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An account of herpetological observations in Macedonia, the Pindos Mountains and Prespa Lake region, Greece.

by Richard Clark,
Norway.

This report is largely based on a trip to Greece in the summer of 1990. I am also taking this opportunity to mention findings made on previous trips to Greece in this general area where these seem relevant. The Pindos Mountains were visited in 1986 and a report on my findings there has been published (Clark, 1989). The reader is also referred to a paper by Malakou, Ravasini and Tsunis (1986) on the N.E.Pindos region. An objective of the 1990 excursion was to locate populations of *Vipera ursinii* known from restricted high altitude localities in the Pindos. This proved unsuccessful. However I was well pleased with the finding of *Lacerta agilis* at a mountain location between Prespa and Florina and a single example of *Elaphe longissima* from Preps itself. There are few mainland records for this snake in Greece. Below I give a brief description of the areas visited with dates followed by a species account.

Site Descriptions;

July 13th - 15th;- Lekani region in extreme eastern Macedonia near the provincial boundary with Thrace. This is an area of relatively high ground north of Kavalla with the highest point of 1260 metres. Sharp contrasts between deciduous forest, richly vegetated meadows, streams and dry, limestone hills. There are several fertile valleys and basins which are intensely farmed. On the eastern side the area is bounded by the Nestos River and on the north the same river separates the Lekani range from the West Rodopi mountains on the Greek/Bulgarian border. The weather here was unsettled with thunderstorms, which are common in summer. Maxima 26°C-28°C.

Northern Pindos;

July 16th;- Grevena to Kranea. Gradually rising ground from 500 metres to 1400 metres. Open countryside near Grevena to thick, coniferous forest at Kranea. Between Kranea to Milea largely forested with clearings, meadows and streams. Milea to Katara Pass (1700 m) forest giving way to open meadows and streams. Several stops made along this route. Weather rather cloudy with light showers and temperature around 25°C.

July 17th - 20th;- Tzepelovo and area. Alpine pastures above the village (1060 m). Coniferous forest from Skamneli (1160 m) to Laitsa (1020 m). Streams and deciduous woodland at Negades (1000 m). Weather sunny, warmer with 33°C at Negades.

July 22nd - 26th;- Aristi and Papingo. These villages stand at around 1000 metres separated by the Voidomatis River (400 m). See Clark (1990) for fuller details. Weather very hot with maxima well over 30°C and 35°C by the river. Dawn temperatures at Aristi around 15°C.

Southern Pindos;

July 20th - 22nd;- Paleohori to Sirako (1100 m) on the lower slopes of Lakmos (2295 m). Open, bleak countryside. Limited woodland. Pragmanta (1200 m), Agnanda, Christoi (Plaka) on the Hroussa River. Pragmanta lies below the Tzoumerko mountains (2469 m). Limited woodland, fields and light woodland near the river. Open hillsides above Pragmanta with scree. Nothing found here despite careful searching upto 1700 metres. Weather unsettled with showers but hot - 36°C by Hroussa River on the 21st, though wet and cool at Sirako on the 20th.

Prespa region;

August 3rd - 6th;- Prespa Lakes. Strip of countryside between the Great and Little Lakes (850 m). Open fields, reed beds, streams, vegetated roadside and rocks. Rocky shoreline at corner of the Great Lake 20-50 metres wide overhang with cliffs. Near Vrontero on the Albanian border (1100 m) the terrain was wooded with deciduous trees and some streams. Areas of rock and scrub. Agios Germanos (1050 m) - open hillsides, stream valleys below forested mountain slopes. Weather fine, temperatures 15°C at dawn to 27°C mid-afternoon. Pissoderi (1600 m) - deciduous light woodland, alpine pastures and streams.

All localities visited and discussed in the text are shown on the accompanying map apart from the Lekani region. This can be found easily on any standard map of Greece just north of Kavalla.

N.B. Numbers in brackets under "Localities" refer to the number of specimens actually observed or examined. In other cases the species was either common or so abundant that no tally of specimens was possible.

