



## Xylanase as a processing aid for *papads*, an Indian traditional food based on black gram

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### ABSTRACT

*Papad* is an Indian traditional food item having a thin crispy wafer like texture which is consumed as an accompaniment along with meals and snacks. The presence of pentosans in black gram makes the *papad* dough very hard which makes the subsequent rolling very cumbersome. This work reports on the effective use of xylanase on the handling properties of *papad* dough and further the effect on quality of *papads* processed therefrom. Addition of 50 mg kg<sup>-1</sup> of xylanase in the black gram flour and resting the dough for 30 min significantly eased the rollability as seen from texture profile analysis of the dough and also from subjective analysis employing 25 volunteers. It also marginally reduced the oil uptake during frying. Addition of xylanase did not alter the characteristics of *papads* after roasting, microwaving or frying.

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### 1. Introduction

*Papad* is a delicious traditional Indian snack food used as an accompaniment with meals and snacks and croutons in soups. In recent years, it has gained recognition as India's unique contribution to international menu. *Papads* have crunchy wafer-like taste and are normally consumed after roasting or frying. The *papad* industry in India is predominantly a cottage industry and is mainly started for women empowerment and social welfare. Increased mass production of *papad* for domestic consumption and export has necessitated standardization and quality evaluation of the finished product. The commercial production of *papads* is more than 55,000 tonnes of which 12,000 tonnes are being exported (Parpia, 2008). Various small scale and national brands are into *papad* manufacturing in India.

*Papad* is prepared from cereals, legumes and combinations thereof with addition of spices, salts and alkaline additives. *Papads* prepared from rice, black gram, green gram, sago, potato, and sorghum are quite popular all over world. According to consumer preferences, *papads* from black gram split pulse (94.4 percent), rice (63.8 percent) and green gram splits (33.3 percent) are the most preferred (Kamat, Yenagi, & Nagannur, 2009). *Papads* from split

black gram are commonly available. *Papads* from flours of legume blends is practiced widely and varies widely which accounts for differences in taste, texture and oil content of the *papads*. Patil, Singhal, & Kulkarni (2000) reported a 24:36:40 blend of green gram: black gram: bengal gram to be suitable for preparing *papads* with acceptable quality and cost considerations.

*Papad* making is a cumbersome and time consuming process. It requires skill and practice to roll the *papads*. *Papad* rollability is very crucial since the mechanization during sheeting imparts a sudden compressive load which causes distribution and breakage of the protein-carbohydrate matrix and which is responsible for lower expansion of *papads* (Velu, Nagender, Satyanarayana, & Rao, 2008). It also disrupts the matrix of spices and hence alters the flavour and taste of *papads*. Besides, machine made *papads* do not have a 'blister' effect that is seen in handmade *papads* and associated with its quality. Complete mechanization of *papad* may also displace thousands of unskilled women from gainful employment. Therefore it would be advantageous to design semi-manual gadgets where the earnings could be enhanced by improving the quality of the product and the productivity of the worker.

Hemicellulose is present in grains and legumes and its content varies largely within the layer of the kernel, type of legume and grain. Hemicellulose comprises of xyloglucan, glucomannan, mannan, xylan, and arabinoxylan. In wheat, arabinoxylan content is estimated to be 55–78 g kg<sup>-1</sup> in whole grain and to an average of 21 g kg<sup>-1</sup> in flour. It is also suggested that these may be slightly

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