



ICMGP 2024  
CAPE TOWN • SOUTH AFRICA • 21 - 26 JULY

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**Mercury and stable isotopes  
of nitrogen and carbon  
in the hair of wild mammals  
of the North-West of Russia**



# Purpose of research

To establish patterns of accumulation of total mercury, heavy isotopes of nitrogen ( $^{15}\text{N}$ ) and carbon ( $^{13}\text{C}$ ) in the hair of mammals of different positions in the trophic structure of terrestrial and near-aquatic ecosystems of North-West of Russia

## Study area



boreal forest



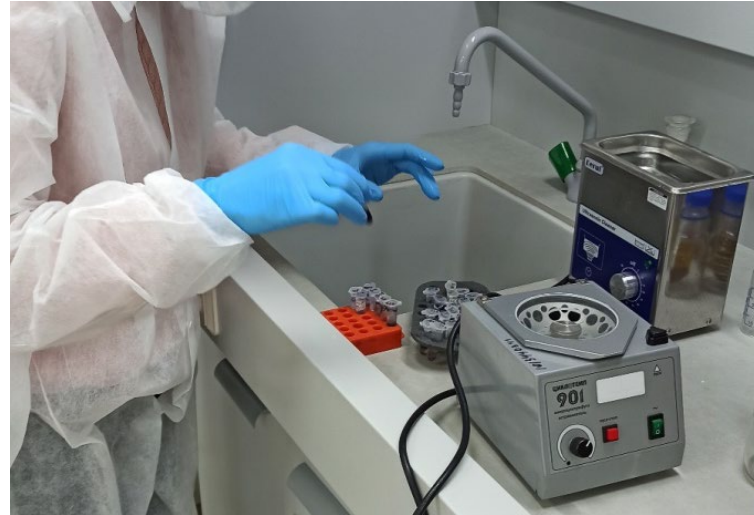
# Research objects



Order	Species	Latin name	N	Total
Carnivora	brown bear	<i>Ursus arctos</i> L., 1758	28	632 individuals 19 species of mammals
	Eurasian lynx	<i>Lynx lynx</i> L., 1758	6	
	wolf	<i>Canis lupus</i> L., 1758	10	
	red fox	<i>Vulpes vulpes</i> L., 1758	41	
	common raccoon dog	<i>Nyctereutes procyonoides</i> G., 1834	35	
	least weasel	<i>Mustela nivalis</i> L., 1766	19	
	wolverine	<i>Gulo gulo</i> L., 1758	3	
	stoat	<i>Mustela ermine</i> L., 1758	19	
	European pine marten	<i>Martes martes</i> L., 1758	115	
	European badger	<i>Meles meles</i> L., 1758	8	
	European polecat	<i>Mustela putorius</i> L., 1758	36	
	American mink	<i>Neovison vison</i> S., 1777	12	
	otter	<i>Lutra lutra</i> L., 1758	10	
Artiodactyla	moose	<i>Alces alces</i> L., 1758	72	
	wild boar	<i>Sus scrofa</i> L., 1758	45	
Lagomorpha	mountain hare	<i>Lepus timidus</i> L., 1758	32	
Rodentia	red squirrel	<i>Sciurus vulgaris</i> L., 1758	3	
	Eurasian beaver	<i>Castor fiber</i> L., 1758	48	
	muskrat	<i>Ondatra zibethicus</i> L., 1766	16	



