The distribution of amphibians and reptiles on Samos Island (Greece)
(Amphibia: Reptilia)

Die Verbreitung der Amphibien und Reptilien auf der Insel Samos (Griechenland)
(Amphibia: Reptilia)

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KURZFASSUNG

Die Arbeit faßt 1580 Funddaten von Reptilien und Amphibien auf der Insel Samos (Griechenland) aus den letzten Jahren (1993-2012) zusammen. Alle Funde wurden auf einem 1 km x 1 km Raster verortet, wobei 40 % der Zellen (261 von insgesamt 648) zumindest eine Beobachtung einer Art aufwiesen. Auf dieser Datengrundlage wurden Verbreitungsmuster und ökologische Beobachtungen mit Vorkommen auf anderen Inseln der Ägäis verglichen. Das in der Arbeit erstmals publizierte Vorkommen der Münzennatter *Hemorrhois nummifer* (REUSS, 1834) auf dieser Insel hebt die Anzahl der bekannten Arten für Samos auf 28 (4 Amphibien- und 24 Reptilienarten).

ABSTRACT

A collection of 1580 recent data records (1993-2012) of amphibians and reptiles from the Greek Island of Samos was compiled. All records were mapped onto a grid of 1 km by 1 km, with 261 of the total 648 cells (40 %) of the island holding at least one observation. Subsequently, the distribution patterns and ecological observations were compared with data from other islands in the Aegean Basin. The discovery of the Coin-marked Snake *Hemorrhois nummifer* (REUSS, 1834), published herein after, constitutes a new island record, setting the herpetofauna list to 28 confirmed species (4 amphibians, 24 reptiles).

KEYWORDS

Amphibia, Reptilia, amphibians, reptiles, distribution, mapping, large contemporary dataset, Samos, Greece, Aegean, island herpetofauna, new island record, *Hemorrhois nummifer*

INTRODUCTION

Samos is a Greek island in the eastern Aegean Sea, separated from Asia Minor by the 1.3 km wide Mycale Strait (Figs. 1A, 1B). The island has a surface of 476 km², roughly 44 km from west to east by 19 km from north to south (STAMATELATOS & VAMVA-STAMATELATOU 2006). Built up by largely mountainous and hilly terrain with a maximal elevation of 1,434 m (Mt. Kerkis), pine forest dominates considerable sections of the inland. Additionally, the island hosts relatively large flatlands, especially in the southeast. These areas are characterized by non-intensively managed olive orchards with rich herbaceous undergrowth bordered by dry-stone walls, providing refuge for wildlife. As sustainable amphibian populations rely on water for reproduction, a number of perennial and intermittent streams, coastal marshes as well as man-made water reservoirs are of particular importance to the anuran species of Samos, as well as a number of reptile species dependent on water habitats (namely, Grass Snake and terrapins). The island's climate is of mild Mediterranean type, with monthly average temperatures ranging from 10.3 (January) to 28.4 °C (July) and monthly rainfall ranging from 0.5 (July) to 164 mm (December) (HELLENIC NATIONAL METEOROLOGICAL SERVICE 2013). Its heterogeneous landscape, mild climate and close proximity to the Anatolian mainland has resulted in a distinct and high biodiversity.

The herpetofauna of Samos is one of the most diverse of all Greek islands, likely to be only surpassed by that of Corfu (Kerkyra) (TÓTH et al. 2002; RAZZETTI et al. 2006). Oskar BOETTGER (1888) set the basis of herpetological studies on Samos, describing specimens collected by Eberhard VON OERTZEN in 1887, thus presenting more or less the first reference to a list of Samos amphibian and reptile species (listed here by their current names): *Bufo bufo*, *Pelophylax bedriagae*, *Chamaeleo chamaeleon*, *Laudakia stellio*, *Ophisops elegans*, *Anatololacerta anatolica*, *Typhlops vermicularis* and *Eirenis modestus*. Subsequently, Enrica CALABRESI (1923) published a list of specimens collected on the island in 1893 by Forsyth MAJOR, adding *Mediodactylus kotschyi*, *Hemidactylus turcicus* and *Ablepharus kitaibelii*. Unfortunately, the specimens collected by F.S.C. MAJOR, until today present in the Museo di Storia Naturale "La Specola" of Firenze, cannot be assigned unambiguously to Samos, as the locality reported on the labels is "Samos e isole vicine" (= Samos and nearby islands) (Annamaria NISTRI, *in litt.* 2013). CALABRESI's first mention of the presence of *Mediodactylus kotschyi* (cited as *Gymnodactylus oertzeni*) was later also listed by Franz WERNER (1930, 1933), and with indication of doubt adopted by BEUTLER & GRUBER (1977) and CHONDROPOULOS (1986). However, since the exact origin of the data is unclear and more recent records of *M. kotschyi* are lacking from the available literature, there seems to be no convincing evidence that this species is present on Samos. In contrast to CALABRESI's citation of *M. kotschyi*, subsequent records confirmed the presence on Samos of *Hemidactylus turcicus* (WERNER 1935) and *Ablepharus kitaibelii* (WERNER 1930). A third major addition to the list of herpetofauna species of Samos was made by a number of papers by WERNER (1930, 1933, 1935, 1938), adding *Bufo viridis, Mauremys rivulata*, *Testudo graeca*, *Pseudopus apodus*, *Dolichophis caspius*, *Zamenis situla* and *Natrix natrix* to the faunal inventory. From the second half of the last century onwards, the majority of the species seemed to have been discovered and reported, and new discoveries became less numerous. DAAN (1967) added *Lacerta trilineata*, *Platyceps najadum* and *Telescopus fallax,* while BEUTLER (1979) mentioned *Trachylepis aurata* for the first time. The first explicit reports of *Montivipera xanthina* were published in the same year within three different publications: VAN WINGERDE (1986), NILSON & ANDRÉN (1986) and TIEDEMANN & GRILLITSCH (1986). The presence of the species on Samos was, however, (indirectly) noted much earlier. In 1857, the Italian explorer and zoologist Orazio ANTINORI was bitten in his right hand and suffered partial paralysis of the arm and discomfort for nearly two years (AMBROGI 1992; MAZZOTTI 2011). *Natrix tessellata* was listed as occurring on Samos by CHONDROPOULOS (1989), by authority of an observation made by S. VALAKOS in 1984, but has been revoked by the latter (S. VALAKOS *in verbis*). BUTTLE (1990) mentioned *Blanus strauchi* for Samos by authority of a personal communication of Achilles DIMITROPOULOS, which was subsequently indicated as erroneous by the latter (A. DIMITROPOULOS *in verbis*). BOL (1992) was the first to mention *Eryx jaculus* for Samos from a 1989 find, although an earlier observation (1988) was reported two years later (IOANNIDES et al. 1994). IOANNIDES et al. (1994) also published the presence of *Hyla arborea* (see also IOANNIDES & DIMAKI 1996, 1997) and *Malpolon insignitus* for the first time. The last addition to the herpetofauna list of the island was *Emys orbicularis*, published by MEYER & FRITZ (1996).

Leaving sea turtles aside, and excluding three unconfirmed species (*Mediodactylus kotschyi*, *Blanus strauchi* and *Natrix tessellata*), prior to this paper, twenty-six species have been found, confirmed, published and repeatedly recorded on Samos, which includes four species of amphibians and twenty-two species of reptiles. As some of these species occur within Greece only on Samos and other islands off the Turkish western coast, the herpetofauna of the island has been identified as holding an 'Asian' character, in contrast to islands west of the Mid-Aegean Trench, with a more 'European' fauna composition (PAFILIS 2010).

The aim of this paper is to collect, discuss and map recent distribution records, most of which have never been published before, in order to enhance knowledge about presence, abundance, seasonality and distribution of the herpetofauna of Samos.

Table 1: Number of herpetological records available for the present analysis, tabulated by year and month.
Tab. 1: Die Anzahl der für die Analyse verfügbaren Funddaten, geordnet nach Jahr und Monat.

Month / Monat	Year / Jahr																				
	'93	'94	'96	'97	'98	'99	'00	'01	'02	'03	'04	'05	'06	'07	'08	'09	'10	'11	'12	?	total	%
Apr		14	22	14				4	1		124				24	4	12	5			224	14
May							59	2			52		89	73	48	2	5	78	3	1	412	26
Jun	38	59			24		1								8	12	2	1	10		155	10
Jul						18	44			3		29			20	33	33	17			197	12
Aug							28					1	1	11	13	3	59	22	17		155	10
Sep		28		1			9	7							28	1	75	11			160	10
Oct			4	28			14		8						3	105	1	4			167	11
Nov				4															42		46	3
Dec		4																			4	0
?			1											1				1		57	60	4
total	38	105	27	47	24	18	155	13	9	3	176	30	90	85	144	160	187	139	72	58	1580	100

MATERIALS AND METHODS

Data

Data was collected opportunistically from 1993 to 2012 (Table 1) by the authors as well as from numerous contributors (see acknowledgements). Table 1 summarizes the temporal spread of the collected data, with spring (April-May) and a number of years with dedicated field trips taking up large portions of the total data.

The degree of accuracy differs within the data, ranging from exact GPS coordinates, estimated sites of location in Google Earth and other available detailed mapping tools, to only the indication of the grid cell (see below) of observation. Such data was of sufficient quality for the present mapping purposes, while less precise observations were omitted.

Repeated sightings of the same species at the same site were not lumped, in order to maintain an image of sampling bias and observational preferences. Densities (number of observed individuals per observation and/or site) could unfortunately not be taken into account, as this information was frequently unavailable. A certain contributor-specific bias that may exist (e.g., some contributors focus on one or a number of species rather than collecting data for all, some do not search at night or under objects, etc.), was assumed to be largely levelled out by the large number of available records. Thus, the authors consider the relative number of records for each species to reflect its detectability and/or abundance. One notable exception is given by the data of *Chamaeleo chamaeleon*, for which one of the authors (MD) conducted intensive species-specific sampling.

Mapping

The distribution database was intersected in ArcGIS10 with a 1 km x 1 km grid (coordinate system WGS84, UTM zone 35) comprising 648 individual cells, encompassing Samos and the small satellite island of Samiopoula (Fig. 1C). An overall sampling density map and grid maps per species were created to visualize the distribution (Figs. 5 - 8) and calculate the portion of occupied grid cells within the total grid.

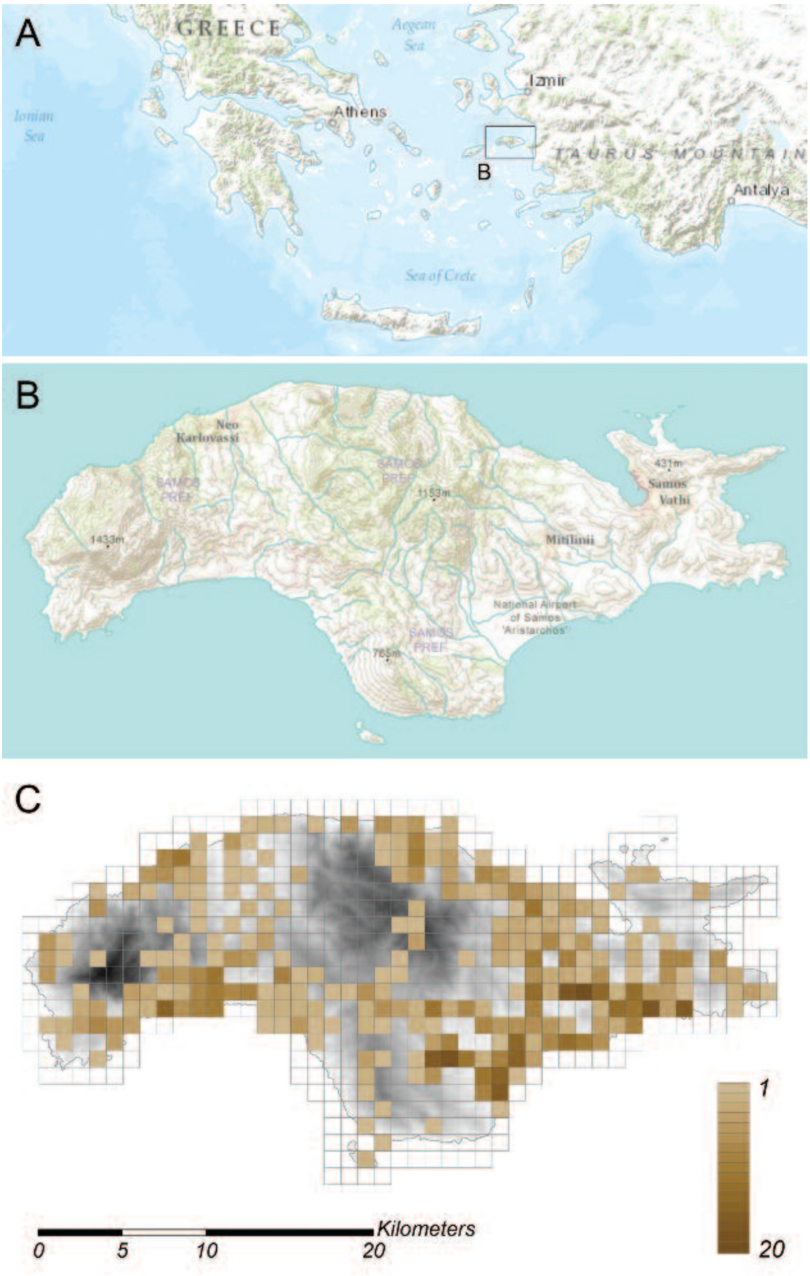

Fig. 1: A & B - Geographic location of the Island of Samos (East Aegean, Greece) and basic topography and hydrology of the island; C - Density distribution of collected herpetological data, represented by different shades of brown. The legend shows the number of species within each grid cell.

