

Zelus renardii (Hemiptera Reduviidae) an assassin bug candidate for *Philaenus spumarius* biocontrol

Salerno M.¹, Russo V.¹, Sefa V.¹, Lamaj F.¹, Baser N.¹, Verrastro V.¹,
Porcelli F.^{1,2}

1 CIHEAM IAMB, Valenzano (BA),
Italy; 2 DiSSPA-UNIBA Aldo Moro, Bari, Italy



Topic's - and presentation perhaps - flow chart

Prey shift

M. gladiata findings on urban *Ficus* in Alicante (Spain)

Z. renardii preys *M. gladiata* on *Ficus microcarpa* in Bari (Italy)

Z. renardii laboratory breeding on *M. gladiata*: bionomics, cannibalism

Z. renardii accepts *Philaenus spumarius* and other preys.

Breeding *Z. renardii* on liquid or jellified liver-based oligidic or meridic diet

Breeding *Z. renardii* by meridic & oligidic diets micro-capsulated in alginate-based matrix

The psyllid *Macrosiphonia gladiata* Kusnezova, 1906 (Homoptera: Psyllidae: Homotribeidae) - a *Ficus* pest recently introduced in the EPPU region

Abstract
The psyllid *Macrosiphonia gladiata* Kusnezova, 1906 (Homoptera: Psyllidae: Homotribeidae) is a pest of *Ficus* species in the EPPU region. It was first reported in the region in 2014. The psyllid is a pest of *Ficus* species in the EPPU region. It was first reported in the region in 2014. The psyllid is a pest of *Ficus* species in the EPPU region. It was first reported in the region in 2014.

Introduction
The psyllid *Macrosiphonia gladiata* Kusnezova, 1906 (Homoptera: Psyllidae: Homotribeidae) is a pest of *Ficus* species in the EPPU region. It was first reported in the region in 2014. The psyllid is a pest of *Ficus* species in the EPPU region. It was first reported in the region in 2014.

Materials and methods
The psyllid *Macrosiphonia gladiata* Kusnezova, 1906 (Homoptera: Psyllidae: Homotribeidae) is a pest of *Ficus* species in the EPPU region. It was first reported in the region in 2014. The psyllid is a pest of *Ficus* species in the EPPU region. It was first reported in the region in 2014.

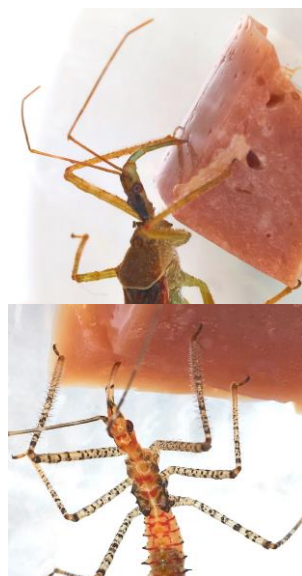


The Z. renardii (Kolombatovic, 1857) (Homoptera: Psyllidae) as a prominent predator of the psyllid *Macrosiphonia gladiata* (Kusnezova, 1906) (Psyllidae: Homotribeidae) and *Ficus microcarpa* Hort. Steud. ex Walp. (Moraceae) ornamental of the urban area of Bari

Abstract
The Z. renardii (Kolombatovic, 1857) (Homoptera: Psyllidae) is a prominent predator of the psyllid *Macrosiphonia gladiata* (Kusnezova, 1906) (Psyllidae: Homotribeidae) and *Ficus microcarpa* Hort. Steud. ex Walp. (Moraceae) ornamental of the urban area of Bari.

Introduction
The Z. renardii (Kolombatovic, 1857) (Homoptera: Psyllidae) is a prominent predator of the psyllid *Macrosiphonia gladiata* (Kusnezova, 1906) (Psyllidae: Homotribeidae) and *Ficus microcarpa* Hort. Steud. ex Walp. (Moraceae) ornamental of the urban area of Bari.

