Regional, seasonal, and hematological analysis of equine granulocytic anaplasmosis in Europe (2022-2025)

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Take homes

- Consideration of *A. phagocytophilum* infections **all-year-round** as differential diagnoses, especially in horses from **Northern/Central Europe** with **thrombocytopenia**
- ***A. phagocytophilum*-PCR**: **355/2,606 horses** tested positive **(13.6%, 95%-CI: 12.4-15.0%)**, indicating **acute/active *A. phagocytophilum* infections**
- ***A. phagocytophilum*-IFAT**: **1,116/4,330 horses** tested positive **(25.8%; 95%-CI: 24.5-27.1%)**, indicating **exposure to *A. phagocytophilum*** in the past (limited clinical value)
- **Most common hematological abnormalities** in horses tested **PCR-positive**: moderate to marked **thrombocytopenia** and mild **anemia**
- **Hematological results** in accordance with those of **dogs, cats, and humans** suffering from granulocytic anaplasmosis (**"One-health-aspect", "All-species-approach"**)
- Most horses tested PCR-positive **in Northern/Central Europe in the summer**, in accordance with **habitats and activity of ticks of the *Ixodes ricinus/I. persulcatus* complex**

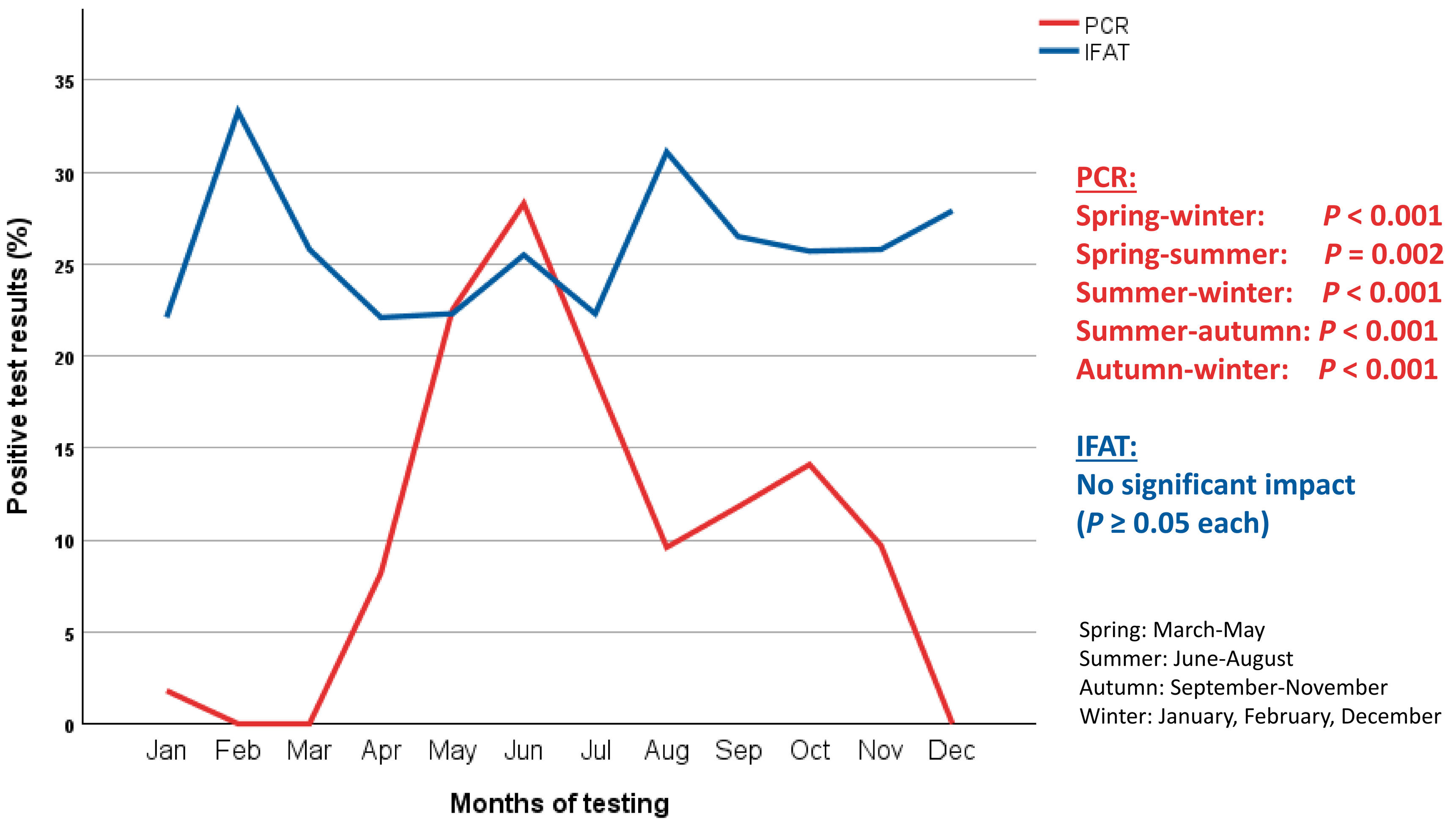