Species Account;

Salamandridae

Salamandra s. salamandra (Linnaeus)

Locality; Lekani Forest.

Nearly fully metamorphosed larvae observed in abundance in a mountain stream on July 14th. Several examples of 60-70 mm length displayed the adult orange/yellow patches. All had gills.

Discoglossidae

Bombina variegata scabra (Kuster)

Localities; widespread.

This toad occurred at nearly all the sites visited. It could be found in small streams, ponds, roadside puddles and pools as well as man-made concrete watering troughs either supplied by natural springs or pipes. In the latter case it is difficult to see how the animals colonised the site, as at Prespa, since there was no natural water present. Often sympatric with *Rana graeca*. At Lekani several pairs were seen in amplexus and there was some spawn present indicating more than one breeding season a year. Background biotope was alpine meadow (Pissoderi), coniferous forest (Grevena to Methadon), deciduous woodland (Lekani), open plains (Prespa), dry, scrub hillsides (Aristi), edges of fast-flowing rivers (Voidamatos).

Bufo

Bufo bufo spinosus Daudin

Localities; Skamneli (2), Aristi (1).

At the former site one was found DOR, the other in a hollow in soft earth beneath a fallen log that was lifted. This measured 110 mm. The Aristi example was also DOR measuring 130 mm.

Ranidae

Rana graeca Boulenger

Localities; widespread.

This species, as with *B.v.scabra*, was encountered at all the stations visited wherever there were streams. Often found in swiftly running water as in the Voidamatos below Papingo and Aristi where it showed itself to be a strong swimmer, diving into the water when disturbed and moving upstream to cling to rocks and stones. Near Papingo it was found in a stream valley with steep rocks and cliffs which were permanently in shadow. Several were found several feet above the water sheltering in narrow clefts in the cool, damp rocks.

Otherwise often seen basking in the sun close to running water. Highly variable as to coloration and patterning which feature has been noted by Malakou et al. (1986).

Rana ridibunda ridibunda (Pallas)

Locality; Lekani Forest.
This was the only upland locality where Green Frogs were seen. One adult caught was green with dark blotches and a bright mid-dorsal yellow line. Calling was heard at the Ioannina Lake and at Prespa. Sympatric with both *B.variegata* and *R.graeca* in the Lekani Forest.

Testudinae

Testudo hermanni Gmelin

Localities; widespread.
Observations on this tortoise were made over a large area and a diversity of habitats from near sea level to well over 1000 metres altitude in the Pindos and Prespa Lake regions. These localities, along with relevant data, are summarised in Table 1. *T.hermannii* was not particularly sought after and the records represent casual encounters while driving (quite often found crossing roads) or while looking for other species. In view of the attention paid recently to the division of the supracaudal scute in this and other species (Highfield, 1989; Buttle, 1989), I made notes on this feature which are given in the Table.

In only two examples (N.Pindos) was the supracaudal scute entire. In all others there was a suture down the middle, but only seldom was this as clear as the division between the other plates and was frequently only a shallow groove which did not reach the lower edge of the scute. I concur with Highfield that this feature is of little taxonomic importance and certainly does not imply hybridisation with *T.graeca*. As Highfield takes the trouble to point out; "this (hybridisation) appears extremely unlikely in the complete absence of any other characters indicating hybridisation...".

Considerable variation of carapace shape was noted in some instances. Notable was the flared-out rear in the three tortoises from Pragmanta (S.Pindos) and a high-domed carapace in another from the same area. I will also mention the large example from between Grevena and Kranea (285 mm over-carapace-length) and the very long caudal spur. Unfortunately the straight carapace length was not noted. Buttle (1989) found *T.hermannii* and *T.graeca* sympatric in Thrace. He also noted that 42% of his *T.hermannii* had an undivided supracaudal.

In 1986 I found large numbers of *T.hermannii* on and near a mountain road west of Amindeo following a heavy thunderstorm. Over thirty examples were counted over a short distance.

Anguidae

Anguis fragilis (Linnaeus)

Localities; Lekani Forest (1), Kranea to Milea (4), Tzepelovo to Laitsa (1).

