isabella d'Aragona. A case of chronic mercury intoxication. *Ossa*, 13, 233e254.
- Fornaciari, G. (2006). Le mummie aragonesi in San Domenico Maggiore di Napoli. *Med. Secoli* 18, 875e896.
- Gaeta, R., Giuffra, V., & Fornaciari, G. (2013). Atherosclerosis in the Renaissance elite: Ferdinand I King of Naples (1431-1494). *Virchows Arch.*, 462, 593-595.
- Glori, C. (2015). The Illumination by Birago in the Sforziad incunabulum in Warsaw: in defence of Horodyski's thesis and a new hypothesis.  
[https://www.academia.edu/17531825/The\\_Illumination\\_by\\_Birago\\_in\\_the\\_Sforziad\\_incunabulum\\_in\\_War\\_saw\\_in\\_defence\\_of\\_Horodyski\\_s\\_thesis\\_and\\_a\\_new\\_hypothesis](https://www.academia.edu/17531825/The_Illumination_by_Birago_in_the_Sforziad_incunabulum_in_War_saw_in_defence_of_Horodyski_s_thesis_and_a_new_hypothesis)
- Hare, C. (1911). *Isabella of Milan. Princess D'Aragone and wife of Duke Gian Galeazzo Sforza*. New York, Charles Scribner's Sons.
- Harris, J. C. (2013). Leonardo da Vinci's Mona Lisa. *JAMA Psychiatry*, 70(6), 555-556.
- Keele, K. D. (1959). The genesis of Mona Lisa. *J. Hist. Med. Allied Sci.*, 14(2), 135-159.
- Kemp, M., & Pallanti, G. (2017). *Mona Lisa: The people and the painting*. Oxford University Press.
- Kettlewell, J. K. (1981). *The Hyde collection catalogue*. Glens Falls, NY, pp 62-64.
- Kulski, J. K. (2017). *Leonardo da Vinci: The Melzi Chronicles*. Published by Jerzy. K. Kulski. ISBN: 978-0-6480653-1-9.
- Lanzirotti, A., Bianucci, R., LeGeros, R., Bromage, T.G., Giuffra, V., Ferroglio, E., Fornaciari, G., & Appenzeller, O. (2014). Assessing heavy metal exposure in Renaissance Europe using synchrotron microbeam techniques. *Journal of Archaeological Science*, 52, 204-217.
- Lorusso, S., & Natali, A. (2015). Mona Lisa: A comparative evaluation of the different versions and their copies. *Conservation Science In Cultural Heritage*, 15, 57-84.
- Luckyj, Christina (ed) (2011). *The Duchess of Malfi. A Critical Guide*. Continuum International Publishing Group, London and New York. ISBN: 978-08264-4124-9.
- Maloney, W. J. (2011). Bell's palsy: the answer to the riddle of Leonardo da Vinci's 'Mona Lisa'. *J. Dent. Res.*, 90, 580-582.

- Mehra, M.R., & Campbell, H. R. (2018). The Mona Lisa decrypted: Allure of an imperfect reality. *Mayo Clin. Proc.*, 93, 1325-1327.
- Mims, J. L., 3<sup>rd</sup>. (2012). History of medicine: ocular disorders of the Mona Lisa (strabismus) and other famous paintings in the Louvre, Paris. *Binocul. Vis. Strabolog. Q. Simms. Romano*, 27, 35-38.
- Missinne, S. J. (2014). The oldest anatomical handmade skull of the world c. 1508: 'the ugliness of growing old' attributed to Leonardo da Vinci. *Wien. Med. Wochenschr.*, 164(11-12), 205-12. doi: 10.1007/s10354-014-0282-0.
- Ose, L. (2008). The Real Code of Leonardo da Vinci. *Current Cardiology Reviews*, 4, 60-62.
- Ottini, L., Falchetti, M., Marinozzi, S., Angeletti, L. R., & Fornaciari, G. (2011). Gene-environment interactions in the pre-Industrial Era: the cancer of King Ferrante I of Aragon (1431–1494). *Hum. Pathol.* 42, 332–339.
