

FACULTÉ DE PHARMACIE DE LYON

COURS
DE
PHARMACOGNOSIE

MATIERE MEDICALE

3^{ème} ANNEE

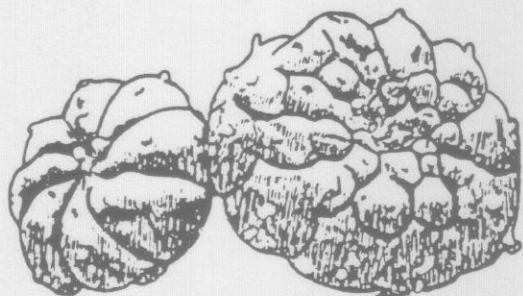
J. RAYNAUD

A.A.E.P.L.
Association des Etudiants en Pharmacie de Lyon
8 avenue R... 69573 LYON CEDEX 08
Tél. : 78-74-4057

DROGUES A
ALCALOÏDES

DROGUES À ALCALOÏDES DÉRIVÉS

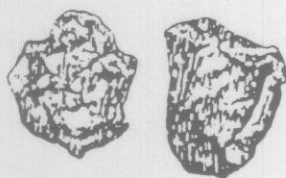
DE LA PHÉNYLALANINE



Aspect général de la plante

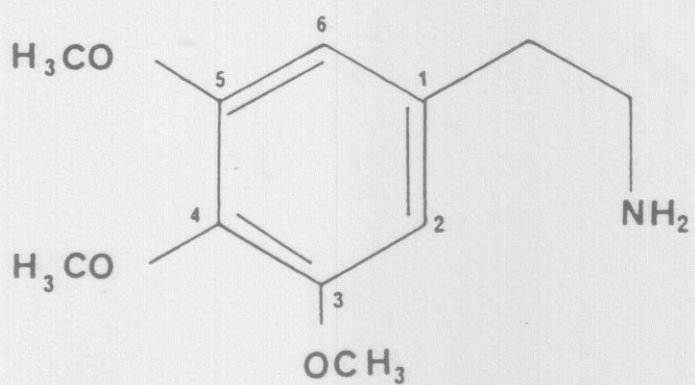


Jeune pied coupé en long

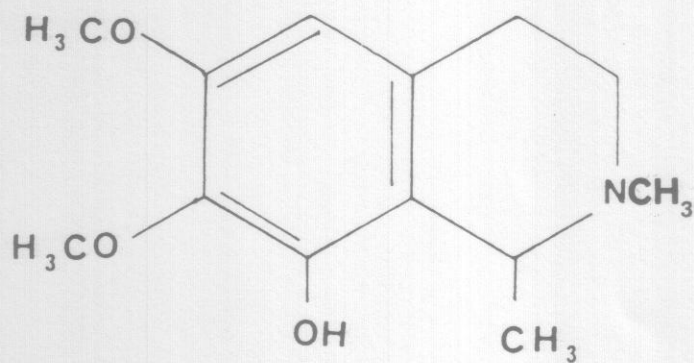


Fragments découpés en rondelle
et desséchés
Mescal-buttons

ALCALOIDES DU PEYOTL

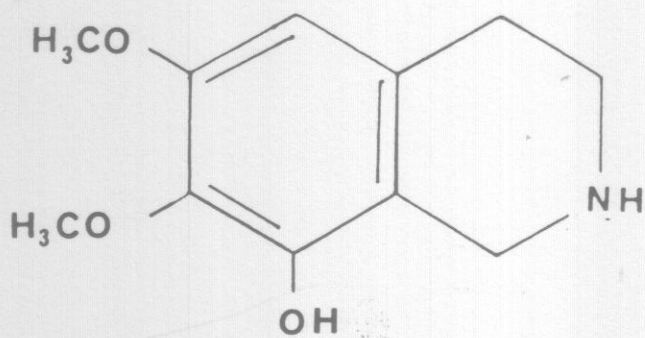


Mescaline

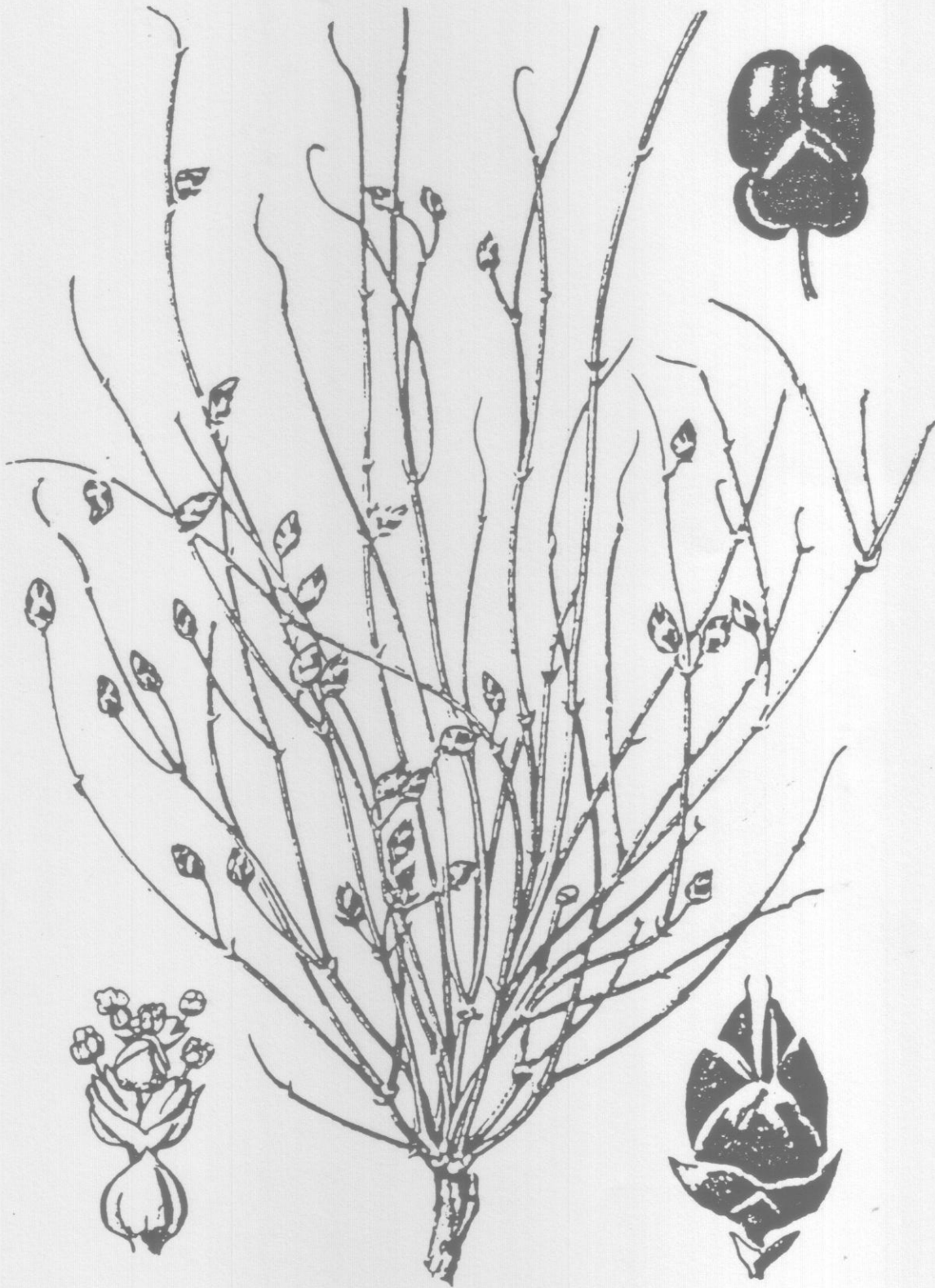


Peyotline

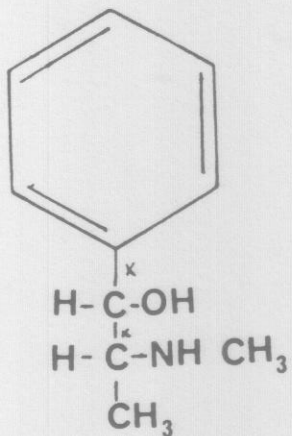
Anhalamine



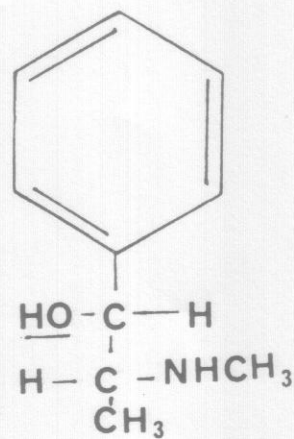
LES EPHEDRAS : *Ephedra* divers Gnétacées



ALCALOIDES DES EPEDRAS

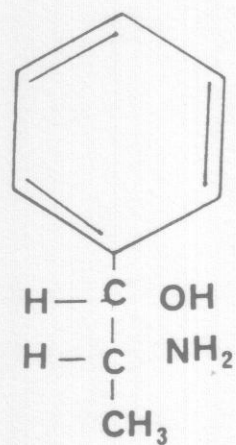


L.Ephédrine



D. Pseudoéphédrine

Nor Ephédrine



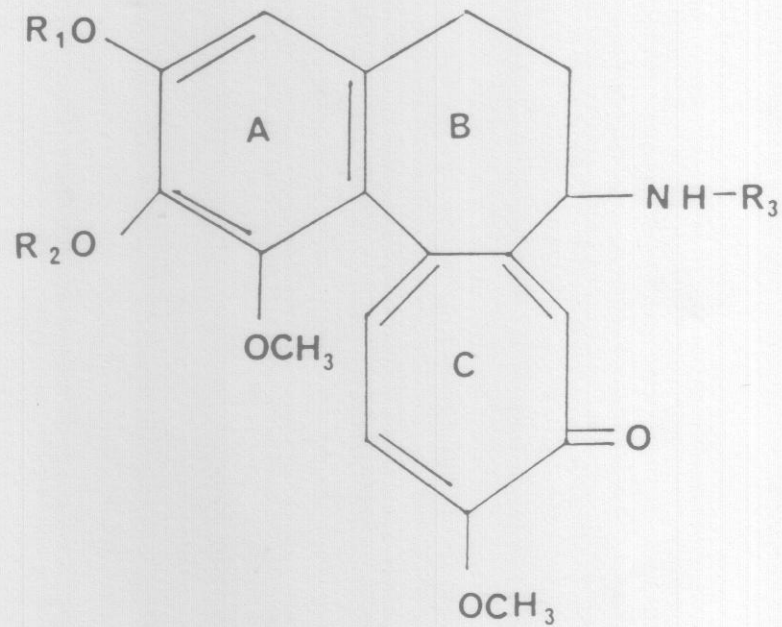
DROGUES A ALCALOÏDES

DÉRIVÉS DU NOYAU TROPOLONE

LE COLCHIQUE : *Colchicum autumnale* L. Liliacées

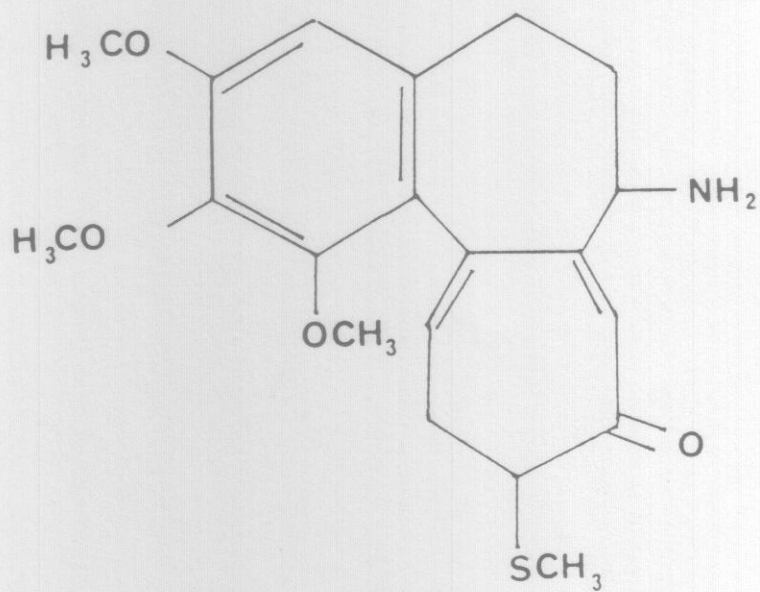


ALCALOIDES ET DERIVES



	R ₁	R ₂	R ₃
Colchicine	- CH ₃	- CH ₃	- C(=O) - CH ₃
Colchicoside	- C ₆ H ₁₁ O ₅ (glucose)	- CH ₃	- C(=O) - CH ₃
Demecolcine	- CH ₃	- CH ₃	- CH ₃

DERIVES D'HEMISYNTHESE



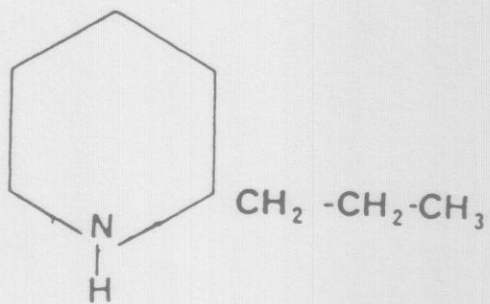
N désacétylthiocolchicine = thiocolciran^(R)

DROGUES À ALCALOÏDES DÉRIVÉS DE
LA PYRIDINE OU DE LA PIPÉRIDINE

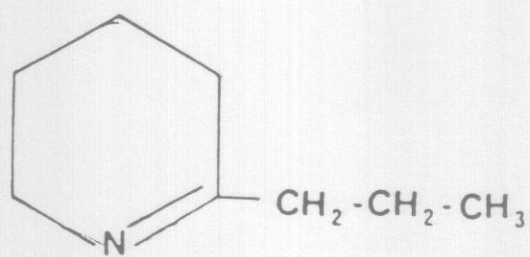
LA GRANDE CIGUË : *Conium maculatum* L. Ombellifères



