

# Isoprenoide III

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Wirkstoffe aus dem Pflanzen- und Tierreich:  
Abwandlung und Nutzung

LV 641.271 (V 2011.1)

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Diterpenalkaloide  
Sesterterpene  
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# Diterpenalkaloide

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**C<sub>19</sub>**  
**(hochtoxisch)**

**Aconitin**  
**Browniin**

**C<sub>20</sub>**

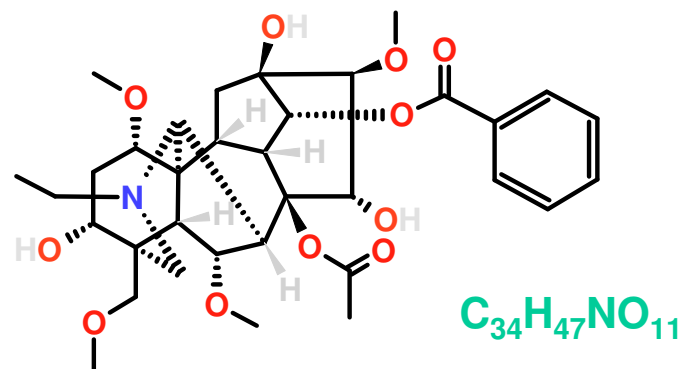
**Atisin**  
**Hetisin**  
**Napellin**

In *Aconitum* (Eisenhut-) und  
*Delphinium*- (Rittersporn)-Arten

# Aconitin / Browniin

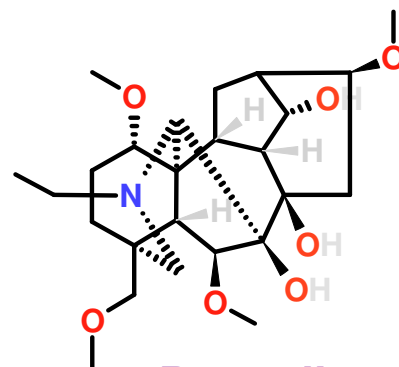


*Aconitum napellus*  
Blauer Eisenhut



**Aconitin**  
RN 302-27-2

LD<sub>50</sub> 166 µg / kg (maus i.v.)

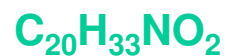
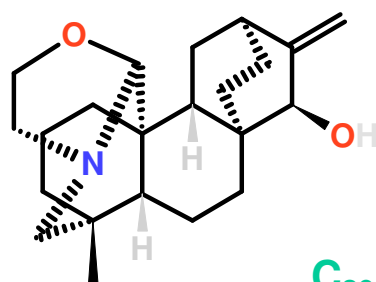


**Browniin**  
RN 5140-42-1



*Delphinium brownii*  
Rittersporn

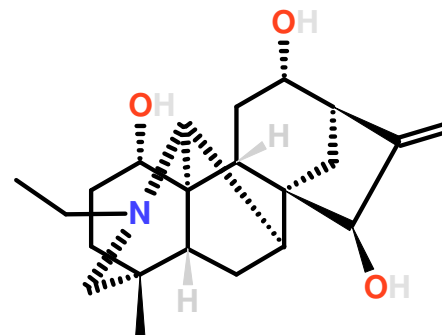
# Atisin / Hetisin / Napellin



**Atisin**

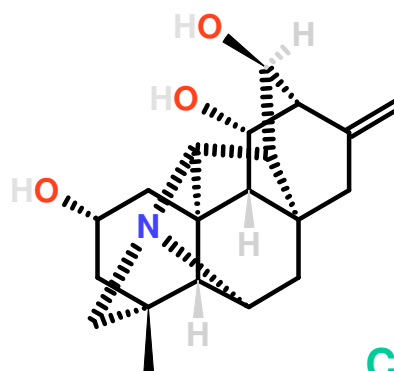
RN 466-43-3

*Aconitum heterophyllum*



**Napellin**

RN 5008-52-6



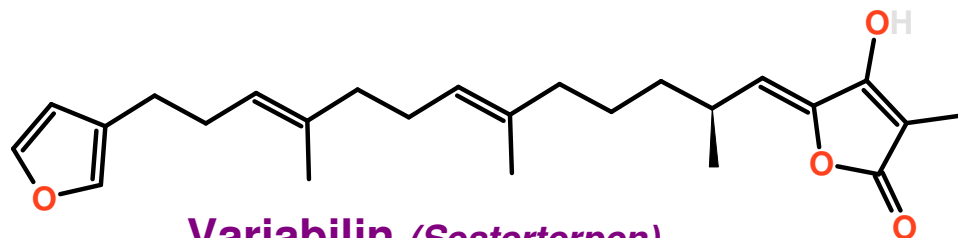
**Hetisin**

RN 10089-23-3



*Delphinium cardinale*

# Sesterterpene (C<sub>25</sub>, 5 Me) (I)



**Variabilin (Sesterterpen)**

RN 51847-87-1 (S)-4Z,10E,14E-(-)

