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Fonni's dog: morphological and genetic characteristics for a breed standard definition

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ABSTRACT

Italy is home to several populations of native dogs that reside only in certain demographic regions. Such dog populations have not been under tight selection by humans and, as such, have never been officially recognised as breeds. One such population is the 'Cane Fonnese' or Fonni's Dog, which features uniform morphologic and behavioural traits that reproduce across generations, thus qualifying Fonni's Dog as a true breed eligible for recognition by national or international breed registries. The Fonni's Dog population examined in the present work is native to Sardinia, where they are used as property or livestock guardian dogs. As such, they are greatly appreciated by the local populace. We have carried out morphological evaluations on 200 Fonni's Dogs with the aim of developing a standard breed definition upon which the foundation of the Fonni's Dog breed can be based. We have also reported genetic data of the Fonni's Dog compared to four other established breeds sampled from the same geographic area.

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Cane fonnese; Sardinia; Fonni's dog; ENCI

Introduction

Worldwide there are many populations of dog that have been bred for appearance and/or behaviour. Many are recognised as true breeds, as all members of the population share common critical features and those features are reliably passed from parent to offspring. Fourteen dog breeds of Italian origin are officially recognised by the National Agency of the Italian Kennel Club (ENCI). In 2009, 126,540 dogs of all breeds were enrolled in the Register of Italian Origin (ROI) and the RSR, an additional approved registry (ENCI 2009). There are, however, many regional populations of dogs that share distinct features and represent closed populations, but which have never been recognised as true breeds. Typically these populations, or varieties as they are often called, live within well-demarcated geographic regions. They are often used as guard dogs for sheep flocks or country homes, both functions that are greatly valued by local populations. Even today, Fonni's Dogs are trained by shepherds using ancient methods with a goal of forming an unshakeable bond between the herd and the dog.

There are many such closed populations in Italy and each represents an undeniable genetic and cultural heritage that has existed for centuries. Yet, they have rarely been acknowledged as formal dog breeds. The first step required for protection and conservation of these well-defined populations is an official recognition as a breed by the ENCI. To achieve this goal, however, it is necessary to generate a breed standard that is based on the morphological, genetic and behavioural characteristics of the dog population and demonstrate that the defining traits breed true to all offspring.

The Fonnese dog, also known as Fonni's Mastiff or Fonni's Dog, is an interesting example of a variety native to Italy (see Appendix). The precise origin of the Fonni's Dog is uncertain, but the population is found only in Sardinia and is believed to have ancient

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origins. The first archaeological documents that attest to the presence of similar dogs date to the Bronze Age, a time that, in Sardinia, coincides with the Nuragic Age, which extends from the 19th century B.C. to the 2nd century A.D. A number of striking bronze objects were found in Nuraghe Cuccurada (Mogoro, Oristano, Italy) which are now on display at the National Archaeological Museum of Cagliari, representing hunting scenes with dogs who have a general appearance that is similar to the Fonni's Dog. Further support is provided by several sets of skeletal remains of Nuragic dogs, which share a similar gross morphology to dogs depicted in the bronze sculptures from the village of Su Coddu (Selargius, Cagliari, Italy) (Iilliu 1966). These findings attest to the possible existence of two distinct dog populations: one featuring large dogs with large ears and cut tails, and another with mid-sized dogs, brachycephalic or mesocephalic heads and tails that curved upward. The Nuragic dogs were used as both guard and hunting dogs. The discovery of earthenware pieces, depicting both molosser (mastiff-like) and levrieroid (sighthound-like) dogs, near the lagoon of Santa Gilla (Cagliari, Italy) in the 19th century confirms the presence of these two distinct dog populations in the region during the Phoenician-Punic age (Bernardini 2003). The combination of these two ancestors is believed to be present in the modern Fonni's dog.

Perhaps the best historical documentation with what is possibly one of the few known direct references to 'Fonni's Dog' is from 1885 in which Cetti describes a particular 'Sardinian dog' that was common to the island (Cetti 1885). The dog was described to be of medium size and as 'a mix between a dog and a greyhound-like hunting dog, not nice to see.' It was used both as a guard dog and for hunting hare and wild boar. Supporting this are the writings from the mid-1800's of de Saint-Severin (1827), Goffredo Casalis (Angius & Casalis 2004) and Antonio Bresciani (Bresciani 1850), each of whom wrote of a Sardinian Mastiff, used locally as a guard dog with a coarse appearance, woolly coat and a 'grim and bloody look' which shows striking loyalty to their owners, but a fierce aggression toward strangers. The name 'Fonni's Dog' is attributed to Giovanni Voltan's report of the breed in 1899 (reference).

