

These fact leads to animal abuse, especially illegal hunting. Educational programs showing the environmental importance and the hole of birds of prey should be reinforced. The laws applied to these subjects must be considered and other mitigating measures in place to protect these animals should be maintained and reinforced to optimize the health of raptor populations.

References

BRASIL. Lei nº 9.605, de 12 de fevereiro de 1998. Dispõe sobre as sanções penais e administrativas derivadas de condutas e atividades lesivas ao meio ambiente, e dá outras providências. **Diário Oficial [da] União**, Brasília, DF, 13 fev. 1998. Seção I, p. 25-29.

DEEM, S. L.; TERRELL, S. P.; FORRESTER, D. J. A retrospective study of morbidity and mortality of raptors in Florida: 1988–1994. **Journal of Zoo and Wildlife Medicine**, Lawrence, v. 29, n. 2, p. 160-164, 1998.

INSTITUTO CHICO MENDES DE CONSERVAÇÃO DA BIODIVERSIDADE (ICMBio). **Plano de ação nacional para a conservação de aves de rapina**. Brasília, DF: ICMBio, 2008. 136 p. (Série Espécies Ameaçadas, 5)

PUNCH, P. A retrospective study of the success of medical and surgical treatment of wild Australian raptors. **Australian Veterinary Journal**, Carlton, v. 79, n. 11 p. 747-752, 2001.

WENDELL, M. D.; SLEEMAN, J. M.; KRATZ, G. Retrospective study of morbidity and mortality of raptors admitted to Colorado State University Veterinary Teaching Hospital during 1995 to 1998. **Journal of Wildlife Diseases**, Ames, v. 38, n. 1, p. 101-106, 2002.

DETECTION OF FRAUD IN CANNED TUNA

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Introduction: Canned tuna is defined as a product made with tuna, packaged in hermetic way, followed by sterilization to avoid contamination and multiplication by microorganisms, beyond to propitiate integrity until the end of shelf life of the product. For this

product processing, Ministério da Agricultura, Pecuária e Abastecimento (MAPA) published the Normative Instruction 46 of December 15th of 2011, which regulates the production of canned tuna in Brazil (BRASIL, 2011). Thus, fraud occurs for substitution of fish species not allowed by legislation. This study aimed standardize the detection of fraud in tuna canned by polymerase chain reaction (PCR) and real time PCR (qPCR). **Methods:** The samples were constituted of canned tuna from seven different factories, in the following presentation: solid, piece, grated, in oil, in natural, light, and in tomato sauce, comprising 27 samples. The previous treatment of the samples for PCR and qPCR were performed as described by Chapella *et al.* (2007). DNA extraction was made using Wizard® SV Genomic DNA Purification System (Promega®) kit, according to manufacturer's instructions. As internal control, we used primer for beta-actin gene designed in laboratory. **Results:** Of 27 samples analyzed, only one not amplify by PCR, showing the tuna absence (Figure 1). For qPCR 4 samples were considered as containing only tuna, 6 with low concentration of tuna, and 17 with high concentration of other kind of fish.

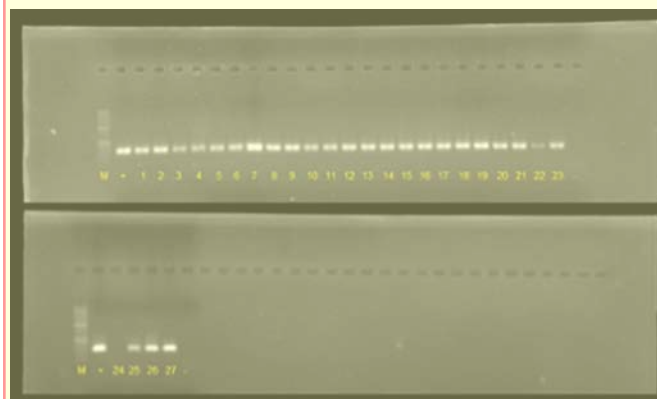


Figure 1 - Product amplification of 100 bp. M: Molecular weight of 100 bp. 1-27: canned tuna. +: Positive control. -: Negative control.

