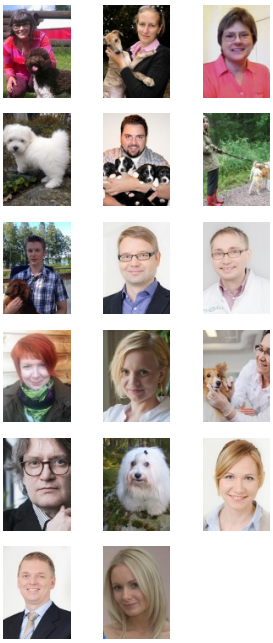
MyDogDNA news Exploring dog DNA testing, breed health and discoveries in canine genetics

Authors



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About Nordic Hunting Dog Breeds: New Finding in Norrbottenspitz

English, Spitz, Norrbottenspitz, Ataxia, genetic diversity, Nordic Hunting Dogs

01/05/2014 AT 10:40 AM – JONAS DONNER

Today, DNA information can be widely utilized in breeding and in efforts to preserve a breed's health. With the help of DNA testing, it is possible to get information about hereditary diseases and characteristics as well as about genetic diversity and genetic differences, both on an individual and on a breed level. Comprehensive DNA information can thus be harnessed to be a powerful and efficient supportive tool foor sustainable breeding.

The Norrbottenspitz section of the Finnish Breed Club "Suomen Pystykorvajärjestö" (Finnish Spitz Club) started a project aiming to assess the genetic diversity of the Finnish population of Norrbottenspitz. The project was launched at the end of year 2013. Here are some of the results obtained so far, compared to some other Nordic Hunting Dog breeds in the graphs.

Genetic Diversity

Graph 1 below illustrates the genetic diversity in Norrbottenspitz. The dynamic graph gives up-to-date information about the situation and gets updated with each analyzed individual. The median diversity for Norrbottenspitz is 33.7 % (distribution 30.9 % - 36.0 %). The median for all tested dogs is 28.8 % (15.3 % -

analysis (2) DNA testing (1) Bernese Mountain Dog (1) Kerry Blue Terrier (1) genetic differences (1) Curly Coated Retriever (1) Lagotto Week (1) Appenzell Cattle Dog (1) Irish Soft Coated Wheaten Terrier (1) Nordic Hunting Dogs (1) Ataxia (1) Entlebucher Mountain Dog (1) Greater Swiss Mountain Dog (1) Spitz (1)

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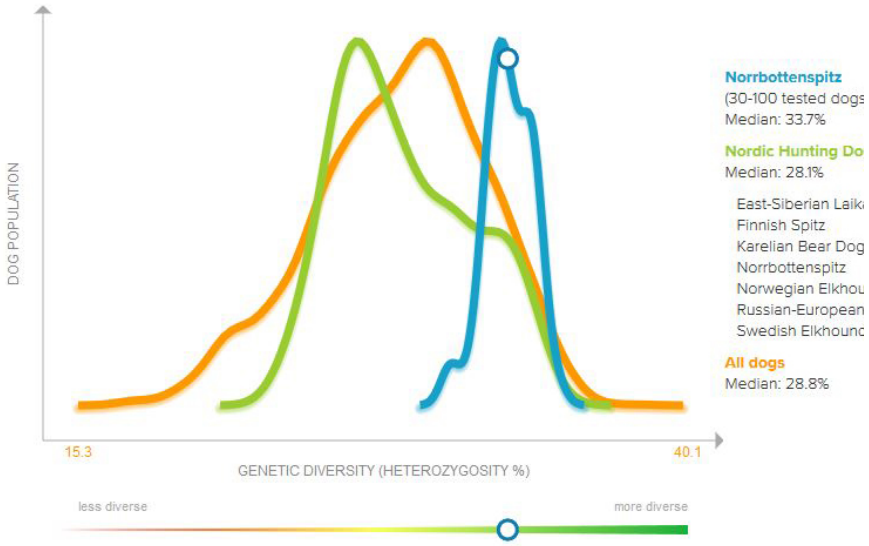
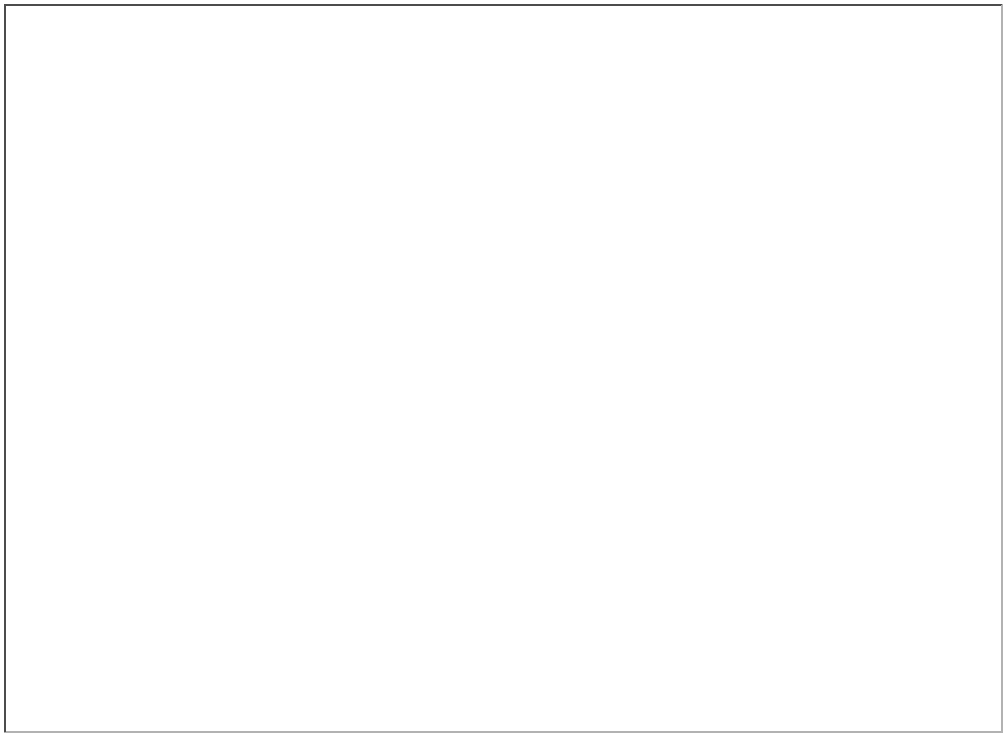
40.1 %). Compared to other Nordic Hunting Dog breeds, the state of the Norrbottenspitz population is quite good. The median for all Nordic Hunting Dogs combined (including also Norrbottenspitz) is 28.1 %, which is lower than the figure for all tested population. The genetic diversity distributions in other Nordic Hunting Dogs are listed under the graph. Some of these are based on a limited sample of dogs, and more dogs would need to be tested to get a more accurate view of the situation.



