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Comments on the Status of the Sardinian-Corsican Lacertid Lizard *Podarcis tiliguerta*

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Podarcis tiliguerta **is a lacertid lizard endemic to Corsica, Sardinia and many of their satellite islands. The purpose of this study was to assess the relationships among the various island populations using morphological characters, to assess the usefulness of these characters in phylogenetic studies, and to test the concordance of morphological and earlier genetical studies. Snout-vent length and 11 pholidotic characters have been studied on 2783 specimens from localities on the two main islands and the majority of their respective satellite islands. Data for males and females are analyzed separately using uni- and multivariate statistical methods; the results are compared to previous genetical analyses. With few exceptions, the two populations, one on Corsica, the second on Sardinia (and their satellite islands), are readily distinguishable. We argue that the few exceptions may be due to a founder effect and/or genetic drift. The male sample from northern Corsica and both sex samples from southern Corsica present unresolved problems because they group with the Sardinian clade. Our results, for the most part, are in accord with those obtained with genetical analyses, but further studies are needed to clarify the unresolved questions.**

Riassunto

Podarcis tiliguerta **è una specie endemica di Corsica, Sardegna e molte delle loro isole satelliti. Nel presente lavoro sono stati analizzati la lunghezza testa-cloaca e 11 caratteri della folidosi di 2783 esemplari provenienti da varie località delle isole principali e la maggior parte delle loro isole satelliti. Lo scopo è stato quello di analizzare da un punto di vista morfologico le relazioni tra le varie popolazioni, di verificare l'utilità di questi caratteri negli studi filogenetici e di testare la concordanza tra risultati morfologici e genetici. I dati sono stati analizzati, separatamente per maschi e femmine, con metodi di statistica univariata e multivariata, e i risultati sono stati confrontati con precedenti studi genetici. Le due popolazioni di Corsica e Sardegna (e rispettive isole satelliti) risultano piuttosto ben distinguibili, con poche eccezioni dovute probabilmente a fenomeni di effetto fondatore e deriva genetica. Il campione di maschi del nord della Corsica e i due campioni di maschi e femmine del sud della Corsica occupano una posizione problematica, risultando inclusi nella popolazione sarda. In generale i risultati concordano in larga parte con quelli ottenuti dalle analisi genetiche, ma ulteriori studi sono ritenuti necessari per chiarire alcune delle que-stioni rimaste aperte.**

KEY WORDS: Reptiles, Lacertidae, *Podarcis*, morphology, phylogeny, biogeography, Sardinia, Corsica.

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Podarcis tiliguerta is a lacertid lizard that is endemic to the islands of Corsica and Sardinia and their respective satellite islets. These islands, as a group, have been isolated from the mainland since the last glacial-eustatic marine regression (Ulzega 1995). It is uncertain when the ancestor of *P. tiliguerta* entered the area; although it could have been present before the detachment of the Sardinian-Corsican microplate in the Miocene, there is as good a chance that it arrived during the late Miocene Messinian sea-regression (Lanza 1983). The uncertainty exists because to this day the species' phylogenetic affinities remain unclear. For instance, in one recent study, *P. tiliguerta* has been related to *P. raffonei* (Oliverio et al. 2000), whereas in another study, its affinities are posited with the "Western Islands group," which also includes *P. filfolensis, P. lilfordi,* and *P. pityusensis* (Harris and Arnold 1999).

As do many other of its congeneric species, *P. tiliguerta* shows considerable intraspecific variability in both color pattern and coloration, with even some melanic and concolor populations (Lanza 1972, 1976; Lanza and Brizzi 1974, 1977; Brizzi and Lanza 1975; Lanza and Poggesi 1986; Arnold and Ovenden 2002). The fact is that a number of subspecies have been described for populations occurring on different satellite islands (Lanza and Corti 1996); these nominal taxa have been based mainly on colour pattern and some morphological traits (Corti and Lo Cascio 2002). Inasmuch as recent studies using genetic markers have indicated a high degree of variability and population sub-structuring within previously recognized *Podarcis* species, some authors have come to consider them either as separate species or as species complexes (e.g., Capula 1994 [*P. wagleriana*]; Harris and Sá-Sousa 2001, 2002 and Sá-Sousa and Harris 2002 [Iberian *Podarcis*]; Poulakakis et al. 2003 [*P. erhardii*]). *Podarcis tiliguerta* seems not to be an exception. Electrophoresis studies by Capula (1996) showed that the species' genetic variation was distributed within two and possibly three main groups, one Corsican and a second Sardinian, with the Cerbicale-Lavezzi Archipelago populations having differentiated from both, although seemingly closer to the one on Corsica. Indeed, genetic distances among the three groups were considered higher than those ordinarily found within other *Podarcis* species. More recently, several studies based on mtDNA have partly supported Capula's results. Pinho et al. (2004) and Harris et al. (2005) detected deep genetic divergence between the Corsican and Sardinian clades, but at that time no samples from the Cerbicale-Lavezzi Archipelago were analysed. Almost simultaneously, Podnar and Mayer (2005) detected three mtDNA lineages: Corsica, northern + central + western Sardinia, and eastern Sardina, but they rejected the hypothesis of a species complex. Finally, Vasconcelos et al. (in press) reanalysed all previously published mtDNA sequences to which they added several new samples, including one from the Cerbicale Islands. Their results confirmed the strong genetic divergence between Corsican and Sardinian populations and the Cerbicale population, which, nonetheless, appears to nest with the Corsican clade. However, without additional samples from the eastern Sardinian clade, this form is still known from only one sample.

In lacertid lizards, as in other groups, morphological and molecular studies are proving most useful in supplying complementary information, and both have been used for the reconstruction of phylogenies (see, for instance, Arnold 1989; Harris et al. 1998; Malhotra and Thorpe 2004a and 2004b, these latter two on Asian pitvipers of the genus *Trimeresurus*). At this point, the aim of our work is to test the *P. tiliguerta* "species complex hypothesis" using morphological data, that focuses on pholidosis, an aspect that has never been extensively studied in this species. Our goal is to assess the usefulness of the characters in phylogenetic studies and to test the concordance of morphological and genetical results.

FIGURES 1–4. *Podarcis tiliguerta.* (1) Four adult ♂♂, Leg. Paolo Malenotti, 1980. Mount Spada, m 1400-1500 a.s.l., northern slope of the Gennargentu Mountains (central eastern Sardinia). Photo Benedetto Lanza; (2) Two ♂♂ (left) and two ♀♀ (right), data otherwise as in Fig. 1; (3). Six adult ♂♂, Leg. Benedetto Lanza, 25.VII.1972. Between Giannuccio and Omo di Cagna (S. Corsica). Photo B. Lanza; (4). Four adult ♀♀, data otherwise as in Fig. 3.

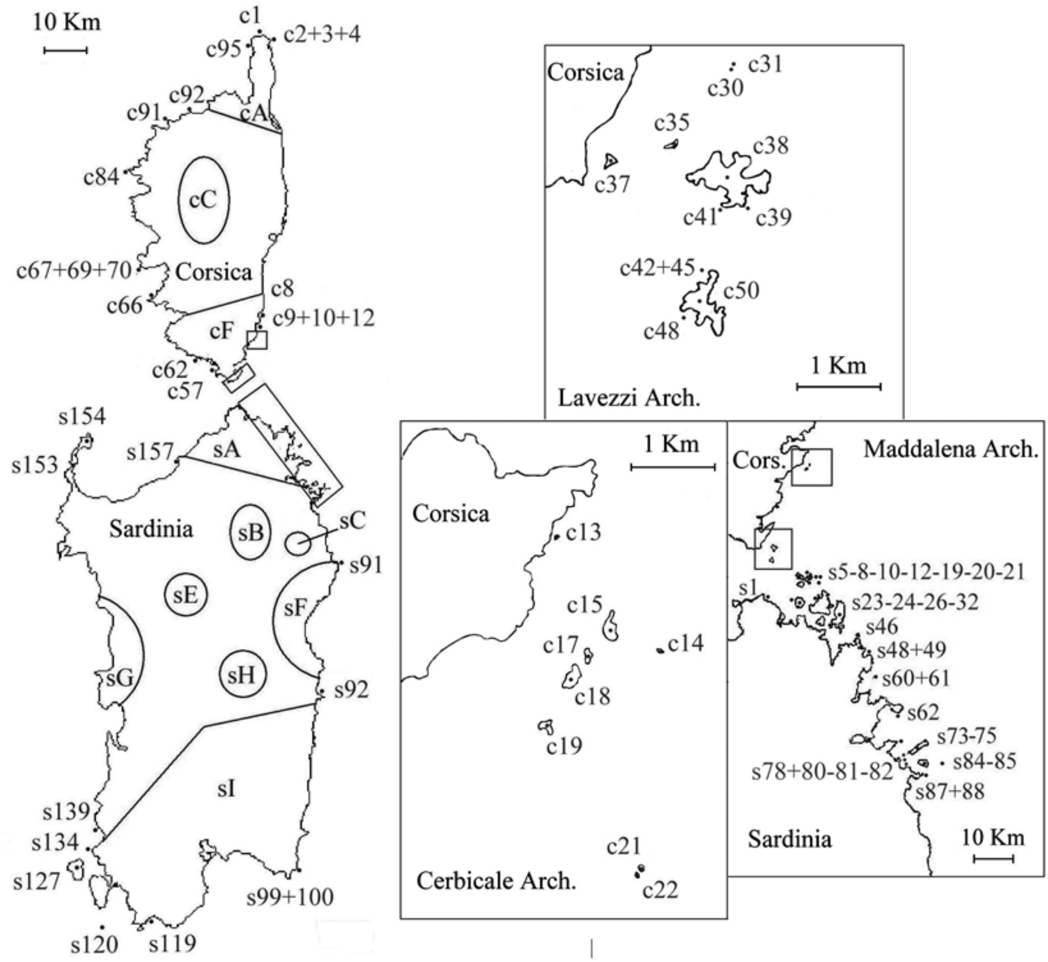

FIGURE 5. Islands and localities studied. The numbering used for the Sardinian satellite islands is the same as in Poggesi et al. (1995) and Lanza & Poggesi (1986) for those around Corsica. c1: Giraglia Island; c2: Di Mezzo Islet; c4: Finocchiarola Islet; c8: Pinarello Island; c9: Cornuta Islet; c10: San Cipriano Island; c12: Scoglio Ziglione; c13 Farina Islet; c14: La Vacca Islet; c15: Forana Island; c17: Maestro Maria Island; c18: Piana delle Cerbicali Island; c19: Pietricaggiosa Island; c21 Toro Grande Island; c22: Toro Piccolo Island; c30: Poraggia Piccola Islet; c31: Poraggia Grande Islet; c35: Ratino Island; c037: Piana di Cavallo Island; c38: Cavallo Island; c39: Camaro Canto Islet; c41: San Bainzo Islet; c42: Luigi Giaffieri Islet; c45: Giacinto Paoli Islet; c48: Semillante Islet; c50: Lavezzi Island; c57: Northern Tonnara Islet; c62: Bruzzi Grande Islet; c66: Piana di Portigliolo Island; c67: Mezzomare Island; c69: Locca Islet; c70: Porro Islet; c84: Gargalu Island; c91: Spano Islet; c92: Rossa Island; c95: Centuri Island; s1: Marmorata Northern Island; s5: Razzoli Island; s8: Capicciolu Islet; s10: S. Maria Island; s12: Paduleddi Northern Islet; s19: Corcelli Islet; s20: Piana della Maddalena Island; s21: Barrettini Island; s23: Spargiotto Islet; s24: Spargi Island; s26: Abbatoggia Islet; s32: Caprera Island; s46: Le Bisce Island; s48: Li Nibani Northern Island; s49: Li Nibani Western Island; s60: Camere Western Island; s61: Soffi Island; s62: Figarolo Island; s73: Barca Sconcia Island; s75: Tavolara Island; s78: Piana di Tavolara Island; s80: Cavalli Island; s81: Reulino Island; s82: Cana Island; s84: Molara Island; s85: Molarotto Islet; s87: Proratora Island; s88: Brandinchi Island; s91: Ruia Island; s92: Ogliastra Island; s99: Southern Varaglione of Serpentara; s100: Serpentara Island; s119: Rossa di Punta Niedda Island; s120: Toro Island; s127: S. Pietro Island; s134: Meli Islet; s139: Pan di Zucchero Island; s153: Piana dell'Asinara Island; s154: Asinara Island; s157: Rossa di Trinità d'Agulto Island. Female's samples are missing from islands: c84, c91, s1, s10, s19, s24, s46, s48, s49, s60, s61, s82, s99, s119, s139, s157.

Materials and methods

A total of 2783 specimens were studied (1812 ♂♂ and 971 ♀♀). Nearly all specimens were collected between the end of the 1960s and the first half of the 1990s primarily by B. Lanza and collaborators (M. Borri, B. Conti, C. Corti, M. Poggesi, and others) from three Corsican and eight Sardinian localities and many of their respective satellite islands (Fig. 5). Most of the specimens are preserved in the Zoological Section "La Specola" of the Natural History Museum, University of Florence (MZUF); additional material in the herpetological collections of the California Academy of Sciences (CAS) San Francisco, USA was also examined.