Abb. 1: A. & B - Die geographische Lage von Samos, sowie eine vereinfachte Darstellung der Topographie und Hydrologie; C - Dichte der gesammelten herpetologischen Daten, verdeutlicht durch unterschiedliche Braun-Schattierungen. Die Legende zeigt die Anzahl der Arten innerhalb jeder Zelle.

Altitudinal information was not available for the records. This is why for each species, the occupied grid cells were combined with altitude descriptors, viz. average altitude ± SD (Hijmans et al. 2013) to display the species' vertical distribution. Mean altitude ± SD of the entire island, based on the averages of all its 648 grid cells is 304.25 ± 263.59 m, and of the territory covered by occupied grid cells, based on the averages of the 261 occupied grid cells is 116 ± 150.37 m.

Bibliographic data and references to museum specimens were included in each species account. To reflect true data accumulation, it was attempted to only list papers providing new distributional data, excluding secondary sources like reviews such as Chondropoulos (1986, 1989). Specimen information was requested from numerous museum collections, while some were obtained from online catalogues. Unfortunately, some of these queries remained unanswered. Concerning the use of museum acronyms, standard symbolic codes for institutional resource collections as listed in Sabaj Pérez (2013) were adopted: AMNH - American Museum of Natural History, New York; GNHM - Goulandris Natural History Museum, Athinai; MCZ - Museo Civico di Zoologia, Roma; MHNG - Muséum d'Histoire naturelle, Genève; MNHN - Muséum national d'Histoire naturelle, Paris; MSNF - Museum of Natural Sciences, Firenze; NHMAS - Natural History Museum of the Aegean, Mitilini; NHMC - Natural History Museum of Crete, Iraklió; NHMW - Naturhistorisches Museum, Wien; NRM - Swedish Museum of Natural History, Stockholm; YPM - Yale University Peabody Museum, New Haven.

RESULTS AND DISCUSSION

A total number of 1,580 records (species observation at a given site and date), belonging to 28 species, were collected (Table 2). Merging multiple observations of the same species within the same grid cell, resulted in 1,019 species-cell observations remaining.

Species frequently represented by numerous records per grid cell showed higher values in the percentage of observations in comparison to the percentage of occupied grid cells (e.g., *Pelophylax bedriagae* and especially *Mauremys rivulata*), or vice versa, occupied less grid cells than the general overall trend would predict, judging their number of observations. This is likely to be due to both habitat specificity as well as relatively high ease of observation; other types of biased sampling (seasonal and behavioral effects) may add to this imbalance. Figure 2 illustrates the relation between the tabulated percentages. The graph indicates that the more frequently observed species tended to be observed more often in the same grid cell than seemingly rarer species.

As shown in Fig. 1C, coverage is incomplete at the chosen grid resolution: 261 grid cells of a total of 648 cells (40%) hold one or more observations. Important (in most cases mountainous) parts of the center and central south of the island are readily visible as gaps in the mapping effort, with available data partially concentrated around commonly used tourist accommodation facilities, serving as the working base of most of the field trips, which contributed to this data compilation.

The frequency distribution of specific grid occupancy rates (number of grid cells by number of herpetological species) is given in Fig. 3. The highest number of species within a single cell was 20.

The altitudinal distribution of each species is illustrated in Fig. 4 and will be discussed in the species accounts below. As more observations and surveying activities were done in lower, coastal and more accessible areas, sampling is unbalanced with regard to medium and higher elevations.

In the following section, the species are discussed in detail. Available references to bibliography and museum specimens are given.

Mean altitudes of the sites of observation are represented by the mean altitudes of the corresponding grids ± 1 Standard Deviation given in m a.s.l..

Table 2: Amphibians and reptiles of Samos Island (Greece). Overview of available records per species, including number of records, proportion of records in total dataset (n = 1,580), number of occupied grid cells (1 km x 1 km), and proportion of occupied grid cells in total number of grid cells (n = 648).

Tab. 2: Amphibien und Reptilien von Samos (Griechenland). Überblick der vorhandenen Nachweise. Angegeben werden für jede Art: Anzahl der Nachweise, Prozentsatz der Nachweise bezogen auf den Gesamtdatensatz (n = 1580), Anzahl der belegten Rasterfelder (1 km x 1 km), Prozentsatz der belegten Rasterfelder bezogen auf die Gesamtanzahl der Rasterfelder (n = 648).

Species - - -	Number of records / Anzahl der Nachweise	Proportion relative to all records (%) / Anteil an allen Beobachtungen (%)	Number of grid cells / Anzahl der Rasterfelder	Proportion relative to all grid cells (%) / Anteil an allen Rasterfeldern (%)
Bufo bufo	34	2.2	26	4.0
Bufo viridis	22	1.4	17	2.6
Hyla arborea	13	0.8	10	1.5
Pelophylax bedriagae	117	7.4	57	8.8
Testudo graeca	26	1.6	24	3.7
Mauremys rivulata	68	4.3	23	3.5
Emys orbicularis	7	0.4	4	0.6
Trachemys scripta	3	0.2	1	0.2
Laudakia stellio	182	11.5	93	14.4
Chamaeleo chamaeleon	162	10.3	86	13.3
Hemidactylus turcicus	48	3.0	31	4.8
Anatololacerta anatolica	45	2.8	30	4.6
Lacerta trilineata	100	6.3	60	9.3
Ophisops elegans	154	9.7	98	15.1
Ablepharus kitaibelii	47	3.0	40	6.2
Trachylepis aurata	23	1.5	20	3.1
Pseudopus apodus	66	4.2	46	7.1
Typhlops vermicularis	44	2.8	35	5.4
Eryx jaculus	24	1.5	23	3.5
Malpolon insignitus	18	1.1	17	2.6
Natrix natrix	30	1.9	18	2.8
Dolichophis caspius	106	6.7	67	10.3
Eirenis modestus	82	5.2	65	10.0
Hemorrhois nummifer	9	0.6	7	1.1
Platyceps najadum	54	3.4	47	7.3
Telescopus fallax	32	2.0	28	4.3
Zamenis situla	13	0.8	11	1.7
Montivipera xanthina	51	3.2	35	5.4
Total	Σ = 1580	$\bar{x}$ = 3.56	Σ = 1019	$\bar{x}$ = 5.61

AMPHIBIANS

Bufo bufo
(LINNAEUS, 1758) (Fig. 5)

Even though it was one of the first species recorded (BOETTGER 1888), subsequent sightings remained fairly scarce. Only 34 records were collected, corresponding to 2.2 % of the data. These fall within 26 grid cells (4.0 % of entire grid). The present records are scattered across different parts of Samos. Possibly, a certain bias is caused by most of the data originating from months of suboptimal conditions for this species to be active (after reproductive period), in combination with lack of interest for nocturnal searches during rain, and tadpoles as helpful means of detection. Being a species of typically temperate humid climates, this toad is absent from most Greek islands (VALAKOS et al. 2008). The relatively high mean altitude of the sites of observation (160 ± 27 m) coincides with a more inland distribution and could also be related to the species' occurrence in more temperate habitats such as woodland. As inland records are relatively scarce, this species' distribution is likely insufficiently sampled. No obvious seasonal pattern seems to emerge from the data; the percentage of observations per month does not strongly differ from that of the entire dataset.

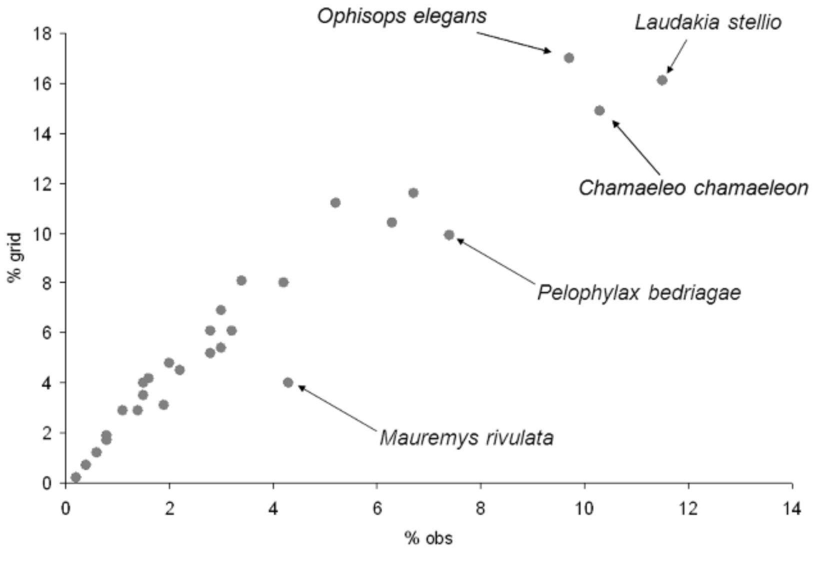

Fig. 2: Relation between percentages of observations (% obs) and occupied grid cells (% grid) for 28 herpetological species on the Island of Samos.

Abb. 2: Die Beziehung zwischen prozentualer Anzahl der Beobachtungen (% obs) und prozentualer Anzahl der besetzten Rasterfelder (% grid) für 28 herpetologische Arten auf der Insel Samos.

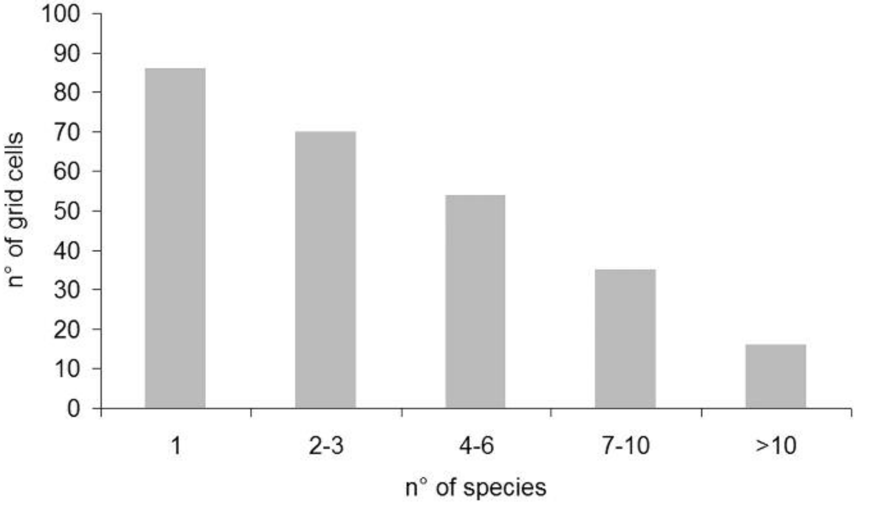

Fig. 3: Frequency distribution of specific grid occupancy rates (number of grid cells by number of herpetological species).