ALCALOIDES DE LA GRANDE CIGUË



Coniine

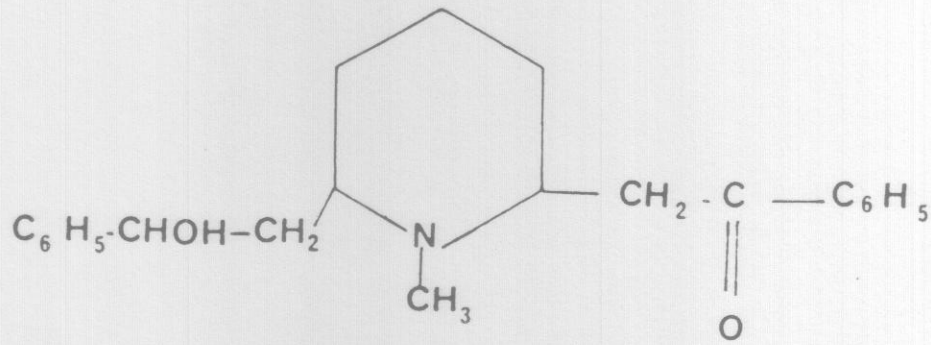


Conicéine

LA LOBELIE : *Lobelia inflata* L. Lobéliacées



ALCALOÏDES DE LA LOBELIE

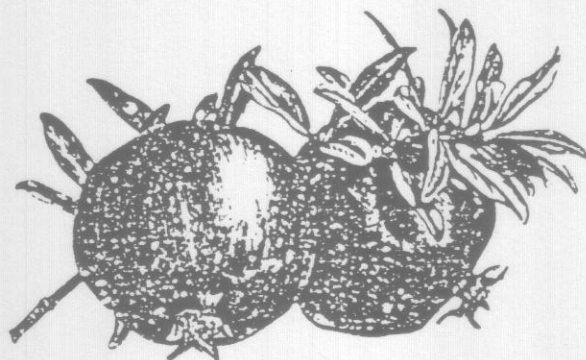


Lobéline

LE GRENADIER : *Punica granatum* L. Punicacées

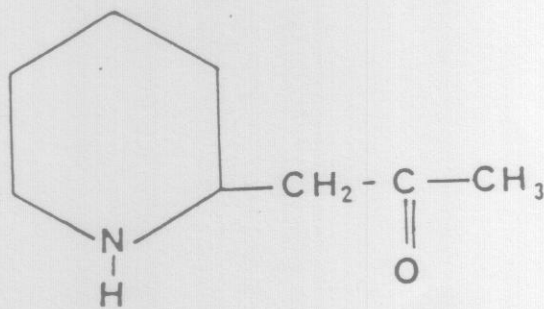


Grenadier



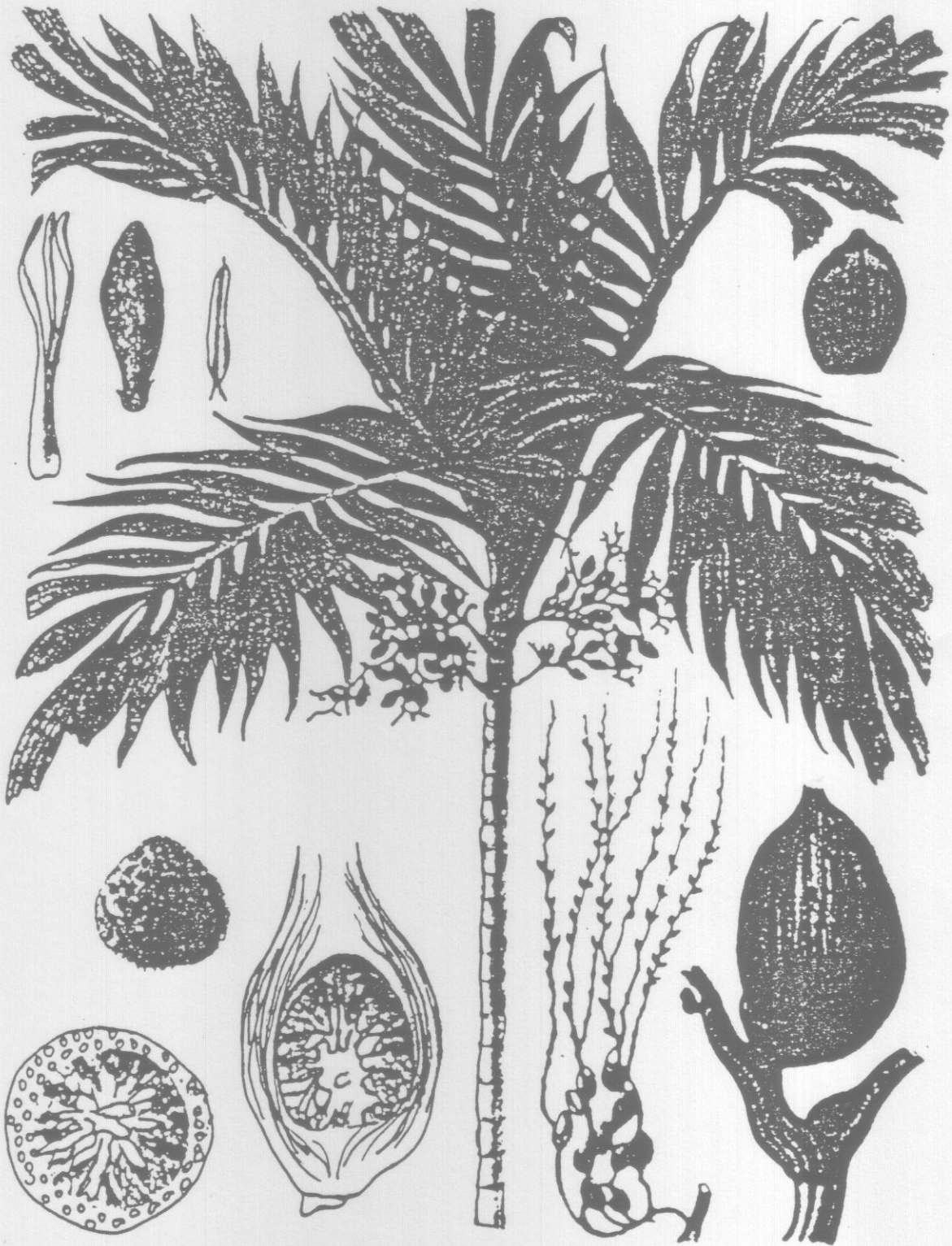
Grenadier : Rameau fructifère

ALCALOIDES DU GRENADIER

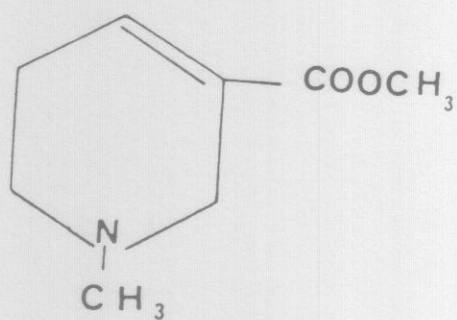


Pelletierine

L'AREQUIER : *Areca catechu* L. Palmiers



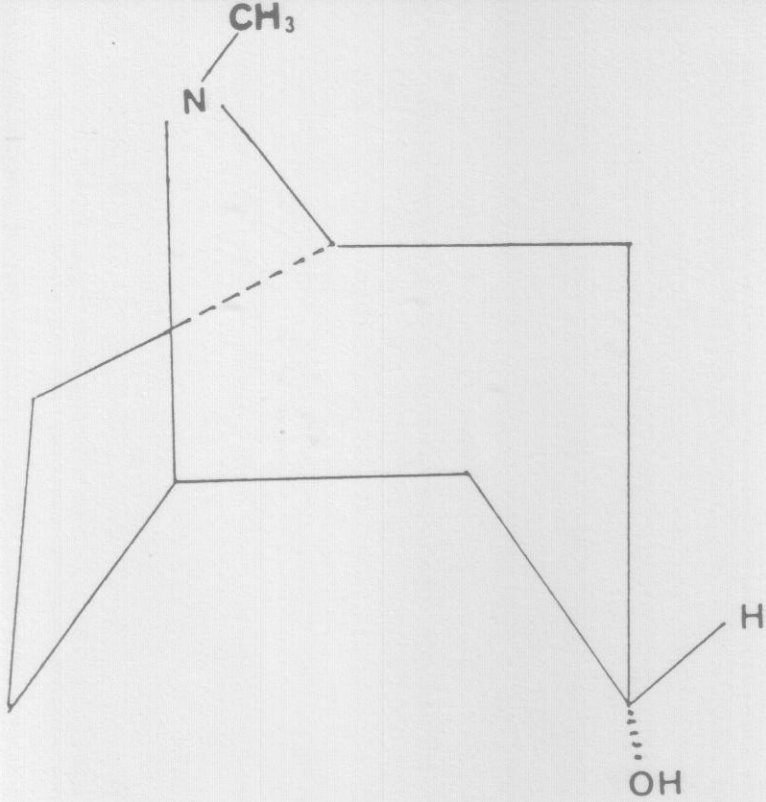
ALCALOIDE DE L'AREQUIER



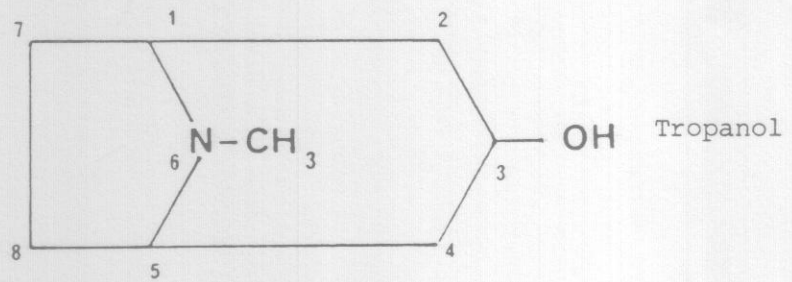
Arécoline

DROGUES À ALCALOÏDES

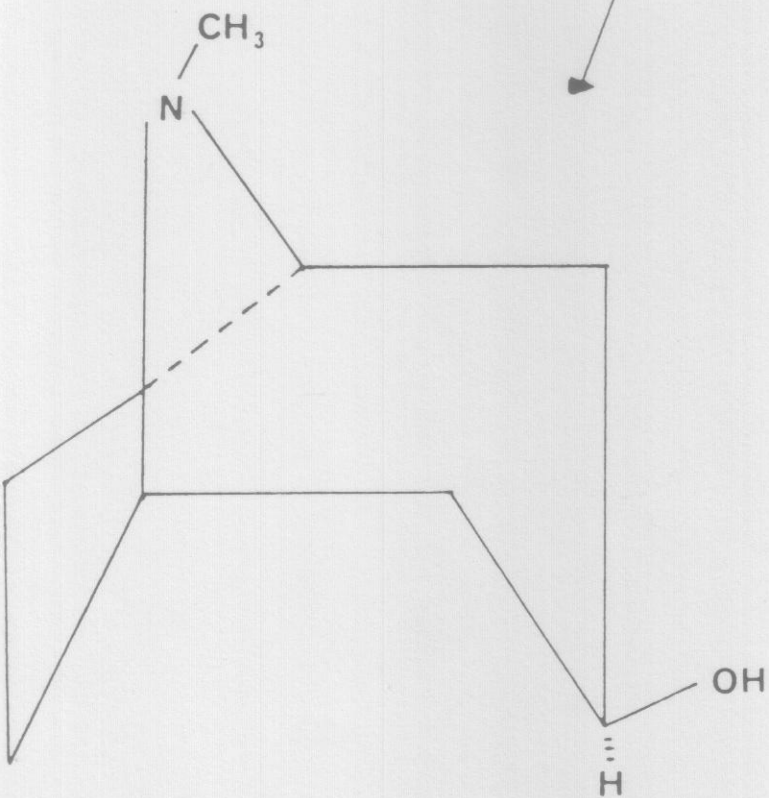
DÉRIVÉS DU TROPANE



Tropanol vrai

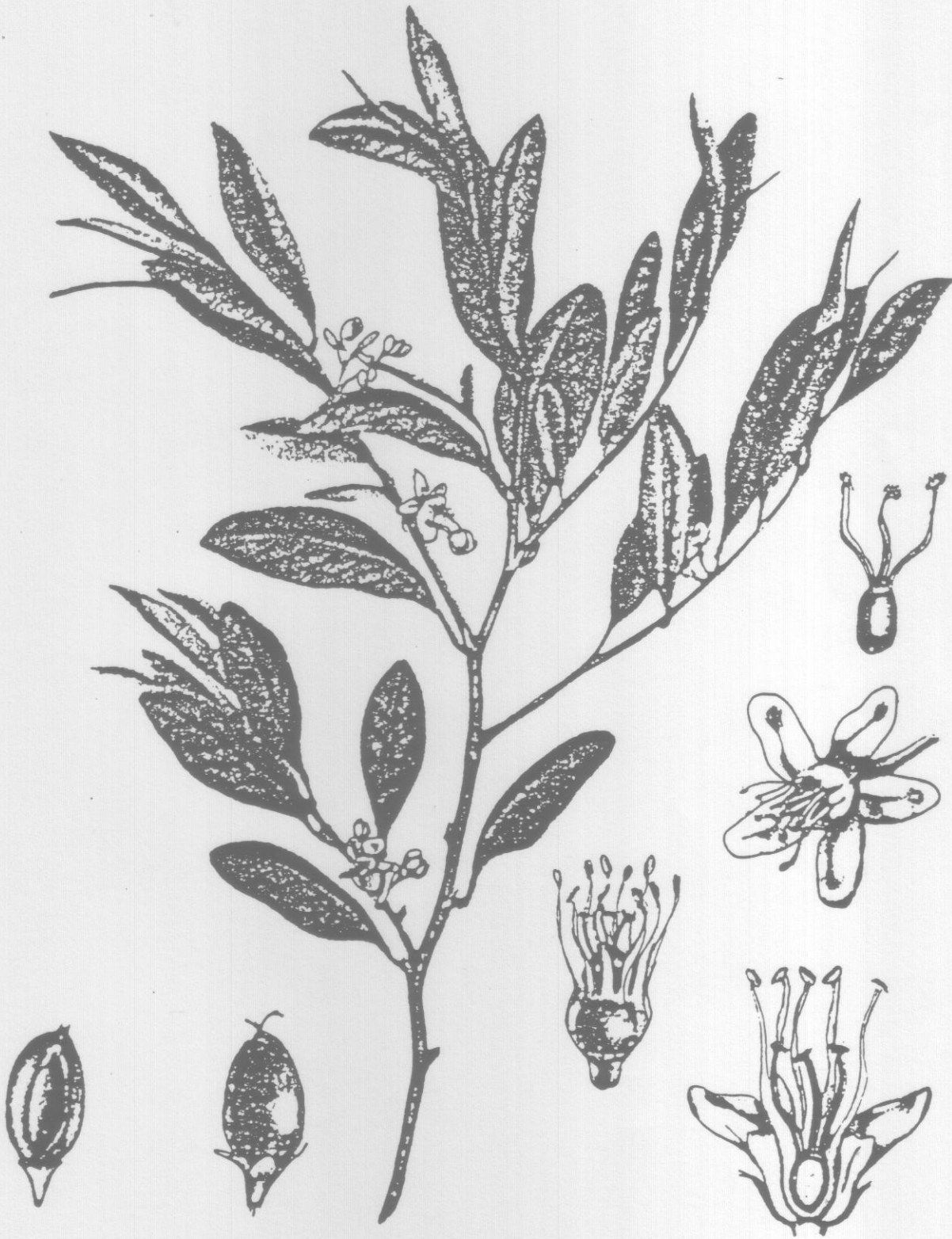


Tropanol



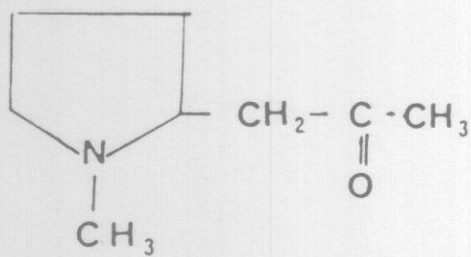
Pseudotropanol

LE COCA : *Erythroxylon coca* Lamk Linacées

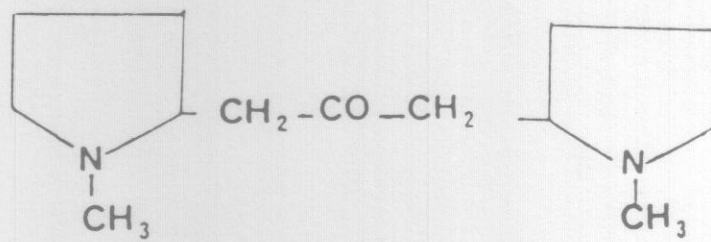


ALCALOÏDES DU COCA

. Alcaloïdes dérivés de la N-méthyl pyrrolidine

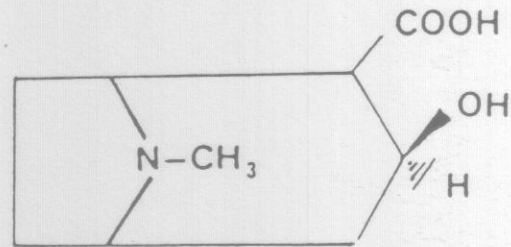


Hygrine

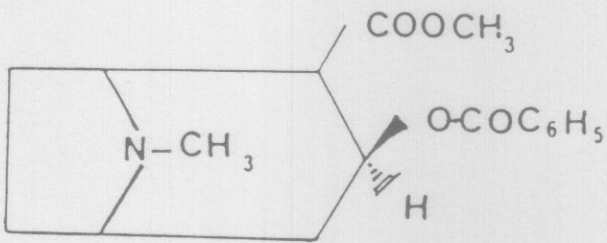


Cuscohygrine

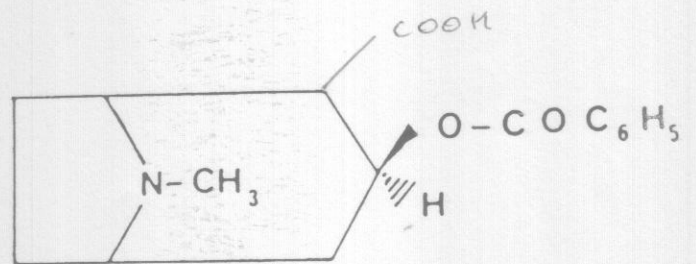
Alcaloïdes dérivés du Pseudotropanol



Ecgonine

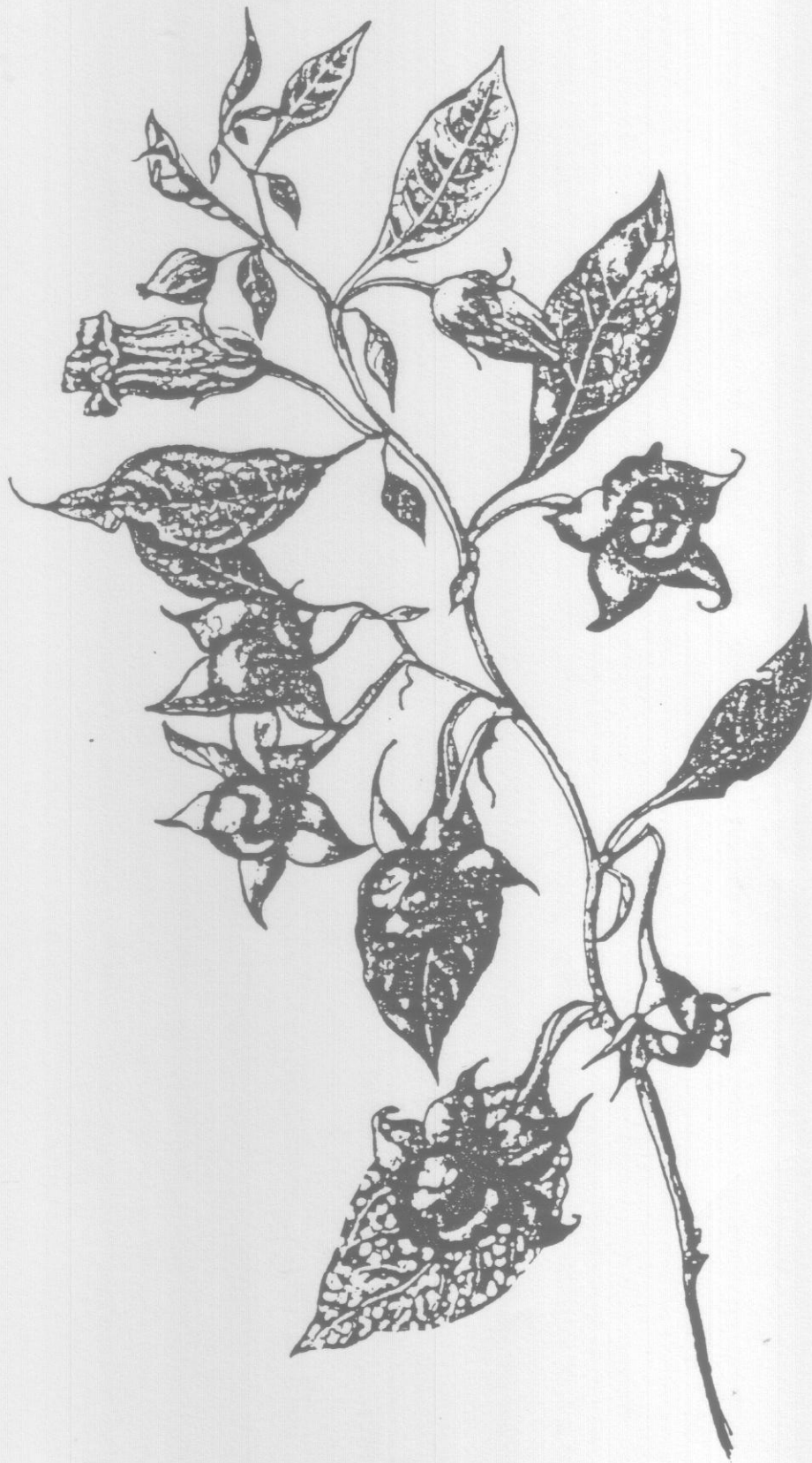


Cocaine



Tropacocaine

LA BELLADONE : *Atropa belladonna* L. Solanacées



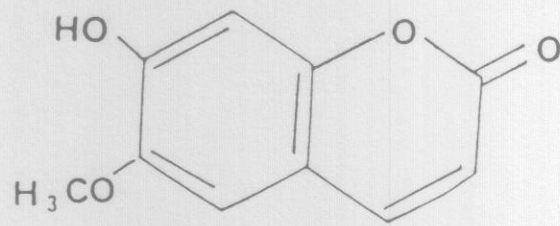
JUSQUIAME : *Hyoscyamus niger* L. Solanacées



DATURA : *Datura stramonium* L. Solanacées



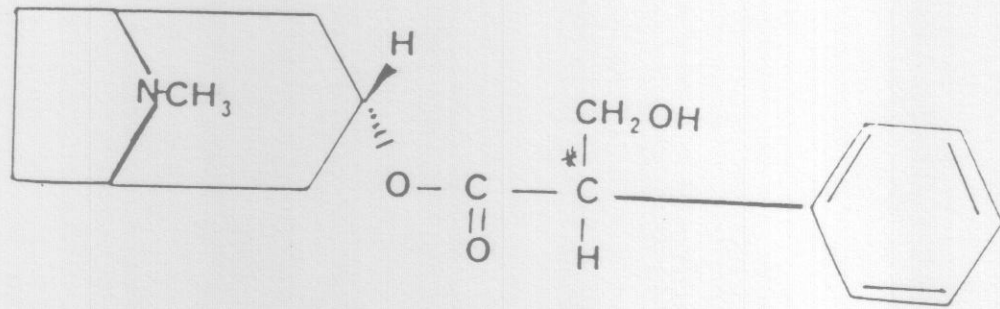
COUMARINE



Scopoletin

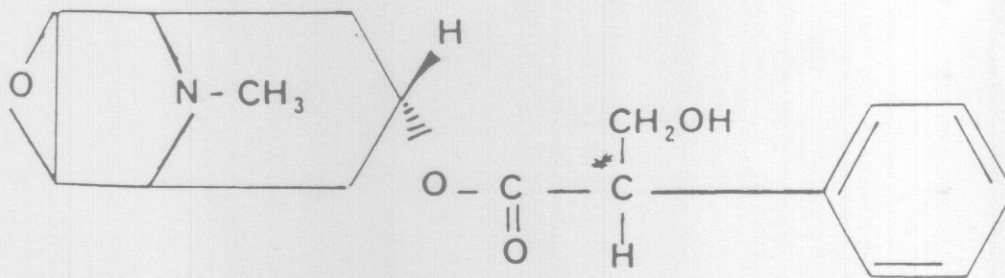
surtout présente dans la belladone

ALCALOIDES DES SOLANACEES



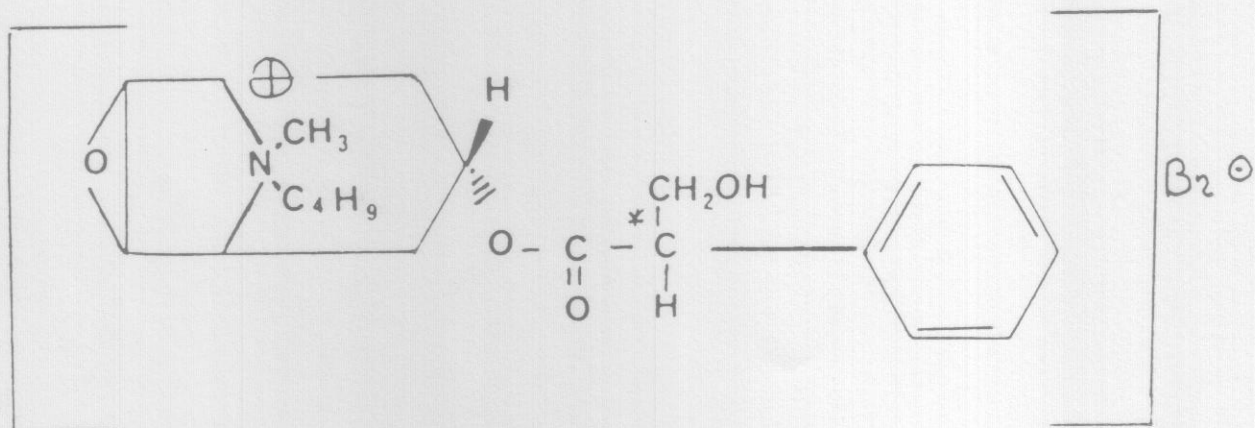
Hyoscyamine

Atropine (racémique ±)



