Wild harvested nuts and berries in time of new pests, diseases and climate change, 12-14 June 2019, Palencia, Spain

An invasive agricultural and forest pest, Asian chestnut gall wasp, and its classical biological control in Turkey

Kahraman Ipekdal, Ahi Evran University Faculty of Agriculture, kipekdal@gmail.com

Asian chestnut gall wasp (*Dryocosmus kuriphilus*)

Hymenoptera: Cynipidae

The most dangerous insect pest of the sweet chestnut

- Origin: China
- Adult size: 3 mm
- Parthenogenetic

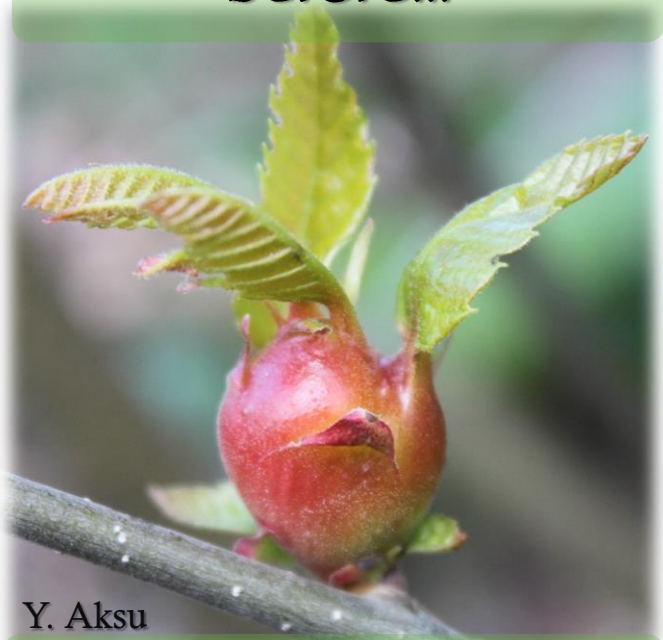
Phenology of the ACGW

Univoltine

Oviposition in late spring-summer

Y. Aksu

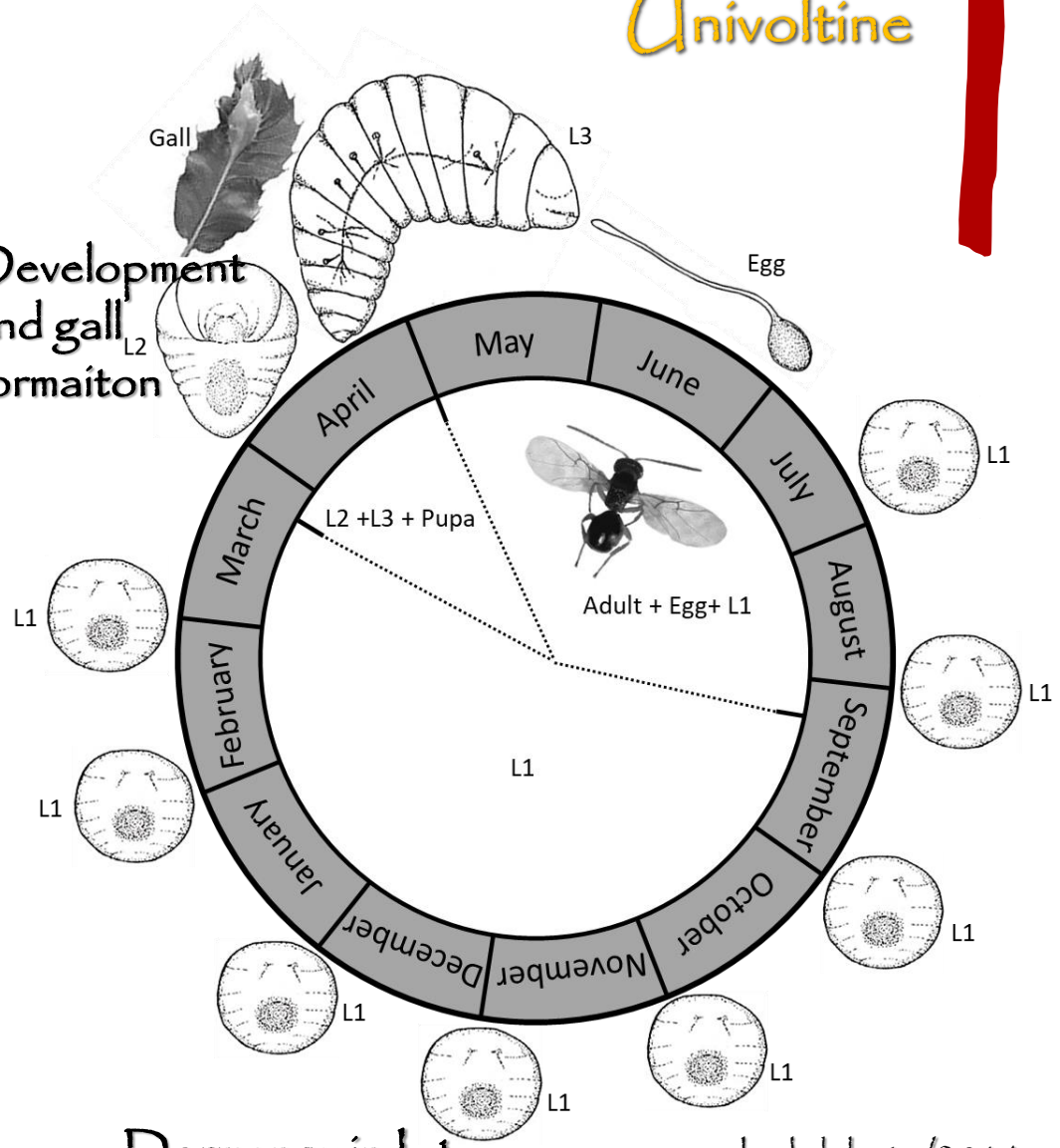
before...