Abb. 3: Häufigkeitsverteilung der Belegungsdichten der Rasterzellen mit unterschiedlichen Artenzahlen (Anzahl von Rasterzellen bezogen auf die Anzahl der herpetologischen Arten).

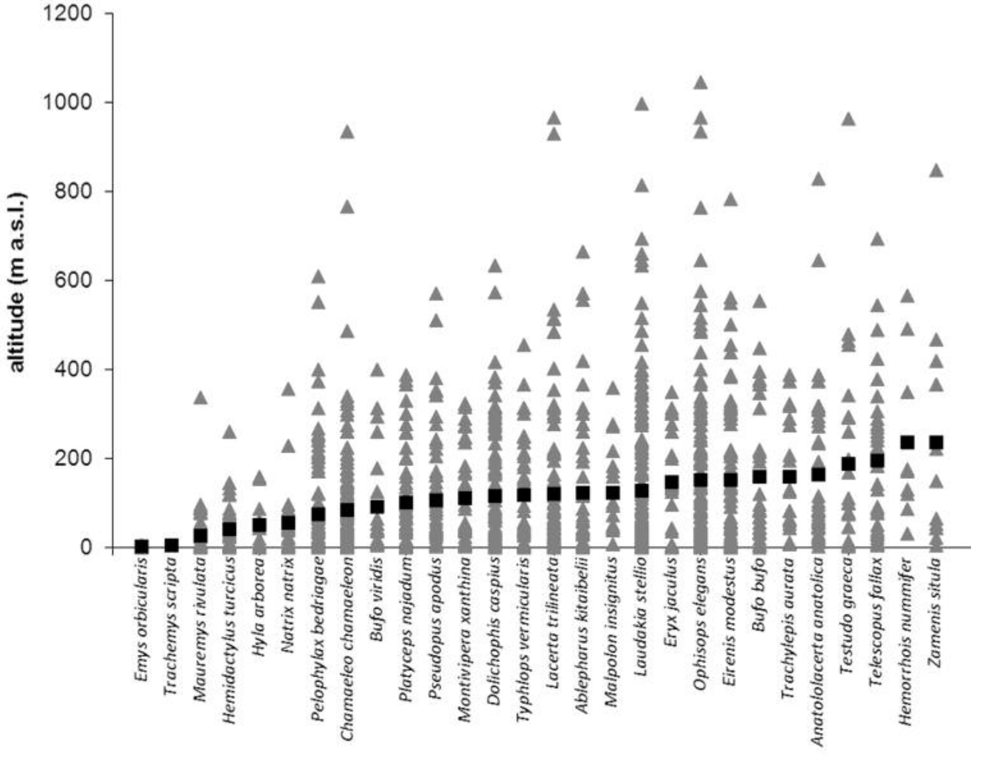

Fig. 4: Altitudinal distribution of the amphibian and reptile species records (*n* = 1019 grid cells) on the Island of Samos. Triangles indicate individual data points, squares are species means.
Abb. 4: Höhenverteilung der Amphibien- und Reptiliennachweise (*n* = 1019 Rasterfelder) auf der Insel Samos. Dreiecke kennzeichnen einzelne Fundpunkte, Quadrate zeigen den Durchschnittswert pro Spezies an.

Museum specimens: NHMAS 27-28, 4103, NHMW 27904, 27905, 30980:1-65.

Bibliographic data: BOETTGER (1888), WERNER (1938), IOANNIDES et al. (1994), IOANNIDES & DIMAKI (1996), CLARK (2000), CATTANEO (2003).

Bufo viridis
(LAURENTI, 1768) (Fig. 5)

Only 22 records, or 1.4 % of the data, relate to this species. These fall within 17 grid cells (2.6 % of entire grid). While this rather xerophilic species is adapted to more temporal, shallow and even brackish waters as breeding grounds than the previous species, and consequentially occurs on many of the bigger Greek islands (VALAKOS et al. 2008), other above raised hypotheses might apply here as well. Sightings are relatively uncommon and seem to display some bias to the more intensively sampled south-eastern parts of Samos, coinciding with a mean altitude of observation (92 ± 25 m) which is lower than in *B. bufo*. Although the rather small number of observations for this species may be misleading, its detectability may be higher in spring – while only 14 % of all available data was collected in April, 32 % of the records of this species were collected during that same month. The species may be recorded more efficiently earlier in the year.

Remarks: STÖCK et al. (2006) proposed to split *Bufo viridis* into a number of different species, of which *Bufo variabilis* (PALLAS, 1769) would be the taxon inhabiting Samos. However, as at present this arrangement is not generally accepted, the authors follow Speybroeck et al. (2010), awaiting further support for the species rank of *B. variabilis* and maintaining the use of the genus name *Bufo*.

Museum specimens: MCZ A-19372, NHMAS 4106, NHMW 30818, 30991.

Bibliographic data: Werner (1933), Ioannides et al. (1994), Ioannides & Dimaki (1996), Cattaneo (2003).

Hyla arborea
Bedriaga, 1890 (Fig. 5)

Only the larger, more humid Greek islands are inhabited by this species (Valakos et al. 2008). Recorded for the first time as late as the first half of the 1990s (Ioannides et al. 1994; Ioannides & Dimaki 1996 1997), *Hyla arborea* seems localized and rare on Samos (13 records (0.8 %) relate to the species), in contrast to its widespread and abundant nature in many other parts of the range. As these 13 observations fall within 10 different grid squares (1.5 % of total grid), a possibly relatively large yet localized range of *H. arborea* seems to be the case, at relatively low altitude: 53 ± 15 m, maximum of 161 m. Records appear to be clearly restricted to the south-eastern parts of the island. While this area does indeed provide suitable wetland areas as habitat, it cannot be ruled out that other parts of Samos have been surveyed incompletely for this species.

Remarks: Stöck et al. (2008, 2011 and 2012) assigned the tree frogs of the area in which Samos is located (including samples from the Anatolian mainland as well as Lesbos Island) to *Hyla orientalis* Bedriaga, 1890. As taxonomical discussion is clearly not in the scope of the present paper, the Samos populations were conservatively assigned to *H. arborea*.

Bibliographic data: Ioannides et al. (1994), Ioannides & Dimaki (1996, 1997).

Pelophylax bedriagae
(Camerano, 1882) (Fig. 5)

While generally restricted to the water sources of the island, this species was easily spotted, and thus commonly encountered, with 117 records (7.4 % of collected data) belonging to it. These fall within 57 grid cells (8.8 % of the entire grid), indicating a rather high number of observations per grid cell. In contrast to the other amphibians of Samos, this species displayed a fairly regular presence and abundance. Most records are from sites at relatively low altitude (76 ± 10 m, maximum of 610 m).

Remarks: The validity of this species is under debate. Hotz et al. (2013) suggested *Pelophylax bedriagae* possibly should be treated as a synonym of *Pelophylax ridibundus* while other authors like Bülbül et al. (2011) confirmed the validity of the species based on analyses of mtDNA sequences.

Museum specimens: AMNH 37088, NHMW 30817:1-4, 30990:1-7.

Bibliographic data: Boettger (1888), Calabresi (1923), Werner (1938), Bol (1992), Ioannides et al. (1994), Ioannides & Dimaki (1996), Clark (2000), Cattaneo (2003).

REPTILES

Testudo graeca
Linnaeus, 1758 (Fig. 5)

From the authors' experience in other parts of Greece and Turkey in similar habitat and comparable seasonal conditions, numbers of this species seem relatively low on Samos: 26 sightings (1.6 % of collected data) were made. These fall within 24 grid cells, corresponding to 3.7 % of the entire grid. A possibly biased image appears, as sightings seem absent from the northwest of Samos. The altitudinal range of this species is rather wide (188 ± 43 m).

Museum specimens: NHMAS 8102.

Bibliographic data: Werner (1935), Ondrias (1968), Ioannides et al. (1994), Müller (1995), Ioannides & Dimaki (1996), Broggi (1997), Clark (2000), Cattaneo (2003).

Mauremys rivulata
(Valenciennes, 1833) (Fig. 5)

This species seems largely restricted to the south-eastern wetland areas of the island. Interesting in this regard, is a single record from the north-western coast near

Karlovasi. A relatively high tolerance for elevated levels of salinity and eutrophication make this species fairly abundant within suitable habitats. While local populations appear to be safe, the number of records remains limited (68 records, 4.3 % of collected data). Furthermore, these fall within 23 grid cells (3.5 % of the entire grid), thus indicating large numbers of observations per grid cell. From the collected data, this is a lowland species (27 ± 6 m).

Museum specimens: NHMC 80.3.15. 101-104, NHMW 33342:1, NRM 6707.

Bibliographic data: WERNER (1935, 1938), BOL (1992), IOANNIDES et al. (1994), IOANNIDES & DIMAKI (1996), CLARK (2000), CATTANEO (2003).

Emys orbicularis (LINNAEUS, 1758) (Fig. 5)

This species is extremely rare on Samos. Seven records were available (0.4 % of collected data), including the first sighting on the island (MEYER & FRITZ 1996), which is the only previously published record. The other records refer to two additional coastal sites (4 ± 1 m). The observations fall within 4 grid cells, corresponding to 0.6 % of the entire grid. Since numbers of this species are reported by our observers as well as CLARK (2000) to be extremely low, the conservation of the species on Samos deserves attention. Occurrence of the species in the adjacent part of Turkey is also restriced (EISELT & SPITZENBERGER 1967).

Museum specimens: GNHM 4104, NHMAS 4104.

Bibliographic data: MEYER & FRITZ (1996), CLARK (2000).

Trachemys scripta (SCHOEPFF, 1792) (Fig. 5)

Three records of this alien species, subspecies *elegans* (WIED, 1838), at a single site are available to the authors. As this site is also inhabited by *Mauremys rivulata* and close to one of the very few sites of *Emys orbicularis*, eradication of this potentially harmful species (e.g., CADI & JOLY 2004; POLO-CAVIA et al. 2011) may be considered.

Laudakia stellio (LINNAEUS, 1758) (Fig. 6)

This most commonly recorded lizard, accounting for 11.5 % of all collected data (182 records) and inhabiting the ample exposed, rocky habitats on the island, was indeed one of the most conspicuous, widespread and abundant species. Observations fell within 93 grid cells (14.4 % of entire grid), which indicates a rather high number of observations per grid cell. Altitudinal distribution was concentrated at 128 ±13 m, with the maximum altitude recorded as high as at 999 m.

Remarks: In the collection of the Muséum National d'Histoire Naturelle (Paris) there is a stuffed specimen (MNHN 7494) of *Stellio vulgaris* collected by Admiral Jules DUMONT D'URVILLE (1790-1842) (Ivan INEICH *in litteris*, 2013). It was probably collected during the hydrographical survey (1819-1820) of the Aegean Sea by the ship Chevrette (GOEPP & CORDIER 1877), thus this specimen represents the oldest museum sample from Samos, apparently predating the oldest available published record (BOETTGER 1888).

BAIG et al. (2012) proposed the assignment of this species to the genus *Stellagama*. As evidence of the alleged paraphyly of the genus *Laudakia* sensu lato is limited (MACEY et al. 2000), the authors refrain from the use of the new name.

Museum specimens: GNHM 5092, 7081, MCZ R-37019, MNHN 7494, MSNF 727, 13691-92, NHMAS 23-24, 4107, 70011, NHMW 7297, 27584, 30820:1-2, 30989:4, 33040:2, 35403:12-14, YPM HERR 005835.

Bibliographic data: BOETTGER (1888), CALABRESI (1923), WERNER (1933), ONDRIAS (1968), BOL (1992), IOANNIDES et al. (1994), IOANNIDES & DIMAKI (1996), CLARK (2000), CATTANEO (2003).

