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Putative vectors of Central European lacertilian and chelonian unicellular blood parasites

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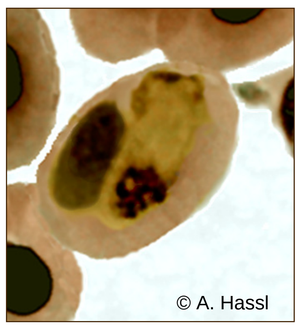
Background: Unicellular blood parasites of the apicomplexian suborder Adeleorina, collectively known as hemogregarines, and of the family Haemoproteidae are common, widely distributed, and speciose pathogens of all reptilian taxa and of amphibians. Most of them are transmitted by arthropod or leech vectors; yet the ascertained species of the domestic vector is arguable in some cases.

Lacertidae are specifically infected by members of the genera *Haemogregarina*, *Karyolysus*, and *Hepatozoon*, which use the blood cells of their lizard hosts for maturing to gamonts (7). Among these pathogens, *Karyolysus* seems to be the most prevalent parasite in Palearctic lizards. Experimentally induced sporogony occurs in adult mites of the parasitic species *Ophionyssus saurarum,* a rare saurian parasite in the wilderness. Lizards get infected by ingestion of mite nymphs of the next generation. But, epidemiological data about lizard hemogregarines in Central Europe are scarce, especially concerning the prevalence of these blood parasites and the frequency of parasitic mites.

Karyolysus latus



Karyolysus lacertae
= K. lacertarum

Haemoproteus degiustii

A few free-living populations of full-grown **Emydid** sliders of the predominant species *Trachemys scripta* exist in three locations around Velden in Carinthia (4). Until now all the sliders in Austria are derelict pet animals borne in captivity in the USA decades ago (1). Thus, we assumed an absence of American-borne vector-transmitted parasites with short-time parasitemiae, as accidentally introduced parasites usually cannot establish a domestic life-cycle due to the absence of suitable vectors and/or essential hosts. In North America the Plasmodiid parasite *Haemoproteus degiustii*, transmitted by the horse fly *Chrysops callidus*, its definitive host, regularly infects slider hatchlings at summer time.

Results of field studies in Lower Austria, Carinthia, Croatia and Hungary (3):

In Lower Austria *K. lacertae* was detected for the first time in red blood cells of *Zootoca vivipara,*
frequently infested with *Ixodes ricinus* ticks,
but never with *O. saurarum* mites.

In Croatia *K. latus* was detected for the first time in red blood cells of the lizard species *Algyroides nigropunctatus, Podarcis muralis*, and *P. melisellensis;*
almost all animals infested with *Haemaphysalis concinna* ticks,
but none with *O. saurarum* mites.

Results of field studies in Carinthia (2):

43% of the free-living sliders were infected with the obviously neobiotic blood parasite *Haemoproteus degiustii*, brought to Austria within imported pet slider hatchlings. As the local vector and as the domestic definitive host a horse fly of the genus *Chrysops* may serve as well here as in the US, most probable one of the common, aestival, paludicolous and autochthonous species, e.g. *Chrysops caecutiens* or *C. relictus* (5,6,7).

Chrysops caecutiens

Chrysops relictus

Conclusions: A transmission of a native lizard blood parasite by the bite of an infectious tick appears to be much more efficient than ingestion of transovarially infected mite nymphs, and ticks stuck to lizards are much more abundant in nature than molesting mite nymphs. The transmission of the neobiotic blood parasite *Haemoproteus degiustii* between free-living former pet sliders must happen on a regular basis at least in Carinthia, almost certainly by bites of some common, native and euryxenous horse flies.

Selected References:
(1) Gemel R., Marolt M., Ochsenhofer G. (2005): Ungewöhnliche „Naturbrut“ einer Rotwangen-Schmuckschildkröte (Trachemys scripta elegans) in der Südsteiermark. ÖGH-Aktuell 15: 9-11.
(2) Hassl A., Kleewein A. (2012): Parasites of forsaken allochthonous sliders in Carinthia. 33. Jahrestagung der ÖGHMP, Salzburg: Poster P-55.
(3) Hassl A. (2012): Blood parasitism by hemogregarines in Central European lizards. Herpetozoa 25 (1/2): 83-86.
(4) Kleewein A., Wöss G. (2010): Niedliche Tierchen als ökologischer Zündstoff: Über faunenfremde Schildkröten in Österreich. In: Rabitsch W., Essl F. (eds): ALIENS Neobiota und Klimawandel – Eine verhängnisvolle Affäre? Katalog des Landesmuseums Niederösterreich 485: 105-112.
(5) Kutzer E., Mally M. (1984): Zur Tabanidenfauna Österreichs und Betrachtungen zu ihrer medizinischen Bedeutung. Mitt. Österr. Ges. Tropenmed. Parasitol. 6: 97-103.
(6) Mally M. (1983): Die Bremsen-Fauna des Burgenlandes, nebst Angaben zur Biologie der Species (Diptera, Tabanidae). Z. Arbeitsgem. Österr. Ent. 35(1/2): 55-60.
(7) Moucha J. (1970): Die Tabaniden-Fauna Österreichs (Diptera, Tabanidae). Ann. Naturhistor. Mus. Wien 74: 211-219.
(8) Telford S.R. (2009): Hemoparasites of the Reptilia: color atlas and text. CRC Press Taylor and Francis Group, Boca Raton; 376 pp.