Scopolamine

DERIVES D'HEMISYNTHESE

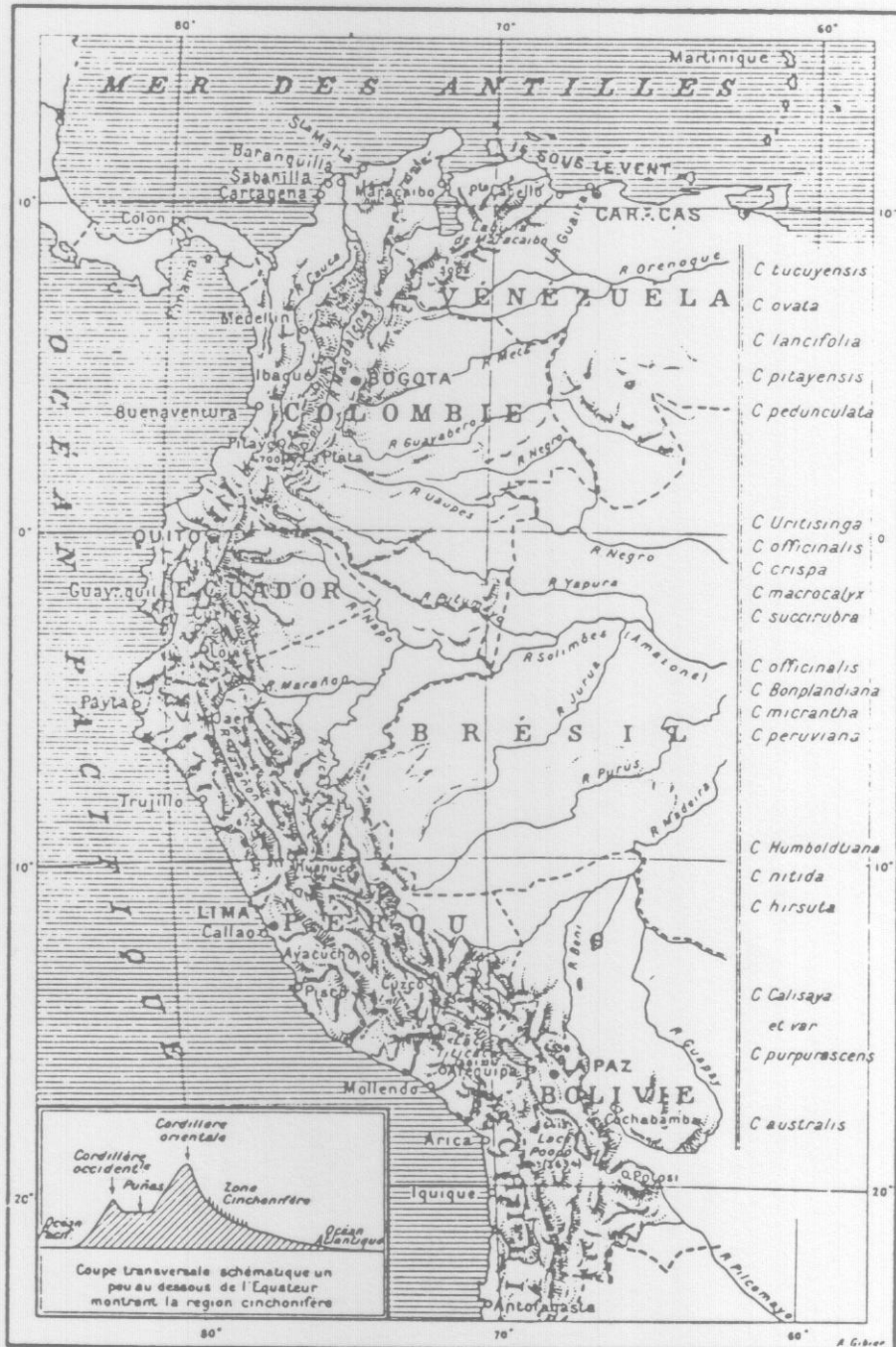


Buscopan (R)

DROGUES À ALCALOÏDES DÉRIVÉS

DE LA QUINOLÉINE

LES QUINQUINAS

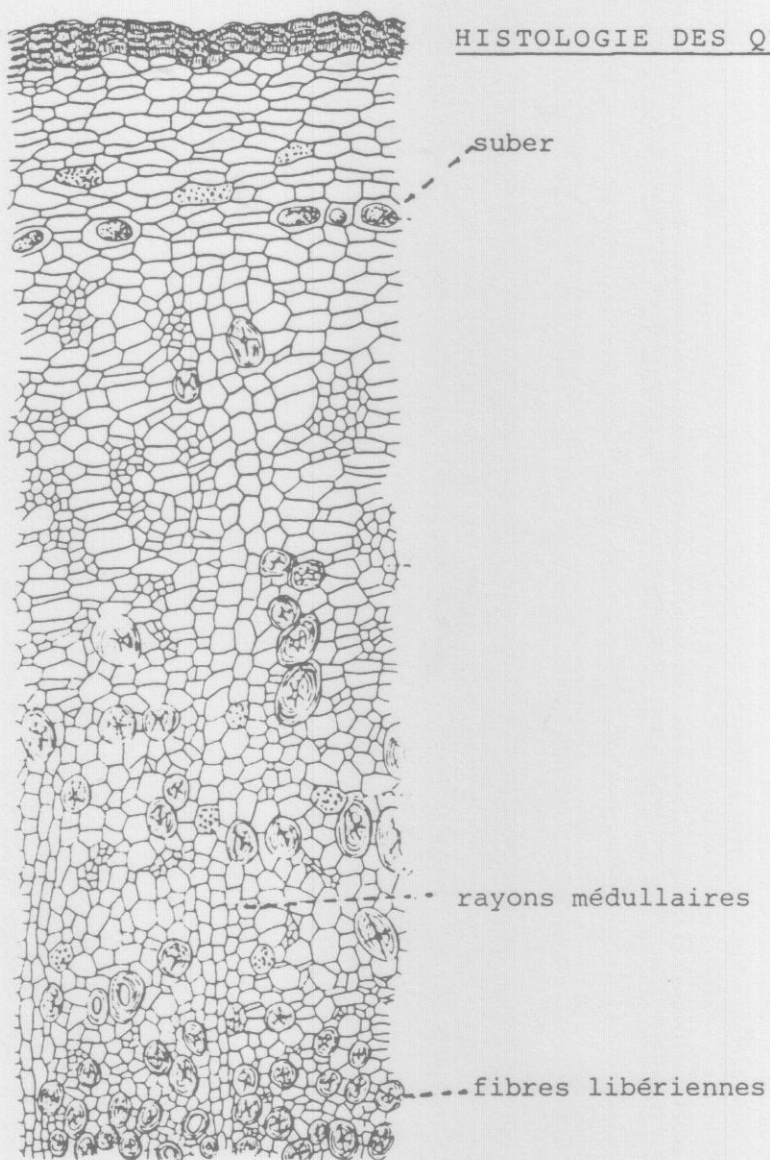


Dispersion géographique des principales espèces sauvages de *Cinchona* dans l'angle de la carte, coupe très schématique, de la côte Pacifique au bassin des Amazones, indiquant la situation de la zone cinchonifère sur le versant oriental de la Cordillère des Andes

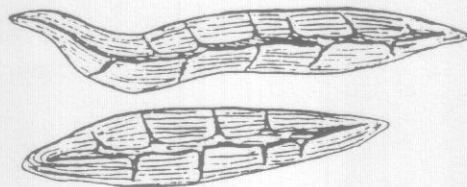
QUINQUINA : *Cinchona succirubra* Pav. Rubiacées



HISTOLOGIE DES QUINQUINAS

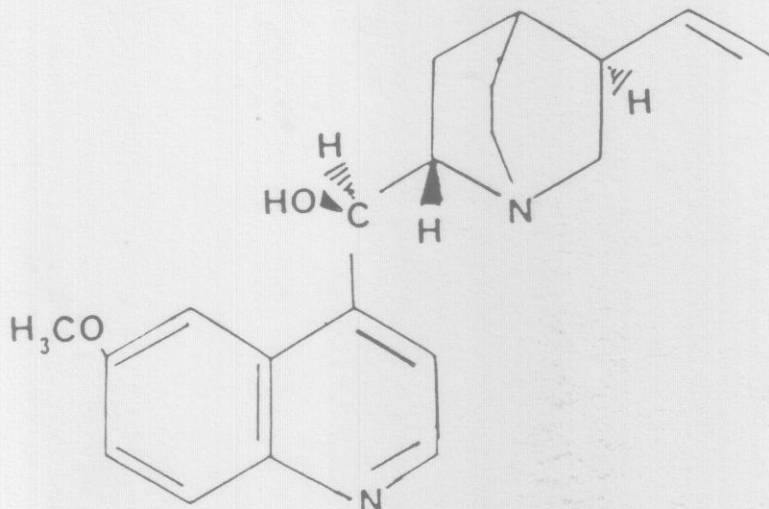


Coupe transversale de l'écorce

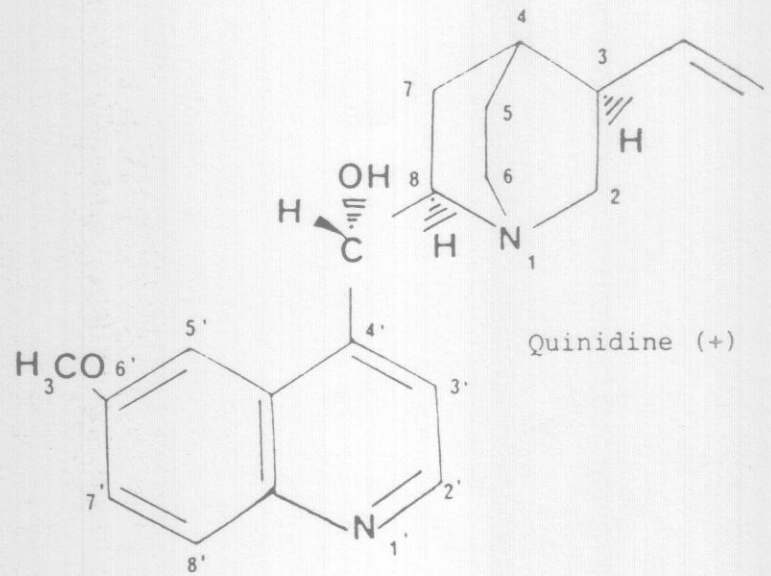


fibres isolées

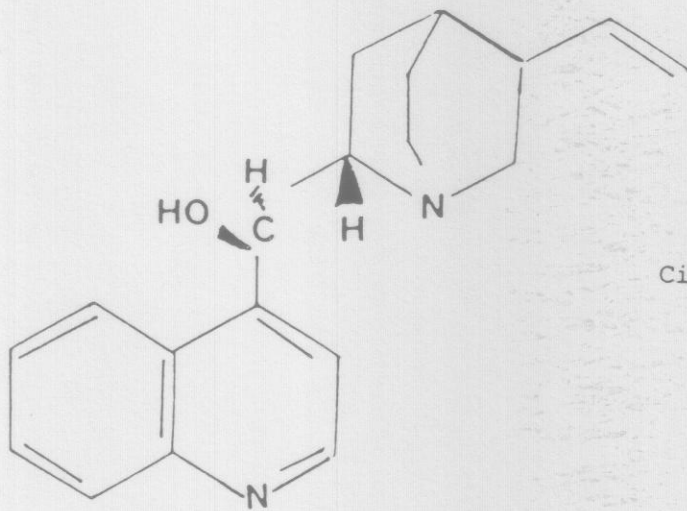
ALCALOÏDES DU QUINQUINA



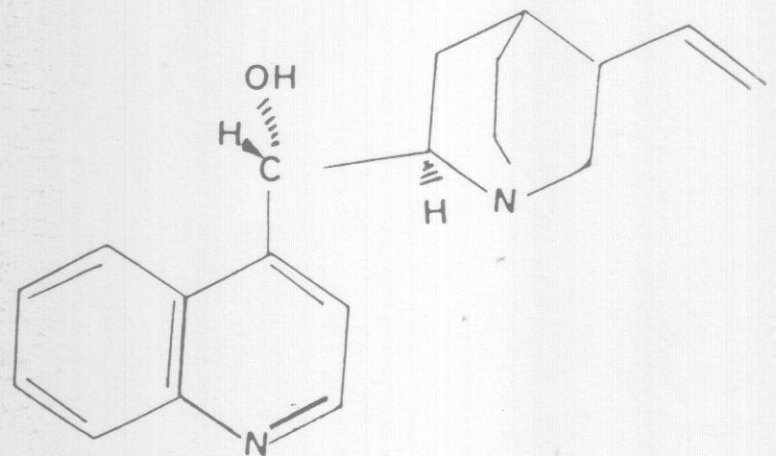
Quinine (-)



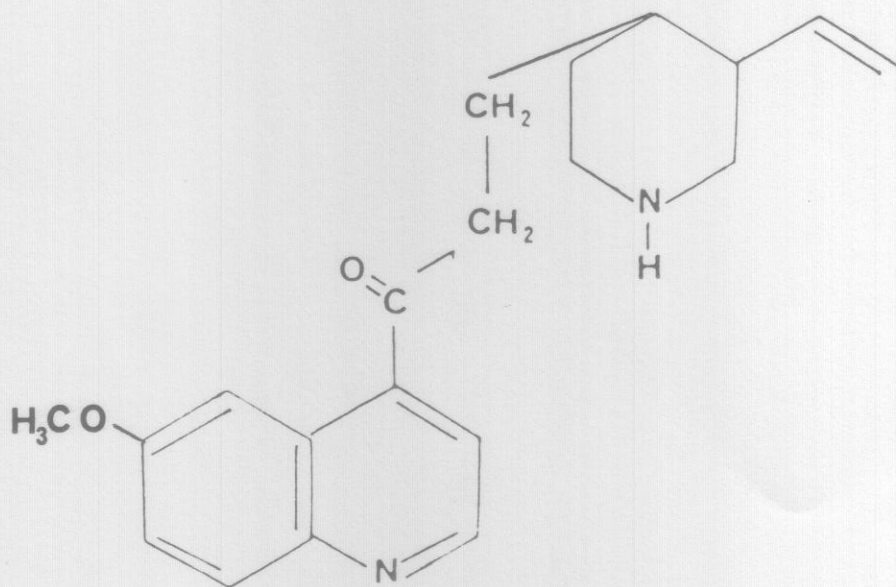
Quinidine (+)



Cinchonidine (-)



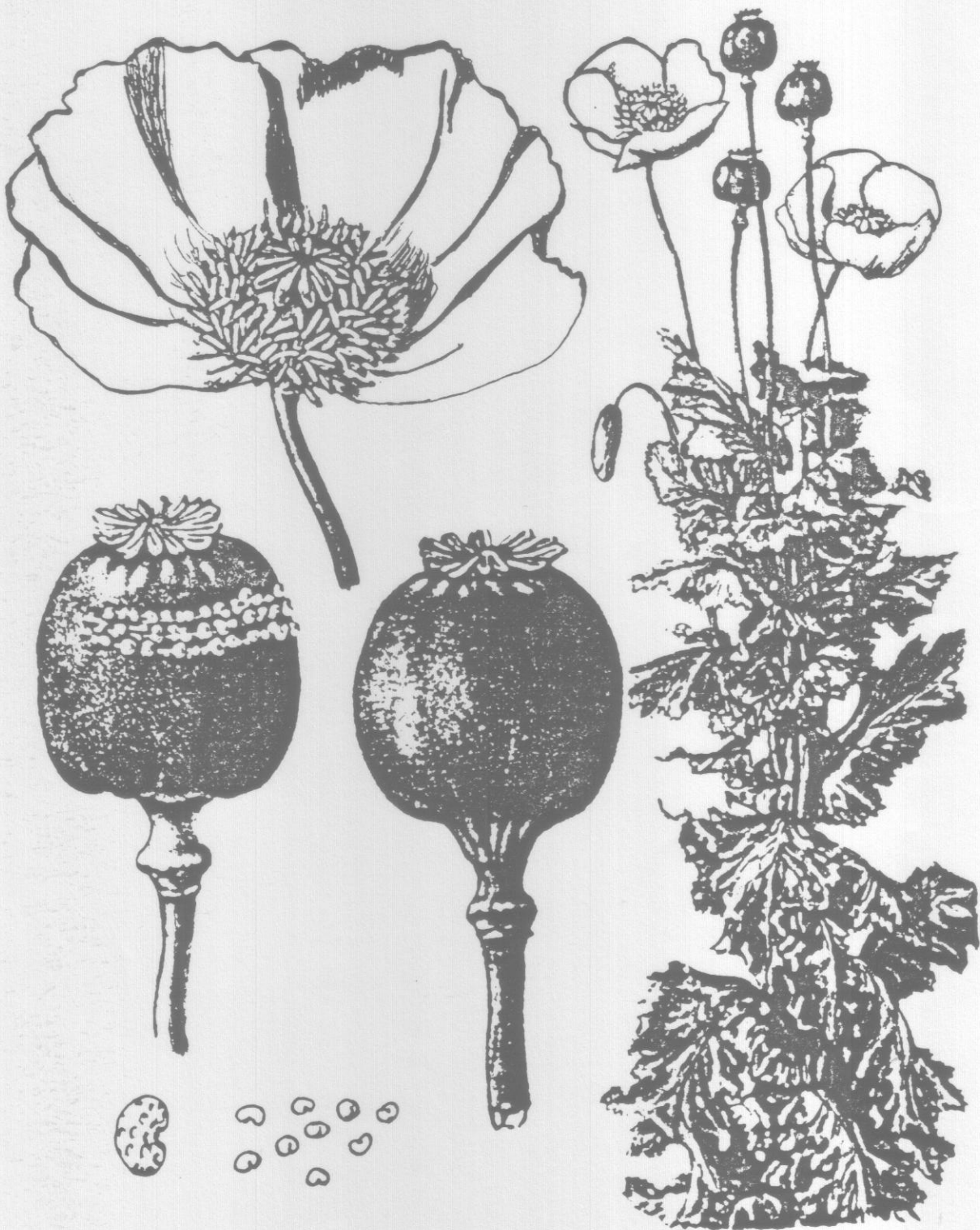
Cinchonine (+)



Quinicine

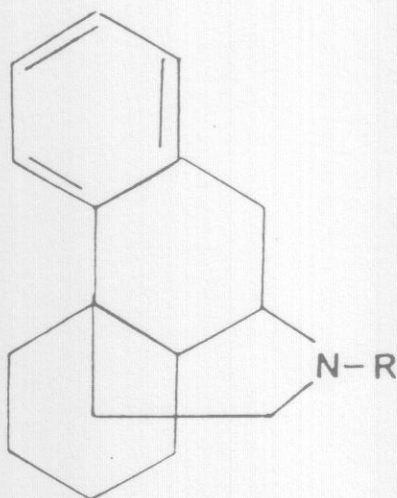
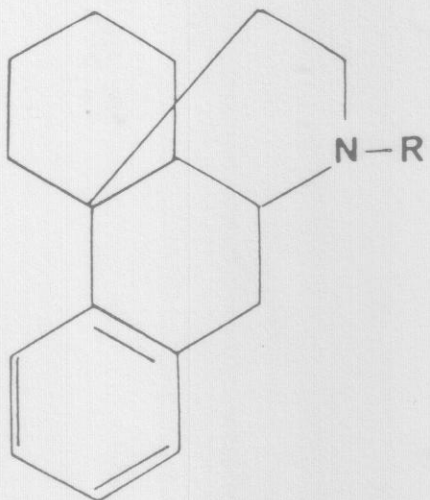
DROGUES À ALCALOÏDES DÉRIVÉS
DE L'ISOQUINOLÉINE

