

SEASONAL OCCURRENCE PATTERNS OF SOCIAL WASPS (Hymenoptera: Vespidae) IN PIEDMONT TRAPPED WITH BEER

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Twenty-two species of social wasps (Hymenoptera: Vespidae) are present in Europe, and 19 in Northern Italy. Since 2004 a new hornet species from the Oriental Region – *Vespa velutina* Lepeletier – has been reported in France (Lot-et-Garonne) and is spreading in the neighbouring regions towards Spain and Italy. Some social wasps can be pestiferous insects that prey honey bees and feed on honey, damage fruit, sting people and their animals in work and outdoor places. In Italy the mortality due to Hymenopteran stings has been estimated at 0.03 per million inhabitants per year. The aim of this study was to ascertain what social wasp species present in Piedmont were trapped with beer as bait so to determine the seasonal pattern of occurrence mainly of species that are likely to be pestiferous. Moreover, it would be interesting to follow the eventual spread of *V. velutina* in Italy to evaluate its impact on social bees and wasps.

TAB 1 - Sample sites, species of social wasps and number and percentage of adults trapped in Piedmont.

Year	Locality (District)	Abbreviation	Altitude m a.s.l.	<i>Vespa crabro</i>		<i>Vespula germanica</i>		<i>Vespula vulgaris</i>		<i>Dolichovespula media</i>		<i>Polistes dominulus</i>		<i>Polistes associus</i>		Total
				n°	%	n°	%	n°	%	n°	%	n°	%	n°	%	
2008	Grugliasco (Torino)	GRU	293	117	79.6	22	15.0	4	2.7			3	2.0	1	0.7	147
2009	Grugliasco (Torino)	GRU	293	194	30.1	415	64.4	27	4.2	1	0.2	6	0.9	1	0.2	644
2009	Volvera (Torino)	VOL	251	62	55.9	44	39.6	2	1.8	1	0.9	2	1.8			111
2009	Reagle (Torino)	REA	400	193	48.5	11	2.8	190	47.7	3	0.8	1	0.3			398
2009	Roascio (Cuneo)	ROA	458	193	63.5	14	4.6	89	29.3	2	0.7	6	2.0			304
2009	Montecomposto (Torino)	MCOMP	700	60	42.6	2	1.4	76	53.9	3	2.1					141
				819	46.9	508	29.1	388	22.2	10	0.6	18	1.0	2	0.1	1745