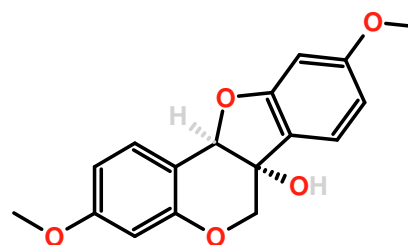
aus Meeresschwämmen (*Ircinia* spp.)



Dean DePhillipo - Passage Productions

antiviral aber auch cytotoxisch

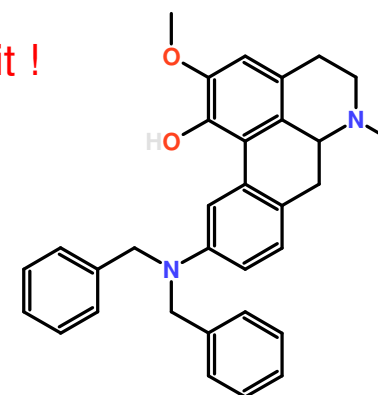
Namensgleichheit !



**Variabilin (Phytoalexin)**

**Homopisatin**

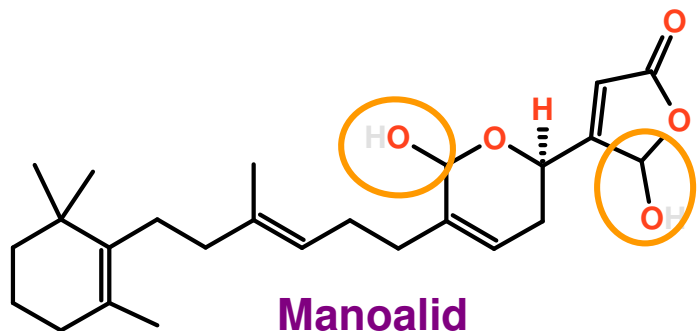
RN 3187-52-8 (6aR,11aR)



**Variabilin (Aporphin-Alkaloid)**

RN 40374-54-7

# Sesterterpene (II)



**Manoalid**

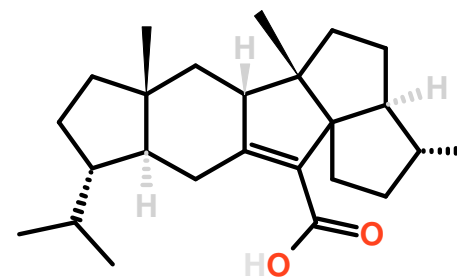
RN 75088-80-1

entzündungshemmend,  
analgetisch, immunsuppressiv  
Phospholipase A<sub>2</sub>-Hemmer

aus Meeresschwämmen (*Luffariella variabilis*)