Y. Aksu

...after

Development and gall formaiton



Dormancy in L1

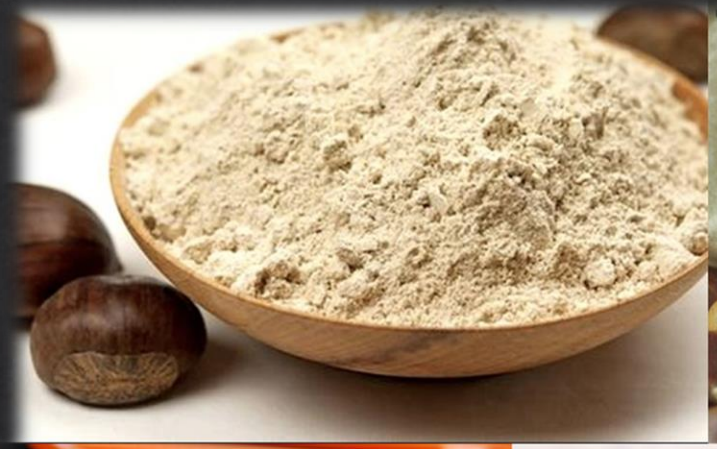
Ipekdal *et al.*2014

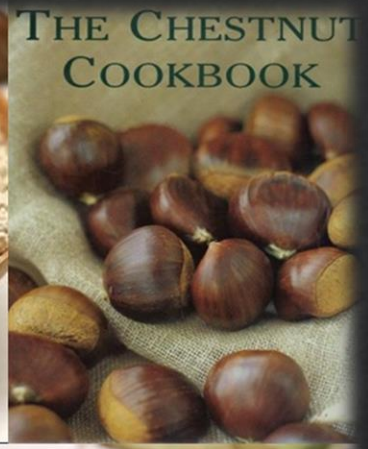
Symptoms and impact of the ACGW

Gall formation prevents leaf, flower and fruit formation.

Symptoms and impact of the ACGW

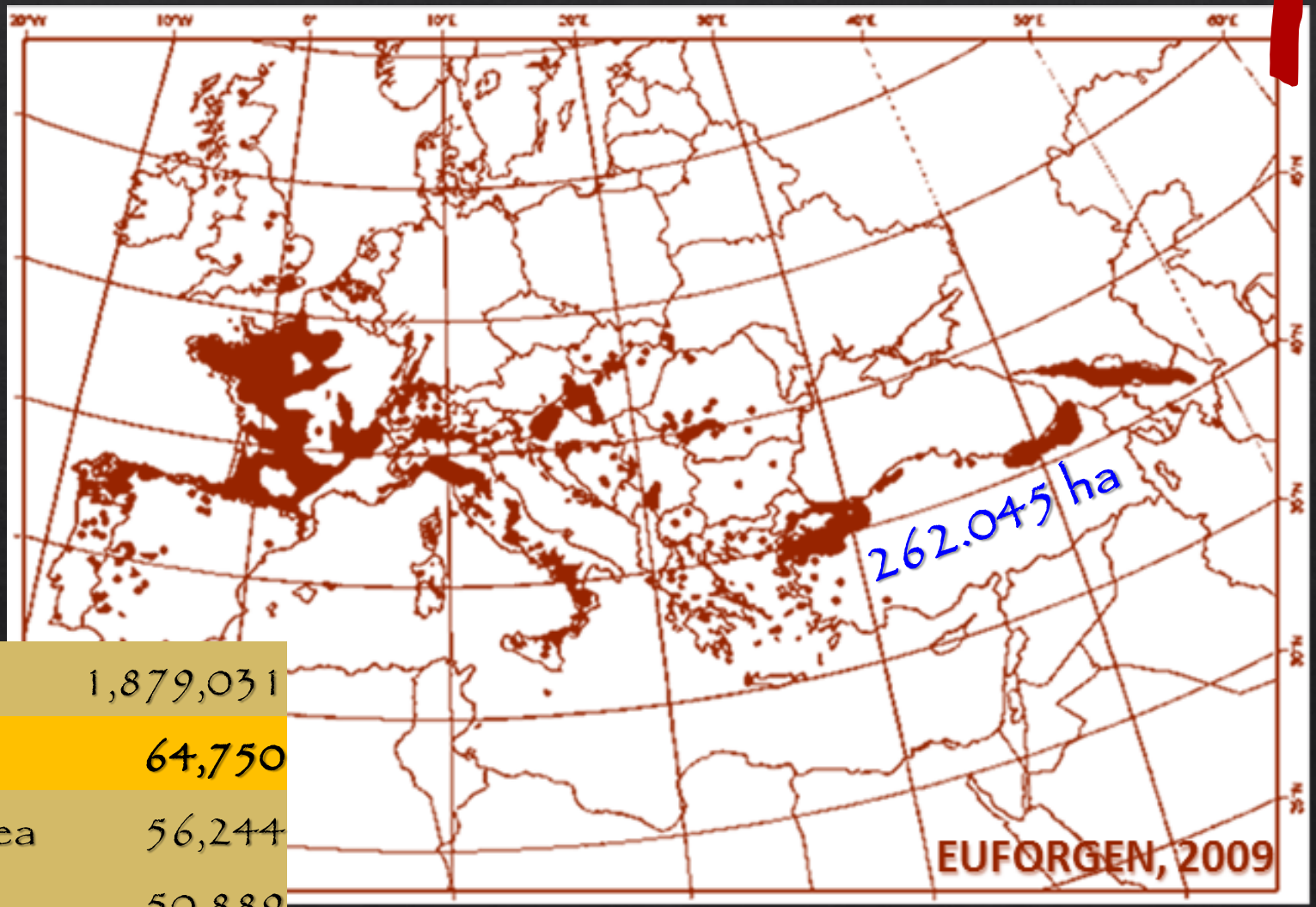
Gall formation prevents leaf, flower and fruit formation.





