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NOTE

Identification of the Extractives Chemical Compounds in Kiwi Residues by GC/MS Methods

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In this research, some chips of kiwi residues (Actinidia Spp.) From the west of Mazandaran in North of Iran were randomly chosen . At first wood flour and then measured extractive by TAPPI standard methods. The results of this study showed that average of extractives, cellulose, lignin and ash in Kiwi residues are 5.48, 36.75, 27 and 1.42 %, respectively. Then wood flour was washed by toluene-ethyl alcohol with the 2:1 ratio. To the extractives residue was added BSTFA reactor and samples kept in Ben Marry Bath in 70 ºC for 1 h and they were analyzed by GC/MS. For the identification of compounds were used GC diagram which shows abundance and retention time of each compound and calculation of quartz index and Adams table. The specified 14 compounds were present in Kiwi residues *i.e.*, hexenol, isopropyl butyrate, phthalic acid, 2-methoxy pyrazine, ethylamine in high quantities.

Key Words: Kiwi residues, Retention time, GC/MS.

About 250,000 t/y Kiwi residues production from planted garden in the North of Iran, that they are burning after imported about 35 years in Iran. The Mazandaran Wood and Paper Industries are biggest and important mill in Iran, but this mill have a problem for raw material provide and consumption in new years. Vaysi *et al.*[1] reported that wood of kiwi residues had semi-ring porous, group's vessels with spiral thickening. The parenchymas were longitudinal and axial. There were a lot of rays in cross-section. The average of the fiber diameter, ray thickness, fiber length, Runkel coefficient, dry density, basic density, shrinkage and porosity were 172, 17.6, 1371, 116.6, 0.668, 0.564 g/cm^3, 15.7 and 55.1 %, respectively.

The results also indicated that kiwi residues properties were very fit and same the hard woods. The results also pointed out that the above-mentioned of wood kiwi residues properties can to replace some or full of the raw material for production pulp and paper, fiber board, particle board and another wood composition boards in the wood and paper industries[1]. Hosseini[2] reported that exhaustive ethanol-toluene of the bark and heartwood of *Juglans regia* L. (Juglandaceae) afforded pale red-coloured extractives 10 and 12 % yields, respectively. Detailed chemical evaluation of these extracts using GC/MS revealed the major components in the bark and heartwood extractives to be the 3,7-dioxa-2,8-disilanonane, 2,2,8,8-tetramethyl (25.17 %), while the major heartwood extractives constituent was benzoic acid and gallic acid (44.57 %). The same components of the bark and the heartwood also contained amounts of the gallic acid, 3,7-dioxa-2,8-disilanonane, 2,2,8,8-tetramethyl and d-glucose,2,3,4,5,6-*pentakis-o*-(hydroxyl). The most toxic components in the heartwood, were juglone (5.15 %) and 2,7-dimethylphenantheren (5.81 %)[2]. Vaysi[3] reported that extractive variation decrease in the longitudinal direction. The average of extractives in natural and planted cypress tree are 7.52 and 2.57 %, respectively. There are specified 14 compounds in natural and 12 compounds in planted cypress tree. That isophyllocladene, 9-octadecenamide, cinnamaldehyde-2-hexyle, bourbonanone and 1h-naphtho-[2,3-c]pyran-3-acetic acid there were in either species so much and these compounds are very important in durability. Gupta *et al.*[4] reported that the durability of walnut has been related to the presence of phenolic compounds such as flavonoides, naphthaquinone and hydrolyzable tannins. The wood and the bark of black walnut have not been found to contain tannins. However, the wood contains appreciable amounts of gallic acid as well as ellagic acid, glucose and a dark violet polymer.

The kiwi residues were collected from planted kiwi garden in north of Iran. At first wood flour and then measured extractive by TAPPI standard methods. Then extractives, cellulose, lignin and ash measured in Kiwi residues. The flour was washed by toluene-ethyl alcohol with the 2:1 ratio. To the extractives residue was added BSTFA reactor and samples kept in Ben Marry Bath in 70 ºC for an hour and they were analyzed by

using GC/MS on an Agilent 6890 gas chromatograph, equipped with a split/split less injector and a 7963 mass selective detector (MSD). The column oven was programmed as follows: chromatography was performed on a HP-5MS capillary column (SGE, 30 m, 0.25 mm), kind of carrier gas, helium with 1 mL/min speed and temperature program between 60-260 ºC, increase temperature 6 ºC/min. For the identification of compounds, GC diagram were used which shows abundance and retention time of each compound.

