

Grzimek's Animal Life Encyclopedia

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Reptiles

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Wall lizards, rock lizards, and relatives

(*Lacertidae*)

Class Reptilia
Order Squamata
Suborder Sauria
Family Lacertidae

Thumbnail description

Small- to medium-sized diurnal, heliothermic, terrestrial lizards, all with well-developed legs and a tail usually much longer than the body

Size

Usually less than 8 in (20 cm), maximum around 20 in (50 cm)

Number of genera, species

28 genera; 225+ species

Habitat

Varied; most abundant in scrublands and desert, but also entering forest and montane grassland

Conservation status

Critically Endangered: 1 species; Endangered: 1 species; Vulnerable: 5 species



Distribution

Old World, throughout Africa, sub-Arctic Eurasia, and the northern East Indies

Evolution and systematics

Lacertid lizards are the sister groups of teioids (teiids and relatives of the New World). Together they form the Lacertiformes. Molecular studies have allowed the recent recognition of three subfamilies, although the relationships of a number of genera (e.g., *Takydromus*) remain unresolved. The most primitive subfamily is the Gallotiinae, which comprises the giant lizards of the Canary Islands and the smaller, but closely related *Psanmodromas* from Iberia and adjacent North Africa. They share a suite of unusual, but non-unique features, as well as the strange ability to squeak. The Eremiinae includes many genera endemic to the Ethiopian region. The basal genera occur in tropical forests (e.g., *Holaspis*, *Gastropholis*, and *Poromera*) or montane habitats (e.g., *Adolfus* and *Tropidosaura*), with a progression of more specialized genera showing increasing adaptation to arid habitats (e.g., *Ichnotropis*, *Heliobolus*, *Meroles*, *Pedioplanis*, *Ophisops*, *Mesalina*, and *Acanthodactylus*). The remaining subfamily, Lacertinae, includes the typical lacertids of Eurasia. The relationships and composition of many of the genera in the subfamily remain in question. The large genus *Lacerta* has long been paraphyletic but has been increasingly subdivided in recent years, with the creation of a number of genera and subgenera, e.g., *Omanosaura*, *Timon*, *Darevskia*, *Caucasilacerta*, *Parvalacerta*, and so on.

Lacertids are believed to have arisen in Eurasia and invaded Africa and the Ethiopian region, where they evolved more xeric forms (adapted to arid conditions). One or more derivatives then re-entered the dry areas of Eurasia. The fam-

ily has a long but fragmentary fossil history, extending back at least as far as the Palaeocene. Fragments of a recently described 120 million-year-old fossil lizard in amber from the Lower Cretaceous of Lebanon shows that common external features of lacertids and other autarchoglossan lizards had already evolved.

Physical characteristics

Lacertids are conservative in morphology, and no species have lost limbs, ears, or eyes. They are small- to medium-sized with slender bodies, well-developed limbs, and a long tail that in oriental grass lizards (*Takydromus*) may be nearly five times as long as the head and body. The dorsal scales are usually small, smooth, and granular (although in some genera they are large, rough, and overlapping). The belly scales are always large and quadrangular and almost always arranged in distinct longitudinal and transverse rows. The head is covered with large, symmetrical scales that have osteoderms, and most species have a pineal "eye" on the top of the head. The tongue is quite deeply notched. A skin-fold "collar" of enlarged scales on the neck is also usually present. In the skull the upper temporal arches are completely ossified, and the pterygoid and palatine bones are paired and lie close together anteriorly. The pterygoids often bear a group of palatal teeth. The dentition of the jaws is pleurodont (the teeth attached to the sides of the jawbone). Femoral pores are usually present in both sexes. The tail has whorls of keeled scales, which may be spiny; the tail is easily shed but can be regenerated. A complex armature supports the hemipenes in the Eremiinae.



A wall lizard (*Podarcis lilfordi*) from southern Europe. (Photo by Animals Animals © E. R. Degginger. Reproduced by permission.)