Distribution of chestnut around the Mediterranean

Turkey is an important chestnut producer.

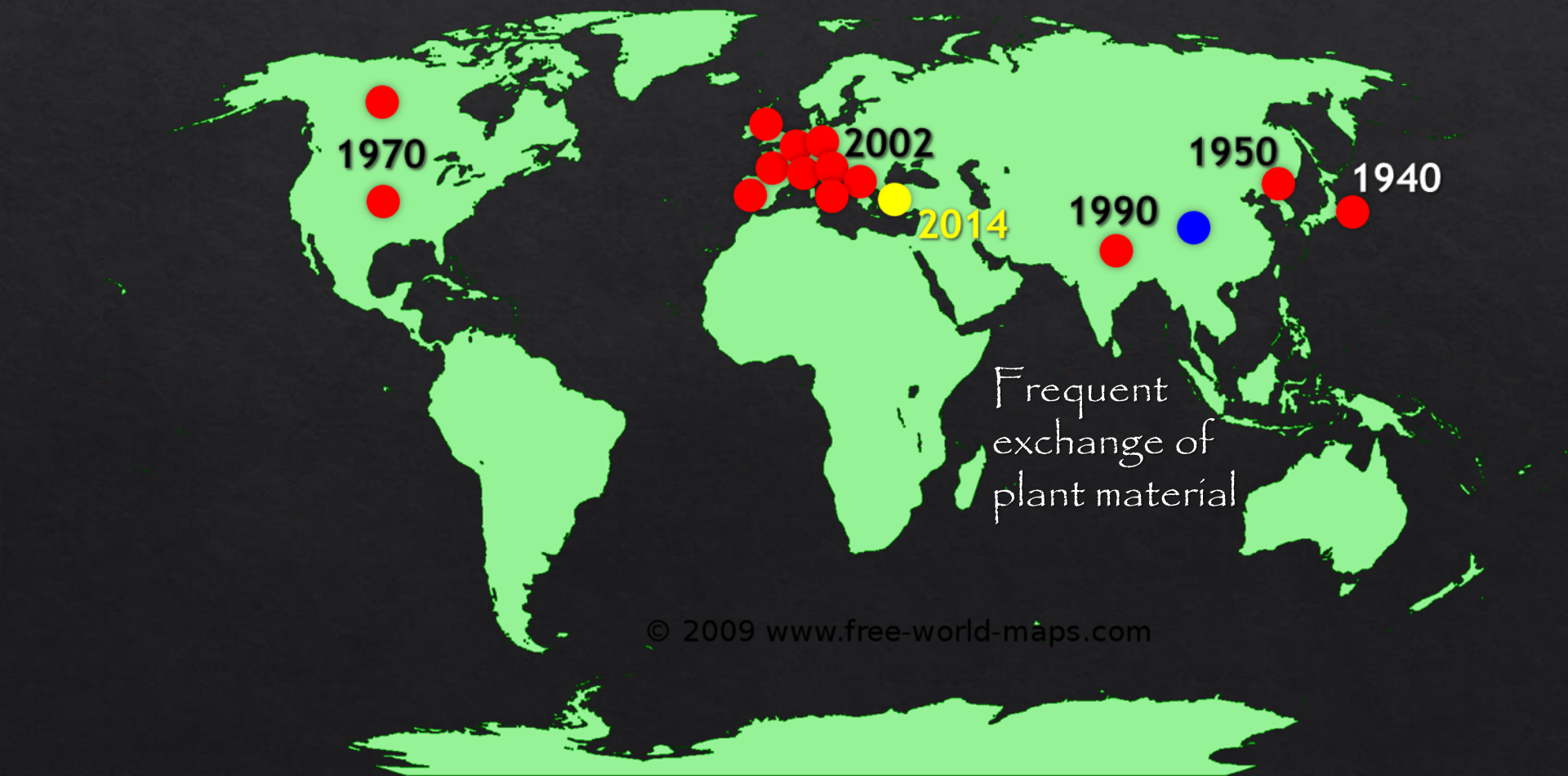


China	1,879,031
Turkey	**64,750**
South Korea	56,244
Italy	50,889

FAOSTAT, 2016

Distribution of the ACGW

Anthropogenic factors, active and passive flight



