



*Dryocosmus kuriphilus* and  
*Torymus sinensis* in TRAGSA  
nursery

PLURIFOR Chestnut Galp Wasp Risk Workshop  
UTAD. Vila Real. October 19th, 2017



# Index

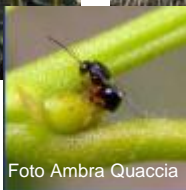
- 01 The cycle of the parasite: how is it in the nursery related to the field?
- 02 Autochthonous parasitoids: potentiality?
- 03 Susceptibility of rootstocks and fruit varieties to *Dryocosmus kuriphilus*
- 04 Production of *Torymus sinensis* in captivity

1.a

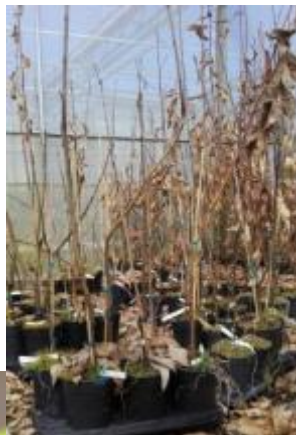
# Cycle of the parasite



June-July



December-March



Winter



Spring-Summer



Growing under insect net: what happens?

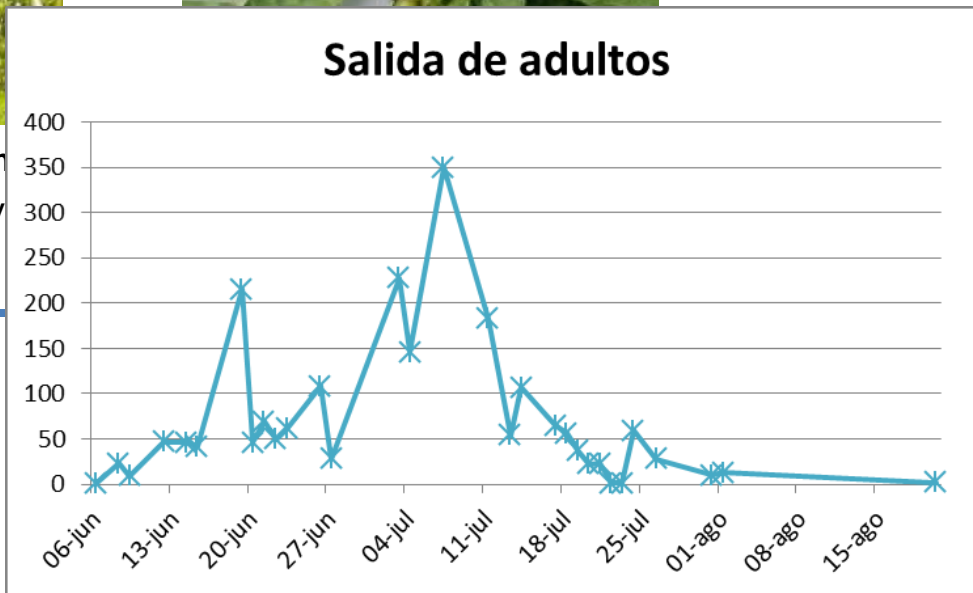


# 1.b

## Cycle of the parasite



NURSERY



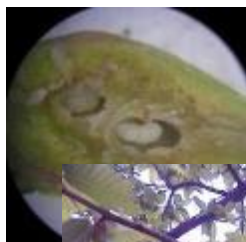
First galls seen  
25 April-1 May



March April May

2-8 May

First galls seen



Decem. January February



FIELD

# 1.c

## Cycle of the parasite

Natural parasitism rate out of the insect net:

Nº plantas iniciales			Plantas con agallas						Agallas						Tipo de Agallas												
			C.sativa		Híbridos		Injertos		C.sativa		Híbridos		Injertos		Hojas				Estípulas				Pecíolo				
C.sativa	Híbridos	Injertos	Nº	% plantas parasitadas	Nº	% plantas parasitadas	Nº	% plantas parasitadas	Nº	Nº agallas/planta	Nº	Nº agallas/planta	Nº	Nº agallas/planta	%	Tamaño medio	Comienzo vuelo	Fin de vuelo	%	Tamaño medio	Comienzo vuelo	Fin de vuelo	%	Tamaño medio	Comienzo vuelo	Fin de vuelo	
<b>Invernadero 2016</b>																											
30.000	14.000	2725	6	0,02	13	0,09	13	0,48	15	2,5	32	2,45	24	1,84													
<b>Umbráculo 2016 (planta vieja de 2 savias)</b>																											
8650	0	0	2	0,02	---	---	---	---	2	1,00	---	---	---	---													