The results showed that wood of kiwi residues had semiring porous, group's vessels with spiral thickening. The parenchymas were longitudinal and axial. There were a lot of rays in cross-section. The average of extractives, cellulose, lignin and ash in Kiwi residues were 5.48, 36.75, 27 and 1.42 %, respectively. The 14 organic compounds present in Kiwi residues are hexenol, isopropyl butyrate, 1,2-benzene-dicarboxylic acid, 2-methoxy pyrazine, ethylamine, tetradecanoic acid, 1-hydroxy-2-(1-hydroxyethyl) (Table-1 and Fig. 1).

TABLE-1
A COMPARATIVE ANALYSIS OF THE COMPOSITION OF THE CHEMICAL CONSTITUENT

Chemical component of Kiwi by GC/MS	Retention time	Area (%)	KI
5-Methyl furfural	7.88	1.43	692
2-Methoxy pyrazine	4.47	9.72	894
Hexenol	5.78	53.17	849
Ethylamine	5.84	7.48	847
4,5-Dimethyl thiazole	8.66	2.27	934
Camphenilone	10.05	1.33	1083
Isopropyl butyrate	8.49	12.59	842
Trimethyl silane	10.45	2.12	1065
3,7-Dioxa-2,8-disilanonane	13.15	2.78	1170
1-Hydroxy-2-(1-hydroxyethyle)	14.41	5.21	1123
Tetradecanoic acid	22.7	1.28	1588
5-Neocedranol	25.15	1.89	1677
1,2-Benzenedicarboxylic acid	25.06	11.58	1681
Tetradecanoic acid	25.56	6.65	1685

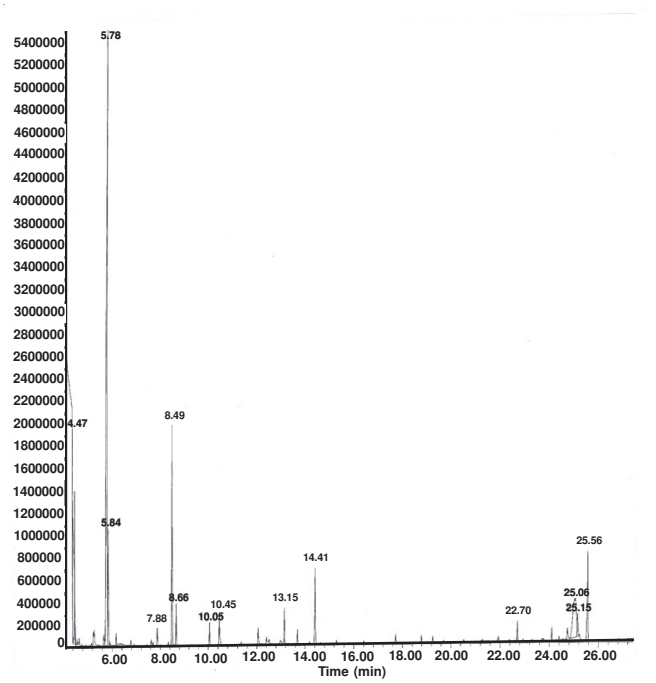

Fig. 1. Gas chromatograph of the extractives chemical compounds in Kiwi residues

REFERENCES

1. R. Vaysi, Investigation on the Physical, Anatomical, Fiber Biometry and Paper Properties in the Kiwi Residues, International Conference Tropical Forestry Change in a Changing World, Bangkok, Thailand (2008).
2. S. Kh. Hosseini, *J. Agric. Sci*., **12**, 126 (2009).
3. R. Vaysi, *J. Sci. Tech. Nat. Res.*, **4**, 79 (2009).
4. S.R. Gupta, B. Ravindranah and T.R. Seshari, *Phytochemistry*, **11**, 2634 (1972).