Preliminary control practices in Turkey

GDF projects

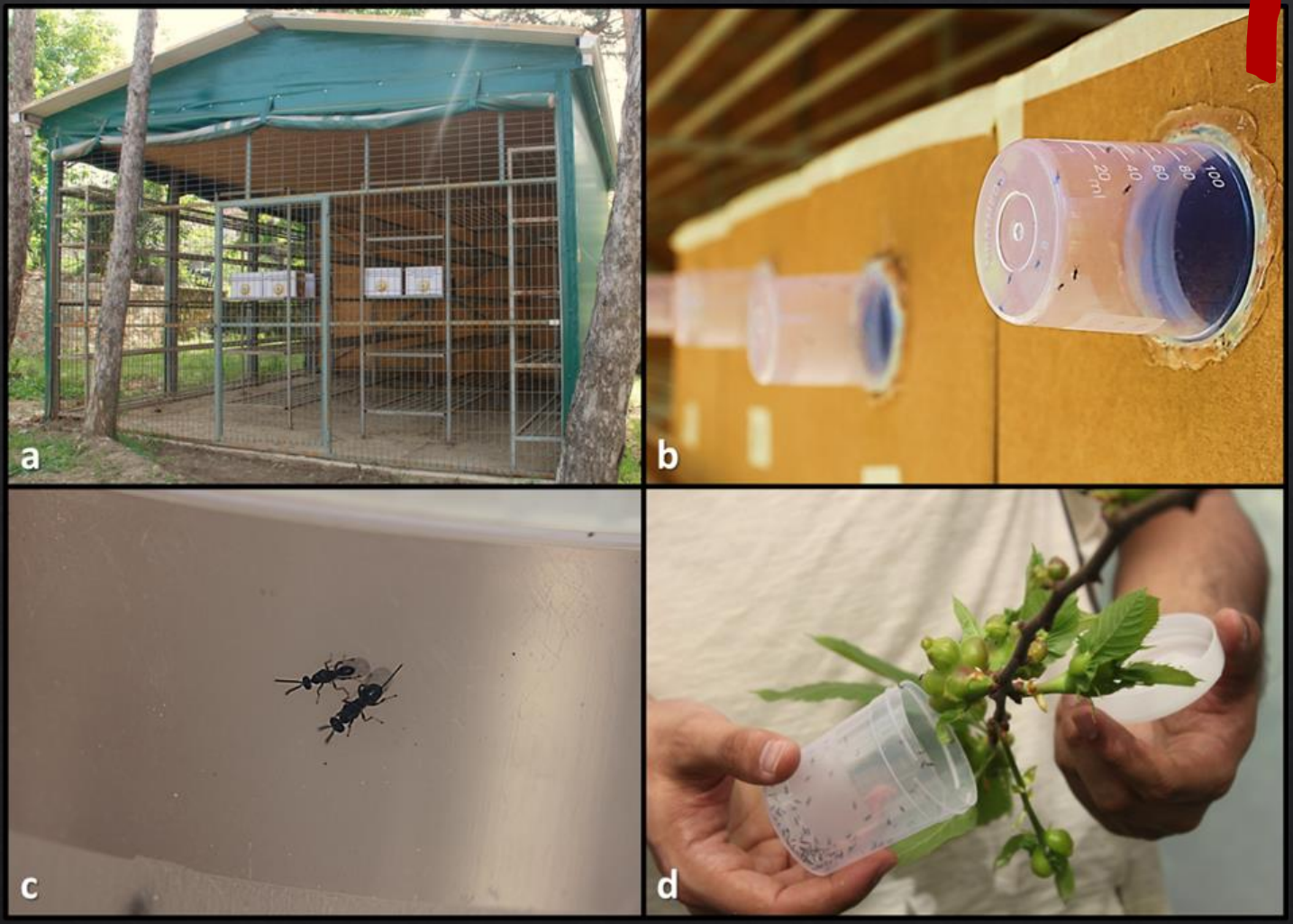
Visiting Veneto Region

Preliminary control practices in Turkey
GDF projects

From Padova to Yalova

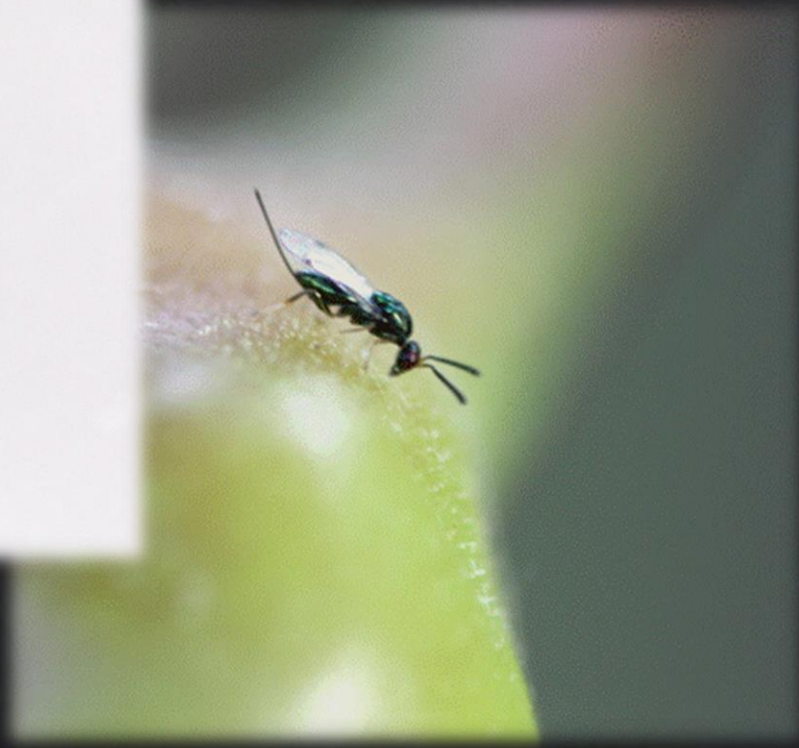
Preliminary control practices in Turkey
GDF projects