Finnish Spitz	24.0 % - 32.2 %
Karelian Bear Dog	27.1 % - 34.0 %
Norwegian Elkhound, grey	22.7 % - 29.9 %
Swedish Elkhound	26.1 % - 31.6 %

Graph 2 indicates how smilar or different the Nordic Hunting Dog breeds are genetically.



Overall, based on the genetic diversity analysis, it can be concluded that the Finnish Norrbottenspitz population has a higher level of genetic diversity compared to what is observed across all tested dogs, as well as other Nordic Hunting Dogs, in the MyDogDNA database. In fact, Norrbottenspitz is one of the breeds with the highest diversity level observed in the database so far. The result was more or less expected, as the Finnish Spitz Club describes the breed's Finnish population as young and heterogeneous. The most likely reason for the high level of diversity is the maintenance of open stud books; "new blood" has constantly been brought into population. This can be considered positive for the breed's health, vitality and adaptability. It is also worth remembering that genetic differences between individuals form the raw material for selection: Without genetic differences, there will be fewer differences in observable characteristics, and only little variability in breeding material to take the breed forward.

Analyzed genetic disorders

As part of the MyDogDNA analysis, about 100 known mutations that cause genetic disorders were examined from each dog (**http://www.mydogdna.com/sites/default/files/files/mydogdna_tested_disorders_and_traits_2014.pdf**). None of the studied genetic disorders had previously been found in Norrbottenspitz. However, MyDogDNA's approach to screen widely for genetic disorders has proven to be successful. We have made a number of new findings, i.e. found mutations for the first time in breeds in which these mutations have previously

been unknown. We always ensure with careful validation that the effect of the mutation is the same in the new breed.

Essential for Norrbottenspitz is the fact that based our observations, there are carriers for a mutation causing Progressive Early-onset Cerebellar Ataxia. The mutation was originally found in Finnish Hound, but never in other breeds. Next, it would be extremely important to identify the extent to which the mutation occurs in Norrbottenspitz, as well as to examine whether possible cases of puppy deaths have occurred that could be related to the effects of this particular mutation. One plausible explanation for the mutation being present in Norrbottenspitz is that it has transferred to this breed as a result of some historical cros-breeding, followed by uptake into the breed registry. The second possible explanation would be that the mutation was present in a distant common ancestor of the Norrbottenspitz and Finnish Hound.

We highly recommend that more dogs from Norrbottenspitz and other Nordic Hunting Dog breeds are tested. Especially for Norrbottenspitz, it would be essential to find out, how large a proportion of the population carries the observed defective ataxia gene. In this context, the MyDogDNA analysis is most likely to have had a preventative role as the mutation was observed before it became a widespread health concern of the breed. It is possible to identify all carriers with genetic testing. Having affected puppies can be avoided by mating the carriers with dogs that have been tested clear for the same mutation.

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