A total of 12 variables have been studied: snout-vent length (SVL), measured to the nearest 1 mm using callipers, and 11 pholidosis characters (Fig. 6). For bilateral characters, only the right side was considered, although the left side was examined in the case of the ventral scales, for handling reasons. In those instances where the right side was damaged, we did take data from the left side. Furthermore, where either unilateral and/or bilateral characters could not be assessed because damage to both sides of a specimen, those specimens have not been included in the multivariate analyses. Measurements and counts were done mainly by S. Bruschi, B. Lanza, and C. Corti.

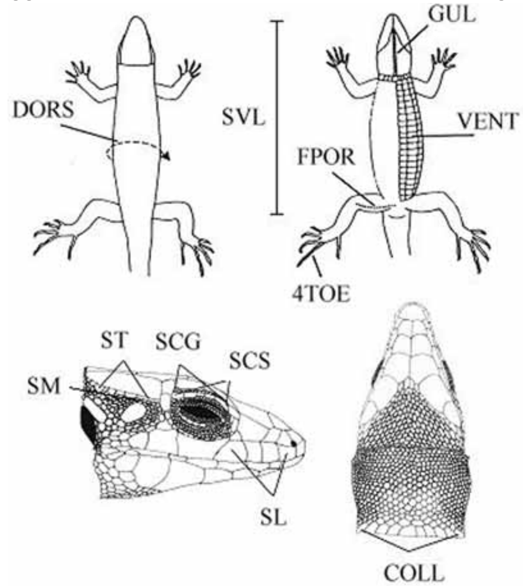

FIGURE 6. Characters analysed (above: by Cheylan, 1988, modified; below: original). SVL: snout-vent length; DORS: dorsal scales along a transversal line at the middle of the body; VENT: ventral scales along the midline on the left side of the body; COLL: collar shields; GUL: gular scales on the midline (from the confluence of the inframaxillary scales to the collar shields); FPOR: femoral pores; 4TOE: scales under the 4th toe; SCS: supraciliar scales; SCG: supraciliar granules; ST: supra-temporal scales; SL: supra-labial scales preceding the eye; SM: scales on the shortest line connecting the masseteric shield and the supratemporal scales.

Pholidotic characters have been analysed with both uni- and multivariate methods. AN(C)OVA and MAN(C)OVA were used to test variation between localities and island groups for each variable and for all of them, respectively. SVL was used as covariate. Discriminant function analysis on the raw data or on the regression residuals against SVL were performed to distinguish the most relevant island groups. The subsequent matrix of Mahalanobis distances among populations was used to construct both a UPGMA tree and a MDS (Multidimentional Scaling) bidimensional plot.

Results

ANOVAs conducted prior to the other statistical analysis indicate that males and females of the species are dimorphic in many of the studied characters (SVL, DORS, VENT, COLL, GUL, FPOR, 4TOE) with no interaction effects between sexes and sites. Consequently, all statistical analyses have been conducted keeping the sexes separated. ANOVA and MANOVA also showed a highly significant variability among localities for the different variables. For more detailed results, see Table 1. For descriptive statistics, see the Appendix, Tables 2 and 3.

Discriminant function analysis using forward stepwise procedure showed that the 11 pholidotic variables were highly significant in discriminating among the groups, so all were included. In

UPGMA trees for males and females (Figs. 7 and 8), two clades grouping Corsican and Sardinian samples, respectively, easily could be distinguished. Nevertheless, some islands and islets did not group within either of these two geographic groups: among these were Corsican males, c91 (Spano), and Corsican females, c13 (Farina). This also happened with males from the circum-Sardinian islands s19 (Corcelli), s82 (Cana), and s99 (Faraglione di Serpentara), from where no female samples were available, males from s85 (Molarotto), whose females grouped with the Sardinian clade, and females from s12 (Northern Paduleddi), whose males grouped in the Sardinian clade. Finally, both males and females of c14 (La Vacca Islet), c21 (Toro Piccolo Islet), and c22 (Toro Grande Islet), belonging to the Cerbicale Islands, as well as c30 (Poraggia Piccola), s20 (Piana della Maddalena), and s134 (Meli Islet), did not group with either one of the two clades, nor did they coalesce to form a third clade; rather they appeared as independent entities in our trees.

In a like manner, some samples from the islands bordering Sardinia on the north and northeastern nested within the Corsican clade: males, s48 (Northern Li Nibani), s61 (Soffi), s153 (Piana dell'Asinara) and s157 (Rossa di Trinità d'Agulto). Interestingly, females, which were available only from island s153, nested within the Sardinian clade, whereas samples from s8 (Capicciolu) and s26 (Abbatoggia) fitted into the Corsican clade. Males of the latter two islands fell within the Sardinian clade as did both sexes of c39 (Camaro Canto, SE Corsica).

With regard to the two main islands, all populations were allocated into the two main clades. The only exception were males from cA and both sexes of cF (N and S Corsica, respectively), which fell into the Sardinian clade, and females of sC (surroundings of Torpé, NE Sardinia), which did not fit in either clade.

The existence of the Corsican and Sardinian groups was also graphically supported by the MDS plots (Figs. 3 and 4). The 95% confidence ellipses overlapped, slightly more in males than in females, but the separation between them was in any case evident. Those populations previously ungrouped with any of the clades in the trees were those plotted apart from the others in the MDS: for both sexes c14 (La Vacca) and c22 (Toro Piccolo) from the Cerbicale Islands; for males s82 (Cana), s49 (Western Li Nibani), and s99 (Varaglione di Serpentara) (note that s82 [Cana] fell into the Corsican ellipse [female samples were lacking for the same localities]); for females s20 (Piana della Maddalena), s12 (Northern Paduleddi), and s134 (Meli) (note that s20

TABLE 1. ANOVA and MANOVA comparisons between sites and sexes for localities from which samples of both sexes were available. Numbers indicate F (ANOVA) or Wilk's λ (MANOVA), df and P.

ANOVA	*Site*	*Sex*	*Site*sex*
dors	20.33	229.97	0.78
	71, 2378	1, 2378	71, 2378
	<0.0001	<0.0001	0.91
vent	7.54	1308.47	1.15
	71, 2378	1, 2378	71, 2378
	<0.0001	<0.0001	0.19
coll	10.8	12.23	0.95
	71, 2378	1, 2378	71, 2378
	<0.0001	<0.0001	0.6
gul	16.19	34.47	1.18
	71, 2378	1, 2378	71, 2378
	<0.0001	<0.0001	0.14
fpor	17.73	32.01	1.24
	71, 2378	1, 2378	71, 2378
	<0.0001	<0.0001	0.09
4toe	12.64	13.91	0.74
	71, 2378	1, 2378	71, 2378
	<0.0001	0.0002	0.95
scs	5.05	2.65	1
	71, 2378	1, 2378	71, 2378
	<0.0001	0.1	0.48
scg	10.07	2.93	1.1
	71, 2378	1, 2378	71, 2378
	<0.0001	0.09	0.26
st	12.9	1.05	0.92
	71, 2378	1, 2378	71, 2378
	<0.0001	0.3	0.66
sl	2.27	0.47	1.14
	71, 2378	1, 2378	71, 2378
	<0.0001	0.49	0.21
sm	11.06	2.94	1.21
	71, 2378	1, 2378	71, 2378
	<0.0001	0.09	0.12
MANOVA	9.74	147.35	1.01
	781, 25793	11, 2368	781, 25793
	<0.0001	<0.0001	0.0001

[Piana della Maddalena] also fell into the Corsican ellipse).

Inasmuch as all these multivariate analyses showed a clear separation between the Corsican and Sardinian populations, discriminant function analysis considering these two geographic groups was performed. Results indicated high, not absolute, percentages of correct classification for both males (82% for Corsica and 75% for Sardinia, total 79%) and females (86% for Corsica and 75% for Sardinia, total 81%). Such analyses were repeated considering different population groups. Every attempt to separate La Vacca, Toro Grande, and Toro Piccolo Islets resulted in a general slight decrease in those values, both considering them as a third group (males: Corsica 82%, Sardinia 77%, islets 66%, total 79%; females: Corsica 84%, Sardinia 76%, islets 70%, total 80%) or deleting them from the analyses (males: Corsica 82%, Sardinia 77%, total 79%; females: Corsica 84%, Sardinia 76%, total 80%). The same applied when islets were forced to segregate from the main islands within each clade, considering them as a third and fourth group (males: Corsica 21%, Sardinia 0%, Corsican islands 83%, Sardinian islands 79%, total 61%; females: Corsica 22%, Sardinia 12%, Corsican islands 84%, Sardinian islands 74%, total 60%). On the other hand, when considering the sample of S Corsica integrated in the Sardinian sample, the percentages showed little variation with an improvement for Corsica and a decrease for Sardinia (males: Corsica 77% and Sardinia 83%, total 81%; females: Corsica 81%, Sardinia 79%, total 80%). Separating southern Corsican from the Corsican and the Sardinian samples resulted in a slight improvement in the classification percentages of the two former clades (males: Corsica 84%, Sardinia 83%; females: Corsica 85%, Sardinia 79%), but it also led to a decrease in totals (males 76% and females 77%) because the third and fourth groups could not be correctly classified (males 1% and females 0%). Finally, the classification of single individuals, at least within S Corsica, did not show clear microgeographical separation from specimens classified as "Sardinian" or "Corsican."

Considering the three groups of Corsica, Sardinia, and southern Corsica, MANOVA detected significant variation (males: Wilk's $\lambda_{22,3242} = 0.57$, $p<0.0001$; females Wilk's $\lambda_{22,1828} = 0.54$, $p<0.0001$). Almost all variables were different among localities with the one exception of SL (both sexes) and SM (females). Many subsequent ANOVA comparisons were significant: between Corsica and Sardinia DORS, COLL, GUL, FPOR, SCG and ST for both sexes, SCS, SL, and SM for males, 4TOE for females; between southern Corsica and Corsica DORS, VENT, GUL, FPOR, SCS, SCG, and ST for both sexes, COLL for males; between southern Corsica and Sardinia DORS, VENT, COLL, GUL, 4TOE, SCS, ST, and SM for both sexes, FPOR for females (Scheffe's test $p<0.05$). In both sexes and for the significant variables, Sardinian animals had more scales than those from Corsica, except in the case of ST, in which the reverse is true. The southern Corsican sample occupies an intermediate position with respect to DORS, COLL, GUL, FPOR, SCG, ST, and SL, but more scales are present for 4TOE and SCS and fewer scales for VENT and SM than in either Corsican or Sardinian samples.

In addition to meristic characters, in body size, Sardinian lizards were longer than Corsican ones ($p<0.00001$ in both sexes). Furthermore, a correlation analysis among SVL and several pholidotic characters detected positive, significant relations: in males, DORS (R^2=0.14 p=0.0004), GUL (R^2=0.07 p=0.02), FPOR (R^2=0.05 p=0.04), 4TOE (R^2=0.11 p<0.002), and ST (R^2=0.06 p=0.02; in females, DORS (R^2=0.16 p=0.0005), VENT (R^2=0.16 p=0.0005), and 4TOE (R^2=0.08 p=0.01). Therefore, all the analyses were repeated correcting for body size. Discriminant function analyses performed on the regression residuals of the variables against SVL produced similar UPGMA trees, MDS plots and percentage of correct classification of cases. Similarly, the same results were obtained performing MANCOVA and ANCOVAs calculated using SVL as a covariate.

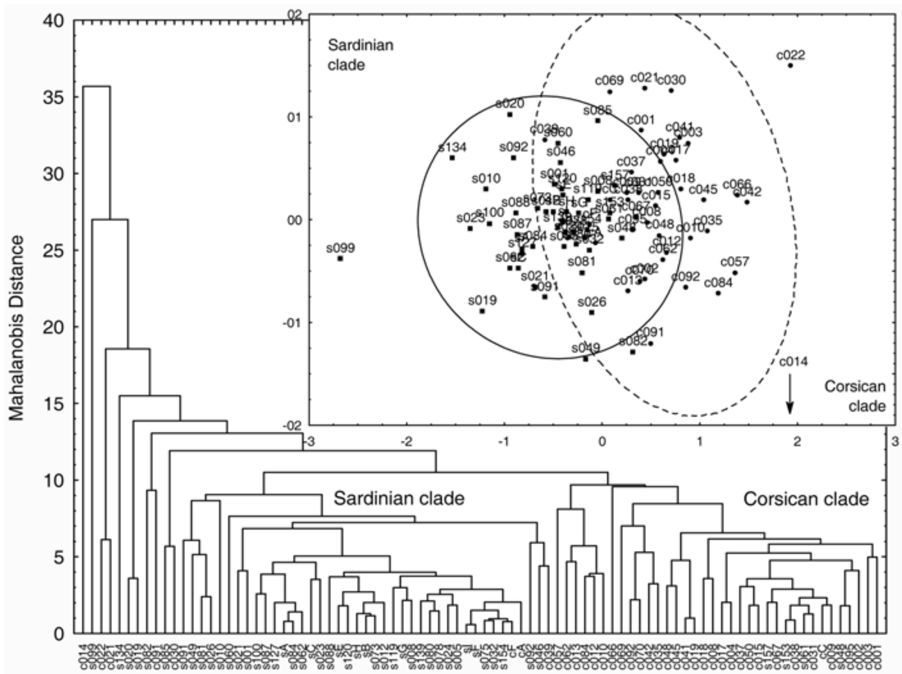

FIGURE 7. UPGMA tree and MDS scatterplot for males.