LE PAVOT : *Papaver somniferum* L. Papavéracées

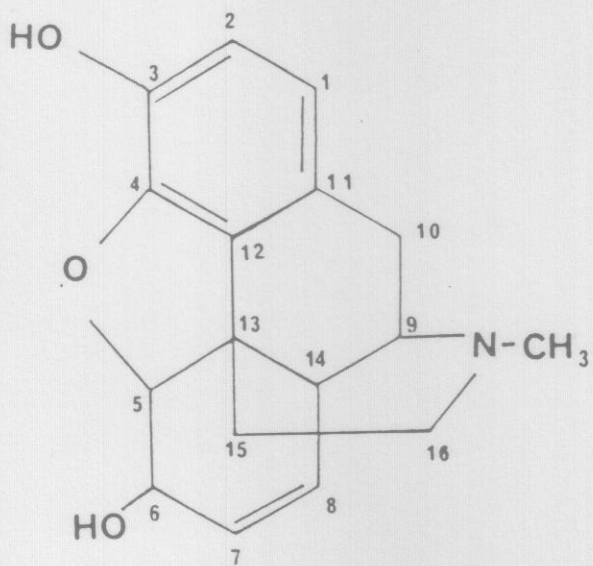


ALCALOIDES DU PAVOT

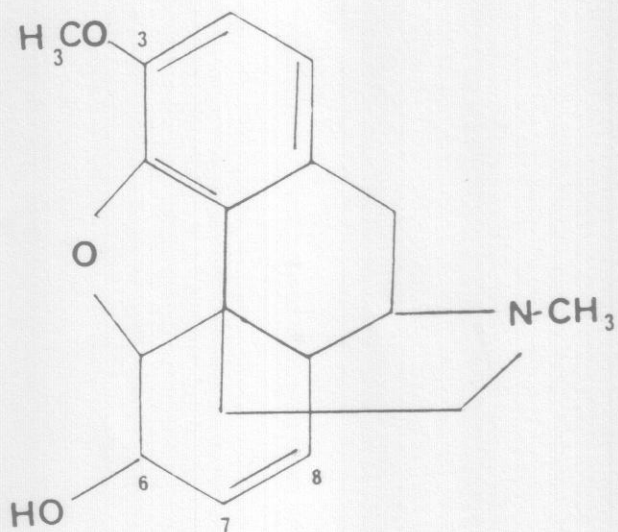
Alcaloïdes du groupe de la morphine



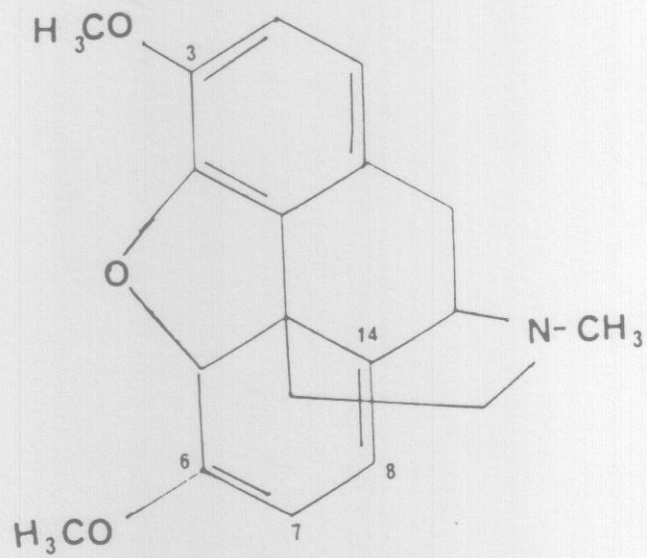
Noyau morphinane



Morphine

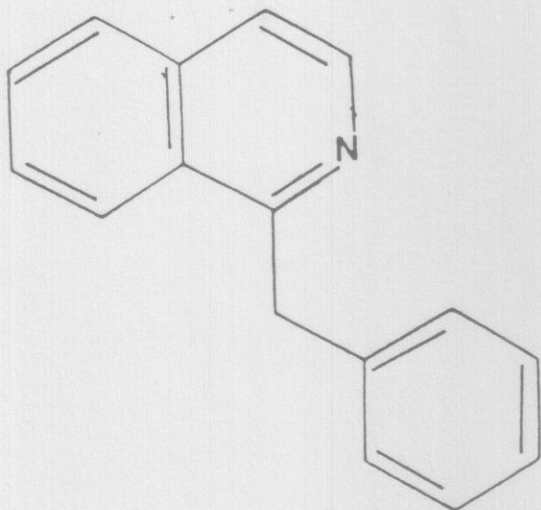


Codéine

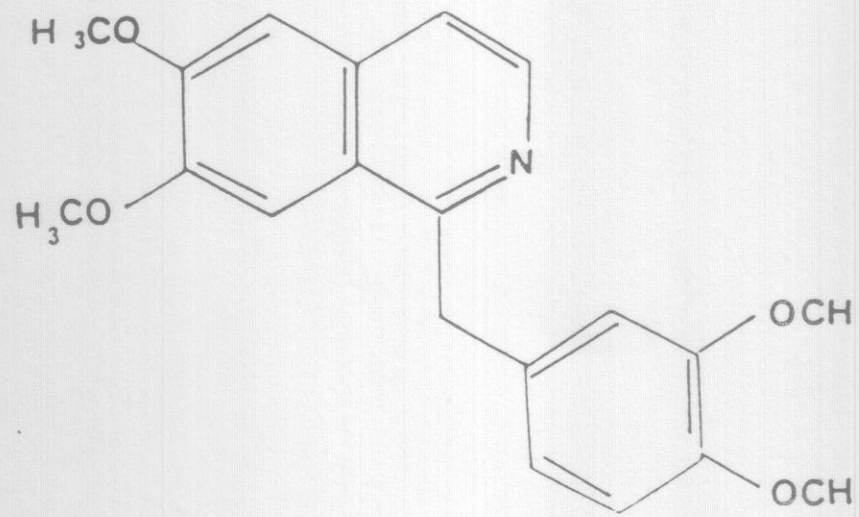


Thebaine

Alcaloïdes du groupe de la papavérine

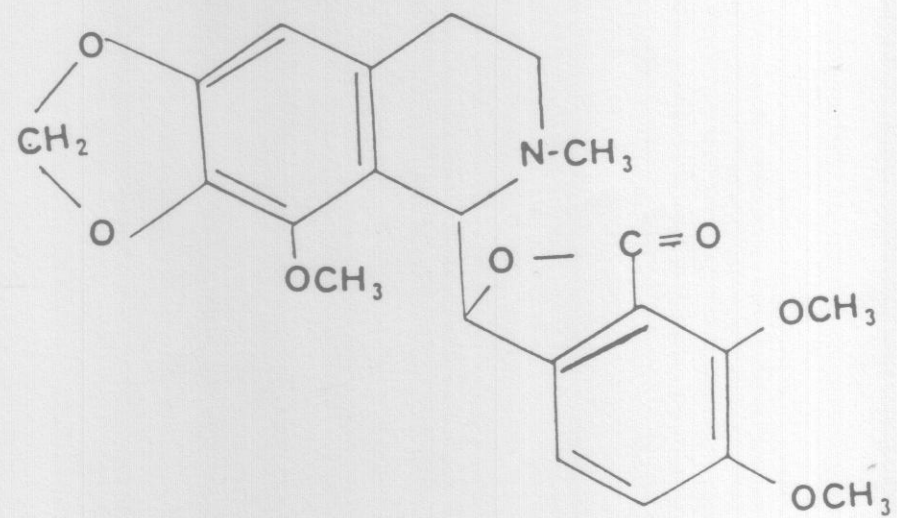


benzyloisoquinoline



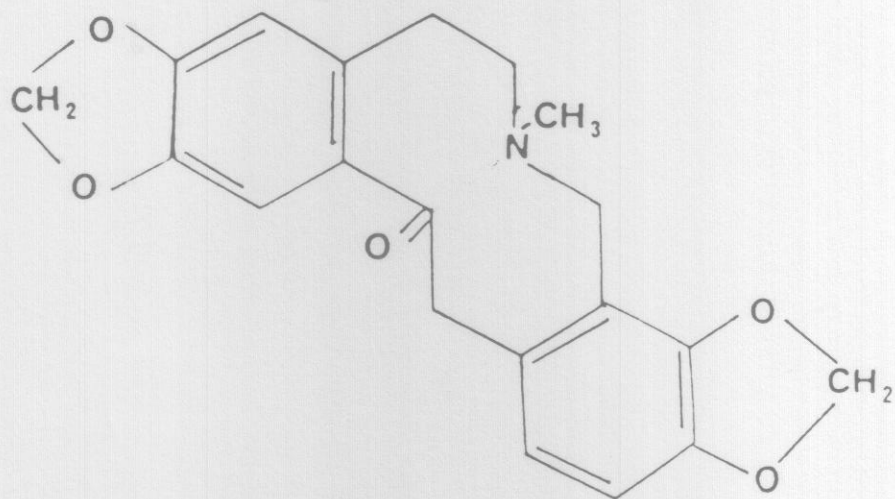
papaverine

. Alcaloïdes du groupe de la narcotine



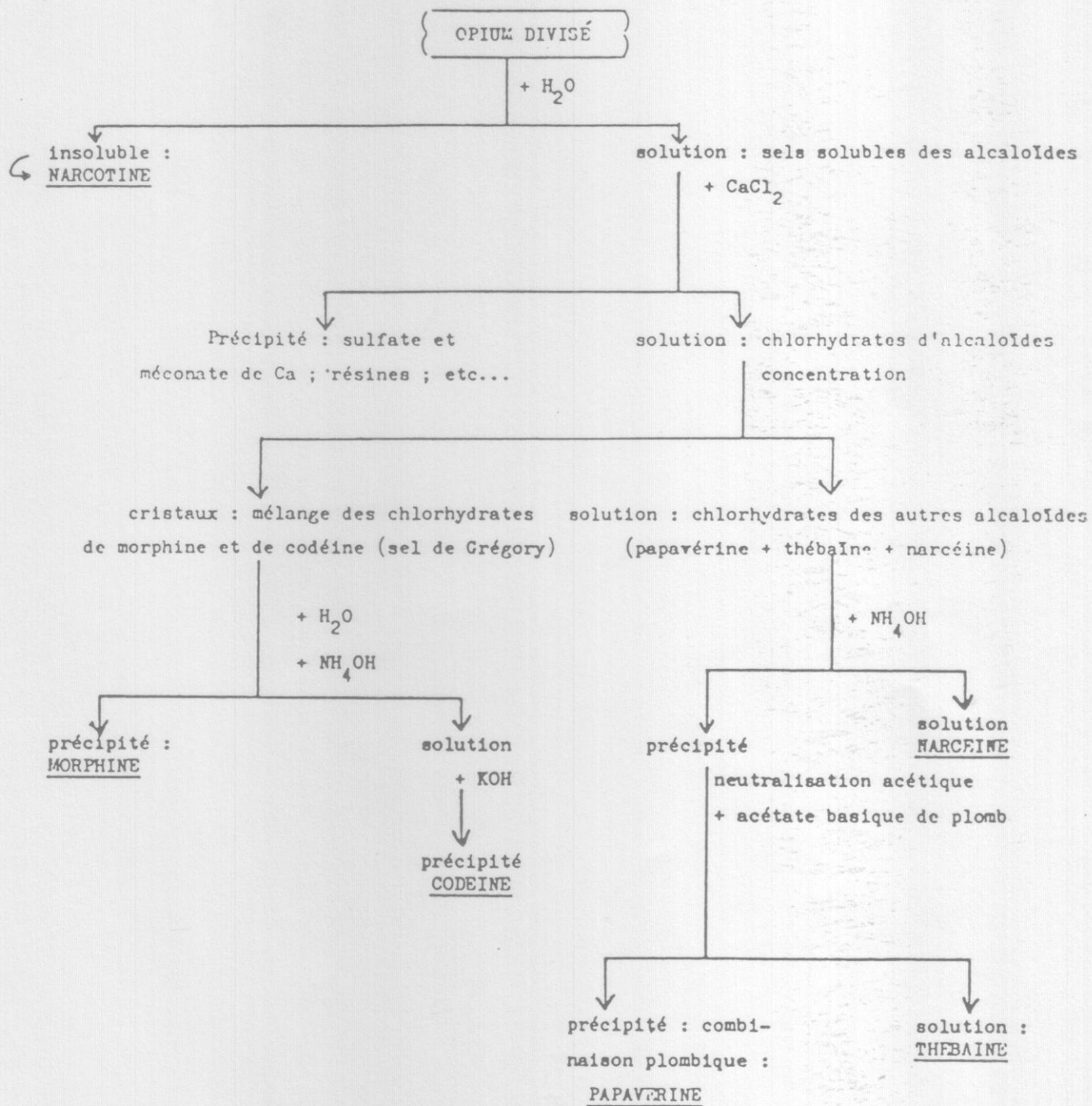
narcotine : noscapine

Alcaloïdes du groupe de la protopine

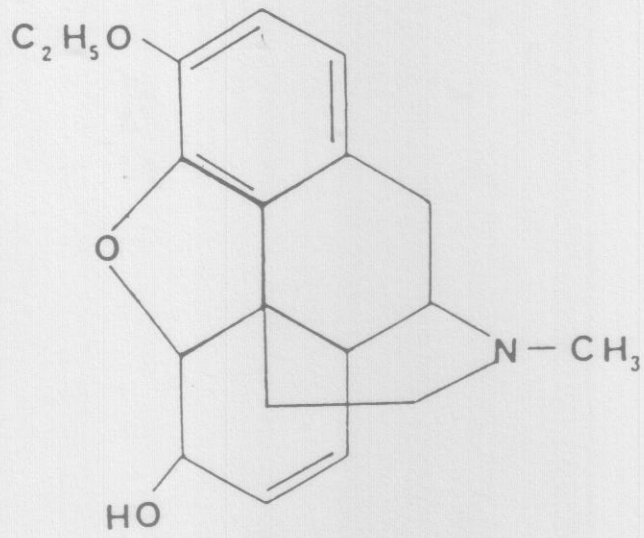


Protopine

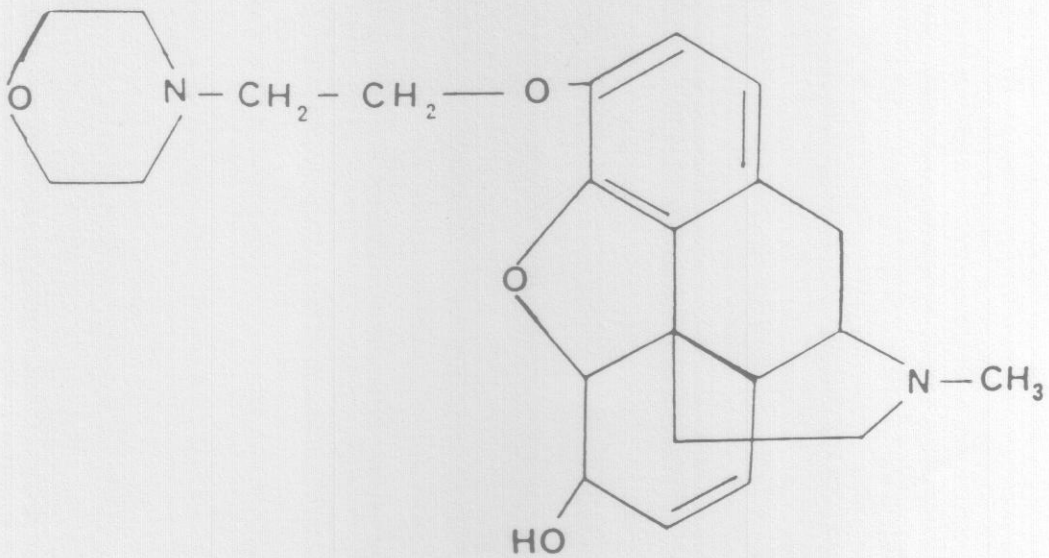
PRINCIPE DE L'EXTRACTION DES ALCALOÏDES
DE L'OPIUM (METHODE DE GREGORY-ROBERTSON)



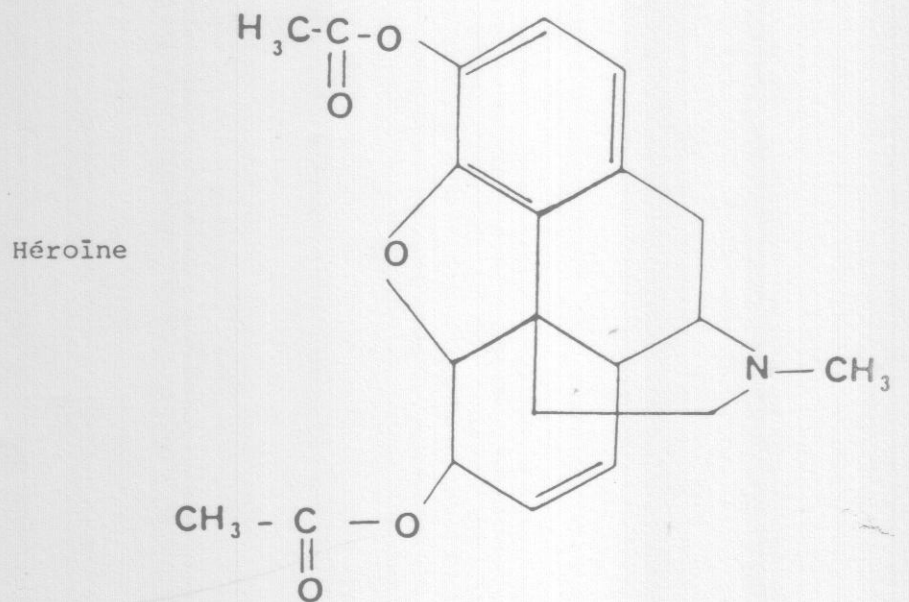
DERIVES D'HEMISYNTHESE



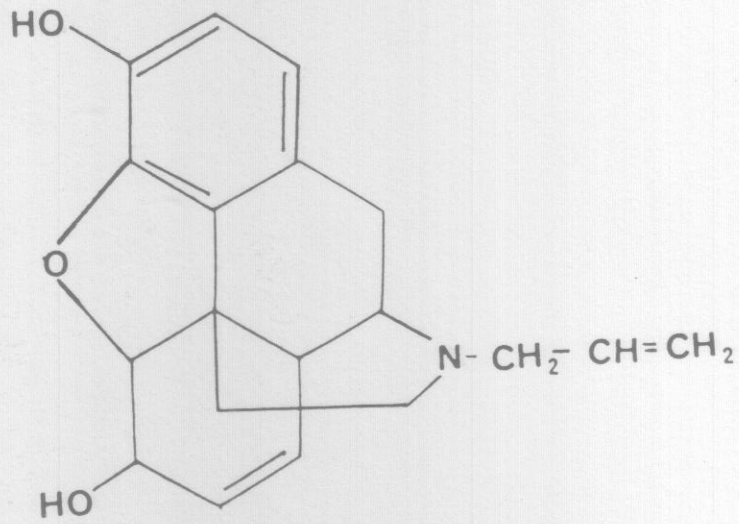
Codéthyline



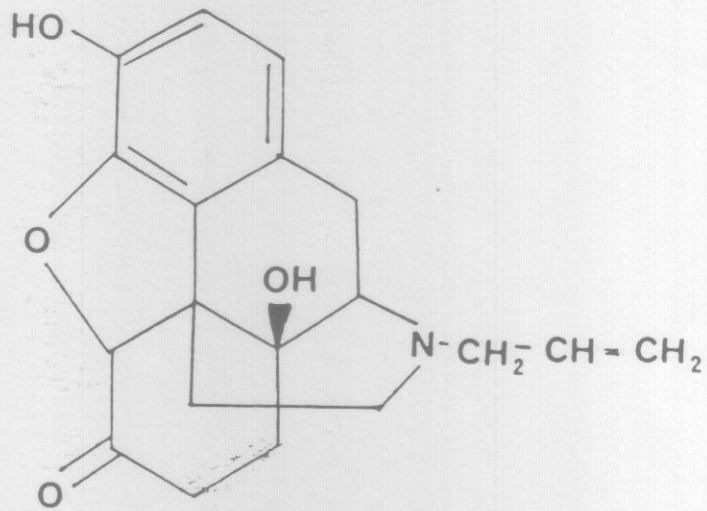
Pholcodine



Héroïne



Nalorphine

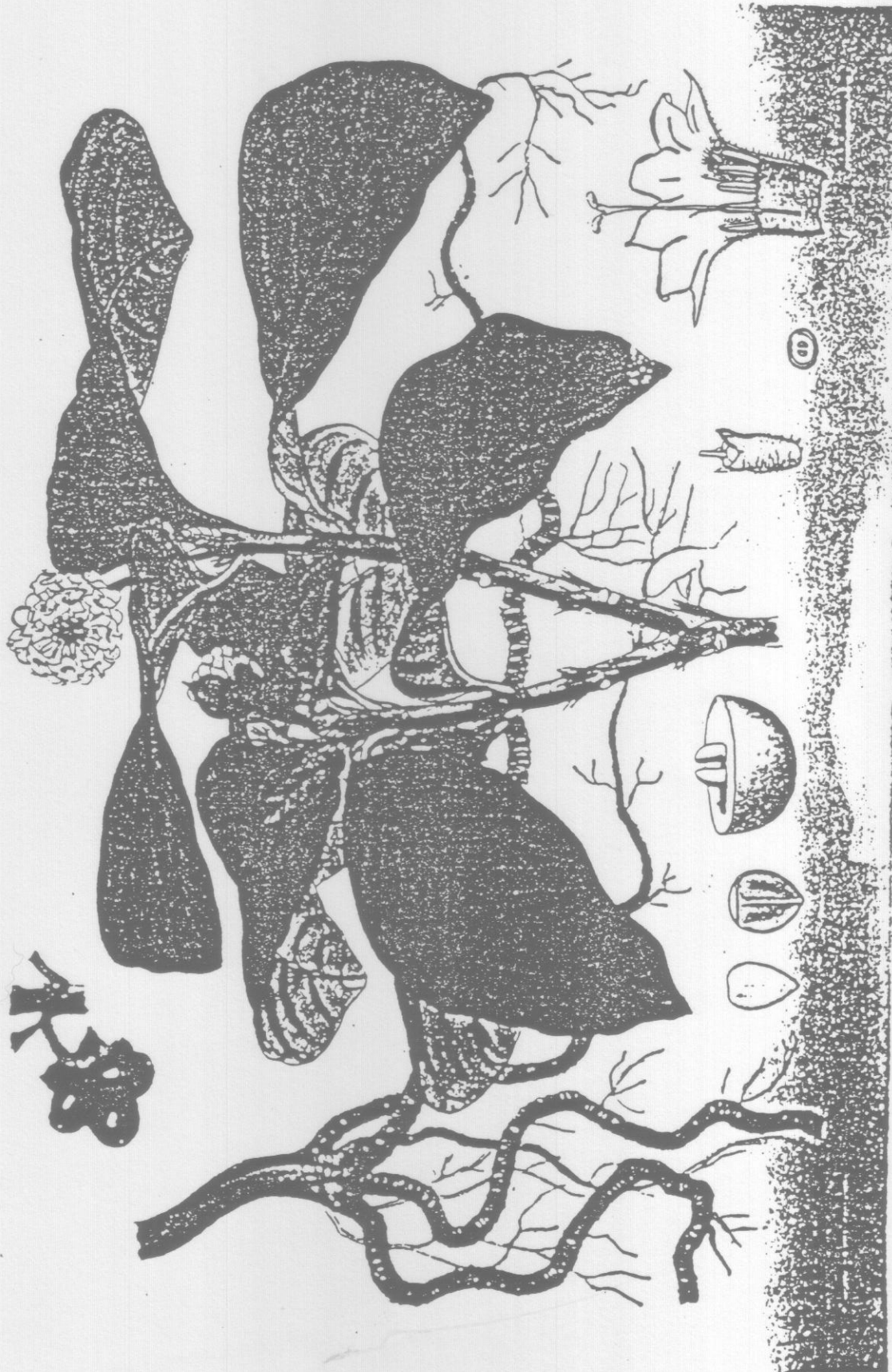


Naloxone

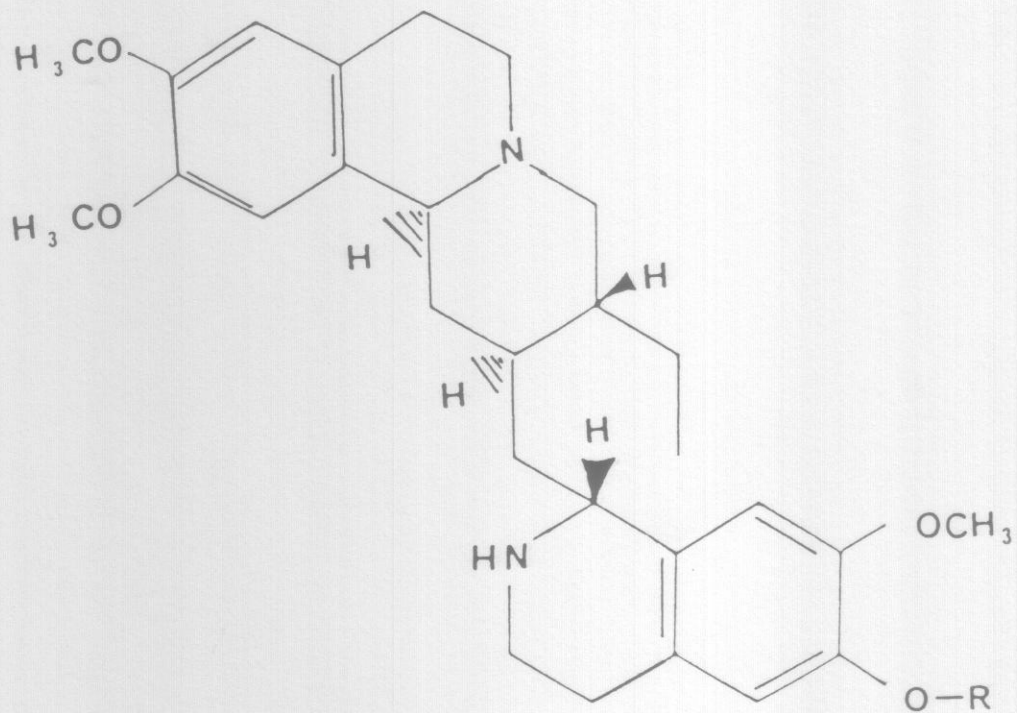
LES IPECAS :

Ipeca annelé mineur : *Cephelis ipecacuanha* A. Rich. (= *Uragoga ipecacuanha* Baill.)

