

NOTA BREU

Torymus sinensis* Kamijo, 1982 (Hymenoptera, Torymidae) has arrived in Spain**Torymus sinensis* Kamijo, 1982 (Hymenoptera, Torymidae) ha arribat a Espanya**

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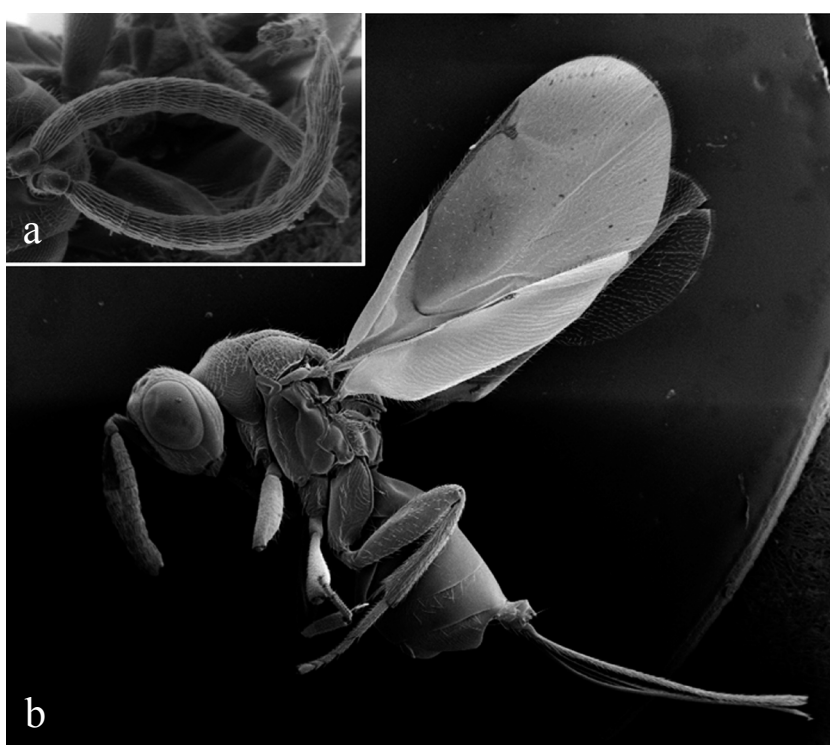


Figure 1. SEM pictures of *Torymus sinensis* collected in Catalonia: (a) male antenna, (b) female habitus.

Dryocosmus kuriphilus Yasumatsu, 1951 (Hym., Cynipidae), an Oriental pest in chestnut (*Castanea* spp), was detected for the first time in the Iberian Peninsula in 2012 (Pujade-Villar *et al.*, 2013). It was introduced accidentally in Europe, via Italy in 2002, according to (Brussino *et al.*, 2002).

Torymus sinensis Kamijo, 1982 (Fig. 1) is a parasitoid, native from China, and a specific species attacking *D. kuriphilus*. It has already been used in America and Oriental Palaearctic successfully. In Europe, the first releases of this species took place in Italy in 2005 (Quacchia *et al.*, 2008) which also served as a testing ground. Among the many studies conducted in Italy with *T. sinensis*, Matošević *et al.* (2015) mention that after 6-7 years parasitism, this parasitoid reduced the populations of *D. kuriphilus* to tolerable levels (infestation less than 30 %). Later, several years after releasing *T. sinensis* in Italy and probably pressured by tree economic losses, different co-

untries took this initiative as well: France from 2011-2013 (Borowiec *et al.*, 2014), Croatia and Hungary in 2014-2015 (Matošević *et al.*, 2015) and Slovenia in 2015 (Matošević *et al.*, 2015). Once released this species does not only occupy the area of liberation but spreads into others due to its great mobility. There have been some test-releases in Spain and Portugal as well (Paparella *et al.*, 2016). In the case of Spain, these tests were carried out in the South (Andalusia) and the Northwest (Galicia and Asturias) of the country, according to Gerardo Sánchez Peña (pers. com., Biocastanea-2017)..

Torymus sinensis has shown high dispersal ability, spreading over short distance by active flight and over long distance aided by wind, being able to cover more than 70 km in only a few days (Colombari & Battisti, 2015). In the northeast of the Iberian Peninsula, the locations where *T. sinensis* were collected emerging (in 2016) from *D. kuriphilus* galls

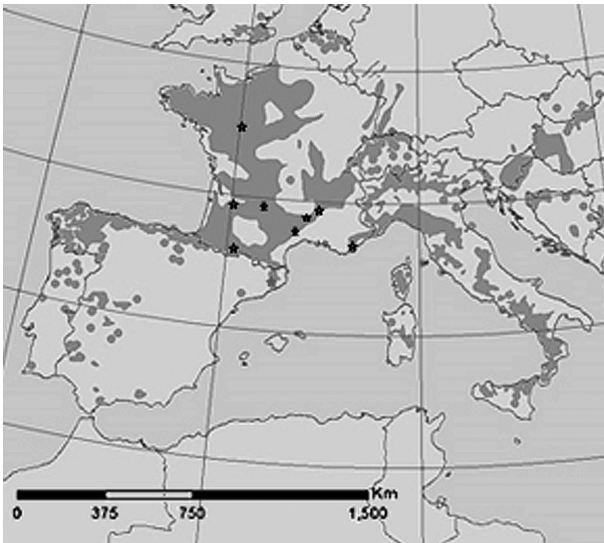


Figure 2. Distribution of *Castanea sativa* in Eastern Europe (obtained from http://www.euforgen.org/fileadmin/templates/euforgen.org/upload/Documents/Maps/JPG/Castanea_sativa.jpg) including the points of *T. sinensis* release in France (obtained from <https://www6.inra.fr/cynips-chataignier/Principaux-resultats>) and the point where this parasitoid was collected in *Dryocosmus kuriphilus* Catalanian galls.