# Materials and methods



RA-915M, Lumex



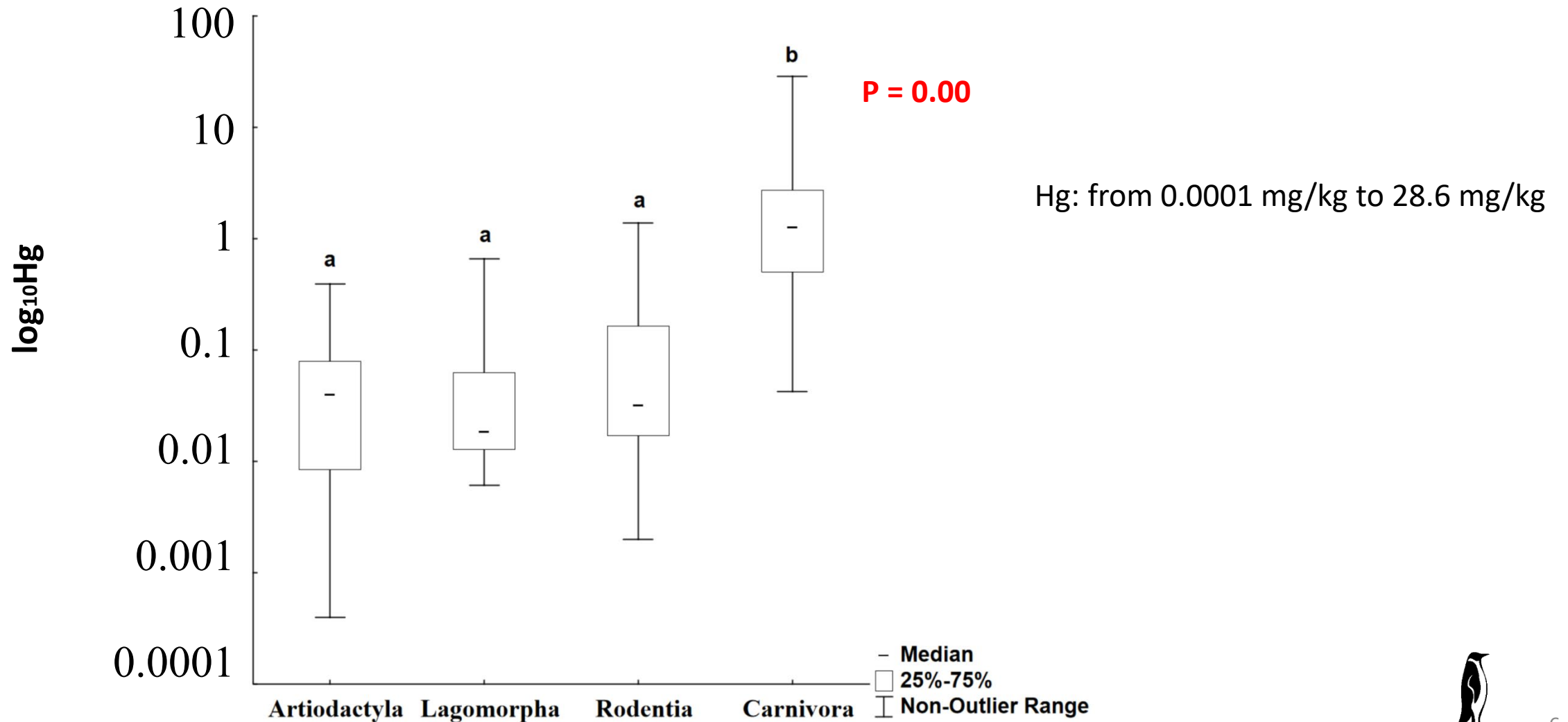
Thermo Fisher Delta V Advantage



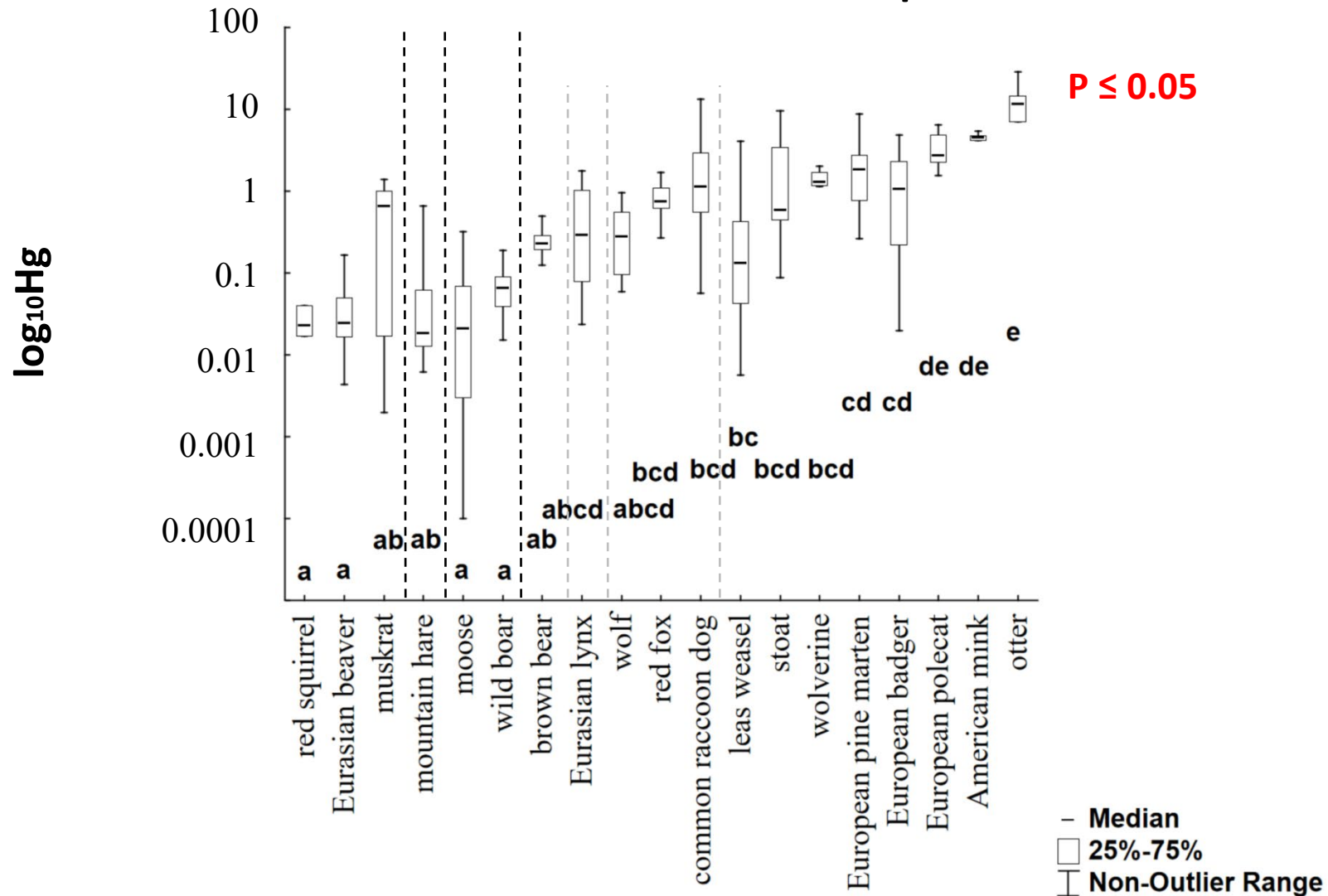