From Padova to Yalova



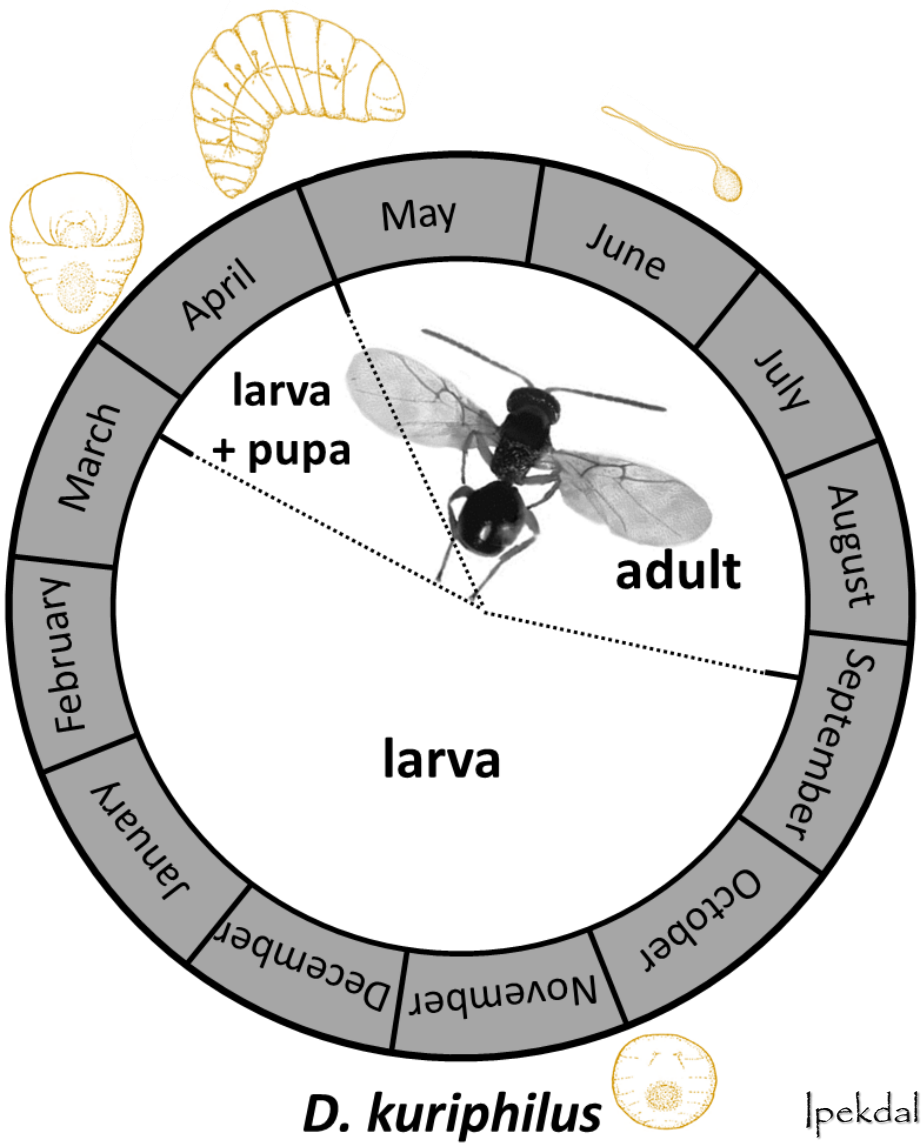
Preliminary control practices in Turkey
Classical biological control of the ACGW by using *Torymus sinensis*