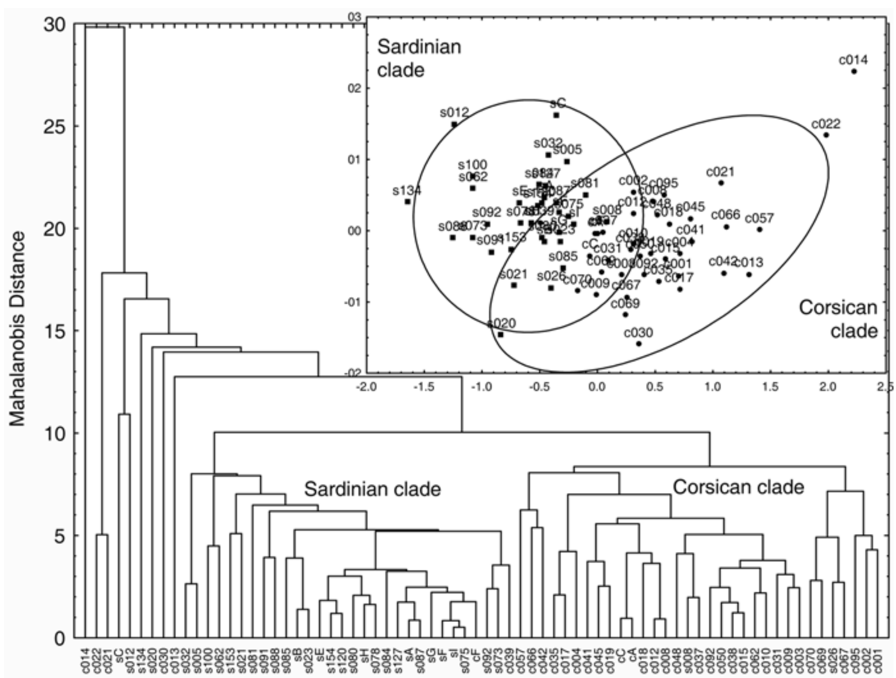

FIGURE 8. UPGMA tree and MDS scatterplot for females.

DISCUSSION

Discriminant function analysis of pholidotic characters of *Podarcis tiliguerta* shows that there is a good differentiation between Corsican and Sardinian populations. No north-south geographical gradient could be detected, and it is possible to exclude even possible effects of insularization: % of correct classification of main islands' specimens did not increase considering Sardinian and Corsican islands as third and fourth groups, and these two last groups had very low levels of correct classification. Thus, it is not possible to discriminate among satellite islands and their respective main islands.

In stepwise discriminant function analysis, all pholidotic variables proven useful in discriminating among the groups. ANOVAs show that most of the variables are significantly different between Corsican and Sardinian clades (excluding from consideration southern and northern Corsican sample): Sardinian specimens have more dorsal, collar, and gular scales, more femoral pores, supracilar granules and scales between the masseteric shield and the supratemporal scales (the last in males). On the other hand, Corsican specimens have more supratemporal scales. Many, if not all the characters are thus important in distinguishing between the two groups of animals, even though the ranges of scale counts largely overlap as in all *Podarcis* species (Arnold and Ovenden 2002).

It must be noted that Sardinian animals are also longer (snout-vent length) than Corsican ones, and a correlation between some pholidotic variables and snout-vent length has been detected between populations. Correlation was not detected within populations and corrections for length did not change the results in either discriminant function analysis or ANOVAs. This suggests that at least part of the variation in scale counts between the two groups is due not to differences in size but rather to phylogeny. This conclusion is further supported by the fact that the number of supratemporal scales decreases, rather than increases, with increasing snout-vent length.

The present work then agrees with the results of the genetics analyses conducted by Harris et al. (2005) and Vasconcelos et al. (in press). The existence of a third clade, represented by specimens from the Cerbicali Islands (Capula 1996), is not supported by morphological data inasmuch as the populations from this archipelago do not group into a uniform clade. Noteworthy is that the "archipelago's" islands and islets include Toro Grande, Toro Piccolo, and La Vacca. Toro Grande and Toro Piccolo are located at the greatest distance from the coast of Corsica and are the only Corsican islands for which the depth of the sea strait separating them from the main island is more than 50 m. (see Figs. 5 and 9). Based on these values and the known oscillations of the sea level during the past 20,000 years, it has been estimated that these islands have been isolated since about 11,000–12,000 years ago. In a like manner, La Vacca became isolated between 8,000 and 8,500 years ago (Lanza and Poggesi 1986). Thus, the deviations noted in their populations may be attributed to both founder effect and genetic drift on islands of ancient origin. We have been unable to detect multiple lineages on Sardinia itself, despite the apparent existence of two divergent mtDNA lineages (Podnar and Mayer 2005). The female sample sC from the surroundings of Torpé (NE Sardinia) cannot be aligned with any clade; this may be attributed to the small sample size that was available for study and analysis.

None of the previously mentioned molecular studies on *P. tiliguerta* included specimens from southern Corsica. From a morphological point of view, these specimens clade with Sardinia and have intermediate scale counts with respect to dorsal, collar, gular, and supratemporal scales, femoral pores, and supraciliar granules, more lamellae and supraciliar scales, fewer ventral scales and scales between the masseteric shield and the supratemporal. We suggest the possibility of hybridization between Corsican and introduced Sardinian specimens. For instance, the city of

Bonifacio, which is located on the southern coast of Corsica, has an active harbour that daily receives commerce from N Sardinia. Inasmuch as introductions of Sardinian animals have already been detected, for example, *Podarcis sicula cettii* (Delaugerre and Cheylan 1992), it seems reasonable to expect that *P. tiliguerta*, a species often found close to human settlements (Corti and Lo Cascio 2002), should also be among the introductions.

FIGURE 9. Submarine topography showing the Sardinia-Corsica submarine platform and its relation to coastal shelf topography of northwest Italy and of North Africa in the vicinity of coastal Algeria and Tunisia. Map generated using the AGI, USGS, ESRI, *Global GIS DVD* 2003. (USGS DDS-62H).

Similar problems of misclassification are encountered with northern Corsican males. In this case, the present results do not coincide with the general ones and further study is needed.

From both historical and evolutionary perspectives, whereas the history of the detachment of the Corsican and Sardinian microplate has been extensively studied (see for example Bellon et al. 1977 and related literature), little is known about contacts that the two main islands may have had in the past. Surely they were in contact during the late Miocene and again on and off during the Pleistocene, and almost certainly during the latter part of the Würm Glaciation up to at least about 10,000 ybp (see Fig. 9 in which the shallow submarine platform connecting the islands is clearly shown). On the other hand, the length of time during which Sardinia and Corsica were isolated from one another must have been long enough to permit speciation, as indicated by the presence of *Euproctus montanus* in Corsica and *E. platicephalus* in Sardinia (Delaugerre and Cheylan 1992).

More studies, both molecular and morphological, are needed to understand the status of *Podarcis tiliguerta*, with particular emphasis on both southern and northern Corsican areas and the Cerbicali Islands. The latter promises to be an excellent region for calibrating molecular clocks and for other comparative phylogeographic studies (see Vasconcelos et al., in press). Lastly, as we noted earlier, the range of scale counts among *Podarcis* species largely overlap, so that the morphological traits seen by different populations, as for instance extreme northern Corsican males, could follow some adaptive pattern, which has yet to be explored. It is obvious that only the integration of genetical and morphological studies can help us understand the evolutionary history of this interesting group of lizards.

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References

Arnold, E.N. 1989. Towards a phylogeny and biogeography of the Lacertidae: relationships within an Old-World family of lizards derived from morphology. *Bulletin of the British Museum* (*Natural History*), *Zoology* 55(2):209–257.

Arnold, E.N., and D.W. Ovenden. 2002. *A Field Guide to the Reptiles and Amphibians of Britain and Europe*. Harper Collins Publishers, London, UK. 128 pp.

Bellon, H., C. Coulon, and J.-B. Edel. 1977. Le déplacement de la Sardaigne. Synthèse des donnée géochronologiques, magmatiques et paléomagnétiques. *Bulletin de la Société de Géologique de France* 7(4):825–831.

Brizzi, R., and B. Lanza. 1975. The natural history of the Macinaggio Islets (northeastern Corsica) with particular reference to their herpetofauna. *Natura, Milano* 66(1–2):53–72.

Capula, M. 1994. Genetic variation and differentiation in the lizard *Podarcis wagleriana* (Reptilia, Lacertidae). *Journal of the Linnean Society, Biology* 52:177–196.

Capula, M. 1996. Evolutionary genetics of the insular lacertid lizard *Podarcis tiliguerta*: genetic structure and population heterogeneity in a geographically fragmented species. *Heredity* 77:518–529.

Cheylan, M. 1988. Variabilité phénotypique du lézard des murailles *Podarcis muralis* sur les îles de la côte provençale, France. *Revue d'Ecologie* (Terre vie) 43: 287–321.

Corti, C., and P. Lo Cascio. 2002. *The Lizards of Italy and Adjacent Areas*. Edition Chimaira, Frankfurt am Main, Germany. 165 pp.

Delaugerre, M., and M. Cheylan. 1992. Atlas de repartition des batraciens et reptiles de Corse. Parc Naturel Regional de Corse—Ecole Pratique des Hautes Etudes, Pampelune. 128 pp.

Harris, D.J., E.N. Arnold, and R.H. Thomas. 1998. Relationships of lacertid lizards (Reptilia: Lacertidae) estimated from mitochondrial DNA sequences and morphology. *Proceedings of the Royal Society of London*, ser. B, 265:1939–1948.

Harris, D.J., and E.N. Arnold. 1999. Relationships of wall lizards, *Podarcis* (Reptilia: Lacertidae) based on mitochondrial DNA sequences. *Copeia* 1999(3):749–754.

Harris, D.J., C. Pinho, M.A. Carretero, C. Corti, and W. Böhme. 2005. Determination of genetic diversity within the insular lizard *Podarcis tiliguerta* using mtDNA sequence data, with a reassessment of the phylogeny of *Podarcis*. *Amphibia-Reptilia* 26:401–407.

Harris, D.J., and P. Sá-Sousa. 2001. Species distinction and relationships of the western Iberian *Podarcis* lizards (Reptilia, Lacertidae) based on morphology and mitochondrial DNA sequences. *Herpetological Journal* 11:129–136.

Harris, D.J., and P. Sá-Sousa. 2002. Molecular phylogenetics of Iberian wall lizards (*Podarcis*): is *Podarcis hispanica* a species complex? *Molecular Phylogenetics and Evolution* 23(1):75–81.

Lanza, B. 1972. The natural history of the Cerbicale Islands (southeastern Corsica) with particular reference to their herpetofauna. *Natura, Milano* 63(4):345–407.

Lanza, B. 1976. On a new wall lizard from Corsica, with notes on the Sanguinarie Islands (Reptilia: Lacertidae). *Natura, Milano* 67(3–4):185–202.

Lanza, B., 1983. Ipotesi sulle origini del popolamento erpetologico della Sardegna. *Lavori della Società Italiana di Biogeografia* 3:723–744.

Lanza, B., and R. Brizzi. 1974. On two new Corsican microinsular subspecies of *Podarcis tiliguerta* (Gmelin, 1789) (Reptilia: Lacertidae). *Natura, Milano* 65(3–4):155–193.

Lanza, B., and R. Brizzi. 1977. The lizard of Piana di Cavallo Island (Southeastern Corsica): *Podarcis muralis contii* subsp. nova (Reptilia: Lacertidae). *Natura, Milano* 68(301504):157–165.

Lanza, B., and C. Corti. 1996. Evolution of the knowledge on the Italian herpetofauna during the 20th century. *Bollettino del Museo civico di Storia naturale di Verona* 20(1993):373–436.

Lanza, B., and M. Poggesi. 1986. Storia naturale delle isole satelliti della Corsica. *L'Universo, Firenze* 66(1):1–198.

Malhotra, A., and R.S. Thorpe. 2004a. Maximizing information in systematic revisions: a combined molecular and morphological analysis of a cryptic green pitviper complex (*Trimeresurus stejnegeri*). *Biological Journal of the Linnean Society* (London) 82:219–235.

Malhotra, A., and R.S. Thorpe. 2004b. A phylogeny of four mitochondrial gene regions suggests a revised taxonomy for Asian pitvipers (*Trimeresurus* and *Ovophis*). *Molecular Phylogenetics and Evolution* 32:83–100.