EA Isolink Flash IRMS



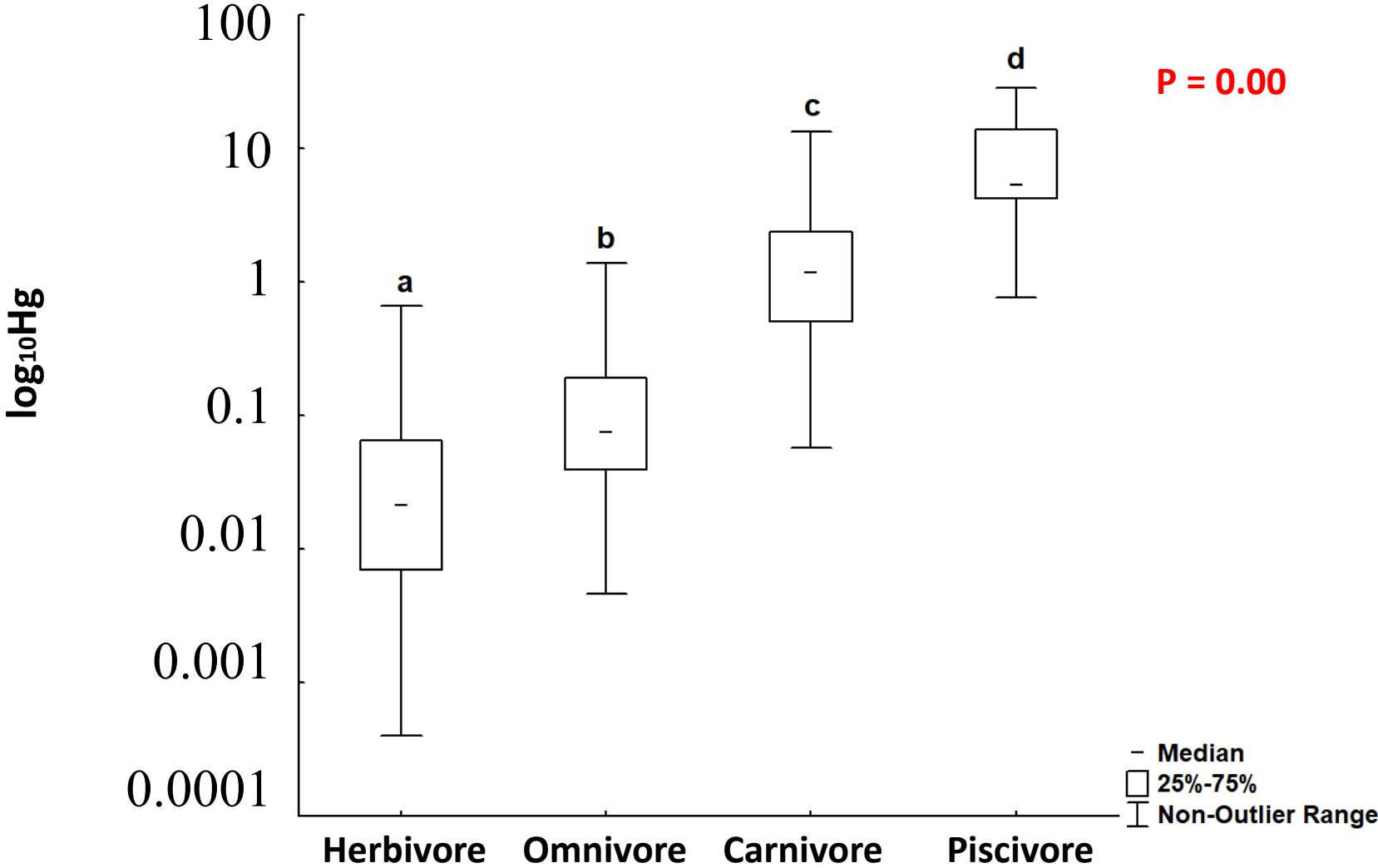
# Mercury content in the hair of mammals of different orders



