

Questionnaire survey of *Thelazia callipaeda* prevalence in Italy and vector samplings indicate Lazio region as a hot-spot of thelaziosis

I Bernardini^{1,2}, RP Lia³, S Manzi², C Poggi², V Petrarca², F Beugnet⁴, J Máca⁵, MS Latrofa³, D Otranto³, M Pombi²

¹Istituto Superiore di Sanità, Dipartimento di Malattie Infettive, Rome, Italy; ²Sapienza Università di Roma, Dipartimento di Sanità Pubblica e Malattie Infettive, Roma, Italy; ³Università degli Studi di Bari, Dipartimento di Medicina Veterinaria, Valenzano, Italy; ⁴Boehringer-Ingelheim, Lyon, France; ⁵Czech Entomological Society, Praha, Czech Republic.

INTRODUCTION. Thelaziosis is a zoonotic disease caused by the oriental eyeworm *Thelazia callipaeda*, transmitted through lachryphagous activity of *Phortica variegata*. In European countries, increasing cases of thelaziosis have been registered during last years in domestic and wild animals, and occasionally humans (Fig.1).

AIM. In order to evaluate the burden of this disease in Italy, an on-line survey has been administered on veterinarians. This information has also been associated to *T. callipaeda* prevalence in vector populations focusing on Lazio region.

MATERIALS AND METHODS. A questionnaire was distributed through the Federazione Nazionale dei Medici Veterinari Italiani requesting information about clinical records of thelaziosis cases in Italy (Figure 2). Sampling of lachryphagous drosophilids was conducted in 10 areas of Lazio region (Figure 3; Table 1). Collected specimens were morphologically identified and molecularly tested by PCR (*cox1*) to detect the presence of *T. callipaeda*.



Fig.1. Thelaziosis prevalence in European countries according to literature.

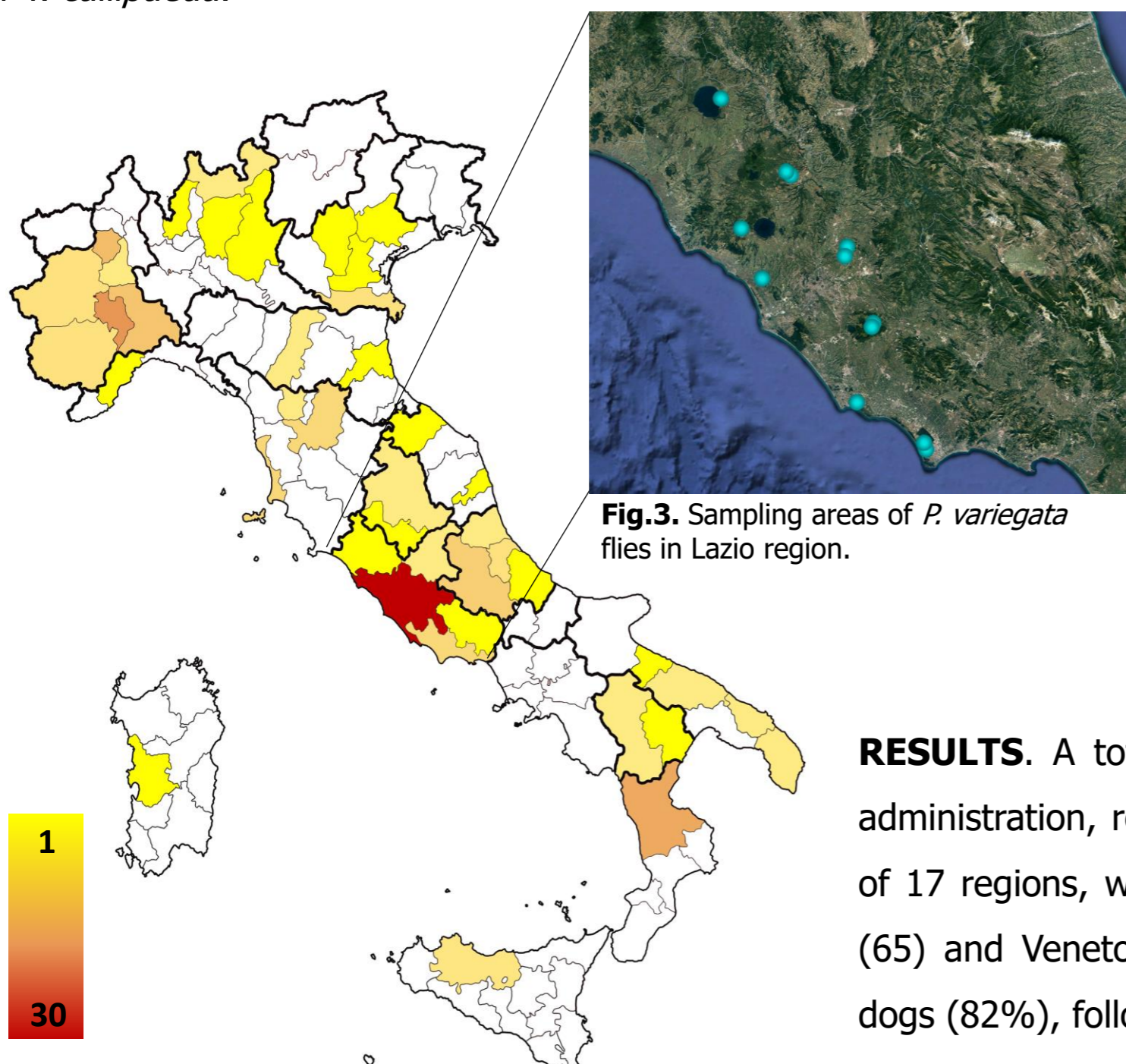


Fig.3. Sampling areas of *P. variegata* flies in Lazio region.

Site	% infected <i>P. variegata</i> males (N tested)			
	2017	2018	2019	2020
Fabrica di Roma (VT)	-	-	0% (43)	-
Fogolino (RM)	-	-	-	1% (167)
Gattaceca (RM)	-	-	-	1% (162)
Manziana (RM)	5% (80)	2% (413)	1% (100)	2% (250)
Nomentum (RM)	-	-	-	1% (80)
Rocca Priora (RM)	-	-	-	0% (24)
Sabaudia (LT)	-	-	0% (100)	-
Torrimpietra (RM)	-	-	0% (100)	-
Parco Turona (VT)	-	-	-	1% (84)
Vivaro (RM)	-	-	-	0% (10)
Total	5% (80)	2% (413)	1% (343)	1% (777)

Tab.1. Prevalence of infection of lachryphagous *P. variegata* males in Lazio region.

RESULTS. A total of 408 records were obtained from questionnaire administration, reporting an overall presence of *T. callipaeda* in 15 out of 17 regions, with higher participation in Lazio (66), Emilia-Romagna (65) and Veneto (57). Most thelaziosis cases have been observed in dogs (82%), followed by cats (10%) and a few other animal cases. The first clinical detection dates 1980 in Frosinone (Lazio), with an increasing trend through the years, particularly after 2015.

In Lazio, 1% (1613) of lachryphagous *P. variegata* were tested positive for *T. callipaeda*, particularly in Manziana, where the eyeworm was stably diagnosed from 2017 to 2020.

CONCLUSIONS. *Thelazia callipaeda* seems to be present in Italy since at least 40 years and it is now widespread among mammal hosts throughout the country. This results also indicate that Lazio region, in particular, is a hot-spot of thelaziosis.