Data on the distribution of the terrestrial herpetofauna of Morocco: records from 2001–2006

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MOROCCO is situated in the Northeast point of Africa, with an area of just over 400,000 km^2 (excluding Western Sahara). Together with Algeria and Tunisia it forms the Maghreb, a well defined geographic region within North Africa. Morocco has a great diversity of habitats, ranging from Mediterranean to Sahara, which are essentially separated by the Atlas Mountains range that traverses the country from Northeast to Southwest. Morocco has the highest diversity of herpetofauna of North Africa and of the Western Mediterranean region. Bons & Geniez (1996) accepted 104 species, with 23 endemic to Morocco, and several new taxa have been formally recognised since (e.g. Wade, 2001). Additionally analyses of genetic variation suggest several widespread forms may actually be species complexes.

Here we report on the findings of six years of field work carried out in Morocco, from 2001 to 2006, totalling approximately 70 person/weeks of observations. Field trips were in most cases carried out during spring, and a total of 427 observations of amphibian and reptile species were recorded. When a species was observed, the coordinates of the location were it was found were marked with a GPS. A total of 159 localities were sampled (Map 1, Appendix 1), resulting in the observation of nine species of amphibians and 57 species of reptiles, representing more than two thirds of the known species. Specimens are classified at the species level, but subspecific comments are supplied when relevant. Since the taxonomy of several Moroccan taxa is still unresolved, we implement some of the more stable nomenclatural changes since Bons & Geniez (1996), but also discuss recently suggested alternatives.

AMPHIBIA

URODELA, **Family Salamandridae**

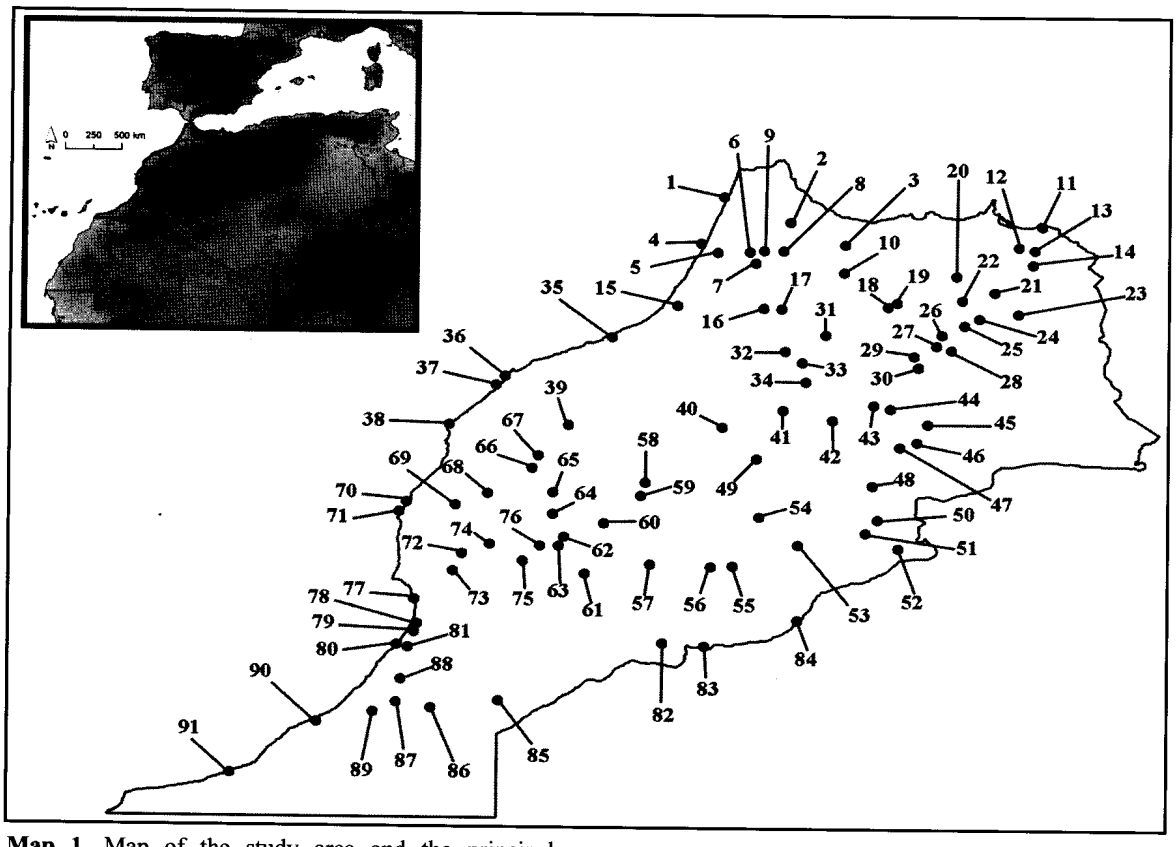
Pleurodeles waltl Michahelles, 1830; localities 5 and 36.

Locality 36, El Jadida (square S11 in Bons & Geniez, 1996): between the northern (main) distribution area and the southern localities were the species was observed, namely Safi [Q15] and Essaouira island [N19], for which Bons & Geniez (1996) suggested the need for confirmation. Adults were found under stones during wet weather (locality 36, reported in detail in Carretero *et al.* (2004)), juveniles in large, shallow temporary ponds (locality 5).