Plasnor 400: 320 plants/m2

2L pots: 67 plants/m2

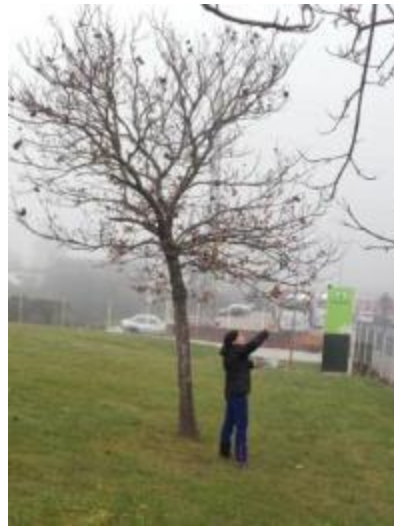
3,5L pots: 33 plants/m2

# 2.a

## Autochthonous parasitoides

Galps collected in March 2016

- 6 different points
- 4 trees per point
- 50 galps per tree



Tasa de parasitismo=  $\frac{n^{\circ}\text{parasitoides}}{(n^{\circ}\text{agallas} * n^{\circ}\text{celdas/agalla})} * 100$

LOCALIDAD	Fechas de emergencia	<i>Eupelmus urozonus</i>	<i>Eurytoma brunniventri</i>	<i>Mesopolobus mediterraneus</i>	<i>Torymus flavipes</i>	Total parasitoides	Tasa parasitación
Cuevas	23 may-23 jun	4	4	1	0	9	1,29
Guamil	1-2 jun	3	0	0	0	3	0,43
A Forcadela	23 may-21 jun	4	0	0	0	4	0,57
Os Milagres	19-may	2	0	0	0	2	0,29
Seiró	21-26 mayo	2	0	0	0	2	0,29
Maceda	21 may-1 jun	1	0	0	1	2	0,29
Total		16	4	1	1	22	0,52

## 2.b

# Autochthonous parasitoides

Galps collected in June 2016

- 6 different points
- 4 trees per point
- 50 galps per tree

Tasa de parasitismo=  
 $n^{\circ}\text{parasitoides}/(n^{\circ}\text{agallas} \cdot n^{\circ}\text{celdas/agalla}) \cdot 100$

Localidad	Fechas de emergencia	<i>Torymus flavipes</i>	<i>Torymus auratus</i>	<i>Torymus sp. 3</i>	<i>Torymus sp. 4</i>	<i>Eupelmus urozonus</i>	<i>Eurydema brunniventris</i>	<i>Mesopolobus mediterraneus</i>	<i>Sycophila variegata</i>	<i>Ormyrus pomaceus</i>	Total parasitoides	Tasa parasitación
Cuevas	12-18 julio	0	0	0	0	0	0	2	0	0	2	0,29
Guamil	6-28 julio	4	1	0	0	1	0	2	1	4	13	1,86
A Forcadela	5-28 julio	12	2	0	1	2	0	3	2	2	24	3,43
Os Milagres	26 jun-2 agos	6	0	1	0	0	1	3	4	10	25	3,57
Seiró	26 jul-16 ago	0	0	0	0	0	0	0	0	30	30	4,29
Maceda	26 jun-26 jul	3	0	0	0	3	0	7	1	3	17	2,43
<b>Total</b>		<b>25</b>	<b>3</b>	<b>1</b>	<b>1</b>	<b>6</b>	<b>1</b>	<b>17</b>	<b>8</b>	<b>49</b>	<b>111</b>	<b>2,64</b>

- 9 different species of non specific parasitoids
- 4 species delay the emergence: some individuals emerge in summer and some others the following spring
- Summer emergence is too late to control *Dryocosmus*
- Spring emergence reaches a parasitism rate of only 0,52% adding the 4 species together

# 3.a

# Susceptibility of clones and varieties



% de plantas infectadas			Entrada		
Mesa S1	31,70%	52,50%	64,58%		
Mesa S2	57,30%	62,50%	71,50%		
Mesa S3	67,1	88,3	20,8	90,60%	71,70%
Mesa V1	95,80%	75%	83,30%	79,20%	80,00%
Mesa V2	87,5	83,30%	91,70%	92,20%	78,6
Mesa V3	100%	85,70%	81,30%	87,1	92,5
Mesa H1	84,40%	74,40%	75%	90,90%	85,40%
Mesa H2	78,20%	87,20%	90,90%	85,70%	87,50%
Mesa H3	88,90%	78,30%	87,50%	83,30%	76,10%
Mesa S4	82,50%	92,20%	90,40%	50,00%	43,80%
Mesa S5	59,2	50	67,70%	48,30%	41,70%
Mesa S6	29,20%	37,70%	27,3		
Mesa S7					
Mesa S8					
Mesa S9					
Mesa S10					
Mesa S11					
Mesa S12					
Mesa S13					
Mesa S14					
Mesa S15					

