

ASSAY OF BETA-AMYLASE IN MALT

BY

OPTICAL ROTATION

by

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TABLE OF CONTENTS

2.2 LIST OF FIGURES

LIST OF TABLES

INTRODUCTION	1
REVIEW OF THE LITERATURE	2
I. Malting	2
A. Raw Materials	2
B. Malting Process	3
C. Enzymes	5
D. Malt Amylase	7
II. Alpha- and beta-amylase and their determination	8
A. Iodine Staining	10
B. Viscosity Method	11
C. Reducing Sugar Method	11
D. Optical Rotation Method	12
MATERIALS AND METHODS	15
I. Preparation of Barley, Sorghum and Wheat Malt	15
II. Extraction of Barley, Sorghum and Wheat Amylase	15
III. Inactivation of the Beta-amylase by Heat	16
IV. Substrate	16
V. Determination of Beta-amylase Activity by Polarimetry	16
VI. Determination of Alpha-amylase Activity by Reducing Sugar Method	18
VII. Determination of Aminoid Nitrogen	19
VIII. Chromatography	20
RESULTS AND DISCUSSION	22
SUMMARY	32
BIBLIOGRAPHY	33
ACKNOWLEDGMENT	38

LIST OF TABLES

	Page
Table 1. Malt Extract (Water Extract)	24
Table 2. Concentrated Extract (Crude Amylase)	25

LIST OF FIGURES

	Page
Figure 1. Beta-amylase activities of Barley, Sorghum and Wheat in their treated and untreated states (concentrated - crude amylase)	23
Figure 2. Hydrolysis products of 0.4% soluble starch by crude alpha-amylase to the achroic stages in 0.1 M sodium acetate buffer of pH 4.8 at 30°C	26

INTRODUCTION

Malt is prepared commercially by germinating cereal grains. Usually barley is used, but wheat, sorghum and other grains have limited use also. During germination alpha-amylase is produced and the beta-amylase content also increases. Methods are available for the analysis of alpha-amylase in the presence of beta-amylase, but the reverse, analysis of the beta-amylase in the presence of the alpha-amylase is not easily carried out.

In the present study an optical rotatory method is examined to analyze beta-amylase. The method is based on the principle that during alpha-amylolysis, the optical rotation drops an insignificant amount compared to beta-amylolysis. Barley, sorghum and wheat malts were analyzed and the method was used to test for the effectiveness of destroying beta-amylase in sorghum malt by heat treatment.

REVIEW OF THE LITERATURE

Malt is the product of germination of cereal grains controlled to limit sprout and rootlet development. The process known as malting (1) consists of three phases: steeping, germination, and kilning or drying. Grains are malted primarily to develop or activate enzyme systems, such as amylase (diastase), which are important in subsequent commercial uses of the malt.

The growing of barley and wheat is referred to in the earliest records of agriculture and the use of barley for the production of fermented beverages dates back to the ancients. It is not clear from the records just when the germination of grains to produce starch-splitting enzymes was discovered, but reference to the use of germinated barley or malt is recorded in the history of the Egyptians. The earliest uses of malt were primarily for the production of beer or other fermented beverages; barley was brought into North America with the first settlers, principally for the production of malt for the making of beer (2).

I. Malting

A. Raw Materials

Although barley, wheat, and rye all serve as raw materials for malting in the United States, barley is used in much larger amounts than the other two. Sorghum is used in India