



Relevant Lizard Species for the Risk Assessment of

Plant Protection Products in Southern Europe





Nicolá Lutzmann, Christian Dietzen, Jochen Gerlach, Oliver Körner and Gernot Vogel RIFCON GmbH, Zinkenbergweg 8, 69493 Hirschberg, Germany (E-Mail: nicola.lutzmann@rifcon.de)

According to the new data requirements under the EU regulation 1107/2009, reptiles come into question regarding risk assessments of plant protection products. Although no specific data requirements on reptiles are stipulated in the respective EU documents some toxicity data are available in the open literature. These data are intended to be used for risk assessments. One potential approach for reptile risk assessment may be the way how it is established for birds and mammals (EFSA 2009; i.e. the major routes of exposure are diet and drinking water). In order to provide a scientific basis for reptile risk assessments, a detailed survey of the IUCN red list on habitat use of all lizards occurring in the European Union registration zones was conducted and additional field observations were integrated. The poster presents only the lizard species of the southern zone (according to SANCO/6896/2009 rev 1) which occurring in "agricultural habitats". Species with no indication of using "agricultural habitats", island species (e.g. Canary islands, Samos, Madeira) and extreme area-restricted endemic species are not listed. A complete list of all species and their potential occurrence in "agricultural habitats" is provided at www.rifcon.de.

















Table 1: Lizard species occuring in habitats exposed to Plant Protection Products in EU Southern Zone

	Lizard species		Distribution in Southern Europe	Habitats mentioned for the species where PPP will be applied
Skinks	Chalcides	bedriagai	ES, PT	citrus orchards ² , cereals ² , sunflower ²
		ocellatus	CY, GR, IT, MT	orchards (citrus ² , olive ²), melon ²
	Ablepharus	kitaibelli	BG, CY, GR	orchards (citrus ² , olive ²)
	Ophiomorus	punctatissimus	GR	orchards (citrus ^{1,2} , olive ²)
Geckos	Hemidactylus	turcicus	CY, ES, FR, GR, IT, MT, PT	agricultural areas ¹ , olive orchards ²
	Mediodactylus	kotschyi	BG, CY, GR, IT	orchards (citrus ² , olive ²)
	Tarentola	mauretanica	ES, FR, GR, IT, MT, PT	orchards (citrus ² , stone fruits ²), vineyards ² , stone, concrete walls in cereals ² & sunflowers ²
	Euleptes	europaea	FR, IT	stone walls in agricultural land ¹
Slow Worms	Anguis	fragilis (s.l.)	BU, ES, FR, GR, IT, PT	traditionally farmed agricultural areas ¹
	Pseudopus	apodus	BU, GR,	orchards (citrus ² , olive ²), cereals ²
Agamas	Laudakia	stellio	CY, GR	olive orchards ²
Chameleons	Chamaeleo	africanus	GR	olive orchards ²
		chamaeleon	CY, ES, GR, IT, MT, PT	orchards (citrus ² , olive ²)
True lizards	Lacerta	agilis	BU. FR, GR, IT	traditionally managed agricultural land ¹
		trilineata	BU, GR	orchards ¹
		viridis	BU, GR	cultivated land ¹ , orchards ¹
		bilineata	ES, FR, IT	traditionally cultivated land ¹ , vineyards ¹
	Podarcis	muralis	BU, ES, FR, GR, IT	orchards ¹ , vineyards ^{1,2} , fields ¹
		peleponnesiacus	GR	traditionally cultivated areas ¹ , olive orchards ^{1,2} , vineyards ¹
		bocagei	ES, PT	arable land (corn, ryegrass) ³
		hispanicus (s.l.)	ES, FR, PT	citrus orchards ²
		liolepis	ES, FR	vineyards ²
		siculus	ES, FR, IT	vineyards ¹ , orchards ¹
		waglerianus	IT	cultivated land ¹
		tauricus	BU, GR,	traditionally cultivated areas 1, olive orchards 1
	Algyroides	moreoticus	GR	edges of cultivated land ¹ , olive orchards ²
		nigropunctatus	GR, IT	olive orchards ¹
	Psammodromus	algirus	ES, FR, IT, PT	some agricultural areas ¹ , orchards (olives ² , citrus ²), vineyards ²
		occidentalis	ES, PT	cereals ² , sunflowers ²
Mediterranean Worm Lizards	Blanus	cinereus	ES, PT	wide variety of Mediterranean habitats ¹ , low intensity agricultural land ¹
		mariae	ES, PT	cereals ² , sunflowers ² , olives orchards ²

¹ IUCN 2011. http://www.iucnredlist.org/, ² own data, ³ Amaral *et al*. 2012a&b

Based on the IUCN red data list and data recorded during the last years, some lizard species are utilizing agricultural land in southern EU. Most of these lizard species have been found in orchard crops (particularly olives and citrus) and vineyards, but also in arable crops, gardens, parks or grassland. Nevertheless, this is related to available data, and does not result from surveying all crops. Inhabiting crops may result in dermal absorption of PPPs and the ingestion of PPPs contaminated food items. A high number of species are also found in field margins, where potential exposure due to drift of PPP uses can be expected. However, field margins are generally characterized by more diverse structures (such as hedges, trees, deadwood, rocks and walls) and provide also vegetation cover resulting in interception values of up to 90% (FOCUS Groundwater Guidance, 2011). Consequently, dermal exposure (or inhalation) in reptiles caused by drift in field margins is considered less likely to be of great concern. The major route of PPP contamination appears to be dietary exposure in agricultural habitats with lizards feeding on PPP contaminated food items. All of the lizards listed above are insectivorous, but some feed also on fruits, flowers and leaves (e.g. Lutzmann, 2000). The listed worm lizards feed at least in captivity mainly on dead insects (Götz, 2007). It is important to note that most research on reptiles have been conducted rather in "natural habitats" (see above) than in farmland. This review, and more specific studies on the occurrence and possible risk of lizards in agricultural habitats in southern EU, as the recent studies on a true lizard species (*Podarcis bocagei*) in agricultural habitats in Portugal by Amaral *et al.* (2012a, b) can be a start to assess the risk of PPP to reptiles in Southern Europe.

Amaral, Carretero, Bicho, Soares and Mann 2012a: The use of a lacertid lizard as a model for reptile ecotoxicology studies – Part 1 field demographics and morphology. – Chemosphere, 87(7): 757-764; Amaral, Bicho, Carretero, Sanchez-Hernandez, Faustino, Soares and Mann 2012b: The use of a lacertid lizard as a model for reptile ecotoxicology studies: Part 2 – Biomarkers of exposure and toxicity among pesticide exposed lizards. – Chemosphere, 87(7): 765-774; IUCN 2011. The IUCN Red List of Threatened Species. http://www.iucnredlist.org (last access at 18/11/2011); Götz 2007. On the husbandry and reproduction of *Blanus cinereus* (VANDELLI 1797) (Squamata: Amphisbaenia) in captivitiy. Salamandra 43: 52-56. Lutzmann 2000. Phytophagie bei Chamäleons. Draco 1: 82.

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