

## ***Hyalomma marginatum* model summary**

### **Importance of *Hyalomma marginatum***

*Hyalomma marginatum* is a two-host tick species, mainly distributed in southern parts of Europe, Africa and parts of middle-eastern Asia. It is a common ectoparasite that can be found on various passerine and migratory birds as well as on livestock. Immature stages of the tick can remain attached to the host for approximately four weeks and in the case of migratory birds, the passive transport of these ticks to other continents can thus occur. The importation of livestock can also lead to the importation of vast numbers of ticks. As this tick is robust, it is easily adaptable to a wide range of climatic conditions and habitats, which in turn can lead to this tick being very difficult to eradicate from the environment.

This tick species is a known vector for Crimean-Congo Haemorrhagic Fever virus (CCHF), and other viruses as *Rickettsia aeschlimannii*. Recent studies have shown an increase in the presence of *H. marginatum* ticks in Europe and the spread of this species outside of their natural habitat. An increase in CCHF cases in Eurasia has also been indicated in recent literature. The increase of infestations on dogs raises the risk of this zoonotic disease and as a result, the control of these ticks on companion and livestock animals is of critical importance.

### ***Hyalomma marginatum* isolate at Clinvet Morocco (CVMO)**

The isolate for *H. marginatum* at CVMO is a Moroccan field collected isolate collected in February 2020 in the Beni Yekhlef region, Mohammedia. Engorged field collected female ticks from cattle served as the start of the colony and adults of the first laboratory generation onwards are available for study purposes.

Good tick retention has been observed for this tick species when conducting weekly infestations with 30 ticks (can be increased for cattle) on both cattle (~70%) and dogs (~60%). The predilection site for these ticks are around the udder/scrotum and anal area for cattle and the head, specifically the ears, in dogs. The model can include eight dogs / six cattle per group with a seven-day acclimatisation, IVP treatment on Day 0 and weekly challenges with a removal count 48hrs after the initial infestation / IVP administration depending on study design. Cattle will be fitted with patches to facilitate tick infestations and is fitted with stable blankets to prevent grooming. Dog housing units are part of an indoor insect protected animal unit and dogs can be housed individually, in pairs or in groups. Cattle will be group-housed in an insect-protected ABSL2 animal unit. All housing complies with Directive 2010/63/EU (European Union, 2010).



Figure 1: Dorsal view of female and male *Hyalomma marginatum*.



Figure 2: Tick attachment in dogs a) face of the dog and b) ear pinna.

---

## References:

Estrada-Peña, A., D'Amico, G. and Fernández-Ruiz, N., 2020. Modelling the potential spread of *Hyalomma marginatum* ticks in Europe by migratory birds. *International Journal for Parasitology*.

Chitimia-Dobler, L., Schaper, S., Rieß, R., Bitterwolf, K., Frangoulidis, D., Bestehorn, M., Springer, A., Oehme, R., Drehmann, M., Lindau, A. and Mackenstedt, U., 2019. Imported *Hyalomma* ticks in Germany in 2018. *Parasites & vectors*, 12(1), pp.1-9.

Jameson, L.J., Morgan, P.J., Medlock, J.M., Watola, G. and Vaux, A.G., 2012. Importation of *Hyalomma marginatum*, vector of Crimean-Congo haemorrhagic fever virus, into the United Kingdom by migratory birds. *Ticks and tick-borne diseases*, 3(2), pp.95-99.