

**NEW OBSERVATIONS ON THE *ELAPHE* SNAKES FROM AMORGOS
(CYCLADES, GREECE) AND THE VALIDITY OF *ELAPHE RECHINGERI*
WERNER AS AN ENDEMIC SPECIES**

RICHARD CLARK

Vollenetoppen 3, 4800 Arendal, Norway

Three specimens of *Elaphe quatuorlineata* (Lacépède) and three referable to the disputed taxon *Elaphe rechingeri* Werner were caught on the Cycladean island of Amorgos in April 1993. Analysis of this and earlier material collected by the author reveals the taxa are non-synonymous and separable chromatically, morphologically and in head scalation. A new definition of *E. rechingeri* is given. The status of *E. quatuorlineata* is discussed but no decision taken pending the need for further research. The study is presented against past debate on the Amorgos *Elaphe* snakes, island physiography, sympatric herpetofauna and the urgency for conservation measures.

INTRODUCTION

The type specimen of the Amorgos rat snake *Elaphe rechingeri*, described in 1932 by Werner as a new species endemic to the island of Amorgos, remained the only documented record of a snake of the genus *Elaphe* from this island until 1966. In that year I collected two adult snakes of this genus on Amorgos, one agreeing with Werner's description of *E. rechingeri* the other being unmistakably *Elaphe quatuorlineata*, the four-lined snake. A juvenile example found at the same location as *E. rechingeri* was assigned to this species (Clark, 1971). This was followed by a return trip to Amorgos in April 1977, again finding one adult example of each taxon (Clark, 1990).

Comparing the two species, the most obvious distinguishing feature was the absence of any patterning in *E. rechingeri*. *Elaphe quatuorlineata* on the other hand had the four longitudinal dark stripes of exceptional boldness. Achilles Dimitropoulos of the Goulandris Museum of Natural History in Athens (Kifissia) has himself observed unstriped snakes on Amorgos and remarks that they are well known to the local people who readily distinguish between this "lafitis" and the striped one. In 1970 Erika Lotze found an adult four-lined snake (Lotze, 1970) but no *E. rechingeri* despite exhaustive investigations. In 1992 Buttle was also unsuccessful although he managed to capture an adult specimen of *E. quatuorlineata* (Buttle, pers. comm.).

The need for further evidence to ascertain the taxonomic position of the Amorgos *Elaphe* taxa seems to be a matter of priority. On the occasion of my third investigation in April 1993 I obtained three examples of each taxon. Examination of this material confirms my earlier belief that two *Elaphe* species are involved.

HISTORICAL DEBATE

The status of the unstriped *Elaphe* snake has occupied the attention of experts for some 60 years. Werner himself considered that it had affinities with *Elaphe*

longissima with which Wettstein (1953) was in agreement. Wettstein however relegated it to a subspecies of *E. longissima* and it is so listed in Mertens & Wermuth (1960). Buchholz (1961) examined the type and came to the conclusion that it stood nearer to *E. quatuorlineata* than *E. longissima*, a viewpoint with which Wettstein (1963) concurred after reappraisal.

The revelation in 1966 that there were two *Elaphe* taxa involved raised complications. Although the amount of material collected was admittedly small, amounting to Werner's "type" of *E. rechingeri* and my series of two of this taxon and one of *E. quatuorlineata*, I discounted the possibility of bimorphism within one species since the differences seemed too contrasted and proposed that recognition be given to *E. rechingeri* (Clark, 1971). Hans Lotze, who at the time was unaware of my work on Amorgos, came to the conclusion that *E. rechingeri* was nothing more than a patternless morph of the four-lined snake and described his single specimen as the topotype of *E. quatuorlineata rechingeri* on which the striped pattern was exceptionally well developed (Lotze, 1970). Kratzer (1973) remarks that on Amorgos the four-lined snake demonstrates a broad degree of variability with regard to patterning. This too is the conclusion of Gruber & Fuchs (1977), Arnold, Burton & Ovenden (1978), Gruber (1979), Beutler & Fror (1980) and Chondropoulos (1989). This opinion is not shared by Steward (1971) or Street (1979) who accept *E. rechingeri* as a species in its own right.