Fig 1. *Anaplasma phagocytophilum*-PCR and/or IFAT-results in horses from January 2022 to October 2025 (Kruskal-Wallis-test including Bonferroni correction, $P < 0.05$ statistically significant)

Tab 1. *Anaplasma phagocytophilum*-test results by PCR and/or IFAT in Europe from January 2022 to October 2025 (n tested positive/N total (%))

	Total	Central	North	South	East	West
Spring	73/566 (12.9) 214/920 (23.3)	63/381 (16.5) 128/538 (23.8)	10/52 (19.2) 50/217 (23.0)	0/105 (0) 19/85 (22.4)	0/27 (0) 11/38 (28.9)	0/1 (0) 6/42 (14.3)
Summer	194/1,004 (19.3) 422/1,601 (26.4)	160/739 (21.7) 219/789 (27.8)	30/136 (22.1) 108/418 (25.8)	1/111 (0.9) 21/143 (14.7)	3/17 (17.6) 18/58 (31.0)	0/1 (0) 56/193 (29.0)
Autumn	86/703 (12.2) 310/1,191 (26.0)	69/457 (15.1) 178/627 (28.4)	14/119 (11.8) 84/289 (29.1)	2/79 (2.5) 15/114 (13.2)	1/30 (3.3) 7/38 (18.4)	0/18 (0) 26/123 (21.1)
Winter	2/333 (0.6) 170/618 (27.5)	2/239 (0.8) 121/400 (30.3)	0/26 (0) 25/108 (23.1)	0/54 (0) 12/62 (19.4)	0/14 (0) 7/21 (33.3)	0/0 (0) 5/27 (18.5)
Total	355/2,606 (13.6) 1,116/4,330 (25.8)	294/1,816 (16.2) 646/2,354 (27.4)	54/333 (16.2) 267/1,032 (25.9)	3/349 (0.9) 67/404 (16.6)	4/88 (4.5) 43/155 (27.7)	0/20 (0) 93/385 (24.2)

Spring: March-May; Summer: June-August; Autumn: September-November; Winter: January, February, December

