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Ipersensibilità da veleno di  
imenotteri e gravità della reazione:  
quale ruolo dell'insetto pungitore?

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*Civitanova Marche (MC)*

*“ Tre punture di calabrone  
uccidono un uomo, sette  
un cavallo*

”



Solo una leggenda ?

# Cosa c'è in letteratura?

Eur Ann Allergy Clin Immunol, 2003 Jun;35(6):199-203.

## European hornet (*Vespa crabro*) sting: a new risk factor for life-threatening reaction in hymenoptera allergic patients?

Antoniceilli L<sup>1</sup>, Bilò MB, Napoli G, Farabollini B, Bonifazi F.

### ⊕ Author information

#### Abstract

**BACKGROUND:** Severity of a previous reaction, adult age, male gender and honeybee sting are risk factors for severe systemic reactions after hymenoptera stings. The aim of the study was to assess the association between the *Vespa crabro* sting and severe systemic reactions.

**METHODS:** One hundred fifty seven hymenoptera allergic patients with a positive case history for systemic reactions were selected on the basis of unequivocal identification of the stinging insect. In 97 patients the culprit insect was *Vespula* spp., in 35 was *Vespa crabro* in the remaining 25 patients was *Apis mellifera*. The relative risk for a life-threatening reactions after a sting was evaluated for each hymenoptera species.

**RESULTS:** While the percentage of life-threatening reactions was similar both in *Apis mellifera* (24%) and in *Vespula* spp. Allergic patients groups (27.8%), a very high prevalence (81.2%) was documented in *Vespa crabro* allergic patients group. The relative risk for life-threatening reactions after a *Vespa crabro* sting was about three times higher (RR = 2.74--CI 95% 1.93-3.89--R < 0.0001) than it was for a honeybee or yellow jacket sting. The increase of the risk for life-threatening reactions after a *Vespa crabro* sting was independent from the age of patients.

**CONCLUSION:** *Vespa crabro* sting seems to be a new risk factor for life-threatening reactions after hymenoptera sting.



# Cosa c'è in letteratura?

## Predictors of severe systemic anaphylactic reactions in patients with Hymenoptera venom allergy: Importance of baseline serum tryptase—a study of the European Academy of Allergology and Clinical Immunology Interest Group on Insect Venom Hypersensitivity



TABLE II. Distribution of the severity grade of systemic anaphylactic reactions (grade I/II or III/IV) after the index sting with respect to baseline parameters

Parameter		Grade I or II reaction (n = 756)	Grade III or IV reaction (n = 206)	P value
β-Blocker medication at the time of the index sting	Yes	34 (65.4%)	18 (34.6%)	.024
	No	722 (79.3%)	188 (20.7%)	
ACE inhibitor medication at the time of the index sting	Yes	24 (57.1%)	18 (42.9%)	.002
	No	732 (79.6%)	188 (20.4%)	
Any antihypertensive medication at the time of the index sting	Yes	61 (63.5%)	36 (36.5%)	<.001
	No	695 (80.4%)	170 (19.6%)	
Sex	Male	385 (73.6%)	138 (26.4%)	<.001
	Female	371 (84.5%)	68 (15.5%)	
One or more preceding, less severe systemic sting reactions before index sting	Yes	46 (48.4%)	49 (51.6%)	<.001
	No	710 (81.9%)	157 (18.1%)	
Insect responsible for index sting and associated allergic reaction	Bee	241 (83.4%)	48 (16.6%)	.016
	Vespid	515 (76.5%)	158 (23.5%)	
Age (y) at index sting according to median	<38	424 (86.2%)	68 (13.8%)	<.001
	≥38	332 (70.6%)	138 (29.4%)	