Lotze has argued that if the Milos grass snake, *Natrix n. schweizeri* and the leopard snake, *Elaphe situla*, on Milos show variability why not *E. quatuorlineata* on Amorgos? He is referring to melanism in the former and the occurrence of both barred and striped morphs in the latter species. I feel there is a flaw in the reasoning here since in the case of the two species mentioned both demonstrate bimorphic tendencies elsewhere: the situation is not exclusive to Milos. Extrapolation cannot be

used to account for the situation on Amorgos where, incidentally, *E. situla*, is absent. Dimitropoulos (1992) remarks that *E. quatuorlineata* is a constant species morphologically and in colouration. With the exception of the eastern subspecies *sauromates*, in which the juvenile livery is retained into adulthood and the striped pattern fails to develop, all other populations are similar to the nominate form. On the Cycladean islands the tendency is for the snakes to be paler in colour with narrower striping. The adult patterning develops at an earlier stage and adult size is smaller. The exception is Kea where the four-lined snake resembles those on the mainland but this island is not truly Cycladean in its herpetofauna as is proven by the presence of *Chalcides o. ocellatus*. On Amorgos *E. quatuorlineata* is characterized by darker rather than lighter ground colouration and has broader and more intense striping even when compared with the nominate form. It also grows larger than on the other islands.

The statement made by Böhme & Scerbak (1993) that a patternless population of the four-lined snake occurs in Bosnia needs to be considered. This implies that an exceptional situation could occur elsewhere. Is this perhaps the case on Amorgos? On the evidence available I feel that this is not so. Striped specimens have a consistent ground colour whereas in patternless individuals the ground colour is highly variable. Furthermore, as we shall see, there are distinct differences in head scaling. This implies either an abnormally plastic gene pool in one species or the existence of two species. I am inclined to accept the latter possibility.

PHYSIOGRAPHY

Amorgos belongs to the central group of the Cyclades lying some 35 km SE of Naxos. The principle islands in order of size are Naxos (448 km²), Paros (209 km²), Amorgos (134 km²) and Ios (105 km²). Otherwise the land area of Amorgos is exceeded by Andros, Tinos and Milos making it the sixth largest island of the Cyclades.

The island itself is some 35 km long and 6 km across at the widest point with a NE/SW axis. A low mountain ridge runs the length with a mean altitude of some 400 m with peaks of 821 m in the north east, 698 m in the centre above Chora and 607 m in the south west. The hillsides are typically Cycladean, treeless and with phrygana scrub. There is extensive hillside terracing, regions of denser vegetation and pockets of cultivation in steep-to valleys with scattered hamlets and cottages. The coastal lowlands at Katapola and Aigali offer the greatest variety of habitat. At Katapola the plain has an area of roughly 2.25 km² within the 50 m contour. Towards the foothills it is dissected by a system of ravines and gullies which form seasonal water courses. The severe drought of recent years and the low rainfall of the winters of 1991/2 and 1992/3 meant that there was little surface water. An isolated spring was found near the head of a narrow gully and some water was present in

open cisterns and in two stream beds that had been dammed upstream from the dam wall. The area is extensively but thinly cultivated with olive plantations, vineyards, barley fields and scanty pasture as well as fallow, stony fields. There are innumerable tracks, paths, stone walls and embankments.

At Aigali the coastal plain is narrower with an area of about 1 km² within the 50 m contour. The extremities are flatter and rockier, there are no water courses and much of the region is given over to olive production and olive groves are more extensive than at Katapola.

STUDY AREA

The coastal regions and hinterland at Katapola and Aigali had formed the main areas for previous field work. *E. rechingeri* had been found in a harvested field at Katapola and in an olive grove at Aigali. At both locations *E. quatuorlineata* was caught on paths near stone walls.