Chamaeleo chamaeleon (LINNAEUS, 1758) (Fig. 6)

As its current status on the islands of Chios and Crete needs further investigation, Samos currently holds the only stable and confirmed population of this species in Greece (DIMITROPOULOS 1987; VALAKOS et

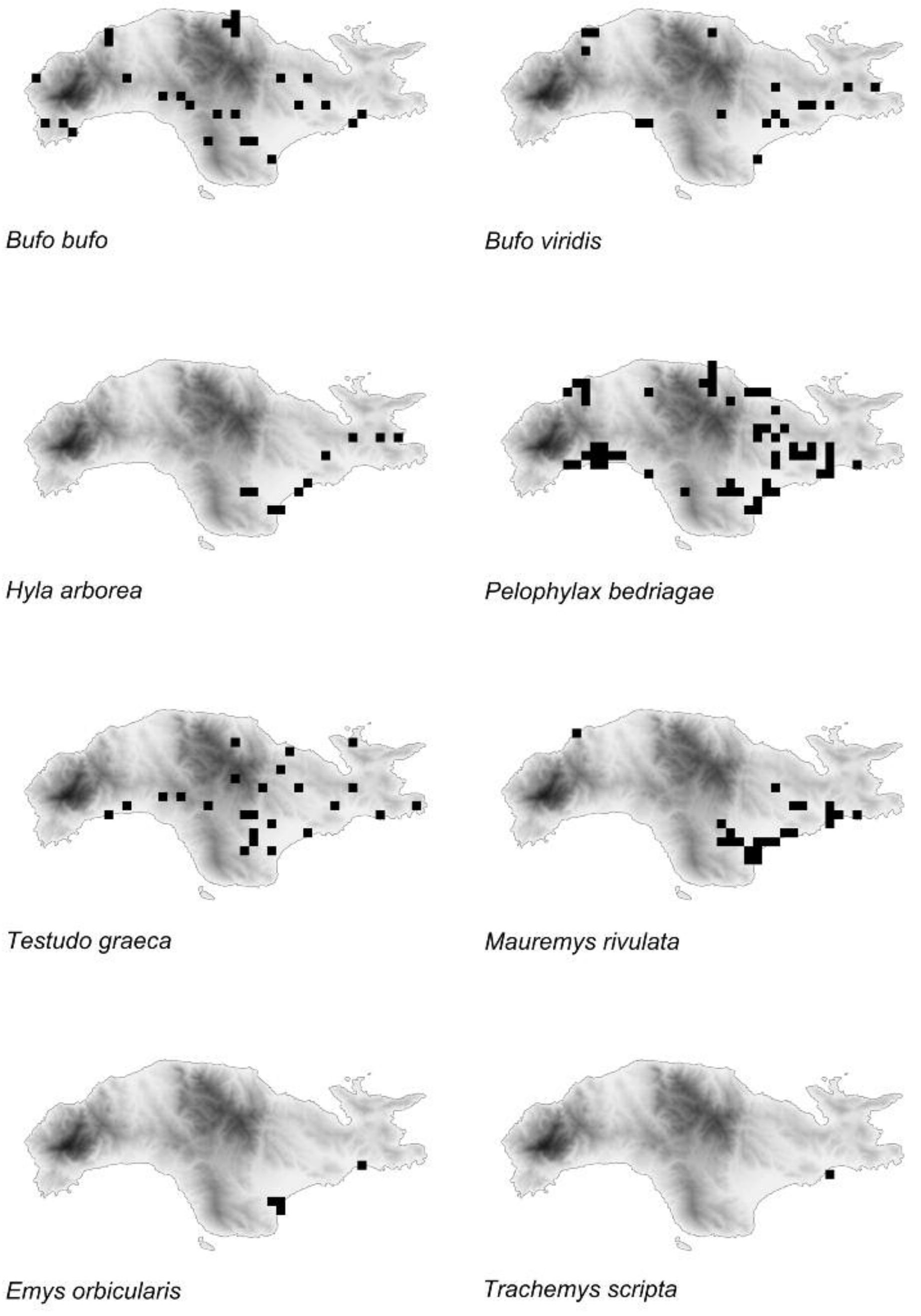

Fig. 5: Island of Samos, distribution maps – amphibians, tortoises and terrapins.
Abb. 5: Insel Samos, artspezifische Verbreitungskarten – Amphibien, Land- und Sumpfschildkröten.

al. 2008). Chameleons are cryptic and easily overlooked, thus often recorded as single individuals only. Yet, as part of the present data originated from specific research effort (Dimaki 2008; Dimaki et al. 2010), the species takes up 10.3 % of the data (162 observations). These fall within 86 grid cells, corresponding to 13.3 % of the entire grid. While also recorded in many places in the interior of the island, most sightings were made in or near wetlands fairly close to the coast, in concordance with the presence of water, soft substrate (for nesting) and warmer habitats. Its altitudinal range is accordingly (84 m ± 10 m). While only 10 % of the entire dataset stemmed from August, 47 % of the observations of this species were made in that month. Although a certain bias originated from the nature of species-specific data collection, this seems to indicate that this species is one of the few more readily encountered during warmer months. This is related to mating and breeding activities making adults (especially males but also ground-dwelling, nesting females in autumn) more conspicuous, while in September, hatchlings add to the population density (e.g., Bons & Bons 1960; Díaz-Paniagua et al. 2002; Dimaki 2008).

Museum specimens: GNHM 1-3, 19-23, 78-83, 183-200, 268, 358-367, 369-411, 538-539, 541, 4097, 7083, 7094, 8082-8083, 8085, 8087, 8091-8092, 8121, MHNG 2679.95-96, NHMAS 14-17, 7103, 8001, 8003-8009, 9001, 71012, 80010-80012, 80014-80016, 81011, 81014-81015, NHMC 80.3.91.5, 80.3.91.16-18, NHMW 7398, 30987.

Bibliographic data: Boettger (1888), Werner (1930), Wettstein (1953), Ondrias (1968), Ioannides et al. (1994), Ioannides & Dimaki (1996), Dimaki et al. (2000), Dimaki (2001, 2008), Dimaki et al. (2010).

Hemidactylus turcicus
(Linnaeus, 1758) (Fig. 6)

Forty-eight observations (3.0 % of the total) were available in the collected data. These fall within 31 grid cells (4.8 % of the entire grid).

Seemingly restricted to coastal locations (41 ± 8 m) in limited parts of the island, this species' distribution seems to indicate sampling bias, related to its nocturnal activity pattern and its presence in human environments (among other places). Its actual presence might in reality take up a much more significant portion of the coastal lowlands, including less developed areas.

Museum specimens: NHMAS 8103, NHMW 30995:4-6, MSNF 703.

Bibliographic data: Calabresi (1923), Werner (1935), Ioannides et al. (1994), Ioannides & Dimaki (1996), Cattaneo (2003).

Anatololacerta anatolica
(Werner, 1902) (Fig. 6)

While from the authors' experience, seemingly less abundant than the related *Anatololacerta oertzeni* (Werner, 1904) on other Greek islands like Symi or Rhodes, 45 the records (2.8 %) display a fairly widespread distribution across the island, in a wide range of rocky, often vegetated habitats. The observations fall within 30 grid cells, corresponding to 4.6 % of the entire grid. Samos holds the only Greek population of this species (Valakos et al. 2008). Vertical distribution seems mainly, but not exclusively, related to medium and lower altitudes (164 ± 27 m).

Remarks: Boettger (1888) recorded *Lacerta danfordi* (Günther, 1876) among the specimens he studied from Samos. Calabresi (1923) omitted to take the former paper into account, and assigned the 14 specimens collected by J. C. F. Major to *Lacerta muralis* Laur. var. *erhardi* Bedr., a taxon at the time known from Seriphos Island (e.g., Schreiber 1912).

Museum specimens: NHMW 30981: 1-6, MSNF 745 e 18021-32.

Bibliographic data: Boettger (1888), Calabresi (1923), Bol (1992), Ioannides et al. (1994), Ioannides & Dimaki (1996), Cattaneo (2003).

Lacerta trilineata
Bedriaga, 1886 (Fig. 6)

With 100 records (6.3 %) and 60 occupied grid cells (9.3 %), this species is fairly frequently sighted and widespread. While 36 % of all data was collected in May and

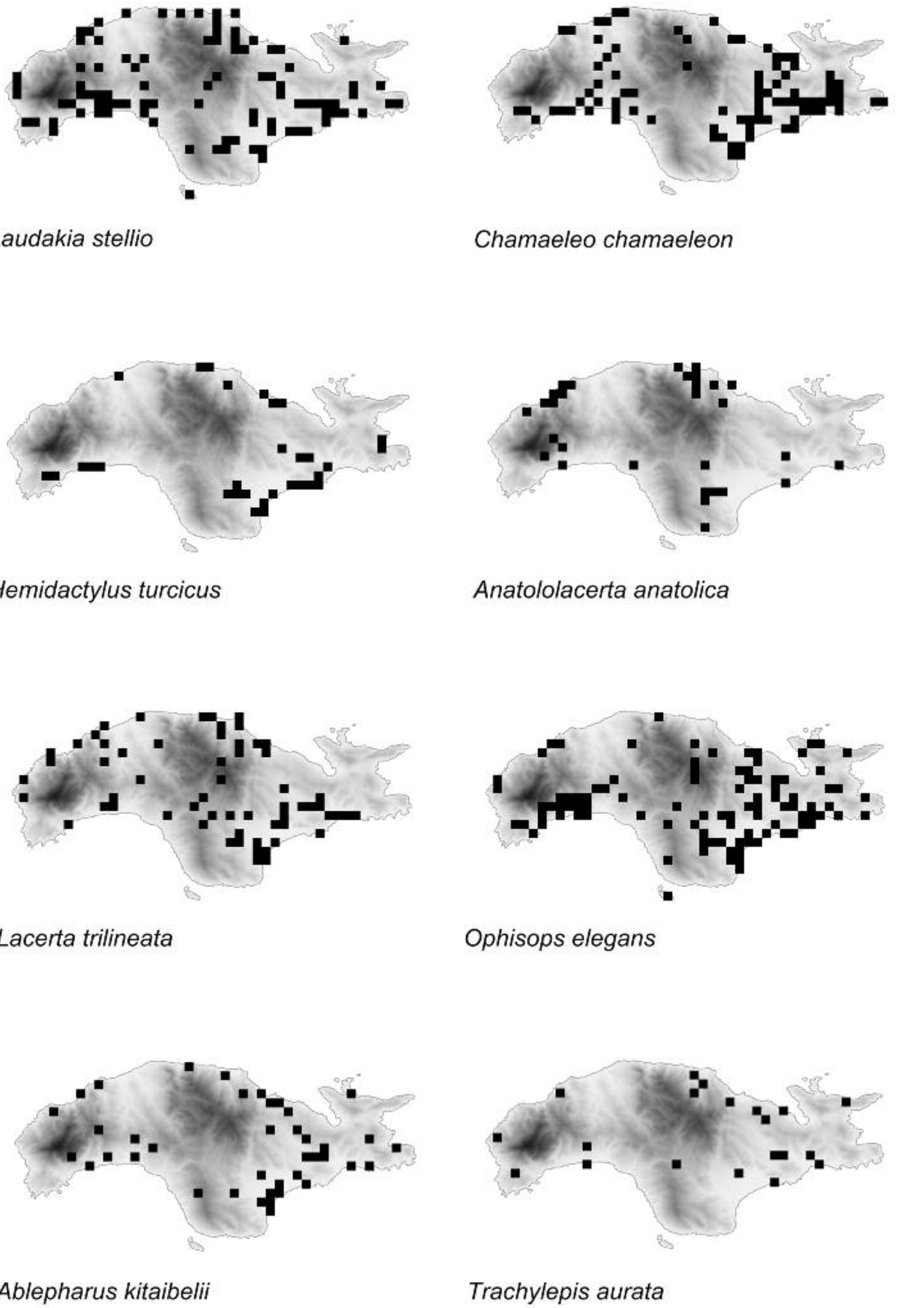

Fig. 6: Island of Samos, distribution maps – lizards except *Pseudopus apodus*.
Abb. 6: Insel Samos, artspezifische Verbreitungskarten – Echsen außer *Pseudopus apodus*.