Concerted effort to breed, select and train Fonni's Dogs for modern military purposes began in 1911 during the Sardinian War (Corradori 1912; Vitale 1964). The Fonni's Dog population remained relatively steady from the First World War through the 1960's, but dropped dramatically thereafter (Corda 1985). Current unofficial estimates suggest ~1000 Fonni's Dogs residing on Sardinia (data not shown).

The recent interest of dog enthusiasts have led to rejuvenated efforts to investigate the origin and preserve the history of this intriguing breed (Masseti 2008; Balia 2009). Preliminary research has been carried out by the AACF (Fonni's Dog Lovers Association), investigating the genetic variability of the breed, and genetic overlaps with other recognised dog breeds sharing the same geographic region and behavioural traits.

Here, we present the results of a series of studies detailing the morphological and genetic characteristics of the modern population of Fonni's Dogs. The study was based on variation detected using ten microsatellites markers (STS) (ISAG; FHC2010, FHC2054, FHC2079, PEZ1, PEZ3, PEZ5, PEZ6, PEZ8, PEZ12, PEZ20) in 50 Fonni's Dogs from different farms/areas all over Sardinia. The breeders communicated no genetic exchange between farms.

Materials and methods

Sample and measurement collection

A total of 200 dogs were sampled and evaluated from different regions of Sardinia. Of these, 166 (82 males and 84 females) passed quality control for completeness. Dogs were chosen on the basis of phenotypic characteristics meeting the typical Fonni's Dog description. A total of 64 dogs came from the Sassari area, 89 from Nuoro and 13 from Oristano. Dogs were presented for participation by private owners, and DNA was extracted from whole EDTA blood using Illustra™ blood genomic Prep Mini Spin Kit (GE Healthcare UK Limited, Amersham Place, Little Chalfont, Buckinghamshire, UK), according to the manufacturer's protocols. Blood samples were collected according to the recommendations of the European Council (1986) concerning animal care. Measurements were collected using a kinesimeter, measuring tape, goniometer, 30 cm calliper, and a scale. Dog weight was obtained from a subsample of 35 males and 29 females from a single weighing of each dog that had been fasting for $\geq$8 h.

Measurement points are depicted in Figure 1 and include: height at withers (HG), trunk length (LT), head length (Lte), skull length (Cr), bizygomatic distance (Biz), distance between maxillary canine teeth, chest height (HT) and chest circumference (CT).

Morphological relation indices, as described by Solaro (1958), Barbieri (1993) and Bordignon (2009), were calculated as the ratio between trunk length and