It was decided to follow-up this work in 1993. Since the Katapola region offered a richer spectrum of biotopes, activities were concentrated here during the time spent on the island (April 15-21) with one day at Aigali. Particular attention was paid to deserted buildings, abandoned gardens and orchards, rocks in open fields by overturning, stone piles and discarded litter.

Weather conditions were favourable being dry apart from a few showers on April 17. On April 18 strong north winds caused the build up of heavy low cloud to windward and over high ground, clearing abruptly to leeward. Otherwise there was a good deal of sunshine. Early morning temperatures (07.30 hr) in the range of 9°C to 13°C, maxima 18°C to 24°C and evening values (17.30 hr) 15°C to 22°C.

FIELD RESULTS

ELAPHE QUATUORLINEATA

Katapola, April 17: Young female under flat rock near base of stone wall in field on margin of olive grove in hiding with an adult *Eryx jaculus*. Adult male coiled in spiny bush at base of dry stone wall on west-facing, sloping open field, 14.00 hr. April 18: juvenile freshly killed on tarmac section of road bordering olive groves before ascent to Chora, 14.00 hr. No further sightings were made and no sloughs found.

ELAPHE RECHINGERI

Aigali, April 19: adult male basking on margin of vineyard/stony path close to thickets, 15.30 hr. Katapola, April 21: adult female on open hillside amongst phrygana, 11.00 hr; adult male on rough path nearby, 11.15 hr. No further sightings were made and no sloughs found.

REMARKS

The two *E. rechingeri*, from Katapola, were taken in a habitat not previously associated with this species, namely in the dry scrub. This raises the question of differing ecological preferences between the Amorgos rat

snake and the four-lined snake. Although *E. rechingeri* certainly enters cultivated areas, it may do so whilst foraging for food. Crop growing is non-intensive with little effort to claim unprofitable land. Fields and scrub are in juxtaposition and the peripheral zones often ill-defined. This hypothesis needs testing by further field work.

SYMPATRIC HERPETOFAUNA

The Amorgos herpetofauna is depauperate compared with the neighbouring islands of Naxos, Paros and Ios. This, combined with the fact that Amorgos is as rich in habitats as the other islands, might well have been a factor in the evolution and maintenance of an endemic species. The following amphibians and reptiles exist on Amorgos, all of which were found in 1993, subspecific status omitted: *Rana ridibunda*, *Bufo viridis*; *Hemidactylus turcicus*, *Tenuidactylus kotschyi*, *Ablepharus kitaibelli*, *Lacerta erhardii*; *Eryx jaculus*, *E. quatuorlineata*, *E. rechingeri*. Most conspicuously absent are *Lacerta trilineata* and *Vipera ammodytes*. These are both found on the other islands and the latter is present on the small islands of Ano Kufonissi and Iraklea in the Erimonissia group situated between Naxos and Amorgos (Lotze, 1973; Dimitropoulos, 1992). Reptile species that might be anticipated but which are lacking are: *Mauremys caspica*, *Natrix natrix*, *Agama stellio* (Naxos, Paros), *E. situla*, *Telescopus fallax* (Paros), *Typhlops vermicularis* (Naxos). The most interesting apparent absentee is *T. fallax* which is one of the most successful of the Aegean snakes with regard to distributional potential. This species is in fact listed from Amorgos (Chondropoulos, 1989; Dimitropoulos, 1992). These inclusions are based on Werner (1938) and Wettstein (1953). In the absence of more recent confirmation it must be assumed that this snake is either rare or, as is more likely, the original listing was in error. *Eryx jaculus* reaches high population densities on Amorgos. I disclosed 13 in hiding in 1993 and Buttle (pers. comm.) 20 in 1992. This may be correlated with the absence of *V. ammodytes*. On islands where the two snakes occur *V. ammodytes* always occurs in larger numbers than *Eryx jaculus*.

Eryx jaculus cannot be considered a serious competitor with any European *Elaphe* species either in its dietary requirements or ecology. The absence of *E. situla*, *N. natrix* and *T. fallax* could have been instrumental in providing a niche for the Amorgos rat snake unless one reasons that this species itself led to the extermination of one or more of the above mentioned species.