There appear few documented records for N.Greece, although the species is widespread and locally not uncommon at moderate altitudes (800 - 1200 metres). The example from the Lekani Forest was found dead on a forestry track. Of the four from between Kranea to Milea two were taken from under fallen logs. These were of bronze ground colour with a dark vertebral line and the lower flanks and venter black. Another was found dead in a field nearby evidently having been killed by human hands. This was plain grey in coloration. The fourth specimen was found D.O.R. in poor condition as was the individual from the last named site. The habitat at Lekani was beech forest and at other places coniferous forest with grassy clearings and small streams. Adema and In den Bosch (1980) found it near Morfi (150 metres) which is located near Parka.

Lacertidae

Algyroides nigropunctatus (Dumeril & Bibron)

Localities; Tzepelovo, Aristi, Voidomatos River, Papingo, Prespa.

At Tzepelovo it was found on rocks, walls and vegetation outside the village soon after sunrise (18°C) when it was quite common. A single example was seen in the early evening. Above the village of Aristi just a few were spotted also early in the day but along the Voidomatos River it was less scarce occupying shady spots living on tree trunks and rocks in the late afternoon (33°C). At Mikro Papingo it was frequently seen in the village on dry stone walls, paths and buildings. See Clark (1989) for an account of its occurrence at Megalo Papingo. At Prespa it was abundant in a small area amongst tumbled rocks and boulders near the shoreline of the Great Lake. Time 08.00 - 09.00, 18°C - 21°C. Examples here were large in size and darker than usual in background coloration. Neck and throat of adult males a striking blue, the belly a rich red. At Prespa it was also found by the roadsides on rocks and stones where sympatric with *Podarcis erhardii* but was much less common.

A.nigropunctatus inhabits as varied a range of biotope as *P.muralis*. The territorial rivalry between these species means that either one or the other can be found in large numbers at a given locality but not both; at the margins of populations often sympatric with *P.muralis* but in much smaller numbers. From observations made in 1990 I came no nearer to defining an eastern boundary for *A.nigropunctatus* but I am convinced that Tzepelovo and Papingo must be near the limit of the range. Along the route from Grevena to Metsovon there was no evidence of it, albeit that the locations between Kranea and Milea appeared suitable.

Lacerta agilis bosnica Schreiber

Locality; Pissoderi.

This locality is in the Vernon Mountains not far from Agios Germanos but at higher altitude (1600 metres). The finding of *L.agilis* was of great interest to me since it was new to my records from Greece although not, I believe, a first record for Greece.

Arnold et al (1978) state that it is definitely absent. In any case it must have a narrow penetration into Greek territory and only at higher altitudes. None were found around Prespa nor Agios Germanos. Several examples were found, 7 or 8, in damp meadows around midday with an air temperature of 19.7°C - 21.2°C. Another was seen on the edge of deciduous woodland amongst twigs and leaf debris and one more was caught on a dry bank amongst bushes and rocks a little distance from the main site. Four were caught (2 males, 1 female & 1 juvenile) and later released. Data on the three adults is given in Table 2. The tails were very delicate and broke easily at the slightest touch. Though not very active *L.agilis* was difficult to catch since it would run a short distance and hide itself in dense tussocks of grass and undergrowth and remain motionless when it could not be detected. A large area was carefully searched but no more were found indicating it occurs in small groups and is localised. The alpine meadows were heavily grazed by sheep and horses. In both sexes the ground colour was brown/olive. There were black patches either side of a narrow, light vertebral stripe and there was a dorso-lateral row of black patches, these centred with light specks. The venter in males was bright green with black speckling and in females white, immaculate with grey spotting on the outer ventral rows.

Lacerta trilineata trilineata Bedriaga.

Localities; Aristi (2), Voidomatis (1) and Mikro Papingo (1). I encountered this species much less often than *L.viridis* in 1990 but have numerous records and data for *L.trilineata* collected on previous visits to Greece from the whole of the area under consideration. One of the examples seen above the village of Aristi at 1300 metres was subadult with a dark chocolate ground colour and three lemon dorsal stripes. The other, also subadult, was green with brown markings and lacked the striped pattern.