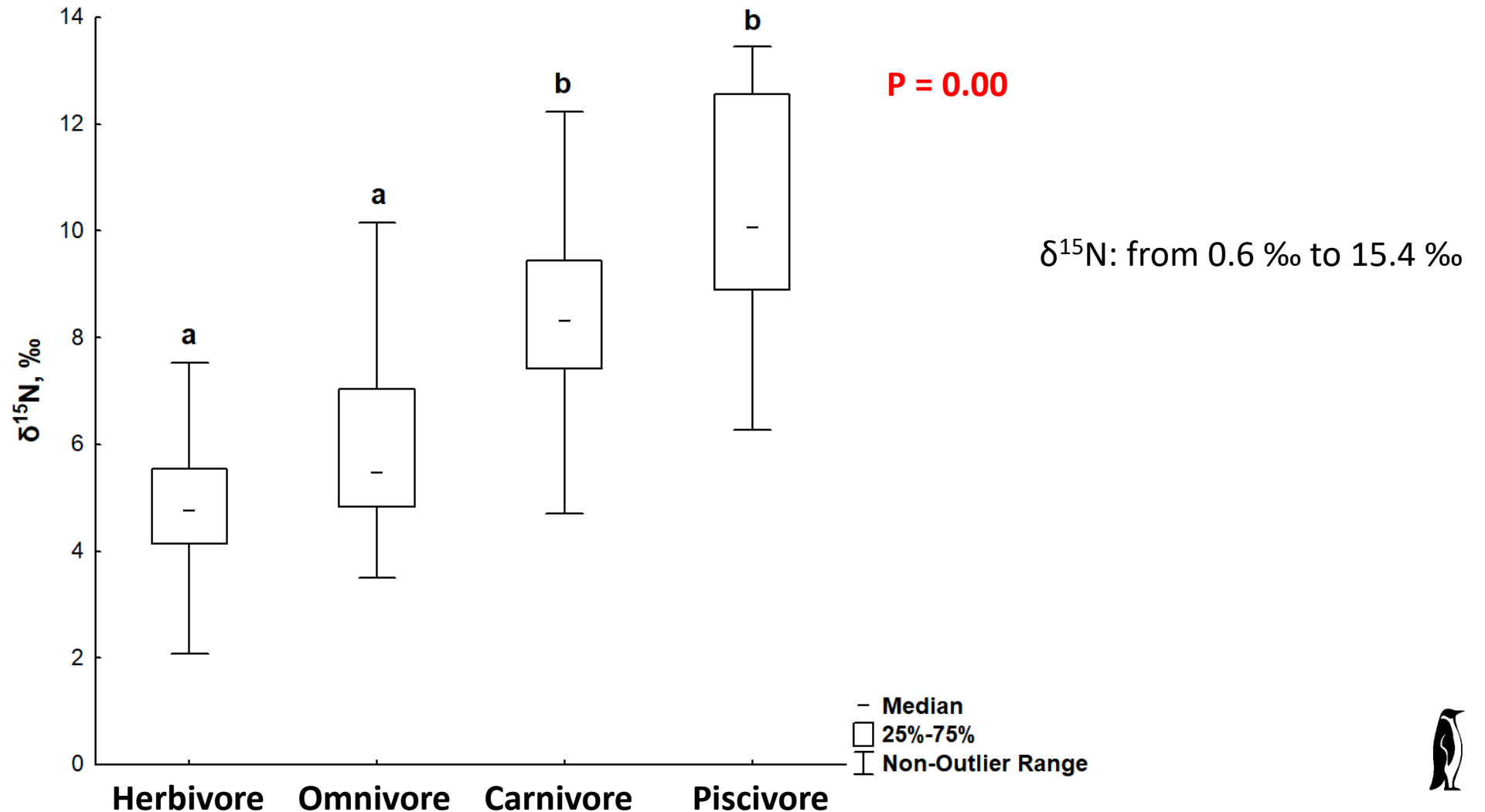
# Mercury content in the hair of mammals of different species