## Over- and under medication and Hymenoptera v

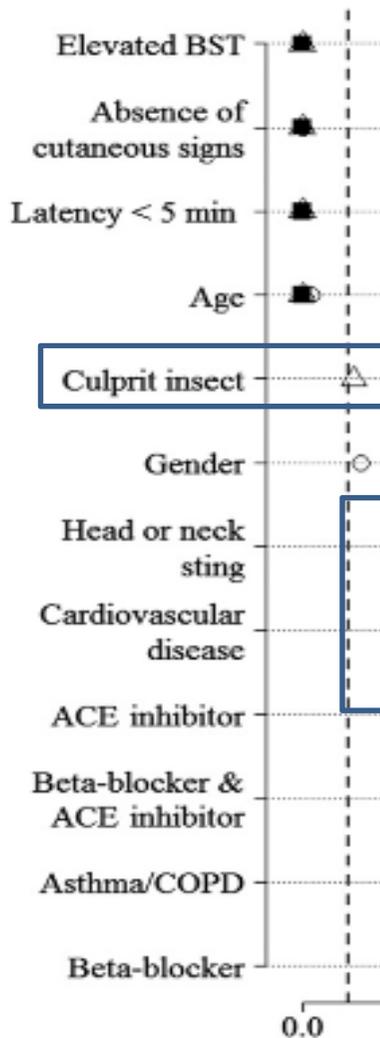
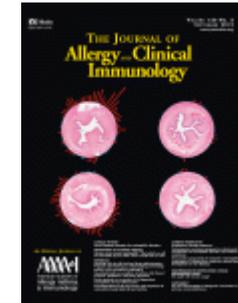


TABLE II. Clinical and laboratory data

	n	%
No. of patients	657	
Age (y), mean (range)	44 (6-84)	
Male/female	361/296	
Severity of anaphylaxis		
Grade I	208	31.7
Grade II	277	42.2
Grade III	172	26.2
Sting localization		
Head/neck	195	29.7
Hand	133	20.2
Arm	124	18.9
Foot	78	11.9
Leg	56	8.5
Trunk	71	10.8
Latency		
<1 min	12	1.8
1-5 min	274	41.7
6-15 min	226	34.4
16-30 min	123	18.7
31 min to 1 h	22	3.3
Diagnosis: IgE-mediated allergy to sting of		
Yellow jacket ( <i>Vespula vulgaris/germanica</i> )	480	73.1
European hornet ( <i>Vespa crabro</i> )	45	6.8
Honeybee ( <i>Apis mellifera</i> )	109	16.6
Bumblebee ( <i>Bombus</i> spp)	2	0.3
Honeybee and yellow jacket	21	3.2
Concomitant diseases		
Cardiovascular disease	130	19.8
Asthma/chronic obstructive pulmonary disease	25	3.8
Elevated BST	46	7.0
Concomitant medication		
Beta-blocker	59	9.0
ACE inhibitor	32	4.9
Beta-blocker and ACE inhibitor	27	4.1

scular



Ipersensibilità da veleno di imenotteri e gravità della reazione:  
quale ruolo dell'insetto pungitore?



# Vespa Crabro: generalità

- Nome comune: CALABRONE  
(Inglese: hornet)
- Nome scientifico: *Vespa crabro*
- Famiglia: Vespe (Vespidae)
- Ordine: Imenotteri (Imenoptera)
- Classe: Insetti (Insecta)



- Corpo: massiccio, quasi glabro, colorato di giallo, nero e ruggine
- Dimensioni: 2,5-3,5 cm
- Pungiglione: liscio
- Aggressività: elevata nei pressi del nido
- Attitudine al volo notturno

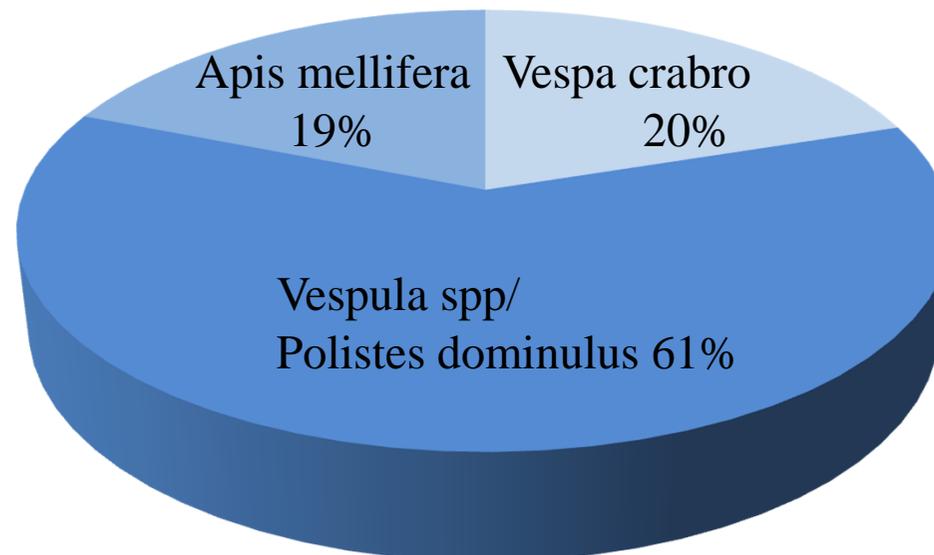
# I nostri dati...



