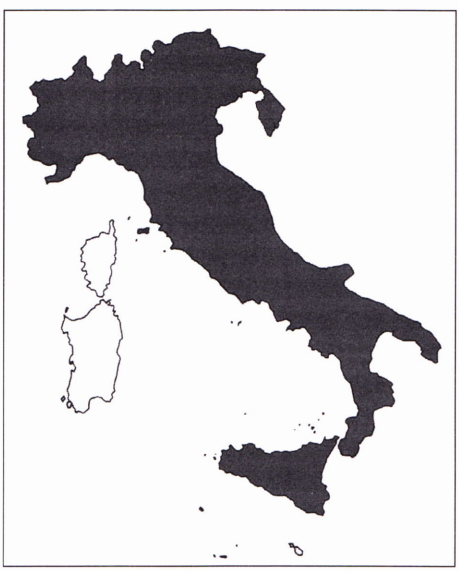
Lacerta bilineata Daudin, 1802

Western Green Lizard · (Italian name: ramarro occidentale)

Large lizard, with relatively short but large head (particularly in males). Males have a bright green dorsal coloration, with some black spots that can be intenser on the head. Females can be uniformly green or brown, with two narrow longitudinal light stripes, often bordered by darker spots or lines. This pattern is also typical of the majority of juveniles. Rarely individuals of both sexes present dorsal dark spots in contact each other, forming a sort of reticulation. Ventral part yellowish, sometimes even slightly dark spotted. Throat (in males often also the pileus and sometimes the lateral part of the head) is frequently dark blue or blue, particularly before and during the reproductive period. Females show this character after mating (Schiavo, 1996). Male total length up to 45 cm; SVL up to 13 cm. Females are generally smaller.

L. bilineata cannot easily be confused with other lizards sharing the Italian Peninsula, Sicily and Elba Island, but is difficult to distinguish from *L. viridis*.



Distribution, zoogeography and taxonomy: Recently the western Green Lizard populations have been separated from *Lacerta viridis* (Laurenti, 1768) based on hybridisation (Rykena, 1991) and electrophoretical studies (Amann et al., 1997). The present distribution of *L. bilineata* should include: northeastern Iberian Peninsula, France (with the coastal islands of Oléron, Aix, Noirmoutier, Belle-Ile, Groix, Guernsey and Porquerolles), Jersey Island, Switzerland, western Germany (Rheinland-Pfalz and Hessen), Italy, western Slovenia and northwestern Croatia (Istria) with the islands of Veliki Briijun and Cres (Amann et al., 1997; Tvrtkovic et al., 1998; Mayer & Podnar, 2002). A naturalized populations is found in urban SW Topeka, Kansas, U.S.A. (Deichsel & Miller, 2000; Kalyabina-Hauf & Deichsel, in press). Following the hypothesis by Brückner et al. (1998) *L. viridis* is expanding westward, therefore the presence of *L. bilineata* on Cres Island (its eastern distribution limit) could be reputed relictual.

Relatively termophilous, this lizard occupies mainly maquis and forest edges, open and sunny slopes, meadows, areas close to water and cultivated areas when provided by

Fig. 50: *Lacerta bilineata*, Campagnatico, Tuscany. W. Böhme

Fig. 51: *Lacerta bilineata,* Topeka, Kansas. This specimen caught in Kansas belongs to a population of animals introduced from Italy in the late 1950s. L. L. Miller

Fig. 52: *Lacerta bilineata,* juvenile, Uccellina Natural Park, S Tuscany. C. Corti

Fig. 53: *Lacerta bilineata,* Uccellina Natural Park, S Tuscany. C. Corti

grassy edges or bramble-bushes. This is a terricole species that can climb on bushes to bask (Saint Girons, 1977). This lizard occurs up to 1500 m in the Iberian Peninsula and France, up to 2000 m in the Swiss Alps (S. Gottard), but at least in the Italian Alps this species is rare above 1300–1400 m; in the central Apennines it reaches 2100 m (Bressi, 1992). In Sicily Turrisi & Vaccaro (2001) report the species up to 1850 m on Mount Etna.

Many subspecies or races have been described in the former *Lacerta viridis* populations. De Betta (1857) reported 8 subspecies for northeastern Italy, besides other 5 have been described by Taddei (1950) for the Peninsula. Mertens & Wermuth (1960) considered as valid only the following: ssp. *chloronota* Rafinesque-Schmaltz (1810) of Sicily and Calabria; ssp. *fejervaryi* Vasvary (1926) of the southern part of the Italian peninsula and Elba Island, while the remaining populations are referred to the nominal form. As recently underlined by many authors (Elbing et al., 1997; Keller et al., 2001; Amann et al., 2001) the taxonomic status of the Italian peninsular and insular populations of this species deserve further research.