Materials and discussion
The Z. renardii (Kolombatovic, 1857) (Homoptera: Psyllidae) is a prominent predator of the psyllid *Macrosiphonia gladiata* (Kusnezova, 1906) (Psyllidae: Homotribeidae) and *Ficus microcarpa* Hort. Steud. ex Walp. (Moraceae) ornamental of the urban area of Bari.



Macrohomotoma gladiata findings on urban Ficus in Alicante (Spain)

Bulletin OEPP/EPPO Bulletin (2012) 42 (1), 161–164

ISSN 0250–8052. DOI: 10.1111/epp

The psyllid *Macrohomotoma gladiata* Kuwayama, 1908 (Hemiptera: Psylloidea: Homotomidae): a *Ficus* pest recently introduced in the EPPO region

D. Mifsud¹ and F. Porcelli²

¹Department of Biology, Junior College, University of Malta, Msida MSD 1252 (Malta); e-mail: david.a.mifsud@um.edu.mt

²DiBCA Sez. Entomologia e Zoologia, Università degli Studi di Bari Aldo Moro, Bari (Italy)

Urban Forestry & Urban Greening 14 (2015) 123–128

2012



Contents lists available at ScienceDirect

Urban Forestry & Urban Greening

journal homepage: www.elsevier.com/locate/ufug



Preliminary study on the biology, natural enemies and chemical control of the invasive *Macrohomotoma gladiata* (Kuwayama) on urban *Ficus microcarpa* L. trees in Valencia (SE Spain)

Rafael Laborda^a, Jorge Galán-Blesa^a, Adrián Sánchez-Domingo^a, Pilar Xamaní^a, Vicent D. Estruch^b, Jesús Selfa^c, Emilio Guerrieri^d, Eugenia Rodrigo^{e,*}

^a Departamento Ecosistemas Agroforestales, Escuela Técnica Superior de Ingeniería Agronómica y del Medio Natural, Universitat Politècnica de València, Camino de Vera s/n, 46022 Valencia, Spain

^b Institut d'Investigació per a la Gestió Integrada de Zones Costaneres, IGIC, Escola Politècnica Superior de Gandia, Universitat Politècnica de València, Paramif, 1, 46730, Grau de Gandia, Gandia, Spain

^c Universitat de València, Departament de Zoologia, Laboratori d'Investigació d'Entomologia, C/Dr. Moliner s/n, E-46100 Burjassot, València, Spain

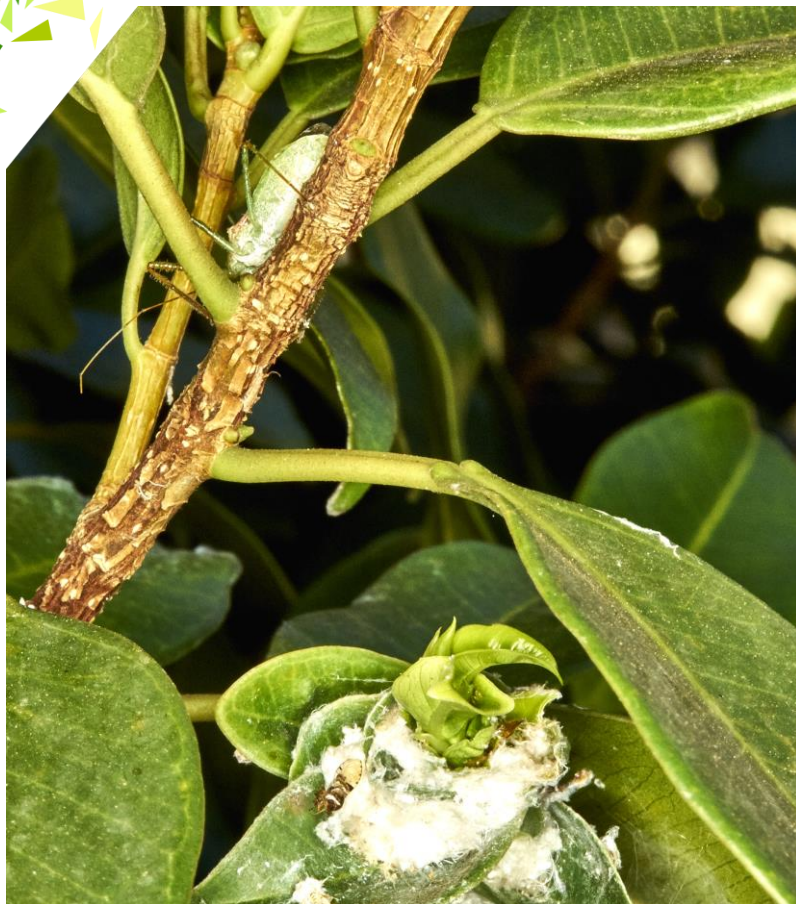
^d National Research Council of Italy, Institute for Sustainable Plant Protection, Via Università 133, I-80055 Portici, NA, Italy