511 pazienti con reazioni sistemiche da puntura di Imenotteri dal 2001 al 2016

469 identificato l'insetto pungitore

	Vespula spp. Polistes dominulus	Apis mellifera	Vespa Crabro
Pazienti	284	91	94

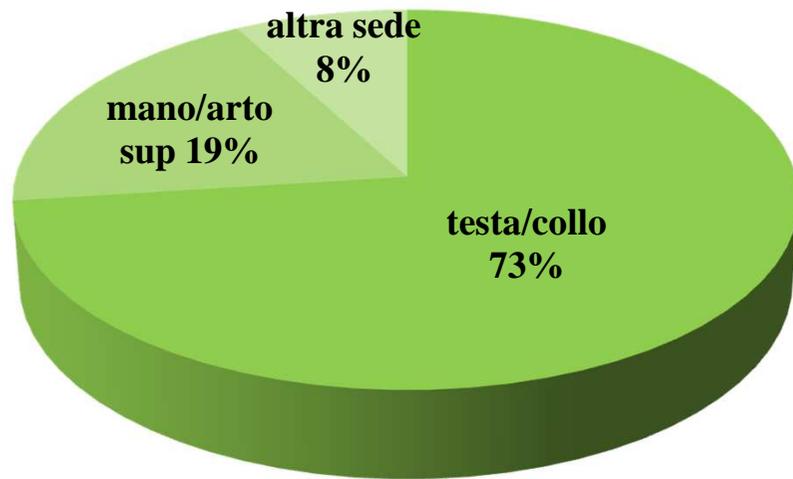


# I nostri dati...

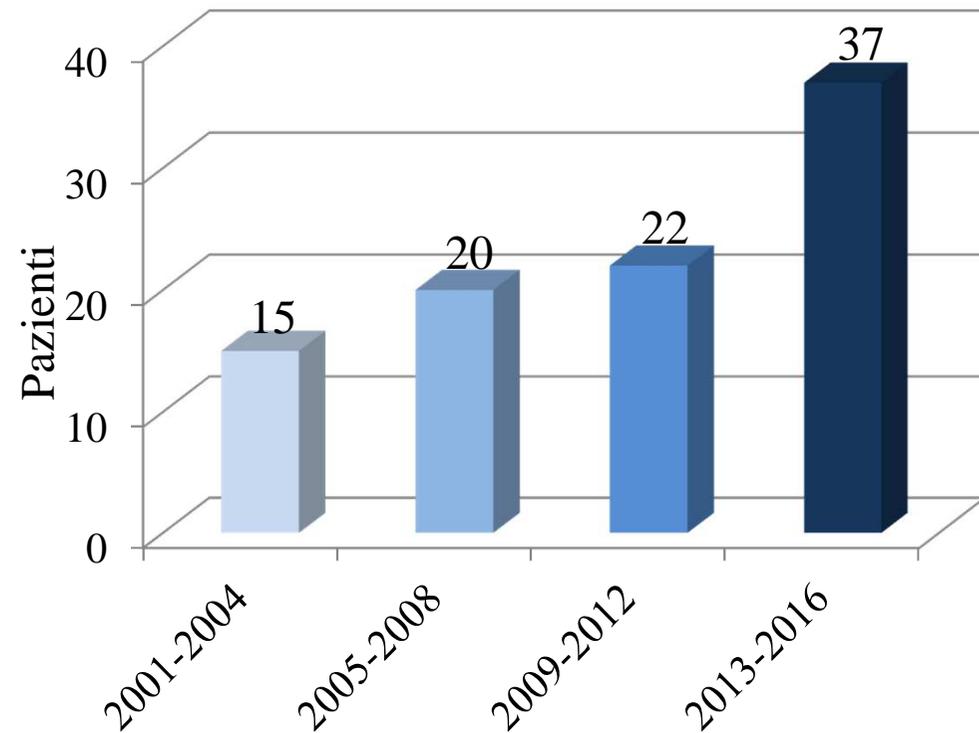