Distribution

This family occurs throughout Africa and most of Eurasia. A few species occur on some off-shore islands, including the British Isles, the Canaries, Madeira, many Mediterranean islands, Socotra, Sri Lanka, and many islands of the Sunda Shelf. They are absent from Madagascar, however. They are the only lizards to enter the Arctic Circle.

Habitat

Members of this family are found from tundra and high montane grasslands through heath, Mediterranean vegetation, tropical forests, semi-arid scrublands, and true desert.

Behavior

Most species are active terrestrial or rock-living species, while a few others are arboreal. All are diurnal heliotherms. The exceptionally long tails of Asian grass lizards are prehensile to allow them to climb in vegetation. Of the many desert-living species, the most superbly adapted is the shovel-snouted lizard (*Meroles anchietae*) of the Namib Desert. It has large hindlimbs with fringed toes to help it run quickly over loose sand, and an aptly named snout that allows it to dive under the sand to escape predators and to sleep in cooler, deeper sand. Hatchlings of the Kalahari sand lizard (*Heliobolus lugubris*) are boldly marked in black and white and walk with a stiff-legged gait. They mimic the noxious oospister ("eye squirter") beetle (*Anthia*), but when adult they become colored in cryptic tans and brown.

When attacked, lacertids can discard their tail. From the sixth vertebrae backwards, every tail bone has a special plane of weakness through its body. There are corresponding weak points in the surrounding connective tissue and musculature. If the tail is held, circular muscles at that position contract strongly, the tissues break, and the tip of the tail falls off. The discarded fragment continues to twist violently to attract the attention of the attacker while the tailless lizard escapes. The shortened tail can regrow, but it lacks bone and is supported only by a central rod of cartilage.

Feeding ecology and diet

Lacertids are active, diurnal lizards that hunt insects in open situations. A few are sit-and-wait ambush predators, usually capturing their prey with a quick dash from shaded cover. All are primarily insectivores, although some are also partial herbivores, eating dried seeds or fruit. The giant lizards (*Gallotia*) of the Canary Islands are almost entirely vegetarian, at least as adults.

Reproductive biology

The males of many species are brightly colored, with dominant males developing bright breeding colors. When defending its territory, the lizard displays by turning broadside, lifting its head, and expanding its throat. The flanks also flatten so as to present the most massive, threatening appearance. If the threat display does not deter a rival, an attack follows. The combatants bite each other and shake, but wounds are seldom serious because the head is well-armed.

With the exception of a few European species, all lacertids are oviparous, which is surprising as many live in temperate and montane environments where viviparity could be expected to evolve. Most lay small clutches (usually fewer than 10) of soft-shelled eggs in a small chamber dug in moist soil, often beneath a sun-warmed stone. As usual in lizards, the larger species lay more eggs, and in the eyed lizard (*Lacerta lepida*) this may be up to 20. There is no brood-care behavior. The viviparous lizard of northern Europe (*Lacerta vivipara*) is one of the few lacertids to give birth to live babies. A small brood of four to 11 young is born from late July to early October after a three to four month gestation. Seven Caucasian lacertids of the genus *Darevskia* are all-female species. They reproduce by parthenogenesis and result from inter-specific hybridization.

Over much of the savannas of the northern part of southern Africa, the Cape rough-scaled lizard (*Ichnotropis capensis*) and common rough-scaled lizard (*I. squamulosa*) live together. It is a simple rule in ecology that two species do not inhabit the same niche, as they would compete for the same resources. However, adult and juvenile lizards do not usually compete for the same food, and even if they eat the same species they take different size classes. The two rough-scaled lizards grow to maturity, mate, and lay their eggs within a year, and after reproducing die. Incubation of the eggs takes about two months. During any sixth-month period, one species is represented by adults that mate and lay eggs. At this time the other species' eggs are hatching, and the adults have died after reproducing. There is therefore no competition for food between the adults of one species and the hatchlings of the other species. As these hatchlings grow to maturity, the adults of the first species die, while within the ground their eggs develop. The two "annual" rough-scaled lizards have therefore evolved an elegant rotating solution to living together that minimizes competition.