^e Instituto Agroforestal Mediterraneo, Universitat Politècnica de València, Camino de Vera s/n, 46022 Valencia, Spain

2015



Zelus renardii preys *Macromotoma gladiata* on *Ficus microcarpa* in Bari (Italy)

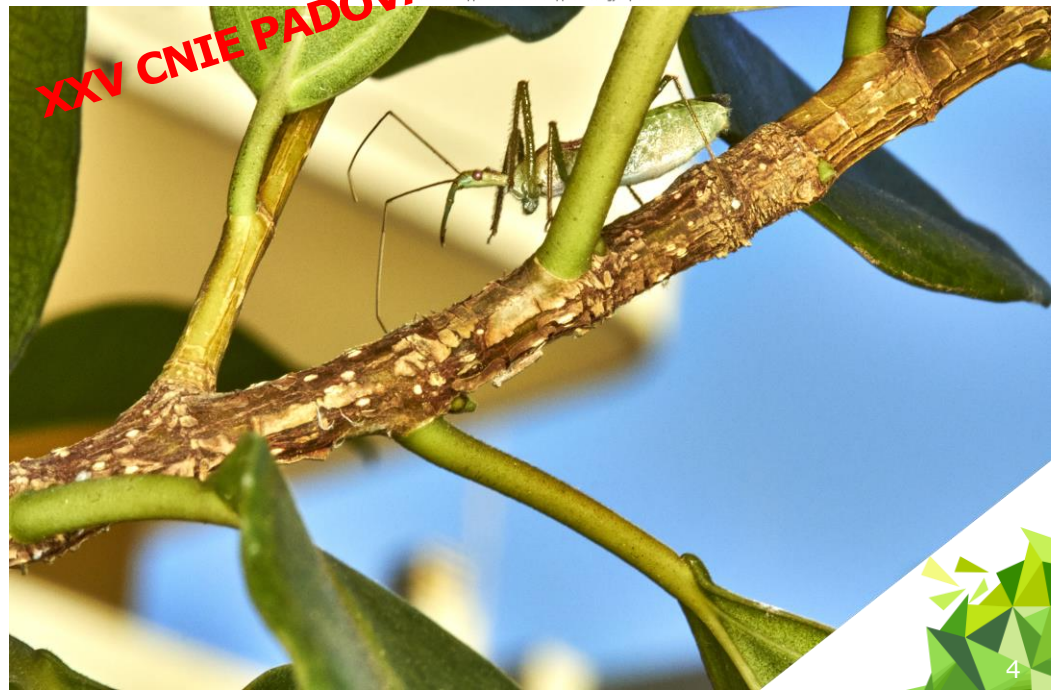


Lo *Zelus renardii* (Kolenati, 1857) (Heteroptera Reduviidae): un promettente predatore della *Macromotoma gladiata* (Kuwayama, 1908) (Psylloidea Homotomidae) sui *Ficus microcarpa* Hort. Berol. ex Walp. (Moraceae) ornamentali del verde urbano a Bari

