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**Infestation of wood pallets by *Sinoxylon unidentatum* (Fabricius)
(Coleoptera Bostrichidae) in Italy**

Abstract - *Sinoxylon unidentatum* (Fabricius) (= *S. conigerum* Gerstäcker) was found infesting wood pallets used to import tea from Sri Lanka. The tea arrived in Italy in June 2009. The beetles completed the development in the warehouse and spread the infestation to other pallets. *S. unidentatum* was previously intercepted in Italy but this is the first time it has been reported to be able to complete the development and to spread the infestation in an indoor site.

Riassunto - *Infestazione di Sinoxylon unidentatum* (Fabricius) su pallet di legno in Italia.

Si segnala una importante infestazione provocata da *Sinoxylon unidentatum* (Fabricius) (= *S. conigerum* Gerstäcker) in un magazzino, a seguito di una importazione di the dallo Sri Lanka, su pallet in legno di *Shorea* sp.. Dopo alcuni mesi dal rilevamento, si è riscontrata la diffusione dell'attacco su altri pallet, costringendo alla distruzione di tutto il materiale ligneo. *S. unidentatum* era già stato intercettato in Italia, ma questo è il primo caso in cui è stato in grado di svilupparsi e di diffondersi in un magazzino.

Key words: auger beetles, infested pallets, alien insects, *Sinoxylon unidentatum*, warehouse infestation.

At the end of September 2009, an insect infestation was observed in a warehouse in Tortona (44°51'N; 8°48'E), province of Alessandria, Piedmont. Several bostrichids were attacking wood pallets used to stack the tea sacks. The wood pallets and the tea sacks had been imported from Sri Lanka in June 2009. During the inspection piles of sawdust and newborn adults were noticed under several pallets. The beetles were able to complete the development in the warehouse during summer and to spread the infestation to near pallets.

About fifty adults were collected and identified as *Sinoxylon conigerum* Gerstäcker, 1855, using Lesne's monograph (1906). In addition to confirm its identification, our material was compared with some *S. conigerum* specimens cited by Poggi *et al.* (1994), preserved at Museo civico di Storia naturale "G. Doria" of Genoa. We examined in particular specimens coming from Giuba (Somalia) and specimens intercepted in Turin (Italy), that were compared with material identified by Lesne. *Sinoxylon conigerum* is actually considered a junior synonym of *S. unidentatum* (Fabricius, 1801) (Borowski, 2007).

S. unidentatum is common in the Tropics, especially in Asian countries. The species was described by Fabricius from *India orientali* and it is widespread in various countries of Oriental and Afrotropical regions; it is also recorded for Yemen and China (Borowski, 2007). Introductions are known in Australian, Nearctic and Neotropical regions (Borowski, 2007), and in Japan (Iwata & Nakano, 2006). In Europe it was intercepted in Germany, Great Britain, Italy, Poland, Russia and Spain (Karnkowski, 2006; Bahillo de la Puebla *et al.*, 2007; Borowski, 2007).

The first record in Italy was at Venice port in 1969 by Ratti (2004, sub *S. conigerum*) that found an adult on rhizomes of manioc imported from South Africa. In 1994 *S. unidentatum* was found in Turin, in small branches of wood imported from the Philippine Islands (Poggi *et al.*, 1994, sub *S. conigerum*).

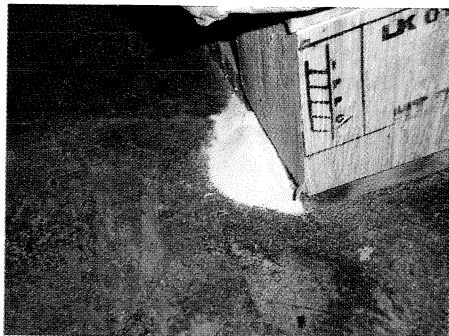
Other alien species of the same genus were recorded in Italy: *Sinoxylum ruficorne ruficorne* Fåhraeus, 1872 (Gambetta & Orlandi, 1982; Audisio *et al.*, 1995), *S. sudanicum* Lesne, 1895 (Ratti, 2004), *S. sp. aff. angolense* Lesne, 1906 (Ratti, 2004). As for *S. unidentatum* they were intercepted but not established.

S. unidentatum can attack a great variety of plants belonging to several families as Ulmaceae, Euphorbiaceae, Lauraceae, Dipterocarpaceae, Mimosaceae, Leguminosae, Anacardiaceae, Rubiaceae, etc. (Fisher, 1950; Poggi *et al.*, 1994; Peres Filho *et al.*, 2006; all sub *S. conigerum*).

The biology of *S. unidentatum* appears not to have been studied in detail, but it is likely to resemble that of other *Sinoxylum* species (Beeson & Bathia, 1937; Liu *et al.*, 2008). Fisher (1950) said the adults are nocturnal and attracted to lights.