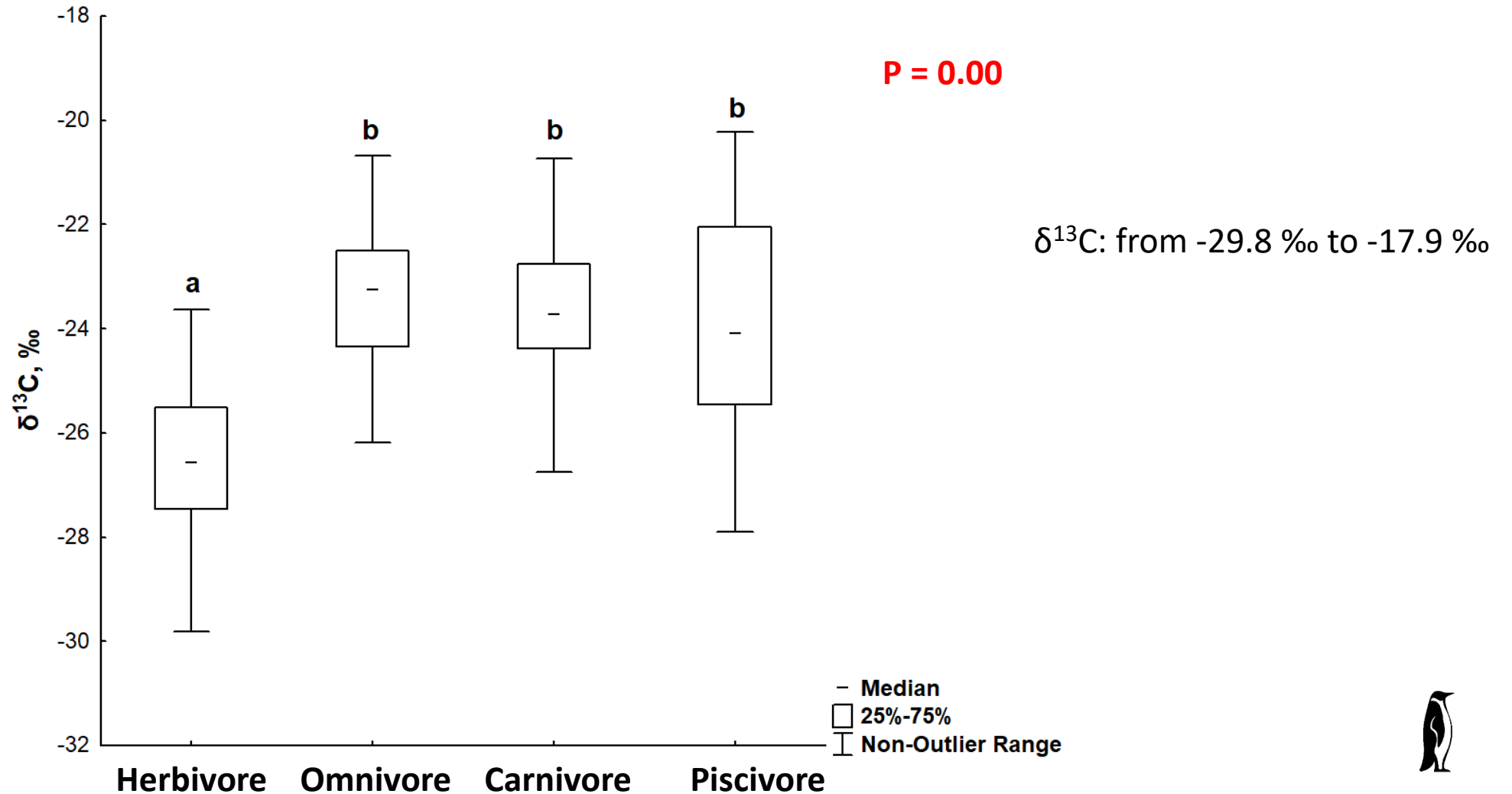
# Mercury content in the hair of mammals of different diets