D. Cornara¹, A. Nocera¹, I. Corrado¹, V. Verrastro^{2,3}, F. Lamaj², A. El Kenawy¹, V. Russo², F. Porcelli^{1,2,3,4}

¹ DISSPA-UNIBA Aldo Moro, francesco.porcelli@uniba.it; ² CIHEAM-MAIB OAD, verrastro@iamb.it; ³ Rete di Laboratori Pubblici di Ricerca Selge; ⁴ CNR-IRAP s.s. Bari Via Amendola 122/D, 70126 Bari - Italy.

ABSTRACT: *Macromotoma gladiata* ha invaso i *Ficus* spp. di Bari a partire dall'estate 2013, infestando intensamente molte piante delle alberature. La presenza del fitomizo si manifesta con gravi deformazioni degli apici vegetativi che sono imbrattati da grandi secrezioni fucose di cera bianca. Durante la primavera-estate del 2014 abbiamo osservato in un ambiente urbano numerosi individui di *Zelus renardii* predare adulti di *Macromotoma gladiata*. In tale situazione di campo circa un attacco su quattro ha avuto successo. Il predatore ci è sembrato essere interessato agli adulti di *M. gladiata* ciascuna al giorno deponendo circa venti uova ogni dieci giorni. Cinque femmine di *Zelus*, allevate singolarmente in scatoline (10x10x5 cm) di metacrilato cristallino (circa 2/3) e 60% di acqua, sono consumato fino a 14 *M. gladiata* ciascuna al giorno deponendo circa venti uova ogni dieci giorni. Dalle uova sono regolarmente nati i giovani che hanno manifestato una spiccata attitudine al cannibalismo, condivisa anche dalle loro madri. Gli allevamenti sono stati sospesi dopo aver ottenuto due deposizioni da ogni femmina e aver verificato che la specie si adatta bene ai piccoli contenitori. Questo predatore esotico accidentalmente introdotto in Italia si è ben acclimato. Potrebbe essere facilmente allevato in massa, per essere utilizzato in programmi di controllo biologico o come componenti per il controllo biologico integrato (IPM) anche contro insetti dannosi in ambiente urbano.



XXV CNIE PADOVA 20-24 June 2016

Zelus renardii laboratory breeding on *Macrohomotoma gladiata*: bionomics

1. Long-living adults
2. Easy to breed on *Macrohomotoma gladiata*-infested *Ficus* twigs
3. One egg cluster per week
4. Adult to last nymphs cannibalism



Zelus renardii laboratory breeding on *Macrohomotoma gladiata*: bionc



Zelus renardii accepts *Philaenus spumarius* and other preys



Zelus renardii accepts *Philaenus spumarius* and other preys

	Ps1			Ps2			Ps3			Ps4			Ps5		
	T.A (min)	T.F	T.R	T.A	T.F	T.R	T.A	T.F	T.R	T.A	T.F	T.R	T.A	T.F	T.R
Z.W1	19	103	12	12	36	7	7	5	24	24	90	52	52	19	0
Z.D1	1	36	4	4	26	18	18	47	28	28	30	5	5	18	0
Z.W1	15	7	4	4	20	3	3	55	76	76	37	43	43	13	0
Z.D1	18	58	33	33	26	30	30	42	16	16	39	10	10	2	0
Z.W1	21	29	3	3	40	68	68	73	12	12	36	24	24	47	0
Z.D1	3	27	22	22	33	85	85	62	128	128	4	14	14	2	
Z.W1	4	36	20	20	39	33	33	47	29	29	15	54	54	12	0
Z.D1	2	36	22	22	19	37	37	39	7	7	17	111	111	2	0
Z.W1	17	23	32	32	38	18	18	52	21	21	19	17	17	36	0
Z.D1	11	25	33	33	38	12	12	30	17	17	70	4	4	6	0
Z.W1	21	25	29	29	21	10	10	32	15	15	15	16	16	62	0
Z.D1	1	11	1	1	38	18	18	59	1	1	2	3	3	14	0
Z.W1	13	49	56	56	22	30	30	5	33	33	43	59	59	17	0
Z.D1	1	39	32	32	49	56	56	10	30	30	9	28	28	6	0
Z.W1	5	22	12	12	66	24	24	31	74	74	7	0	0	0	0
Z.D1	1	20	14	14	28	93	93	35	70	70	32	42	42	23	0
Z.W1	42	39	5	5	99	49	49	22	48	48	8	75	75	10	0
Z.D1	27	16	24	24	14	23	23	46	10	10	15	62	62	16	0
Z.W1	20	42	29	29	35	28	28	44	18	18	45	58	58	7	0
Z.D1	22	11	6	6	42	23	23	36	22	22	71	10	10	5	0