Conservation status

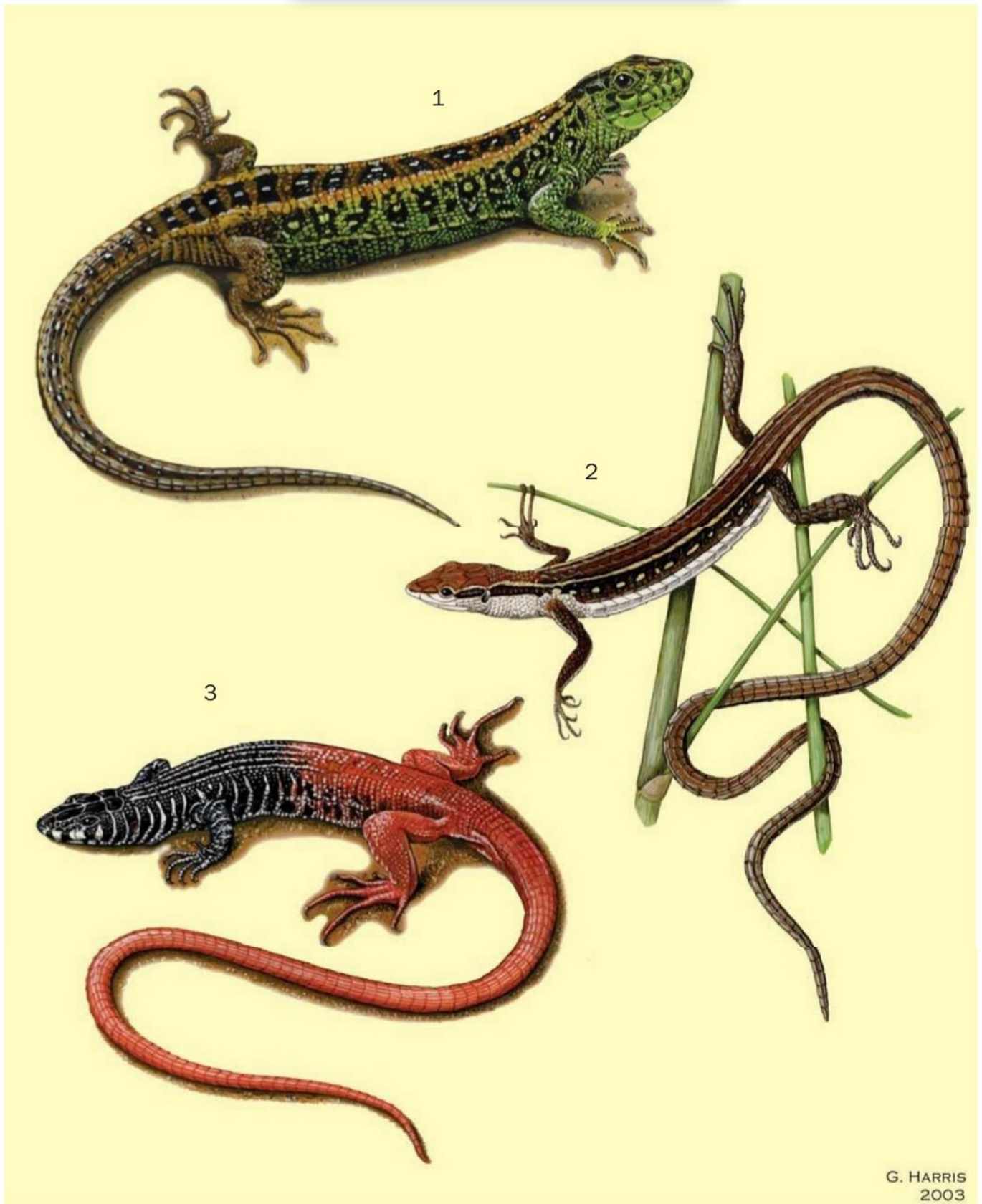
Simony's giant lizard (*Gallotia simonyi*) of the Canary Islands was for many years considered extinct, until a small pop-

