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### PROCEEDINGS OF THE THIRTY-FIFTH MEETING OF THE ZOOLOGICAL SOCIETY OF ISRAEL

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**PROCEEDINGS OF THE  
THIRTY-FIFTH MEETING OF THE  
ZOOLOGICAL SOCIETY OF ISRAEL**

HELD AT  
UNIVERSITY OF HAIFA AT ORANIM  
20 December 1998

*PROGRAM*

A session in memory of Dr. Menachem Dor, J. Heller (Hebrew University) presiding.

*SCIENTIFIC SESSIONS*

Presiding: D. Afik (University of Haifa at Oranim), A. Ar (Tel Aviv University), Z. Arad (Technion), L. Blaustein (University of Haifa), A. Bouskila (Ben-Gurion University), T. Dayan (Tel Aviv University), I. Izhaki (University of Haifa at Oranim), G. Katzir (University of Haifa at Oranim), Y. Lubin (Ben-Gurion University), E. Spanier (University of Haifa), Y. Terkel (Tel Aviv University), Y. Yom-Tov (Tel Aviv University).

*GENERAL MEETING OF THE SOCIETY: M. Ilan presiding*

Board Elected: D. Afik (University of Haifa at Oranim), Z. Arad, treasurer (Technion), D. Golani, comptroller (Hebrew University), A. Bachi (Ben-Gurion University), A. Haim, chairperson (University of Haifa at Oranim), J. Heller (Hebrew University), E. Spanier, comptroller (University of Haifa), O. Mokady (Tel Aviv University), S. Nemtzov (The Nature Protection and National Parks Authority), M. Ziv (Ben-Gurion University).

*CLOSING CEREMONY: J. Heller presiding*

The Michael Costa Prize for the best Ph.D. student paper was awarded to N. Leader (Tel Aviv University) for his presentation "Microgeographic song variation in the orange-tufted sunbird, *Nectarinia osea*." The Gidy Zakai Memorial Prize for the best M.Sc. student paper was awarded to N. Werner (Tel Aviv University) for his presentation "Family quarrels: Evidence for interference competition among helpers in a cooperatively breeding species."

Special thanks to the Zakai and Costa families for the contribution of the awards given to the best presentations, and to D. Graur for helping in the preparation of the proceedings.

profile of migrating and wintering pelicans did not indicate a state of dehydration but did indicate energy deficiency. The less extreme changes in the blood chemistry of the food-deprived birds compared with that of the migrating ones suggest that the former have not reached a state of starvation. We conclude that migrating white pelicans need to rest and replenish their reserves during their stopover in Israel in order to complete their autumn migration to Africa.

**Bird species diversity in the Negev: Effects of scrub fragmentation by planted woods**

E. SHOCHAT. *Department of Life Sciences, Ben-Gurion University of the Negev, Beer Sheva 84105, Israel*

Since 1956, large scrub areas in the northern Negev have been fragmented by planted forest patches comprised of uniform subunits of different ages. Today, this new landscape matrix consists of scrub patches and primarily coniferous woods. This alteration in landscape pattern was followed by changes in bird diversity. I evaluated bird abundance and distribution in scrubland and woodland patches using line transects. Specialist ground-nesting species were absent from all planted areas and from small (< 50 ha) scrub patches. In woods, 91% of species richness could be explained by area. Five new immigrant species from the Mediterranean zone are apparently woods specialists, as their distribution was restricted to woods older than 13 years in patches greater than 300 ha. My results suggest that species richness increases in wood patches due to habitat heterogeneity; large patches contain a wider range of tree ages than small patches. Furthermore, I found a significant effect of tree age on species density and species richness. Species richness peaked in 30-year-old woods.

**Density-dependent habitat selection in migratory passerines during stopovers: What causes the deviation from an ideal free distribution and habitat-matching?**

E. SHOCHAT. *Department of Life Sciences, Ben-Gurion University of the Negev, Beer Sheva 84105, Israel*

I studied the distribution of migratory warblers in stopover patches in the northern Negev, Israel by integrating two approaches to density-dependent habitat selection: the isodar method and habitat-matching. My purpose was to test predictions based on the ideal free-distribution (IFD) model in a natural ecosystem with a high turnover of individuals moving between unfamiliar foraging patches. I compared bird densities, body condition, and resource-consumer matching between two *Pistachia atlantica* groves. Fruit density in the rich grove was 45 times higher than in the poor grove. In agreement with IFD predictions, repeated measures of different individuals throughout autumn revealed a high correlation between the warbler densities in the two groves. However, warbler density in the poor patch was higher than expected by the habitat-matching rule. This habitat under-matching, also detected by the isodar method, had a cost, as birds in the poor plot were lean, compared to the rich plot. Neither different competitive abilities, nor interference, could explain the apparent under-matching pattern. Rather, I suggest that temporal bird communities are not at equilibrium due to imperfect knowledge of resource distribution. This lack of knowledge leads to a free but non-ideal distribution across unfamiliar stopover sites.