Ipeca annelé majeur : *Cephelis acuminata* Karsten



LES ALCALOÏDES DE L' IPECA

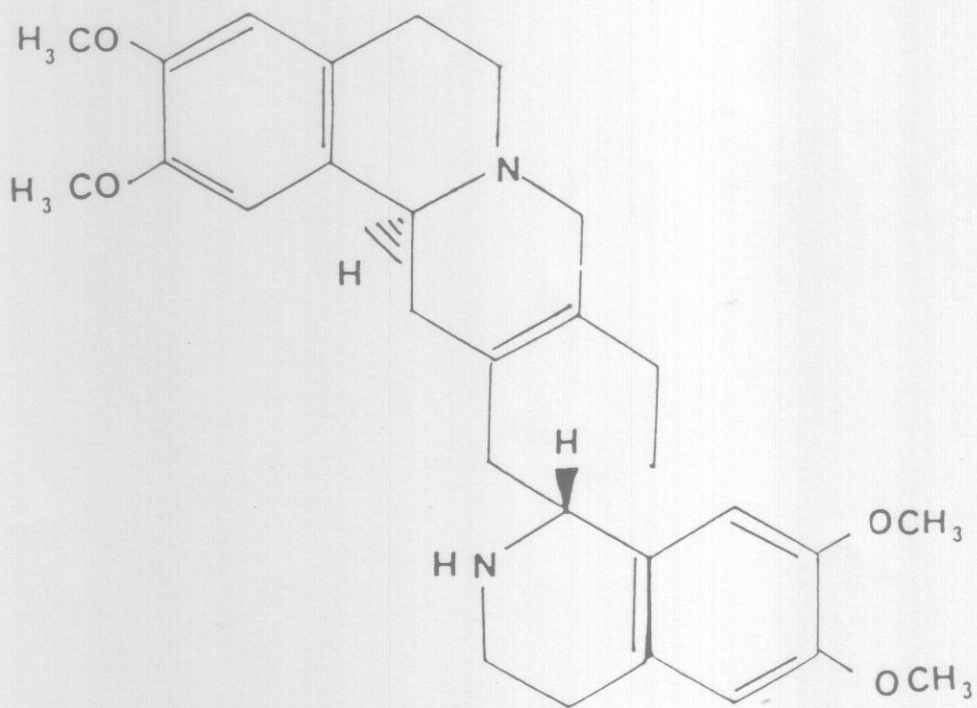


R = CH₃

Emétine

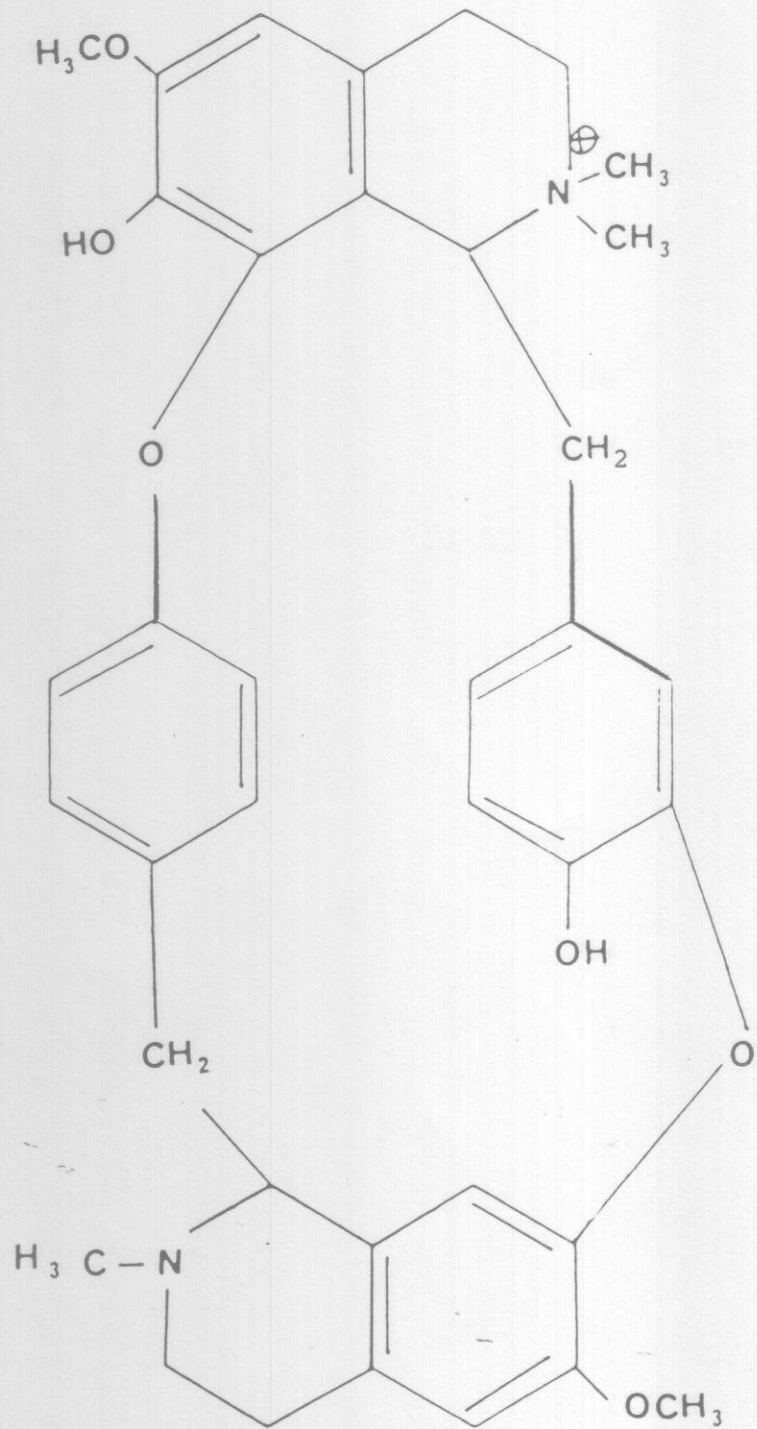
R = H

Céphéline



Déhydroémétine

ALCALOÏDE

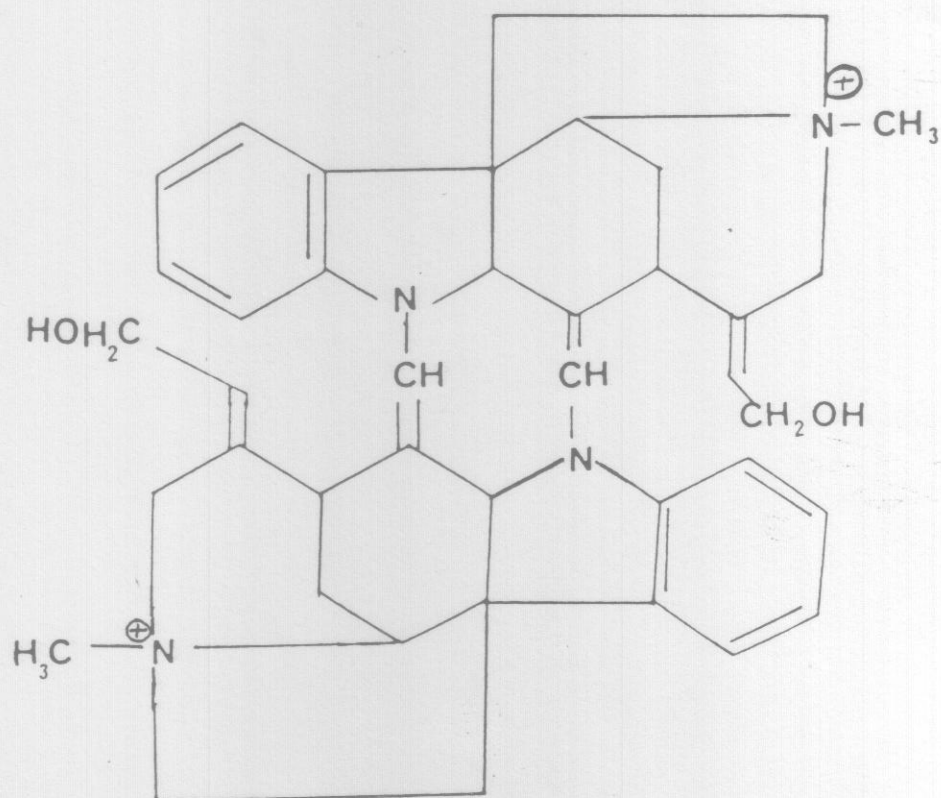


Tubocurarine

DROGUES À ALCALOÏDES DÉRIVÉS

DU NOYAU INDOLE

LES CURARES EN CALEBASSE : *Strychnos* divers Loganiacées

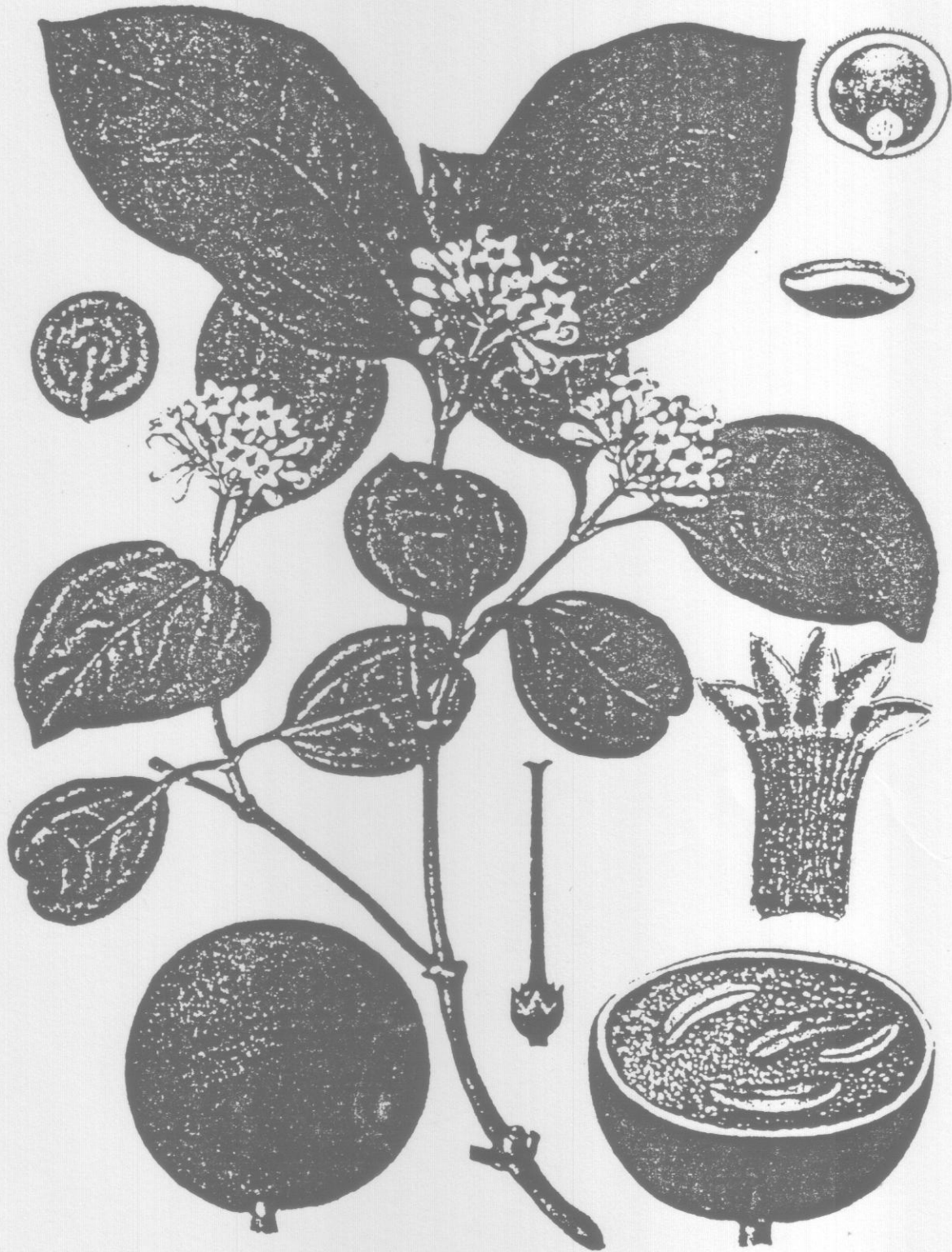


Toxiférine I

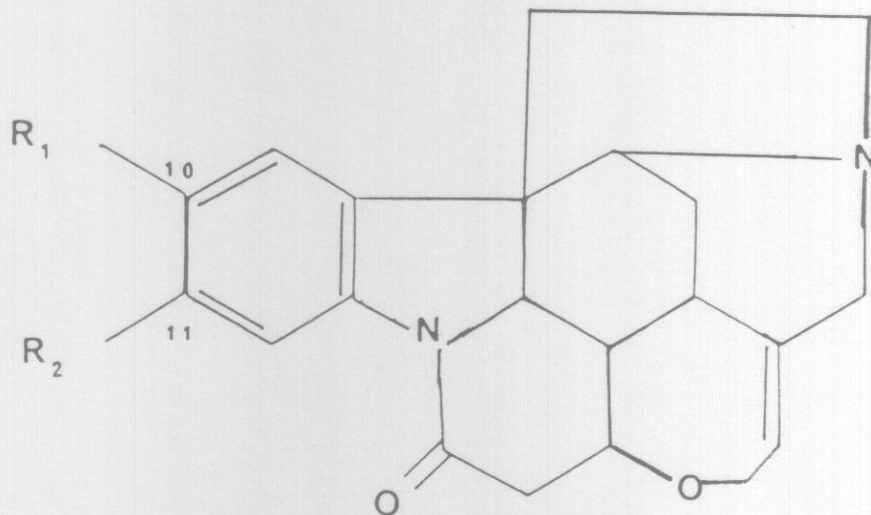
N Allyl toxiférine

CH₂=CH-CH₂ au lieu de CH₃

LA NOIX VOMIQUE = *Strychnos nux vomica* L. Loganiacées



ALCALOÏDES DE LA NOIX VOMIQUE



$R_1 = R_2 = H \quad \dashrightarrow \text{Strychnine}$

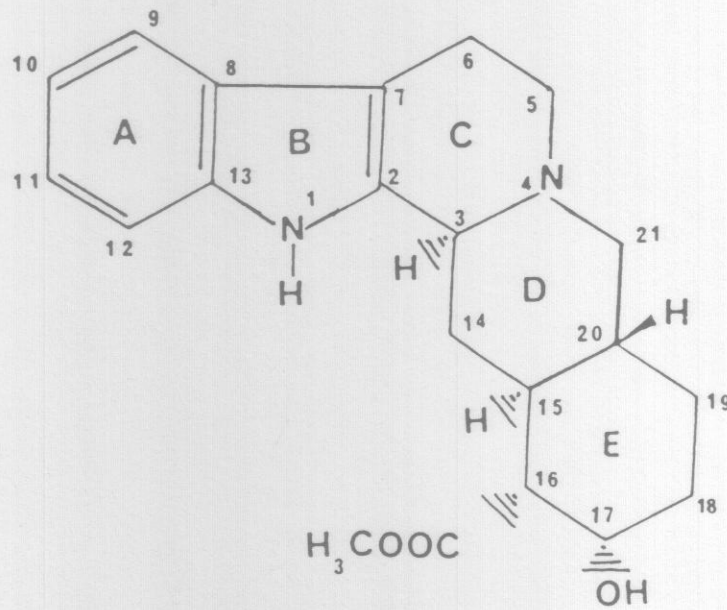
$R_1 = R_2 = OCH_3 \quad \dashrightarrow \text{Brucine}$

$R_1 = H$
 $R_2 = OCH_3$ { α colubrine

$R_1 = OCH_3$
 $R_2 = H$ { β colubrine

LE YOHIMBE : *Pausinystalia yohimbe* (K. Shum.) Rubiacées

1) ALCALOÏDE PRINCIPAL



Yohimbine

2) ALCALOÏDES DERIVANT DE L'HETEROYOHIMBANE : l'Ajmalicine (cf Rauwolfias)

LES RAUWOLFIAS : *Rauwolfia divers* Apocynacées

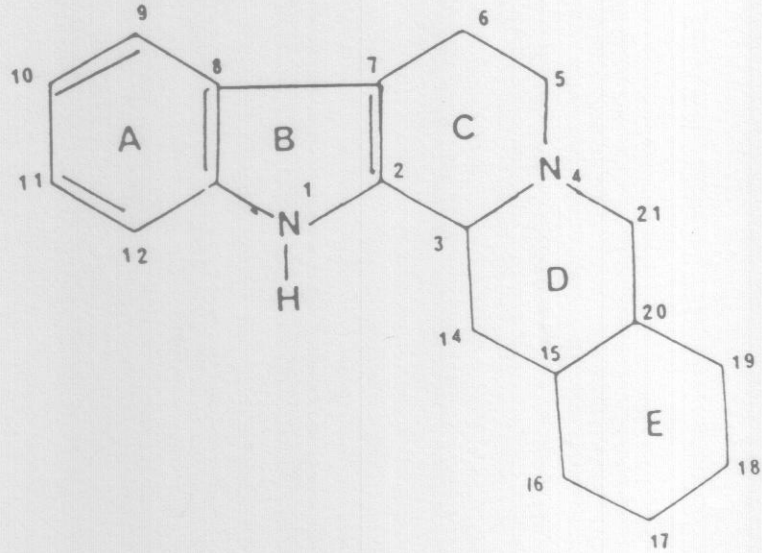


Rauwolfia serpentina Benth.

