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This is the first comprehensive monograph to look in depth at saponins. Saponins are glycosides of triterpenes, steroids or steroid alkaloids which have a very wide distribution in plants and some marine organisms. Their biological activity includes haemolysis and fish poisoning, and the steroid saponins are essential for the manufacture of oral contraceptives and sex hormones. Saponins have also been exploited commercially as soap substitutes and in several other industrial applications. This book gives detailed information on the occurrence and distribution of saponins, their structural types, isolation, analysis and structure determination. Biological and pharmacological activities are discussed, as are aspects of commercial and industrial use. The volume provides a valuable source of data for the different classes of compound and includes an extensive list of references.

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*Chemistry and Pharmacology of Natural Products*

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## **CHEMISTRY AND PHARMACOLOGY OF NATURAL PRODUCTS**

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# Saponins

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## Glossary

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Ac	acetyl
ACTH	adrenocorticotrophin, corticotrophin
All	$\beta$ -D-allose
Api	$\beta$ -D-apiose
Ara	$\alpha$ -L-arabinose
Bz	benzyl
Dta	6-deoxy- $\alpha$ -L-talopyranose
EBV	Epstein–Barr virus
Fuc	$\beta$ -D-fucose (6-deoxygalactose)
Gal	$\beta$ -D-galactose
GalA	$\beta$ -D-galacturonic acid
GalNAc	<i>N</i> -acetyl-2-amino-2-deoxygalactose
Glc	$\beta$ -D-glucose
GlcA	$\beta$ -D-glucuronic acid
GlcNAc	<i>N</i> -acetyl-2-amino-2-deoxyglucose
HI	haemolytic index
HIV	human immunodeficiency virus
5-HT	5-hydroxytryptamine
i.p.	intraperitoneal
i.v.	intravenous
Ma	malonyl
Man	$\alpha$ -L-mannose
Me	methyl
PDE	phosphodiesterase
p.o.	oral
Rha	$\alpha$ -L-rhamnose (6-deoxymannose)
Rib	$\beta$ -D-ribose



Qui	$\beta$ -D-quinovose (D-chinovose, 6-deoxyglucose)
s.c.	subcutaneous
Ulo	6-deoxy- $\beta$ -D-xylo-hexos-4-ulo-pyranose
Xyl	$\beta$ -D-xylose
<i>f</i>	furanose
<i>p</i>	pyranose

### Techniques

APT	attached proton test
CA	collisional activation
CAMELSPIN	cross-relaxation appropriate for minimolecules emulated by locked spins
CD	circular dichroism
CF-FAB	continuous-flow FAB-MS
CI-MS	chemical ionization mass spectrometry
COLOC	$^{13}\text{C}$ - $^1\text{H}$ two-dimensional correlation spectroscopy via long-range couplings
COSY	two-dimensional $^1\text{H}$ correlation spectroscopy
CPC	centrifugal partition chromatography
CTLC	centrifugal thin-layer chromatography
DCCC	droplet countercurrent chromatography
D/CI-MS	desorption-chemical ionization mass spectrometry
DEPT	distortionless enhancement by polarization transfer
DQF-COSY (DQ-COSY)	double quantum-filtered, phase-sensitive COSY
EI-MS	electron impact mass spectrometry
ELISA	enzyme-linked immunosorbent assay
FAB-MS	fast atom bombardment mass spectrometry
FD-MS	field desorption mass spectrometry
FLOCK	long-range heteronuclear correlated spectroscopy incorporating bilinear rotation decoupling pulses
FRIT-FAB	frit fast atom bombardment mass spectrometry
GC	gas chromatography
GC-FTIR	gas chromatography-Fourier transform IR
GC-MS	gas chromatography-mass spectrometry

HETCOR	$^{13}\text{C}$ - $^1\text{H}$ heteronuclear correlated spectroscopy
HMBC	$^1\text{H}$ -detected heteronuclear multiple-bond spectroscopy
HMQC	$^1\text{H}$ -detected heteronuclear one-bond spectroscopy
HOHAHA	homonuclear Hartmann–Hahn spectroscopy
HPLC	high-performance liquid chromatography
I.D.	internal diameter
INADEQUATE	incredible natural abundance double quantum experiment
INEPT	insensitive nuclei enhanced by polarization transfer
IR	infra-red
LC–MS	liquid chromatography–mass spectrometry
LD	laser desorption
LD/FTMS	laser desorption/Fourier transform mass spectrometry
LPLC	low-pressure liquid chromatography
LSPD	long-range selective proton decoupling
MIKE/CAD	mass-analysed ion kinetic energy/collision-activated dissociation
MPG	microporous glass
MPLC	medium-pressure liquid chromatography
NMR	nuclear magnetic resonance
NOE	nuclear Overhauser enhancement
NOESY	nuclear Overhauser enhancement correlation spectroscopy
ODS	octadecylsilyl
OPLC	overpressure layer chromatography
ORD	optical rotatory dispersion
PD-MS	plasma desorption mass spectrometry
PRFT	partially relaxed Fourier transform spectroscopy
RCT	relayed coherence transfer
RIA	radioimmunoassay
RLCC	rotation locular countercurrent chromatography
ROESY	2-D NOE in a rotating frame
RP	reversed phase

SIMS	secondary ion mass spectrometry
SINEPT	selective INEPT
TLC	thin-layer chromatography
TOCSY	total correlation spectroscopy
TSP	thermospray
UV	ultra-violet
VLC	vacuum liquid chromatography
XHCORR	long-range $^{13}\text{C}$ - $^1\text{H}$ correlation spectroscopy