ANURA

Family Discoglossidae

Alytes obstetricans (Laurenti, 1768); only found in locality 19d. Currently referred to *Alytes maurus* (Fromhage *et al.*, 2004, Gonçalves *et al.*, 2007). Adult specimens were found under stones on a well-grazed, steeply sloping hillside.



Map 1. Map of the study area and the principal localities sampled (see Table 1).

Discoglossus pictus Otth, 1837; localities 2a, 18, 19d, 32, 35, 47a and 61. Currently referred to *Discoglossus scovazzi* (Fromhage *et al.*, 2004, Zangari *et al.*, 2006).

Locality 47a: Gourrama. Previously unreported from east of the Atlas Mountains, this extends the distribution into the drier region to the east (Fig. 1A). Found in a variety of ponds, roadside ditches and marshy mountain meadows.

Family Bufonidae

Bufo bufo (L., 1758); localities 31b, 61, 61b, 62a and 73.

Bufo mauritanicus Schlegel 1841, localities 1, 3, 18, 19a, 19d, 24, 29, 31b, 34a, 38, 45a, 46, 50, 57, 61, 69 and 73.

Bufo viridis Laurenti, 1768; localities 24, 28b, 36, 45a, 58 and 68. *Bufo viridis* appears to be a species complex (Stöck *et al.*, 2006). Some of these new localities fill gaps in the known range of this widespread species.

Bufo brongersmai Hoogmoed, 1972; only found in localities 58 and 74a. These connect the locations of Souss basin and south of High Atlas with the isolated observations in the Marrakech plain (Fig. 1B).

Mature adult *Bufo* sp. were generally found under stones. Huge numbers of recent metamorphosed *B. mauritanicus* were observed in various regions of the Rif mountains.

Family Hylidae

Hyla meridionalis Boettger, 1874; localities 19d, 61, 61b and 62. Typically found in reeds near more permanent streams and rivers. Unusual silver coloured individuals were seen at Jebel Sirwah (locality 61).

Family Ranidae

Rana saharica Boulenger, 1913; localities 3, 17, 19, 19a, 28b, 31b, 32, 43, 45a, 46, 47a, 61 and 73. Proposed as a possible species complex by Bons and Geniez (1996), but analysis of mtDNA shows minimal variation across Morocco (Harris *et al.*, 2003a). Common in a variety of water bodies throughout its range.

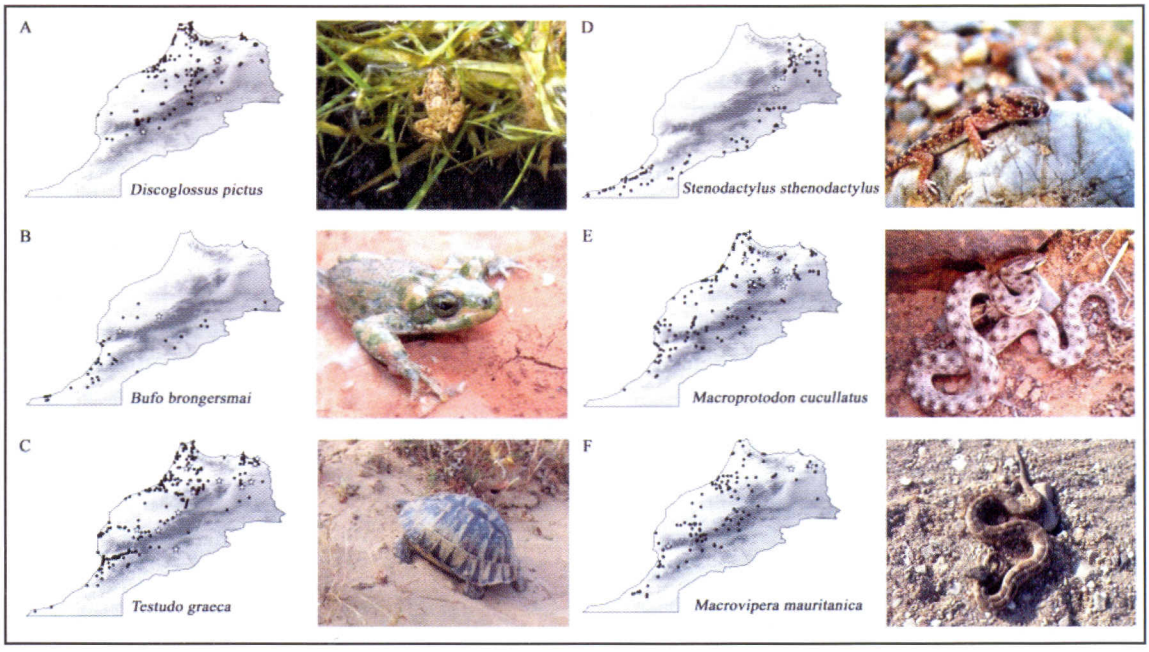


Figure 1. Distribution maps of some of the species observed. Black dots represent known distributions of the species (extracted from Bons & Geniez, 1996) and stars represent new records reported in this study.