June, as much as 54 % of the observations of this species were made in these months, indicating a spring activity peak. Altitudinal range is fairly wide (122 ± 18 m, from 2 to 968 m).

Museum specimens: NHMAS 18, 7104, NHMC 80.3.60.286, NHMW 30816:1-4, 30988:1-3, NRM 6703.

Bibliographic data: Daan (1967), Bol (1992), Ioannides et al. (1994), Ioannides & Dimaki (1996), Clark (2000), Cattaneo (2003).

Ophisops elegans
Ménétries, 1832 (Fig. 6)

Only *Laudakia stellio* and (the specifically intensively sampled) *Chamaeleo chamaeleon* were sighted more often than this species (154 site records, 9.7 % of collected data). The observations fall within 98 grid cells, corresponding to 15.1 % of the entire grid. As in *L. stellio*, observational bias of sighting the same species more than once in limited surveyed areas seems to be the case. *Laudakia stellio* and *O. elegans* often co-occur in dry and hot environments, the latter being the most common small lacertid, and clearly more ground-dwelling than *Anatololacerta anatolica.* The map for this species shows a broad occurrence throughout the island, albeit with significant gaps, most likely due to lack of sampling. Records are most numerous from lower locations (152 ± 15 m), but range as wide as from 0 to 1,047 m a.s.l., the latter representing the highest record throughout the dataset.

Museum specimens: MCZ R-37052, 38505, NHMAS 19, NHMC 80.3.70.120, 80.3.70.350, 80.3.70.351, 80.3.70.352, 80.3.70.421, NHMW 11921:1-2, 30819:1-5, 30967:4, 30985:4-5, YPM HERR 005801.

Bibliographic data: Boettger (1888), Werner (1902, 1933), Cyrén (1941), Bol (1992), Ioannides et al. (1994), Ioannides & Dimaki (1996), Clark (2000), Cattaneo (2003).

Ablepharus kitaibelii Bibron & Bory de Saint-Vincent, 1833 (Fig. 6)

This species, while observed less frequently (47 records, 3.0 %), showed a distribution pattern similar to that of the most widespread taxa *Ophisops elegans* and *Laudakia stellio*. This rather indicates sampling bias than actual presence and is most likely due to its inconspicuous and rather secretive nature. The observations fall within 40 grid cells, corresponding to 6.2 % of the entire grid (altitudinal range: 123 ± 24 m). Remarkably, 40 % of the records were collected in April, whereas only 14 % of the entire dataset originated from that month.

Museum specimens: MSNF 864, 12763-77, NHMC 80.3.82.54, NHMW 30993:1-2.

Bibliographic data: Calabresi (1923), Werner (1930, 1935, 1938), Ioannides et al. (1994), Ioannides & Dimaki (1996), Clark (2000), Cattaneo (2003).

Trachylepis aurata
(Linnaeus, 1758) (Fig. 6)

While records of this species are scattered, it is recorded infrequently (23 records, 1.5 %; 20 grid cells, 3.1 %; altitudinal range: 160 ± 27 m) and is unclear to which extent this is due to its secretive habits, actual rareness or other factors. While 26 % of all data was collected in May, 35 % of observations of this species were made in that month, possibly suggesting a spring activity peak.

Museum specimens: GNHM 7096, NHMAS 80017.

Bibliographic data: Beutler (1979), Bol (1992), Ioannides et al. (1994), Ioannides & Dimaki (1996), Cattaneo (2003).

Pseudopus apodus
(Pallas, 1775) (Fig. 7)

Commonly recorded (66 records, 4.2 %; 46 grid cells, 7.1 %; altitudinal range: 107 ± 16 m), the map of this species highlights most likely sampling intensity rather than actual presence. Personal experience suggests abundance values similar as in places outside Samos. While 26 % of all data was collected in May, as much as 48 % of observations of this species were made in that month, indicating a spring activity peak.

Museum specimens: GNHM 5091, NHMAS 29, 5004, NHMW 30962:1-2, 30998.

Bibliographic data: WERNER (1933), BOL (1992), IOANNIDES et al. (1994), IOANNIDES & DIMAKI (1996), CATTANEO (2003).

Typhlops vermicularis
MERREM, 1820 (Fig. 7)

While bias may exist due to the fact that finding this species requires turning stones and other cover objects, this is a commonly recorded snake species (44 records, 2.8 % of data; 35 grid cells, 5.4 % of entire grid; altitudinal range: 119 ± 18 m), occurring throughout the island. While its fossorial habits and apparent seasonal behavior (including aestivation or deeper underground activity) make this species hard to encounter during summer or autumn, spring sightings are rather common. As much as 89 % of records relate to observations in April or May, while these months together hold only 40 % of the entire dataset.

Remarks: Local folklore seemed to incorrectly attribute a venomous character to this species, as Franz WERNER (1932), fifty years before the first scientific record about the presence of a viperid snake on Samos wrote: "Das angebliche Vorkommen von Giftschlangen auf Samos bezieht sich nicht auf Vipern, sondern auf den allgemein sehr gefürchteten *Typhlops vermicularis*" [The alleged occurrence of venomous snakes on Samos does not relate to vipers, but to the in general greatly feared *Typhlops vermicularis*].

Museum specimens: GNHM 7992, NHMW 15419:4 (collected 1901), 30972:1-7, 30997:3-7.

Bibliographic data: BOETTGER (1888), WERNER (1902, 1930), BURESCH & ZONKOV (1934), WERNER (1938), IOANNIDES et al. (1994), IOANNIDES & DIMAKI (1996), CATTANEO (2003).

Eryx jaculus
(LINNAEUS, 1758) (Fig. 7)

With first records as recent as 1988 and 1989 (BOL 1992; IOANNIDES et al. 1994), this was one of the more infrequently recorded species on Samos (24 records, 1.5 % of data; altitudinal range: 148 ± 25 m). Interestingly, nearly all records fell in different grid cells, 23 of which are occupied (3.5 %). Being a secretive burrowing snake, the rather limited data availability was not in contrast to what is known for other Greek islands (e.g., TÓTH et al. 2002; RAZZETTI et al. 2006). The data did not allow clear identification of patterns. Most of the individuals have been observed on the inner side of coastal lagoons or at the border of cultivated areas, as loose soils are usually preferred by this species.

Museum specimens: GNHM 6, NHMAS 7106, 7109, 50013.

Bibliographic data: BOL (1992), IOANNIDES et al. (1994), IOANNIDES & DIMAKI (1996), CLARK (2000), CATTANEO (2003).

Malpolon insignitus
(GEOFFROY SAINT-HILAIRE, 1827)
(Fig. 7)

Eighteen records (1.1 %) were available to this study, which fall in 17 different grid cells (2.6 % of entire grid), suggesting widespread occurrence, albeit concentrated in the eastern parts of the island. The few records mainly originated from low-lying areas (altitudinal range: 125 ± 24 m). As the species of this genus are known as opportunistic and often abundant snakes, being able to thrive in anthropogenic environments (e.g., PLEGUEZUELOS 2003), its apparent absence from much of the island could be related to competition with sympatric *Dolichophis caspius* (GMELIN, 1789), as both species are large diurnal, mostly terrestrial snakes (ARNOLD & OVENDEN 2002). Since island ecological networks are simplified, with species broadening their niche, competition can be particularly strong (e.g., LISTER 1976; CASE & BOLGER 1991; BOBACK 2003). Published sightings are limited: IOANNIDES et al. (1994) found a dead specimen near Karlovasi and an additional specimen near Mytilini, while CATTANEO (2003) found two specimens near Marathokampos. From the latter locality, one animal was also collected in 1979 by H. MALICKY and donated to the NHMW (27588). The 18 presently evaluated data add strongly to the available records. Noteworthy is that 14 of these relate to animals found as traffic victims.

Museum specimens: GNHM 36-38, 10971, NHMAS 4109, 5009, 7009, 50010, NHMW 27588.

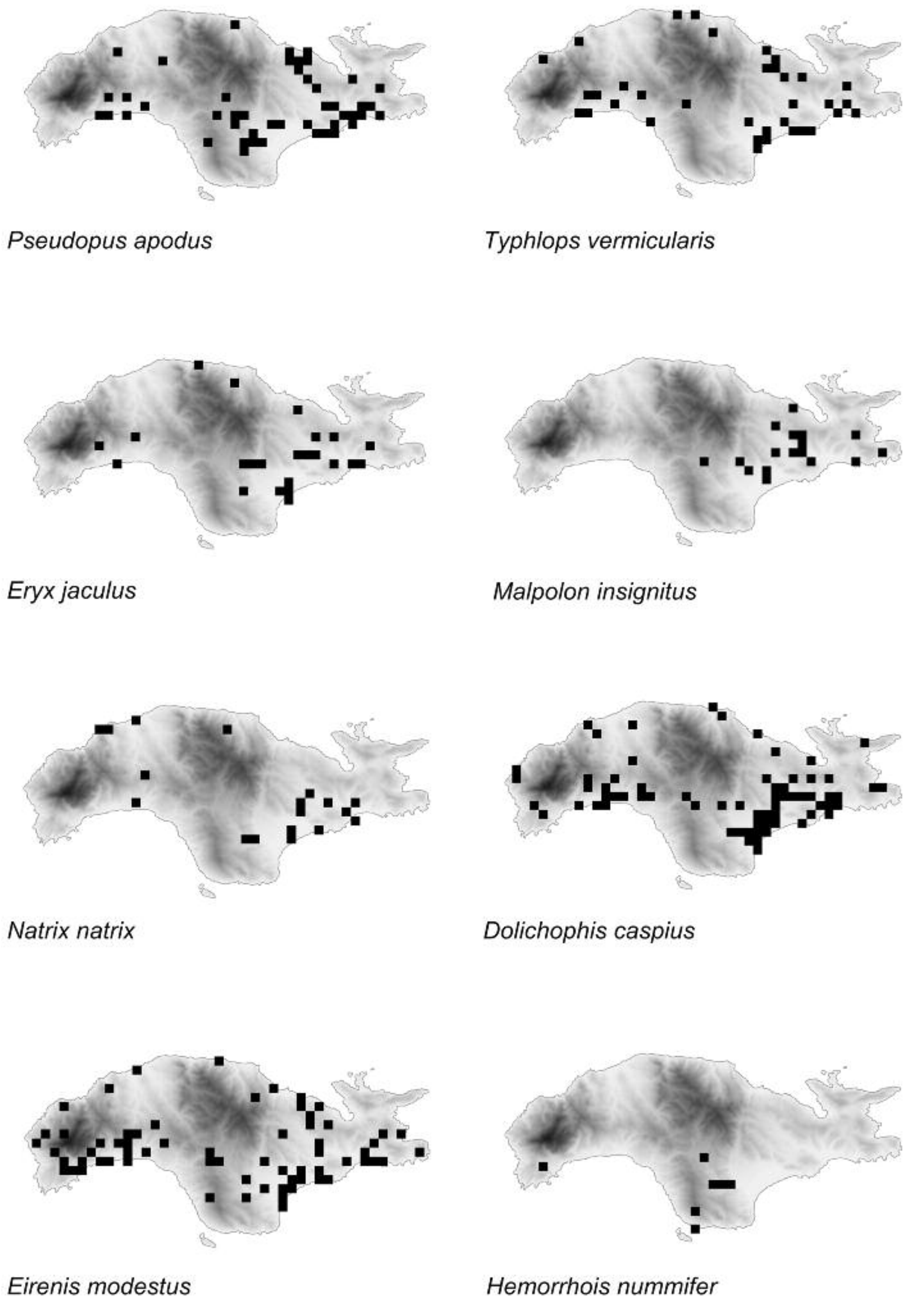

Fig. 7: Island of Samos, distribution maps – snakes part 1 and *Pseudopus apodus*.
Abb. 7: Insel Samos, artspezifische Verbreitungskarten – Schlangen Teil 1 und *Pseudopus apodus*.

Bibliographic data: IOANNIDES et al. (1994), IOANNIDES & DIMAKI (1996), CATTANEO (2003).