SYSTEMATIC ACCOUNT

Elaphe rechingeri and *E. quatuorlineata* have been synonymised. It is thus necessary to present a revised diagnosis of the former and a comparison with the latter. Amongst the 1993 collection was a male *E. rechingeri*, SVL 109.5 cm, and a male *E.*

quatuorlineata, SVL 104 cm. Since both were of the same sex and practically identical in body length it was decided to use these to assess differences in appearance, proportions and pholidosis. Additional material was utilised to determine range of characters and variability and thus build up a description of each taxon. Only one juvenile of each has been available for study: *E. rechingeri* SVL 46.2 cm, tail 8.7 cm; *E. quatuorlineata* SVL 29 cm, tail 5.8 cm. The subadult female *E. quatuorlineata*, SVL 58.5 cm, tail 12.3 cm, had the stripes present but not completely formed and the juvenile cross barrings still plainly evident.

ELAPHE RECHINGERI WERNER

Colouration. Olive-green, grey-green or brown but never dark brown. Head, dorsal and lateral zones uniform. Flank scales inconspicuously light tipped anteriorly. Sometimes a suspicion of faint, shadowy dorso-lateral and/or lateral lines. A dark mid-dorsal narrow line may be present (Dimitropoulos, 1992). Indefinite dark "smudge" occasionally determinable from eye to jaw angle. Eye pale with a well defined ring round pupil. Venter white, cream or less often pale yellow. Belly nearly immaculate or lightly mottled or flecked with grey, more pronounced along ventral margins. Underside of tail dark marked in equal proportion to ground. Throat lightly marked with grey or fawn, sometimes with pinkish flush extending onto head and neck. No sexual dimorphism.

Morphology. A robust snake especially large males which are markedly thick along first third of body displaying scale interstices. Body weakly compressed with vertebral ridge. Head narrow, not distinct from neck. Temporal region "taut" and does not flatten. Neck and anterior one-fifth of body can "spread" on nervous and newly captured individuals. Eye moderately large, round, angled inward anteriorly and not obviously protruding laterally when viewed from above. Forwardmost point of eye does not attain first third of length of frontal shield. Supralabials only narrowly visible viewed from above (Fig. 1).



FIG. 1. *Elaphe rechingeri* - lateral view

Size. Large for a Cycladean snake, to at least 130 cm total length (SVL 109.5 cm, tail 23.5 cm) though usually less. SVL on five examples 74.5 - 89 cm. Damaged tails frequent at around 67%.

Pholidosis. Dorsals 25 at midbody, ventrals 203-205 (males) 214-219 (females). Subcaudals 65 (one male) 60 (one female). Dorsals lightly keeled except three lower rows. Scales on back of head granular, rather smaller than on neck. Supralabials 8 with 4th and 5th bordering eye. Sublabials 10 or 11. Supraocular long, anterior point nearly reaches in line with the junction of the 2nd and 3rd supralabial, posterior point in line with junction of 5th and 6th supralabial; supraocular markedly "jutting" laterally giving frowning appearance, straight margined over eye. Loreal trapezoid with upper side shorter than lower, higher than long. Two preoculars, lower small and in infra-ocular position. Parietals large occupying not less than one-third of head area (ratio 2.7 in named specimen), sharp-edged, angular. Temporals straight-edged, about 6 large and 4 smaller. The latter twice the size of neck scales; border between posterior temporal region and neck sharply defined. Rostral viewed from below broad, widely grooved projecting forward. Posterior postmentals meet along midline or if not only narrowly separated by less than one gular scale.

ELAPHE QUATUORLINEATA (LACÉPÈDE) SUBSP.?