REPTILIA

CHELONIA

Family Testudinidae: *Testudo graeca* L., 1758; localities 7, 8c, 13a, 19d, 23, 24b, 32, 38, 40, 56, 59 and 65.

Locality 56: There are few citations of *T. graeca* from the East of the Atlas Mountains. Extensive anthropogenic effects make it difficult to rule out artificial introductions, although this new locality is a long way from any large human settlements (Fig. 1C).

Family Bataguridae: *Mauremys leprosa* (Schweigger, 1812); localities 1a, 8b, 8d, 35, 59 and 87. Although most specimens were found near large mountain streams and rivers, many were clearly of a temporal nature that were likely to be dry for much of the year.

SAURIA

Family Agamidae

Agama bibroni Dúmeril & Dúmeril, 1851; localities 2a, 2b, 3, 5, 8c, 10, 13a, 18, 19d, 20, 30, 31, 32, 37, 44, 47, 47a, 54b, 59, 63b, 74, 75b, 79, 86c and 88b. One of the most commonly seen species in Morocco, found in a wide variety of habitats but typically associated with rocks.

Trapelus mutabilis (Merrem, 1820); localities 45d, 50a, 54a and 59a.

Uromastyx acanthinurus Bell, 1825; localities 20, 44, 47, 54, 54c and 85. Mitochondrial DNA analysis indicates all the Moroccan specimens form a clade within this species, although this includes a relatively high level of genetic variation (Harris *et al.*, 2007). Although still quite common in the rocky desert areas, many specimens were roadkills, and individuals were often observed sold in markets, indicating the dual threats to this species.

Family Anguidae: *Ophisaurus koellikeri* (Günther, 1873); only found in locality 32, under stones in a broad-leaf forest. Currently referred to *Hyalosaurus koellikeri* (Macey *et al.*, 1999).

Family Chamaeleonidae: *Chamaeleo chamaeleon* (L., 1758); localities 20, 54a and 91. One specimen (locality 20) was found in a surprisingly open and arid area, walking along the ground.

Famiily Gekkonidae

Geckonia chazaliae Mocquard, 1895; only found in locality 91a. Currently referred to *Tarentola chazaliae* (Carranza *et al.*, 2002).

Hemidactylus turcicus (L., 1758); only found in locality 11, within a ruined building. Analysis of mtDNA sequence variation indicates *H. turcicus* is probably introduced in Morocco (Carranza & Arnold 2006).

Ptyodactylus oudrii Lataste, 1880; localities 43 and 45a.
Locality 43 (Tamdafelt bridge): This record extends the distribution area of the species further north into the Moulouya river valley. All specimens were found on large boulders. In locality 43 the specimen was on the underside of a rock above an irrigation channel.

Quedenfeldtia moerens (Chabanaud, 1916); localities 63, 72, 75 and 75b.

Quedenfeldtia trachyblepharus (Boettger, 1874); localities 61 and 62.
Locality 61 (El Azib n-Iriri, Jbel Siroua) regarding forms: Most citations from this area are of *Quedenfeldtia* sp. only. This confirms the presence of *Q. trachyblepharus* from this area. *Quedenfeldtia* were active even when the sky was extremely overcast, and were usually found in very high densities when present.

Stenodactylus sthenodactylus (Liechtenstein, 1823); localities 20, 21, 22, 30, 44 and 89.
Localities 22 and 30: these lie between the northern and southern areas of distribution, making it more continuous through the Moulouya river (Fig. 1D). A few specimens were found under rocks, but many more by digging out the small holes beneath thorn bushes, often also occupied by *Acanthodactylus* sp.

Saurodactylus mauritanicus (Dúmeril & Bibron, 1836); localities 12, 13, 13a, 14 and 23.
Saurodactylus brosseti Bons & Pasteur 1957, localities 36, 58, 64, 65, 65a, 68, 71, 72, 74, 77, 78, 81, 88a.

Saurodactylus fasciaticus Werner, 1931; localities 8a, 9a and 39. Locality 39 adds another southerly locality to the few isolated points known, and increases the range of sympatry between *S. fasciatus* and *S. brosseti*. Recent analyses suggest that *Saurodactylus* is paraphyletic (Rato & Harris, 2008), in which case future taxonomic changes to this group are likely.

Tarentola mauritanica (L., 1758); localities 1, 2b, 3, 4, 7, 8c, 11, 17, 19, 19b, 19e, 25, 29, 31, 31b, 32, 32a, 33, 36, 39, 40, 42, 59, 61, 63b, 65, 65a, 67, 73, 75a and 76. *Tarentola mauritanica* appears to be a species complex, although the two accepted subspecies in Morocco do not seem to correspond to genetic lineages (Harris *et al.*, 2004a, b). *Tarentola mauritanica* is extremely widespread in both natural habitats but especially in buildings.

Tarentola deserti Boulenger 1891, localities 50b and 50d. Found on clusters of large boulders. Superficially very similar to *Tarentola mauritanica*, but with a notably ochre-yellow iris.
Tropiocolotes tripolitanus Peters, 1880; found only in locality 89, under rubbish in a small open area within the town of Gourrama.