Z.W1= *Z. renardii* (wild 1st adult)

Z.D1= *Z. renardii* (artificial diet 1st adult)

Ps= *P. spumarius*

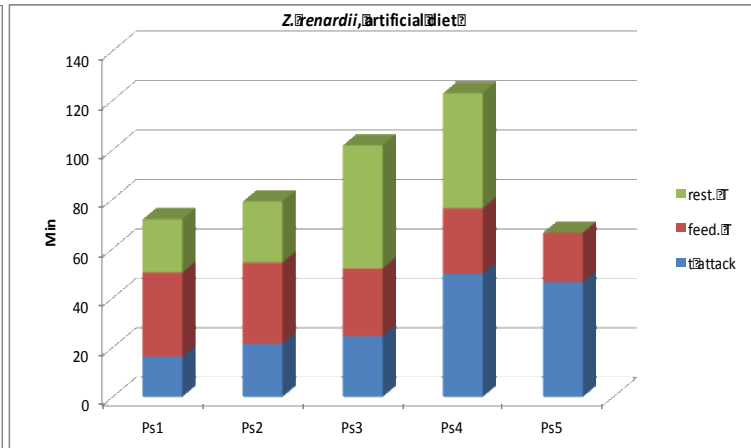
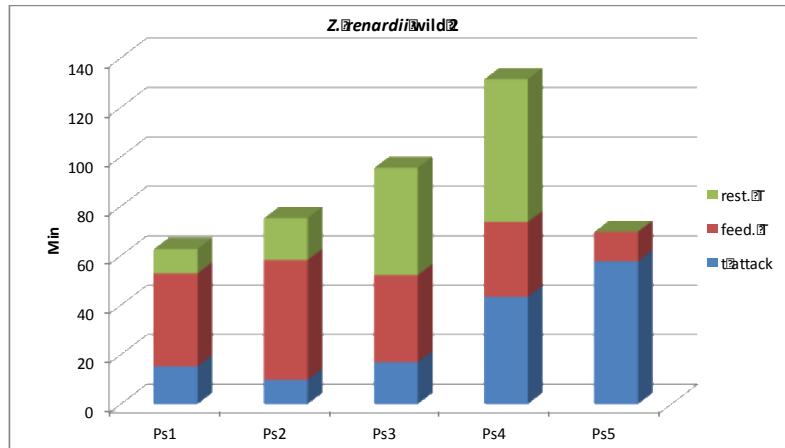
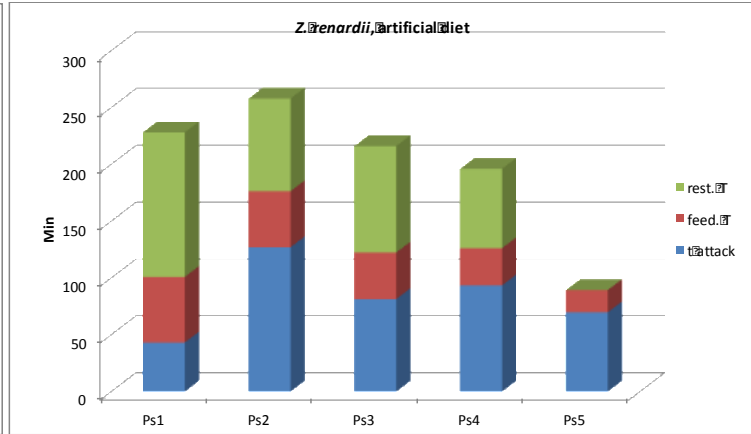
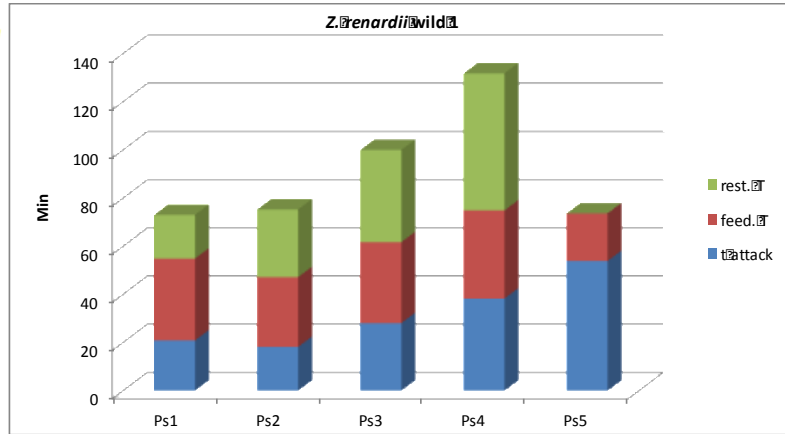
T.A= time to attack