Oliverio, M., M.A. Bologna, and P. Mariottini. 2000. Molecular biogeography of the Mediterranean lizards *Podarcis* Wagler, 1830 and Teira Gray, 1838 (Reptilia, Lacertidae). *Journal of Biogeography* 27:1403–1420.

Pinho, C., C. Corti, M.A. Carretero, and D.J. Harris. 2004. Genetic variability within *Podarcis tiliguerta*: preliminary evidence from 12s rRNA gene sequences. Page 35 *in* C. Corti and P. Lo Cascio, eds., *Fifth International Symposium on the Lacertids of the Mediterranean Basin, Lipari, Aeolian Islands, Sicily, Italy, 7–11 May 2004*. Firenze University Press, Florence, Italy.

Podnar, M., and W. Mayer. 2005. Can mitochondrial DNA draw the phylogenetic picture of Central Mediterranean island *Podarcis*? *Herpetozoa* 18:73–77.

Poggesi, M., P. Agnelli, M. Borri, C. Corti, P. Finotello, B. Lanza, and G. Tosini. 1996. Erpetologia delle isole circumsarde. *Biogeographia,* new series, 18:583–618.

Poulakakis, N., P. Lymberakis, A. Antoniou, D. Chalkia, E. Zouros, M. Mylonas, and E. Valakos. 2003. Molecular phylogeny and biogeography of the wall-lizard *Podarcis erhardii* (Squamata: Lacertidae). *Molecular Phylogenetics and Evolution* 28:38–46.

Sá-Sousa, P., and D.J. Harris. 2002. *Podarcis carbonelli* Pérez-Mellado, 1981 is a distinct species. *Amphibia-Reptilia* 23:459–468.

Ulzega, A. 1995. Paleogeografia delle “piccole isole”della Sardegna alla fine dell'ultimo glaciale. *Biogeographia*, n.s, 18:27–31.

Vasconcelos, R.,. D.J. Harris, C. Corti, M.A. Carretero, M. Capula, C. Pinho, M. Delauguerre, and G. Spano. (In press: 2006). *Podarcis tiliguerta*, a species complex. *In*: C. Corti, P. Lo Cascio, and M. Biaggini, eds., *Mainland and Insular Lizards: A Mediterranean Perspective*. Firenze University Press, Florence, Italy.

Appendix

TABLE 2: descriptive statistics for the males. Numbers indicate average ± ES and range. The number in parentheses following the range statement indicates the number of data points that were not reported for that variable in the sample of the population studied.

sample	n	svl	dors	ventr	coll	gul	fpor	4toe	scs	scg	st	sl	sm
c001	28	52.50±0.61	62.21±0.58	25.17±0.24	10.96±0.23	27.29±0.36	20.46±0.32	29.39±0.29	5.75±0.10	9.88±0.31	5.44±0.15	4.04±0.04	1.36±0.09
		44-57	57-70	22-28	9-13 (1)	24-32	17-25	27-33	5-7	7-13 (2)	4-7 (1)	4-5	1-2
c002	11	55.09±0.80	60.09±1.25	24.45±0.41	10.45±0.28	30.91±0.69	21.00±0.49	28.89±0.45	5.27±0.14	10.82±0.58	5.91±0.21	4.00±0.00	1.55±0.21
		51-60	52-66	22-26	9-12	27-34	17-23	28-32 (2)	5-6	8-13	5-7	4	1-3
c003	8	50.88±0.99	62.25±1.82	25.75±0.49	11.00±0.00	28.25±0.62	20.50±0.42	28.88±0.44	6.00±0.19	10.50±0.68	7.13±0.30	4.13±0.13	0.50±0.27
		47-55	56-71	23-28	11	26-32	19-22	28-31	5-7	8-13	6-8	4-5	0-2
c004	26	52.19±0.67	64.27±0.67	26.58±0.19	10.38±0.24	30.58±0.44	20.88±0.32	28.76±0.31	5.50±0.13	10.23±0.23	6.96±0.23	4.04±0.04	1.23±0.14
		46-59	59-71	25-28	9-13	24-34	18-24	25-31	4-6	8-13	5-10	4-5	0-3
c008	22	56.27±0.42	62.86±0.93	25.32±0.20	9.82±0.23	29.86±0.49	23.41±0.34	30.91±0.61	5.68±0.17	13.27±0.55	5.50±0.25	4.14±0.04	0.91±0.17
		52-60	55-72	23-27	8-12	27-34	20-26	27-40	4-7	10-20	3-7	4-5	0-3
c009	19	52.26±0.69	62.89±1.00	25.42±0.16	10.05±0.28	28.63±0.48	20.42±0.29	27.27±0.28	5.63±0.23	12.05±0.56	5.74±0.28	4.00±0.00	1.00±0.17
		45-58	58-73	24-26	8-12	24-32	18-32	25-29 (4)	3-7	8-16	3-8	4	0-2
c010	13	54.54±0.46	65.85±0.90	25.54±0.39	9.46±0.31	31.69±0.67	21.92±0.35	29.38±0.57	6.00±0.11	14.15±0.56	7.69±0.33	4.08±0.08	0.69±0.17
		51-58	60-71	24-28	9-13	28-35	19-24	27-33	5-7	11-17	6-10	4-5	0-2
c012	14	59.71±1.15	66.68±0.88	25.21±0.38	9.36±0.31	31.21±0.75	24.07±0.30	31.15±0.48	5.92±0.18	12.62±0.51	6.57±0.33	4.00±0.00	0.64±0.13
		49-67	62-72	23-28	8-11	26-25	22-26	28-33 (1)	4-7 (1)	10-17 (1)	4-9	4	0-1
c013	14	53.07±0.71	66.36±1.27	25.14±0.23	0.29±0.27	31.79±0.55	22.79±0.43	28.93±0.55	6.00±0.15	14.50±1.04	6.57±0.36	3.64±0.17	1.36±0.23
		49-57	58-73	24-27	7-11	28-35	21-26	25-33	5-7	10-25	2-8	2-4	0-3
c014	11	58.55±1.11	64.09±0.96	25.36±0.15	8.91±0.16	33.18±0.66	22.09±0.28	32.30±0.37	5.36±0.28	11.91±0.58	7.00±0.23	4.00±0.00	14.55±0.21
		52-63	58-70	25-26	8-10	30-37	21-24	31-34 (1)	4-6	9-16	6-8	4	4-6
c015	21	55.00±0.38	64.00±0.55	25.38±0.25	9.38±0.18	29.67±0.51	21.38±0.40	30.20±0.40	6.00±0.17	11.24±0.40	5.95±0.19	4.00±0.00	0.95±0.15
		52-58	59-68	23-28	8-11	26-36	18-24	27-36	5-8	6-14	4-8	4	0-2
c017	15	53.73±0.59	60.53±0.75	26.20±0.22	10.13±0.22	30.33±0.80	19.73±0.57	28.07±0.40	5.33±0.16	10.53±0.27	6.33±0.25	3.93±0.07	1.20±0.14
		49-57	56-66	25-28	9-11	24-35	18-27	25-31	4-6	9-13	4-8	3-4	1-3
c018	10	55.20±1.06	61.10±1.46	26.40±0.34	10.40±0.34	31.60±0.62	22.70±0.62	31.90±0.53	5.80±0.13	11.90±0.41	5.90±0.35	4.00±0.00	1.00±0.21
		50-60	55-69	25-28	9-13	29-36	20-26	29-35	5-6	10-14	4-8	4	0-2
c019	12	54.58±0.62	63.25±1.00	26.17±0.30	9.25±0.37	27.50±0.44	20.17±0.32	28.10±0.38	5.42±0.29	11.67±0.36	5.42±0.23	4.00±0.00	0.67±0.19
		50-57	57-69	24-28	7-11	25-30	19-22	26-30 (2)	3-7	10-14	4-7	4	0-2
c021	38	65.18±0.57	69.13±0.50	26.53±0.20	10.53±0.18	31.96±0.38	22.92±0.25	32.28±0.32	4.95±0.15	12.78±0.29	6.95±0.21	3.97±0.03	1.37±0.10
		57-71	63-75	23-28	9-14	26-36	20-27	29-36 (2)	3-7 (1)	10-17 (1)	3-9	3-4	0-3
c022	17	66.82±0.91	67.24±0.82	27.71±0.35	10.18±0.20	29.71±0.39	21.53±0.41	33.35±0.40	5.06±0.11	10.31±0.47	7.41±0.19	4.06±0.06	1.94±0.16
		60-73	63-75	25-30	9-12	26-32	19-24	30-36	4-6 (1)	7-14 (1)	6-8	4-5	1-3
c030	16	56.00±0.94	64.63±0.80	25.69±0.28	10.75±0.17	28.63±0.47	17.81±0.29	28.53±0.26	5.63±0.15	9.33±0.35	5.88±0.24	4.00±0.00	0.69±0.20
		49-63	59-70	24-28	9-12	25-33	26-20	26-30 (1)	5-7	7-12	4-8	4	0-2
c031	30	58.07±0.68	63.33±0.53	26.27±0.19	9.70±0.24	29.40±0.52	21.60±0.34	29.13±0.31	6.03±0.09	12.23±0.28	5.50±0.19	4.00±0.00	0.50±0.10
		50-63	59-73	24-28	7-12	24-35	19-26	26-33	5-7	10-17	3-7	4	0-2
c035	9	53.44±0.96	59.89±0.81	25.33±0.29	9.11±0.20	29.33±0.67	19.89±0.42	27.00±0.68	6.11±0.26	12.44±1.08	6.56±0.44	4.11±0.11	0.56±0.18
		49-57	57-64	24-27	8-10	26-32	18-22	24-30	5-7	5-16	4-8	4-5	0-1
c037	45	50.44±0.57	63.60±0.54	25.91±0.16	10.76±0.19	29.84±0.31	23.02±0.28	28.52±0.18	5.80±0.08	10.31±0.24	6.40±0.19	4.00±0.03	0.067±0.08
		43-58	55-72	24-29	8-13	25-34	19-26	26-31 (1)	4-7	7-14	4-9	3-5	0-2
c038	18	54.50±0.74	64.11±0.48	25.83±0.32	10.33±0.28	30.50±0.51	21.39±0.38	28.72±0.29	5.83±0.15	11.39±0.37	5.28±0.27	4.00±0.08	0.94±0,15
		50-62	61-68	24-28	8-12	27-34	28-24	27-31	5-7	7-14	5-9	3-5	0-2