Family Lacertidae

Acanthodactylus erythrurus (Schinz, 1833); localities 2b, 3, 19b, 24, 32, 32a, 33, 41, 41a, 61, 65, 65a and 72.

Acanthodactylus lineomaculatus Dúmeril & Bibron, 1839; localities 4, 4a, 15, 15a, 38, 70 and 71a. Evidence based on mtDNA do not support the distinction of this species from *A. erythrurus* (Harris *et al.*, 2004).

Acanthodactylus maculatus (Gray, 1838); localities 14, 30a and 53a.

Acanthodactylus busacki Salvador, 1982; localities 79, 81 and 90.
The morphological distinction of *A. busacki* has not always been accepted (see Harris & Arnold 2000). Mitochondrial DNA sequence variation indicates considerable variation within an "*A. pardalis* species complex", including *A. pardalis*, *A. maculatus*, *A. busacki* and *A. mechriguensis* (Fonseca *et al.*, 2008). However, exact delimitation of species remains equivocal. Members of this species complex are extremely difficult to separate in the field. All, like the other Moroccan *Acanthodactylus* sp. are typically seen running over open areas between bushes where the animals take refuge in holes around the roots.

Acanthodactylus boskianus (Daudin, 1802); localities 11, 20, 27, 28, 28a, 28b, 30, 45c, 46, 47a, 48a, 48b, 53, 55, 82, 86, 86a and 86b.

Acanthodactylus dumerili (Milne Edwards, 1829); localities 50c, 50d, 82a, 83a and 84.

Acanthodactylus longipes Boulenger, 1921; localities 52 and 83.

Acanthodactylus aureus Günther, 1903; localities 80 and 90a.

Lacerta tangitana Lataste, 1880; localities 3, 6, 18, 19a, 19d, 24, 32, 32a, 34, 34a, 40a, 40b, 45a, 45b, 61, 63a, 63b and 75. Currently referred to *Timon tangitanus* (Arnold *et al.*, 2007), and may represent a species complex in Morocco (Paulo, 2001). While Debdou (locality 24) is within the range typically assigned to *Lacerta pater*, specimens from here are still *L. tangitana*.

Lacerta andreanszkyi Werner, 1929; localities 62 and 63. Currently referred to *Atlantolacerta andreanszkyi* (Arnold *et al.*, 2007). Found under rocks in the open high mountain meadow of Oukaimeden, with *Podarcis hispanica* and *Scelarcis perspicillata* on the larger rocks and walls surrounding the meadow.

Mesalina guttulata (Lichtenstein, 1823); localities 25, 45a, 48, 54a, 54b and 86c. These new citations fill some gaps in the widespread distribution of this species.

Mesalina olivieri (Audouin, 1829); localities 20, 24, 47 and 65a. The specimen from the last locality (10km NE of Marrakesh) corresponds to the subspecies *M. o. simoni*. All Moroccan *Mesalina* are small, shy species found in dry open areas running between small bushes used as refugia.

Ophisops occidentalis Boulenger, 1887; found only in locality 23.

Podarcis hispanica (Steindachner, 1870); localities 1, 2, 2b, 3, 8, 8c, 8d, 18, 19a, 19b, 19d, 24, 32, 32a, 33, 34, 34a, 42, 61, 61a, 63b and 75. Locality 61 (El Azib n-Iriri, Jbel Siroua): Most Moroccan and Southern Spanish populations are now referred to *Podarcis vaucheri* (Busack & Lawson, 2005). Pinho *et al.* (2006, 2007) show that the populations from locality 61 are not related to other Moroccan populations, but rather to a Tunisian form of the *Podarcis hispanica* species complex. Generally Podarcis were found in areas with Mediterranean climate, and especially near water courses such as streams. However some populations, such as that from within the town of Midelt, were on walls in quite dry areas.

Psammodromus algirus (L., 1758); localities 2a, 2b, 3, 4, 7, 9a, 13a, 19, 19a, 19b, 19d, 19e, 25, 31, 32, 32a, 33, 34, 40, 41a, 45b, 59, 59a and 61. Locality 45b (25km W of Talsinnt): Two other Mediterranean species (*P. vaucheri* and *S. perspicillata*) have isolated records from this region. This adds another Mediterranean species to this isolated group. *Scelarcis perspicillata* was confirmed at the same place, although *P. vaucheri* was not observed. The two accepted subspecies in Morocco do not appear to be genetically distinct based on analysis of mtDNA sequences (Carranza *et al.*, 2006).

Scelarcis perspicillata (Dúmeril & Bibron, 1839); localities 17, 19, 19a, 19b, 19e, 24, 31, 32, 32a, 33, 40a, 45, 59, 61, 63b and 75.

Scelarcis perspicillata has three distinct morphological forms in Morocco. Considerable mtDNA variation was reported (Harris *et al.*, 2003b), and a 100% coincidence of morphotypes and mtDNA lineages was observed at a contact zone of two forms near Taza (Perera *et al.*, 2007), indicating a probable species complex with forms separated by perhaps 5.5 million years (Arnold *et al.*, 2007). However, there are only two distinct genetic lineages, and in other areas populations with similar colour morphs do not coincide with these. Specimens were found predominantly on high cliffs and large rocks, often near running water, where their flattened morphology allows them to take refuge in very narrow crevices. Occasionally also seen climbing on trees.