50 male / 100 female



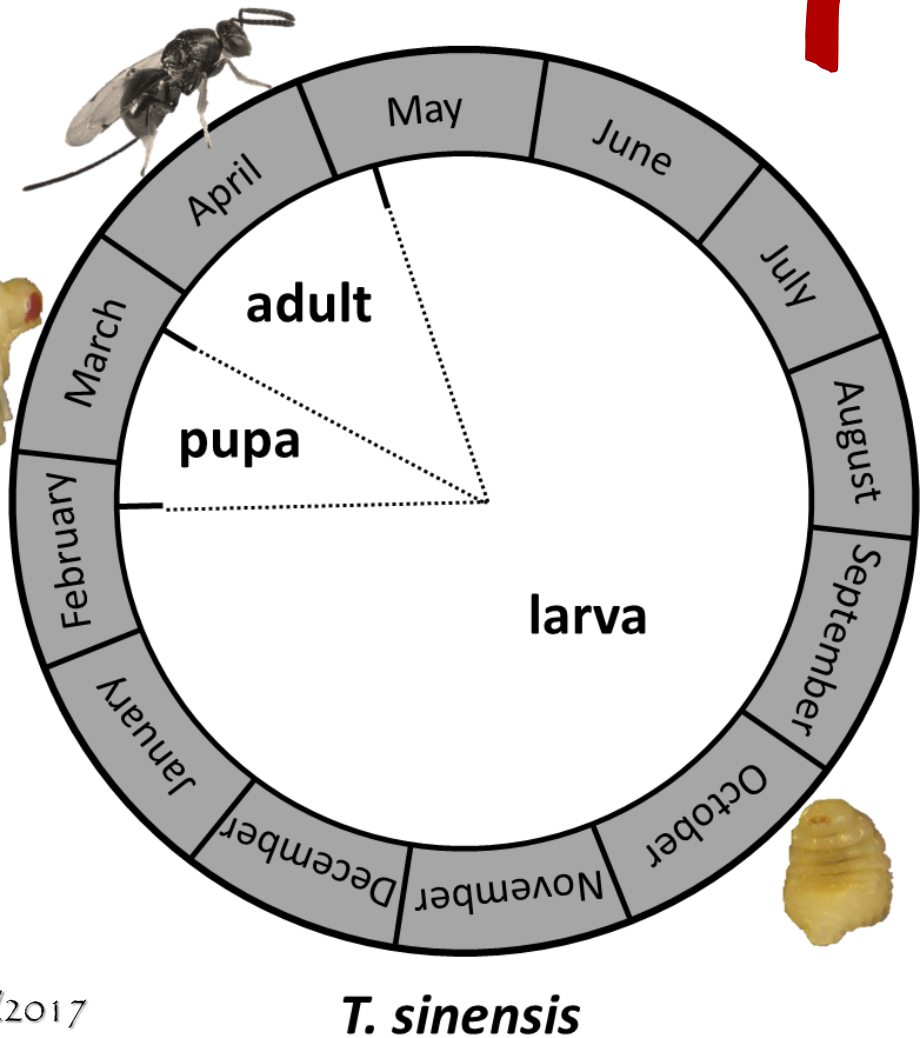
Preliminary control practices in Turkey

The parasitoid and the host; similar phenologies



D. kuriphilus

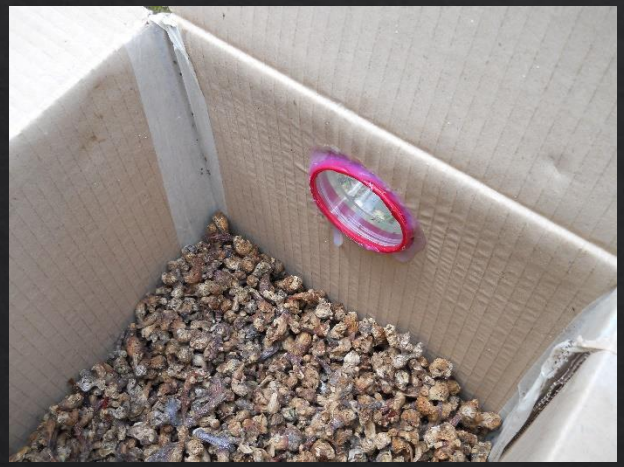
Ipekdal *et al.*2017

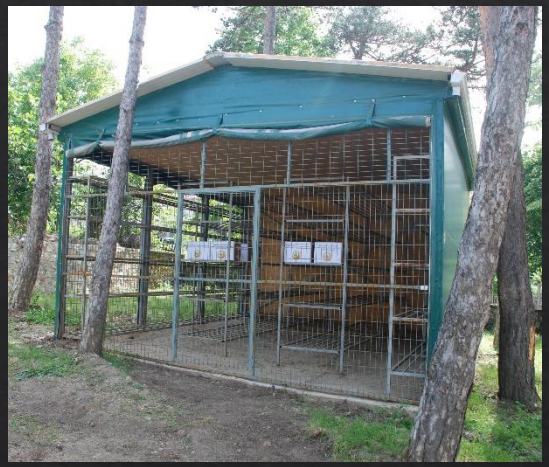


T. sinensis

Preliminary control practices in Turkey

Rearing *T. sinensis*





- Releasing → Spring
- Gall collecting → Autumn
- Adult collecting, Feeding, Mating & Releasing →Spring

Preliminary control practices in Turkey
Classical biological control of the ACGW by using *Torymus sinensis*

S. Şah

Number of *T. sinensis* adults released

2015 → 4737
2016 → 4141
2017 * → 250

2018 * → 550/2500
2019 * → 8000

Number of galls collected from 1 m of randomly selected twigs
(1 twig per tree, 10 tree per site)

	Site1	Site2	Site3	Site4
Tree1	22	33	30	17
Tree2	11	40	22	35
Tree3	53	27	19	53
Tree4	54	11	16	8
Tree5	11	6	30	50
Tree6	11	53	17	55
Tree7	19	15	16	14
Tree8	18	19	7	12
Tree9	3	34	17	21
Tree10	13	21	21	17
Total	215	259	195	282

LTR


Preliminary control practices in Turkey
FAO project

Preliminary control practices in Turkey
FAO project

Kestane Mazı Arısı
ve Mücadelesi

ZARARLARI

- Fazla sayıda gal oluşumu, yaprak, çiçek ve meyve sayısında azalmaya neden olur.
- İtalya'da 50 cm'lik dalda 6 adet gal bulunması halinde %80'lik bir meyve kaybının söz konusu olduğu tespit edilmiştir.
- Galler fotosentez alanının azalmasına yol açarak, ağacın büyümesine ve gelişmesine engel olurlar.
- Gal sayısındaki artış ağacın kestane dal kanseri gibi diğer hastalıklara karşı daha dayanıksız olmasına neden olur.

Gal arısı gali ve parazitoiti (*Torymus sinensis*)

MÜCADELESİ

- En etkin mücadelesi karantina önlemidir.
- Meyve kalitesi ve tadının daha iyi ya da meyve verimi daha yüksek olduğu düşüncesiyle, bulaşık alandan başka yerlere kestane fidanı, aşı kalemi, çelik, sırık gibi materyal nakli yapılmamalıdır.
- Doğal düşmanları vasıtasıyla biyolojik mücadele uygulanmalıdır.

ORMAN GENEL MÜDÜRLÜĞÜ

Classical biological control of the Asian chestnut gall wasp (*Dryocosmus kuriphilus*)

Fernanda Colombari
Dahraman Şekkal

Food and Agriculture Organization of the United Nations

General Directorate of Forestry

Chestnut Gall Wasp in Sustainable Chestnut Production (Symptoms, Damages and Management)

International Technical Assistance to Control Gall Wasp (*Dryocosmus kuriphilus*) in Turkey's Chestnut Forests

MAGES

- Excessive amount of gall formation leads to decrease in number of leaves, flowers and fruits.
- In Italy, it was discovered that 6 galls on a 50 cm branch cause 80 percent fruit loss.
- Galls cause loss of photosynthetic tissue and thus decelerate tree growing.
- Increase in the number of galls make the tree more vulnerable against canker (chestnut blight).

