## CHAPTER TWELVE

## BIOSYNTHESIS OF UNSATURATED FATTY ACIDS IN HIGHER PLANTS

E. M. STEARNS, Jr.

University of Minnesota, The Hormel Institute, Austin, Minnesota 55912, U.S.A.

## CONTENTS

		Page
I.	INTRODUCTION AND SCOPE	455
II.	EARLY FINDINGS AND METHODS OF STUDY	456
	A. Indirect or compositional studies	457
	B. Direct studies	459
	C. General reviews	461
III.	SYNTHESIS OF Δ9-MONOUNSATURATED ACIDS	461
	A. Indirect or compositional studies	462
	B. Direct studies of plant monoene synthesis	464
	1. Evidence supporting a separate pathway for the synthesis	
	of monoenoic acids	464
	2. Evidence supporting direct desaturation of preformed	
	long-chain fatty acids	473
IV.	SYNTHESIS OF LINOLEIC AND LINOLENIC ACIDS	481
	A. Indirect or compositional studies	481
	B. Direct studies	485
V.	UNUSUAL UNSATURATED AND RELATED ACIDS	491
٠.	A. Unusual nonconjugated unsaturated acids	492
	1. Carbon chain modification	492
	2. $\Delta^3$ -Unsaturated acids	494
	3. Δ <sup>5</sup> -Unsaturated acids	495
	4. Δ <sup>6</sup> -Unsaturated acids	495
	5. Miscellaneous nonconjugated acids	497

## CONTENTS

	В.	Related acids	498
		1. Cyclopropane and cyclopropene acids	498
		2. Hydroxy acids	499
		(a) Ricinoleic acid	499
		(b) Other nonconjugated hydroxy acids	500
		3. Epoxy acids	501
		4. Acetylenic acids	502
	C.	Conjugated acids	503
VI.	СО	NTROL OF SYNTHESIS IN HIGHER PLANTS	505
ACK	NO	WLEDGEMENTS	507
REE	FRI	ENCES	508