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Honeybee (*Apis mellifera*) health is increasingly compromised by multiple chemical stressors, including pesticides, environmental chemicals and in-hive produced chemicals. Assessing their impact requires holistic, non-invasive, and standardized approaches, as traditional methods often involve live colonies and suffer from limited sensitivity and comparability.

This study presents the APIStrip (Adsorb Pesticide In-hive Strip), a Tenax-TA-based passive sampler that accumulates target and non-target chemicals inside hives without disturbing bees. APIStrips are deployed for 15 days, enabling standardized, trace-level monitoring. Extraction followed by both high-resolution mass spectrometry (HRMS) provides a comprehensive chemical profile.

Preliminary validation showed high sensitivity, reproducibility, and representativeness. A non-targeted HRMS study was conducted using APIStrips in 30 apiaries across Denmark, Sweden, and Finland. Duplicate samples were collected during two (Sweden, Finland) or five (Denmark) sampling rounds. Full scan and IDA-MS/MS modes enabled tentative identification of key compounds through spectral libraries and accurate mass analysis.

Discovery-based exposomics revealed variations in hive chemical burdens across regions and time. For example, Linoleoyl ethanolamide was frequently found in Swedish hives but not in others. Seasonal variation in Denmark highlighted dynamic shifts in chemical exposures.

These results demonstrate that APIStrips combined with HRMS offer a powerful, non-invasive exposomic platform. This methodology supports hypothesis generation for follow-up studies on bee health and provides insight into regional and temporal differences in chemical exposure. The findings highlight the potential of passive samplers in environmental monitoring and contribute to a better understanding of stressor impacts on bee populations