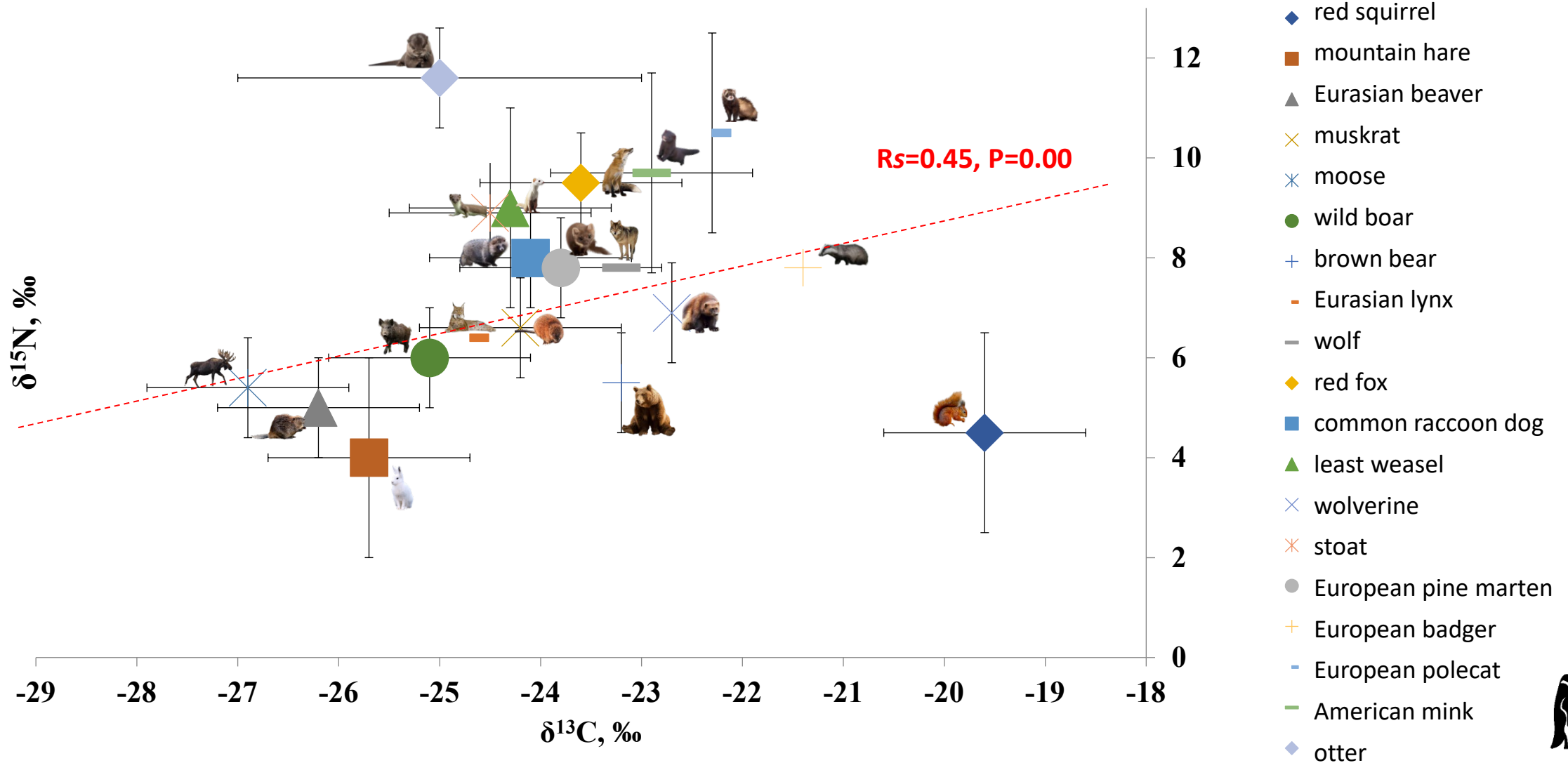
# The ratio of stable nitrogen isotopes in the hair of mammals of different diets