aus der Laubflechte *Lobaria retigera*



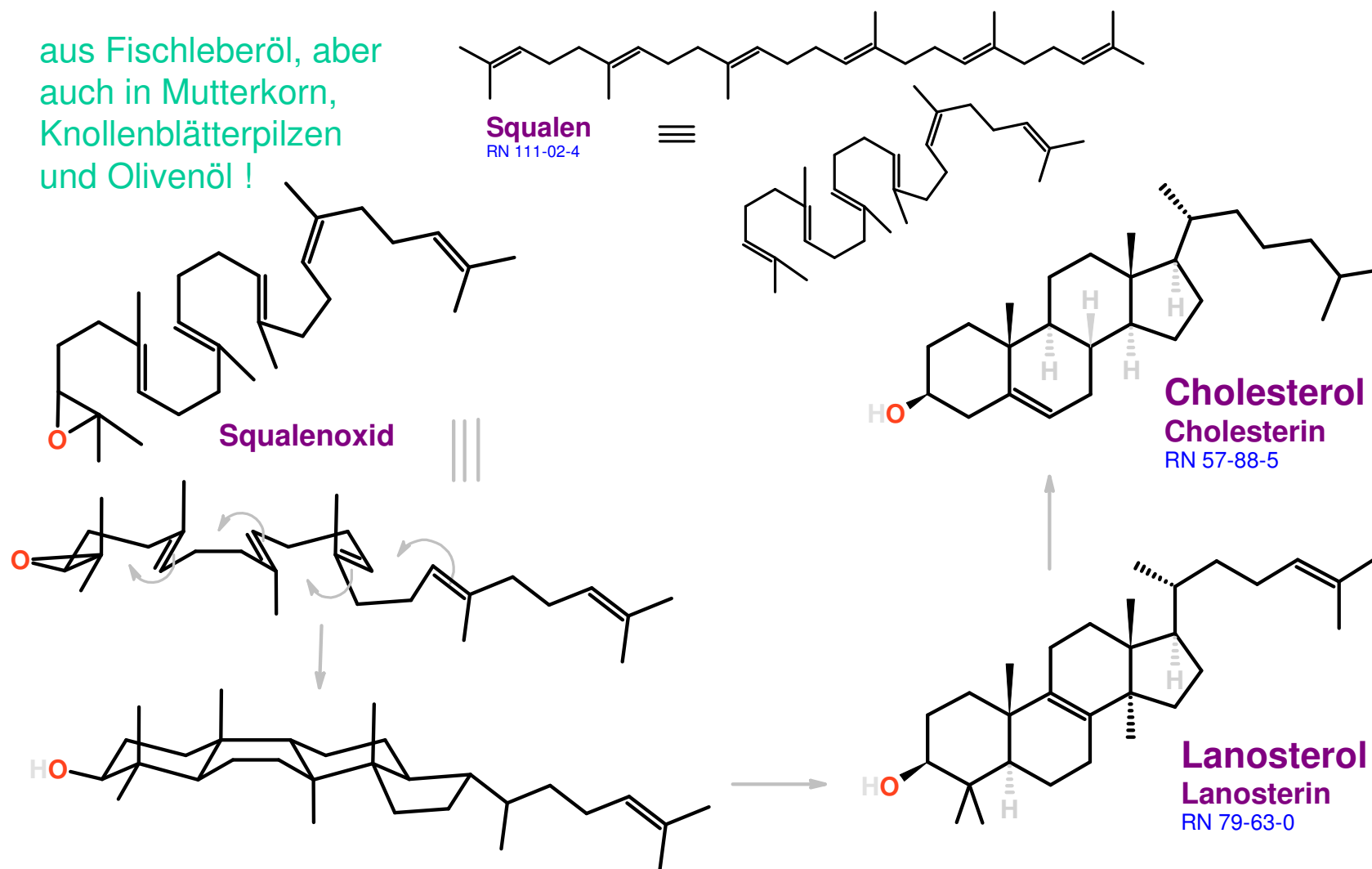
**Retigeransäure A**

RN 40184-98-3

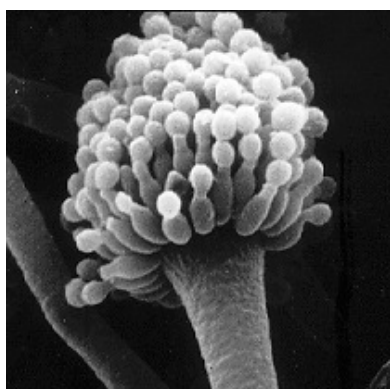
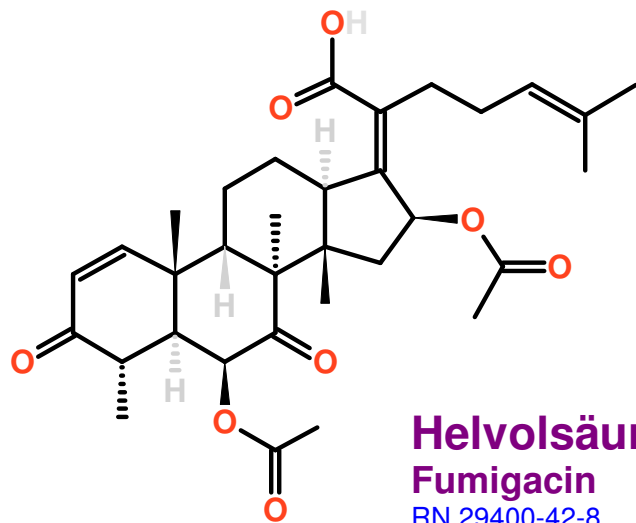
Pentacyclus !

# Triterpene (C 30 ; 6 Me) (I)

aus Fischleberöl, aber auch in Mutterkorn, Knollenblätterpilzen und Olivenöl !