Natrix natrix
(LINNAEUS, 1758) (Fig. 7)

As amphibians often build up a significant portion of its diet, this snake is usually (but not always) recorded near water. *Natrix natrix* is among the most readily recorded species in other parts of Greece and Turkey (e.g., VALAKOS et al. 2004), yet on other islands the species appears to be rare and localized (e.g., Cyprus - BAIER et al. 2009). Records for Samos seem rather infrequent from the data processed (30 records, 1.9 %; 18 grid cells, 2.8 %). Observation sites are mainly located in the southeast of the island, which might be related to a relatively higher sampling effort in that area, as well as a locally higher availability of suitable habitat. As to be expected from multiple records near low-lying wetlands and other water sources, the collected data for this species is mainly restricted to low elevations (55 ± 13 m).

Museum specimens: GNHM 7082, 7084, NHMAS 5003, 7005, NHMC 80.3.34.7.

Bibliographic data: WERNER (1933), CLARK (1968), BOL (1992), IOANNIDES et al. (1994), IOANNIDES & DIMAKI (1996), CLARK (2000), CATTANEO (2003).

Dolichophis caspius
(GMELIN, 1789) (Fig. 7)

This is the most often recorded snake species in the dataset analyzed (106 records, 6.7 %; 67 grid cells, 10.3 %), in concordance with the authors' experience from other parts of southeast Europe, including Greece, Bulgaria, Montenegro and Romania (SPEYBROECK, unpublished data). It occurs throughout the island. This species is frequently recorded as a traffic victim, with 62 records relating to such findings. Altitudinal data points towards low elevations (117 ± 13 m).

Museum specimens: GNHM 7, 33-34, 39, 4943, 5002, 6941, 6984-6985, 7001, 7095, 7994, 8084, 70014, MCZ R-37003, NHMAS 22, 5001, 5006, 5008, 5101, 6001, 7007, 7107, 8101, 41010-41011, 41013, 50011, 50018, 50020, 70014, 71011, NHMC 80.3.117.25, NRM 6702.

Bibliographic data: WERNER (1933), BURESCH & ZONKOV (1934), CLARK (1968, 2000), SCHÄTTI (1988), BOL (1992), IOANNIDES et al. (1994), IOANNIDES & DIMAKI (1996), CATTANEO (2003).

Eirenis modestus
(MARTIN, 1838) (Fig. 7)

This was, from the data analyzed, the second most recorded and widespread snake species (82 records, 5.2 %; 65 grid cells, 10.0 %), mirroring its mainland abundance (e.g. FRANZEN et al. 2008). The species seems to display a rather wide altitudinal range (153 ± 18 m).

Remarks: From the "Samos region", WETTSTEIN (1937) described *Contia modesta werneri* from Alazonisi on Fourni Island. This taxon was later considered invalid by BARAN (1976).

Museum specimens: GNHM 8, 4942, 6942, 7993, MCZ R-37005-37006, NHMAS 21, 25, 5102, 7002, 7101-7102, 7108, 8002, 50015, 50019, 70010, 70013, 80013, NHMW 30971:1-4, 31000:1-4, NRM 6705, 6706, 6708, YPM HERR 005751.

Bibliographic data: BOETTGER (1888), CALABRESI (1923), WERNER (1902, 1933), CLARK (1968), BOL (1992), IOANNIDES et al. (1994), IOANNIDES & DIMAKI (1996), CATTANEO (2003).

Hemorrhois nummifer
(REUSS, 1834) (Figs. 7, 8)

The present data includes what is most likely the first record of this species on the island, made available by Andreas MEYER and dating back to 1996. Also for the east Aegean islands of Lesbos (HOFSTRA 2008), Samothraki and Chios (STRACHINIS & LYMBERAKIS 2013), this species represents a recent addition to the known fauna.

On some islands, this species could be difficult to detect, as according to SCHÄTTI & SIGG (1989), from Cypriot data, *H. nummifer* has reclusive habits, even though it can be locally abundant.

Observers suggested that this species might be easier to record in autumn than in

Fig. 8: *Hemorrhois nummifer* (REUSS, 1834), from Samos, found and photographed by first author (JS), autumn 2009.

Abb. 8: *Hemorrhois nummifer* (REUSS, 1834) von Samos, gefunden und fotografiert vom Erstautor (JS), Herbst 2009.

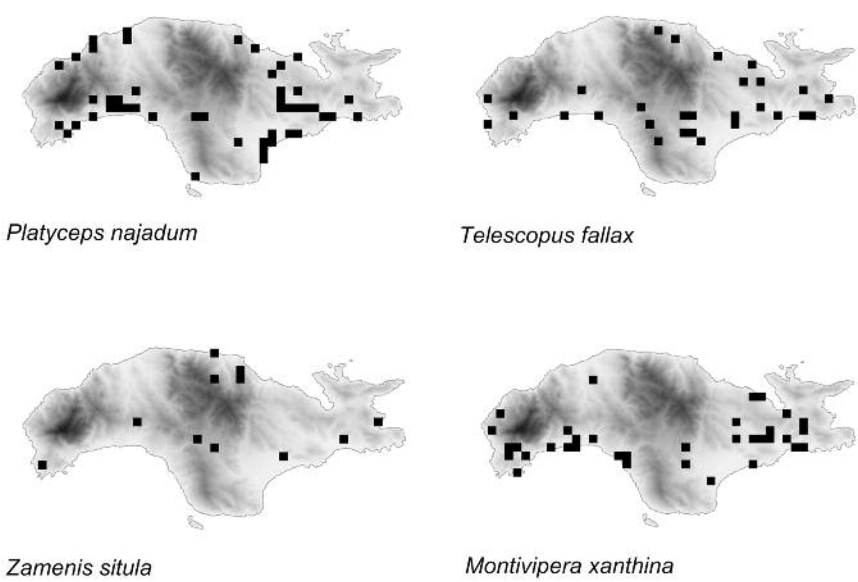

Fig. 9: Island of Samos, distribution maps – snakes part 2.

Abb. 9: Insel Samos, artspezifische Verbreitungskarten – Schlangen Teil 2.

spring, whereas herpetofauna searches often focus on the spring months April and May. In this regard, it deserves mentioning that five (55 %) of the available records (9 records, 0.6 %; 7 grid cells, 1.1 %) stem from autumn observations. This could be related to the dispersion of juveniles. As eight out of nine records originate from the central southern part of the island, a 2011 western observation from near Agia Kiriaki stands out. The limited available data show an average altitude which is, together with that of *Zamenis situla* (LINNAEUS, 1758), the highest among all Samos herpetofauna species (237 ± 63 m).

Platyceps najadum
(EICHWALD, 1831) (Fig. 9)

This species is ffrequently encountered (54 records, 3.4 %; 47 grid cells, 7.3 %), displaying a wide distribution in warm, rocky habitats across the island. While 40 % of all data analyzed was collected in April and May, 56 % of observations of this species were made in those months, suggesting a spring activity peak. The limited available data point to a relatively low (to medium) altitudinal distribution (103 ± 15 m).

Museum specimens: GNHM 9118, NHMAS 26, 5007, 7105, 50014, NHMW 30968, 30999:3.

Bibliographic data: DAAN (1967), BOL (1992), IOANNIDES et al. (1994), IOANNIDES & DIMAKI (1996), CLARK (2000), CATTANEO (2003).

Telescopus fallax
(FLEISCHMANN, 1831) (Fig. 9)

Since this species is nocturnal and secretive, the number of 32 records (2.0 %; 28 grid cells, 4.3 %) is in fact relatively high, in relation to species which are usually encountered much more frequently elsewhere, like *N. natrix* and *M. insignitus*. Available records occur across most of the island. As such, this species is possibly not particularly rare on Samos. The fact that it is often recorded as traffic victim, with 21 records relating to such findings, is also exemplified by its recent first time discovery for Chios by one of the authors (KIRCHNER 2009). Altitudinal distribution seems relatively wide (195 ± 31 m, from 8 to 695 m a.s.l).

Museum specimens: GNHM 40, 4941, 9091, NHMAS 5002, 41012, 50016-50017, 81012, NHMC 80.3.38.36, NHMW 30969.

Bibliographic data: DAAN (1967), IOANNIDES et al. (1994), IOANNIDES & DIMAKI (1996).

Zamenis situla
(LINNAEUS, 1758) (Fig. 9)

This species, known as secretive, is generally observed in relatively low abundances (VALAKOS et al. 2008). Thus, the number of 13 records (0.8 %; 11 grid cells, 1.7 %) was not particularly low in relation to those of other snake species. Available records occur across most of the island. As such, *Z. situla* is possibly not particularly rare on Samos. While 14 % of all processed records originated from April, 31 % of the *Z. situla* records fell in that same month, suggesting some seasonality in the chance to observe this species. This species was, together with *Hemorrhois nummifer*, found at the highest mean elevation (237 ± 69 m).

Museum specimens: GNHM 6983, NHMAS 20, 7001, NHMC 80.3.30.39.

Bibliographic data: WERNER (1933), BURESCH & ZONKOV (1934), IOANNIDES et al. (1994), IOANNIDES & DIMAKI (1996), CATTANEO (2003).

Montivipera xanthina
(GRAY, 1849) (Fig. 9)

Directed searching by one of the authors (MD) may have added some bias to the dataset processed (51 records, 3.2 %; 35 grid cells, 5.4 %), as, from the rest of the data, this species appeared infrequently sighted. This might, in part, explain its rather recent first reference (NILSON & ANDRÉN 1986; TIEDEMANN & GRILLITSCH 1986; VAN WINGERDE 1986; yet, CLARK 1989 refers to a 1984 sighting of the species near Marathokampos). *Montivipera xanthina* is frequently recorded as traffic victim, with 34 records relating to such findings. Despite geographically biased sampling, the species seems to be more frequently encountered in the southern half of the island, mainly at relatively low elevation (111 ± 14 m).

Museum specimens: GNHM 4096, 6986, 8081, 9942, NHMAS 7003-7004, 7006, 7008, 8104, NHMW 27587, 30963.

Bibliographic data: VAN WINGERDE (1986), NILSON & ANDRÉN (1986), TIEDEMANN & GRILLITSCH (1986), CLARK (1989), IOANNIDES et al. (1994), IOANNIDES & DIMAKI (1996), CLARK (2000), CATTANEO (2003).

The high herpetofauna diversity observed on Samos is largely the result of the complex paleogeography and geological history of the island, and the Aegean region in general, especially during the glaciations (PANITSA et al. 2010). The sea level changes during late Pleistocene and Holocene are particularly relevant as they exposed a large part of the continental shelf, thus connecting Samos and adjacent islands, including Ikaria, Fourni, Patmos, Lipsi, Arkoi and Agathonisi, to the Anatolian coast (AKSU et al. 1995; LAMBECK 1995; FOUFOPOULOS & IVES 1999). Since Samos is separated from the Turkish coast by the shallow Mycale Strait (with a maximum depth of less than 20 m) it was probably still connected to the mainland 9,000 years B.P. when the sea level was about 35 m lower than now (AKSU et al. 1995). The herpetofauna of western Turkey and of the entire Anatolian Peninsula is particularly rich because of its geographical location functioning as a bridge or barrier for species dispersal between Asia and Europe (SINDACO et al. 2000). Moreover, western Anatolia acted as a refugium during the Ice Ages and later allowed the re-colonization of northern areas during the interglacial periods (HEWITT 1996). Accordingly, these connections promoted the crossing of species from the Anatolian mainland onto Samos, giving the island its 'Asian character' (PAFILIS 2010). The obvious absence of several species to be expected, including *Blanus strauchi* (BEDRIAGA, 1884), *Mediodactylus kotschyi* (STEINDACHNER, 1870) and *Natrix tessellata* (LAURENTI, 1768) on Samos, is not self-evident and asks for explanation. It may be the result of secondary stochastic events of extinction, as these species occur abundantly on the Anatolian mainland (FRANZEN et al. 2008) and were easily observed by one of the authors (ER) during a short survey. As noted before, the apparent rarity of some species on Samos could be explained by interspecific competition on this island, however, these hypotheses remain to be verified.