Family Scincidae

Chalcides colosii Lanza, 1957; only found in locality 2b.

Chalcides minutus (Caputo, 1993); only found in locality 24a.

Chalcides mionecton (Boettger, 1874); localities 15, 15a, 68 and 89.

Chalcides ocellatus (Forsskål, 1775); localities 13a, 14, 20, 22 and 24.

Chalcides polylepis Boulenger, 1890; localities 19b and 36.

Chalcides pseudostriatus (Caputo, 1993); only found in locality 2a. All *Chalcides* specimens were found turning rocks. Recently an extensive review suggests that future taxonomic changes for some species are likely (Carranza *et al.*, 2008).

Eumeces algeriensis Peters, 1864; localities 9a, 16, 19e, 28, 30, 36, 39, 59, 65a, 68 and 79. Eastern localities fall within an area where the form *Eumeces (algeriensis) meridionalis* could have been expected, but all samples corresponded to *E. a. algeriensis*.

Sphenops boulengeri (Anderson, 1896), only found in locality 82.

AMPHISBAENIA

Family Amphisbaenidae (currently Blanidae following Kearney & Stuart, 2004).

Blanus mettetali Bons, 1963; found only in locality 40.

Blanus tingitanus Busack, 1988; localities 8c, 19a and 19b.
Currently two species of *Blanus* are recognised in Morocco, *B. mettetali* and *B. tingitanus*, and one in Iberia, *B. cinereus*. Vasconcelos *et al.* (2006) indicate that *B. cinereus* is a species complex, and that one individual was found in Taza (locality 19). The existence of this form in North Africa needs further investigation.

Family Trogonophidae: *Trogonophis wiegmanni* Kaup, 1830; localities 1, 9a, 19e, 23, 35, 36, 38 and 59. Mendonça & Harris (2007) reported the two localities for *T. w. wiegmanni* in the Moulouya river valley region, that link the northern and southern populations of this form in Morocco. They indicate that three genetic lineages exist in North Africa, corresponding to the accepted subspecies in Morocco plus an additional lineage in Tunisia. All the amphisbaenians observed were found under rocks or litter.

SERPENTES

Family Colubridae (s.l.)

Hemorrhois hippocrepis L., 1758; Localities 7, 9, 9a, 17, 19b, 19c, 24a, 31a, 32, 66 and 67. As with all the following colubrid snakes, many specimens were roadkills.

Hemorrhois algirus (Jan, 1863); found only in locality 54.

Coronella girondica (Daudin, 1803); localities 19d, 24, 49 and 63.

Macroprotodon cucullatus (Geoffroy Saint-Hilaire, 1827); localities 3, 9a, 19b, 19d, 26, 30, 32 and 33. In a recent morphological analysis Wade (2001) recognized four species of *Macroprotodon*, with three, *M. cucullatus*, *M. mauritanicus* and *M. abubakeri* in North Africa and *M. brevis* in North Africa and the Iberian Peninsula. Assessment of mtDNA variation indicates considerable variation in North Africa and a recent colonization of the Iberian Peninsula (Carranza *et al.*, 2004; Vasconcelos & Harris, 2006). However exact delimitation of genetic units in North Africa requires further analyses (Fig. 1E).

Malpolon moilensis (Reuss, 1834); found only in locality 85a.

Malpolon monspessulanus (Hermann, 1804); localities 1a, 2c, 8c, 17, 18, 19d, 33, 61 and 65.
Natrix maura (L., 1758); localities 3, 5a, 8d, 10, 11, 46, 59 and 61. Several specimens were caught swimming in small ponds, streams or irrigation channels. All were collected very close to such water bodies.

Psammophis schokari (Forsskål, 1775); localities 20, 45, 54b and 60. Although three colour morphs have been described for Morocco (Bons & Geniez, 1996), all three form part of the same mtDNA genetic lineage (Rato *et al.*, 2007).

Psammophis and *Malpolon* are the only non-viperid Moroccan snakes belonging to the Subfamily Psammophiinae. Since the recognition of Atractaspididae and Elapidae make traditional Colubridae paraphyletic according to the last molecular phylogenies (Lawson *et al.*, 2005), this well defined group probably merits Family status.
Spalerosophis dolichospilus (Werner, 1923), only found in locality 47a, currently the easternmost report in Morocco.

Family Viperidae

Cerastes cerastes (L., 1758); found only in locality 57a. A roadkilled specimen, without the typical horns.

Macrovipera mauritanica (Gray, 1849); localities 14, 73a and 20. Currently referred to *Daboia mauritanica* (Lenk *et al.*, 2001). These new localities fill gaps in the range of this widespread species, particularly in the low Moulouya basin (Fig. 1F).