Source: Personal file.

Discussion: In the obtained Results, only 15% of the samples were considered as containing only tuna, which elucidates fraud in the others products. Considering that the product must have credibility and guarantee the rights and food safety for consumers (BARBOSA, 2016), the method applied could be an instrument for fraud detection in canned tuna.

References

- BARBOSA, J. M. Fraudação na comercialização do pescado. *Acta of Fisheries and Aquatic Resources*, São Cristóvão, v. 3, n. 2, p. 89-99, 2016.
- BRASIL. Ministério da Agricultura e Abastecimento. Secretaria de Defesa Agropecuária. Instrução normativa nº 46 de 15 de dezembro de 2011. *Diário Oficial [da] União*, Brasília, DF, 16 dez. 2011. Seção 1, p. 25-26.
- CHAPELA, M. J. *et al.* Comparison of DNA extraction methods from muscle of canned tuna for species identification. *Food Control*, Guildford, v. 18, n. 10, p. 1211-1215, 2007.

CHROMOSOMAL ANALYSIS OF CHELONOIDIS CARBONARIA AND CHELONOIDIS DENTICULATA KEPT IN CAPTIVITY

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Introduction: Chelonians, an order of the class *Reptilia* are mostly long lived animals with relatively small capacity for rapid population growth (POUGH; HEISER; MCFARLAND, 1999). The most widely distributed genus is the *Chelonoidis*, which comprises 22 species found in South America, Africa, Asia and the Oceanic Islands. In Brazil, two species of turtles come from humid forests, the *Chelonoidis carbonaria* and *Chelonoidis denticulata*. The devastation and deforestation of these forests are pointed out as one of the reasons for species of this genus to spread and even mate with each other.

Hybrids may compete for resources with parental species, favored by “hybrid vigor” or, if they are fertile, have an impact on the genetic integrity of wild populations due to the potential risk of backcrossing with consequent introgression. Hybridization can pose a threat to small populations, even when the gene sets do not mix. There are records of hybrids involving species of the same suborder, with the genus *Trachemys* (JACKSON, 2010). In order to provide subsidies for the improvement of sustainable biological management and conservation programs as well as for future projects to be developed with chelonians, this work aimed the characterization of the karyotypes by means of conventional staining, chromosome banding and mapping of some repetitive DNAs in two *Chelonoidis* kept in captivity. **Methods and Materials:** This work analyzed 28 specimens of the genus *Chelonoidis* kept in captivity at the Wildlife Medicine and Research Center from Botucatu/SP and at the Municipal Ecological Park from Americana/SP, Brazil. The morphological characterization between the two species was carried out according to Siqueira, Silva and Moral (2004). The material collection was performed in order to provide the lowest possible risk to the physical integrity of the animal. For the cytogenetic analyzes, samples of 3 mL of peripheral blood were obtained by puncturing the caudal vein. To obtain metaphase chromosomes, it was applied the technique described by Moorhead *et al.* (1960). The banding techniques employed included C-banding by Sumner (1972), the sequential staining CMA₃/DA/DAPI by Schweizer *et al.* (1983) and Ag-NOR-banding by Rufas *et al.* (1987). In addition, slides were submitted to the fluorescence *in situ* hybridization (FISH) procedure employing the 18S rDNA and telomeric motif (TTAGGG)_n as probes. The 18S rDNA probe was obtained from the genomic DNA of *C. carbonaria* using the protocol by Sambrook and Russel (2001). The Polymerase Chain Reaction (PCR) was performed by using the primers Sca18SF and Sca18SR (CABRAL-DE-MELLO; MOURA; MARTINS, 2010). Telomeric probe was obtained by PCR using the complementary primers (TTAGGG)₅ and (CCCTAA)₅ according to (IJDO *et al.*, 1991). The procedures and animal handling were authorized by the Ethical Committee for Animal Research of the São Paulo State University (Unesp), Brazil (protocol 217/10-CEEA). **Results:** By means of morphological analyzes, 20 specimens were defined as *C. denticulata* and eight as *C. carbonaria*.