Colouration. Vertebral and dorso-lateral zones darkish brown, flanks lighter and greyish. Head above not as dark as top of body. Four intense black lines down body continuing onto tail, the upper pair three scales in width the lower one-and-a half scales wide. Dark line from orbit to angle of jaw. Eye dark, almost black with the pupil ill-defined. Anterior face of lateral body scales cream or white, more pronounced below mid-lateral stripe. Venter white or cream marked with grey flecking and powdering extending onto throat and chin. Tail below more or less dark grey. No sexual dimorphism. Buttle (pers. comm.) states that on his example the body striping was of equal width occupying two scale rows.

Morphology. Body rather slender, cylindrical not compressed. Head well distinct from neck, markedly broad in temporal region which is "flaccid" and can flatten. Eye prominent, large, somewhat broader than deep and in same plane as side of head; eye obviously protruding laterally when viewed from above with supralabials plainly in view (Fig. 2).

Size. Larger than from other Cycladean islands except Kea (nominant form) and possibly Ios. SVL on largest individual 104.3 cm, tail 18.2 cm incomplete (Lotze, 1970). Otherwise SVL in range 92.5-104 cm. Damaged tails in 80% of cases. SVL/tail ratio in only complete specimen (male) 4.2. This indicates a maximum length of at least 130 cm.

Pholidosis. Dorsals 25 at midbody, but 23 in one example; ventrals 206-210 in males, in single female 216; subcaudals 70 in one male, 68 in one female, 64 in one



FIG. 2. *Elaphe quatuorlineata* - lateral view

juvenile. Dorsals keeled except for the lowest row and rather more strongly than in *E. rechingeri*. Scales on back of head no smaller than on neck. Supralabials 8 with 4th and 5th bordering the eye. Sublabials 9, less often 10. Supraocular not long, anterior point in line with the junction of the 3rd and 4th supralabials, curved over eye and thin edged. Loreal almost square, slightly trapezoid seldom higher than long, if so markedly oblique. Two preoculars, the lower small and in infraocular position. Parietals medium occupying not more than one-quarter of head area (ratio 4.2 in named specimen). Two or three long narrow and obtuse temporal scutes with several smaller scales; boundary with neck poorly defined. Rostral viewed from below narrow, slightly grooved not projecting forward. Posterior postmentals clearly separated by one or two gular rows.

SYNOPSIS

The two taxa are separable on a number of features amongst which can be named:

- (1) *Elaphe rechingeri* patternless, coloration variable. *Elaphe quatuorlineata* strongly marked black striping, coloration consistent.
- (2) *Elaphe rechingeri* strongly built, robust, body obviously thickened anteriorly. Head slim, narrow across temporals. *Elaphe quatuorlineata* more slender, no thickening of the body anteriorly. Head markedly broad across temporals.
- (3) *Elaphe rechingeri* eye not large, non-protruding viewed from above; eye pale, pupil well-defined with darker surrounding ring. *Elaphe quatuorlineata* eye large, protruding laterally viewed from above; eye dark, pupil ill-defined with no darker surrounding ring.
- (4) *Elaphe rechingeri* with weakly keeled dorsals, lowermost three rows unkeeled. Snake smooth to the touch. *Elaphe quatuorlineata* with more strongly keeled dorsals, lowermost row unkeeled. Snake rather rough to the touch.
- (5) Head scalation, the most obvious points being: character of the supraocular, size and shape of the loreal and

parietals, number and form of the temporals, appearance of the rostral and condition of the postmentals.

DISCUSSION

On the limited juvenile material available there seems little to differentiate the two species. Seen in the wider context of the *Elaphe* genus as a whole it is questionable how much difference one would expect. A characteristic juvenile pattern is common to very many species; basically dark bands or saddles on a lighter ground and this is found across the whole range of the genus from Europe to the Far East as well as the New World. In *E. rechingeri* the single juvenile had a brown/grey ground with darker narrow cross barrings; in *E. quatuorlineata* the ground was more dull silver grey and the narrow bars fawn/grey. A point of difference was that the scales forming the cross bars had a light central streak in the latter species. The change from juvenile to adult livery takes several forms in the genus and it is worth mentioning that the four striped pattern is not peculiar to the four-lined snake but is paralleled in *E. obsoleta quadrivittata* and *E. bairdi* (New World), and *E. quadrivirgata* and *E. climacophora* (Far East).

