The family Plethodontidae is by far the largest salamander family of the world, with more than 376 recognised species. Salamanders in this family are commonly called ‘lungless salamanders’ and are widely distributed in the Americas, with a small number of species in southeastern France, north and central Italy and Sardinia, and one species in Korea. All plethodontid salamanders are lungless and breathe through their moist skin. Fertilisation is internal by means of a spermatophore. Plethodontids are unique among salamanders in having narrow grooves between each nostril and the upper lip, called nasolabial grooves. Costal grooves are pronounced. Most plethodontids are completely terrestrial and lay eggs on land. They lack aquatic larvae and miniature adults hatch directly from the eggs (Larson et al., 2006b).

The European lungless salamanders are presently grouped in two genera, Atylodes with one species, and Speleomantes with seven species. Their taxonomic history is complicated and their classification and nomenclature is subject to debate (Wake et al., 2005; Frost, 2013). The Korean genus Karsenia is monotypic and sister to a clade containing the North American Hydromantes and European Atylodes and Speleomantes (Min et al., 2005; Vieites et al., 2007).

References Frost (2013), Larson et al. (2006b), Min et al. (2005), Vieites et al. (2007), Wake et al. (2005).

**Plethodontidae** Gray, 1850

*Speleomantes supramontis*, Dorgali, Sardinia.
Photo: Max Sparreboom.
**Atylodes Gistel, 1868**

Atylodes was considered a synonym of Hydromantes (sensu lato) prior to its recognition as a subgenus, and subsequently as a genus. See Frost (2013) for a discussion of the intertwined taxonomic histories of Atylodes, Hydromantes and Speleomantes, and Vieites et al. (2007) for theories on the historical biogeography of plethodontids and their colonisation of Eurasia.

All the available evidence suggests that the taxon that occurs in southwestern Sardinia, known as Speleomantes genei, is widely divergent from the other European lungless salamanders included in that genus, in their proteins, mitochondrial DNA, sex chromosomes, and to a minor extent in morphology. If these differences justify separation at the genus level, the sister taxon to Speleomantes should be named Atylodes, an old, available name (Wake et al., 2005). *Atylodes genei* is generally considered to have split off from the ancestral stock well before the other species. This taxon is probably the most basal European plethodontid species, but the question has not yet been resolved with confidence (Carranza et al., 2008; Van der Meijden et al., 2009).

Like the Speleomantes species, *Atylodes* is largely nocturnal. These salamanders are active in the dark, at temperatures between 5 and 15°C and at air humidity between 70 and 100%. During dry and hot periods they live underground or in caves, often but not exclusively in karstic and calcareous soils. In caves, they frequently occupy areas close to the entrance, where most of the insects on which they prey are found. They eat all sorts of small prey, including molluscs, arthropods, ants and millipedes. The tongue can be projected with great precision and speed. With their large feet, which are partially webbed, and assisted by a prehensile tail, these salamanders are perfectly adapted to climb vertical rock faces and stony walls (Adams & Nistri, 2010). They are protected against predators to some extent by a secretion of the glands in the skin (Brizzi et al., 1991), but may fall victim to, for instance, snakes (*Natrix*) and slow-worms (*Anguis fragilis*) (Lanza et al., 2007).

**Atylodes genei** (Temminck & Schlegel, 1838)

**References** Adams & Nistri (2010); Brizzi et al. (1991); Carranza et al. (2008); Frost (2003); Lanza et al. (2007); Van der Meijden et al. (2009); Vieites et al. (2007); Wake et al. (2005).

**Atylodes genei** (Temminck & Schlegel, 1838) | Gené’s Cave Salamander

**Description** A small salamander, rather robust with moderately broad head. Head flattened, a little longer than wide, and wider than trunk. Snout truncated. Tongue significantly longer than in continental Speleomantes, but shorter than in Sardinian Speleomantes. Eyes large and protruding. In young specimens the nostrils are particularly large, and have a small tentacle under the lower side. Adults have a more or less distinct swelling in the area of the nasolabial groove. Gular fold present. No paratoids and no labial fold. Body short, slender, cylindrical, with 13 trunk vertebrae. Tail cylindrical, approximately same length as snout-vent length or a little shorter, tapering to a sharp point. Limbs well-developed, with four fingers and five toes, clearly truncate and often enlarged at tips. Foot large but significantly smaller than in Sardinian Speleomantes species. Fingers webbed at the base, toes half-webbed. Skin smooth (Thorn, 1969; Lanza et al., 1995, 2007; Lanza, 1999e).

Dorsal parts dark brown to blackish, often with a more or less brown, olive-green or, rarely, ochre-yellow marbling, sprinkled with whitish dots. Ventral side less pigmented, uniformly bright or brown-grey. The purplish aspect of the belly is due to the interior organs that are visible through the skin, which is more or less transparent. Ventral side usually with a more developed dark stippling than in Sardinian Speleomantes species. In young specimens dorsal parts are often more or less extensively greenish, with a metallic sheen (Thorn, 1969; Lanza et al., 1995).

Sexual dimorphism not pronounced. Premaxillary teeth slightly enlarged in male (Greven et al., 2004). Mental gland under the chin in the male is poorly visible outside the breeding season. No cloacal swelling. Cloacal opening is a longitudinal fold, situated a little more backward in the male than in the female (Thorn, 1969).

Two different forms have been described, that may be species or subspecies, based on genetic differences. The two forms cannot be distinguished morphologically (Lanza et al., 2007). Their exact range boundaries are unclear.

Total length 115 mm in males and 124 mm in females (Lanza et al., 1995).

**Diagnosis** A small, dark-coloured, lungless salamander. Canthus rostralis missing or poorly developed, giving the snout a rounded appearance. Foot large, but smaller than in other...