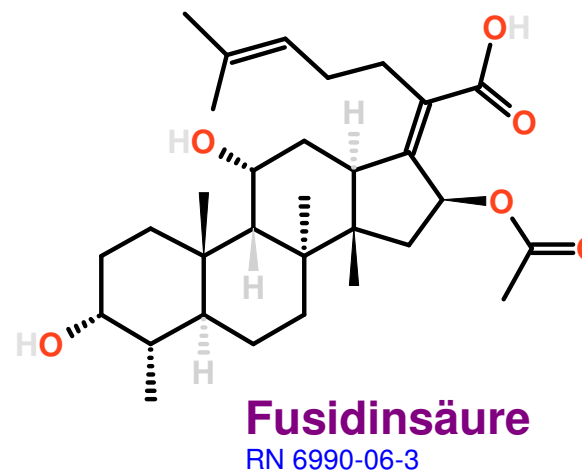


# Triterpene (II)



aus *Aspergillus fumigatus*

mehrere antibiotisch wirksame  
 Triterpene sind bekannt

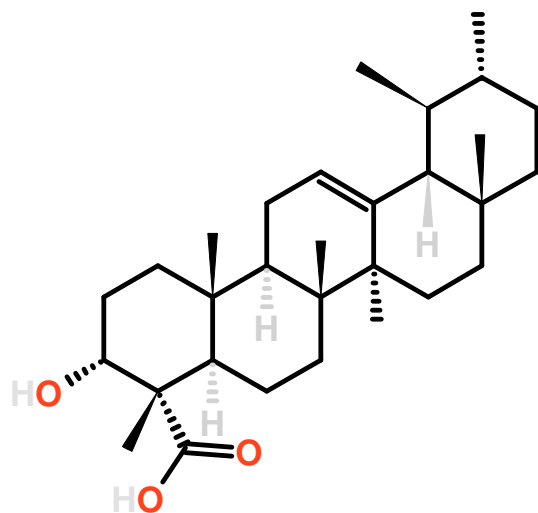


aus *Fusidium coccineum*

# Triterpene (III)



**Boswellinsäuren** aus dem **Weihrauch**  
Santiago des Compostella  
(antiphlogistisch, aber auch durchblutungsfördernd)