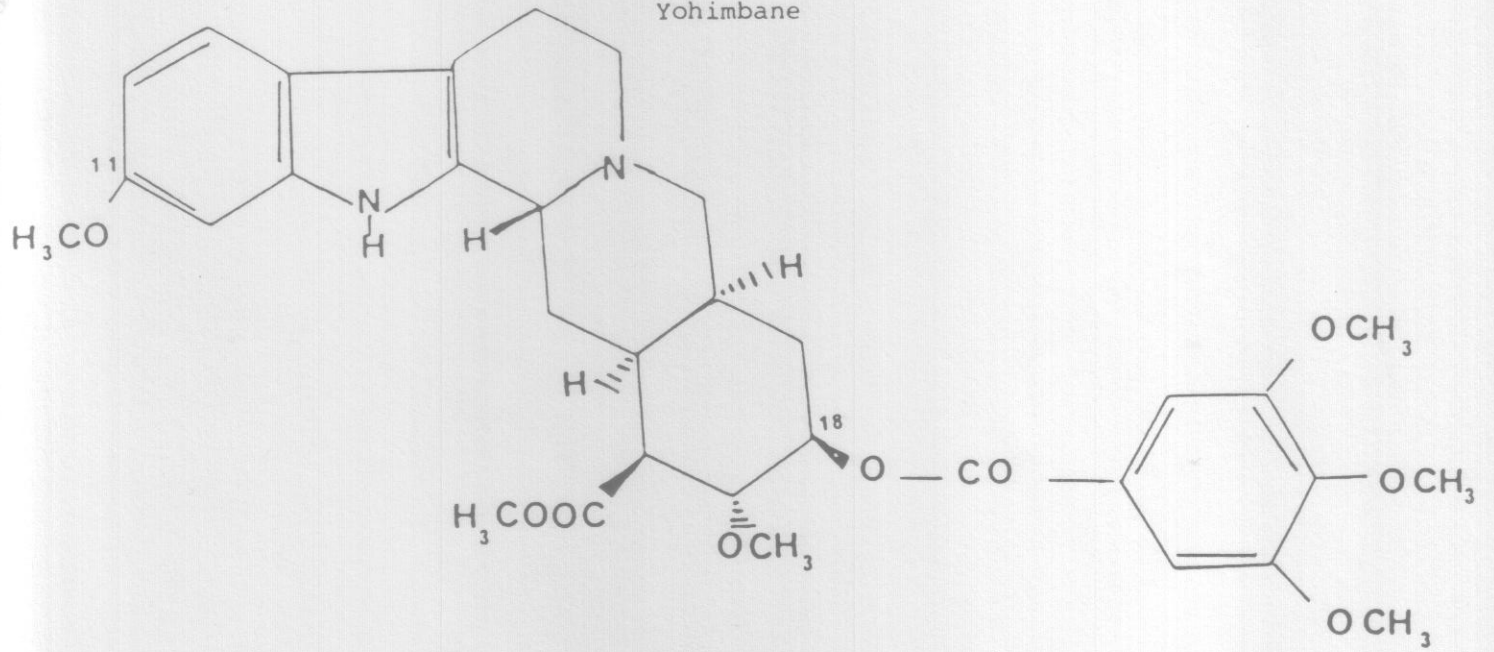
ALCALOÏDES DE RAUWOLFIA

Premier groupe

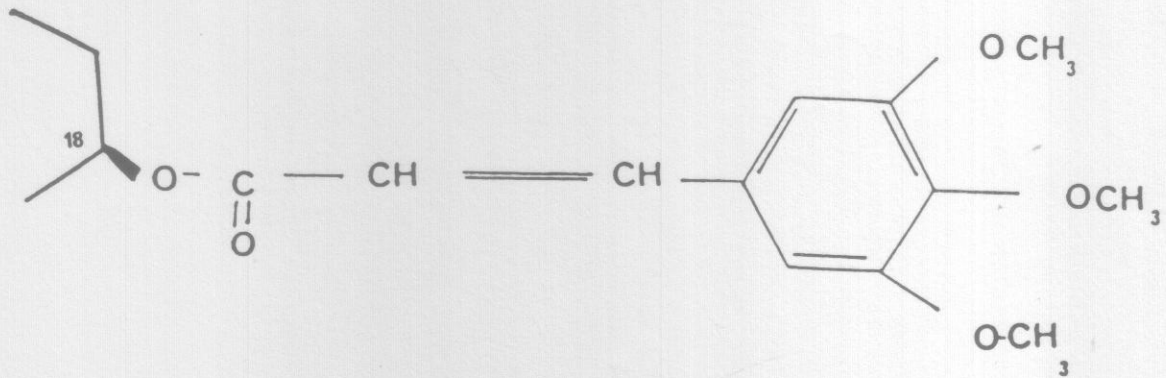
. Alcaloïdes dérivés du Yohimbane



Yohimbane



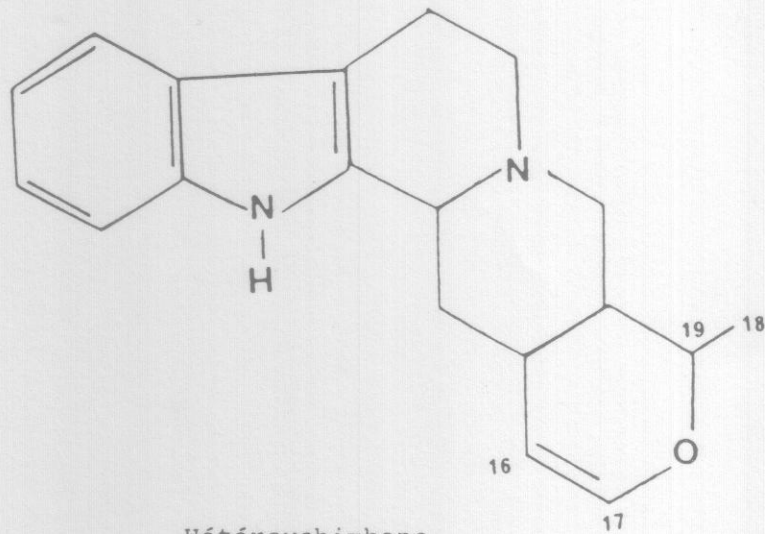
Résérpine



Rescinamine

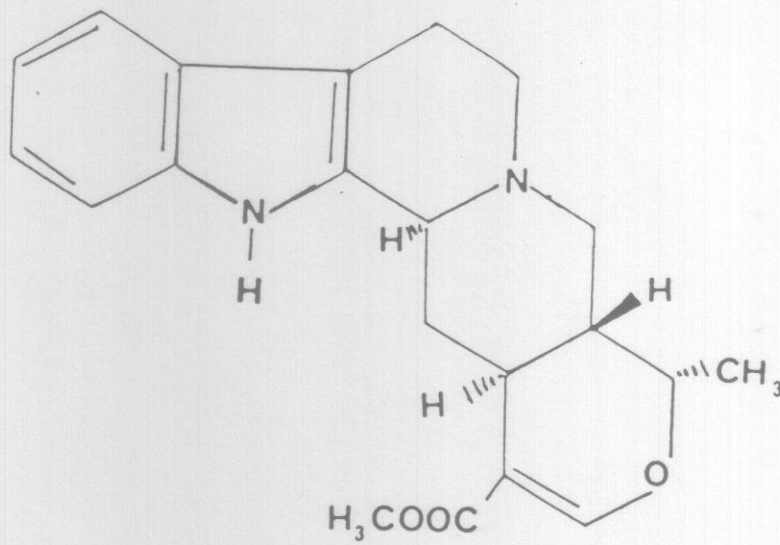
Deuxième groupe

Alcaloïdes dérivés de l'hétéroyohimbane



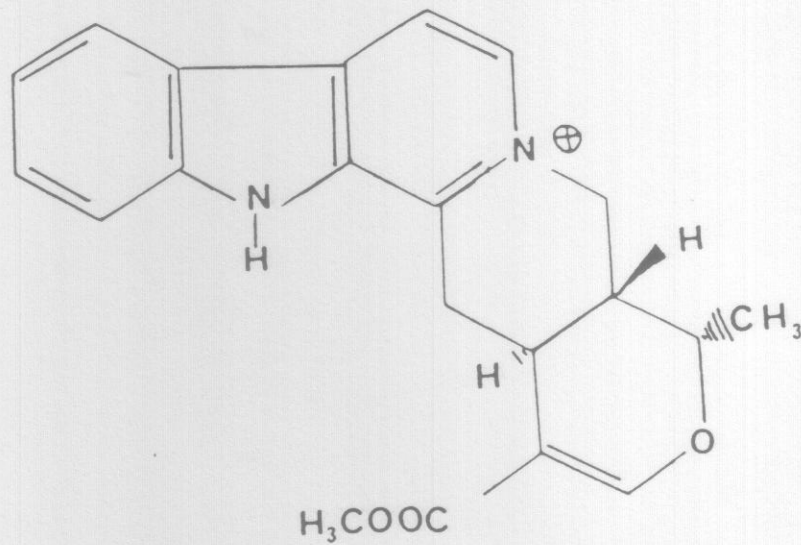
Hétéroyobimbane

Sous-groupe de l'Ajmalicine (Raubasine)



Ajmalicine

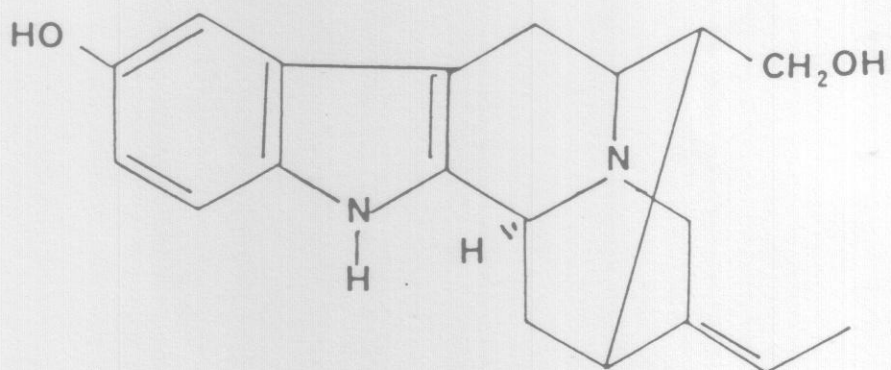
Sous-groupe de la serpentine



Serpentine

Troisième groupe

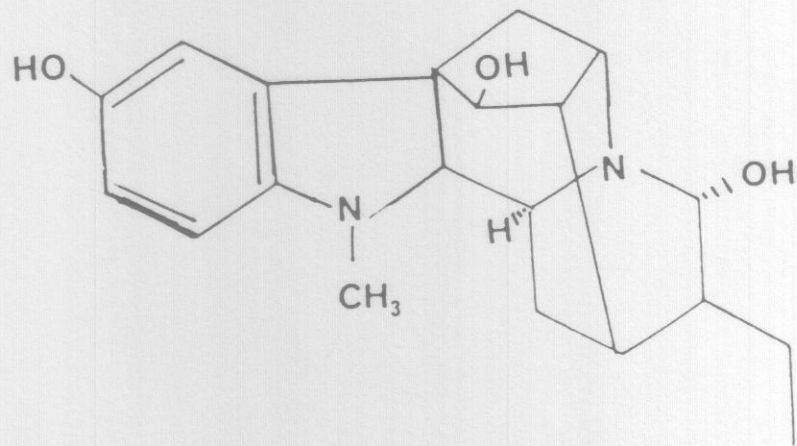
Groupe de la sarpagine



Sarpagine

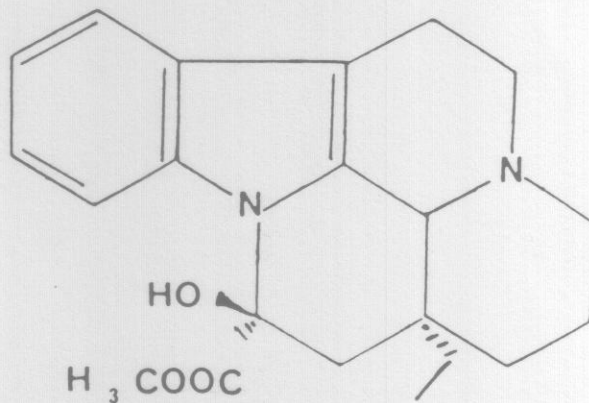
Quatrième groupe

. Groupe de l'Ajmaline



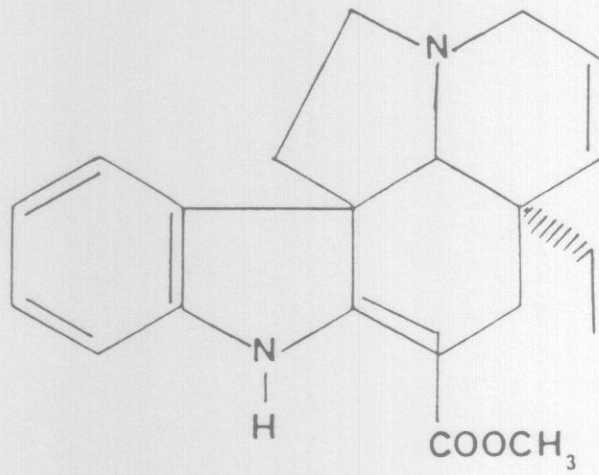
Ajmaline

LA PERVENCE OFFICINALE : *Vinca minor* L. Apocynacées



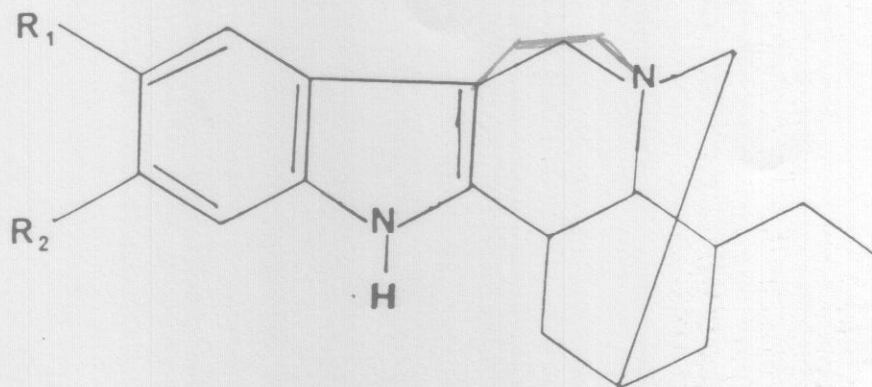
La vincamine

LE VOACANGA : *Voacanga africana* Stapf. Apocynacées



La tabersonine

L'IBOGA : *Tabernanthe iboga* H. Bn. Apocynacées



- | | | | |
|---------------------|-------------------------|---|---------------|
| $R_1 \rightarrow H$ | $R_2 \rightarrow H$ | → | Ibogamine |
| $R_1 \rightarrow H$ | $R_2 \rightarrow OCH_3$ | → | Tabernanthine |
| $R_2 \rightarrow H$ | $R_1 \rightarrow OCH_3$ | → | Ibogaine |

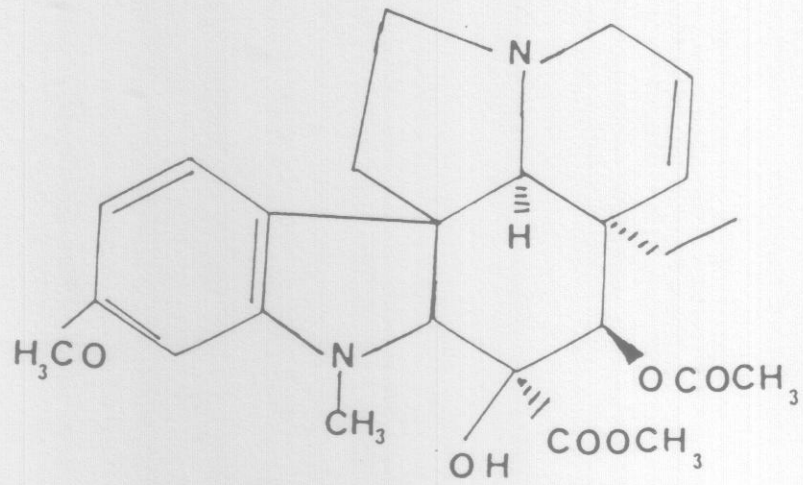
LA PERVENCHE DE MADAGASCAR : *Vinca rosea* L. =

Catharanthus roseus G. Don =

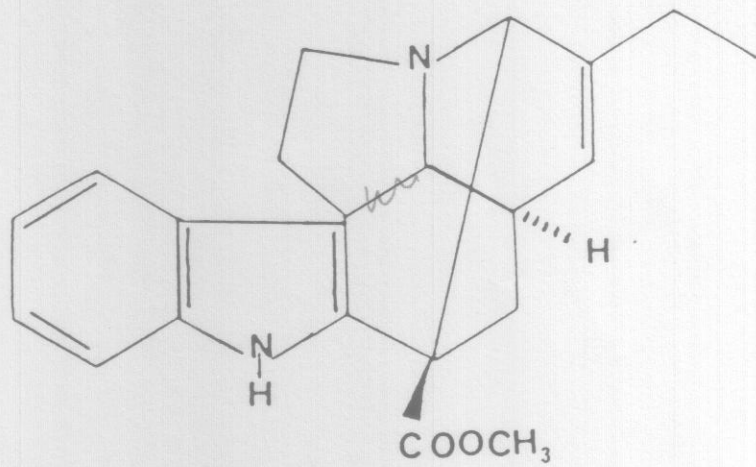
Lochnera rosea Reichb. Apocynacées



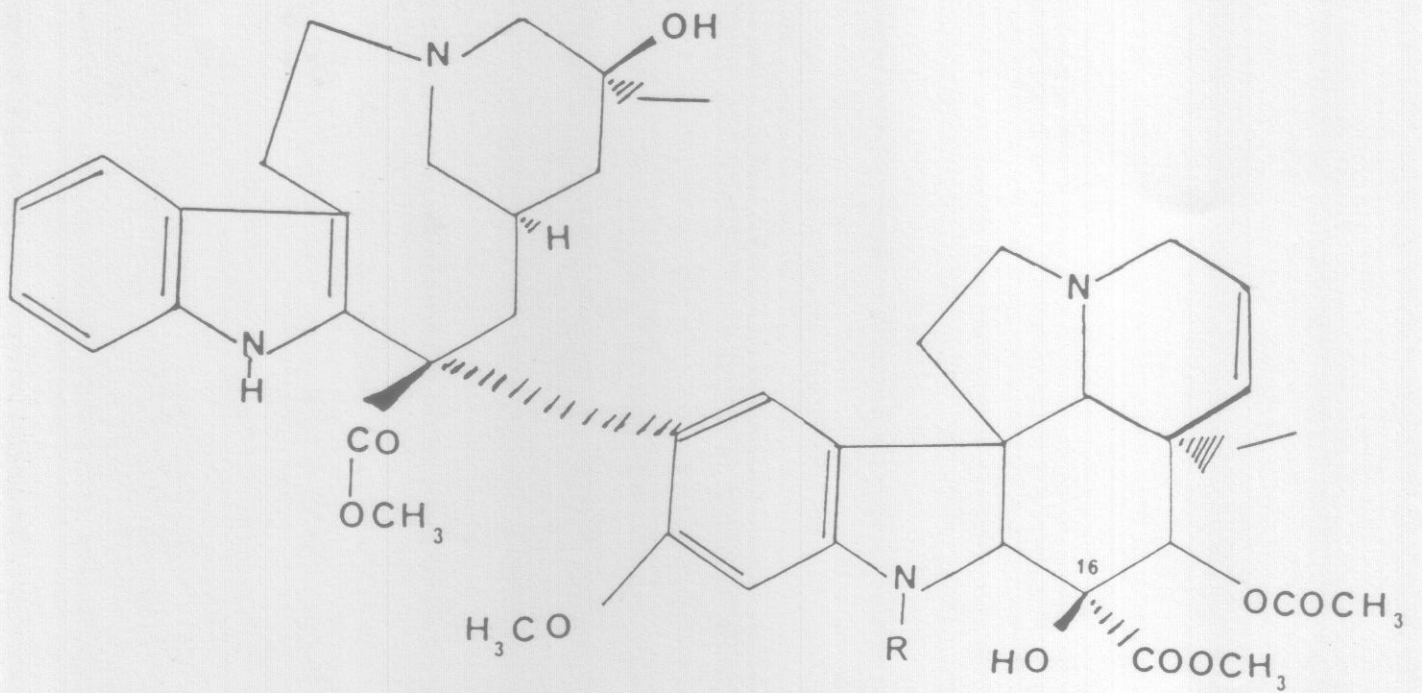
LES ALCALOÏDES DE LA PERVENCHE DE MADAGASCAR



La vindoline



La catharanthine



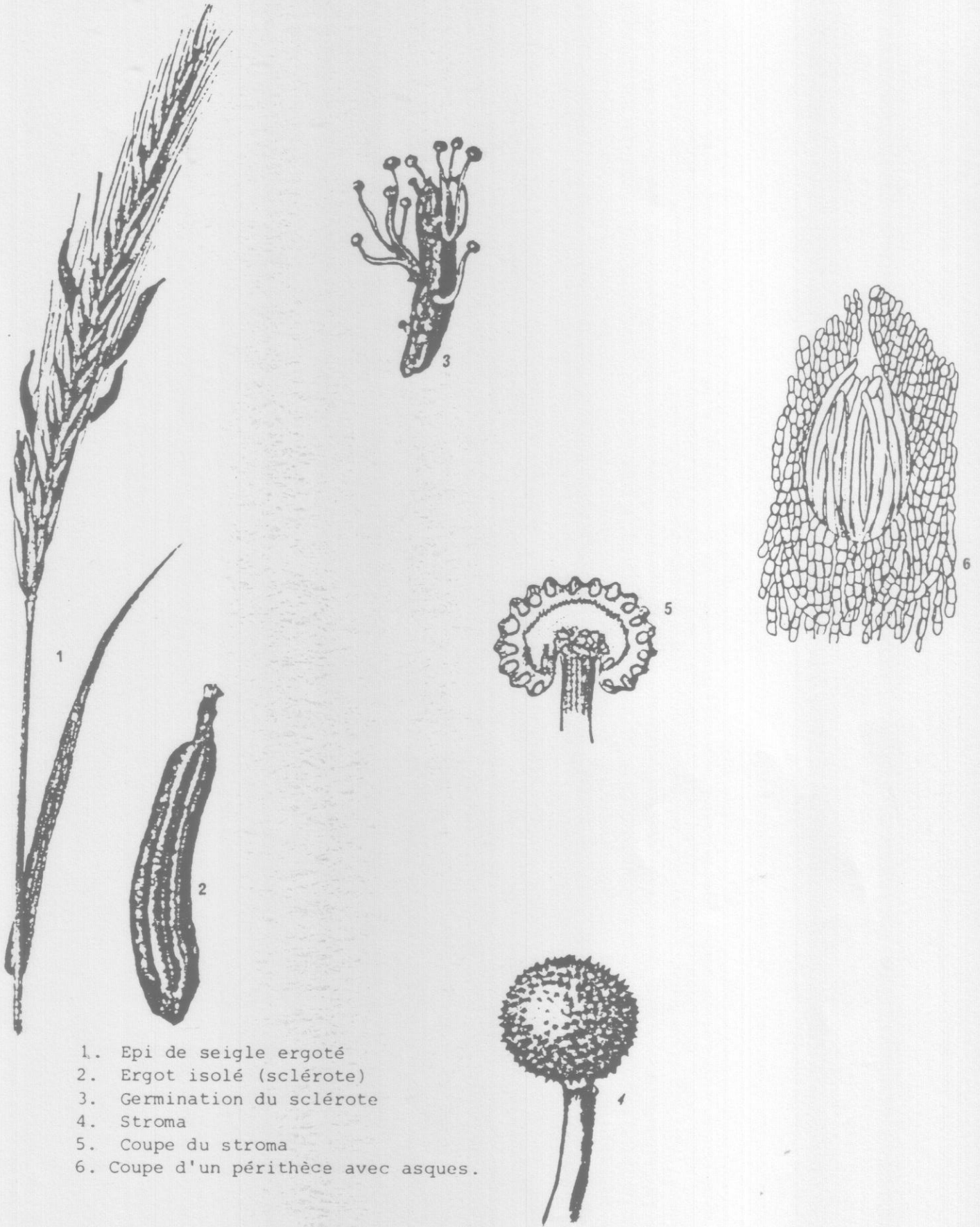
Vinblastine R = CH₃

Vincristine R = $\begin{array}{c} \text{--- C --- H} \\ || \\ \text{O} \end{array}$

