

**Analysis of Pesticide Residues in Chili Local (*Capsicum annum*) in The Region of Mandailing Natal Regency**

Analisa Residu Pestisida pada Cabai Lokal (*Capsicum annum*) di Wilayah Kabupaten Mandailing Natal

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**ABSTRACT**

Pesticides are chemicals always applied to various types of plant commodities. The most widely applied pesticide applications are horticultural crops. The purpose of this study was to determine the organophosphate pesticide residues contained in local chili in Mandailing Natal regency. The research method in the form of a survey conducted on several local chili farmers and traders in the Mandailing Natal area. In this study, 2 main locations of chili cultivation were taken namely in the village of Sibanggor Julu and Tangga bosu. The study was interviewing 5 local chili farmers. The results showed that the local chili which was observed in the two villages contained pesticide residues. Pesticide residues found in the village of Sibanggor Julu exceed the maximum residue limit (BMR), namely Dimethoat 127,7504 mg/kg and chlorpyrifos 0,1513 mg/kg. As for the Tangga bosu profenofost 7,4302 mg/kg and dimethoat 30,0019 mg/kg.

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**Keywords:** Pesticide, local chili, organophosphate

**ABSTRAK**

Pestisida merupakan bahan kimia yang selalu di aplikasi pada berbagai jenis komoditi tanaman. Aplikasi pestisida yang paling banyak dilakukan adalah pada tanaman hortikultura terutama tanaman sayuran. Tujuan dari penelitian ini adalah untuk mengetahui residu pestisida organofosfat yang terkandung pada buah cabai lokal di Kabupaten Mandailing Natal. Metode penelitian berupa survey yang dilakukan terhadap beberapa petani dan pedagang cabai lokal yang ada di wilayah Mandailing Natal. Pada penelitian ini diambil 2 lokasi utama pertanaman cabai yaitu di desa Sibanggor Julu dan desa Tangga Bosu. Penelitian dilakukan dengan mewawancarai 5 petani cabai lokal. Hasil penelitian menunjukkan bahwa cabai lokal yang diamati di dua Desa tersebut mengandung residu pestisida. Residu pestisida yang ditemukan di Desa Sibanggor Julu melebihi Batas Maksimum Residu (BMR) yaitu; Dimethoat 127,7504 mg/kg dan klorpirifos 0,1513 mg/kg. Sedangkan untuk Desa Tangga bosu ditemukan jenis profenofos yaitu 7,4302 mg/kg dan Dimethoat 30,0019 mg/kg

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**Kata kunci :** Pestisida, cabai lokal, Organofosfat

**INTRODUCTION**

Pesticide is one of important part in the agriculture that can help farmers. Hasibuan (2015), explains the pesticide has an important role to help overcome the problems of pests. Although before commercially produced pesticides have undergone testing are very strict about the terms of salvation, but

described by Chen *et al.*, (2011), pesticides are bioactive and is toxic. Each venom contains the danger in its use, both to the environment and humans. Pesticide contamination can directly result in acute poisoning or chronic to its users. As for the broader community, its risks in the form of poisoning pesticide residues found in agricultural products (Chen *et al.*, 2011). Pesticide application is the most

widely performed is on the horticultural crops especially vegetable crops. Chemical pesticides often used by Farmers in Indonesia (95,29%) as a means of controlling Plant pest Organisms (OPT) because it is effective, efficient and considered to be economically profitable (Ahmed *et al.*, 2011)

Pesticides organophosphate and carbamates also cause adverse effects on the central nervous system and inhibition of the enzyme acetyl cholinesterase (Balingtang, 2013) there are studies that test the 315 samples of the agricultural products found the presence of pesticide residue as much as 47% on a sample of fresh product and 7% are the content of residual pestida on samples of processed foods. In 1998, testing of pesticide residues at 180 samples of vegetables, from the total of samples of vegetables tested, 89% is fresh products while 11% is refined products. From the results of the testing of pesticide residues, found 35% of samples of fresh products which contain residues of pesticides and 10% of the samples processed vegetables that contain pesticide residues (Afriani *et al.*, 2019). The purpose of this study was to determine the residues of organophosphate pesticides contained in fruits chili peppers city in the District of Mandailing Natal.

## **MATERIAL AND METHODS**

Research methods in the form of survey was done to some farmers and traders of chilli in the local region of Mandailing Natal. In this study, taken 2 the location of the main crop of chili is in the village of Sibanggor Julu village and Household Bosi. Research was conducted by interviewing 5 chili farmers local. In the first process the chili peppers will be purchased as much as 5 kg from each farmer. Next chillies the local that has been collected from each farmer is taken each as much as 5 kg to selanjutnyadilakukan content analysis residupestisidanya at the Laboratory of the Agricultural University of Andalas.