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Appendix 1: Localities sampled (coordinates in WGS1984; LAT D: Latitude, Degrees, LAT M: Latitude, Minutes, LONG D: Longitude, Degrees, LONG M: Longitude, Minutes). Codes in bold letter indicate the localities represented in Map 1. Due to the big number of localities sampled, localities that are close together are grouped together.

1: ASSILAH; N 35° 28.264'; W 6° 1.873'; **1a: Road Larache-Tetouan;** N 35° 23.245'; W 5° 55.788'; **2: CHEFCHAOUENE;** N 35° 10.023'; W 5° 15.145'; **2a: 3km S of Derdara crossroad;** N 35° 5.543'; W 5° 18.445'; **2b: Bab Taza;** N 35° 3.98'; W 5° 12.08'; **2c: After Bab Taza;** N 35° 3.669'; W 5° 6.965'; **3: KETAMA;** N 34° 52.694'; W 4° 36.652'; **4: MOULAY BOUSSELHAIM BEACH;** N 34°

53.761'; W 6° 17.266'; **4a: 1km before Moulay Bousselhaim;** N 34° 53.27'; W 6° 15.5'; **5: ROAD TO MOULAY BOUSSELHAIM 1;** N 34° 46.24'; W 6° 5.195'; **5a: Road to Moulay Bousselhaim 2;** N 34° 41.799'; W 6° 1.552'; **6: CLOSE TO BASRA;** N 34° 47.483'; W 5° 43.533'; **7: 5KM AFTER HAD KOURT;** N 34° 39.059'; W 5° 39.628'; **8: ZOUMI;** N 34° 48.026'; W 5° 20.416'; **8a: Road to Zoumi;** N 34° 46.102'; W 5° 30.971'; **8b: 5km before Zoumi;** N 34° 44.759'; W 5° 25.369'; **8c: 15km before Zoumi;** N 34° 46.102'; W 5° 30.971'; **8d: 4,5km SE of Zoumi;** N 34° 47.361'; W 5° 18.201'; **9: 2KM BEFORE OUAZZANE;** N 34° 47.759'; W 5° 33.543'; **9a: Close to Ouazzane;** N 34° 37.814'; W 5° 32.283'; **10: TAOUNATE;** N 34° 31.797'; W 4° 38.085'; **11: MOUTH OF OUED MOULOUYA; 9KM W OF SAIDA;** N 35° 7.243'; W 2° 19.981'; **12: 3 KM E OF MOULOUYA RIVER BRIDGE;** N 34° 52'; W 2° 36'; **13: ROAD TO TAFORALT;** N 34° 50'; W 2° 25'; **13a: 11km S of Berkane;** N 34° 51.435'; W 2° 25.525'; **14: 10KM N OF EL AIOUN;** N 34° 38.666'; W 2° 26.471'; **15: FORET DE LA MAMORA;** N 34° 6.279'; W 6° 33.73'; **15a: Kenitra (highway);** N 34° 12.264'; W 6° 33.715'; **16: VOLUBILIS (ROMAN RUINS);** N 34° 4.532'; W 5° 33.445'; **17: NEAR MOULAY IDRISS;** N 34° 3.867'; W 5° 21.337'; **18: HALOUANE;** N 34° 6.791'; W 4° 7.283'; **19: RAS-EL-OUED, TAZZEKA;** N 34° 9.249'; W 4° 0.556'; **19a: 10km S of Taza;** N 34° 7.829'; W 4° 1.751'; **19b: 15km S of Taza - Taza Caves;** N 34° 6.257'; W 4° 4.349'; **19c: 30km S of Taza - P.N. Tazekka;** N 34° 5.55'; W 4° 6.188'; **19d: 35km S of Taza - P.N. Tazekka;** N 34° 5.021'; W 4° 6.849'; **19e: Canyons between Sidi Abdallah and Taza;** N 34° 11.573'; W 4° 11.391'; **20: 15KM S OF SAKA;** N 34° 29.801'; W 3° 19.564'; **21: FROM TAOURIRT TO DEBDOU;** N 34° 18.154'; W 2° 53.14'; **22: 5KM S OF CROSSROAD TO MISSOUR;** N 34° 11.629'; W 3° 15.13'; **23: 60KM NW OF AIN BENIMATHAR;** N 34° 1.502'; W 2° 36.34'; **24: GAADA DE DEBDOU;** N 33° 57.7'; W 3° 2.868'; **24a: Gaada de Debdou 1;** N 33° 58.476'; W 3° 1.876'; **24b: Gaada de Debdou (Plateau du Rekkam) 1;** N 33° 47.018'; W 3° 2.518'; **25: RCHIDA;** N 33° 52.472'; W 3° 