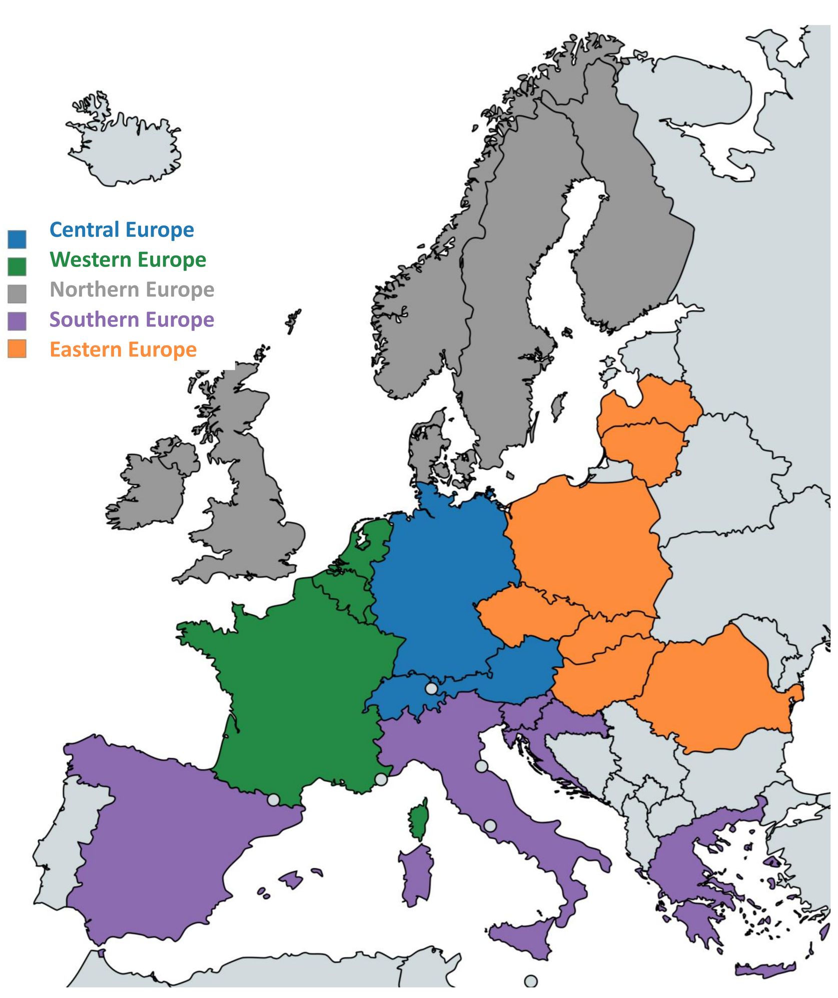

Fig 2. Countries of sample submissions in horses tested for *Anaplasma phagocytophilum* by PCR and/or IFAT in Europe

