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## SUPPLEMENTARY ONLINE MATERIAL FOR

### **New systematic insights about Plio-Pleistocene moles from Poland**

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#### **Supplementary Online Material**

**SOM 1.** List of the specimens used in the GM analysis.

**SOM 2.** Measurements of the material of *Rzebikia polonica* and *Rzebikia skoczeni*.

**SOM 3.** List of the localities and relative ages where *Q. europaea*, *Rzebikia skoczeni* gen. nov. and *Rzebikia polonica* gen. nov. are present.

**SOM 4.** Wrapper functions used.

## SOM 1

List of the specimens used in the GM analysis. Abbreviations: IVPP, Institute of Vertebrate Paleontology and Paleoanthropology, Beijing, China; ISEZ-PAN, Institute of Systematics and Evolution of Animals –Polish Academy of Sciences, Kraków, Poland; UCMP, University of California, Museum of Paleontology, Berkeley, USA; LACM, Los Angeles County Museum, Los Angeles, USA.

<b>Species</b>	<b>Code</b>	<b>Museum</b>	<b>Locality</b>
<i>Quyania chowi</i>	6453.1.26, 6453.1.94	IVPP	Ertemte 2, China
<i>Rzebikia polonica</i>	MF/1015/23, MF/1015/24, MF/1015/25, MF/1015/26, MF/1017/9, MF/1018/24	ISEZ-PAN	Rębielice Królewskie 1A, Zamkowa Dolna Cave C, Kielniki 3B, Poland
<i>Neurotrichus gibbsii</i>	no code, 123766a, 123766b, 115.37.16, 115.37.17, 93940, 93942, 93943, 93944, 86880b, 86880c	UCMP; LACM	Lane County, Bodega Bay, USA
<i>Urotrichus dolichochoir</i>	69136a, F-38, 69015, P6-1067, 69136b	Lyon Université, France; Augsburg NaturMuseum, Germany	La Grive, France; Petersbuch 6, Germany
<i>Urotrichus talpoides</i>	29116, 28206, 20661, 28207, 29456, 20169, 20690, 28208, 20618, 20623, 20620, 29455	National Museum of Nature and Science, Tsukuba, Japan	Japan
<i>Dymecodon pilirostris</i>	27443, 27459, 27449, 27450, 27455, 29144, 20621, 29113	National Museum of Nature and Science, Tsukuba, Japan	Japan

**SOM 2**

Measurements (in mm) of the material of *Rzebikia polonica* and *Rzebikia skoczeni*. The measurements taken follow Skoczeń (1980; 1993). Abbreviations: L, length; W, width, N, sample amount.

Locality	Material	N	Measure	Min	Mean	Max
<i>Rzebikia polonica</i>						
Rębielice Królewskie 1A	P <sup>4</sup>	1	L W1 W2		1.7 0.8 1.22	
Rębielice Królewskie 1A	M <sup>1</sup>	3	L1 L2 L3 W1 W2	2.4 1.28 1.18 1.20 2.70	2.4 1.33 1.29 1.4 2.82	2.4 1.4 1.35 1.51 2.9
Rębielice Królewskie 1A	M <sup>2</sup>	1	L1 L2 L3 W1 W2		2 1.48 1 2 2.45	
Rębielice Królewskie 1A	P <sub>3</sub>	1	L W		0.91 0.60	
Rębielice Królewskie 1A	M <sub>1</sub>	3	L1 L2 L3 W1 W2	1.85 0.9 0.85 0.97 1.22	1.92 0.96 0.99 1.07 1.26	1.95 1 1 1.1 1.3
Rębielice Królewskie 1A	M <sub>2</sub>	9	L1 L2 L3 W1 W2	1.96 1 0.85 1.1 1.1	2.02 1.1 0.95 1.16 1.21	2.1 1.12 1 1.2 1.3
Rębielice Królewskie 1A	M <sub>3</sub>	4	L1 L2 L3 W1 W2	1.7 0.96 0.5 0.9 0.8	1.75 1 0.7 0.97 0.84	1.82 1.1 0.77 1 0.9
Zamkowa Dolna Cave C	M <sup>1</sup>	3	L1 L2 L3 W1 W2	2.2 1.12 1.1 1.1 2.42	2.33 1.14 1.27 1.2 2.58	2.49 1.18 1.4 1.3 2.68
Zamkowa Dolna Cave C	M <sup>2</sup>	1	L1 L2 L3 W1 W2		1.8 1.26 0.92 1.78 2.45	
Zamkowa Dolna Cave C	M <sub>1</sub>	1	L1 L2 L3 W1 W2		1.71 1 0.71 0.88 1.18	