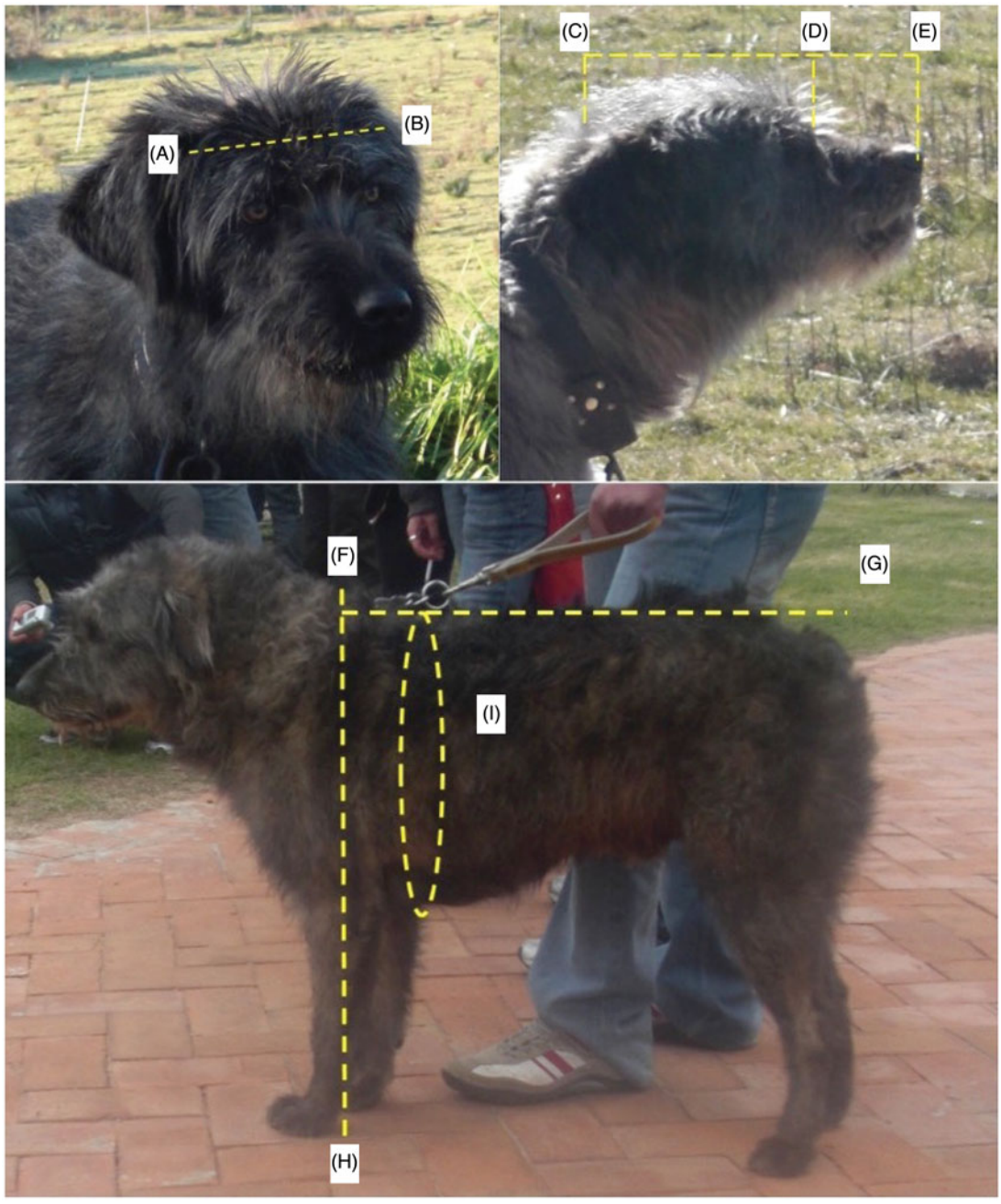

Figure 1. Photographic representation of the Fonni's Dog. Schematic indication of the measurements collected for documentation of breed structure. A–B = bizygomatic distance (Biz). C–D = cranium length (Cr). C–E = head length (Lte). F–H = height at withers (HG). F–G = trunk length (TL). I = chest circumference (CT).

height at withers (LT/HG), the ratio between head length and height at withers (LTE/HG), and the ratio between chest circumference and height at withers (CT/HG).

A conformational assessment of each dog was made to note the general appearance of the neck, top line, back, lumbar region and tail, as well as front and hind legs, including both their morphology and the positions during stance and gait. Photographs were collected to note the skin and coat condition, type, length and colour.

Microsatellite analysis

A total of sixty-four dogs were randomly chosen from the population of measured Fonni's Dogs and were genotyped at ten sequence tagged sites (STS): PEZ1, PEZ3, PEZ5, PEZ6, PEZ8, PEZ12, PEZ20, FHC2054, FHC2079, FHC2010 by StockMarks® for Dogs Canine Genotyping (Zenke et al. 2011).

Microsatellites were amplified by PCR using published conditions (Bigi et al. 2015) and alleles separated using an ABIPRISM 310 sequencer. Analysis of

fragments was conducted with Genescan and Genotyper software's (Nowacka-Zawisza et al. 2015; Roth et al. 2016).

Fifty Fonni's Dogs (FNN), unrelated by the first generation were compared statistically to 14 Maremma Sheepdogs (MRM), nine Schnauzers (SCH), 20 Cane Corso (CRS) and 16 Bergamasco Sheepdogs (BRG). Comparative breeds were selected on the basis of behaviour (MRM), comparative historical origin (CRS) and coat type (SCH and BRG). Microsatellite allele frequencies, expected and observed heterozygosis, genetic differentiation (F_{ST}), inbreeding coefficients (F_{IS}) and exact G test (Fisher's method) for genetic differentiation were estimated with the GENEPOP software v4.2 (Rousset 2008). Heterozygosis index for locus and median (Nei 1978), and PIC for locus and median (Todhunter et al. 2003), were calculated based on allele frequencies with Cervus software (Kalinowski et al. 2007). Evaluation of subject distribution was conducted using genetic distance (D_{DAS}), with POPULATIONS v1.2.31 (Downing et al. 2012) and MEGA v7.0.14 (Kumar et al. 2016) software. Principal components analysis on the AFC were calculated using the *adegenet* R package (Jombart 2008; Jombart & Ahmed 2011).

Statistical analysis

The statistical analysis of data included the assessment of the sample mean and of the 95% confidence intervals for males and females, separately. Variance analysis was carried out using the model: $Y = \mu + sex + place + (sex \times place) + \varepsilon$, where Y represents the single variant of the considered variable (somatic measures or indices), μ represents the general mean and ε represents the residual error. Linear correlations were calculated between somatic measures and indices.

Results and discussion

Morphologic variability

In this study, we sought to define a series of metrics, and utilise them to test the hypothesis that the Fonni's Dog is an independent breed. We found that dogs of the breed displayed considerable variability with regard to several morphological measures, which distributed in no specific patterns throughout the three geographical regions tested (Sassari, Nuoro and Oristano) (Table 1) (Boyko et al. 2010).