13.644'; **26: ZERZAIA ROAD S329;** N 33° 45.765'; W 3° 29.688'; **27: FRITISSA;** N 33° 37.288'; W 3° 32.945'; **28: 24KM E OF CROSSROAD TO AIN BENIMATHAR;** N 33° 33.761'; W 3° 22.456'; **28a: 10km E of crossroad to Ain Benimathar;** N 33° 30.446'; W 3° 32.244'; **28b: 2km E of crossroad to Ain Benimathar;** N 33° 20.214'; W 3° 34.962'; **29: TIRNEST;** N 33° 29.268'; W 3° 48.658'; **30: OUTAT-OULAD-EL-HAJ;** N 33° 21.198'; W 3° 45.63'; **30a: 30km N of Missouri;** N 33° 15.927'; W 3° 48.243'; **31: MIDELT TO TAZA 1;** N 33° 44.549'; W 4° 49.911'; **31a: Midelt to Taza 2;** N 33° 29.666'; W 4° 51.754'; **31b: Midelt to Taza 3;** N 33° 15.043'; W 4° 41.229'; **32: 15KM N OF AZROU (BALCON D' ITO);** N 33° 32.562'; W 5° 19.014'; **32a: 5km S of Azrou;** N 33° 26.11'; W 5° 10.913'; **33: MISCHLIFFEN;** N 33° 24.326'; W 5° 6.199'; **34: 10KM S OF TIMAHDITE;** N 33° 9.313'; W 5° 4.096'; **34a: 15km S of Timahdite;** N 33° 6.788'; W 5° 1.652'; **35: N - CASABLANCA (HIGHWAY);** N 33° 42.675'; W 7° 18.922'; **36: EL JADIDA;** N 33° 12.725'; W 8° 33.058'; **37: JORF LASFAR;** N 33° 5.282'; W 8° 39.192'; **38: MOUSSA;** N 32° 36.182'; W 9° 11.5'; **39: MECHRA BEN ABHOU; 110KM NW OF MARRAKECH;** N 32° 36.099'; W 7° 48.66'; **40: EL KSIBA;** N 32° 34.511'; W 6° 2.109'; **40a: El Ksiba Area;** N 32° 33.599'; W 6° 4.135'; **40b: Titt-n-Tazzart;** N 32° 29.281'; W 6° 0.852'; **41: KERROUCHEN;** N 32° 48.106'; W 5° 19.386'; **41a: Tizi-n' Rechou;** N 32° 47.062'; W 5° 13.508'; **42: MIDELT;** N 32° 40.972'; W 4° 44.568'; **43: TAMDAFELT BRIDGE;** N 32° 52.471'; W 4° 15.916'; **44: 25KM S OF MISSOUR;** N 32° 49.87'; W 4° 4.371'; **45: 22KM W OF TALSINNT;** N 32° 38.328'; W 3° 38.489'; **45a: Unnamed village 30km W of Talsinnt;** N 32° 35.158'; W 3° 45.631'; **45b: 25km W of Talsinnt;** N 32° 34.143'; W 3° 42.255'; **45c: 18km S of Talsinnt;** N 32° 22.545'; W 3° 25.897'; **45d: 25km S of Talsinnt;** N 32° 19.321'; W 3° 28.777'; **46: AIT ICHCHOU;** N 32° 25.13'; W 3° 46.232'; **47: 10KM E OF GOURRAMA;** N 32° 21.063'; W 3° 57.967'; **47a: Gourrama;** N 32° 20.094'; W 4° 4.469'; **48: AR-RACHIDIA (CAMPING);** N 31° 51.922'; W 4° 17.17'; **48a: 5km S of Source Blue de Merski;** N 31° 50.935'; W 4° 15.308'; **48b: Aoufouss;** N 31° 47.087'; W 4° 13.525'; **49: LAKE TISLI;** N 32° 11.564'; W 5° 38.054'; **50: ERFOUD;** N 31° 26.215'; W 4° 13.264'; **50a: 5km N of Erfoud;** N 31° 30.012'; W 4° 12.11'; **50b: 10km N - Erfoud;** N 31° 31.098'; W 4° 11.56'; **50c: 15km N - Erfoud;** N 31° 31.205'; W 4° 11.533'; **50d: 12km N of Erfoud;** N 31° 32.343'; W 4° 11.152'; **51: 5KM W OF RISSANI;** N 31° 16.217'; W 4° 21.865'; **52: ERG CHEBBI;** N 31° 4.356'; W 3° 58.173'; **53: 2KM E OF ALNIF;** N 31° 7.117'; W 5° 8.577'; **53a: 10km E of Alnif;** N 31° 9.609'; W 5° 2.237'; **54: MERZOUGA TO OUARZAZATE DESERT ROAD 1;** N 31° 27.708'; W 5° 35.661'; **54a: Merzouga to Ouarzazate desert road 2;** N 31° 22.414'; W 5° 52.564'; **54b:**

