English Abstracts

■ Long-horned beetles as a threat to forest and ornamental trees in Israel: current situation and management options

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Long-horned beetles (Cerambycidae) may become severe pests when they encounter tree species suitable for their colonization and development. Susceptible host trees may display a genetic mismatch or be subjected to physiological weakness, and therefore lack the required defense systems needed to face the beetles' attack. Approximately 130 species of cerambycids are known in Israel, and as expected, only a minority among them are considered severe pests of healthy trees. Herein, we review some indigenous species that have become harmful: the duke beetle *Cerambyx dux*, the great capricorn beetle *C. cerdo*, the grape wood borer *C. Chlorophorus varius*, the mango branch borer *Niphona picticornis* and the sycamore borer *Rhaesus serricollis*. The five aggressive invasive long-horned beetle species identified in Israel, are also briefly discussed: the mango stem borer *Batocera rufomaculata*, two eucalyptus borers *Phoracantha semipuncatata* and *P. recurva*, the lebbek borer *Xystrocera globosa*, and the black pine sawyer beetle *Monochamus galloprovincialis*, known as a vector for the pine pathogenic nematode *Bursaphelenchus xylophilus*. Potential damage of the two Asian long-horned beetles, *Anoplophora glabripennis* and *A. chinensis* in Israel is discussed. Both these species have already become established in the East Mediterranean and may invade northern Israel in the near future. We present in brief, the direct and indirect effects of climate change on the performance of long-horned beetles as tree pests. Development of management tools to cope with the emerging problem of the long-horned beetle focused on three fields of activity. 1) Evaluating ten commercial insecticide formulations to prevent tree colonization by long-horned beetles, with an emphasis on environmentally friendly compounds; 2) evaluating the efficacy of specifically designated seismic sensors to detect tree colonization by larvae of long-horned beetles; 3) establishing a network of traps baited with commercial lures to identify the occurrences of the Asian long-horned beetles and the black pine sawyer beetle in Israel.

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■ The Nazareth-Dabburiya wildfire: remote sensing to assess burn severity — use and insights

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Wildfires are part of the Mediterranean ecosystem and are expected to increase due to climate change and global warming. This study focused on mapping and classifying burn severity using image-processing techniques based on remote sensing and machine learning. The wildfire in the Nazareth-Dabburiya Forest, which took place on October 9, 2020, was used as a case study to characterize areas with different burn severity. The analysis was based on images from the Sentinel-2 satellite of the European Space Agency (ESA) and an aerial photo taken by the KKL-JNF on 10/25/2020 (about two weeks after the fire). We calculated several vegetation indices, reflecting the changes in the vegetation's chlorophyll or water content following the fire. We used the aerial photo to compile a catalog for a visual assessment of damage to vegetation, consisting of five categories of burn severity. We calibrated the vegetation indices with the catalog and found that the indices allowed us to distinguish the catalog's different categories. We also found a positive relationship between overstory cover percentage and burn severity. This indicates the importance of planting density and thinning to reduce burn severity. We found that the vegetation index, which reflected the chlorophyll content changes, had the highest correlation with the percentage of overstory cover. This may be explained by the dominance of coniferous vegetation in the study area. This study shows the importance of combining satellite information and high spatial resolution aerial photography for assessing fire damage.

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■ Bedouin sheep pens in Keren Kayemeth LeIsrael-Jewish National Fund forests near Modi'in as a basis for the study of ancient pens in the Negev and Sinai

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Abstract

This article was written following the last conference of the IALC and presents data from two research projects focusing on a multidisciplinary-environmental approach to archaeological sites.

One study examined a number of contemporary Bedouin animal pens in anticipation that this investigation would shed light on the rationale underlying the construction of the ancient pens. The study area was in the KKL-JNF forests near Modi'in leased to Bedouins from the desert area of Arad, ca. 100 km to the south during the months grass grow grows naturally. It was found that the main pen in the Bedouin grazing camps is divided into 6-8 smaller areas and is used for sheep, unlike goat pens, which were divided into no more than 2-3 smaller areas. This type of structure is well known from ancient sites in the Negev and Sinai deserts, named "enclosed structures", which were already identified as sheep/goat pens in 19th century studies.

The numerous subdivisions of the sheep pens include the following areas: An area for ewes without lambs, an area for ewes with young lambs, an area for males and ewes who do not go out to graze, (sick or just about to give birth), an area for older lambs who go out to graze, an area for young lambs who do not go out to graze, a feeding area for ewes, a milking area, a meeting area for ewes to suckle their lambs, and the like.

In addition, two more facts were discovered: one is that the sheep need three daily waterings vs. two for goats, and the critical need of the sheep for seasonal green grass in the early springtime without which they do not breed.

The second project, which included fieldwork at selected sites, focused on mapping agricultural systems and sites to a display a ground plan that encompasses all the components of the sites and the surroundings. It was found that during most of the periods the enclosed structures believed to be sheep pens, constitute only about 5% of all the pens, most of which were used for goat husbandry. The exception was a large group of Early Bronze buildings spread between the town of Arad and southern Sinai, in which almost all of the buildings were enclosed structures (95%). The Bedouin encampments layout supports the assumption that sheep husbandry was dominant in that settlement. The goal of this work is to integrate the data of the two projects focusing on the issue of sheep rearing in the desert.

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