Indeed, there are no significant differences in phenotype range between regions. In general, we observed no evidence for sexual dimorphism in the breed (Table 2), except for head length ($p < .05$) and weight ($p < .05$), which was significantly greater in males than in females. Mean weight of males was 30.8 kg ±0.31 and weight of females was 27.0 kg ±0.29.

Table 1. Mean and confidence intervals (95%CI) of the somatic measurements and indices for male ($n = 82$) and female ($n = 84$) Fonni's Dogs.

	Males		Females		Male 95%CI		Female 95%CI	
	Mean	St.dev.	Mean	St.dev.	Lower	Upper	Lower	Upper
HG	56.73	5.33	54.80	4.62	55.58	57.88	53.81	55.80
HT	24.17	5.21	22.96	3.46	23.05	25.29	22.21	23.70
CT	69.37	7.23	68.73	6.13	67.81	70.92	67.42	70.05
LT	89.84	7.63	87.32	7.40	88.20	91.48	85.73	88.92
Lte	22.67	2.06	21.50	2.25	22.23	23.12	21.02	21.99
Cr	12.58	2.05	12.47	1.38	12.14	13.02	12.17	12.77
Biz	11.63	1.30	11.34	0.92	11.35	11.91	11.14	11.54
Teeth	42.89	3.42	42.15	2.20	42.15	43.63	41.67	42.62
LT/HG	1.59	0.12	1.60	0.13	1.56	1.62	1.57	1.63
Lte/HG	0.40	0.03	0.39	0.04	0.39	0.41	0.38	0.40
CT/HG	1.23	0.11	1.26	0.14	1.20	1.25	1.23	1.29

Measurements include height at withers (HG), chest height (HT), chest circumference (CT), trunk length (LT), head length (Lte), skull length (Cr), bizygomatic distance (Biz), distance between canine teeth (Teeth). Indices include ratio of trunk length to withers height (LT/HG), head length to withers height (Lte/HG) and chest circumferences to withers height (CT/HG).

Correlation analysis demonstrated that some traits showed a high degree of similarity between individuals while others did not (Table 3 and Figure 1).

For instance, chest circumference correlated well with both the height at the withers and chest height. The strongest consistent comparisons were those that define the overall allometry of the dog; body length, head circumference, height, etc. Surprisingly, the distance between the canine teeth correlated relatively well with many other traits; however, many of the traits are reflections of overall size of the dog. By comparison, there was little correlation between traits that have no selection and which, from a developmental point of view, do not need to be well matched. These include the ratio of trunk length/height at the withers, which are themselves well correlated, to most other traits including those related to head size. The ratio values of trunk length, head length and chest circumference to height at withers were only significantly correlated with the individual values used in the ratios. The ratio metrics were not correlated with the other independent measurements, suggesting that a dog can, therefore, have a great deal of variance in head measures related to metrics that describe body size.

While it is possible that some measurements contained a degree of error, the observation of variability is likely due to the lack of selective pressure to which this population has been subjected. However, there were some strong commonalities that remained

Table 2. Means of the somatic measurements and indices for dogs from each geographic area.

	Sassari			Nuoro			Other		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
HG	55.77[b]	56.50[b]	56.10	57.29[b]	53.53[a]	55.40	58.23[ab]	56.83[b]	57.50
HT	24.75	23.07	23.91	23.51	22.87	23.19	25.14	23.12	24.13
CT	68.23	68.88	68.55	69.67	68.68	69.17	73.29	68.50	70.89
LT	89.96[a]	87.93[b]	88.94	89.29[a]	86.85[b]	88.07	92.50[a]	88.17[ab]	90.33
Lte	22.49[b]	21.28[a]	21.88	22.70[b]	21.53[a]	22.11	23.50[b]	22.42[ab]	22.96
Cr	12.32	12.39	12.36	12.91	12.41	12.66	11.93	13.33	12.63
Biz	11.37[ab]	11.20[b]	11.29	11.82[a]	11.40[ab]	11.61	11.79[ab]	11.58[ab]	11.68
Teeth	43.00[b]	41.00[a]	42.00	43.00[b]	42.00[ab]	43.00	42.00[ab]	44.00[b]	43.00
LT/HG	1.62	1.56[b]	1.59	1.57[b]	1.63[a]	1.60	1.58[ab]	1.55[ab]	1.57
Lte/HG	0.40[b]	0.38[a]	0.39	0.40[b]	0.40[b]	0.40	0.41[ab]	0.40[ab]	0.40
CT/HG	1.23[b]	1.23[b]	1.23	1.22[b]	1.29[a]	1.25	1.26[ab]	1.20[ab]	1.23

Measurements include height at withers (HG), chest height (HT), chest circumference (CT), trunk length (LT), head length (Lte), skull length (Cr), bizygomatic distance (Biz), distance between canine teeth (Teeth). Indices include ratio of trunk length to withers height (LT/HG), head length to withers height (Lte/HG) and chest circumferences to withers height (CT/HG).
[a,b]$p < .05$.