Gall of the chestnut gall wasp and its parasitoid (*Torymus sinensis*)

MANAGEMENT

- The most effective way of management are quarantine measures.
- Materials such as saplings, grafts, scions, and sticks should not be transported from contaminated areas.
- Biological management should be conducted by using the gall wasp's natural enemies.

IN ORDER TO SUCCEED

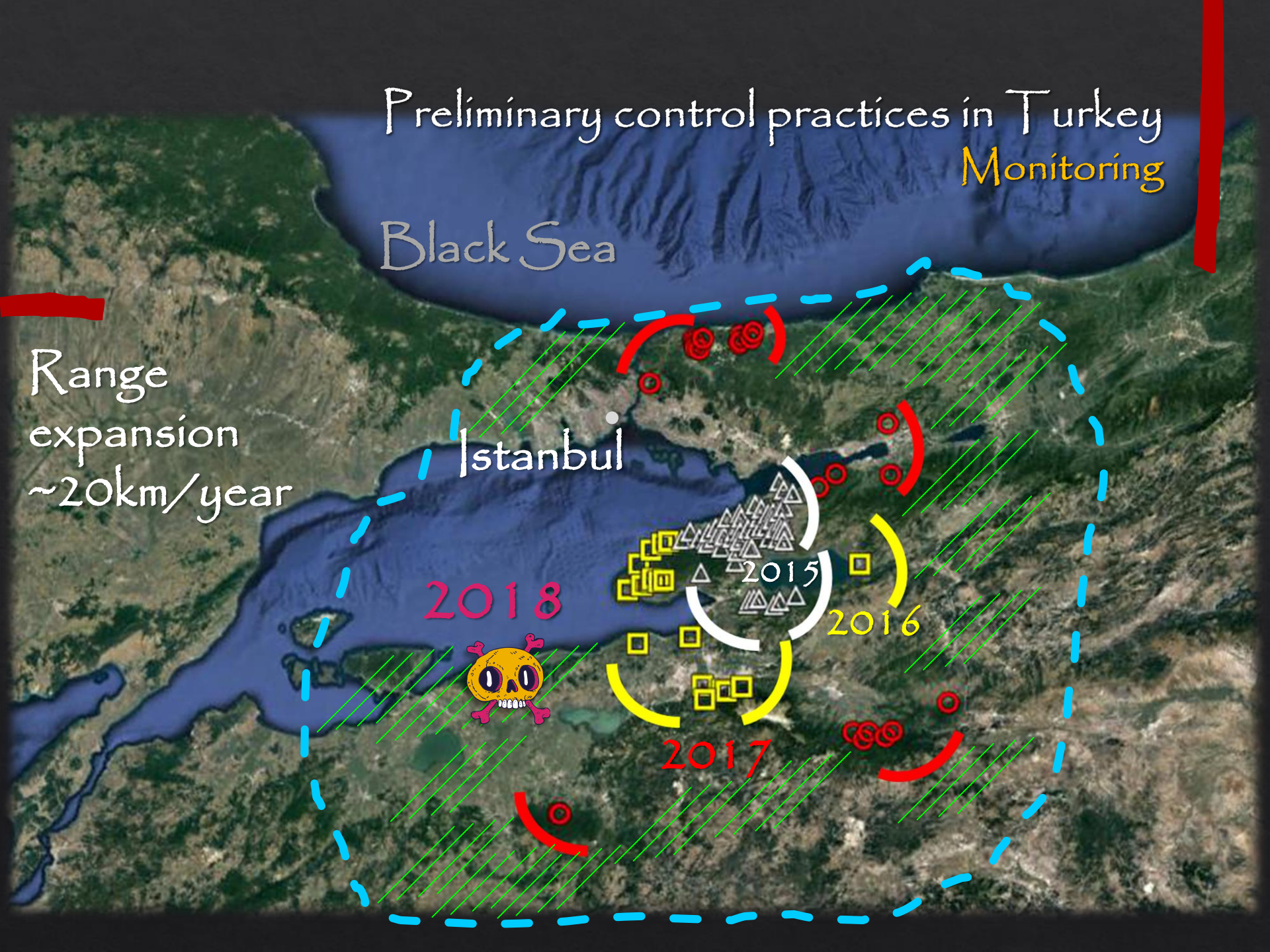
- When signs of this pest species are observed on chestnut trees, the local forestry department should be informed immediately. Quarantine measures should be strictly followed. Otherwise, chestnut production may be endangered.
- Success in pest management is possible when institutions, producers, and researchers work together closely against this pest.