are: Olot (La Garrotxa, Girona): 12 ♀ 9 ♂; Celrà (El Gironès, Girona): 13 ♀ 5 ♂; and Montseny (La Selva, Girona): 5 ♀ 1 ♂. All these localities are around 300-400 km far from the closest *T. sinensis* releasing sites in France (Fig. 2). Considering the data mentioned above, they have had enough time to reach the Catalan territory (4-7 years), so we have no doubt that this has been the most possible way for *T. sinensis* to reach Catalonia. We must also keep in mind that the border between Spain and France is a windy place where the heights of the mountains (via Girona near the sea) are by no means in any case a geographical barrier, while winds are strong and abundant in this mentioned area. We must also mention that cinipids (and by extension Chalcidoidea) can travel long distances thanks to air currents; Ros-Farré & Pujade-Villar (1988) showed that *Plagiotrochus amenti* Kieffer, 1901 (Hym.: Cynipidae) was displaced off in an annuity about 200 km. On the other hand, a nearly continuous distribution of *C. sativa* with presence of *D. kuriphilus* favours the implantation of *T. sinensis* in areas far from the liberation site (Fig. 2). In fact, the present populations of *T. sinensis* in Hungary are due not only because of the releasing but also by the natural migrating of specimens from Italy (Matošević *et al.*, 2017a). Records of *T. sinensis* in countries where no release has yet been made have already been mentioned in Switzerland in 2013, in England in 2015 (Bartlett, 2016), in Bosnia and Herzegovina in 2016 (Matošević *et al.*, 2017b) and now (since 2016) in Catalonia (Girona province).

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Bibliography

- BARTLETT, D. 2016. Viewpoint: Partnerships in action – Europe and beyond. *Inpractice* [Bulletin of the Chartered Institute of Ecology and Environmental Management. CIEEM (Chartered Institute of Ecology and Environmental Management)], 94: 13-15.
- BOROWIEC, N., THAON, M., BRANCACCIO, L., WAROT, S., VERCKEN, E., FAUVERGUE, X., RIS, N. & MALAUSA, J. C. 2014. Classical biological control against the chestnut gall wasp *Dryocosmus kuriphilus* (Hymenoptera, Cynipidae) in France. *Plant Protection Quarterly*, 29 (1): 7-10.
- BRUSSINO, G., BOSIO, G., BAUDINO, M., GIORDANO, R., RAMELLO, F. & MELIKA, G. 2002. Nuovo cinipide galligeno in Piemonte. Pericoloso insetto esotico per il castagno europeo. *L'Informatore Agrario*, 37: 59-61.
- COLOMBARI, F. & BATTISTI, A. 2015. Spread of the introduced biocontrol agent *Torymus sinensis* in north-eastern Italy: dispersal through active flight or assisted by wind? *Biocontrol*, 61: 127-139.
- MATOŠEVIĆ, D., LACKOVIĆ, N., MELIKA, G., KOS, K., FRANIĆ, I., KRISTON, E., BOZSO, M., SELJAK, G. & ROT, M. 2015. Biological control of invasive *Dryocosmus kuriphilus* with introduced parasitoid *Torymus sinensis* in Croatia, Slovenia and Hungary. *Periodicum Biologorum*, 117: 471-477.
- MATOŠEVIĆ, D., LACKOVIĆ, N., KOS, K., KRISTON, E., MELIKA, G., ROT, M. & PERNEK, M. 2017a. Success of classical biocontrol agent *Torymus sinensis* within its expanding range in Europe. *Journal of Applied Entomology*, 141 (9): 758-767. DOI: <https://doi.org/10.1111/jen.12388>.
- MATOŠEVIĆ, D., MUJEZINOVIĆ, O. & DAUTBAŠIĆ, M. 2017b. First record of biocontrol agent *Torymus sinensis* (Hymenoptera; Torymidae) in Bosnia and Herzegovina. *South-east European forestry*, 8 (2): 147-149. DOI: <https://doi.org/10.15177/seeefor.17-14>.
- PAPARELLA F., FERRACINI C., PORTALURI A., MANZO A. & ALMA, A. 2016. Biological control of the chestnut gall wasp with *T. sinensis*: a mathematical model. *Ecological Modelling*, 338: 17-36.
- PUJADE-VILLAR, J., TORRELL, A. & ROJO, M. 2013. Primeres troballes a la península Ibèrica de *Dryocosmus kuriphilus* (Hym., Cynipidae), una espècie de cinípid d'origen asiàtic altament perillosa per al castanyer (Fagaceae). *Orsis*, 27: 295-301.
- QUACCHIA, A., MORIYA, S., BOSIO, G., SCAPIN, I. & ALMA, A. 2008. Rearing, release and settlement prospect in Italy of *Torymus sinensis*, the biological control agent of the chestnut gall wasp *Dryocosmus kuriphilus*. *BioControl*, 53: 829-839.
- ROS-FARRÉ, P. & PUJADE-VILLAR, J. 1998. Estudio mediante una trampa Malaise de la comunidad de cinípidos cecidógenos e inquilinos de Santa Coloma, Andorra (Hymenoptera, Cynipidae). *Ecología*, 12: 441-454.