sample	n	svl	dors	ventr	coll	gul	fpor	4toe	scs	scg	st	sl	sm
c039	4	58.00±0.71	68.00±2.12	25.75±0.25	11.25±0.63	29.50±0.87	23.00±0.58	27.00±0.41	5.75±0.25	10.00±1.35	5.50±0.87	4.00±0.00	0.50±0.50
		56-59	62-71	25-26	10-13	28-32	22-24	26-28	5-6	8-14	3-7	4	0-2
c041	22	56.36±0.52	63.00±1.11	26.77±0.25	9.14±0.34	26.64±0.50	20.95±0.47	27.86±0.43	5.27±0.16	10.82±0.32	5.77±0.23	4.00±0.00	0.86±0.15
		51-50	53-78	25-29	6-12	22-32	17-27	24-32	4-6	9-14	4-8	4	0-3
c042	7	59.00±0.69	61.29±0.99	24.86±0.14	8.71±0.18	28.00±0.90	19.29±0.36	28.50±0.56	6.43±0.20	12.00±0.49	6.57±0.37	4.00±0.00	0.43±0.30
		56-61	59-66	24-25	8-9	25-31	18-21	26-30 (1)	6-7	10-14	5-8	4	0-2
c045	11	59.55±0.59	62,64±0.62	26.55±0.21	8.36±0.24	28.73±0.43	22.09±0.62	29.70±0.30	5.64±0.15	12.09±0.92	6.36±0.24	4.09±0.09	1.09±0.21
		57-63	60-66	25-27	7-10	26-31	19-25	28-31 (1)	5-6	8-19	5-7	4-5	0-2
c048	14	52.86±1.03	64.50±0.56	25.79±0.26	8.57±0.27	30.07±0.46	23.71±0.38	28.92±0.47	5.86±0.18	11.79±0.67	5.57±0.23	4.07±0.07	0.64±0.17
		47-59	61-68	24-27	7-10	26-32	21-26	27-32 (1)	5-7	9-17	4-7	4-5	0-2
c050	63	57.24±0.25	64.95±0.44	25.54±0.12	9.38±0.13	29.10±0.33	21.97±0.24	28.57±0.21	5.63±0.10	10.17±0.33	6.48±0.19	4.02±0.03	0.78±0.08
		53-63	57-72	24-28	7-12	22-35	18-37	24-32	4-8 (1)	5-19 (3)	4-11	3-5	0-2
c057	18	58.83±0.68	65.17±0.63	26.44±0.18	8.53±0.38	31.22±0.75	22.00±0.42	30.35±0.38	6.17±0.19	14.89±1.00	7.61±0.27	4.17±0.09	2.00±0.16
		53-63	59-72	25-27	6-12 (1)	26-38	19-25	27-33 (1)	4-7	11-24	5-10	4-5	1-3
c062	26	55.85±0.76	67.12±0.59	24.46±0.22	8.69±0.17	29.23±0.35	21.96±0.33	28.65±0.42	6.15±0.16	13.23±0.48	5.85±0.25	3.96±0.04	0.73±0.15
		43-60	62-75	23-27	7-10	26-32	18-25	24-32	3-7	9-18	4-9	3-4	0-3
c066	12	60.92±0.66	65.58±0.74	25.25±0.22	8.58±0.19	28.50±0.40	19.50±0.45	30.92±0.31	6.25±0.13	13.00±0.66	5.75±0.41	4.17±0.11	0.83±0.11
		57-64	62-69	24-27	8-10	27-31	17-23	29-33	6-7	10-17 (1)	4-8	4-5	0-1
c067	15	52.53±0.61	62.40±0.86	24.53±0.22	9.93±0.34	29.20±0.57	21.13±0.35	29.60±0.48	5.73±0.21	12.47±0.53	5.27±0.21	3.87±0.09	0.93±0.18
		48-56	57-69	23-26	8-13	26-34	19-24	27-33	4-7	9-17	4-7	3-4	0-2
c069	6	52.50±0.92	60.00±1.73	24.00±0.26	9.50±0.43	27.17±0.98	18.67±0.71	27.17±0.60	5.50±0.22	12.33±0.56	4.33±0.21	4.00±0.00	0.33±0.21
		49-56	56-66	23-25	8-11	26-32	16-21	26-30	5-6	10-14	4-5	4	0-1
c070	13	52.31±0.56	61.08±0.47	24.08±0.26	9.15±'0.19	30.15±0.49	21.38±0.46	27.69±0.38	6.23±0.17	11.69±0.40	5.23±0.26	4.00±0.00	0.85±0.10
		49-56	57-63	22-25	8-10	27-33	19-25	26-30	5-7	9-14	4-7	4	0-1
c084	6	53.67±0.71	67.67±0.76	26.00±0.45	8.33±0.21	31.67±0.95	24.17±0.79	30.33±0.61	6.00±0.00	15.67±1.20	7.33±0.49	4.17±0.17	1.00±0.45
		51-55	65-70	25-27	8-9	29-34	21-26	28-32	6	13-21	6-9	4-5	0-2
c091	10	55.10±0.48	64.40±0.79	24.70±0.30	8.90±0.31	28.30±0.67	21.00±0.45	28.13±0.35	6.20±0.20	15.30±1.30	5.90±0.31	3.80±0.13	2.10±0.23
		52-57	60-68	23-26	8-11	25-31	19-24	26-29 (2)	5-7	9-25	5-7	3-4	1-3
c092	12	55.25±0.63	62.17±1.41	24.17±0.21	8.25±0.22	30.25±0.60	20.83±0.52	28.25±0.28	6.33±0.14	12.50±0.56	5.75±0.28	4.25±0.13	1.08±0.19
		52-59	57-72	23-36	7-9	26-33	18-24	26-29	6-7	9-16	4-7	4-5	0-2
c095	27	52.67±0.84	62.85±0.61	25.15±0.17	9.67±0.20	31.30±0.34	22.59±0.51	29.78±0.39	5.41±0.13	11.44±0.45	5.81±0.20	4.00±0.05	1.15±0.15
		38-59	57-69	23-27	7-11	29-37	18-31	25-34	4-7	4-15	4-8	3-5	0-3
cA	47	54.11±0,64	63.19±0.62	24.89±0.17	10.77±0.17	31.49±0.51	22.94±0.31	29.09±0.32	6.06±0.09	13.49±0.44	5.57±0.18	4.04±0.04	1.34±0.11
		43-62	54-73	23-27	9-13	24-41	19-28	24-34	5-8	8-21	3-9	3-5	0-3
cC	85	57.71±0.49	61.32±0.45	25.72±0.14	10.60±0.14	29.84±0.31	21.09±0.18	28.52±0.21	5.91±0.08	12.34±0.23	5.15±0.13	4.06±0.03	1.06±0.08
		45-66	51-72	22-29	8-13	24-36	17-25	24-34 (1)	4-8	7-17	3-8	3-5	0-3
cF	137	56.72±0.31	66.19±0.32	25.06±0.09	10.49±0.11	31.75±0.25	22.77±0.18	29.59±0.18	5.99±0.05	13.09±0.22	5.37±0.10	4.05±0.03	0.95±0.07
		45-64	58-76	22-28	7-14 (1)	26-41	18-35	24-37	4-8	5-20	2-9 (1)	3-5	0-3
s001	7	60.57±0.84	66.57±1.11	26.00±0.62	10.00±0.53	32.00±0.76	22.57±0.37	19.00±0.53	5.00±0.38	13.43±1.46	4.57±0.43	4.14±0.14	0.71±0.18
		57-64	64-72	24-28	8-12	28-34	21-24	27-31	4-7	10-21	3-6	4-5	0-1
s005	11	55.18±0.38	65.73±1.20	26.00±0.30	11.00±0.43	33.55±0.98	22.36-0.47	29.20±0.53	5.91±0.09	14.27±0.78	5.55±0.47	4.36±0.15	1.64±0.20
		53-57	61-74	24-27	9-13	29-38	20-25	26-31 (1)	5-6	10-18	3-8	4-5	1-3
s008	21	54.24±0.75	63.90±0.94	26.14±0.26	11.00±0.23	30.24±0.65	21.90±0.24	29.43±0.51	5.81±0.19	12.71±0.50	5.48±0.33	4.00±0.00	1.81±0.18
		46-60	58-75	24-28	9-13	22-35	20-24	25-36	4-7	8-17	3-9	4	1-4
s010	5	53.80±0.97	61.60±1.60	25.40±0.75	12.40±.024	33.20±1.24	23.20±0.86	28.20±0.37	5.80±0.37	12.60±1.12	5.80±0.58	4.00±0.00	1.60±0.40
		52-57	58-67	23-27	12-13	29-36	21-26	27-29	5-7	10-15	4-7	4	1-3
s012	6	57.17±1.33	70.33±1.63	26.00±0.26	11.00±0.63	33.33±1.23	22.83±0.79	29.75±1.18	6.17±0.17	12.83±0.54	4.83±0.60	4.17±0.17	1.00±0.26
		52-61	65-75	25-27	9-13	30-37	20-25	28-33 (2)	6-7	11-14	3-7	4-5	0-2
s019	5	57.20±0.97	65.20±0.97	25.00±0.71	10.80±0.49	30.20±0.37	21.00±0.84	27.40±0.51	6.00±0.00	16.80±0.66	4.60±0.40	4.60±0.24	1.20±0.20

sample	n	svl	dors	ventr	coll	gul	fpor	4toe	scs	scg	st	sl	sm
		55-60	62-68	23-27	9-12	29-31	19-23	26-29	6	15-19	4-6	4-5	1-2
s020	14	54.71±0.55	63.50±0.81	25.93±0.27	11.07±0.38	29.21±0.71	20.79±0.32	26.33±0.48	5.21±0.15	13.71±0.51	4.85±0.44	4.43±0.14	1.00±0.26
		50-58	59-69	25-28	9-14	23-33	18-22	24-30 (2)	4-6	11-16	2-7 (1)	2-5	0-3
s021	24	54.33±0.67	65.29±0.61	26.21±0.21	10.29±0.23	31.50±0.42	20.17±0.30	26.29±0.34	5.13±0.16	13.50±0.49	4.71±0.24	4.21±0.08	0.83±0.14
		47-59	59-72	24-28	8-14	29-36	18-23	22-30 (3)	3-6	9-19	3-8	2-5	0-3
s023	10	59.80±0.80	69.60±1.16	26.70±0.37	12.20±0.51	34.20±0.90	22.90±0.72	29.30±0.54	6.00±0.00	15.10±1.06	4.60±0.40	4.10±0.10	1.40±0.27
		54-63	64-75	25-28	10-15	30-39	19-28	27-32	6	11-23	2-7	4-5	0-3
s024	6	54.00±0.93	65.83±1.85	25.50±0.22	11.17±0.31	32.67±0.49	21.67±0.49	29.50±0.76	5.83±0.31	14.50±0.76	5.33±0.56	4.00±0.00	1.50±0.50
		52-58	61-72	25-26	10-12	32-35	20-23	27-32	5-7	12-17	4-7	4	0-3
s026	7	51.43±1.51	64.71±1.91	25.29±0.29	10.71±0.42	32.71±1.46	20.86±0.14	27.67±0.56	6.14±0.14	12.29±0.97	5.71±0.36	4.14±0.14	2.14±0.40
		45-56	59-73	24-26	10-13	27-38	20-21	26-30 (1)	6-7	9-16	4-7	4-5	1-4
s032	6	58.67±10.9	67.00±2.05	25.17±0.83	10.33±0.33	33.83±1.11	23.50±1.31	30.33±0.99	6.17±0.17	12.33±0.42	5.67±0.49	4.00±0.00	1.33±0.21
		56-62	60-72	22-28	9-11	30-37	19-29	28-34	6-7	11-14	4-7	4	1-23
s046	8	55.38±0.78	64.50±1.63	25.88±0.44	11.75±0.37	29.63±0.68	21.75±0.56	28.00±0.65	5.25±0.31	10.88±1.04	4.25±0.45	4.00±0.00	0.75±0.25
		53-59	56-68	24-28	10-13	26-32	20-25	26-30 (1)	4-6	6-24	2-6	4	0-2
s048	7	55.71±0.52	61.71±1.15	25.86±0.40	10.00±0.44	31.86±0.91	23.57±0.69	28.80±0.97	5.29±0.29	10.57±0.57	5.14±0.34	3.86±0.14	0.86±0.14
		54-57	56-66	24-27	9-12	29-35	21-26	26-31 (2)	4-6	9-13	4-6	3-4	0-1
s049	10	54.10±0.74	60.70±1.21	26.70±0.30	9.90±0.31	32.70±1.05	20.40±0.45	26.78±0.32	5.60±0.22	9.30±0.65	4.80±0.33	3.80±0.13	1.80±0.25
		50-57	56-68	25-28	8-11	28-37	17-22	25-28 (1)	5-7	5-12	3-7	3-4	0-3
s060	5	50.40±2.73	68.00±0.84	26.40±0.40	10.40±0.51	31.00±0.63	22.40±0.51	27.50±2.50	5.60±0.24	14.60±0.87	6.00±0.45	4.00±0.00	1.20±0.20
		44-58	65-70	25-27	9-12	30-33	21-24	25-30 (3)	5-6	13-18	5-7	4	1-2
s061	9	50.78±1.00	64.67±1.64	25.33±0.41	10.11±0.35	30.22±0.72	21.67±0.78	28.57±0.75	6.11±0.20	13.00±0.76	5.67±0.33	4.00±0.00	1.00±0.29
		46-56	59-73	23-27	8-11	27-34	19-25	26-32 (2)	5-7	10-17	4-7	4	0-2
s062	10	53.20±0.66	71.40±0.64	25.00±0.37	10.50±0.45	35.80±1.08	24.40±0.85	30.33±1.26	5.90±0.10	14.10±0.75	4.60±0.43	4.10±0.10	1.50±0.17
		49-56	67-74	23-27	8-13	32-43	21-29	21-34 (1)	5-6	9-17	1-6	4-5	1-2
s073	27	55.74±0.64	70.85±0.63	25.70±0.21	10.59±0.22	31.81±0.41	22.00±0.38	28.28±0.39	5.93±0.18	12.70±0.57	4.44±0.18	4.11±0.06	0.96±0.12
		43-61	65-77	24-28	8-13	27-36	18-26	25-32 (2)	4-8	7-21	2-6	4-5	0-2
s075	52	56.02±0.51	66.54±0.60	25.17±0.17	10.48±0.21	32.90±0.40	23.37±0.26	29.41±0.28	5.81±0.12	12.63±0.48	5.38±0.25	4.10±0.06	1.40±0.11
		45-62	58-78 (2)	22-29	7-14 (2)	26-39 (2)	19-27 (1)	26-34 (1)	3-8	4-23	2-10	3-6	0-3
s078	41	55.54±0.57	66.88±0.51	25.56±0.16	10.71±0.21	33.54±0.45	22.18±0.26	28.03±0.35	5.80±0.12	14.03±0.36	5.46±0.20	3.95±0.03	0.83±0.12
		46-62	60-76	23-29	9-14	29-40 (4)	18-25 (1)	25-33 (6)	3-7 (1)	8-19 (1)	3-8	3-4 (1)	0-3
s080	13	56.08±0.87	67.69±1.28	26.00±0.25	10.62±0.33	34.46±0.75	22.69±0.40	28.67±0.63	6.00±0.20	13.31±0.76	5.85±0.32	4.08±0.08	1.46±0.14
		47-60	60.79	25-27	9-12	29-38	21-26	26-33 (1)	5-7	8-17	4-7	4-5	1-2
s081	34	58.44±0.52	66.21±0.60	26.32±0.21	10.62±0.22	34.00±0.51	22.00±0.28	28.42±0.31	6.00±0.14	11.91±0.52	5.79±0.16	3.97±0.03	1.91±0.17
		50-64	60-73	24-29	8-13	28-41	19-25	25-32 (1)	4-8	7-19	4-8	3-4	0-4
s082	5	60.40±0.68	66.80±1.98	24.80±0.49	9.40±0.40	33.80±0.58	22.60±0.51	32.40±0.40	5.60±0.24	15.40±0.51	5.80±0.58	3.60±0.24	1.80±0.66
		59-62	60-72	23-26	9-11	33-36	21-24	31-33	5-6	14-17	5-8	3-4	0-4
s084	105	53.82±0.54	70.80±0.45	25.43±0.12	10.96±0.13	34.31±0.28	24.37±0.21	30.43±0.19	5.95±0.06	15.20±0.25	5.47±0.13	4.08±0.03	1.30±0.08
		38-62 (1)	57-87	22-29	8-15 (6)	29-43 (3)	21-30 (3)	25-35 (3)	3-7 (1)	10-24 (2)	2-9 (1)	3-5 (1)	0-4 (1)
s085	52	65.79±0.63	71.08±0.54	25.92±0.15	10.63±0.14	29.56±0.30	19.82±0.20	29.40±0.16	5.33±0.09	12.52±0.37	5.47±0.15	3.96±0.03	1.12±0.08
		48-73	60-79	23-38 (1)	11-13 (3)	23-34 (2)	16-22 (1)	27-31 (4)	4-7	7-22	3-9 (3)	3-4 (1)	0-3 (2)
s087	19	60.32±0.68	70.79±0.99	25.32±0.20	11.00±0.44	31.68±0.54	23.21±0.16	30.63±0.49	6.00±0.17	15.95±0.61	4.63±0.19	4.11±0.07	1.63±0.16
		53-66	62-78	24-27	8-14	28-36	22-25	28-35	5-7	13-24	3-6	4-5	0-3
s088	10	58.80±0.85	67.40±1.54	25.60±0.31	11.70±0.37	32.90±0.53	22.70±0.62	27.56±0.50	6.00±0.37	11.10±0.77	4.60±0.58	4.00±0.00	1.20±0.39
		54-62	61-75	24-27	10-14	30-36	19-25	26-30 (1)	5-9	9-16	2-8	4	0-4
s091	13	54.85±1.32	66.62±1.07	25.85±0.25	9.92±0.42	31.77±0.52	22.62±0.31	25.92±0.42	6.00±0.16	12.62±0.70	4.54±0.35	4.00±0.00	1.77±0.26
		42-61	61-75	25-28	8-13	29-35	21-24	23-28 (1)	5-7	10-20	2-7	4	1-4
s092	4	56.50±1.94	71.50±2.06	25.50±0.50	11.50±0.65	29.50±1.85	22.50±1.32	28.25±0.95	6.25±0.25	13.25±1.70	5.00±1.15	3.75±0.25	0.75±0.48
		51-60	67-75	25-27	11-13	25-33	19-25	27-31	6-7	10-18	3-7	3-4	0-2