Table 3. Linear correlations between somatic measurements and indices from the sample of Fonni's Dogs (above the diagonal) and their respective significance values (beneath the diagonal).

	HG	HT	CT	LT	Lte	Cr	Biz	Teeth	LT/HG	Lte/HG	CT/HG
HG	1	0.28	0.40	0.58	0.49	0.39	0.48	0.51	−0.53	−0.44	−0.51
HT	<0.00	1	0.44	0.29	0.46	0.30	0.31	0.35	−0.03	0.19	0.15
CT	<0.00	<0.00	1	0.46	0.45	0.30	0.51	0.48	0.01	0.07	0.58
LT	<0.00	<0.00	<0.00	1	0.51	0.35	0.41	0.50	0.38	−0.04	−0.10
Lte	<0.00	<0.00	<0.00	<0.00	1	0.49	0.51	0.52	−0.04	0.56	−0.03
Cr	<0.00	<0.00	<0.00	<0.00	<0.00	1	0.49	0.32	−0.07	0.13	−0.08
Biz	<0.00	<0.00	<0.00	<0.00	<0.00	<0.00	1	0.50	−0.12	0.06	0.04
Teeth	<0.00	<0.00	<0.00	<0.00	<0.00	<0.00	<0.00	1	−0.07	0.04	−0.01
LT/HG	<0.00	0.72	0.93	<0.00	0.63	0.37	0.13	0.39	1	0.45	0.45
Lte/HG	<0.00	0.01	0.37	0.64	<0.00	0.10	0.47	0.61	<0.00	1	0.44
CT/HG	<0.00	0.05	<0.00	0.18	0.70	0.30	0.63	0.85	<0.00	<0.00	1

Measurements include height at withers (HG), chest height (HT), chest circumference (CT), trunk length (LT), head length (Lte), skull length (Cr), bizygomatic distance (Biz), distance between canine teeth (Teeth). Indices include ratio of trunk length to withers height (LT/HG), head length to withers height (Lte/HG) and chest circumferences to withers height (CT/HG).

consistent across dogs sampled from different locations. These included several non-measurable aspects of morphology such as an amber eye colour and a characteristic 'monkey face' countenance. The coat, irrespective of colour, has a typical coarse outer layer, as well as a woolly and dense undercoat. The hair on the head and hindquarters is typically short, while the face has longer furnishings around the eyes and a beard-like length around the muzzle and chin. The male dogs have a longer and thicker coat around the neck that appeared to form a mane. A short-coated variety exists at a low frequency of 15%, and is generally selected against in favour of the long-coated variety. A natural lack of a tail exists at an approximate frequency of 30%.

Genetic variability

Microsatellites markers are routinely used in parentage test worldwide and can define a preliminary description genetic variability. Across the ten measured microsatellites, 64 alleles were observed within the Fonni's Dog population. Alleles per loci ranged from four to ten. Table 4 shows observed (H_o) and expected (H_e) heterozygosis, and PIC data for the Fonni's Dog and the four additional comparison breeds that, based on geographic location and general appearance, we expected to be genetically comparable to the Fonni's Dog. The Fonni's Dog shows a high H_o, a high H_e and considerable informativeness of markers relative to other breeds (Table 4). The Fonni's Dog population shows high genetic variability underlined by heterozygosis values. The PCA of the studied markers shows the position of each individual dog on the first two axes (Figure 2).

Table 4. Observed (Ho), expected (He) heterozygosis and PIC data for the Fonni's Dog and four additional breeds.

Breed	Allele No.	H_o	H_e	PIC
Fonni's Dog (FNN)	64	0.68	0.74	0.69
Maremma Sheepdog (MRM)	53	0.66	0.70	0.63
Schnauzer (SCH)	30	0.59	0.54	0.44
Cane Corso (CRS)	56	0.60	0.63	0.57
Bergamasco Sheepdog (BRG)	47	0.61	0.67	0.60

When individual dogs from the five breeds are plotted within bidimensional space, the dogs of each separate breed cluster together in identifiable groupings.

The dogs from the five breeds are clearly identifiable, with the Fonni's Dog located between the herding, guardian and molossoid breeds, as shown on the first axis accounting for 6.8% of the alleles' variability. Axis 2 accounts for 6.0% of allele variability, the SCH forms a close cluster that confirms its position as out-group compared with the analysed agricultural breeds of Italian origin. Cladistics representation of the genotypes for each of the individual dogs of five breeds reveals clustering of the Fonni's Dog relative to the remaining breeds (Figure 3).