ulation was discovered in 1975 on a few inaccessible cliffs on El Hierro. It occurs in low numbers and is categorized as Critically Endangered by the IUCN. The Gomeran giant lizard (*G. gomerana*) was only known from sub-fossil material until a very small population of live lizards was discovered in 2001, again on inaccessible sea cliffs. It appears to be even rarer than Simony's giant lizard and, while not yet listed by the IUCN, is one of the most endangered reptiles in the world. Both species are threatened by the introduction of predators such as cats and rats to the islands. Clark's lacerta (*Darevskia clarko-*

rum), which is listed as Endangered, is restricted to the Black Sea region. Five other lacertids are considered Vulnerable in the IUCN Red List 2000, while over 30 lacertids are included on the Bern Convention on Conservation of European Wildlife.

Significance to humans

Few lacertids grow big enough to eat, although the giant lizards of the Canary Islands were eaten by the early settlers.



1. Sand lizard (*Lacerta agilis*); 2. Six-lined grass lizard (*Takydromus sexlineatus*); 3. Western sandveld lizard (*Nucras tessellata*). (Illustration by Gillian Harris)

Species accounts

Western sandveld lizard

Nucras tessellata

SUBFAMILY

Eremiainae

TAXONOMY

Nucras tessellata A. Smith, 1838, eastern parts of the Cape Colony.

OTHER COMMON NAMES

English: Striped sand lizard.

PHYSICAL CHARACTERISTICS

A slender, brilliantly colored lizard with a tail almost twice as long as the body. The lizard has a black body with four thin cream stripes on the back and brilliant white bars on the sides of the head and body. The rear of the body, hind limbs, and long tail are rich red-brown.

DISTRIBUTION

This species occurs in the western arid region of South Africa, just extending into adjacent Namibia and Botswana.

HABITAT

This lizard inhabits succulent scrubland in a winter-rainfall area.

BEHAVIOR

This is an unusual lacertid that spends long periods underground, sheltering in its burrow. It forages on rocky hillsides among the stones and succulent vegetation.

FEEDING ECOLOGY AND DIET

Despite its relatively small size, this lizard specializes in feeding on scorpions, although grasshoppers and beetles are also eaten. It searches actively for the insects' burrows and then digs them out. As it spends a lot of time locating and digging for food, it is vulnerable to predators such as birds and mongoose. Its

bright red tail helps to deflect sudden attacks away from the vulnerable head towards the expendable tail. Safety in this lizard is therefore not based on camouflage or mimicry but on distraction.

REPRODUCTIVE BIOLOGY

A small clutch of three to four eggs are laid under a sun-warmed rock and take two to three months to develop.

CONSERVATION STATUS

Its habitat is sparsely populated and it is not threatened.

SIGNIFICANCE TO HUMANS

None known. ♦

Sand lizard

Lacerta agilis

SUBFAMILY

Lacertinae

TAXONOMY

Lacerta agilis Linnaeus, 1766, southern Sweden (restricted by Mertens and Muller, 1928).

OTHER COMMON NAMES

French: Lézard agile; German: Zauneidechse.

PHYSICAL CHARACTERISTICS

This is a heavy-bodied lacertid, reaching almost 12 in (30 cm) in eastern populations but smaller in the west. The head is blunt and short. Color is variable; in western races the female is brown with darker spots, while males develop bright green flanks; in eastern forms the whole back is almost completely green.