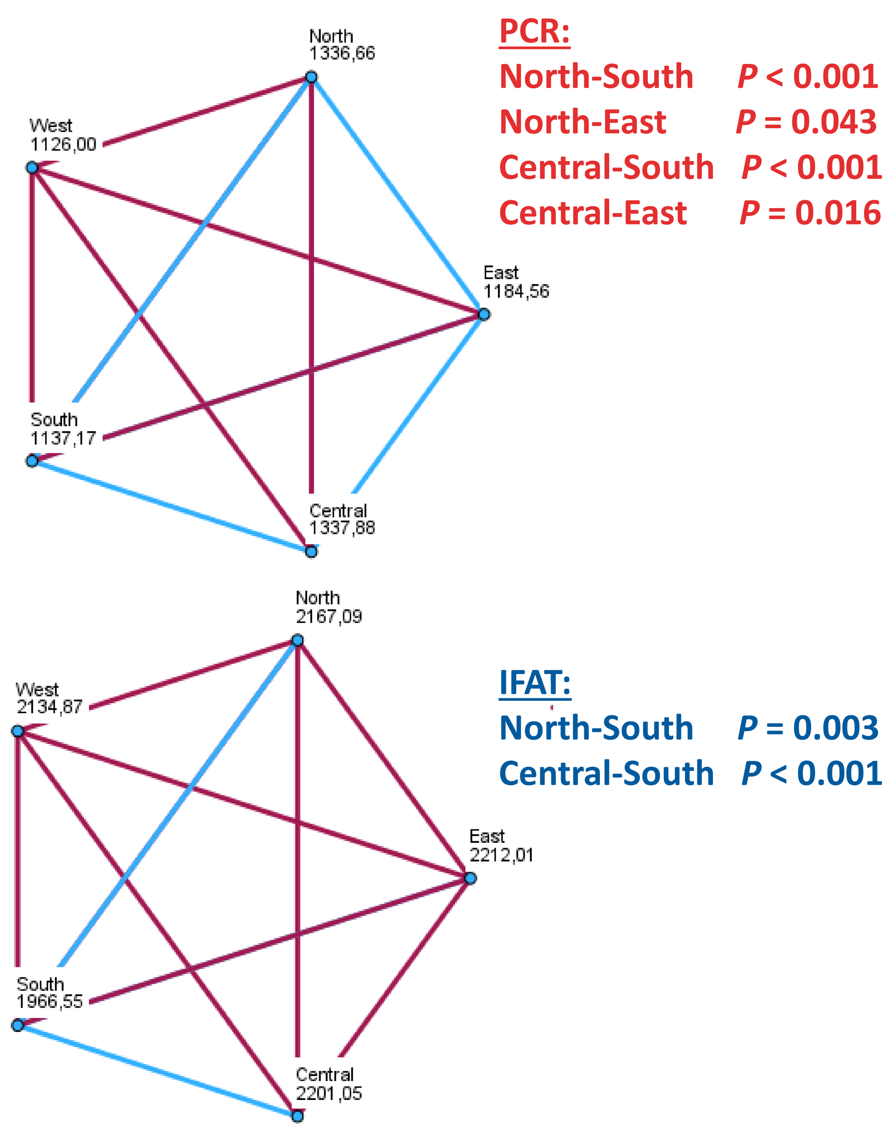

Fig 3-4. Statistically significant impact of regionality on *A. phagocytophilum* PCR and IFAT-results in horses in Europe
(Kruskal-Wallis-test including Bonferroni correction, $P < 0.05$ stated as significant)

- Horses tested by ***Anaplasma phagocytophilum*-PCR** and/or **IFAT** in Europe from **EDTA-blood**
- Timeframe: January 2022 – October 2025
- Analysis of hematological results, if availabe