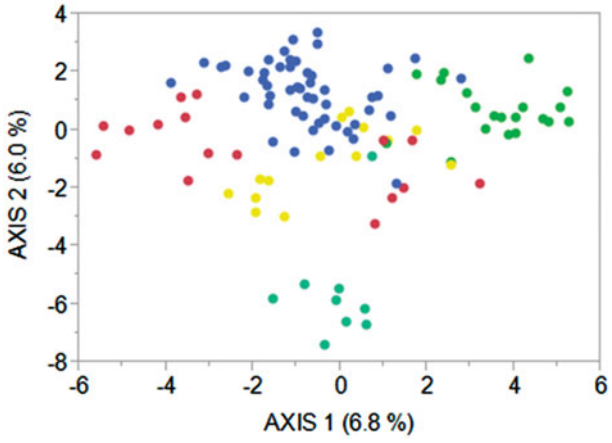

Figure 2. Allele frequency components (AFC) of five dog breeds (Fonni's Dogs – blue, Maremma Sheepdogs – yellow, Schnauzers – light green, Cane Corso – dark green, Bergamasco Sheepdogs – red), represented in a bidimensional spatial arrangement.

The use of D_{DAS} takes into account the shared alleles in each population. The large majority of Fonni's Dogs clearly cluster together in a single branch; the remaining individuals branch close to the BRG and CRS individuals. Likewise, the SCH has the highest pairwise F_{ST} observed across all loci (Figure 3). F_{ST} values for Fonni's Dog and BRG (0.088) and MRM (0.087) Sheepdogs are relatively low. In spite of this minor genetic differentiation, the exact G test (Fisher's method) for each population pair shows a highly significant genetic differentiation between each pair of the five breeds analysed across all loci. Thus, the Fonni's Dog presents as genetically distinctive population comparable to those of BRG, CRS and MRM. The presented results define clearly the ability of Fonni's

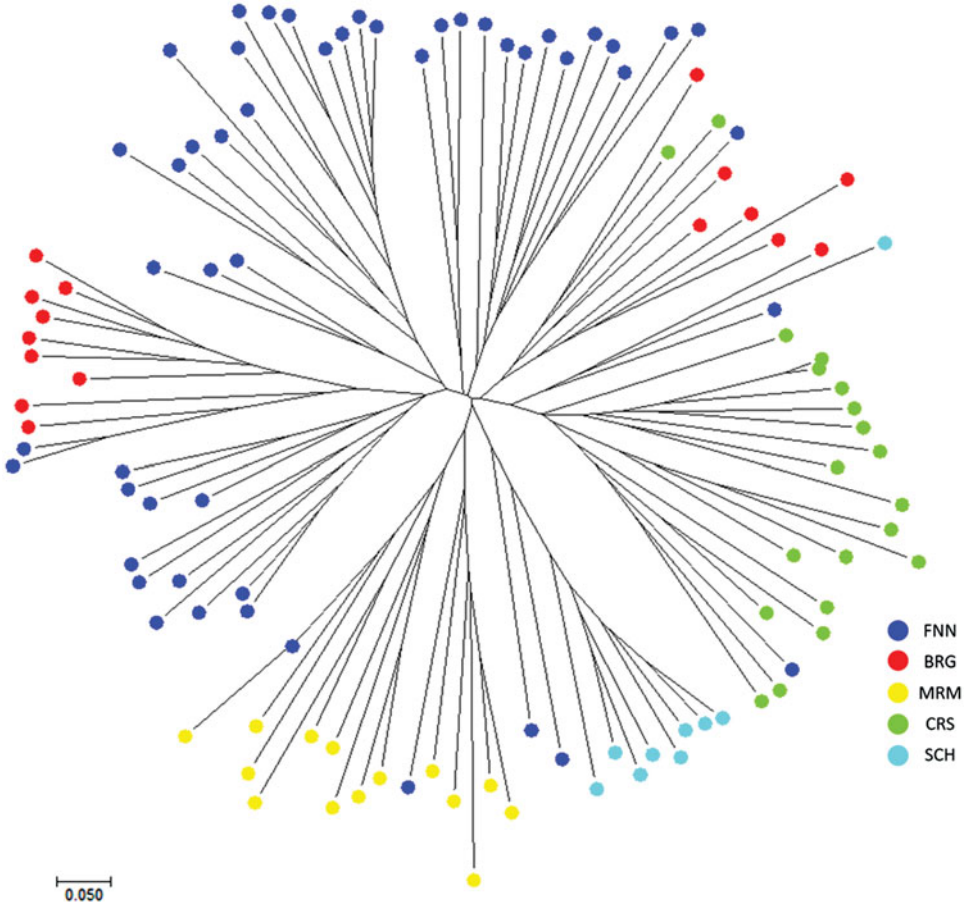

Figure 3. Cladistic representation of five dog breeds (Fonni's Dogs – FNN, Maremma Sheepdogs – MRM, Schnauzers – SCH, Cane Corso – CRS, Bergamasco Sheepdogs – BRG), based on genetic distance (DDAS) calculated on 10 microsatellite markers with Mega®.