Vindesine : structure analogue à la vinblastine sauf pour :

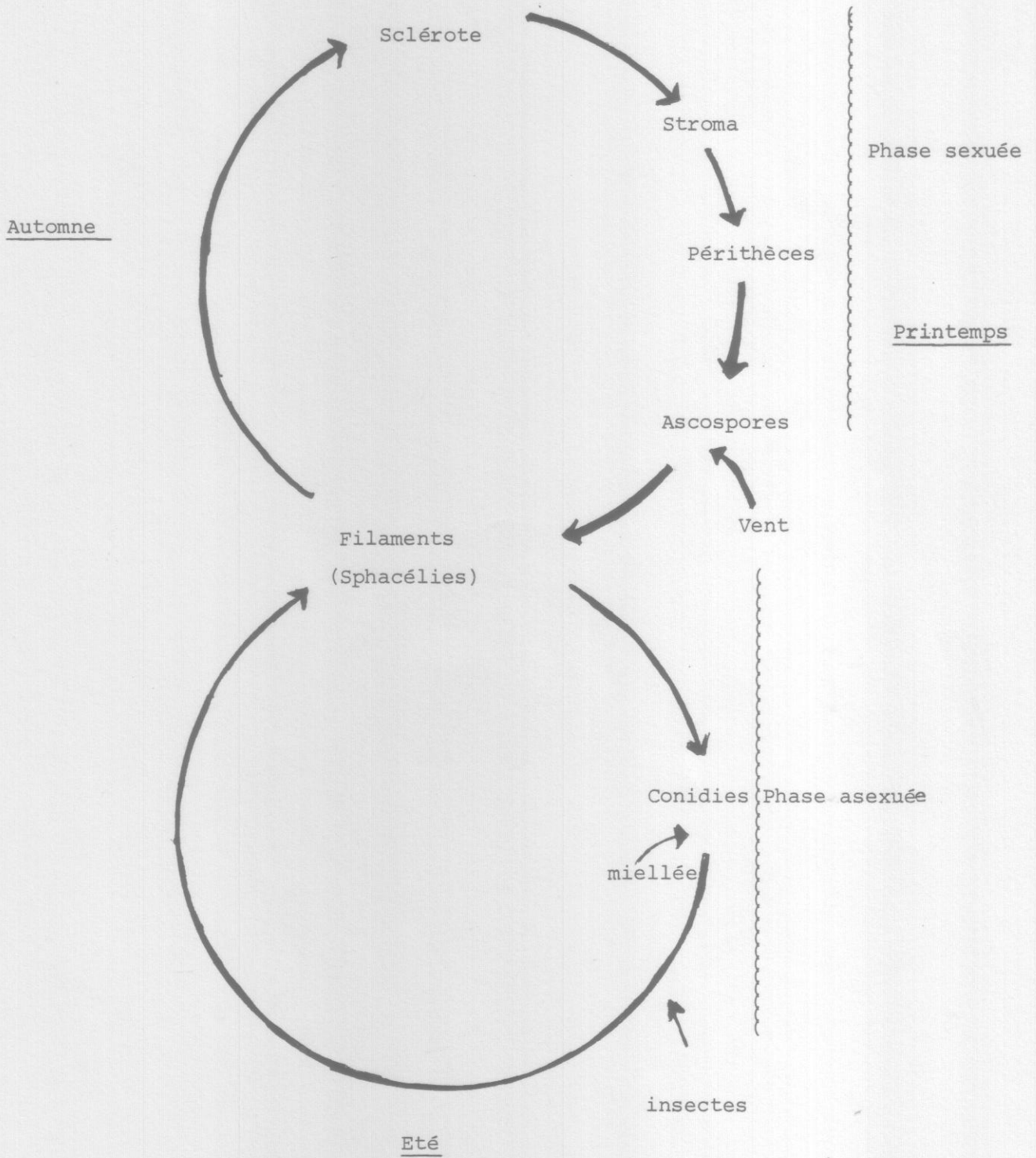
- COOCH₃ en 16 devient $\begin{array}{c} \text{--- C --- NH}_2 \\ || \\ \text{O} \end{array}$

- OCOCH₃ devient OH

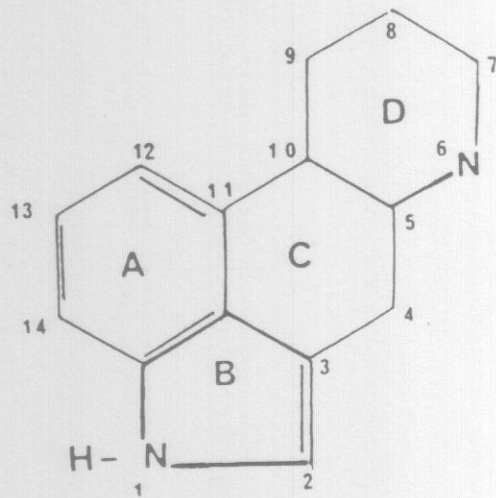


1. Epi de seigle ergoté
2. Ergot isolé (sclérote)
3. Germination du sclérote
4. Stroma
5. Coupe du stroma
6. Coupe d'un périthèce avec asques.

CYCLE DU CLAVICEPS PURPUREA

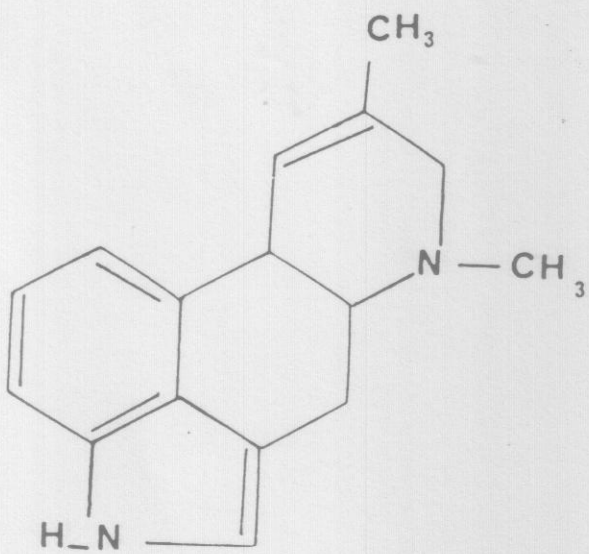


LES ALCALOÏDES DE L'ERGOT DE SEIGLE

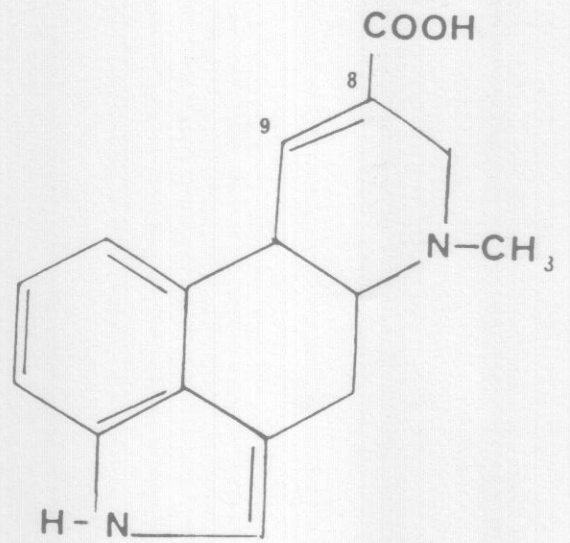


Le noyau ergoline

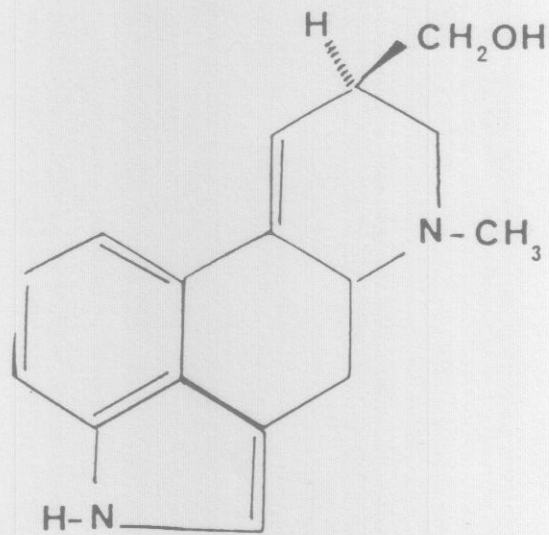
Les clavines



Agroclavine

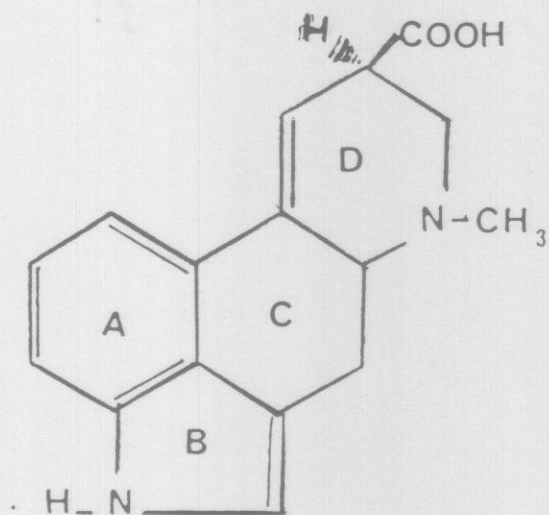


Acide paspalique

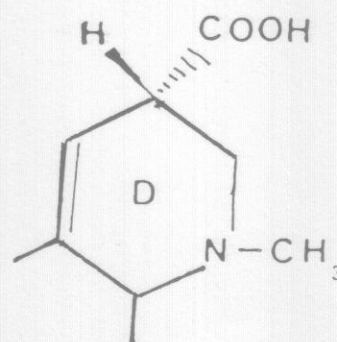


Lysergol

Les acides lysergiques

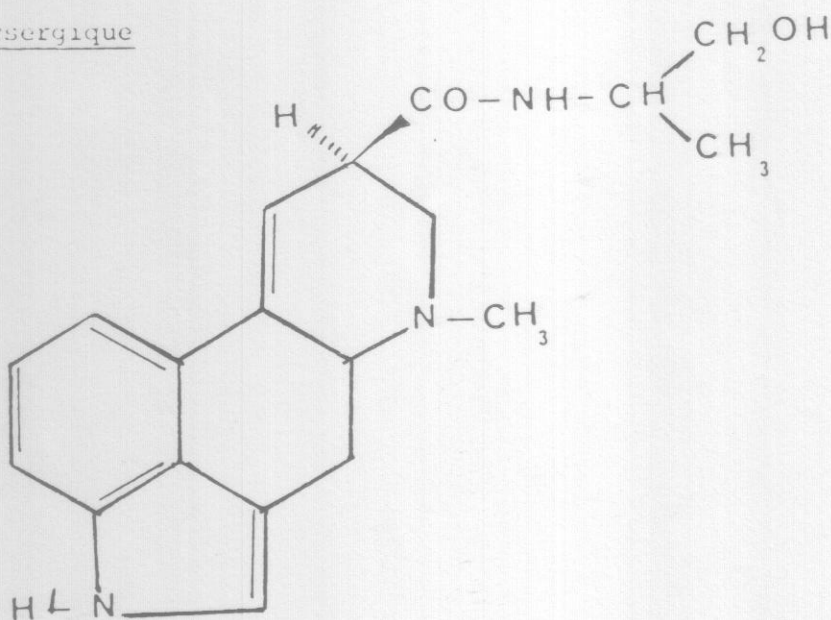


Acide lysergique

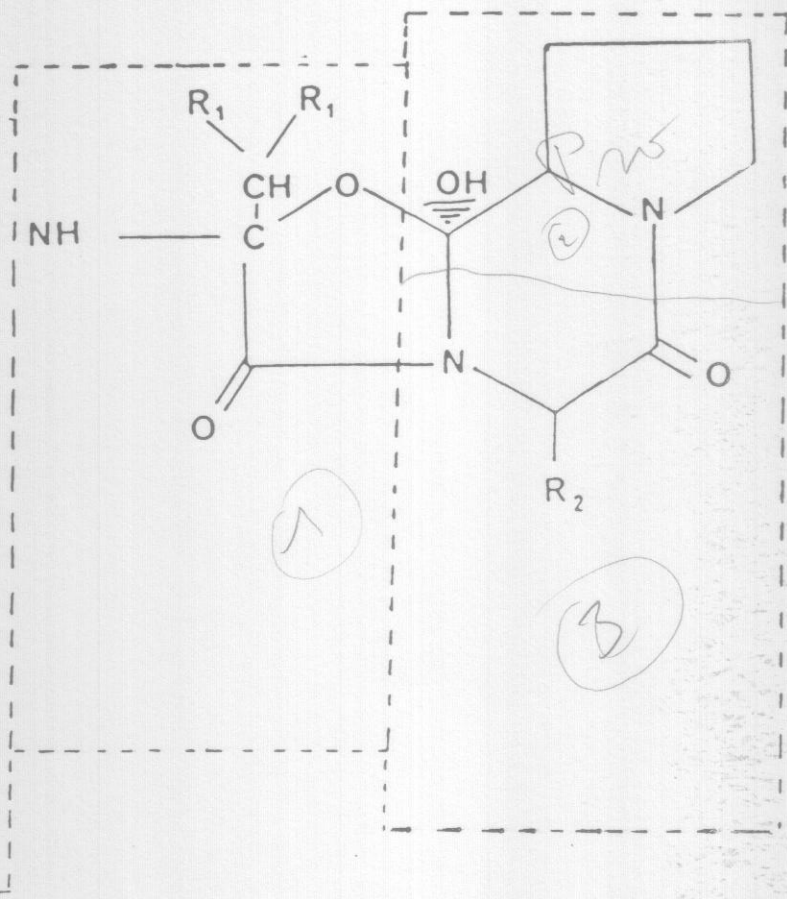
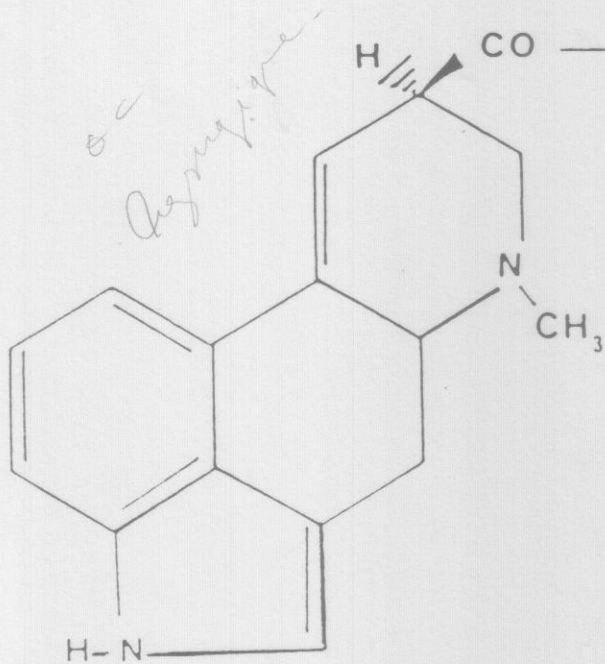


Acide isolysergique

Les amides de l'acide lysergique



Ergobasine = ergométrine



1 -Groupe de l'Ergotamine $R_1 = H$

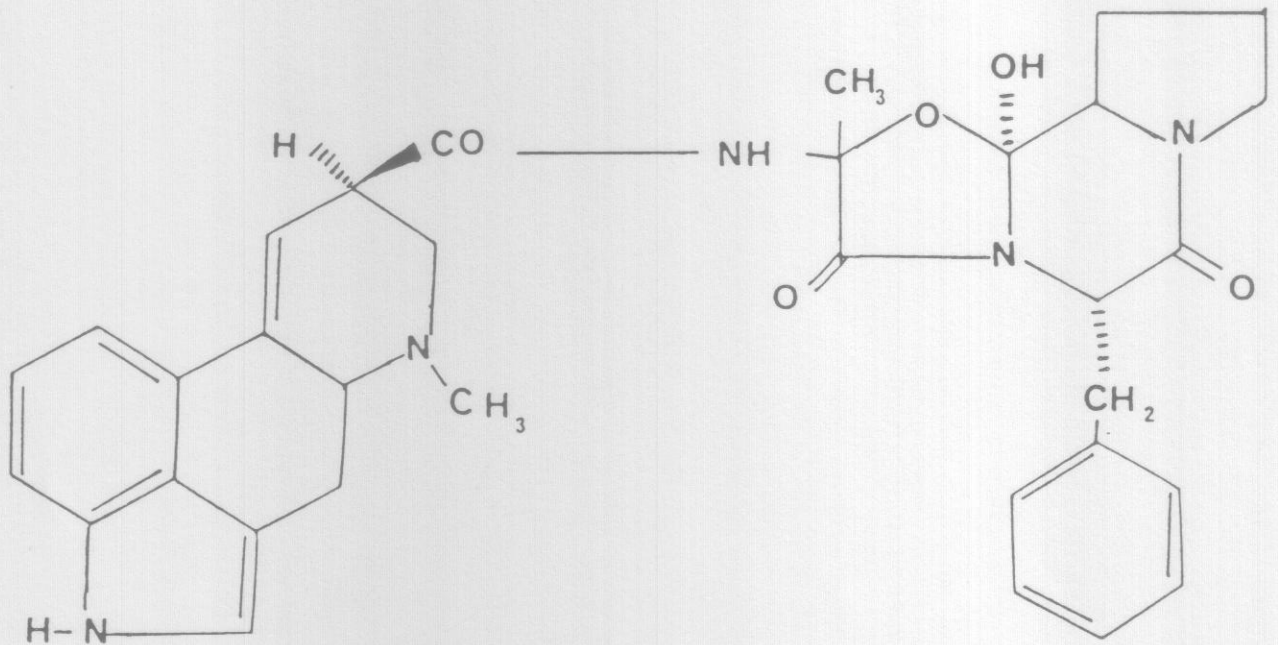
Acide aminé n° 1 = Hydroxyalanine

- a) $R_2 \rightarrow \text{CH}_2 - \text{C}_6\text{H}_5 \rightarrow \text{Ergotamine}$
- b) $R_2 \rightarrow \text{CH}_2 - \underset{\text{CH}_3}{\text{CH}} - \text{CH}_3 \rightarrow \text{Ergosine}$