## Pazienti con Reazione Sistemica da Calabrone

Sede della puntura



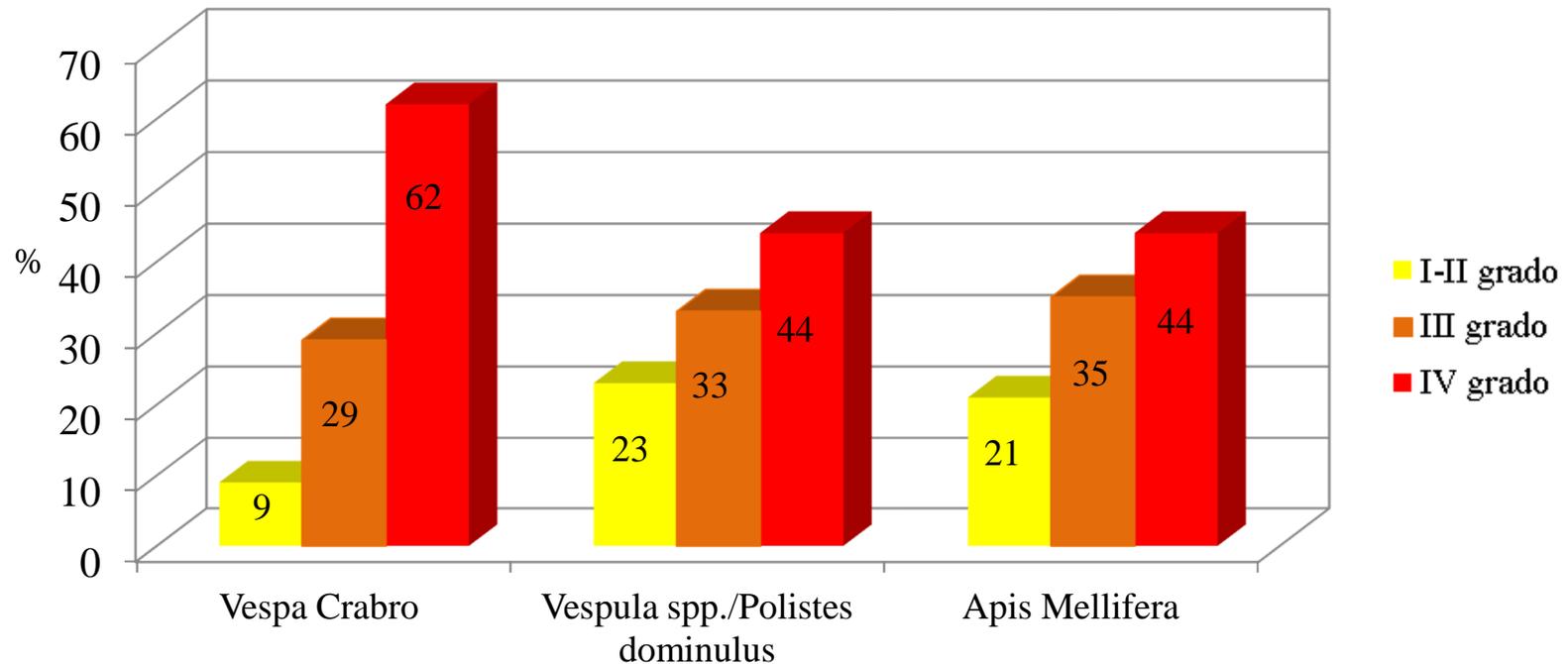
Numero di pazienti punti



# I nostri risultati...



Insetto pungitore & grado di Reazione Sistemica (*Classificazione secondo Mueller*)