T.F= feeding time

T.R= resting time



Zelus renardii preys five/day *Philaenus spumarius* at least...



Zelus renardii accepts other "preys" of concern...



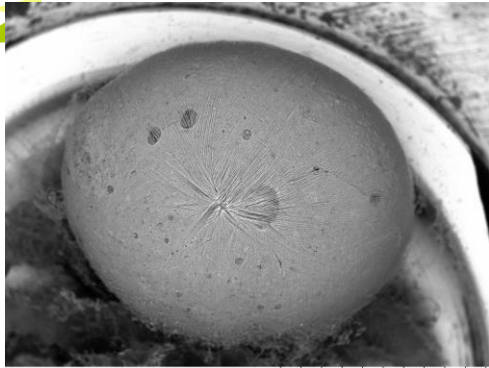
Zelus renardii
predator/parasite
double role while it
uses
Harmonia axyridis?

Breeding *Zelus renardii* on liquid or jellified liver-based oligidic or meridic diet

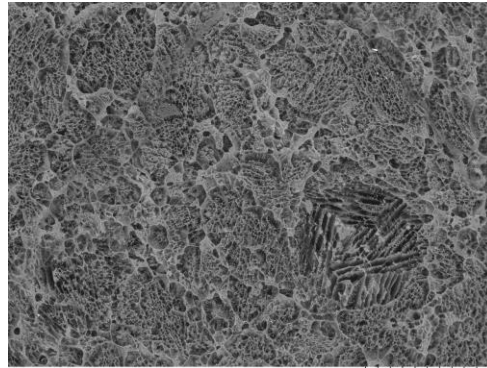


Micro-capsulated in alginate-based matrix, even...