From the three species listed above, *M. kotschyi* deserves some additional attention. As described in the introduction, uncertainty with the initial citation of this species from Samos (CALABRESI 1923), as well as the lack of any subsequent published records, makes its presence in need of confirmation, if not doubtful. However, three specimens are listed in the catalog of the Natural History Museum of Crete (NHMC 80.3.85.1193, 80.3.85.1236, 80.3.85.1237). The animals were collected in 2007 at Psili Ammos in pitfall traps used by Dimitris KALTSAS in his PhD research on the beetle fauna of *Juniperus phoenicea* ecosystems in the Aegean region. Both D. KALTSAS and Petros LYMBERAKIS (who provided the authors with photos of the severely desiccated specimens) see no logical reason to assume any error in this record. Thus, this might represent the first record in over 80 years of the presence of this species on Samos, if not ever. Establishing the absence of a species in a given area is difficult, if not logically impossible, as a lack of observations for a species (even with large series of field data) does not necessarily imply its absence (RAZZETTI & SINDACO 2006). In any case, *M. kotschyi* is at best rare and localized on the island, although suitable habitat seems amply available. Yet, localized and poorly recorded populations of *M. kotschyi* also exist on the large and variably-structured Island of Crete (Petros LYMBERAKIS, *in litt.*). Conclusively, the authors consider the presence of *Mediodactylus kotschyi* on Samos in continued need of confirmation.

The species cited by BOETTGER (1888) include those that were most common in the authors' dataset. While this data is certainly imperfect for scientific evaluation of abundance, several species appear to be scarcer and less widespread on Samos than in many other parts of their range. Regarding conservation issues it should be stressed that frequent and widespread fires affected large parts of the island during the last decades. In 1983, 2,000 ha of forest (ca. 4.2 % of the island's surface) were burned, the 2000 fire burned about one third of the island (EDENFELD et al. 2000; KALABOKIDIS et al. 2008; Dimaki 2008), and an additional major fire hit the island in 2010. Obviously, these frequent and repeated fires are of particular, and potentially damaging effect to less mobile elements of the fauna including various amphibians and reptiles (Fig. 10) (SANTOS & POQUET 2010). Tourist industry development seems to represent another threat. As tourism is an important economic factor in Greece, it seems not infrequently considered prevalent over nature preservation. This is consistently evident in coastal areas. Several coastal and lowland habitats (e.g., wetlands such as marshes and lagoons) are particularly vulnerable. While their flat topography makes them suitable sites for construction of e.g., houses and touristic facilities, their unique natural resources often are unrecognized and neglected. This is in line with the conclusions of BROGGI (1994), who highlighted the importance of threatened Greek island biotopes such as mouths of creeks, cisterns and pits and mountain creeks.

As these and other threats impact the herpetofauna of Samos, it is important to stress that many of the island's amphibian and reptile species are protected under the European Habitat Directive (92/43/CEE). The list of protected species was updated on November 20, 2006, after the accession of Romania and Bulgaria to the European Union (Council Directive 2006/ 105/EC). Four Samos reptile species are listed in the Annex II "animal and plant species of community interest whose conservation requires the designation of special areas of conservation": *T. graeca*, *E. orbicularis*, *M. rivulata* (as *Mauremys caspica*) and *Z. situla* (as *Elaphe situla*). In addition, 20 of the 28 amphibian and reptile species of Samos are listed in Annex IV "animal and plant species of community interest in need of strict protection": *Testudo graeca*, *Emys orbicularis*, *Mauremys rivulata* (as *Mauremys caspica*), *Anatololacerta anatolica* (as *Lacerta danfordi*), *Lacerta trilineata*, *Ophisops elegans*, *Ablepharus kitaibelii*, *Laudakia stellio* (as *Stellio stellio*), *Chamaeleo chamaeleon*, *Pseudopus apodus* (as *Ophisaurus apodus*), *Dolichophis caspius* (as *Coluber caspius*), *Platyceps najadum* (as *Coluber najadum*), *Hemorrhois nummifer* (as *Coluber nummifer*), *Eirenis modestus* (as *Eirenis modesta*), *Zamenis situla* (as *Elaphe situla*), *Telescopus fallax* (as *Telescopus falax*), *Macrovipera xanthina* (as *Vipera xanthina*), *Eryx jaculus*, *Bufo viridis* and *Hyla arborea*. Hence, since a large portion of the Samos herpetofauna is listed in one or both Habitat Directive annexes, a clear legal obligation exists to balance human activities against protection and conservation of the diverse herpetofauna of Samos. In particular, this refers to two listed species which appear very rare on the island – *Emys orbicularis* and *Hemorrhois nummifer*. Eradication of exogenous species like *Trachemys scripta* should be considered.

Perspectives

This paper is not considered an endpoint in data acquisition, therefore, potential contributors to the herpetofauna of Samos are kindly invited to get in touch with Daniel BOHLE at < danielbohle@gmx.de >. The authors of this paper are also open to disseminate the collected data (at grid cell level resolution) to any Greek or international scientific initiative upon simple request.

In summary, the currently known herpetofauna of Samos comprises 28 species, including one that has not been published before (*Hemorrhois nummifer*). Three additional species (*Blanus strauchi*, *Mediodactylus kotschyi* and *Natrix tessellata*), listed elsewhere for the island, require confirmation of their presence, until which time they are disregarded as contemporary parts of the herpetofauna of Samos.

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Fig. 10: *Testudo graeca* LINNAEUS, 1758, from Samos with obvious burn marks, photographed by third author (ER).

Abb. 10: *Testudo graeca* LINNAEUS, 1758 von Samos mit offensichtlichen Brandverletzungen, fotografiert vom Drittautor (ER).

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REFERENCES

AMBROGI, S. (1992): Un arabo perugino. Vita e viaggi di Orazio Antinori in Egitto e nell'Etiopia di Menelik; Torino (Edizioni Rai), pp. 85.

ARNOLD, E. N. & OVENDEN D. (2002): A field guide to the reptiles and amphibians of Britain and Europe; London (Harper Collins Publ. Ltd.), pp. 272.

BAIER, F. & SPARROW, D. J. & WIEDL, H.-J. (2009): The amphibians and reptiles of Cyprus. Frankfurt am Main (Edition Chimaira), pp. 364.

BAIG, K. J. & WAGNER, P. & ANANJEVA, N. B. & BÖHME, W. (2012): A morphology-based taxonomic revision of *Laudakia* GRAY, 1845 (Squamata:

Agamidae).- Vertebrate Zoology, Dresden; 62 (2): 213-260.

Baran, I. (1976): Türkiye yilanlarinin taksonomik revizyonu ve coğrafi dağilişlari.- Tübitak yayınları, Ankara; 309 (9): 1-177.

Beutler, A. (1979): General principles in the distribution of reptiles and amphibians in the Aegean.- Biologia Gallo-Hellenica, Athinai; 8: 337-344.

Beutler, A. & Gruber, U. (1977): Intraspezifische Untersuchungen an *Cyrtodactylus kotschyi* (Steindachner, 1870): Reptilia: Gekkonidae. Beitrag zu einer mathematischen Definition des Begriffs Unterart.- Spixiana, München; 1: 165-202.

Boback, S. M. (2003): Body size evolution in snakes: Evidence from island populations.- Copeia, Washington; 2003 (1): 81–94.

Boettger, O. (1888): Verzeichniss der von Hrn. E. von Oertzen aus Griechenland und aus Kleinasien mitgebrachten Batrachier und Reptilien.- Sitzungsberichte der Königlich Preuβischen Akademie der Wissenschaften zu Berlin, Berlin; 1888 (1): 139-186.

Bol, S. (1992): De reptielen en amfibieën op Samos.- Lacerta, Utrecht; 50 (4): 134-139; 50 (5): 162.

Bons, J. & Bons, N. (1960): Notes sur la reproduction et le développement de *Chamaeleo chamaeleon* (L.).- Bulletin de la Société des sciences naturelles et physiques du Maroc, Rabat, Paris; 40: 323-335.

Broggi, M. (1994): Feldherpetologische Beobachtungen und Bemerkungen zu schützenswerten Biotopen auf griechischen Inseln.- Herpetozoa, Wien; 7 (1/2): 29-34.

Broggi, M. (1997): Zur Verbreitung von *Testudo graeca ibera* Pallas, 1814 auf den Inseln der Nordostägäis und der Dodekanes (Griechenland).- Herpetozoa, Wien; 10 (3/4): 153-155.

Bülbül, U. & Matsui M. & Kutrup B. & Eto K. (2011): Taxonomic relationships among Turkish Water Frogs as revealed by phylogenetic analyses using mtDNA gene sequences.- Zoological Science, Tokyo; 28: 930-936.

Buttle, D. (1990): The herpetofauna of Leros (Dodecanese, S.E. Aegean).- The British Herpetological Bulletin, London; 34: 34-38.

Cadi, A. & Joly, P. (2004): Impact of the introduction of the red-eared slider (*Trachemys scripta elegans*) on survival rates of the European pond turtle (*Emys orbicularis*).- Biodiversity and Conservation, London; 13 (13): 2511-2518.

Calabresi, E. (1923): Anfibi e rettili dell'isola di Samos.- Monitore Zoologico Italiano, Siena; 34: 75-78.

Case, T. J. & Bolger, D. T. (1991): The role of interspecific competition in the biogeography of island lizards.- Trends in Ecology & Evolution, Cambridge; 6 (4): 135-139.

Cattaneo, A. (2003): Note erpetologiche sulle isole Egee di Lesvos, Chios e Samos.- Bollettino del Museo Civico di Storia Naturale di Venezia, Venezia; 54: 95-116.

Chondropoulos, A. (1986): A checklist of the Greek reptiles. I. The lizards.- Amphibia-Reptilia, Leiden; 7: 217-235.

Chondropoulos, A. (1989): A checklist of the Greek reptiles. II. The snakes.- Herpetozoa, Wien; 2 (1/2): 3-36.

Clark, R. (1968): A collection of snakes from Greece.- British Journal of Herpetology, London; 4: 45-48.

Clark, R. (1989): A report on a herpetological trip to N.E. Aegean.- The Herptile, Walsall; 14 (2): 68-82.

Clark, R. (2000): The herpetology of Samos Island, Eastern Aegean Sea, Greece.- The Herptile, Walsall; 25 (4): 172-175.

Cyrén, O. (1941): Beiträge zur Herpetologie der Balkanhalbinsel.- Mitteilungen aus den Königlichen Naturwissenschaftlichen Instituten in Sofia, Sofia; 14: 36-146.

Daan, S. (1967): New record localities of Aegean amphibians and reptiles.- British Journal of Herpetology, London; 3: 312-313.

Díaz-Paniagua, C. & Cuadrado, M. & Blázquez, M. C. & Mateo, J. A. (2002): Reproduction of *Chamaeleo chamaeleon* under different environmental conditions.- Herpetological Journal, Londen; 12: 99-104.

Dimaki, M. (2001): The European Chameleons.- Chameleon information Network, San Diego; 41: 11-13.

Dimaki, M. (2008): Ecology and physiology of the chameleon (*Chamaeleo* spp.) in Greece. PhD thesis University of Athens, pp. 202.

Dimaki, M., Lymberakis, P. & Maragou, P. (2010): Reptiles of Greece, threats, the Common Chameleon, the African Chameleon; pp. 180-189 + 193. In: Legakis, A. & Maragou, P. (eds.): Red Book of Threatened Animals of Greece; Athens (Greek Zoological Society).

Dimaki, M. & Valakos, E. D. & Legakis, A. (2000): Variation in body temperatures of the African Chameleon *Chamaeleo africanus* Laurenti, 1768 and the Common Chameleon *Chamaeleo chamaeleon* (Linnaeus, 1758).- Belgian Journal of Zoology, Bruxelles; 130 (Supplement 1): 87-91.

Dimitropoulos, A. (1987): The distribution and status of the Mediterranean Chameleon – *Chamaeleo chamaeleon chamaeleon* (Linnaeus, 1758) in Greece.- The Herptile, Walsall; 12 (3): 101-104.

