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NEW SPECTROSCOPIC METHOD FOR THE QUANTIFICATION OF PECTIN USING APPLE (*MALUS DOMESTICA*) AS A MODEL OF PECTIN EXTRACTION MATERIAL - A PRELIMINARY INVESTIGATION

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Pectin is a major component in soluble dietary fiber, historically used for the preparation of jams and jellies. Lately with the awareness of health benefits of dietary fiber, especially on the contribution of pectin to physiological benefits in human nutrition there is a dramatic increase on the interest on pectin, and as a result the need for easier methods of pectin extraction and identification is timely. Although methods are reported in literature for the extraction of pectin from different plant sources, there is no standard procedure for pectin extraction. The standard methods available are for extraction and quantification of soluble dietary fiber. In the present investigation a spectroscopic approach was attempted to extract and quantify pectin using ruthenium red, a dye used in anatomical studies in plants. Two apple cultivars (Granny Smith and Fuji) were used for the extraction of pectin. First a standard method for dietary fiber extraction and isolation was used [AOAC method 991.43 (2010)] to extract pectin from apples. Standard solutions of pectin (APA103, Shaanxi TOP, China) were subjected to the standard extraction procedure of dietary fiber. Absorbance was noted in the range of 380 nm to 760 nm to determine a suitable wave length. Next, a concentration series of standard pectin solutions (0.01 g/ml – 0.00001 g/ml) was subjected to AOAC procedure for extraction of dietary fiber and thereafter ruthenium red (0.1 ml of 0.01 mg/l solution) was added before determining absorbance at 531 nm. The obtained data (n = 20, each in triplicate) were used to construct a calibration curve based on Beer-Lambert law. Thereafter further investigations were carried out to see the possibility of minimizing the steps involved in the standard extraction procedure. Significantly higher yields ($p = 0.05$) were obtained for the new spectroscopic method compared to the AOAC method for both apple cultivars. When using the new spectroscopic method it may be possible to eliminate the last step (involving pH adjustment) of the AOAC procedure for soluble dietary fiber extraction as there was no significant ($p = 0.05$) decrease in yield for both apple cultivars with the elimination of this step. It could be concluded that the range of pectin concentrations in fruits can be assayed by the new spectroscopic method, without going through the standard gravimetric procedure and by eliminating the last step in the standard extraction procedure. Thus, the new spectroscopic method specifically designed for pectin extraction is less time consuming than the available standard method for soluble dietary fiber.