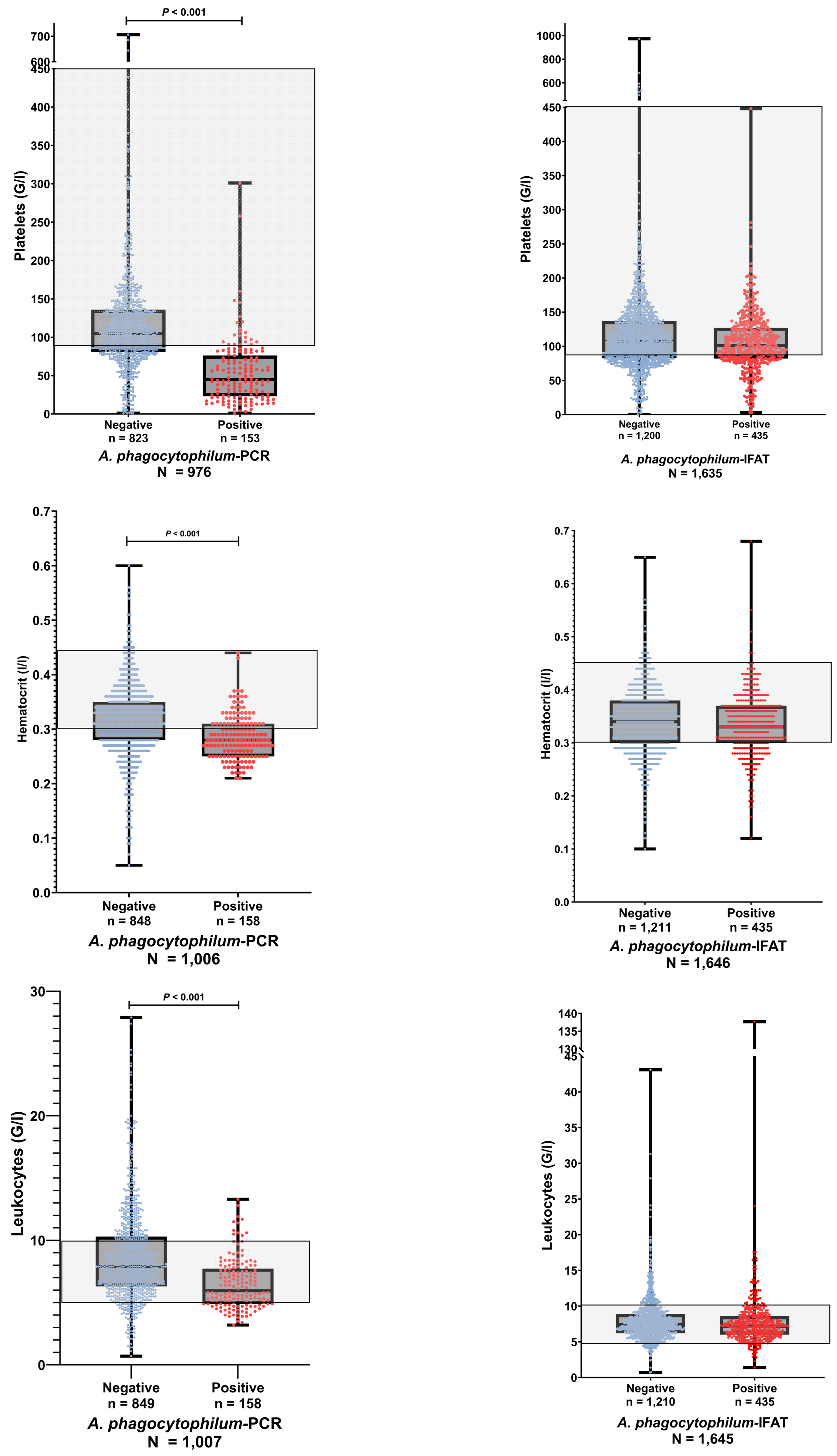

Fig 5-11. Hematological results in horses tested for *A. phagocytophilum* by PCR and/or IFAT in Europe (Mann-Whitney-U-Test, $P < 0.05$ stated as significant, grey box indicating the reference range)

Tab 2. Hematological abnormalities in horses tested by *A. phagocytophilum* PCR and/or IFAT in Europe from January 2022 till October 2025 (n/N (%))

		References	PCR-positive	PCR-negative	IFAT-positive	IFAT-negativ
Thrombocytopenia (confirmed by microscopy)	Present	≤ 89 G/l	**131/153 (85.6)**	**277/823 (33.7)**	**148/435 (34.0)**	**386/1,200 (32.2)**
	Mild	60-89 G/l	34/153 (22.2)	186/823 (22.6)	103/435 (23.7)	288/1,200 (24.0)
	Moderate	40-59 G/l	33/153 (21.6)	39/823 (4.7)	21/435 (4.8)	50/1,200 (4.2)
	Marked	< 40 G/l	64/153 (41.8)	52/823 (6.3)	24/435 (5.5)	48/1,200 (4.0)
Anemia	Present	< 0.30 l/l	**101/158 (63.9)**	**313/848 (36.9)**	**97/435 (22.3)**	**284/1,211 (23.5)**
	Mild	0.20-0.29 l/l	101/158 (63.9)	270/848 (31.8)	90/435 (20.7)	266/1,211 (22.0)
	Moderate	0.15-0.19 l/l	0/158 (0)	23/848 (2.7)	6/435 (1.4)	13/1,211 (1.1)
	Marked	< 0.15 l/l	0/158 (0)	20/848 (2.4)	1/435 (0.2)	5/1,211 (0.4)
Leukocytes	Leukocytosis	> 10.0 G/l	**11/158 (7.0)**	**229/849 (27.0)**	**52/435 (12.0)**	**181/1,210 (15.0)**
	Leukopenia	< 5.0 G/l	**41/158 (25.9)**	**81/849 (9.5)**	**39/435 (9.0)**	**85/1,210 (7.0)**
	Mild	4.0-4.9 G/l	34/158 (21.5)	47/849 (5.5)	27/435 (6.2)	66/1,210 (5.5)
	Moderate	3.0-3.9 G/l	7/158 (4.4	15/849 (1.8)	8/435 (1.8)	14/1,210 (1.2)
	Marked	< 3.0 G/l	0/158 (0)	19/849 (2.2)	4/435 (0.9)	5/1,210 (0.4)