- Payne, R. (1978). *Leonardo*. Garden City, New York, Double & Company, Inc.
- Porzio, F., ed. (1998). *The legacy of Leonardo: Painters in Lombardy 1490-1530*. Milano, Italy: Skira Editore S.p.A.
- Richter, J. P. (1880). *The Notebooks of Leonardo da Vinci*. <http://www.fromoldbooks.org/Richter-NotebooksOfLeonardo/http://www.gutenberg.org/ebooks/5000>.
- Santos-Bueso, E., Vico-Ruiz, E., & García-Sánchez, J (2012). Eye pathology in the paintings by Leonardo da Vinci (iii). Comparative study between the Mona Lisa and the copy in the Prado Museum in Madrid. *Arch. Soc. Esp. Oftalmol.* 87, 381–383.
- Sassoon, D. (2002). *Mona Lisa*. London, Harper Collins Publishers.
- Schwartz, L. F. (1988). The Mona Lisa identification: evidence from a computer analysis. *The Visual Computer*, 4, 40-48.
- Schwartz, L. F. (1995). Morphing the three faces of Mona: The decision-making steps Leonardo used to create his Mona Lisa. *Comput. & Graphics*, 19(4), 529-539.
- Shell, J. & Sironi, G. (1991). Salai and Leonardo's Legacy. *The Burlington Magazine*, 133 (1055), 95-108.
- Spring, M., Mazzotta, A., Roy, A., Billinge, R., & Peggie, D. (2011). Painting Practice in Milan in the 1490s: The Influence of Leonardo. *National Gallery Technical Bulletin*, 32, 78-112.
- Steinitz, K. T. (1961). The Voyage Of Isabella D'aragon: from Naples to Milan, January 1489. *Bibliothèque d'Humanisme et Renaissance*, 23, 17-33.
- The Mona Lisa Foundation (2012). *The Mona Lisa Foundation*. <http://monalisa.org>.
- Vaglianti, F. M. (2004). Isabella d'Aragona, *Dizionario biografico degli Italiani* (Rome, 1960ff.), lxii. 609–615. [http://www.treccani.it/enciclopedia/isabella-d-aragona-duchessa-di-milano\\_\(Dizionario-Biografico\)/](http://www.treccani.it/enciclopedia/isabella-d-aragona-duchessa-di-milano_(Dizionario-Biografico)/)
- Vasari, G. (1550). *The Lives Of The Most Excellent Painters, Sculptors, and Architects*. de Vere GdC, trans. New York, NY: The Modern Library; 2006.
- Vogt-Luerssen, M. (1999). The Neapolitan House of Aragon — Isabella of Aragon, Duchess of Milan. *Kleio.org*. <http://www.kleio.org/en/history/famtree/vip/374/>.
- Vogt-Lüerssen, M. (2010). Die Sforza III: Isabella von Aragon und ihr Hofmaler Leonardo da Vinci, Norderstedt.
- Wood-Marsden, J. (2016). Leonardo da Vinci's Mona Lisa: A Portrait without a Commissioner? In *Illuminating Leonardo*, edited by Constance Moffatt and Sara Tagliagambara, Chapter 12, 169-182. Leiden, Netherlands & Boston, USA. Brill.
- Wozniak, K. (2014). The Warsaw Sforziad. [http://www.bbk.ac.uk/hosted/leonardo/WozniakBP\\_2014.pdf](http://www.bbk.ac.uk/hosted/leonardo/WozniakBP_2014.pdf).
- Zollner, F. (1993). Leonardo's portrait of Mona Lisa del Giocondo. *Gazette des Beaux-Arts*, 121, 1993, S. 115-138. (Reprint in: Farago, Claire J. (Hrsg.): *Leonardo da Vinci. Selected Scholarship*, New York u.a.: Garland Publ., 1999, Bd. III, S. 243-266) (see note 9, page 18).
- Zutshi, P. (2006). The unpublished letter of Isabella of Aragon, Duchess of Milan. *Renaissance Studies*, 20, 494- 501.