In our study, the wood of the infested pallets from Sri Lanka (used to stack the tea sacks) belongs to the genus *Shorea* (Dipterocarpaceae). It is an excellent wood with hand and machine tools, giving a good finish in most operations. It nails, screws and glues well, and takes all finishing treatments. It dries moderately fast, with little tendency to split. It is used for all purposes for which softwoods are used (furniture, interior fittings, joinery, flooring, plywood).

The damage we observed on wing pallets was considerable: a great quantity of fine powder, ejecting from exit holes and accumulating below wooden pallets, noticeable holes of emerged adult and larval tunnels that can compromise the structure (Figs 1-4). Initially, the bulk of infestation was relegated to few pallets. At first the new born adults infested the nearby pallets and in a few months also other pallets in the warehouse. In October 2009, *S. unidentatum* was present in different areas of the whole warehouse. Several holes were also observed on the tea sacks made of paper which had to be removed causing economic loss.



Figs 1 - 2. Fine dust ejecting from exit holes and accumulating below wood pallets.

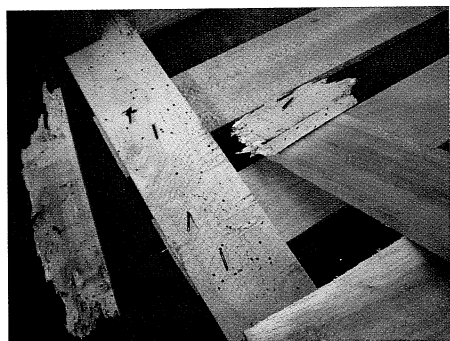


Fig. 3 - Exit holes of *S. unidentatum* adults on wood pallets.



Fig. 4 - Adult of *S. unidentatum* in a tunnel.

All wood pallets in the warehouse were removed and destroyed by burning. The warehouse was cleaned and treated with a pyrethroid on floor and walls. The tea sacks were leant on new pallets made by coniferous wood.

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REFERENCES

- AUDISIO P., GOBBI G., LIBERTI G., NARDI G., 1995 - Coleoptera Polyphaga IX (Bostrichoidea, Cleroidea, Lymexyloidea). In: Minelli A., Ruffo S., La Posta S. (eds.), Checklist delle specie della fauna italiana, 54. - Calderini, Bologna: 27 pp.
- BAHILLO DE LA PUEBLA P., LÓPEZ-COLÓN J.I., BAENA M., 2007 - Los Bostrichidae Latreille, 1802 de la fauna ibero-baleár (Coleoptera). - Heteropterus Revista de Entomología, 7 (2): 147-227.
- BEESON C.F.C., BATHIA B.M., 1937 - On the biology of Bostrychidae (Coleopt.). - Indian Forest Records, Entomology, 2: 223-323.
- BOROWSKI J., 2007 - Bostrichidae, pp. 320-328. In: Löbl I. & Smetana A. (eds.), Catalogue of Palaearctic Coleoptera, vol. 4. - Apollo Books, Stenstrup: 935 pp.
- FISHER W.S., 1950 - A Revision of the North American species belonging to the Family Bostrichidae. - United States Department of Agriculture Miscellaneous Publications, 698: 157 pp.
- GAMBETTA A., ORLANDI E., 1982 - Su alcuni insetti reperiti nel legname nei depositi - I° Lictidi e Bostrichidi. - Contributi scientifico-pratici per una migliore conoscenza ed utilizzazione del legno, C.N.R., Firenze, 30 (77): 1-28.
- IWATA R., NAKANO K., 2006 - Occurrence of *Sinoxylon conigerum* Gerstaecker (Coleoptera: Bostrychidae: Bostrychinae) on a picture frame manufactured in Java. - House and Household Insect Pests, 28 (1): 81-83.

- KARNKOWSKI W., 2006 - Beetles from the family Bostrichidae in wood packaging from China. - *Ochrona Roslin*, 51 (11): 39-40.
- LESNE P., 1906 - Revision des Coléopterès de la famille des Bostrychides. 5^e Mémoire. Sinoxylinae. - *Annales de la Société entomologique de France*, 75: 445-561.
- LIU L.Y., SCHÖNITZER K., YANG J.T., 2008 - A review of the literature on the life history of Bostrichidae (Coleoptera). - *Mitteilungen der Münchner Entomologische Gesellschaft*, 98: 91-97.
- PERES FILHO O., TEIXEIRA É. P., BEZERRA M.L.M., DORVAL A., BERTI FILHO E., 2006 - First record of *Sinoxylon conigerum* Gerstäcker (Coleoptera: Bostrichidae) in Brazil. - *Neotropical Entomology*, 35 (5): 712-713.
- POGGI R., BRUSSINO G., SCARPELLI F., 1994 - Intercettazione in Piemonte di *Sinoxylon conigerum* Gerstäcker (Coleoptera: Bostrichidae). - *Atti XVII Congresso Nazionale Italiano di Entomologia*, Udine 13-18 giugno 1994: 217-219.
- RATTI E., 2004 - *Coleoptera Lyctidae e Bostrichidae* intercettati nel porto e negli ambienti urbani di Venezia. - *Bollettino del Museo civico di Storia naturale di Venezia*, 55: 121-125.

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