Zamkowa Dolna Cave C	M <sub>2</sub>	1	L1 L2 L3 W1 W2		1.91 1.11 0.8 1.07 1.1	
Zamkowa Dolna Cave C	M <sub>3</sub>	1	L1 L2 L3 W1 W2		1.73 1.1 0.63 0.97 0.87	
Kadzielnia	P <sub>4</sub>	1	L W		1.22 0.74	
Kadzielnia	M <sub>1</sub>	2	L1 L2 L3 W1 W2	1.7 0.84 0.8 0.85 1.1	1.75 0.92 0.83 0.86 1.1	1.8 1 0.86 0.88 1.1
Kadzielnia	M <sub>2</sub>	2	L1 L2 L3 W1 W2	1.85 1 0.85 1.1 1.1	1.87 1 0.87 1.1 1.1	1.9 1 0.9 1.1 1.1
Kadzielnia	M <sub>3</sub>	1	L1 L2 L3 W1 W2		1.8 0.97 0.83 1 0.8	
Rębelice Królewskie 1A	Clavicle	6	L W	4.2 0.8	4.2 0.9	4.3 1.0
Rębelice Królewskie 1A	Radius	1	L W		8.8 0.9	
Rębelice Królewskie 1A	Humerus	8	L PW DW	8.4 3.9 4.3	8.6 4.1 4.6	9.1 4.4 4.8
Zamkowa Dolna Cave C	Humerus	1	L PW DW		8.3 4.1 4	
Kadzielnia	Humerus	1	L PW DW		7.8 3.9 3.8	
Varshets	Humerus	1	L PW DW		7.6 3.7 3.9	
Kielniki 3B	Humerus	1	L PW DW		8 4.1 4.2	
<i>Rzebikia skoczni</i>						
Węże 2	Humerus	1	L PW DW		7.2 3.6 4	

### SOM 3

List of the localities and relative ages where *Q. europaea*, *Rzebikia skoczni* gen. nov. and *Rzebikia polonica* gen. nov. are present. (/ = absent; x = present).

Locality	Age	<i>Q. europaea</i>	<i>Rzebikia skoczni</i> gen. nov.	<i>Rzebikia polonica</i> gen. nov.
Podlesice	MN14	x	/	/
Weże 1	MN15	x	/	/
Weże 2	MN15	/	x	/
Rębielice Królewskie 1A	MN16	x	/	x
Kadzielnia	MN17	x	/	x
Kielniki 3b	MN17	/	/	x
Zamkowa Dolna Cave C	MN17	/	/	x
Varshets	MN17	/	/	x

## SOM 4

Wrapper functions used.

```
pwpermanovac<-function(y, group, method="none", nperm = 999){
  library(vegan)
  group<-factor(group,levels=unique(group))
  species<-as.numeric(group)
  fat_species<-group
  r_adonis<-matrix(0,nrow=max(species),ncol=max(species))
  p_adonis<-matrix(0,nrow=max(species),ncol=max(species))
  for(i in 1:(max(species)-1))
  {
    for(j in (i+1):max(species)){
      ado<-
adonis(y[species==i|species==j]~as.factor(fat_species[species==i|species==j]),permutations=nperm,method="euclidean")
      p_adonis[i,j]<-ado$aoV.tab$Pr[1]
      r_adonis[i,j]<-ado$aoV.tab$R2[1]
    }
  }
  rownames(p_adonis)<-colnames(p_adonis)<-levels(fat_species)
  rownames(r_adonis)<-colnames(r_adonis)<-levels(fat_species)

  out<-list(p_adonis=p_adonis,r_adonis=r_adonis)

  tab<-p.adjust.mat(out$p_adonis,method=method)

  return(list(p_value_corrected=tab,r_adonis=out$r_adonis))

}

#####

pwperanovac<-function(y, group,method="none", nperm = 999){
  library(vegan)
  group<-factor(group,levels=unique(group))
  species<-as.numeric(group)
  fat_species<-group
  r_adonis<-matrix(0,nrow=max(species),ncol=max(species))
  p_adonis<-matrix(0,nrow=max(species),ncol=max(species))
  for(i in 1:(max(species)-1))
  {
    for(j in (i+1):max(species)){
      ado<-
adonis(y[species==i|species==j]~as.factor(fat_species[species==i|species==j]),permutations=nperm,method="euclidean")
      p_adonis[i,j]<-ado$aoV.tab$Pr[1]
      r_adonis[i,j]<-ado$aoV.tab$R2[1]
    }
  }
  rownames(p_adonis)<-colnames(p_adonis)<-levels(fat_species)
  rownames(r_adonis)<-colnames(r_adonis)<-levels(fat_species)

  out<-list(p_adonis=p_adonis,r_adonis=r_adonis)

  tab<-p.adjust.mat(out$p_adonis,method=method)

  return(list(p_value_corrected=tab,r_adonis=out$r_adonis))

}
```