sample	n	svl	dors	ventr	coll	gul	fpor	4toe	scs	scg	st	sl	sm
s099	8	57.25±1.59	79.13±2.40	25.13±0.35	12.50±0.50	36.75±0.62	25.38±0.80	28.75±0.65	6.50±0.19	14.63±0.60	4.00±0.42	4.00±0.00	1.25±0.37
		49-64	70-88	24-26	12-15	35-40	23-30	26-31	6-7	12-17	2-6	4	0-3
s100	19	55.89±0.73	71.47±10.1	25.05±0.30	11.26±0.30	31.63±0.62	23.89±0.39	29.89±0.48	6.11±0.13	13.68±0.54	3.79±0.26	4.05±0.05	0.79±0.14
		51-61	66-81	22-27	9-14	26-37	21-27	26-34	5-7	10-19	1-5	4-5	0-2
s119	5	60.60±0.51	66.00±1.14	27.00±0.32	10.60±0.51	32.20±1.85	22.40±0.40	29.00±0.32	5.80±0.20	13.40±1.91	5.60±0.75	4.20±0.20	1.20±0.49
		59-62	63-69	26-28	9-12	26-36	21-23	28-30	5-6	9-20	4-8	4-5	0-3
s120	24	62.04±0.81	68.54±0.98	25.63±0.27	10.00±0.18	30.88±0.44	23.63±0.40	28.71±0.37	5.55±0.18	10.64±0.48	4.57±0.22	4.04±0.04	0.87±0.14
		52-67	60-81	23-30	8-12	28-37	20-27	25-31 (3)	3-7 (2)	5-14 (2)	3-6 (1)	4-5 (1)	0-2 (1)
s127	20	56.40±0.79	68.45±0.69	25.05±0.20	10.60±0.27	34.30±0.50	24.70±0.45	30.40±0.57	5.80±0.16	15.00±0.79	5.05±0.26	4.10±0.10	0.50±0.11
		48-63	64-74	23-27	9-13	29-38	21-30	24-35	4-7	10-22	3-8	3-5	0-1
s134	13	62.69±0.49	62.92±10.5	25.77±0.47	10.92±0.33	34.15±0.61	25.46±0.71	29.78±0.95	5.46±0.22	9.69±0.38	3.08±0.26	4.00±0.00	0.15±0.10
		59-66	57-69	22-29	9-13	30-37	22-32	27-36 (4)	4-7	7-12	1-4	4	0-1
s139	10	61.20±1.24	67.70±0.37	26.10±0.41	11.30±0.33	34.50±0.67	21.50±0.45	28.80±0.59	5.80±0.20	11.30±0.40	5.50±0.56	4.00±0.00	1.10±0.18
		53-66	66-70	24-28	9-13	30-37	20-24	26-32	4-6	10-14	3-9	4	0-2
s153	9	61.44±0.84	65.56±1.16	25.33±0.24	10.44±0.38	31.44±0.63	21.11±0.51	28.33±0.71	6.00±0.17	11.56±0.60	5.89±0.51	4.00±0	0.78±0.28
		58-66	61-72	24-26	9-12	28-34	19-24	25-31	5-7	9-15	4-9	4	0-2
s154	15	58.73±0.62	67.47±0.79	25.40±0.35	10.60±0.25	33.60±0.99	13.13±0.42	30.00±0.56	5.80±0.14	12.60±0.58	5.73±0.48	4.00±0.00	0.93±0.23
		53-62	63-74	24-28	9-12	26-40	20-26	26-35	5-7	8-16	3-9	4	0-3
s157	5	49.20±1.93	64.00±2.66	24.80±0.37	10.00±0.55	28.00±0.32	20.80±0.20	28.40±0.81	6.00±0.00	11.40±0.68	4.60±0.40	4.00±0.00	0.60±0.24
		44-56	57-72	24-26	8-11	27-29	20-21	26-30	6	9-13	3-5	4	0-1
sA	26	58.65±0.80	69.92±0.63	25.54±0.20	10.96±0.23	34.96±0.54	24.54±0.43	29.42±0.36	5.85±0.07	15.12±0.67	5.08±0.24	4.08±0.05	10.04±0.14
		52-59	64-81	23-27	9-15	29-42	20-28	25-34	5-6	10-25	3-7	4-5	0-2
sB	39	60.54±0.51	67.64±0.79	26.21±0.20	10.82±0.20	32.10±0.42	22.64±0.31	28.50±0.38	5.79±0.10	13.31±0.42	4.33±0.22	4.13±0.05	0.92±0.11
		53-69	57-81	24-29	8-14	27-39	20-28	24-34 (1)	4-7	8-20	2-8	4-5	0-3
sC	10	58.60±1.20	70.30±1.37	26.11±0.54	11.00±0.21	34.50±0.99	23.70±0.70	29.90±0.62	6.30±0.33	15.70±0.97	5.50±0.22	4.20±0.13	1.80±0.29
		49-63	60-75	24-29 (1)	10-12	30-40	21-28	28-34	5-9	13-22	5-7	4-5	0-3
sE	12	61.50±2.45	67.75±0.86	25.92±0.40	10.33±0.36	30.25±0.91	22.58±0.51	29.42±0.66	5.75±0.25	12.58±1.10	4.00±0.37	3.92±0.08	0.75±0.22
		41-68	65-76	23-28	7-11	24-35	19-25	27-33	4-7	4-19	2-6	3-4	0-2
sF	42	59.33±0.61	67.95±0.75	25.79±0.19	10.74±0.20	32.83±0.53	23.40±0.27	29.55±0.34	6.07±0.12	14.69±0.57	5.17±0.16	4.00±0.05	1.19±0.15
		50-65	54-78	23-28	8-13	25-40	18-26	25-34	4-8	3-25	3-8	3-5	0-4
sG	5	59.20±2.08	69.00±1.82	26.20±0.20	11.20±0.20	32.20±0.80	23.20±0.49	29.80±0.73	6.00±0.32	12.80±0.58	6.20±0.92	4.00±0.00	1.80±0.49
		54-65	63-74	26-27	11-12	30-34	22-24	28-32	5-7	11-14	3-8	4	1-3
sH	37	61.84±1.10	68.24±0.91	25.81±0.21	10.95±0.17	31.54±0.52	22.22±0.34	28.53±0.40	5.97±0.12	12.51±0.34	4.81±0.19	4.00±0.04	1.38±0.16
		50-79	59-80	23-29	9-13	25-36	18-26	22-36 (1)	4-7	7-17	3-8	3-5	0-4
sI	34	59.21±0.66	67.56±0.77	25.35±0.23	11.06±0.18	32.29±0.60	23.68±0.34	29.88±0.41	5.94±0.13	13.56±0.41	4.97±0.20	4.00±0.06	0.94±0.11
		46-67	60-78	22-28	11-13	26-43	20-28 (3)	24-37	4-7	7-18	2-7	3-5	0-2
Corsican	930	56.05±0.16	64.12±0.14	25.54±0.04	9.95±0.04	30.15±0.09	21.83±0.07	29.31±0.07	5.79±0.02	12.07±0.09	5.95±0.04	4.02±0.01	1.05±0.03
clade		38-73	51-78	22-30	6-14 (3)	22-41	16-35	24-40 (13)	3-8 (4)	4-25 (10)	2-11 (2)	2-5	0-6
Sardinian	880	57.67±0.18	68.05±0.16	25.68±0.04	10.77±0.04	32.59±0.11	22.78±0.08	29.12±0.08	5.82±0.02	13.39±0.10	5.08±0.05	4.05±0.01	1.19±0.03
clade		38-79 (1)	54-88 (2)	22-30 (2)	7-15 (11)	22-43 (9)	16-32 (9)	21-37 (49)	3-9 (4)	3-25 (5)	1-10 (6)	3-6 (4)	0-4 (4)

TABLE 3: Descriptive statistics for the females. Numbers indicate average ± ES and range. The number in parentheses following the range statement indicates the number of data points that awere not reported for that variable in the sample of the population studied.