Dog subjects to create a homogeneous breed-specific group, though notable overlap does occur with the other Italian breeds selected for the same working abilities.

Conclusions

Our data reveal that the population is characterised by low inbreeding level ($F_{is} = 0.079$) and a higher expected heterozygosis ($H_e = 0.74$) and polymorphism information content (PIC $=0.69$). Moreover, the genetic differentiation underlies the diverse genetic basis of the population. However, the allelic frequency component (AFC) showed a clustering of Fonni's Dog samples nearer to the Bergamasco and Maremma sheepdog, compared to other tested breeds. In aggregate, these data highlight the interesting genetic components of this unique and valuable breed.

Development of a breed standard for the Fonni's Dog would benefit from the consideration of the population measurements presented in Tables 1 and 2. Defining breed-specific measurements could focus either on: 1) inclusion of the largest proportion of the current population, targeting mean values of relevant measures and allowing for inclusion of individuals representing characteristics within two standard deviation units (Table 1), or on 2) a narrower definition of a measurement, within the confidence interval of the mean, as shown in Table 1, and disallowing for the variation inherent in the first option. Conversely, a breed standard could be designed around the model of an ideotype, a theoretical ideal representation of the breed. With proportions and measurements selected from the range of observed characteristics, this ideotype would provide a goal to which breeders would aim. In all cases, it is essential to estimate the heritability of each characteristic that is part of the breed standard, in order to obtain information for assessing the genetic progress achieved through the application of a specific selection plan.

The Federation Cynologique Internationale sets the requirements for international dog breed recognition. Its defined model for breed standard production can be strongly supported and easily met through the presented morphometric data. This population of dogs, which we propose to represent the basis of the Fonni's Dog breed, consists of individuals with specific morphological and behavioural characteristics, and represents an undeniable genetic and cultural heritage. The history of Fonni's Dogs, together with their role as protectors of livestock and property, and as hunters, is well documented. The detailed range of morphological variation presented here, generated from 166 dogs of recognisable type, fit reasonable expectations of a distinct breed. Genetic analysis shows that the polymorphic structure of the population is similar to what is observed in other breeds. Across ten polymorphic markers, the Fonni's Dogs shows a significant genetic differentiation from the other four breeds analysed. The genetic distribution of Fonni's Dogs is comparable to that of other officially recognised working Italian breeds. These findings support the proposal that the Fonni's Dog be recognised as a pure breed. Official recognition of the breed would represent a unique tool for ensuring its protection and preservation.

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Disclosure statement

The authors certify that there is no conflict of interest with any financial organisation regarding the material discussed in this article.

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Appendix

Proposed breed standard for the fonni's dog (a breed on the way to be recognised)

Origin: Italy – Sardinia. Resides across the majority of the island.

Type: Herding, guard dog

F.C.I. classification: group 2

General appearance: Medium sized, mesomorphic, lean and well-muscled. Trunk length is longer than the height at the withers. It looks rough and bristly, due to its outer coat of coarse 'goat' hair. The sub-frontal position of the eyes and their amber colour give the dog a typical penetrating 'unfriendly' look, in conformity with the breed's personality and purpose.

Behaviour and temperament: This is a working dog. It does not show predatory tendency with the animals that it guards, but, when the occasion demands, it is an excellent guard dog against predators (foxes or stray dogs). It is a rustic and rough dog, but a reliable partner. It is important to recognise the intelligence and marked instinct for guarding in this dog. Adequate exercise is necessary to preserve its innate balance.

Important proportions: Height at the top of the highest point of the shoulder blades (withers) for males is 56–60 cm, for bitches is 52–56 cm. The length of the truck overtakes the height at the withers by 5–10%. Head length (from occipital crest to nose) is about 38% of the height at withers.

Head: Mesomorphic, with occipital crest well pointed out and large. Pulpy nose with black pigment. The proportion between cranium length and muzzle length is 1:1.

Cranial region: The cranium is slightly convex and equal in width to the bizygomatic distance. Zygomatic arches are well pointed out and the frontal sinus is not overly pronounced.

Facial region: The nose is on the same line as the bridge of the muzzle. Nose is voluminous with large and open nares. It must be perfectly pigmented, even if the coat is light in colour. The only pigment allowed is black.

Muzzle: Strong with lateral sides, slightly converging toward the nose. When viewed from the front, it appears to fit a square. The mandible is the lower bound of the muzzle.

Lips: Firmly fitted and always pigmented.