DISTRIBUTION

It has one of the largest ranges of all lacertids, and occurs from the British Isles in the west to northwest China in the east, and from southern Sweden and Karelia in the north (62°N) to the Pyrenees, Balkans, and central Greece (39°N) in the south.

HABITAT

As can be expected from its common name, this lizard favors sandy soils in the western part of its range, inhabiting heathlands and coastal dunes. In the east, however, it prefers clay soils.

BEHAVIOR

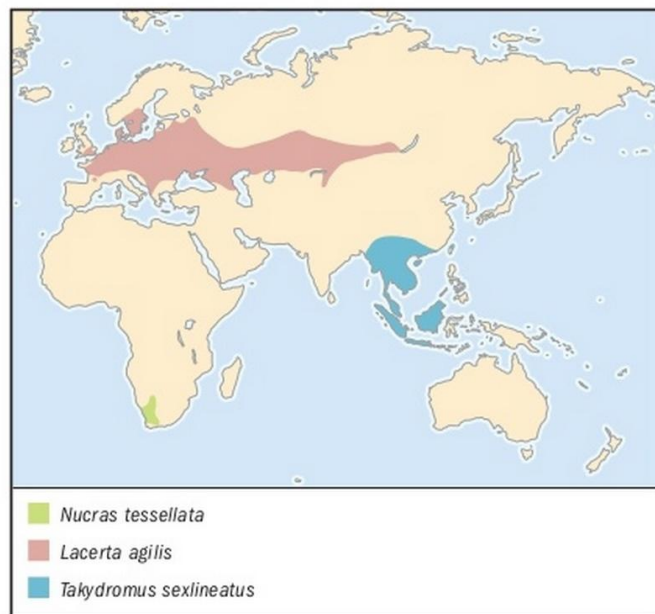
The sand lizard is very inconspicuous, although it often clambers and basks in thick shrub. At night or when threatened it retreats into a hole in the ground or cavities amid the roots of bushy shrubs. Males are territorial and will drive off rival males.

FEEDING ECOLOGY AND DIET

This species actively searches for prey among cover and eats a wide variety of insects, and it is occasionally cannibalistic.

REPRODUCTIVE BIOLOGY

Clutches of from three to 14 eggs are buried in a hole excavated in sun-warmed sand and take 40–60 days to develop.



CONSERVATION STATUS

Not threatened; although locally threatened in many Western European countries (e.g., Britain, Holland, and Germany) by scrub encroachment, deforestation, urban development, and recreational activities.

SIGNIFICANCE TO HUMANS

This is a “flagship” species for protecting threatened heathlands in Western Europe. ♦

Six-lined grass lizard

Takydromus sexlineatus

TAXONOMY

Takydromus sexlineatus Daudin, 1802.

OTHER COMMON NAMES

English: Oriental six-lined runner.

PHYSICAL CHARACTERISTICS

This is a long, slender lizard reaching nearly 14 in (36 cm) in length, of which less than a quarter is head and body. Except for the head shields, all the body and limb scales as well as the tail are roughly keeled. The body is olive green to reddish brown above with light dorsolateral stripes and sometimes spots; the legs and tail are often reddish.

DISTRIBUTION

This species is widespread, extending from southern China through the Malay peninsula to Borneo, Sumatra, and Java.

HABITAT

Grasslands.

BEHAVIOR

This is a very active and acrobatic lizard that climbs easily in vegetation, using its very long and prehensile tail for balance and support.

FEEDING ECOLOGY AND DIET

Insect prey is actively hunted in thick vegetation. It may stand upright, balanced on its tail base, and lunge at flying insects.

REPRODUCTIVE BIOLOGY

Some populations breed throughout the year, producing up to six small clutches of up to 10 eggs. Fewer clutches and fewer eggs are laid in cooler northern parts of its range.

CONSERVATION STATUS

Not threatened.

SIGNIFICANCE TO HUMANS

This species is frequently offered for sale as bird food in pet shops in Hong Kong. ♦

Resources**Books**

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