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An interesting case of polystyrene consumption by *Reticulitermes lucifugus* (Blattodea: Neoisoptera, Rhinotermitidae)

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Abstract
A colony of *Reticulitermes lucifugus* from Apulia (SE Italian Peninsula) was recently observed to have partially consumed some polystyrene panels applied on a wall, and used like seat for termite nest. Further observations could allow to better understand if this colony is just able to physically consume and chew this plastic material, releasing it chemically intact after the passage throughout the termites' digestive system, or if their microbiome could allow the insects to at least partially metabolize and degrade the ingested polystyrene fragments, as recently observed in a few other insects.

Key words: *Reticulitermes lucifugus,* Neoisoptera, Rhinotermitidae*,* polystyrene consumption, biological degradation, plastic-eating insects.

Thanks to the removal of two polystyrene panels (ca. 3 mm thick) from a wall, in a locality of southern Puglia near Lecce (SE Italy: Galatone, ca. 60 m a.s.l., March/April 2019) it was possible to detect that these panels were attacked by a small colony of the widespread termite *Reticulitermes lucifugus* (Rossi, 1792) (Figs 1-3).

The portions of polystyrene attacked by the termites appeared empty inside and, observing the walkways, it was possible to notice abundant excrements mixed with finely chopped polystyrene microfragments. It is certainly remarkable the unusual adaptation of this colony to use a material exhibiting so markedly different physical-chemical characteristics from wood (Figs 1-3).

A key-point of this observation is obviously to check as soon as possible if termites of this colony are just able to physically chew and consume polystyrene without modifying its chemical structure during the transit of plastic micro-fragments in the insects' digestive system, or if their midgut microbiome could allow the insects to at least partially metabolise polystyrene. This possibility potentially introduces perspectives for biological degradation of this widespread plastic material and its derivatives by termites, as elsewhere observed in a few other insect groups, fungi and bacteria (Dickmann 1933; Yamada-Onodera et al. 2001; Yang et al. 2014, 2015; Yoshida et al. 2016; Bombelli et al. 2017; Danso et al. 2019; Cassone et al. 2020).

Among further observations and experimental research planned to face this interesting perspective, particular emphasis will be given to identify the structure of the insect colony endosymbiont microbioma at qualitative and quantitative terms, in comparison with other termite's colonies reared on wood substrate (Husseneder 2010).

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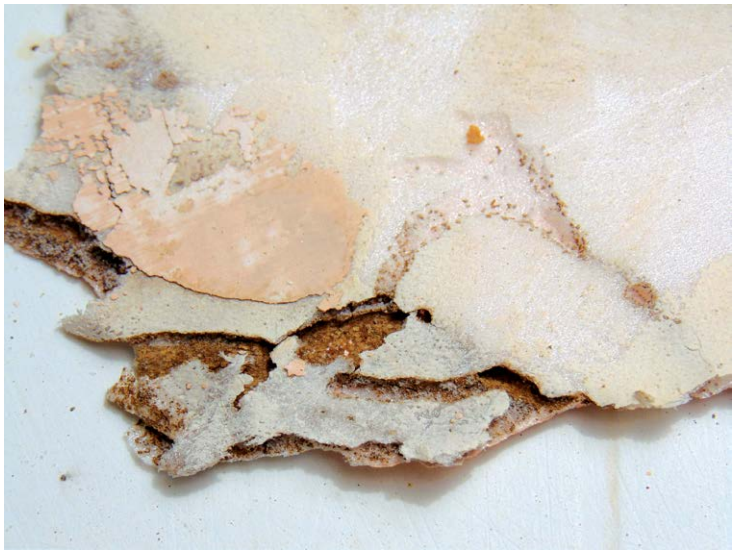

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Figs 1-3 – Different portions of some polystyrene panels perforated by the studied colony of the termite *Reticulitermes lucifugus* (Rossi, 1792) (Italy, Apulia, Lecce province, Galatone, March 2019). Photos by E. Rolli.