With regard to scalation the condition of the preocular(s) varies between species. Some have only one but a number have a large upper and a smaller lower which can be defined as a subocular. *Elaphe rechingeri* and *E. quatuorlineata* fall into the latter category. Scale series in which one might anticipate differences are the dorsals, ventrals and subcaudals. Both taxa have 25 mid-dorsal rows, 23 in one *E. quatuorlineata*. There is no indication of dissimilarity between ventral counts, these being within the general range for not only *E. quatuorlineata* (195-234) but also *E. longissima* (205-248) with one *E. rechingeri* having only 203. The overlap in ventral counts for *E. quatuorlineata* and *E. longissima* is broad but exceeded by the subcaudals which are almost the same: 56-90, 60-91, respectively. The number of damaged tails in Amorgos *Elaphes* does not permit an evaluation but again the implication is that both species are similar in this respect.

DECISION

Although it is undeniable that *E. rechingeri* and *E. quatuorlineata* have characteristics in common these are shared by other species of the genus. There appear to be sufficient distinguishing features to separate the two taxa under consideration at the specific level. It is therefore proposed that *E. rechingeri* Werner be reinstated as a species distinct from *E. quatuorlineata* (Lacépède).

DISTRIBUTION AND SUBSPECIATION

ELAPHE RECHINGERI

This snake appears to be endemic to Amorgos. Since the smaller islands and islets off the coast remain uninvestigated the possibility must remain that *E. rechingeri* could exist on one or more of these. The

most likely, on account of size and physiography, is Nikuria off the north west coast line from which it is separated by a narrow and shallow channel. Nikuria has an area of about 4 km² and a maximum elevation of 350 m. There is no known subspeciation.

ELAPHE QUATUORLINEATA SUBSP.

The four-lined snake has a broad distribution in Greece. On the Cycladean islands it is known from Kea, Andros (Clark, unpublished record from July 1966), Tinos, Mykonos, Paros, Naxos, Ios, Iraklea, Schinoussa, Amorgos, Santorini and Antimilos. It is also present on Pholegandros (Underwood, pers. comm.). This is not listed in Böhme & Scerbak, (1993). This specimen is in the British Natural History Museum collection no. 1938.8.5.1 and is an adult male. Snakes from Kea belong to the nominate form *quatuorlineata*. In the case of Andros and Santorini the evidence is from cast skins making subspecific designation problematic. Otherwise on most of the above named islands the four-lined snake belongs to the subspecies *muenteri*, the characteristics of which have been given.

Juveniles of this subspecies differ from the nominate form in having less contrast between the ground colour and patterning which is more in the nature of narrow bars instead of wide spots of bands. In this respect the Amorgos four-lined snake is similar to *muenteri* although differing in the adult phase. Adults from the neighbouring island of Ios seem to be closer to Amorgos than to the other islands in having wider striping and attaining larger size. On Amorgos and Ios SVL in excess of 100 cm seems not uncommon with a total length of around 130 cm. On the other Cyclades SVL seldom reaches 90 cm and a total length of a little over 100 cm can be considered "large". My biggest, a female from Naxos caught in March 1971, had SVL 90.3 cm, total length 109.8 cm.

In order to place the Amorgos four-lined snake in a subspecific category a thorough analysis and possible revision of other Cycladean populations is required. This is beyond the scope of the present paper.

CONSERVATION

It is important to secure the future of both the Amorgos rat snake and the four-lined snake on Amorgos. On several Greek islands snake populations have been reduced due to illegal collecting, often on a large scale for commercial gain, as for example on Milos where *Macrovipera schweizeri* is threatened. Just as serious is the destruction of natural habitats as the result of massive tourist expansion over the last 20 years or so. The building of hotel complexes and apartment blocks on vital habitats, especially the coastal plains and wetlands, has claimed the habitat of many reptile species. Natural scrub has disappeared owing to private building often some distance from the coast itself and the landscape has been radically altered. Traffic is heavy on many islands and with a wider road network claims substantial mortalities amongst snakes.

