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ABSTRACT BOOK

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Several pesticides are recognized as endocrine disruptors (EDs) since they can interfere with the dysregulation of sexual, thyroid and neuro-endocrine hormones contributing to earlier pubertal onset. Exposure to pesticides can be considered an important factor associated with precocious puberty and premature thelarche in girls. Children are particularly vulnerable to the effects of EDs due to their developmental stage, peculiar lifestyle and dietary habits. The main objective of the PEACH project is to evaluate the association between exposure to pesticides and idiopatic premature thelarche in girls, through the measurement of pesticides in urine and the dietary intake, by analysing locally produced foods. Girls living in an agricultural area of Marche region (Centre of Italy) and with idiopathic premature thelarche (2-7 years old), matched to healthy subjects (controls), were enrolled (N=60+60). They are asked to fill in the food frequency questionnaire (FFQ) and to deliver urine samples. Furthermore, sampling of locally produced foods was performed. Food and urine were analysed by LC or GC-MS/MS to detect the pesticide levels. The FFQ was organized in three parts: the first part included personal information on their area of residence, the second part the eaten food, as well as their place of purchase or local production (farm or private garden), the third part concerned the food diary. The activities are still ongoing, but the preliminary results obtained in the urines (N=43 premature thelarche and N=13 controls) showed pesticide levels below the quantification limit of the method. Otherwise, several pesticides were detected in fruits and vegetables (N= 11 samples consumed by cases and N=11 by controls) sampled in the local farms. Small fruits and berries, in particular grape and strawberry, and stone fruits (apricots, peaches, cherries, and plums) reported the highest number of pesticides including carbamates, pyridinylethylbenzamide, benzamide, phenylpyrrole and triazole fungicides and also insecticides as neonicotinoids and carbohydrazide. The pome fruit and cucurbits (melon and watermelon) reported only the presence of neonicotinoids. Leafy vegetables reported the presence of a systemic fungicide, the metalaxyl. All vegetables and fruit from private gardens are still under analysis as well as the other commodity categories (meats, eggs, oil, honey). At the end of the project, data integration will provide an estimate of the risk of potential effects of pesticides on premature thelarche, linked to dietary intake.

terized through RP-HPLC/nESI-MS/MS and the synthetic peptide was obtained by GenScript Biotech (Netherlands). According to the database BLAST, the sequence showed 75% identity with a carboxypeptidase and endopeptidase of a bacterium, *Candidatus schekmanbacteria*. In order to predict the potential of this molecule as antimicrobial peptide (AMP) and similarities with already described AMPs, the "APD3: Antimicrobial Peptide Calculator and Predictor" tool of the Antimicrobial Peptide Database (APD) has been used. The synthetic peptide has a length of 11 amino acids and is characterized by a negative net charge -1 and a hydrophobic ratio of 36%. The sequence has three hydrophobic residues on the surface and a good Boman index (1.69 kcal/mol). According to the prediction of the database APD3, this synthetic peptide may have good chances to form alpha helices and interact with bacterial membrane. In addition, the sequence also shows 50% amino acid similarity with acidocin LCHV, a bacteriocin from *Lactobacillus acidophilus* whose anti-Gram positive, anti-Gram negative and antifungal properties have already studied in literature. The antimicrobial properties have been evaluated against four relevant bacterial pathogens (*Staphylococcus aureus* ATCC 25923, *Pseudomonas aeruginosa* ATCC 15442, *Escherichia coli* 25922, *Enterococcus faecalis* ATCC 29212) and a yeast (*Candida albicans* ATCC 10231). Synthetic peptide was tested in concentrations ranging from 800 mg/ml to 6.2 mg/ml. The results, expressed in terms of Minimum Inhibitory Concentration (MIC), showed no antimicrobial activity of the synthetic peptide towards planktonic tested strains. The antibiofilm activity of the synthetic peptide has been analyzed against *S. aureus* ATCC 25923, *P. aeruginosa* ATCC 15442, *E. coli* ATCC 25922 and *E. faecalis* ATCC 29212. The assays were performed using sub-MIC concentrations of 50 mg/ml, 25 mg/ml, 12.5 mg/ml and 6.2 mg/ml. The results showed that the inhibition of biofilm formation was strongly evident in *E. coli* ATCC 25922 at IC_{50} 49.8 mg/ml and low in *S. aureus* ATCC 25923. In contrast, the synthetic peptide did not inhibit the formation of biofilm in *P. aeruginosa* ATCC 15442 and in *E. faecalis* ATCC 29212. With the aim to increase the antimicrobial and antibiofilm properties of the natural peptide, the initial sequence has been modifyied, according to the database APD3, by replacing some hydrophilic and negative amino acids with hydrophobic and positive amino acids, obtaining the derivative WVVRLNAPGKK. In conclusion, bioinformatic analysis has revealed that natural peptide identified in green leaves of *P. oceanica*, may represent a new scaffold for the design of novel antimicrobial and antibiofilm peptides, making them promising candidates for the treatment of drug-resistant pathogens.

ANTIMICROBIAL AND ANTIBIOFILM ACTIVITY OF A PEPTIDE IDENTIFIED IN THE SEAGRASS *POSIDONIA OCEANICA*

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The present study was carried out to evaluate the antimicrobial and antibiofilm activity of a peptide identified in a polypeptide-enriched extract from green leaves of the Mediterranean seagrass *Posidonia oceanica* (L. Delile) (Posidoniaceae). The sequence NVVELNAPGDK was charac-

MICROPLASTICS AS A SOURCE OF ENDOCRINE DISRUPTING CHEMICALS: EVALUATION OF THE POSSIBLE EFFECTS ON *IN VITRO* AND *IN VIVO* MODELS

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Environmental pollution caused by plastic wastes is a well-known global issue. Although environmental damages are