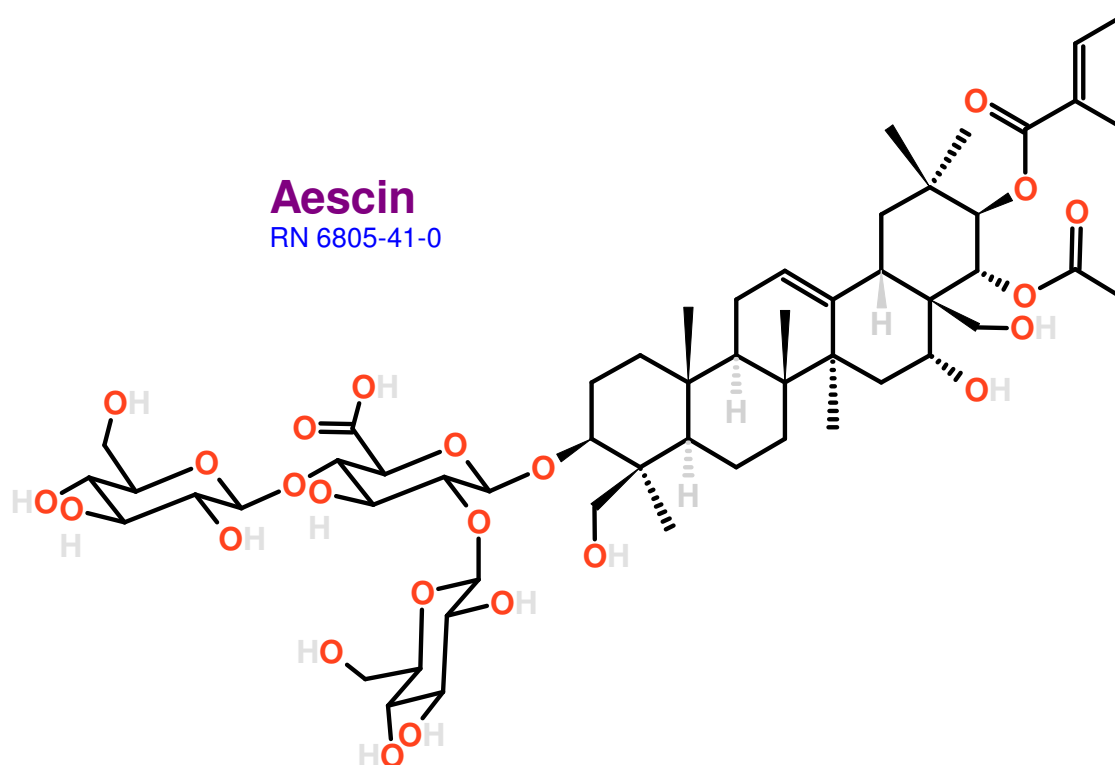


**$\beta$ -Boswellinsäure**  
RN 631-69-6

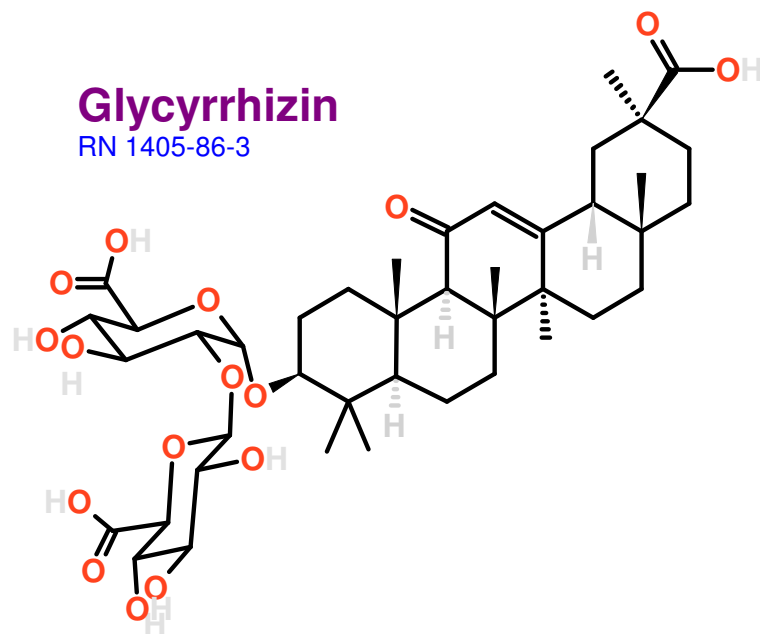


# Triterpene (IV) Aglykone der Triterpen-Saponine

Aus Rosskastanien (*Aesculus hippocastanum*);  
gegen Hämorrhoiden, Venenentzündung, cancerostatisch