Merzouga to Ouarzazate desert road 3; N 31° 6.796'; W 6° 24.474'; **54c: Merzouga to Ouarzazate desert road 4;** N 31° 4.085'; W 6° 32.096'; **55: 15KM W OF TAZZARINE;** N 30° 51.35'; W 5° 54.173'; **56: 20KM NW OF SOUK EL ARBA;** N 30° 50.344'; W 6° 8.735'; **57: 5KM S OF OUARZAZATTE;** N 30° 51.719'; W 6° 50.85'; **57a: 10km S of Ouarzazatte;** N 30° 49.302'; W 6° 46.161'; **58: 3.5KM NE OF TANANNT;** N 31° 53.201'; W 6° 54.85'; **59: IMINIFRI;** N 31° 43.454'; W 6° 58.314'; **59a: After Iminifri;** N 31° 42.428'; W 6° 57.376'; **60: ROAD OUARZAZATTE – MARRAKECH ;** N 31° 22.017'; W 7° 23.53'; **61: EL AZIB N-IRIRI (JBEL SIROUA);** N 30° 44.818'; W 7° 36.557'; **61a: Amzdour;** N 30° 46.617'; W 7° 37.229'; **61b: W of Tachakoucht;** N 30° 48.337'; W 7° 32.627'; **62: OUKAIMEDEN;** N 31° 12.058'; W 7° 51.322'; **62a: 1km S of Oukaimeden;** N 31° 12.757'; W 7° 50.874'; **63: HIGH RERAIA RIVER: 2KM S OF SIDI CHAMHAROUCH;** N 31° 5.254'; W 7° 55.148'; **63a: High Reraia river: Sidi Chamharouch;** N 31° 6.314'; W 7° 54.844'; **63b: Reraia river;** N 31° 6.041'; W 7° 54.867'; **64: 15KM S OF MARRAKESH (S501 TO TAHANNAOUT);** N 31° 29.172'; W 7° 59.022'; **65: MARRAKECH-OULAD SALAS;** N 31° 45.434'; W 7° 58.47'; **65a: 10km NE of Marrakesh;** N 31° 44.335'; W 7° 58.698'; **66: OADDOUR;** N 32° 4.014'; W 8° 13.158'; **67: OULAD BRANIM;** N 32° 13.496'; W 8° 9.89'; **68: OULAD BRAHIM (OUED TENSIFT);** N 31° 45.148'; W 8° 44.06'; **69: AN NZALA;** N 31° 35.43'; W 9° 6.283'; **70: MOULAY BOUZERTOUN BEACH;** N 31° 38.161'; W 9° 40.432'; **71: ESSAOUIRA;** N 31° 30'; W 9° 46'; **71a: 7km S of Essaouira;** N 31° 27.821'; W 9° 45.38'; **72: GRAN PLATEAU DES IDA-OU-BOUZIA;** N 30° 59.567'; W 9° 1.8867'; **73: ARGANA;** N 30° 46.597'; W 9° 7.7717'; **73a: 13km N of Bigoudine;** N 30° 48.713'; W 9° 8.044'; **74: LALA AZIZA;** N 31° 6.223'; W 8° 42.523'; **74a: Temporary pond by the track;** N 31° 10.512'; W 8° 45.217'; **75: 15 KM S-HAZAR ROAD KM 93;** N 30° 54.028'; W 8° 19.888'; **75a: Hazar;** N 30° 56.928'; W 8° 15.853'; **75b: Tizi-n-Test;** N 30° 52.455'; W 8° 22.02'; **76: 31KM S - ASNI;** N 31° 5.413'; W 8° 7.765'; **77: AGADIR, TIZNIT ROAD;** N 30° 25'; W 9° 35'; **78: 49KM TIZNIT;** N 30° 6'; W 9° 33'; **79: TAROUDANT (OUED MASSA);** N 29° 59.828'; W 9° 35.272'; **80: BOU SOUN;** N 29° 51.071'; W 9° 46.238'; **81: OUED MASSA;** N 29° 48.369'; W 9° 38.85'; **82: 30KM E OF FOUM ZGUID;** N 29° 52.81'; W 6° 42.714'; **82a: 40km E of Foum Zguid;** N 29° 51.042'; W 6° 37.318'; **83: ERG MHAZIL - 80KM E OF FOUM ZGUID;** N 29° 51.274'; W 6° 13.535'; **83a: 112km E of Foum Zguid;** N 29° 52.091'; W 6° 0.636'; **84: 60KM E OF TAGOUNITE;** N 30° 11.096'; W 5° 8.796'; **85: 60KM W OF AKKA;** N 29° 9.326'; W 8° 35.596'; **85a: 80km SW of Akka;** N 29° 5.1'; W 8° 41.391'; **86: 3KM E OF TAGGIT;** N 29° 3.177'; W 9° 22.431'; **86a: 4km E of Taggit;** N 29° 3.148'; W 9° 20.753'; **86b: 6km E of Taggit;** N 29° 3.362'; W 9° 20.093'; **86c: 6km W of Taggit;** N 29° 6.052'; W 9° 28.002'; **87: TAGANT;** N 29° 7.48'; W 9° 46.68'; **88: TIZI MIGHERT;** N 29° 24.516'; W 9° 43.634'; **88a: Morght;** N 29° 24'; W 9° 43'; **88b: km.49 Tiznit-Guelmine;** N 29° 23.71'; W 9° 44.065'; **89: GUELMINE;** N 28° 59.87'; W 10° 3.164'; **90: 15KM E OF AOREORA - PLAGE BLANCHE;** N 28° 52.39'; W 10° 42.164'; **90a: 25km S of Aoreora;** N 28° 44.684'; W 10° 44.631'; **91: 50KM S OF TAN-TAN PLAGE;** N 28° 13.847'; W 11° 42.099'; **91a: 60km S of Tan-Tan Plage;** N 28° 11.514'; W 11° 49.47'.