### **Laboratory Analysis**

Materials and equipment the study the Sample used for the Analyst is is implication implication is Bua cagai cagai chili peppers

obtained from farmers fields who prefer a. Chemicals dielukan is the solvent/ solvent namely acetone, dichloromethane, petroleum Eker 40<sup>0</sup>C - 60<sup>0</sup> C, iso baltana baguena bagtizida golanspanof Equipment analyst dipergunan is ultra turex I don'T T. 25, measuring cups 100 ml, labuat 100 ml, beaker glass (uk 200 ml), pipette mumps 25 ml, micro syringe (10bangan), TIML (SABAN0/70/7 = Gas Tube, ABL).

### **Extraction of chilli fruit**

Sample chillies that have been chopped up and then weighed as much as 15 g and then crushed with an ultra turaks (blended) with 30 ml acetone for 30 seconds, were added 30 ml of diklormetan 30 ml of petroleum ether 40<sup>0</sup>C - 60<sup>0</sup> C the mixture is pulverized for 30 seconds and centrifuged for 2 minutes at 4,000 rpm (when the turbid solution), then dianap pour the organic phase. 25 ml of the organic phase pipetted into the flask round, concentrated in the rotavapor at a temperature of tangas water 40<sup>0</sup>C, until nearly dry, then dried with a stream of nitrogen gas until dry. The residue was dissolved in 5 ml of iso octane : toluene (90 : 10 v/v).

### **Analysis Of Pesticide Residues**

Residue analysis of insecticides was done based on the testing methods of pesticide residues published by the Commission of Pesticide Ministry of Agriculture 1977 with reference to the method recommended by the Codex Alimentarius Commission (CAC) by using Gas Chromatography (AGILENT 7890 A) equipped with a detector FPD (Flame Photometric Detector). Stages of analysisinclude: the extraction of chillies, evaporation, the manufacture of the standard solution and the determination (calculation of the levels of residues).

## **RESULTS AND DISCUSSIONS**

### **The levels of Pesticide Residues in Fruits of hot Pepper local**

Analysis of the levels of Pesticide Residues in fruits of Chili local to use various types of pesticides will leave residues on the fruit of the

Pepper locally produced. The results of the

analysis of pesticide residues can be seen in the description of Table 1 below.

Table 1. Pesticide residues Organophospat on the fruit of the Chili pepper local

Pesticide Residues	The Village Sibanggor	The village of Tangga bosi
	The Sample Farmers ppm (mg/kg)	The Sample Farmers ppm (mg/kg)
Dimethoad	127,7504	30,0019
Klorpirifos	0,1513	-
Profenofos	-	7,4302

Pesticide residues found in fruit chili local produced by farmers, it is related to the type of pesticide used is insecticide and systemic fungicide. The workings of systemic insecticide that is absorbed by the parts of the plant through the stomata, the meristems of roots, lenticels of stems and cracks natural. Furthermore, the insecticide would pass through the cells leading to a network carrier both xylem and phloem. The insecticide will leave a residue on the part of the cells that have been passed. vessels haul later insecticides translocated to parts of other plants. As for the types of insecticides that are most toxic among the pesticides and often the cause of poisoning is the type Organofosfat (Hasibuan, 2015). Organophosphate insecticides is the most toxic among the types of pesticides other and often cause poisoning in humans. Eaten only in small amounts can cause death, but it takes a few milligrams to cause death in adults (Zulkarnain, 2010).

Decreased levels of pesticide residues on food can be done by several approaches, namely physical and chemical, such as on agricultural products pesticide residue can be lowered by washing the product with water flowing for some time, then soaked in water for one hour. In addition, in fruits such as peppers, tomatoes, and so forth some of the results of the study reported that the detergent can be used to release the residues of pesticides (Fadhillah, 2020).

### CONCLUSIONS

From the results of the research can be disimpulkan that the chili farmers of the local Village Sibanggor and the Village of Tangga bosi masiap aplikasida Peshi xianaca Yan Type pestida Organofospat maih found in chili peppers city in the two Villages. Resident of

pesticides found in the Village Sibanggor julu exceed the maximum limit residualu (yitu), namely ; Dimethoad 127.7504 mg/klau 1.825% 05pios 0.15 g/BMG. As for the Village of Tang cuisine ditemukan type of profenofos namely 7,4302 mg/kg and Dimethoad 30,0019 mg/kg.

Dari hasil penelitian dapat disimpulkan bahwa petani cabai lokal Desa Sibanggor dan Desa Tangga bosi masih menerapkan aplikasi pestisida yang tidak sesuai dengan cara aplikasi pada kemasan. Jenis pestisida Organophospat masih ditemukan pada cabai lokal di dua Desa tersebut. Residu pestisida yang ditemukan di Desa Sibanggor julu melebihi batas maksimum residu (BMR) yaitu ; Dimethoad 127,7504 mg/kg atau 1,825% dan klorpirifos 0,1513 mg/kg. Sedangkan untuk Desa Tangga bosi ditemukan jenis profenofos yaitu 7,4302 mg/kg dan Dimethoad 30,0019 mg/kg.

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