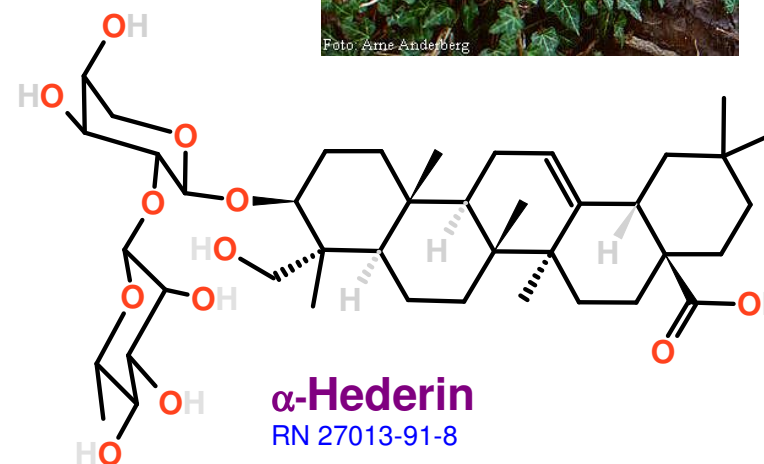


# Triterpene (v) Aglykone der Triterpen-Saponine

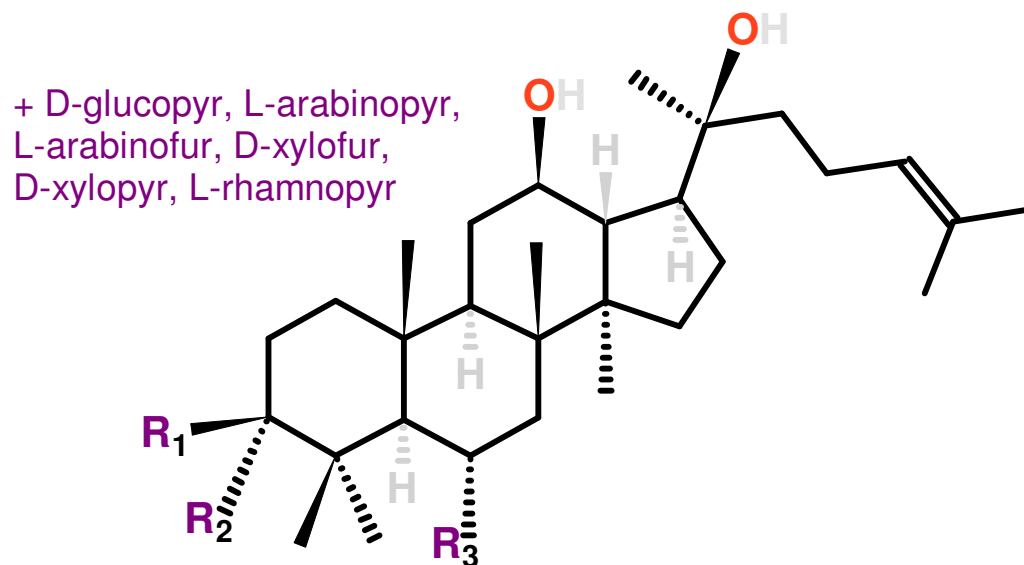


Aus Süßholz (*Glycyrrhiza glabra*); 50 x so süß wie Saccharose; Lakritz-Geschmack

Aus Efeu (*Hedera helix*); stark hämolytisch (Poison Ivy !)



# Triterpene (VI) Aglykone der Triterpen-Saponine

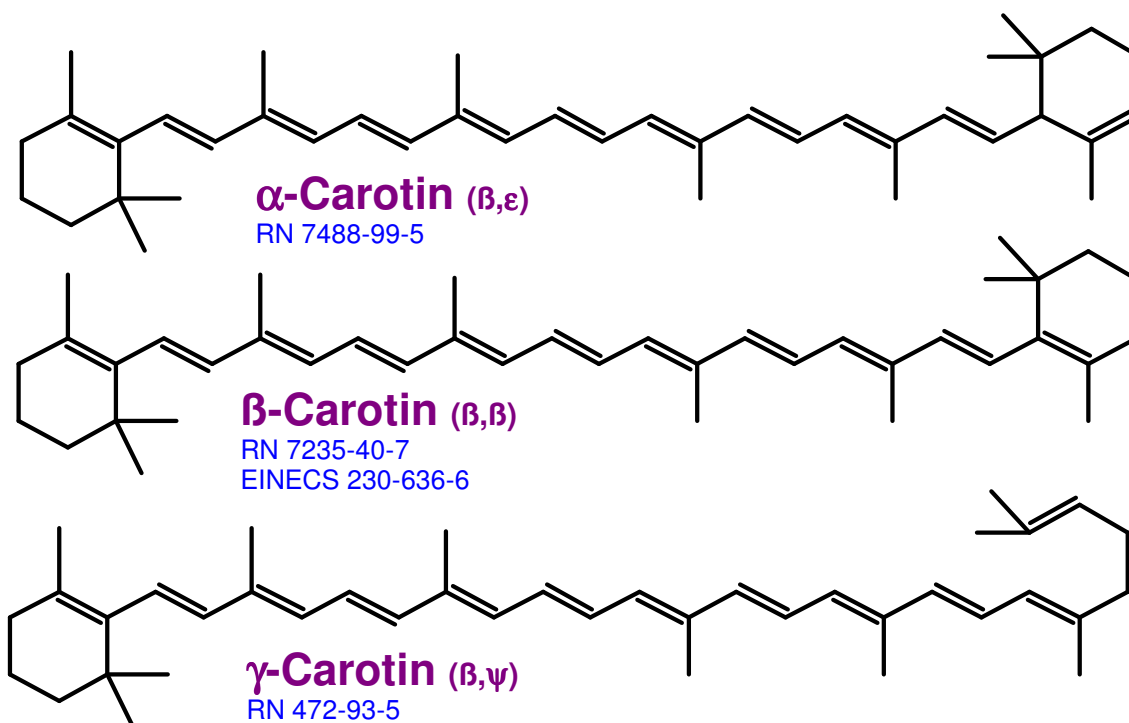


## Ginsenoside

	R <sub>1</sub>	R <sub>2</sub>	R <sub>3</sub>	RN
Betulafolientriol (3 $\alpha$ ,12 $\beta$ ,20S)	H	OH	H	6892-79-1
Protopanaxadiol (3 $\beta$ ,12 $\beta$ ,20S)	OH	H	H	7755-01-3
Protopanaxatriol (3 $\beta$ ,6 $\alpha$ ,12 $\beta$ ,20S)	OH	H	OH	1453-93-6