At Mikro Papingo a handsome adult, bright green with minute black speckling, was seen lying on the edge of a mountain stream submerged in the water. When disturbed it ran up a bank and hid amongst rocks. This had a yellow/white throat and belly. The identification of *L.trilineata* and *L.viridis* in regions where they occur together is not difficult with experience, although mixed populations are suspected in some places. This is beyond the scope of this paper.

Lacerta viridis (Laurenti)

Localities; Lekani village, Lekani Forest, Kranea to Milea, Tzepelovo, Skamneli, Agios Germanos, Vrontero (Prespa). This lizard was common at Lekani village (paths, walls and fields) and up in the forest (grassy fields, stone piles, vegetated stream banks). A green-backed male from the forest zone had irregular black dorsal patches as did a male from Tzepelovo. Near Kranea, Milea and Skamneli it was occasionally encountered in open glades and near streams in the forest, whereas at Vrontero it was more common in deciduous woodland. At Vrontero a large, bright green individual was watched at some length as it prowled amongst undergrowth and leaf debris searching for food. All others seen here were subadult and variable in coloration and markings.

Podarcis erhardii riveti Chabanaud.

Localities; Agnanda to Kataraktis, Papingo, Prespa, Vrontero, Agios Germanos.

This species was found to be very abundant at Agios Germanos living on open, grassy fields, shale and stone covered dry hillsides and eroded gullies with sparse vegetation. Active in the evening (17.30 - 18.45). several were found in hiding under rocks along a stream course at 7.30 (15.9°C) and were inert. By 08.45 when the sun had penetrated the gully (21.2°C) it had gained activity. Males caught were robust in build, boldly marked with black bars and reticulations on the dorsum (midline clear) on a fawn/brown ground colour.

Females less heavily patterned with a light dorso-lateral stripe. At Agios Germanos sympatric with *P.muralis* but this species kept more to boulders and stones amongst bushes and undergrowth. At Vrontero both species occurred in deciduous woodland. It was also not rare along the roadsides at Prespa on banks and stones (see under *A.nigropunctatus*). From other trips to Greece I have records of *P.erhardii riveti* from the Louros Valley north of Arta, Rania (between Arta and Pragmanda on a minor road), the Mazea Pass above Ioannina, Grevena, Kastoria and by Lake Himaditis (between Kastoria and Amindeo). Further east I have found it between Mikropolis and Kato Vrontou east of Serres. In my experience this lizard has a widespread but disjunct and erratic distribution, in some places it is very common and in others occurring in much smaller numbers.

Podarcis muralis albanica (Bolkay).

Localities; Lekani Forest, Kranea to Milea, Tzepelovo, Negades, Ioannina, Prespa, Vrontero, Agios Germanos. At Agios Germanos sympatric with *P.erhardii*. It was conspicuously absent at Aristi and Papingo as well as along the Voidomatis River where *A.nigropunctatus* was the dominant small lacertid. At Tzepelovo common on walls and pathways in the village where *A.nigropunctatus* was absent (see above). Common at Negades near a river and especially at Ioannina where it was to be found on the walls of the old city as well as at the camp site by the lake, living amongst leaf debris on semi-waste ground. This species is more predictably and consistently distributed than *P.erhardii*, tolerating a wide range of habitat and bioclimatic zones.

Podarcis taurica taurica Pallas.

Locality; Prespa.

This species was found in small numbers between the two lakes. Those seen on grassy banks near a stream were bright green in colour whereas animals from drier fields with little vegetation were duller in appearance. The background colour is linked to environmental conditions. Adema & In den Bosch (1980) found this lizard at a similar altitude near Kastoria. Amongst my older records are two examples from Lehovon (950 metres) east of Kastoria taken on May 20th 1969. One was a female containing eggs 12 x 6.5 mm.. This is the highest altitude that I know of for northern Greece. in the Peloponnese *P.t.ionica* is both a lowland and montane species. I have found it on Mt. Killini at 1200 metres and it is known to range even higher (Wettstein, 1953).