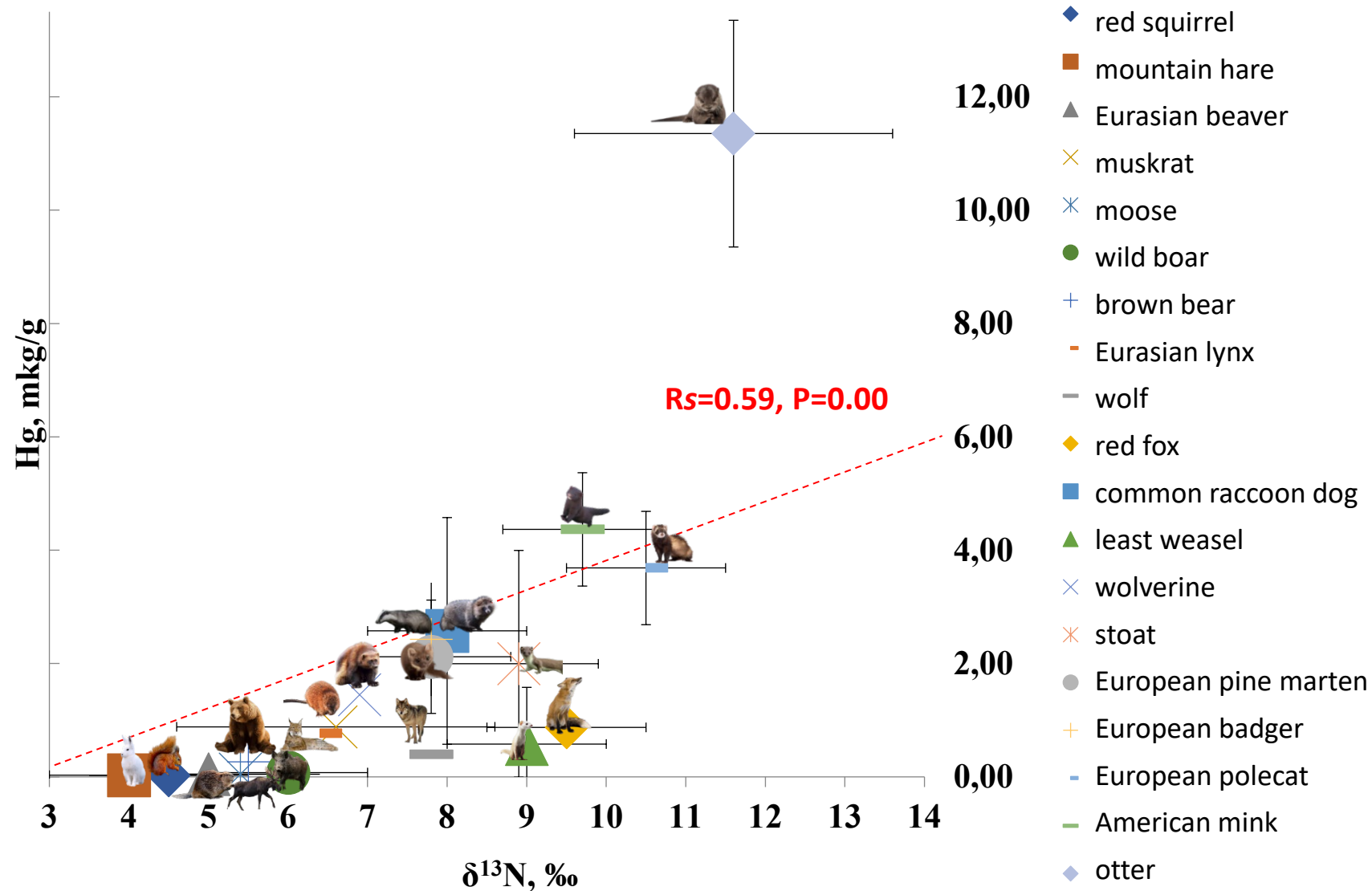
# The ratio of stable carbon isotopes in the hair of mammals of different diets