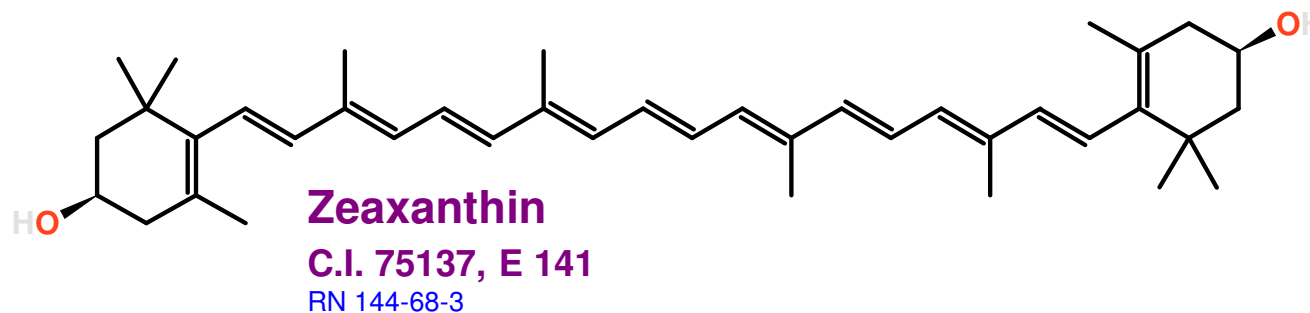
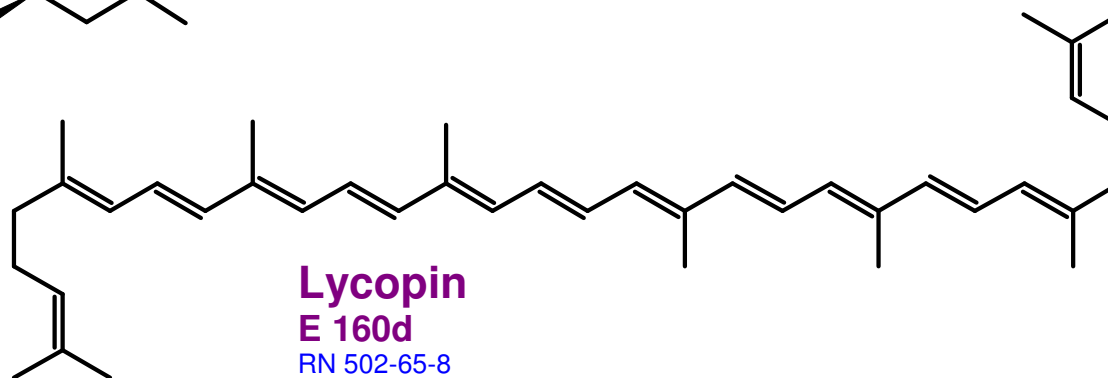
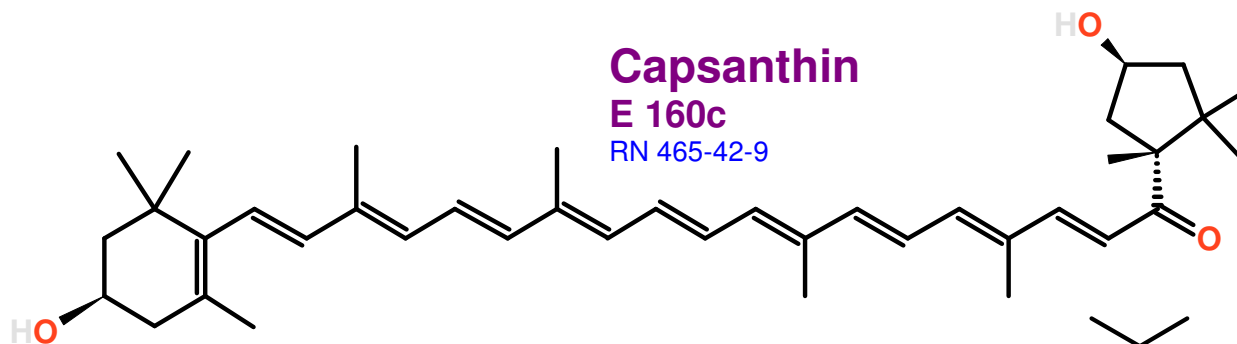
# Tetraterpene (I)

Carotine werden nur in höheren Pflanzen und in Mikroorganismen (Bakterien, Algen, Pilze) gebildet.