Colubridae

Coluber jugularis caspius Gmelin.

Locality; Florina (660 metres).

A metre long subadult was found D.O.R. on the outskirts of the town near the Zoological Gardens. There were houses and gardens in the vicinity.

Elaphe longissima longissima (Laurenti).

Locality; Prespa (Great Lake).

This was caught at the same site as *N. tessellata* at 18.30. It was lying in the water at the edge of the lake. When picked up it bit fiercely but soon became docile. It was released at the same spot after being measuring and described. It was a male, dark olive/green in colour with white flecking on the scale edges. Behind the head there were two faint orange patches. In Table 3 I present data for this example as well as for the only two other specimens I have found in Greece as well as for a large specimen taken from Pec in extreme S.E. Yugoslavia.

Malpolon monspessulanus insignitus (Geoffroy).

Locality; Agnanda (1).

This, the only example of one of the commonest terrestrial snakes in Greece, was found D.O.R.. It measured 700 mm. in total length.

Natrix natrix persa (Pallas).

Localities; Lekani Forest (2), Prespa (1), Pissoderi (1). Those from the Lekani Forest were both juveniles. One lacked the dorso-lateral striping but had clear white/yellow moon patches. The specimen from Prespa had very bold moon patches, clear striping and intense black barring on the the dorsum and flanks. This measured 750 mm.. The juvenile from Pissoderi was seen swimming in a small stream at the same site where *L. agilis bosnica* was found.

Natrix tessellata tessellata (Laurenti).

Localities; Voidomatos River, Prespa (Great Lake).

Two were caught in the Voidomatos upstream from the bridge that spans the river en route from Aristi to Papingo. They were found on the edge in shallow water amongst stones, 18.00, 33°C. At Prespa the snake was locally abundant along the shore line where there were rocks and boulders at the base of steep cliffs.

Since this was the only such habitat in the immediate area, the rest of the shore being flat, open with mud, sand and no cover, the rocky area probably concentrates the species and offers good hibernation possibilities. Two were found in the evening at 18.00 and another seen at the water's edge. Of the two caught one was perfectly uniform on the dorsum and flanks being a plain olive/brown. The venter was orange/white with a mid-ventral dark line.

This measured 665 mm. in total length. Body length 520 mm. Dorsals 19, ventrals 173, subcaudals 73. The head was more blunt and shorter than normal in this species. The following morning the site was revisited between 09.00 and 10.00. Six examples were seen some way from the water amongst rock piles. All these were typical in appearance except that the ground colour was rather dark and the dark markings ill-defined. One of those caught disgorged a partially digested fish. In 1986 this snake was abundant by the Vegoritis Lake.

Telescopus fallax fallax (Fleischmann).

Locality; Near Paleohori (1).

This was found D.O.R. on the mountain road from Paleohori to Sirako.

Viperidae

Vipera ammodytes meridionalis Boulenger.

Localities; Tzepelovo (1), Aristi (1).

Both examples were female. The one from Tzepelovo was seen at 12.00, 28°C, half concealed under a small boulder exposed to the sun. Background biotope was scrub and light woodland. It was very placid and easily caught. The stomach was distended and it had probably recently fed. The example from near Aristi was first seen on July 24th at 08.00, 18°C lying amongst stones and bushes beside a track. It was alert and escaped. The next day the site was revisited at the same time and the snake was again found and caught so as to take some photographs. It was most aggressive and struck vigorously making handling difficult. It was probably gravid. The dark brown dorsal zig-zag was broken into individual rhombi on the anterior part of the body. Length estimated at around 650 mm., the Tzepelovo snake being rather smaller.

Summary;

Because of the diverse ecological and bioclimatic characteristics of the regions visited it is difficult to give a succinct summary. The most ubiquitous species encountered were *R.graeca*, *B.variegata*, *L.viridis*, *P.muralis*, *T.hermannii*.