There is no indication that Amorgos is vulnerable at the present time. Tourist development has been minimal even compared with 30 years ago but it would be unwise to assume that this benign situation will continue. Neither has the island become a collector's target though there was a case recently. Thanks to the vigilance of the local police who had been alerted the person was apprehended and found to have a number of snakes in his possession which were released.

The need for a conservation initiative is vital. The question of setting up protection involves engaging local support. That such a scheme is feasible is demonstrated by the success the SEH (Societas Europaea Herpetologica) has achieved on Milos. This has involved the setting up of notices on the island in Greek, German and English "All snakes on this island are protected by law" and explanatory information. Educational talks are given to the school children and the police force are active in implementing control. This was in 1985 some time after the commercial exploitation of the viper population on the island had begun. Clearly a similar project needs to be put into operation on Amorgos before the snake population becomes decimated by potential bounty hunters.

FUTURE INTENTIONS

In addition to conservation the need to know more about the life style of *E. rechingeri* is paramount and to ascertain population densities and abundance. This must be the objective of further field work. However the study of this snake in captivity is also necessary in order to compare it with *E. quatuorlineata*. A captive-breeding programme will be initiated in 1994. If this is successful it will provide valuable information on the juvenile phases of the two taxa and their subsequent development.

HYBRIDIZATION

The possibility of hybridization between *E. rechingeri* and *E. quatuorlineata* needs considering. This occurs infrequently in European snakes under natural conditions but is known viz: *Vipera berus* x *Vipera ammodytes*, *Vipera aspis* x *Vipera ammodytes* (Street, 1979) and Dimitropoulos (pers. comm.) has evidence that *Vipera berus bosnica* and *Vipera ursinii* may hybridize in parts of the Pindos mountains in Greece. In captivity species that have absolutely no possibility of mating in the wild due to wide geographical separation may do so readily and produce offspring. This is strikingly illustrated by a case quoted by Haagner (1992) where a Burmese python, *Python molurus bivittatus*, mated with a Southern rock python, *Python sebae natalensis*. It would be very natural therefore if *E. rechingeri* and *E. quatuorlineata* did hybridize under captive conditions and not too surprising if they did so in the wild. The case quoted in Böhme & Scerbak (1993) of both morphs resulting from a single clutch of eggs laid by a female *E. rechingeri* might be the result of such a situation. Fertile progeny result-

ing from such crosses would not help to support the case for *E. rechingeri* as a good species distinct from *E. quatuorlineata* but neither would this in itself invalidate it, especially if it could be shown that sterile hybrids also occurred: it could be reasoned that *E. rechingeri* is a relatively young species perhaps not fully stabilized. What is of interest is that on present evidence there is no suggestion of adult snakes found in the field showing mixed characters. The presence of faint body striping on some individuals is akin to the situation sometimes found in *E. longissima* and does not presume necessarily affiliation with *E. quatuorlineata*. I have indicated that there seems to be a habitat difference between the two taxa and there might be other exclusion factors, such as a staggered breeding season, that would help to minimise potential hybridization.

CONCLUSIONS

I believe there is strong evidence to regard *E. rechingeri* and *E. quatuorlineata* as separate species. Apart from colouration and appearance there are undeniable points of distinction in head scalation and morphology. The depauperate reptile fauna on Amorgos may have allowed sympatry between these two large species, although *E. quatuorlineata* is found more often in cultivated areas. Future areas of study are (i) careful and controlled captive breeding experiments to establish phylogeny and (ii) organized and detailed field work over a long period to determine population densities, habitat and dietary needs as well as observations on courtship and mating. There is the need to ascertain whether *E. rechingeri* is extra-limital on the smaller islands round Amorgos. Lastly it is imperative that conservation measures are put into operation to ensure the future survival of both species.

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