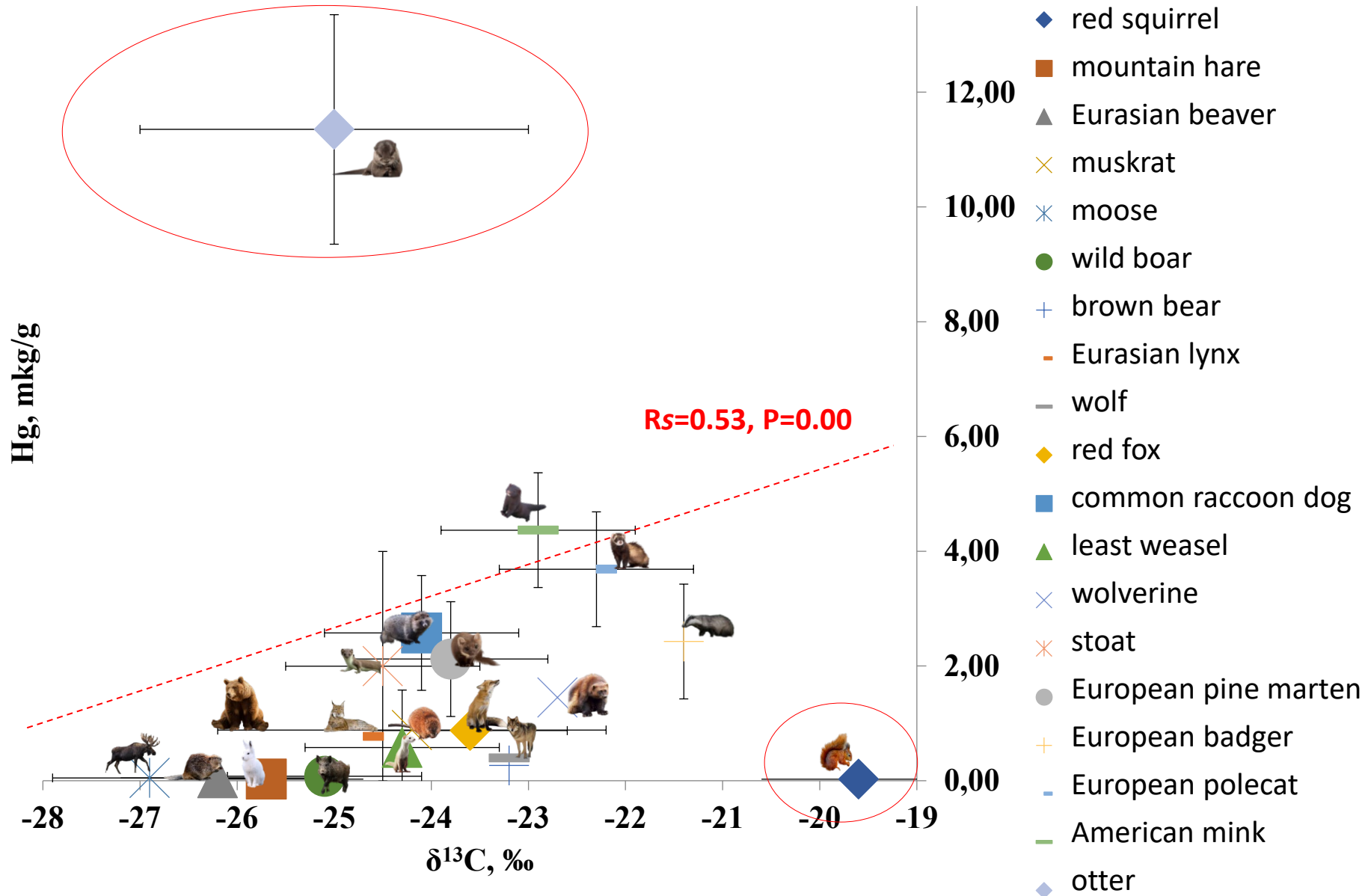
# The isotopic signature of mammals of the Nord-West of Russia



# Correlation of mercury and stable nitrogen isotopes



# Correlation of mercury and stable carbon isotopes



# Conclusions

- Hair is a convenient, non-invasive and informative object of research in the ecotoxicology and ecology of mammalian nutrition
- Based on the isotope signature data, it was found that the concentration of mercury in mammalian hair grows with an increase in the trophic position of the animal
- Near-aquatic mammals tend to be more depleted of heavy carbon isotopes than mammals of terrestrial ecosystems



# Acknowledgements



Dr. Viktor T. Komov  
Chief Researcher

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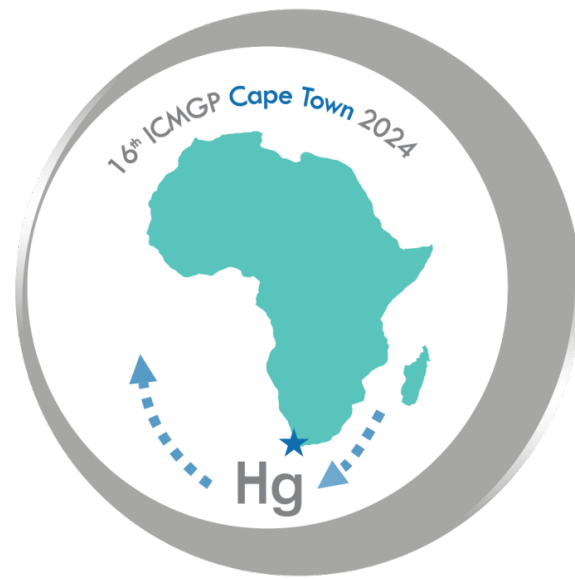
Dr. Elena S. Ivanova  
Leading Researcher

Cherepovets State University



The mercury team  
of Cherepovets State University





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