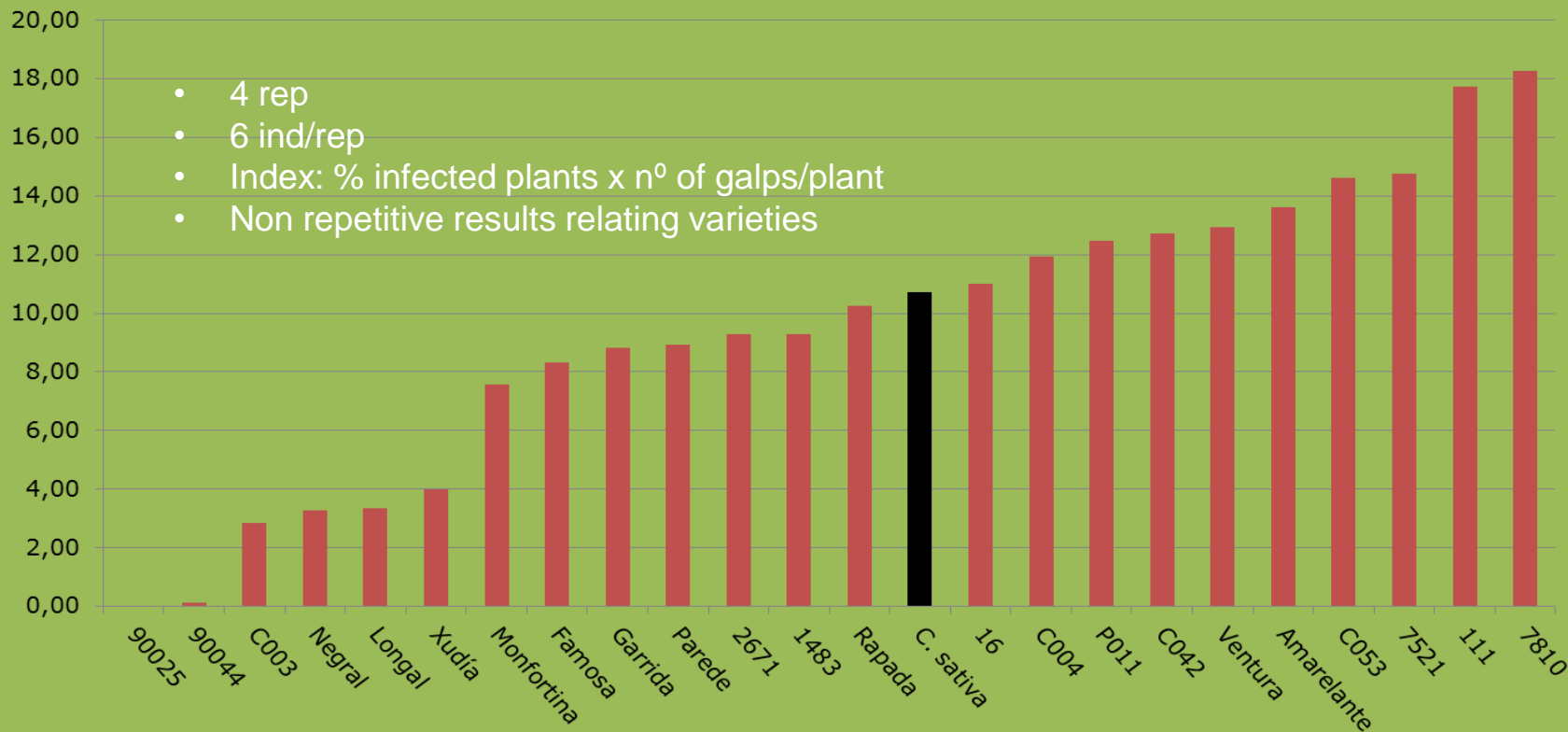
- foco de infección
- infección superior al 75%
- infección entre 50-75%
- infección entre 30-50%
- infección < 30%



# 3.b

## Susceptibility of clones and varieties

**Clon/Varietad**



- 4 rep
- 6 ind/rep
- Index: % infected plants x n° of galps/plant
- Non repetitive results relating varieties

# 4

# Production of *Torymus sinensis*

Italy: collection of winter galps



Breeding in captivity? Essays going on



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