FIG 1 - Trap

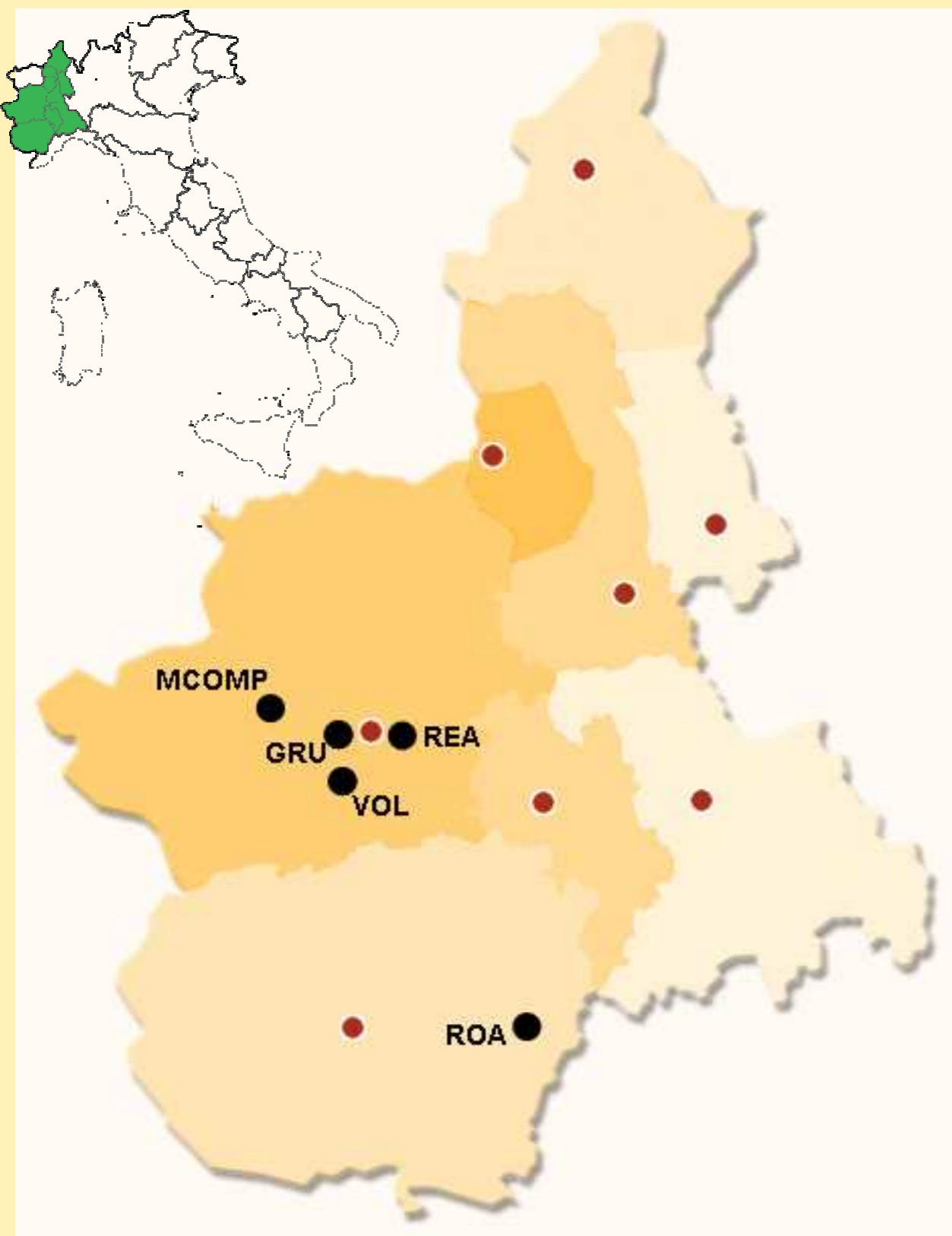


FIG 2 – Map with sites of study

Wasps were trapped by means of a clear polyethylene (PET) bottle of 1.5 L, colourless and transparent, filled with 0.33 L of beer (FIG.1). Traps were set up at five sites during 2008 and 2009 (TAB.1; FIG.2). Two bottles in each site were hung on a branch with a coloured cap approximately 1.7 m above the ground. Traps were checked weekly or every fortnight at Roascio. The research started on 18 March and finished on 23 December.

In total, 1745 adults of social wasps (Hymenoptera: Vespidae) belonging to six species [*Vespa crabro* L., *Vespula germanica* (F.), *V. vulgaris* (L.), *Dolichovespula media* (Retzius), *Polistes dominulus* (Christ), and *P. associus* Kohl] have been trapped. *V. crabro*, *V. germanica*, and *V. vulgaris* were dominant in trap catches throughout all the sites, they were always above 97%; *D. media*, *P. dominulus*, and *P. associus* were rare species ranging from 1% to 2.7% in each site (TAB. 1). Among the total adults trapped, 59 were males: 49 *V. crabro*, 4 *V. germanica*, 1 *V. vulgaris*, 4 *P. dominulus*, and 1 *P. associus*.

The abundance of *V. germanica* and *V. vulgaris* was not independent from the characteristics of sites ($\chi^2=664.5$, with 1 d.f., $P < 0.001$). *V. germanica* was more abundant in small agricultural areas with a high urbanization below 300 m a.s.l., *V. vulgaris* was more abundant in broadleaf forest area with a low urbanization above 400 m a.s.l.

V. crabro was always trapped before *V. germanica* and *V. vulgaris* in all localities and during both years 2008 and 2009 at Grugliasco.

V. crabro was trapped from mid April until late November, and the weekly captures were approximately constant all along the period. *V. germanica* and *V. vulgaris* were trapped from early July until mid December and late November, respectively. Both these species generally showed only a major peak of captures always over 35% of the total adults trapped in the period between early September and mid November.

The median value of captures fell in different dates for each species. The dates observed for *V. crabro* were always before those for *V. germanica* and *V. vulgaris* except at Reagle where the dates were approximately the same for the three species. Too few *P. dominulus*, *P. associus* and *D. media* were trapped for describing a seasonal capture pattern in each site; nevertheless their catches occurred from early July until mid October.

Two males of *V. crabro* were found at mid August at Grugliasco (2008 and 2009), and the other 47 were trapped from early September until early November at Grugliasco (2008 and 2009), Reagle, and Roascio. Four males of *V. germanica* and 1 male of *V. vulgaris* were found in baited traps from mid November until early December at Grugliasco (2008 and 2009). Four males of *P. dominulus* and 1 male of *P. associus* were singularly trapped on five different dates at Grugliasco, Volvera, and Roascio from late July until mid September.

The dominance of *V. crabro*, *V. germanica* and *V. vulgaris* in trap catches from all localities confirms the results obtained in Czech Republic orchards with syrup as bait and in European forest ecosystems with beer. Moreover, *V. germanica* confirms to be more silviphobic than *V. vulgaris* and to prefer more urbanized areas below 300 m a.s.l.

The trapping period of *V. crabro* seems to coincide with the flight period reported in Great Britain. While the capture periods of *V. germanica* and *V. vulgaris* were different from the flight periods reported for Great Britain and Alaska.