Edenfeld, J. & Katsaros, G. & Remmert, M. (2000): Vorstudie zur Naturraumgenese nach Waldbränden. Eine anwendungsorientierte Fallstudie für die ägäische Insel Samos (Griechenland) – Schaden, Folgen, Maβnamen. Institut für Geographie der WWU, Münster, pp. 59.

Eiselt, J. & Spitzenberger, F. (1967): Ergebnisse zoologischer Sammelreisen in der Türkei: Testudines.- Annalen des Naturhistorischen Museums in Wien, Wien; 70: 357-378.

Franzen, M. & Bussmann, M. & Kordges, T. & Thiesmeier, B. (2008): Die Amphibien und Reptilien der Südwest-Türkei; Bielefeld, Laurenti, pp. 328.

Goepp, É. & Cordier, E. L. (1877): Les grands hommes de la France: Navigateurs. 3e edition; Paris (P. Ducrocq), pp. 385.

Hellenic National Meteorological Service (2013): Samos. Document available at < http://www.hnms.gr/hnms/english/climatology/climatology_region_diagrams_html?dr_city=Samos > [last accessed: October 22, 2013].

Hewitt, G. M. (1996): Some genetic consequences of ice ages and their role in divergence and speciation.- Biological Journal of the Linnean Society, London; 58: 247-276.

Hijmans, R. J. & Cameron, S. & Parra, J. (2013): WorldClim - Global climate data. Free climate data for ecological modeling and GIS. Data available at

< http://worldclim.org/current > [last accessed: October 22, 2013].

HOFSTRA, J. (2008): An addition to the herpetofauna of the Greek island Lesbos.- Pod@rcis, Leiden; 9 (1): 2-10.

HOTZ, H. & BEERLI, P. & UZZELL, T. & GUEX, G.-D. & PRUVOST, N. B. M. & SCHREIBER, R. & PLÖTNER, J. (2013): Balancing a cline by influx of migrants: a genetic transition in water frogs of Eastern Greece.- Journal of Heredity, Oxford; 104 (1): 57-71.

IOANNIDES, Y. & DIMAKI, M. & DIMITROPOULOS, A. (1994): The herpetofauna of Samos (Eastern Aegean, Greece).- Annales Musei Goulandris, Athinai; 9: 445-456.

IOANNIDES, Y. & DIMAKI, M. (1996): Systematic observations of reptiles of Samos (in Greek).- Samiakes Meletes, Athinai; 2: 443-463.

IOANNIDES, Y. & DIMAKI, M. (1997): A new locality record for *Hyla arborea* (L., 1758) (Amphibia, Hylidae) on Samos island.- Newsletter of the Hellenic Zoological Society, Athinai; 30: 10.

KALABOKIDIS, K. & IOSIFIDES, T. & HENDERSON, M. & MOREHOUSE, B. (2008): Wildfire policy and use of science in the context of a socio-ecological system on the Aegean Archipelago.- Environmental Science and Policy, Exeter; 11: 408-421.

KIRCHNER, M. (2009): *Telescopus fallax* (FLEISCHMANN, 1831) found in the Aegean Island of Chios, Greece.- Herpetozoa, Wien; 21 (3/4): 189-190.

LISTER, B. C. (1976): The Nature of niche expansion in West Indian *Anolis* Lizards I: Ecological consequences of reduced competition.- Evolution, Lawrence; 30 (4): 659-676.

MACEY, R. J. & SCHULTE, J. A. & LARSON, A. & ANANJEVA, N. B. & WANG, Y. & RASTEGAR-POUYANI, N. & PETHIYAGODA, R. & PAPENFUSS, T. J. (2000): Evaluating trans-Tethis migration: an example using acrodont lizard phylogenetics.- Systematic Biology, Oxford; 49: 233-256.

MAZZOTTI, S. (2011): Esploratori perduti: storie dimenticate di naturalisti italiani di fine Ottocento; Torine (Codice Edizioni), pp. XXXIII + 239.

MEYER, A. & FRITZ, U. (1996): Die Europäische Sumpfschildkröte (*Emys orbicularis hellenica*) auf Samos.- Herpetofauna, Weinstadt; 18 (103): 27.

NILSON, G. & ANDRÉN, C. (1986): The mountain vipers of the Middle East: The *Vipera xanthina* complex.- Bonner Zoologische Monographien, Bonn; 20: 1-90.

PAFILIS, P. (2010): A brief history of Greek herpetology.- Bonn Zoological Bulletin, Bonn; 57 (2): 329-345.

PLEGUEZUELOS, J. M. (2003): Culebra bastarda – *Malpolon monspessulanus*. In: CARRASCAL, L. M. & SALVADOR, A. (eds.): Enciclopedia Virtual de los Vertebrados Españoles. Museo Nacional de Ciencias Naturales, Madrid. Document available at < http:// www.vertebradosibericos.org/ > [last accessed: 22 January 2013].

POLO-CAVIA, N. & LOPEZ, P. & MARTIN, J. (2011): Aggressive interactions during feeding between native and invasive freshwater turtles.- Biological Invasions, London; 13 (6): 1387-1396.

RAZZETTI, E. & BADER, T. & BILEK, K. & DELFINO, M. & DI CERBO, A. R. & DUDA, M. & HILL, J. & RATHBAUER, F. & RIEGLER, C. & SACCHI, R. (2006): A contribution to the knowledge of the herpetofauna of the Greek island of Corfu; pp. 207-216. In: Societas Herpetologica Italica: Atti del V congresso nazionale, Calci (Pisa), 29 settembre-3 ottobre 2004. Firenze (University Press, Firenze).

RAZZETTI, E. & SINDACO, R. (2006): 8. Unconfirmed taxa or in need of confirmation; pp. 644-653. In: SINDACO, R. & DORIA G. & RAZZETTI E. & BERNINI F. (eds.): Atlante degli anfibi e dei rettili d'Italia / Atlas of Italian amphibians and reptiles. Firenze (Societas Herpetologica Italica, Edizioni Polistampa), pp. 792.

SABAJ PÉREZ, M. H. (2013): Standard symbolic codes for institutional resource collections in herpetology and ichthyology: an Online Reference provided by the American Society of Ichthyologists and Herpetologists, Washington, DC. Document available at < http://www.asih.org/sites/default/files/documents/resources/symbolic_codes_for_collections_v4.0_sabajperez_2013.pdf > [last accessed: 22 January 2013].

SANTOS, X. & POQUET, J. M. (2010): Ecological succession and habitat attributes affect the postfire response of a Mediterranean reptile community.- European Journal of Wildlife Research, Berlin; 56 (6): 895-905.

SCHÄTTI, B. (1988): Systematik und Evolution der Schlangengattung *Hierophis* FITZINGER, 1843 (Reptilia, Serpentes). Doctoral thesis, Universität Zürich, pp. 50.

SCHÄTTI, B. & SIGG, H. (1989): Die Herpetofauna der Insel Zypern. Teil 2: Schildkröten, Echsen und Schlangen.- Herpetofauna, Weindstadt; 11 (62): 17-25.

SCHREIBER E., (1912). Herpetologia Europaea, eine systematische Bearbeitung der Amphibien und Reptilien welche bisher in Europa aufgefunden sind; Jena (Gustav Fischer), pp. x + 960.

SPEYBROECK, J. & BEUKEMA, W. & CROCHET, P.-A. (2010): A tentative species list of the European herpetofauna (Amphibia and Reptilia) - an update.- Zootaxa, Auckland; 2492: 1-27.

STAMATELATOS, M. & VAMVA-STAMATELATOU, F. (2006): Geographical dictionary of Greece [Γεωγραφικό λεξικό της Ελλάδας].- To Vima, Athinai; 5: 27-28.

STÖCK, M. & DUBEY, S. & KLÜTSCH, C. & LITVINCHUK, S. N. & SCHEIDT, U. & PERRIN, N. (2008): Mitochondrial and nuclear phylogeny of circum-Mediterranean tree frogs from the *Hyla arborea* group.- Molecular Phylogenetics and Evolution, San Diego; 49: 1019-1024.

STÖCK, M. & DUFRESNES, C. & LITVINCHUK, S. N. & LYMBERAKIS, P. & BIOLLAY, S. & BERRONEAU, M. & BORZÉE, A. & GHALI, K. & OGIELSKA, M. & PERRIN, N. (2012): Cryptic diversity among Western Palearctic tree frogs: Postglacial range expansion, range limits, and secondary contacts of three European tree frog lineages (*Hyla arborea* group).- Molecular Phylogenetics and Evolution, San Diego; 65: 1-9.

STÖCK, M. & HORN, A. & GROSSEN, C. & LINDTKE, D. & SERMIER, R. & BETTO-COLLIARD, C. & DUFRESNES, C. & BONJOUR, E. & DUMAS, Z. & LUQUET, E. & MADDALENA, T. & CLAVERO SOUSA, H. & MARTINEZ-SOLANO, I. & PERRIN, N. (2011): Ever-young sex chromosomes in European Tree Frogs.- PLoS Biology, Lawrence; 9: e1001062.

STÖCK, M. & MORITZ, C. & HICKERSON, M. & FRYNTA, D. & DUJSEBAYEVA, T. & EREMCHENKO, V. & MACEY, J. R. & PAPENFUSS, T. J. & WAKE, D. B. (2006): Evolution of mitochondrial relationships and biogeography of Palearctic green toads (*Bufo viridis* subgroup) with insights in their genomic plasticity.- Molecular Phylogenetics and Evolution, San Diego; 41: 663-689.

Tiedemann, F. & Grillitsch, H. (1986): Zur Verbreitung von *Vipera xanthina* (Gray, 1849) in Griechenland.- Salamandra, Rheinbach; 22: 272-275.

Tóth, T. & Krecsák, L. & Madsen, T. & Újvári, B. (2002): Herpetofaunal locality records on the Greek Islands of Corfu (Amphibia, Reptilia).- Herpetozoa, Wien; 15 (3/4): 149-169.

Valakos, S. D. & Dimaki, M. & Pafilis, P. (2004): Natural history of Lesvos: 1. Reptiles and amphibians; Mytilene (aei-editions for the Natural History Collection of Vrissas of the National and Kapodistrian University of Athens), pp. 128.

Valakos, E. D. & Pafilis, P. & Sotiropoulos, K. & Lymberakis, P. & Maragou, P. & Foufopoulos, J. (2008): The amphibians and reptiles of Greece; Frankfurt am Main (Edition Chimaira)[Frankfurt Contributions to Natural History, Vol. 32], pp. 463.

van Wingerde, J. (1986): The distribution of *Vipera xanthina* (Gray, 1849) on the east Aegean Islands and in Thrace.- Litteratura Serpentium, Asten; 6: 131-139.

Werner, F. (1902): Die Reptilien- und Amphibienfauna von Kleinasien.- Sitzungsberichte der kaiserlichen Akademie der Wissenschaften (mathematisch-naturwissenschaftliche Klasse, Abt. 1), Wien; 111: 1057-1120.

Werner, F. (1930): Contribution to the knowledge of the reptiles and amphibians of Greece, especially the Aegean islands.- Occasional Papers of the Museum of Zoology, University of Michigan, Ann Arbor; 211: 1-46.

Werner, F. (1933): Ergebnisse einer zoologischen Studien- und Sammelreise nach den Inseln des Ägäischen Meeres. I. Reptilien und Amphibien.- Sitzungsberichte der kaiserlichen Akademie der Wissenschaften (mathematisch-naturwissenschaftliche Klasse, Abt. 1), Wien; 142: 103-133.

Werner, F. (1935): Reptilien der Agäischen Inseln.- Sitzungsberichte der kaiserlichen Akademie der Wissenschaften (mathematisch-naturwissenschaftliche Klasse, Abt. 1), Wien; 144 (l-2): 81-117.

Werner, F. (1938). Die Amphibien und Reptilien Griechenlands.- Zoologica, Stuttgart; 35: 1-117.

Wettstein, O. v. (1937): Vierzehn neue Reptilienrassen von den südlichen Ägäischen Inseln.- Zoologische Anzeiger, Leipzig; 118 (3/4): 79-90.

Wettstein, O. v. (1953): Herpetologia aegaea.- Sitzungsberichte der Österreichischen Akademie der Wissenschaften, Wien; 162: 651-833.

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