Jaws: Strongly developed, large with strong dental arch.

Teeth: White, strongly developed, regularly lined up, complete in number. The canines are well spaced, the incisors form a pincers (level) bite or scissor bite.

Eyes: The stare from these dogs is very intense and peculiar, as is typical of the breed. The expression is sad, but intense and authoritative. They have a characteristic 'monkey face' due to the fact that the eyes are oval shaped, of medium size, set in front and close together with strongly developed eyebrows. The colour of the eyes is amber in all its shades. The eyelid must be pigmented and contact closely to the eyeball.

Ears: Triangular in shape, about 7–9 cm in length, attached above the zygomatic arch. They are carried hanging and, even when at attention, fit close to the cheek.

NECK: Strong and muscular, medium length (~1/3 the total height of the dog). There is no dewlap, and the neck shows good musculature at the attachment on top of the shoulder.

Trunk/Body: The length of the trunk is greater than the height at the withers by 5–10%. Top line is straight and horizontal with low pronounced withers. The back is strongly developed, ~1/3 the width of the height at the withers. Loin region is well toned at the junction to the trunk. Chest is quite strong with slightly rounded ribs. Its circumference, measured at the point of the elbow, overtakes the height at the withers by 25%. The body is moderately wide, strongly developed, its width is strictly related to the arch of the ribs. The top of the sternum is set on level with the point of the scapulohumeral joint.

Croup: Strong and muscular, sloping at 15° to the horizontal.

Tail: Set is not high. The tail has a large base, thick root, strong and tapering to the tip. Its length extends slightly beyond the articulation point of the hock. At rest, it is shaped like a pump handle. Never carried erect. When the dog is in motion, the tail may be held above the top line. Some dogs are born with a natural bobtail, brachyure. If born with a tail, it must not be amputated.

Limbs:

Forequarters: Broad and strongly muscled. Straight, with correct perpendicularity seen from the front and in profile. The feet are oval with well-arched toes. Pads are thick and firm. Nails are short and dark. The shoulder is strongly muscled, tightly adherent to the body. Scapulohumeral joint is angled ~110–120°. The forearm is longer than the humerus, forming an angle of 60° from the horizontal. The elbows are tight, metacarus mildly long and angulated at ~10° from the vertical. Dewclaws are to be left intact.

Hindquarters: Strong and well-muscled with correct perpendicularity to give the impression of strength and agility. Thigh is strong and angled at ~75° from the horizontal. The angle of the femoro-tibial-patellar joint (stifle) is ~125–130°. The leg appears quite long, well-muscled. The shank is long in relation to the overall length. It is vertical when viewed from the rear and perpendicular to the top line. Tibial-tarsic joint (hock) is ~150°. Feet are compact with well-arched toes. Pads are thick and firm, nails short and dark. Rear dewclaws are to be left intact.

Gait: The gait is elastic and agile. At a trot, the hindquarters deliver a powerful forward thrust while the forequarters move easily. Its structure is harmonic, with moderate slants, so the trot is characterised by a moderate falcade, symmetrical in hind- and forequarters, never exaggerated or forced. At a gallop, moves with great agility, overtaking all the roughness of the ground in which it works.

Skin: Thick, well pigmented, tight fitting over the whole body, without sagging or dewlap.

Coat: Double coated, with typical course outer coat like 'goat' hair. Woolly, thick and dense undercoat. The ideal length is 5–7 cm, the head and legs are covered with shorter hair. The muzzle has bristly guard hairs around the eyes and a bearded chin. In male dogs, the coat forms a thick mane around the neck. A short coated variety exists, though is less common.

Colour: Black, ash in all its shades, and honey are allowed. Ash and honey may be present with brindling (tabby), and are viewed as more historic.

Weight:

Males 29–40kg

Females 25–32 kg

The males must have two fully descended testicles, healthy and with normal complexion.

Faults: Any deviation from the present standard is considered a fault. Of particular note:

- partial depigmentation of the mouth or eyelid mucosa
- lack of substance or presentation of overweight
- rolled tail, curled up over the back

Serious faults:

- atypical expression
- erect ears
- severe depigmentation of the nose, mouth and eyelid mucosa

Faults that eliminate from judgement:

- prognathia
- albinism
- tail amputated later than the date of D.M. that prohibits amputation

Disqualifications:

- enognathia
- monorchidism
- cryptorchidism

Behaviour and temperament that must be evaluated in the ring:

The breed's personality traits must be kept in great consideration during judgement. The dog has to be calm and sufficiently self-confident when held on leash by the owner. When it is touched, it can be restrained but has to allow touching from the judge. Not admissible: excessive nervousness associated with shyness; extreme reactivity due to emotionally unstable temperament. Oppositional (growling, rushing) or aggressive reactions are cause for removal from the ring.