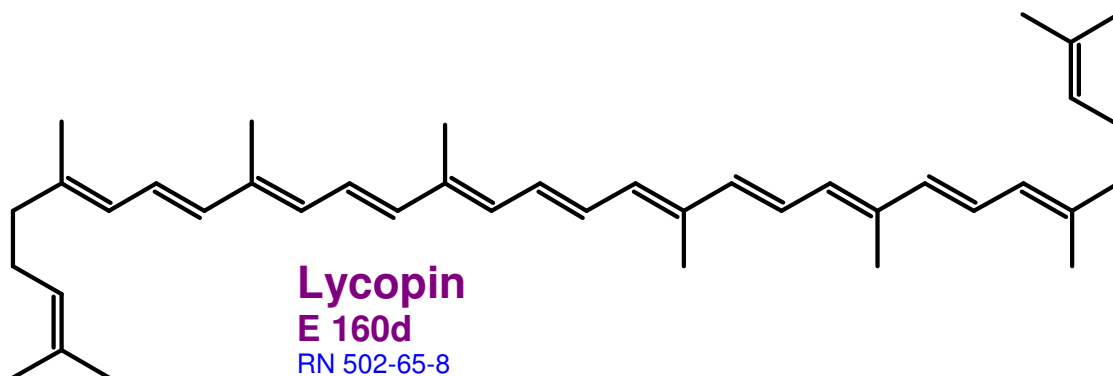
Siehe auch Einheit Naturfarbstoffe)

# Tetraterpene (II)



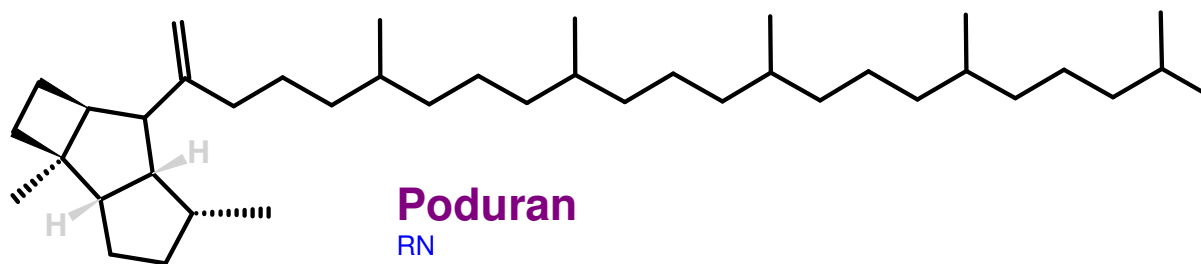


# Tetraterpene (IV)



**Lycopin**  
E 160d  
RN 502-65-8

$C_{40}H_{56}$ , 13 DBE



**Poduran**  
RN

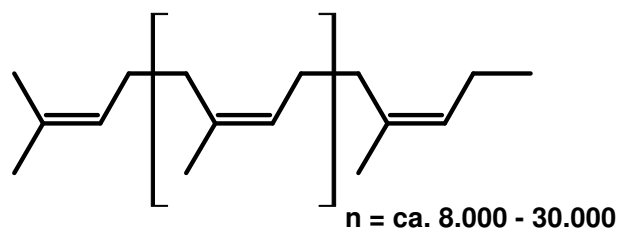
$C_{40}H_{74}$ , 4 DBE

Größter Kohlenwasserstoff in einem lebenden Organismus:  
Aus dem Springschwanz *Podura aquatica* (ca. 2 mm)



Größter Kohlenwasserstoff synthetisch:  
 $C_{390}H_{782}$ , **Nonacontactan**

# Polyterpene



**Naturkautschuk**

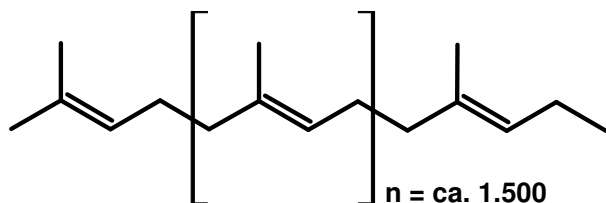
RN

**Kautschuk**

= *cis*-Polyisopren

**Guttapercha (Balata)**

= *trans*-Polyisopren

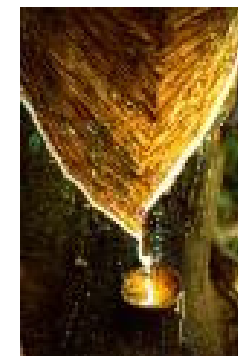


**Guttapercha**

RN 9000-32-2



*Hevea brasiliensis*



*Palaquium-gutta*

5.4 Mio t / a (1992)

*Ende der Einheit*  
*„Isoprenoide III“*