Biology and ecology: In a population of a city-border-site in northern Italy where *Podarcis muralis* is syntopic with *L. bilineata* the latter is often seen in exposed and sunny sites, close to canals or water reserves, while *P. muralis* is more often found close to built-up areas (Scali & Zuffi 1994). On the contrary in Liguria Schiavo (1994) indicate this species as well-adapted to urban areas. In the country sites around Rome *L. bilineata* seem to be mainly linked to habitats with low vegetation (Rugiero, 1993).

The feeding behavior of this species has been studied by Angelici et al. (1997) in a suburban area of Rome, mainly characterized by bushes and *Quercus cerris* and *Q. frainetto* woods. They seem to feed mainly on Coleoptera (33.9 %) and Isopoda (27.6 %); less frequent prey are Hymenoptera (6.6 %), Orthoptera (5.3 %), Gastropoda (4.7 %) and Sauria (juveniles of conspecifics and other lizard species). In the same habitat the juveniles of *L. bilineata* seem to feed mainly on Orthoptera (36.4 %), Hemiptera and Araneae (12.1 % each), Isopoda and Gastropoda (8.1 % each). The species shows an opportunistic feeding strategy.

Close to the northern distribution edge *L. bilineata* show to be strongly affected by weather changes in which temperatures drop drastically, thus influencing movement parameters, except those regarding displacement (Sound & Veith, 2000).

Population density studies in the León region (Spain) show 18–25 individuals per ha (Delibes & Salvador, 1986); while in France varies from 50 up to more than 200 individuals per ha (Saint Girons et al., 1989). Each individual occupies a territory that varies from 300 to 1200 m^2 in Camargue (S France), and from 200 to 600 m^2 in western France (Guillaume, 1975; Saint Girons & Bradshaw, 1989). In general the dimension of the defended area can vary considerably, and the adult males show high territoriality. The dominant male displays a characteristic posture, rising up on the forelimbs with the head turned up and enlarging the bright colored throat (Schiavo,

1996). The territorial behavior of this species seems to show hierarchical aspects, particularly evident during the reproductive period, besides differences of space use between males and females (SOUND & VEITH, 1998). Pairing takes place from May to June; males normally show a longer activity period than females. Clutch size 5–20 whitish eggs of 13–18 x 8–10.5 mm; a second deposition can take place, but generally with smaller clutch size.

Some notes on *Lacerta viridis* (LAURENTI, 1768)

Eastern Green Lizard · (Italian name: ramarro orientale)

Only recently the western and eastern Green Lizard populations have been considered two distinct species and the Italian populations have been referred to *Lacerta bilineata*. *L. viridis* can be distinguished morphologically from *L. bilineata* only because of the throat coloration in juveniles. Very recently a hybrid zone has been found in Friuli. If *L. viridis* is really present within the Italian boundaries is not yet established (AMANN et al., 2001). In the territory considered in this book, the two species occur in the same habitat types. No ecological distinctive features are available at present. For this reason we prefer to limit the treatment of this species to some distributive notes.

The distribution of *L. viridis* should include: eastern Germany, Austria, Slovenia, Croatia (Cres Island excluded), Czech Republic, Slovakia, Hungary (AMANN et al., 1997; TVRTKOVIC et al., 1998), Balkan region, eastward to S Ukraine, central Greece [and on the islands of Kerkyra, Euboea, Skyros, Skyathos, Thasos, Samothraki (ENGELMANN, 1993), Tinos (NAULLEAU, 1997)] and NW Anatolia. Following the hypothesis by BRÜCKNER et al. (1998) *L. viridis* is expanding westward.

Relatively termophilous, this lizard occupies mainly maquis and forest edges, open and sunny slopes, meadows, areas close to water and cultivated areas, when provided by grassy edges or bramble-bushes. In central Europe the species is also found in anthropized sites like gardens, cemeteries, pathways (ELBING, 1998). In the montane habitats of Greece (about 1000 m) the species prefers meadows, provided by bushy zones, forest clearings, while on coastal localities it is mainly found in moisten meadows, oak forests and bramble-bushes (MAYER, 1998).

Many subspecies or races on the *Lacerta viridis* populations have been described.