All photos courtesy of the Republic of Turkey General Directorate of Forestry

GENERAL DIRECTORATE OF FORESTRY
Department of Forest Pest Management
Phone: +90 312 296 40 00 / 3002 - 3003
Fax: 0312 207 65 84
Hotline: 177; www.ogm.gov.tr

CHESTNUT GALL WASP (*Dryocosmus kuriphilus*)

THE CHESTNUT GALL WASP IS SUBJECT TO QUARANTINE!
www.ogm.gov.tr


Preliminary control practices in Turkey
Monitoring
Black Sea
Range
expansion
~20km/year
Istanbul
2018
2015
2016
2017

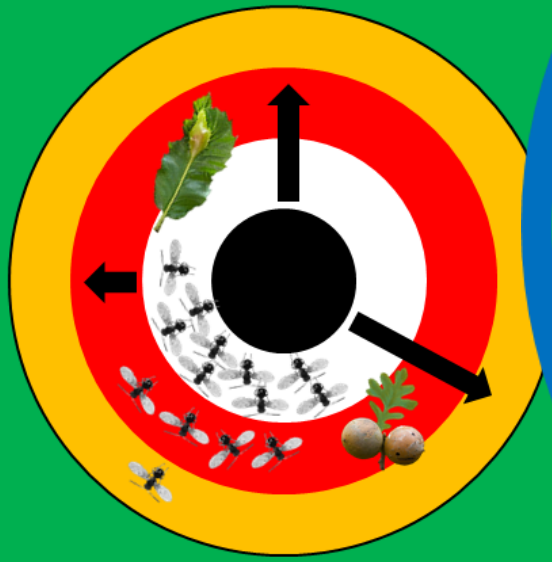
Preliminary control practices in Turkey

Monitoring


Y. Aksu
Project WASPCOM
Submitted to TüBiTAK
>100 oak gall species
>200 parasitoids
High genetic diversity of the chestnut in Anatolia
(Stone *et al.*, 2002)

Project WASPCOM
Submitted to TüBiTAK

WASPCOM



Interactions among
chestnut gall wasp, oak gall wasps,
& their parasitoids

ACGW population

Torymus sinensis population

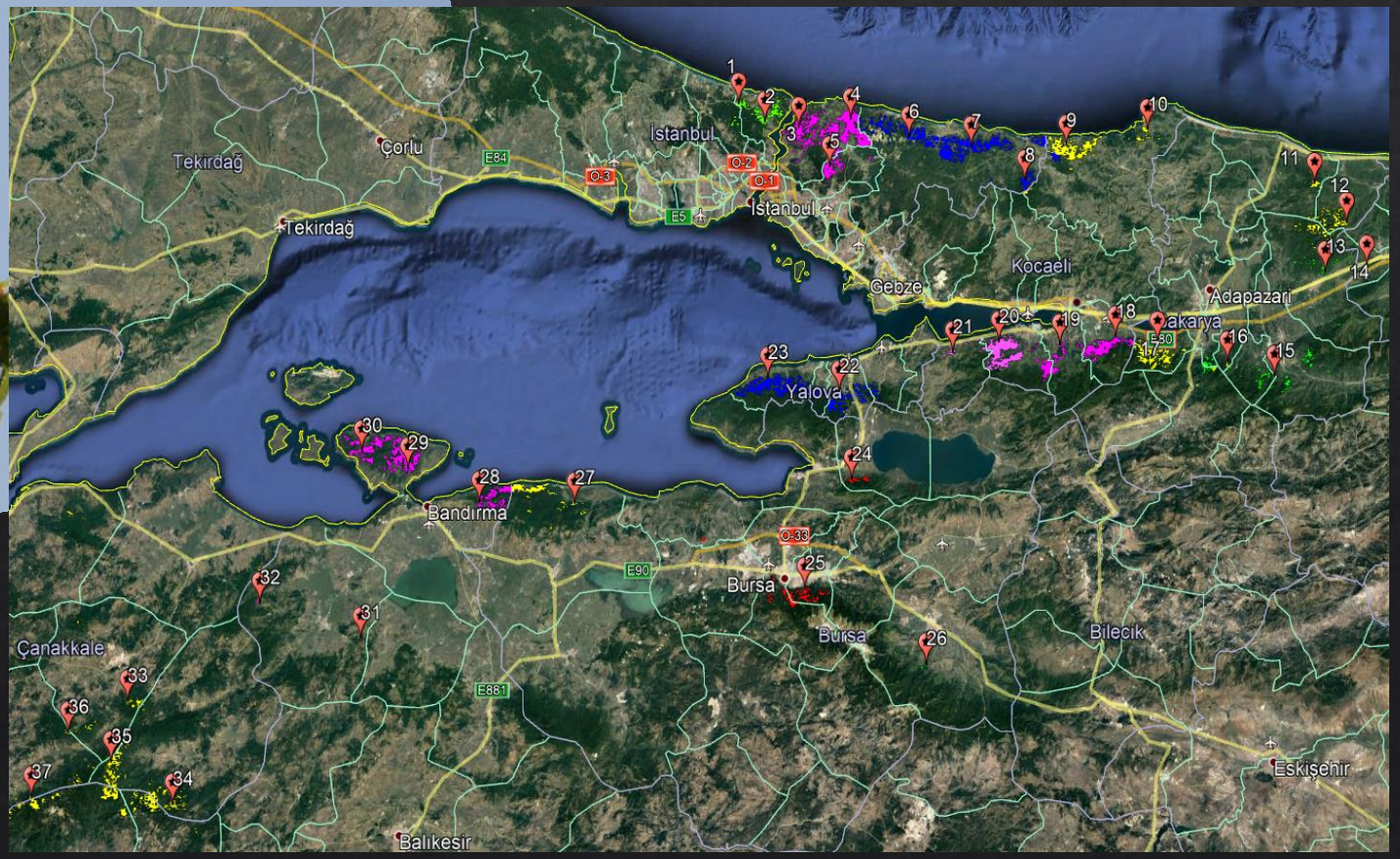
hyperparasitism

hybridization

New parasitoid species

Oak gall wasp species

Project WASPCOM
Submitted to FGD



acknowledgements

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Food and Agriculture Organization of the United Nations
TCP/TUR/3501: International Technical Assistance to Control Chestnut Gall Wasp (*Dryocosmus kuriphilus*) in Turkey's Chestnut Forests

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