

Ambystoma leorae (TAYLOR, 1943).
New records, natural history notes
and threat status

Ambystoma leorae (TAYLOR, 1943), is endemic to the “Sierra Nevada” mountains of central México. Its known distribution (Figs. 1A, 1B) is restricted to six locations within the protected area “Iztaccihuatl-Popocatepetl National Park” (IPNP). The salamander was originally described from the town of Río Frio (TAYLOR 1943); later it was recorded in three sites surrounding the area (VEGA-LÓPEZ & ALVAREZ 1992; LEMOS-ESPINAL et al. 1999), and in another two southern sites (LE MOS-ESPINAL & AMAYA-ELIAS 1985; VEGA-LÓPEZ & ALVAREZ 1992). These records are restricted to the upper tributaries of the Balsas River in the west of the IPNP, dispersed within an area of about 28 km x 0.65 km.

Besides its spatial limitation, *A. leorae* populations are supposed to occur in low abundance in their habitats that might increase their vulnerability to extinction. TAYLOR (1943) recorded four individuals in the type locality, later LEMOS-ESPINAL & AMAYA-ELIAS (1985), found only six individuals in an eight years study at Río Cotzala, and VEGA-LÓPEZ & ALVAREZ (1992) observed no more than 10 in three locations. Finally, LEMOS-ESPINAL et al. (1999), found 59 individuals at the river Río Tonatzin.

Additional information about *A. leorae* is centered on morphology and habitat use (TAYLOR 1943; SMITH & TAYLOR 1948; REILLY & BRANDON 1994). Accordingly, this species is found in small streams (about 2 m wide and 0.5 m deep) and mainly in temperate water (12 to 15 °C); its reproduction is virtually unknown as only one gravid female was ever seen (LE MOS-ESPINAL & AMAYA-ELIAS 1985; VEGA-LÓPEZ & ALVAREZ 1992; LEMOS-ESPINAL et al. 1999).

The urban leviathan of Mexico City is likely to directly threaten this species’ persistence by exploiting its habitat. In fact, it is believed that the population in the type locality has already been extirpated because of chemical pollution, desiccation of the streams and forest clearance. Due to these threats and its limited distribution, *A. leorae*

is listed as a critically endangered species in the IUCN Red List of Threatened Species (SHAFFER et al. 2008) and considered a threatened species by the Mexican government (SEMARNAT 2010).

On 11 October 2010, the authors detected a population of *A. leorae* at “Monte Tláloc” within the IPNP (Fig. 1C) along a stream section (500 m) confined to a small alpine grassland area (*Muhlenbergia* sp.) surrounded by forest (*Pinus hartwegii* and *Abies religiosa*). The first individual was recorded at 3650 m a.s.l. This record represents a 5.5 km northwest expansion of its known distribution (this is a quarter of the total known range area) and is the first one for the Valle de Mexico drainage. The population was observed aggregated in small groups (2-12 individuals) at sites alike those described earlier. The stream salamanders were found in small pools with sandy or rocky bottom (0.2-0.5 m deep) where the water flow was slow (0.3-0.4 m/s) and its temperature (6-10 °C) colder than previously recorded (LE MOS-ESPINAL & AMAYA-ELIAS 1985; VEGA-LÓPEZ & ALVAREZ 1992; LEMOS-ESPINAL et al. 1999). This observation increases the range of water temperatures accepted by the species to 9 degrees (6-15 °C versus previously reported 12-15 °C). LEMOS-ESPINAL et al. (1999) suggested (without providing data) that *A. leorae* lives in highly oxygenated water; this hypothesis is confirmed by the present study in which the value of 78 % dissolved oxygen (6.25 mg/L at pH 7) was registered by the authors.

The new population was visited seven times from January to September 2011. On these occasions, 12 (date: 01/19), 7 (02/12), 19 (03/19), 70 (05/07), 52 (06/25), 51 (07/25) and 12 (08/20) individuals, respectively, were observed. Among the cumulative total of 223 observations, 214 (95.9 %) referred to gilled larvae between 19 and 103 mm snout-vent-length (SVL) and 9 (4.1 %) were transformed adults between 64 and 74 mm SVL. This data identifies the “Monte Tláloc” population as the richest population known for this species and suggests that it is stable.

Since virtually nothing is known about the reproduction of this species, the following observations seem worth reporting: eight clutches, each comprising 1-10 sub-

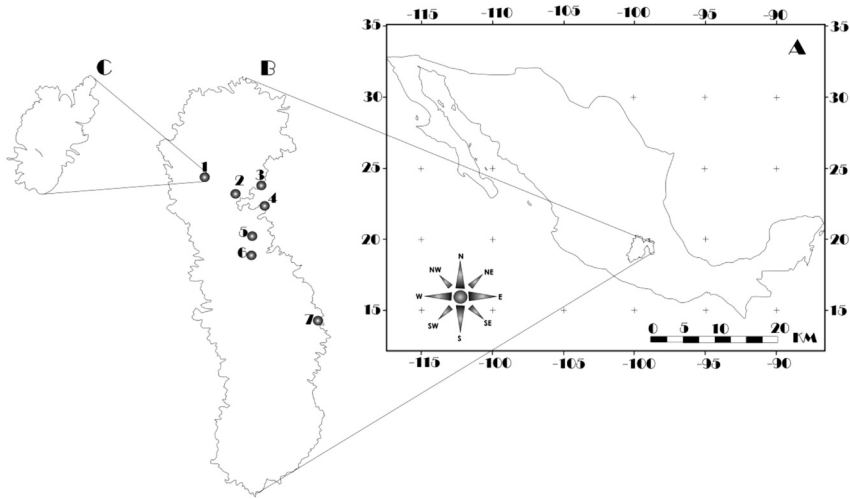


Fig. 1: Outline map of Mexico (A) showing the Iztaccíhuatl-Popocatepetl National Park (IPNP), Municipality of Zoquiapan, Puebla (B). The points marked from 2 to 7 refer to record localities of populations mentioned in the literature. Number 1 denotes the study population on Mount Tláloc (C – area of sampling locations enlarged).

spherical eggs, were found attached to aquatic vegetation or cavity walls between March 19 and June 25 (observation dates between brackets are followed by the egg numbers separated by a slash from the range of diameters in mm: [03/19] 7/12.6-15; [03/20] 6/11.8-13; [03/20] 7/12-15; [03/20] 2/10-13; [03/20] 4/9-12; [05/07] 10/10.9-20.9; [05/08] 7/13.8-17.5; [06/25] 1/not measured). VEGA-LÓPEZ & ÁLVAREZ (1992) collected a gravid female in July. The above findings suggest that oviposition can occur at least during five months (March to July).

The “Monte Tláloc” population is obviously at critical risk of extinction because of the exploitation of the stream water for human water supply. The stream where the population is found originates near the study site, from small sources dispersed all over the grassland. Approximately two kilometers downstream, the water is collected in a drainage system that takes it to nearby villages. This facility restricts the population’s distribution and probably constitutes its main threat. Similar drainage constructions were installed all over the PINP; their number and catchment area increases continuously, putting all the *A. leorae* popula-

tions at a greater extinction risk than previously thought. Urgent measures need to be taken to find out this species’ actual distribution and its populations status in order to propose suitable conservation strategies.

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