➔

Confronto (test di Kruskal-Wallis)	P value
Vespa Crabro vs Vespula spp./Polistes dominulus	<b>P = 0,0008</b>
Vespa Crabro vs Apis Mellifera	<b>P = 0,0069</b>
Vespula spp./Polistes dominulus vs Apis Mellifera	P = 0,9451

# Possibile spiegazione della punteggiatura?



## BRIEF COMMUNICATION

### **Hymenoptera stings in the head region induce impressive, but not severe sting reactions**

L. Arzt, D. Bokanovic, I. Schwarz, C. Schrautzer, C. Massone, M. Horn, W. Aberer & G. Sturm

#### **Abstract**

Stings in the head region are considered to be a risk factor for severe systemic reactions to hymenoptera stings. We supposed that stings in skin areas, which are well supplied with blood, lead to more severe reactions and tested our hypothesis in 847 patients with confirmed hymenoptera venom allergy. However, **symptom severity was independent from sting site: only 16.3% of patients with severe reactions were stung on the head ( $P = 0.017$ )**. But we confirmed age > 40 years ( $P < 0.001$ ) as well as elevated basal tryptase levels ( $P = 0.001$ ) as risk factors. Taking antihypertensive drugs seemed to have an influence: 41.7% of patients taking antihypertensive drugs experienced a severe reaction compared to 29.5% of patients, not taking such drugs ( $P = 0.019$ ). However, considering patients' age in regression analysis, taking antihypertensive drugs had no effect on symptom severity ( $P = 0.342$ ). Importantly, in most patients with severe reactions, cutaneous signs were absent ( $P < 0.001$ ).

# Possibile spiegazione della quantità di veleno iniettato?

*Allergy* 2005; 60: 1339–1349

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ALLERGY

DOI: 10.1111/j.1398-9995.2005.00963.x

Review article

## Diagnosis of Hymenoptera venom allergy

### Venom dose per sting

The amount of venom which is released during a sting varies from species to species and even within the same species: bee stings release an average of 50 µg (11) up to 140 µg (12) of venom protein per sting; however, venom sacs may contain up to more than 300 µg of venom (13). Bumblebee stings release 10–31 µg of venom (11). In contrast Vespinae, which are capable of repeated stings, generally inject less venom per sting: *Vespula* stings release 1.7–3.1 µg of venom, *Dolichovespula* stings 2.4–5.0 µg and *Polistes* stings from 4.2 to 17 µg of protein (11). The amount of venom injected by a single European hornet sting is not known. The dry weight of venom per sac was found to be 260 µg (14).

# Possibile spiegazione: caratteristiche del veleno?



Toxicon  
Volume 27, Issue 6, 1989, Pages 683-688



Comparative study of amino acid composition in an extract from hornet venom sacs: High content of neuroactive amino acids in *Vespa*

*J. Physiol.* (1961), 159, pp. 167-182  
With 8 text-figures  
Printed in Great Britain

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## IDENTIFICATION OF ACETYLCHOLINE, 5-HYDROXY-TRYPTAMINE, HISTAMINE, AND A NEW KININ IN HORNET VENOM (*V. CRABRO*)

By K. D. BHOOLA,\* J. D. CALLE AND M. SCHACHTER  
*From the Department of Physiology, University College London*

(Received 8 June 1961)

# Conclusioni

- Secondo i nostri risultati, la puntura da calabrone rappresenta un possibile fattore di rischio per reazioni sistemiche gravi.
- In letteratura ci sono solo pochi studi che hanno esaminato la presenza di una correlazione tra la gravità della reazione allergica e l'insetto pungitore e gli ultimi lavori non hanno mostrato una relazione tra questi due fattori, probabilmente perchè i vespidi (compresi i calabroni) sono stati considerati tutti insieme e confrontati solo con l'ape.
- Il volume e la composizione del veleno iniettato e le proprietà degli allergeni potrebbero spiegare la differenza di reazione rilevata tra calabrone e altri vespidi, ma saranno necessari ulteriori studi per confermare questi dati e scoprire la loro base fisiopatologica.



*Grazie per l'attenzione*

“ We are drowning in information,  
while starving for wisdom ”

*E. O. Wilson*