sample	n	svl	dors	ventr	coll	gul	fpor	4toe	scs	scg	st	sl	sm
c001	16	48.44±1.03	58.31±0.73	27.19±0.37	10.81±0.26	27.00±0.29	19.50±0.45	28.81±0.39	5.38±0.18	9.94±0.32	5.69±0.24	4.06±0.06	1.44±0.22
		39-54	54-63	24-30	9-12	24-28	17-23	27-32	4-6	8-11	4-7	4-5	0-3
c002	15	48.60±0.97	59.67±0.96	27.13±0.13	10.93±0.30	31.07±0.55	20.87±0.52	29.71±0.47	5.27±0.12	10.07±0.38	5.73±0.18	3.93±0.07	1.33±0.16
		40-54	52-65	26-28	9-13	25-34	17-25	27-33 (1)	5-6	8-13	5-7	3-4	0-2
c003	5	47.00±0.84	60.80±1.74	27.40±0.40	10.00±0.32	28.00±1.14	19.80±0.66	27.80±0.58	5.60±0.24	10.20±0.37	6.00±0.32	4.20±0.20	0.60±0.24
		45-50	57-67	26-28	9-11	25-31	18-22	27-30	5-6	9-11	5-7	4-5	0-1
c004	11	48.82±0.70	59.91±0.59	29.18±0.26	10.18±0.26	30.00±0.60	19.82±0.42	28.36±0.65	5.27±0.27	9.64±0.43	6.18±0.30	4.00±0.00	1.27±0.14
		44-52	56-63	28-30	9-11	27-33	17-22	24-32	3-6	8-12	5-8	4	1-2
c008	9	51.33±0.78	60.00±1.59	27.89±0.48	9.22±0.28	30.33±0.62	23.11±0.77	30.67±0.58	5.67±0.17	12.44±0.99	5.89±0.31	4.11±0.11	1.22±0.15
		48-55	54-66	25-30	8-11	28-33	20-28	28-33	5-6	8-18	5-7	4-5	1-2
c009	10	50.20±0.95	60.20±1.20	27.30±0.30	9.50±0.27	27.50±0.52	19.70±0.47	26.57±0.20	5.90±0.23	11.40-0.70	4.90±0.23	4.20±0.13	0.90±0.10
		46-55	55-66	28-29	8-11	25-31	17-22	26-27 (3)	5-7	7-15	4-6	4-5	0-1
c010	12	51.58±0.63	63.17±0.89	27.08±0.31	9.50±0.15	29.67±0.43	21.42±0.42	28.67±0.50	5.92±0.08	13.17±0.71	6.75±0.30	4.17±0.11	0.75±0.28
		48-56	57-69	26-29	9-10	26-31	19-23	25-31	5-6	9-16	5-8	4-5	0-3
c012	7	53.86±2.19	62.00±1.09	27.57±0.37	9.43±0.37	30.00±1.15	23.14±0.40	30.00±0.53	5.57±0.20	12.57±1.21	6.14±0.51	4.14±0.14	1.00±0.31
		47-61	58-65	26-29	8-11	27-36	22-24	27-31	5-6	9-17	4-8	4-5	0-2
c013	8	50.38±0.53	62.38±1.38	27.25±0.25	8.75±0.31	28.00±1.10	20.50±0.57	28.25±0.77	6.50±0.19	16.50±1.52	6.75±0.25	4.00±0.00	1.63±0.18
		48-52	58-68	26-28	7-10	21-32	18-23	25-31	6-7	10-23	6-8	4	1-2
c014	7	53.43±1.80	61.43±1.41	27.29±0.29	8.71±0.42	32.43±0.97	21.86±0.34	31.14±0.46	5.14±0.46	11.29±0.89	7.00±0.44	3.86±0.14	3.86±0.26
		43-57	57-68	26-28	7-10	28-26	21-23	30-33	4-7	9-15	6-9	3-4	3-5
c015	9	52.33±0.91	60.11±0.70	27.33±0.24	9.22±0.36	28.11±1.02	20.33±0.47	29.00±0.53	6.33±0.24	11.11±0.48	6.33±0.24	4.00±0.00	0.89±0.26
		49-57	58-64	26-28	8-11	24-34	18-22	26-31	5-7	41883.00	6-8	4	0-2
c017	13	49.69±0.87	57.46±0.63	27.92±0.42	9.46±0.22	30.46±0.42	18.69±0.40	28.38±0.50	5.38±0.18	10.92±0.52	6.31±0.29	3.92±0.08	1.15±0.25
		42-55	53-61	24-30	8-11	28-34	16-21	25-32	4-6	8-15	5-8	3-4	0-3
c018	10	50.10±0.92	59.20±1.46	28.50±0.34	10.40±0.31	28.30±0.82	21.20±0.49	30.60±0.64	5.90±0.28	12.80±1.10	6.00±0.45	4.00±0.00	0.90±0.10
		45-55	53-67	27-30	9-12	26-35	19-23	27-33	4-7	9-21	4-9	4	0-1
c019	9	48.89±0.73	59.56±1.06	28.44±0.47	8.56±0.29	28.78±1.13	20.56±0.67	28.11±0.45	5.89±0.20	11.33±0.67	5.56±0.38	4.00±0.00	1.11±0.20
		44-51	53-65	25-30	7-10	24-36	19-24	25-29	5-7	8-14	4-7	4	0-2
c021	26	60.46±0.63	65.31±0.61	28.58±0.24	9.92±0.17	30.00±0.39	21.46±0.30	31.23±0.31	5.04±0.10	11.31±0.29	7.00±0.19	3.88±0.06	1.31±0.09
		53-64	56-73	25-31	9-12	26-35	18-25	27-34	4-6	8-14	5-9	3-4	1-2
c022	11	60.91±1.13	66.64±0.47	29.64±0.36	10.09±0.28	29.55±0.73	21.18±0.54	33.55±0.53	5.27±0.27	11.91±0.56	7.18±0.33	4.09±0.09	2.18±0.18
		51-64	65-70	28-32	9-12	26-34	19-25	31-36	4-7	9-15	6-9	4-5	1-3
c030	6	50.67±1.02	60.67±0.80	27.00±0.26	11.33±0.33	27.33±0.49	17.67±0.56	28.50±0.62	5.33±0.21	9.00±0.45	5.83±0.48	4.00±0.00	0.33±0.21
		48-55	58-63	26-28	10-12	26-29	16-20	26-30	5-6	8-10	4-7	4	0-1
c031	22	53.45±0.94	61.23±0.74	27.73±0.27	9.59±0.25	27.55±0.52	20.59±0.31	28.59±0.35	5.68±0.15	12.18±0.33	5.14±0.14	4.00±0.00	0.50±0.11
		47-60	54-67	25-30	7-12	23-34	18-24	24-31	4-7	9-15	4-6	4	0-1
c035	10	51.50±0.40	57.50±1.21	28.30±0.26	9.10±0.41	31.30±1.13	19.70±0.37	28.78±0.40	6.20±0.33	11.60±0.451	6.20±0.13	4.10±0.10	0.80±0.20
		49-53	54-66	27-30	7-11	27-37	18-22	27-31 (1)	5-8	9-14	6-7	4-5	0-2
c037	22	48.77±0.74	62.55±0.60	28.23±0.25	10.50±0.28	29.64±0.46	21.91±0.46	28.32±0.37	5.77±0.11	10.82±0.38	6.23±0.19	3.95±0.08	0.82±0.16
		41-55	57-67	25-30	8-13	25-33	16-25	26-32	5-7	8-15	5-8	3-5	0-2
c038	6	50.17±1.05	60.67±.33	27.17±0.31	9.50±0.50	29.00±0.86	20.33±0.56	28.67±0.33	5.67±0.33	10.83±0.75	6.00±0.52	4.00±0.00	1.00±0.00
		47-54	60-62	26-28	8-11	26-31	18-22	28-30	5-7	9-13	4-7	4	1
c039	6	54.83±1.19	67.00±0.73	27.83±0.17	10.50±0.43	29.33±1.15	22.83±1.54	28.50±0.89	5.83±0.17	12.33±0.88	5.83±0.31	4.17±0.17	0.83±0.31
		50-59	64-69	27-28	9-12	26-32	19-28	25-31	5-6	10-16	5-7	4-5	0-2

sample	n	svl	dors	ventr	coll	gul	fpor	4toe	scs	scg	st	sl	sm
c041	14	52.64±0.93	60.86±0.82	29.14±0.33	9.36±0.40	26.36±0.46	21.43±0.48	27.93±0.41	5.57±0.20	10.93±0.51	5.79±0.19	4.07±0.07	1.00±0.15
		46-58	56-69	27-31	8-14	24-30	19-25	25-30	4-7	8-15	5-7	4-5	0-2
c042	4	54.50±1.32	59.50±0.96	27.50±0.29	8.75±0.25	26.25±1.11	19.25±0.63	29.00±0.00	6.25±0.25	12.00±0.41	6.25±0.25	4.25±0.25	1.50±0.29
		51-57	58-62	27-28	8-9	23-28	18-21	29	6-7	11-13	6-7	4-5	1-2
c045	7	56.00±1.07	59.29±1.60	28.57±0.30	9.00±0.44	28.29±0.68	21.57±0.57	29.86±0.40	5.71±0.18	10.29±0.84	5.86±0.26	4.00±0.00	1.57±0.20
		53-62	54-65	28-30	8-11	25-30	20-24	29-32	5-6	7-13	5-7	4	1-2
c048	5	50.40±0.68	61.40±1.25	27.20±0.20	9.00±0.55	29.00±1.64	23.00±0.45	29.00±0.45	6.00±0.32	10.20±0.37	6.00±0.71	3.80±0.20	0.80±0.37
		48-52	59-66	27-28	7-10	23-33	22-24	28-30	5-7	9-11	4-8	3-4	0-2
c050	29	52.28±0.59	61.90±0.62	27.59±0.27	9.10±0.17	28.00±0.40	21.03±0.28	27.69±0.36	6.14±0.36	11.31±0.39	6.41±0.14	3.93±0.05	0.86±0.10
		46-61	55-71	24-30	8-12	24-34	18-24	23-32	5-16	8-17	5-9	3-4	0-2
c057	13	54.00±1.17	60.00±0.82	27.92±0.29	8.08±0.40	30.85±0.52	21.23±0.32	29.77±0.48	6.08±0.24	12.62±0.51	7.38±0.29	4.23±0.12	1.69±0.26
		45-58	56-65	26-29	6-11	27-34	19-23	27-33	4-8	9-16	6-9	4-5	0-4
c062	7	54.43±0.97	65-86±1-37	27.43±0.20	8.86±0.26	29.14±0.86	20.71±0.61	28.43±0.20	5.86±0.14	13.14±0.70	6.00±0.22	4.14±0.14	0.71±0.29
		49-57	62-71	27-28	8-10	26-33	19-23	28-29	5-6	11-16	5-7	4-5	0-2
c066	9	55.11±1.31	62.11±0.65	27.78±0.22	8.33±0.17	29.33±0.62	19.78±0.40	31.22±0.60	5.56±0.24	11.44±0.84	5.33±0.17	4.11±0.11	1.44±0.18
		47-60	58-64	27-29	8-9	26-32	18-22	29-34	5-7	7-15	5-6	4-5	1-2
c067	7	50.14±1.24	59.86±1.24	27.14±0.14	9.43±0.48	29.43±0.61	18.71±0.61	29.29±0.47	5.29±0.29	13.71±0.64	5.00±0.22	4.00±0.00	1.14±0.26
		45-53	57-65	27-28	8-11	27-32	17-21	27-31	4-6	12-17	4-6	4	0-2
c069	7	48.29±0.92	57.14±1.47	26.29±0.52	9.14±0.14	27.14±0.96	18.57±0.30	27.86±0.46	5.57±0.20	11.57±0.37	4.57±0.43	4.00±0.00	0.86±0.14
		44-50	53-63	24-28	9-10	25-32	17-19	26-30	5-6	10-13	3-6	4	0-1
c070	7	48.57±0.72	57.29±0.89	26.86±0.26	9.71±0.26	28.57±0.65	19.86±0.74	26.86±0.67	6.00±0.22	10.71±0.78	4.83±0.17	4.00±0.00	1.14±0.14
		46-52	53-60	26-28	9-11	26-31	18-24	24-29	5-7	8-13	4-5	4	1-2
c092	9	53.33±1.20	59.22±1.12	27.11±0.20	8.67±0.37	29.78±0.86	20.33±0.69	27.56±0.41	5.78±0.22	12.11±0.51	6.33±0.33	4.00±0.00	0.78±0.22
		47-59	55-64	26-28	7-10	25-34	18-25	25-29	5-7	10-14	4-7	4	0-2
c095	6	49.17±2.27	60.00±0.45	27.17±0.31	9.67±0.33	30.33±0.80	21.50±0.67	29.80±0.66	5.33±0.21	11.83±0.95	5.83±0.60	3.83±0.40	2.00±0.45
		41-56	58-61	26-28	9-11	28-33	19-24	28-32	5-6	8-15	4-8	2-5	1-4
cA	34	50.88±0.78	59.82±0.74	27.68±0.18	10.12±0.17	30.24±0.48	21.82±0.47	28.53±0.29	5.88±0.10	12.21±0.35	5.56±0.16	4.09±0.05	1.15±0.10
		41-60	50-71	25-30	9-13	25-37	17-32	23-32	5-7	7-18	3-7	4-5	0-2
cC	53	52.72±0.75	57.13±0.56	27.96±0.16	10.17±0.15	29.49±0.35	20.94±0.28	28.04±0.34	6.00±0.09	12.60±0.42	5.38±0.14	4.09±0.05	1.21±0.11
		41-64	50-65	25-31	7-12	22-35	18-26	20-32	5-8	6-27	4-8	3-5	0-3
cF	58	52.29±0.44	62.52±0.62	27.34±0.17	9.95±0.16	30.03±0.36	21.53±0.28	29.33±0.24	6.05±0.07	12.71±0.35	5.53±0.17	4.05±0.04	0.98±0.10
		46-59	50-70	25-30	8-13	23-38	18-31	25-33 (1)	5-8	8-21	3-9	3-5	0-3
s005	5	52.60±10.03	63.60±1.72	28.40±0.24	11.40±0.60	30.60±1.08	23.60±0.51	29.00±0.77	5.60±0.40	13.00±0.45	5.60±0.81	4.00±0.00	2.20±0.37
		49-55	59-68	28-29	10-13	28-34	22-25	28-32	4-6	12-14	4-8	4	1-3
s008	5	48.80±0.97	62.60±2.01	27.40±0.40	10.80±0.49	29.80±0.86	21.60±0.51	28.80±0.92	5.80±0.20	11.80±0.73	6.20±0.80	3.80±0.20	1.40±0.24
		45-50	58-69	26-28	9-12	27-32	20-23	27-32	5-6	10-14	5-9	3-4	1-2
s012	7	53.43±1.00	69.29±1.13	29.86±0.26	11.00±0.44	33.14±0.40	24.57±0.37	31.50±0.81	6.00±0.38	15.86±1.28	5.14±0.26	4.14±0.14	1.29±0.18
		50-57	63-72	29-31	9-12	31-34	23-26 (1)	29-35	4-7	11-21	4-6	4-5	1-2
s020	5	52.40±1.25	58.40±0.93	29.00±0.45	9.80±0.37	28.40±0.51	20.20±0.58	24.75±0.48	5.80±0.20	16.60±1.78	5.20±0.37	4.40±0.24	1.00±0.32
		50-57	55-60	28-30	9-11	27-30	19-22	24-26 (1)	5-6	12-22	4-6	4-5	0-2
s021	8	50.25±0.92	62.50±0.68	28.63±0.38	10.50±0.50	30.75±0.53	20.00±0.27	25.83±0.31	5.63±0.18	12.63±0.84	5.75±0.25	4.25±0.16	0.88±0.13
		46-55	59-65	28-31	8-13	28-33	19-21	25-27	5-6	10-18	5-7	4-5	0-1
s023	5	55.00±1.10	65.20±1.39	28.20±0.37	10.00±0.95	31.80±0.37	20.40±0.75	28.80±1.02	5.80±0.49	13.00±0.95	5.00±0.77	4.00±0.00	1.60±0.24
		52-58	62-69	27-29	8-13	31-33	18-22	26-32	4-7	10-16	4-8	4	1-2
s026	5	52.00±1.64	60.60±1.44	27.20±0.37	10.00±0.55	30.40±0.93	19.00±0.55	27.50±0.96	5.40±0.24	14.20±0.58	4.80±0.58	4.00±0.00	1.40±0.24
		48-58	56-65	26-28	8-11	28-33	18-21	25-29 (1)	5-6	12-15	3-6	4	1-2
s032	5	51.60±1.72	66.20±2.46	28.20±0.58	11.40±0.81	31.20±2.13	23.60±1.21	28.80±0.86	6.00±0.00	14.00±1.64	6.20±0.37	4.40±0.24	2.20±0.37
		47-55	60-75	27-30	9-14	24-36	21-28	26-31	6	11-20	5-7	4-5	1-3
s062	4	49.00±0.91	65.25±2.29	27.00±0.41	10.00±0.41	31.50±1.44	23.00±0.41	28.75±0.75	6.00±0.00	12.75±1.11	3.75±0.95	4.25±0.25	2.00±0.71