**How behavior affects patchy population dynamics in the mosquito *Culiseta longiareolata*: A stage-structured model**

M. SPENCER,<sup>a</sup> L. BLAUSTEIN,<sup>a</sup> J.E. COHEN,<sup>b</sup> and M. MANGEL.<sup>c</sup> *<sup>a</sup>Institute of Evolution, University of Haifa, Haifa 31905, Israel; <sup>b</sup>Laboratory of Populations, Rockefeller University, 1230 York Ave., P.O. Box 20, New York, NY 10021-6399, USA; <sup>c</sup>Department of Environmental Studies, University of California, Santa Cruz, CA 95064, USA*

The mosquito *Culiseta longiareolata* inhabits temporary freshwater pools in Israel and other countries. Motile adult females deposit rafts of eggs in pools, in which larvae develop. Predators such as the backswimmer *Notonecta maculata* cause high larval mortality when present. In the absence of these predators, high densities of larvae result in slower development and possibly higher mortality. Experimental evidence suggests that, given a choice among pools in a region, females avoid ovipositing in pools with predators and perhaps also in pools with high densities of larvae. We describe a preliminary nonlinear stage-structured model which includes these effects. Using parameters estimated from our experiments and the literature, we show that both density-dependent mortality and oviposition habitat selection by females are likely to be important for regional population dynamics. The oviposition habitat-selection strategy used by females may decrease the importance of predation and increase the importance of competition in regulating *Culiseta* populations.

#### **Developing a molecular tool for environmental monitoring**

A. SULTAN and O. MOKADY. *Institute of Nature Conservation Research, George S. Wise Faculty of Life Sciences, Tel Aviv University, Tel Aviv 69978, Israel*

The Mediterranean coastal zone of Israel is subjected to environmental pollution due to domestic sewage and a high concentration of heavy metals and organochlorides, that are discharged to the sea from industrial sources. Conservation of the marine environment requires the calibration of pollution-monitoring systems. Monitoring systems that employ direct analysis of the water and the sediment may not necessarily reflect the true ecological state because the analysis is calibrated for specific pollutants and does not allow the examination of synergistic effects among different pollutants. In addition, actual concentrations of pollutants may not correlate with their bioavailability. Biomonitoring is suggested as a means to overcome these problems. We aim at establishing a biomonitoring system based on alterations in gene expression as a response to environmental pollution. This is achieved by differential display PCR, a method that detects fragments of differentially expressed genes in response to pollution, without prior knowledge of their sequence. The bivalve *Donax trunculus* serves as a biomonitor in this research. Comparative molecular analyses of gene expression were performed on two bivalve populations, one from an area suspected as polluted near the Frutarom chemical plant in Haifa Bay and another from an unpolluted area at Ma'agan Mikha'el. In addition, experimental groups of bivalves, collected from the unpolluted area, were exposed to increasing levels of pollution for 30 days. Alterations in gene expression as a response to the controlled levels of pollution were examined, and differential bands were isolated. Those fragments were cloned for sequencing. It is feasible to design specific primers for every fragment, which will serve in the future as part of a diagnostic kit for identifying marine pollution.

#### **Changes in the meaning of נשר (*Nesher*) and עיט ('*Ayit*) in Hebrew**

D. TALSHIR. *Department of the Hebrew Language, Ben-Gurion University of the Negev, Beer Sheva 84105, Israel*

In the Biblical and Mishnaic Eras, when Hebrew was still a living language, *Nesher* was the Hebrew name for vulture, whereas '*Ayit* was a collective noun for scavenger birds (from the Hebrew root עוֹט) that swoop down on carrion, rather than a reference to a specific bird species. Later, for more than a thousand years, when people no longer lived close to nature and Hebrew ceased to be their language, *Nesher* came to mean eagle, whereas '*Ayit* fell into disuse. In the 19th century, as Hebrew books on zoology began to be written, and terms were needed to designate each and every species, *Nesher* continued to designate the eagle, whereas the vulture assumed the name *Dayya*, and the kite was