Generally the period of largest capture numbers for *V. crabro*, *V. germanica*, and *V. vulgaris* was similar to that reported for other countries in Europe, but there are differences between the sites studied in Piedmont.

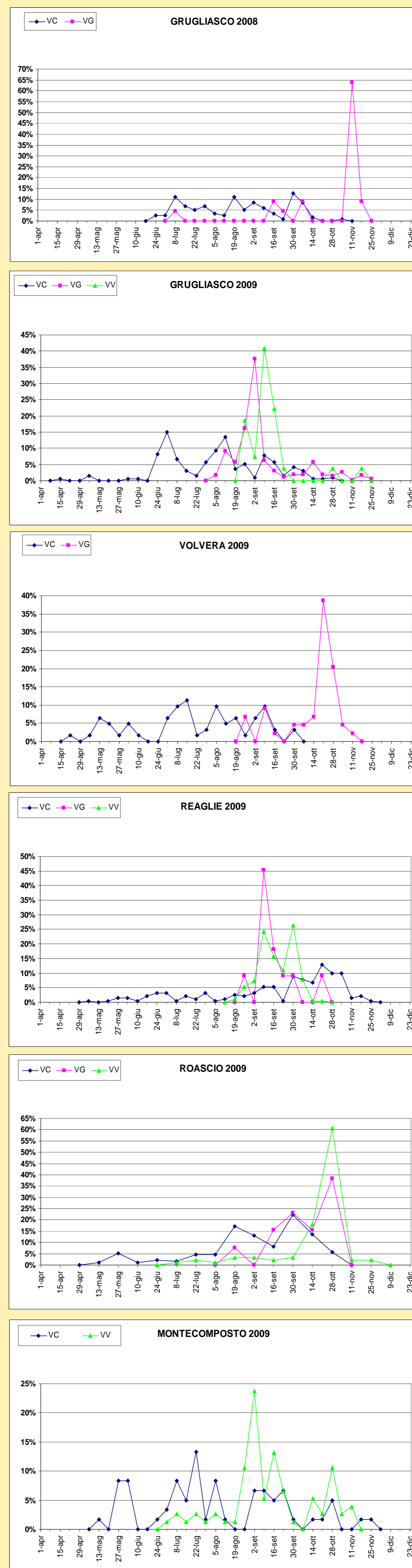


FIG 3 – Seasonal patterns of captures for each site and year. VC: *Vespa crabro*, VG: *Vespula germanica*, VV: *Vespula vulgaris*

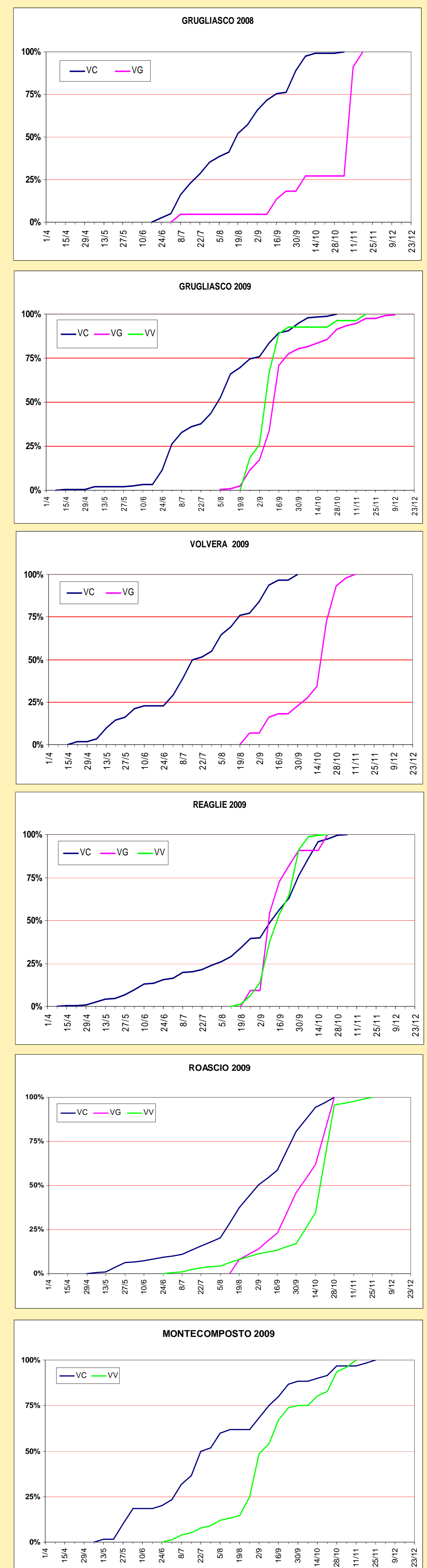


FIG 4 – Cumulative seasonal patterns of captures for each site and year. VC: *Vespa crabro*, VG: *Vespula germanica*, VV: *Vespula vulgaris*