Chapter 1

Introduction:

Naturaly occurring compounds are classified into three types according to their structures and their sources into :

1-**Terpenes** 2-**Steroids** 3-**Alkaloids**

The work in this field classified into :

a-*Isolation* of these compounds from their natural sources

b-*Structural elucidation* by chemical reactions based on their function groups , for example,

a-Oxo compounds e.g.RCOOH by esterification ,RCHO and RCOR by condensation with NH_2NH_2 or NH_2OH

ROH by esterification or oxidation

ArOH by $FeCl_3$ or diazotization

c-*Compounds containing double bonds* , may be with conjugated or separated double bonds

Conjugated double bonds can be detected by Diels Alder Reaction (D.A.R.) by forming an adducts with maleic anhydride ,each two double bonds react with one molecule of maleic .

Separated double bonds (no D.A.R.) and can be detected by H_2 / Ni ,halogenations or by Each *one* double bond absorb *one* molecule of hydrogen and *one* molecule of halogen, thus, the number of double bonds can be determined .

Each *one* double bond absorb *one* molecule of hydrogen during catalyitic hydrogenation and *one* molecule of halogen during halogenation, thus, the number of double bonds and the shape of the molecule can be determined .

Also, compounds with M.F. C_nH_{2n+2} for alkane (acyclic compounds **)** ;

M.F. C_nH_{2n} for alkene and *monocyclic* compounds ;

M.F.C_nH_{2n-2} for alkyne and *bicyclic* compounds ;

M.F.C_nH_{2n-4} for *tricyclic* compounds ;

M.F. C_nH_{2n-6} for *tetracyclic* compounds .

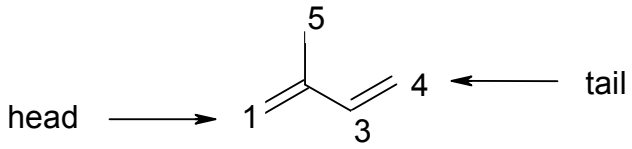
Degradative oxidation : Using oxidizing agents such as O_3,CrO_3, NaOBr (Br_2 / NaOH) , $KMnO_4$ and *total synthesis* can also be used for structure elucidation of the naturally occuring compounds.

Terpenes

a-Compounds contains C,H and may be oxygen.

b-Most of them isolated from plant source .

c-All terpenes have M.F. (C_5H_8)$_n$, because , the thermal degradation of terpenes yielded compound with M.F. C_5H_8 , called *isoprene* . These *isoprene* units joined together head to tail .



No.of carbons	Class
5 (n =1)	C_5H_8 isoprene
10 (n =2)	$C_{10}H_{16}$ monoterpenoids
15 (n =3)	$C_{15}H_{24}$ sesquiterpenoids
20 (n = 4)	$C_{20}H_{32}$ diterpenoids
30 (n = 6)	$C_{30}H_{48}$ triterpenoids
40 (n = 8)	$C_{40}H_{64}$ tetraterpenoids (Carotenoids)
>40(n >8)	polyterpenoids