sample	n	svl	dors	ventr	coll	gul	fpor	4toe	scs	scg	st	sl	sm
		47-51	60-70	26-28	9-11	29-34	22-24	27-30	6	10-15	1-5	4-5	1-4
s073	7	51.86±1.03	67.57±1.57	27.43±0.43	11.00±0.38	30.86±0.34	22.00±0.72	26.43±0.61	5.86±0.14	12.57±0.37	4.86±0.26	4.00±0.00	1.00±0.31
		47-55	61-72	26-29	10-13	30-32	19-25	24-29	5-6	11-14	4-6	4	0-2
s075	32	52.03±0.58	63.16±0.61	27.16±0.20	10.20±0.26	31.89±0.58	23.23±0.34	28.68±0.35	5.94±0.10	12.56±0.41	5.72±0.27	4.03±0.06	1.26±0.12
		44-56	57-71 (1)	25-29 (1)	8-13 (2)	23-37 (5)	20-26 (1)	25-33 (1)	4-7	8-17	3-8	3-5 (1)	0-3 (1)
s078	13	52.23±0.93	64.15±1.40	27.38±0.31	10.75±0.55	32.00±0.73	22.62±0.65	27.91±0.55	5.85±0.10	11.92±0.80	5.62±0.33	4.00±0.00	1.15±0.27
		46-57	53-70	26-29	9-14 (1)	27-37 (1)	19-26	25-32 (2)	5-6	7-17	3-8	4 (1)	0-4
s080	8	53.63±1.28	63.63±1.18	28.50±0.53	10.63±0.46	32.63±0.56	21.38±0.38	27.88±0.30	5.88±0.13	11.63±0.94	5.25±0.45	4.13±0.13	0.88±0.30
		47-58	58-68	27-31	9-13	31-35	20-23	27-29	5-6	6-15	3-7	4-5	0-2
s081	21	54.52±0.69	62.48±0.61	28.43±0.32	10.33±0.17	33.67±0.56	21.52±0.35	27.19±0.44	6.00±0.17	12.43±0.43	6.05±0.23	4.05±0.05	2.10±0.22
		48-60	57-67	25-31	9-12	29-40	19-25	21-30	4-8	10-17	5-9	4-5	0-4
s084	52	48.73±0.66	68.12±0.61	27.33±0.14	11.02±0.25	33.98±0.42	24.04±0.27	29.74±0.27	5.92±0.07	15.08±0.47	5.96±0.19	4.20±0.06	1.56±0.12
		38-60 (1)	58-74 (2)	25-30	8-18 (2)	29-40 (2)	20-29	25-34 (2)	4-7 (2)	10-24 (2)	3-10	4-5 (2)	0-4
s085	44	59.64±0.84	67.23±0.43	27.86±0.16	10.44±0.15	28.82±0.27	19.66±0.23	28.57±0.20	5.23±0.10	11.93±0.34	5.32±0.14	4.00±0.00	1.20±0.10
		40-69	61-73 (1)	25-30	9-13 (1)	25-33	17-24	26-32 (2)	4-6	4-15	4-7	4	0-4
s087	9	55.33±0.90	64.44±1.77	27.00±0.47	10.44±0.44	31.78±0.36	22.44±0.69	29.89±0.59	5.89±0.20	14.22±10.01	4.22±0.32	4.00±0.00	1.33±0.29
		51-60	57-72	25-29	8-13	30-33	19-26	27-32	5-7	11-21	3-6	4	0-3
s088	5	52.20±2.44	65.40±0.68	28.20±0.86	10.40±0.60	33.40±0.51	22.40±0.51	26.60±0.51	6.00±0.00	11.40±0.40	4.00±0.55	4.00±0.00	0.60±0.24
		45-57	63-67	26-31	9-12	32-35	21-24	25-28	6	10-12	3-6	4	0-1
s091	20	53.15±0.66	61.75±0.95	28.60±0.21	9.50±0.24	30.75±0.50	22.35±0.50	26.20±0.46	5.55±0.14	11.10±0.45	3.90±0.19	4.00±0.00	1.25±0.20
		48-59	54-70	27-31	8-11	27-35	20-25	21-30	4-6	7-16	3-6	4	0-3
s092	7	53.86±1.35	69.86±1.83	27.29±0.29	10.43±0.48	29.14±1.01	22.29±1.29	27.86±1.10	5.86±0.14	13.24±1.34	4.43±0.37	4.14±0.14	1.14±0.26
		49-58	61-75	26-28	9-12	25-33	19-29	23-32	5-6	7-17	3-6	4-5	0-2
s100	9	50.11±0.96	68.11±1.56	27.11±0.26	10.89±0.31	30.33±0.90	23.56±0.65	30.11±0.39	6.56±0.24	13.11±0.87	3.87±0.28	4.22±0.15	1.00±0.24
		45-53	60-77	26-28	9-12	26-34	20-27	28-32	6-8	9-18	3-5	4-5	0-2
s120	12	56.67±1.80	66.33±1.39	27.58±0.23	9.83±0.37	32.17±0.58	24.08±0.54	29.00±0.63	5.83±0.11	11.83±0.47	5.00±0.39	4.00±0.00	0.83±0.21
		41-64	57-73	26-29	8-12	29-36	21-28	27-34	5-6	9-14	3-8	4	0-2
s127	6	49.33±0.92	65.17±1.49	28.00±0.52	10.67±0.67	33.00±0.63	24.17±0.60	30.50±0.72	6.17±0.31	14.67±0.61	5.00±0.37	4.00±0.26	1.17±0.48
		45-51	62-72	27-30	8-13	31-35	23-26	28-33	5-7	12-16	4-6	3-5	0-3
s134	14	57.50±0.91	59.50±0.82	28.64±0.25	11.07±0.35	33.64±0.71	24.14±0.38	28.67±0.38	5.43±0.17	9.14±0.36	3.71±0.38	4.00±0.00	0.57±0.14
		53-64	53-64	27-30	9-13	30-39	22-27	27-31 (2)	5-7	7-12	1-6	4-4	0-1
s153	5	57.00±0.84	64.20±1.53	28.60±0.51	10.20±0.58	32.00±1.14	22.40±1.54	27.60±1.40	5.40±0.24	11.80±2.18	5.80±1.20	4.20±0.20	0.20±0.20
		55-59	59-68	27-30	8-11	29-35	19-28	23-31	5-6	7-20	4-10	4-5	0-1
s154	8	54.63±0.98	66.50±0.98	28.13±0.40	10.25±0.37	34.00±0.63	23.38±0.50	28.86±0.59	6.00±0.00	11.63±0.56	5.50±0.46	4.00±0.00	0.88±0.23
		50-58	63-70	27-30	9-12	31-36	21-25	27-31 (1)	6	10-14	4-8	4	0-2
sA	15	53.33±1.49	64.14±1.25	27.64±0.39	10.67±0.41	32.87±0.95	23.07±0.30	29.93±0.56	5.80±0.14	14.73±0.45	4.47±0.26	4.00±0.00	1.00±0.17
		40-61	59-76 (1)	24-30 (1)	8-13	26-38	20-25	27-33	4-6	12-19	2-6	4	0-2
sB	23	54.04±0.91	64.57±1.04	28.57±0.40	10.39±0.27	31.35±0.52	21.00±0.28	28.09±0.47	5.91±0.12	13.17±0.48	4.48±0.23	4.00±0.06	1.00±0.15
		46-62	56-77	25-32	8-13	26-37	18-25	24-32	5-7	9-17	3-6	3-5	0-2
sC	4	52.25±1.03	65.75±2.90	26.25±1.11	11.00±0.41	33.50±2.90	25.50±0.65	31.75±0.95	6.00±0.00	16.50±3.48	6.50±0.29	4.25±0.25	1.50±0.50
		50-55	58-72	23-28	10-12	26-40	24-27	29-33	6	10-26	6-7	4-5	1-3
sE	10	52.50±2.35	67.70±1.53	28.10±0.31	10.50±0.58	32.30±1.18	23.40±0.54	29.50±0.98	5.70±0.21	12.30±1.00	4.20±0.29	4.00±0.00	1.00±0.15
		41-60	62-76	26-29	8-14	26-37	21-26	26-35	4-6	7-17	3-6	4	0-2
sF	31	55.26±0.80	66.29±0.97	27.55±0.26	10.48±0.22	32.32±0.66	22.97±0.37	29.23±0.50	5.97±0.10	13.61±0.37	5.06±0.27	4.00±0.00	1.32±0.13
		41-62	55-79	24-31	8-13	27-47	19-27	24-34 (1)	4-7	8-17	2-8	4	0-3
sG	4	55.00±0.91	61.75±0.91	27.75±0.25	10.00±1.00	32.75±1.65	22.00±1.08	28.50±1.19	5.50±0.50	12.75±1.03	4.75±0.48	4.00±0.00	0.75±0.25
		53-57	56-67	27-28	7-11	29-36	20-25	26-31	4-6	10-15	4-6	4	0-1
sH	24	56.67±1.23	66.21±1.30	28.38±0.27	11.29±0.21	32.04±0.65	22.17±0.47	27.92±0.26	5.75±0.14	13.42±0.72	5.33±0.25	4.00±0.06	1.29±0.23
		42-65	58-80	24-30	10-13	27-39	18-28	26-31	4-7	7-20	3-7	3-5	0-5

sample	n	svl	dors	ventr	coll	gul	fpor	4toe	scs	scg	st	sl	sm
sl	20	51.45±0.99	63.89±1.12	27.68±0.40	10.25±0.23	31.74±0.67	22.40±0.41	28.68±0.34	5.85±0.11	12.70±0.70	5.15±0.23	4.00±0.00	0.90±0.20
		42-56	55-74 (1)	24-30 (1)	9-12	26-37 (1)	17-25	25-32 (1)	5-7	9-21	3-8	4	0-3
Corsican	517	52.08±0.21	60.75±0.19	27.78±0.05	9.70±0.05	29.27±0.12	20.92±0.09	28.97±0.09	5.77±0.04	11.80±0.11	5.91±0.05	4.03±0.01	1.13±0.03
clade		26-64	50-73	24-32	6-14	21-38	16-32 (1)	20-36 (6)	3-16	6-27	3-9 (1)	2-5	0-5
Sardinian	452	53.61±0.25	65.13±0.23	27.86±0.06	10.53±0.06	31.87±0.14	22.43±0.11	28.59±0.11	5.79±0.03	12.98±0.14	5.15±0.06	4.06±0.01	1.23±0.04
clade		38-69 (1)	53-80 (6)	23-32 (3)	7-18 (6)	23-47 (9)	17-29 (1)	21-35 (17)	4-8 (2)	4-26 (2)	1-10	3-5 (4)	0-5 (2)