Of the more cryptic species *B.bufo* and *A.fragilis* seem widely distributed. Other taxa can be abundant at a local level but more erratic in occurrence; *A.nigropunctatus*, *L.trilineata* and *P.erhardii*. Summer, even at the higher elevations, is not a propitious time for snakes and few specimens were found.

N.tessellata was abundant at Prespa and the occasional sightings of *N.natrix* point to a broad altitude tolerance. Interesting was diurnal activity in *V.ammodytes* despite the prevailing high daytime temperatures. The Prespa Lake region was rich in small lacertids, *A.nigropunctatus*, *P.erhardii*, *P.muralis* and *P.taurica* were all found in close proximity and exhibited a degree of sympatry. The finding of *L.agilis* and *E.longissima* were valuable records for species that are poorly known in Greece. We now have a lot of information on the herpetofauna of the Pindos mountains and a check list needs to be compiled which maps the distribution of the various taxa against altitude and ecosystems. It is clear that in many cases biotope is as least as significant as altitude in determining the micro-range in mountain complexes and this should make a worthwhile study.

Table 1;

Observational data on *T.hermanni* (22 specimens).

Locality	Temp.	Habitat	O.C.L.	S.C.Plata	Remarks
Lekani	26.8	scrub	*	#	
30-29	24.5	open scrub	*	#	+
30-29	24.5	scrub/fields	285	-	\$
14	28.3	woodland/scrub	*	-	
15	33.0	woodland	*	#	
12 (2)	21.0	fields/scrub	*	#	
13	27.0	conifer forest	260	#	
13	27.0	juniper scrub	250	#	
10 (2)	18.3	grassy fields/scrub	*	#	
18	*	woodland	230	#	
23 (3)	36.0	grassy fields	(200)	#	\$
23-17	*	fields	*	#	μ
1 (6)	*	grassy hillsides	(200)	#	

N.B. Numbers in brackets after locality indicate total found if more than one. O.C.L. = over carapace length in mm. (200) = under 200 mm. * = not determined. + = supracaudal plate prominently curled under and in. \$ = end of carapace prominently flared. μ = carapace highly domed. \$ = caudal spur long and pointed and 30 mm. long. - = supracaudal plate entire. # = supracaudal plate divided.

Table 2.

Data for *Lacerta agilis bosnica*;

Sex	Male	Male	Female
Body length	55	70	72
Dorsals	37	39	43
Ventrals	23	24	25
Collar	8	8	9
Superciliaries	4+4	5+5	4+4
Granules	0+0	0+0	0+0
Femoral pores	12+12	13+13	11+11

N.B. Ventrals in 6 rows with a smaller outer row. Collar prominently toothed.

Table 3.

Data for *Elaphe longissima longissima*;

Locality	Messini	Lamia	Prespa	Pec
sex	male	female	male	male
total length	896 mm	935 mm	1200 mm	1455 mm
Body length	700 mm	775 mm	960 mm	1170 mm
Dorsals	23	23	23	23
Ventrals	216	237	219	221
Subcaudals	77	72	81	80
Anal	divided	divided	divided	divided

N.B. The locality from near Messini - low lying with fields and hedgerows. The locality near Lamia was at 640 metres altitude on the route to Domokos. The snake was taken in a steep-sided gully. The locality near Pec (S.E.Yugoslavia) was at 1400 metres altitude. The snake was seen on a steep bank beside the road in a forested region.



Fig. 1. *Rana graeca*. From Lekani Forest region.
Photo by R.Clark (see Clark, pp 49 - 63)



Fig. 2. *Lacerta agilis bosnica*. From Pissoderi.
Photo by R.Clark (see Clark, pp 49 - 63)



Fig. 3. *Matrix tessellata*. Plain form. From Prespa.
Photo by R.Clark (see Clark, pp 49 - 63)



Fig. 4. *Vipera ammodytes* (♀). From Tzepelovo. Note dorsal zig-zag broken on anterior part of body.
Photo by R.Clark (see Clark, pp 49 -63)

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