Line Scan



MC1A0004 2017/10/03 12:36 A D5.7 x50 2 mm
Trotti



MC3A0005 2017/09/22 12:22 A D7.1 x120 500 μm
Trotti

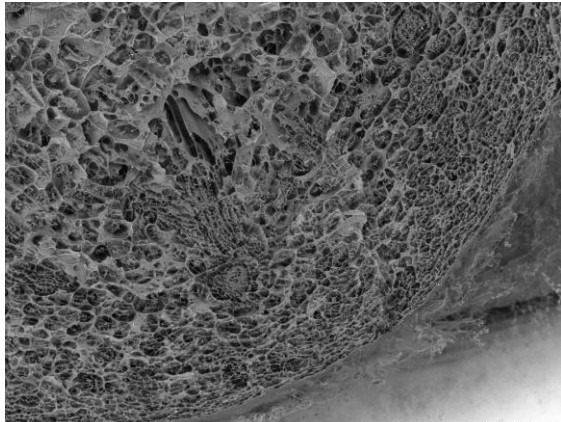
Project: New project

Process Time: 5

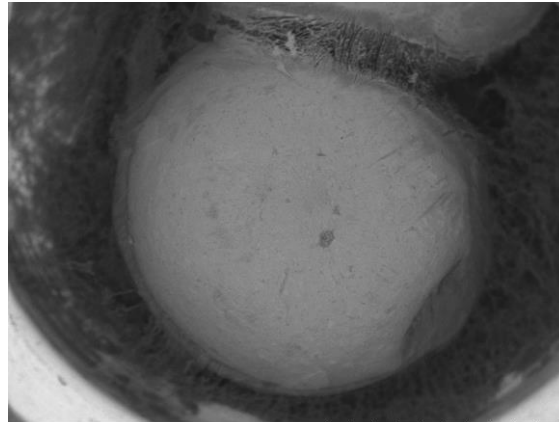
Acc. Voltage: 15.0 kV

Line Resolution: 512 pixels

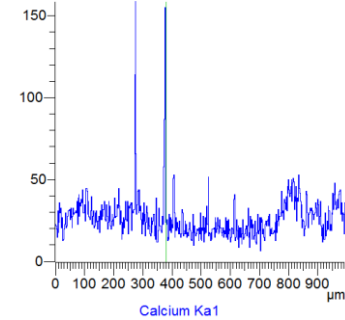
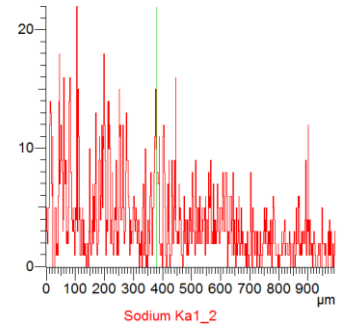
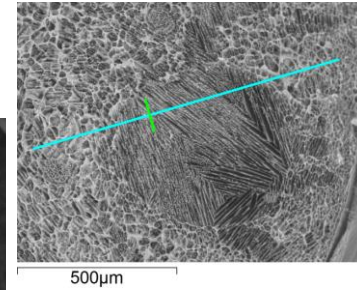
Line Length: 991.5 μm



MC1B0013 2017/10/03 13:01 A D7.4 x120 500 μm
Trotti



MC5B0017 2017/09/21 12:51 F D5.2 x50 2 mm
Trotti



Many thanks to all the guild...



Roberta Roberto



Angie D'Accolti



Ugo Picciotti



Laura Diana



Valentina Russo



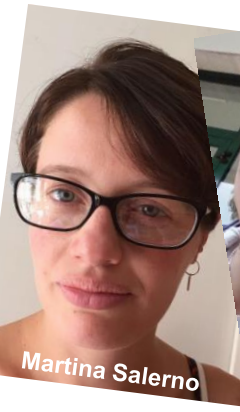
Nino Trotti



Nunzio Denora



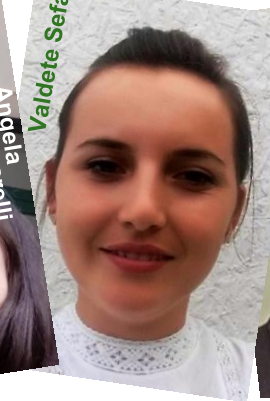
Francesca Garganese



Martina Salerno



Riccardo Gammino



Valdete Sefa



Ahmed El Kenawy



Angela Lopedota



Francesco Diare



Daniele Corràra



Giuseppe Racaniello