2 -Groupe de l'Ergotoxine $R_1 = \text{CH}_3$

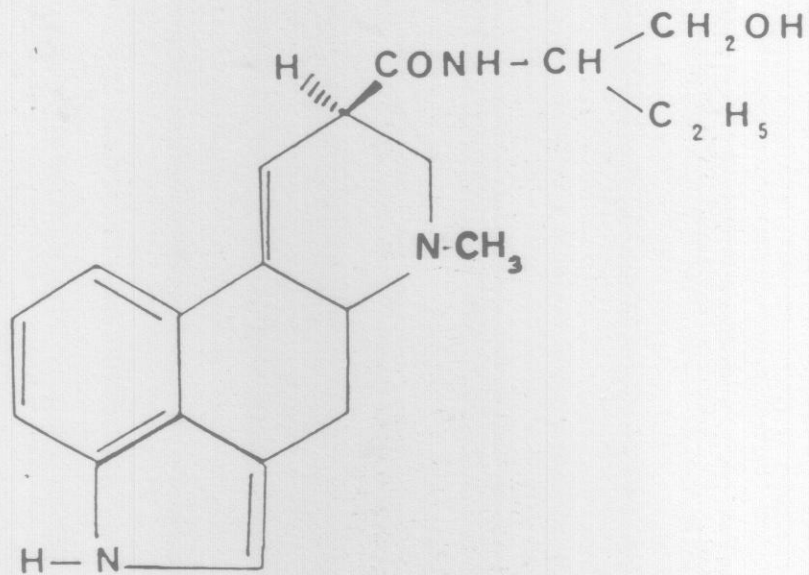
Acide aminé n° 1 = Hydroxyvaline

- a) $R_2 \rightarrow -\text{CH}_2 - \text{C}_6\text{H}_5 \rightarrow \text{Ergocristine}$
- b) $R_2 \rightarrow -\text{CH}_2 - \underset{\text{CH}_3}{\text{CH}} - \text{CH}_3 \rightarrow \alpha \text{ Ergocryptine}$
- c) $R_2 \rightarrow \underset{\text{CH}_3}{\text{CH}} - \text{CH}_2 - \text{CH}_3 \rightarrow \beta \text{ Ergocryptine}$
- d) $R_2 \rightarrow \underset{\text{CH}_3}{\text{CH}} \begin{matrix} \text{CH}_3 \\ \text{CH}_3 \end{matrix} \rightarrow \text{Ergocornine}$



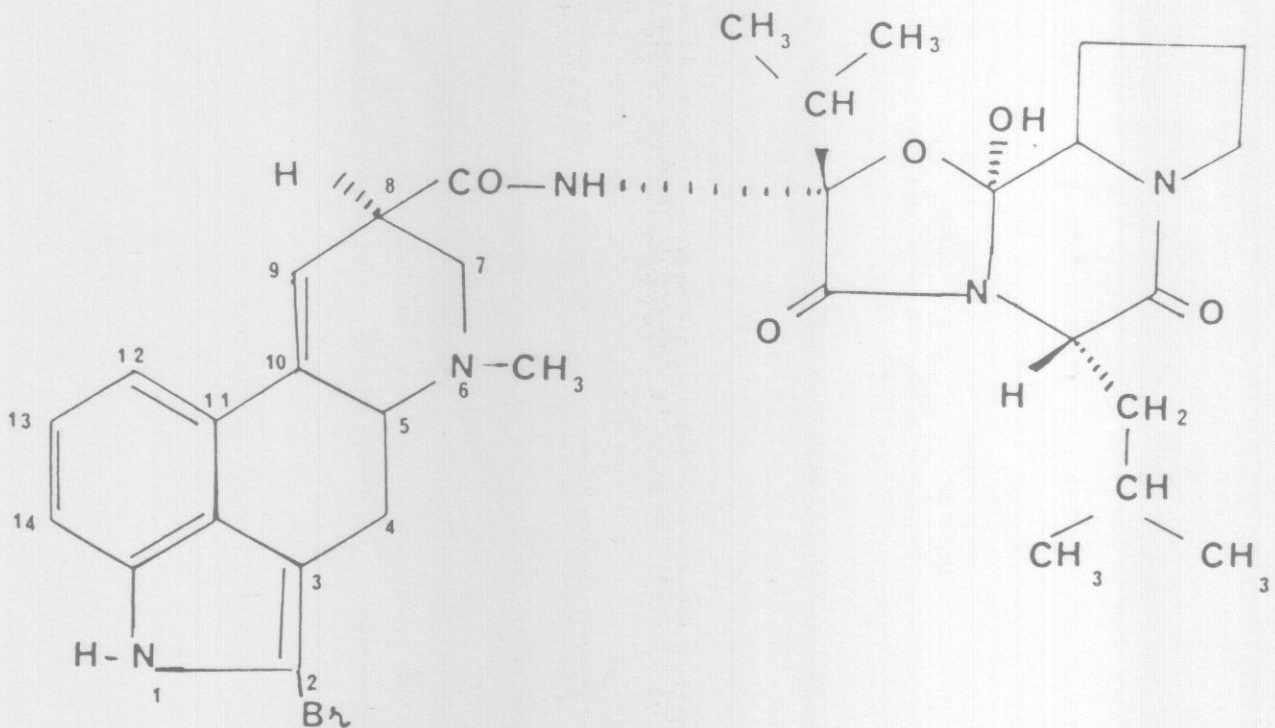
Ergotamine

LES DERIVES D'HEMISYNTHESE



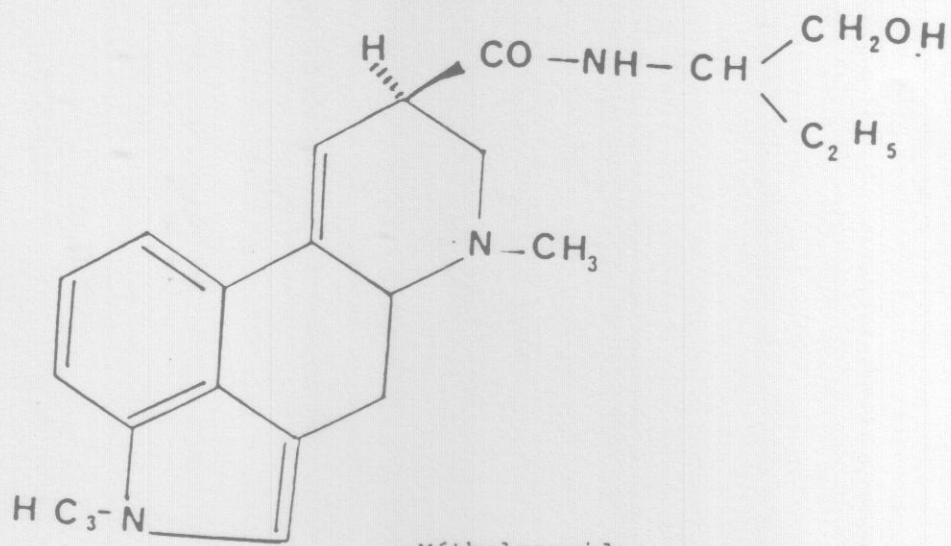
Méthylergométrine

Methergin^(R)



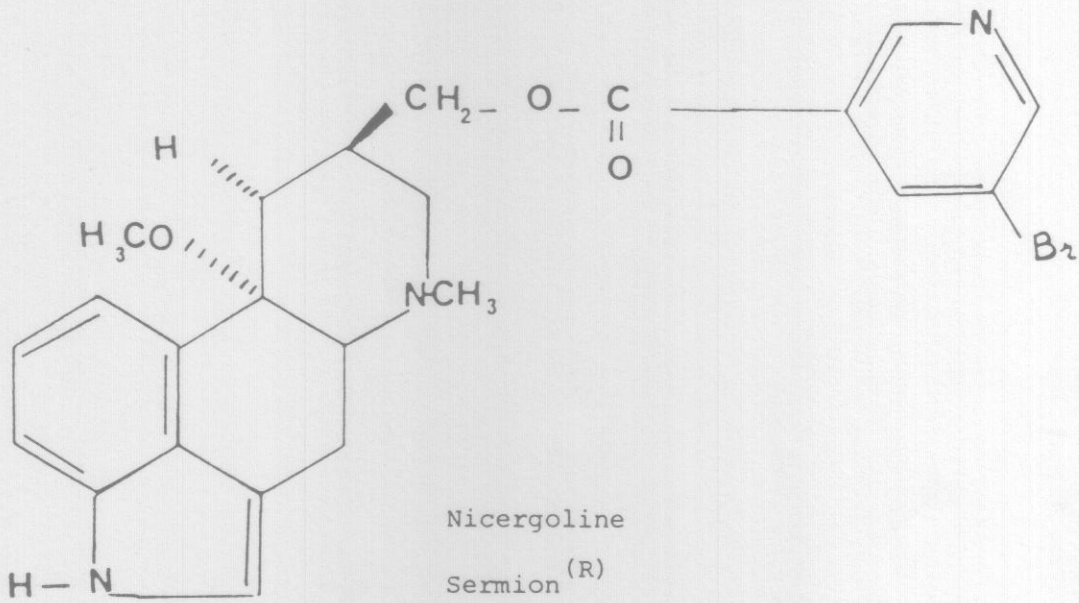
Bromo 2 alpha ergocryptine

Parlodel^(R)



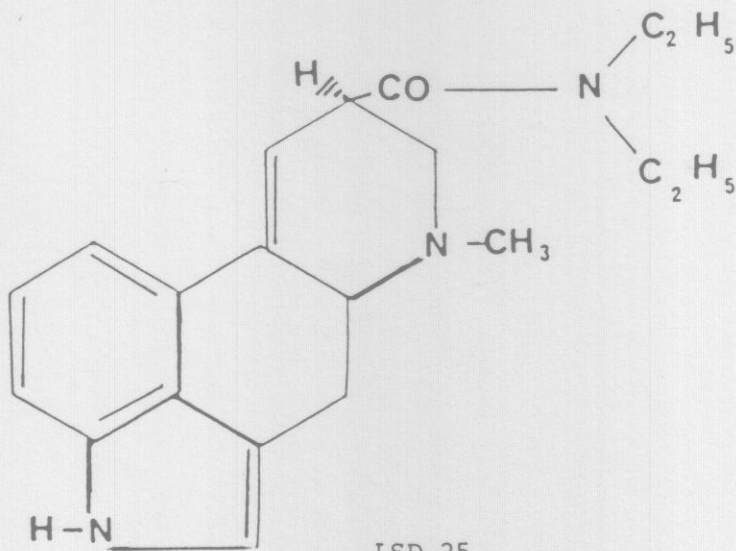
Méthylsergide

Déserymyl (R)



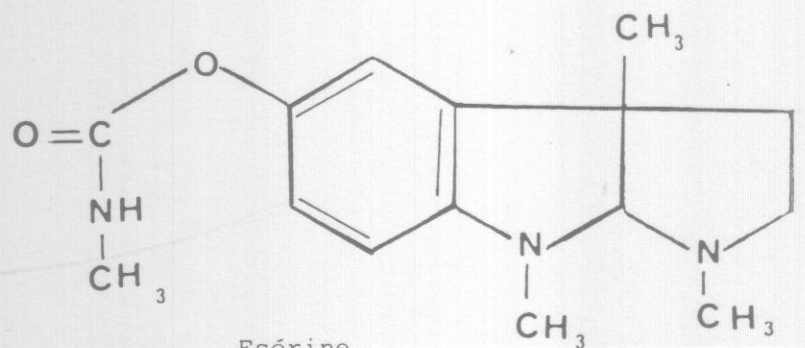
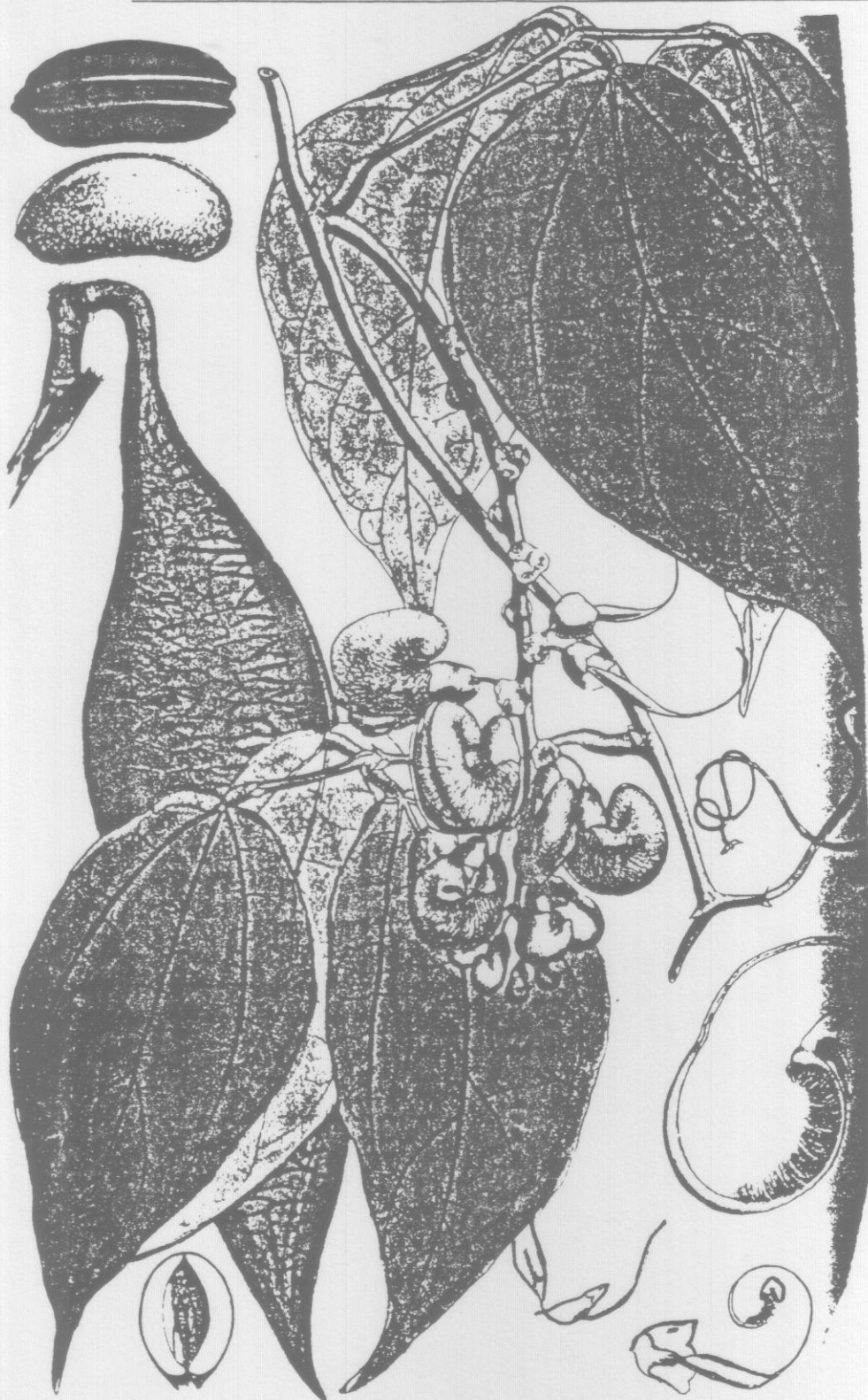
Nicergoline

Sermion (R)

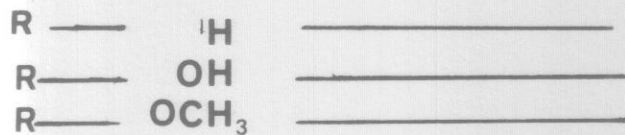
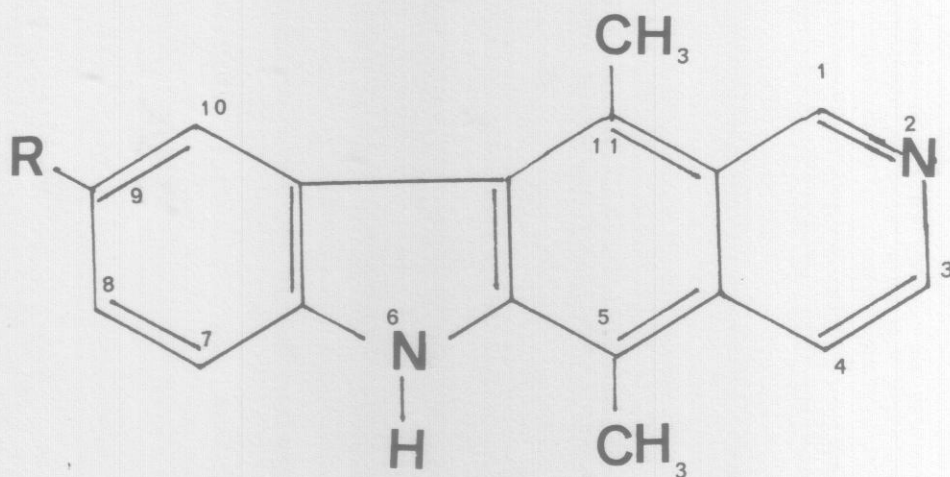


LSD 25

LA FEVE DE CALABAR : *Physostigma venenosum* Balf. Légumineuses



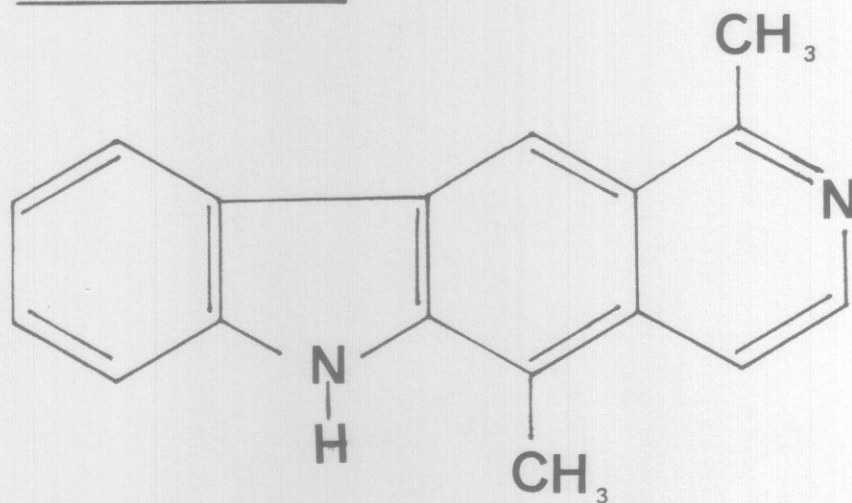
LES OCHROSIA



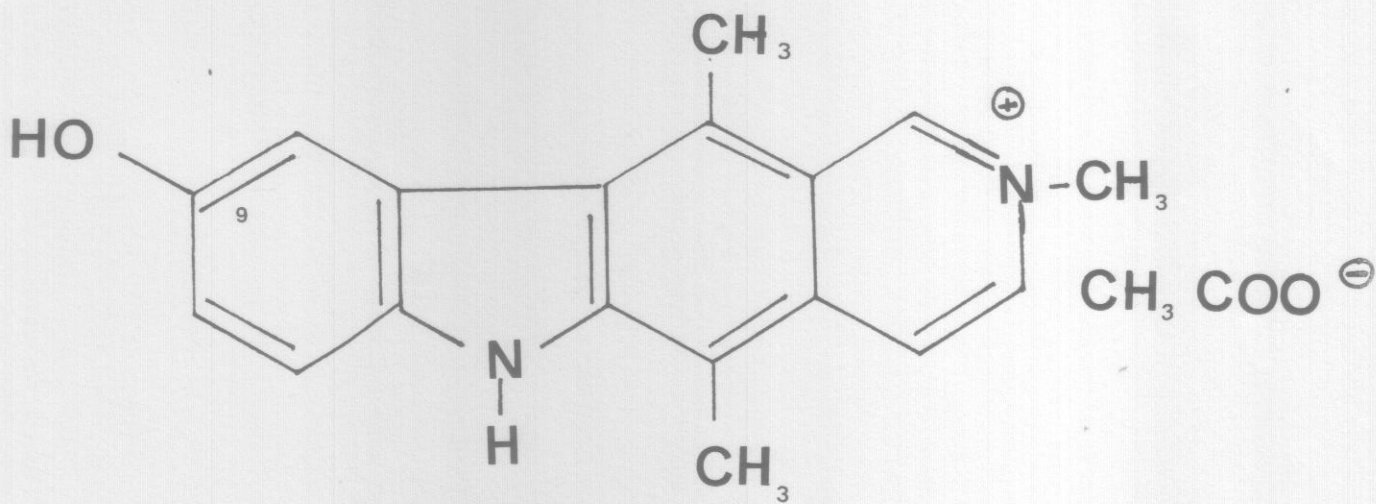
ELLIPTICINE

HYDROXY 9 ELLIPTICINE

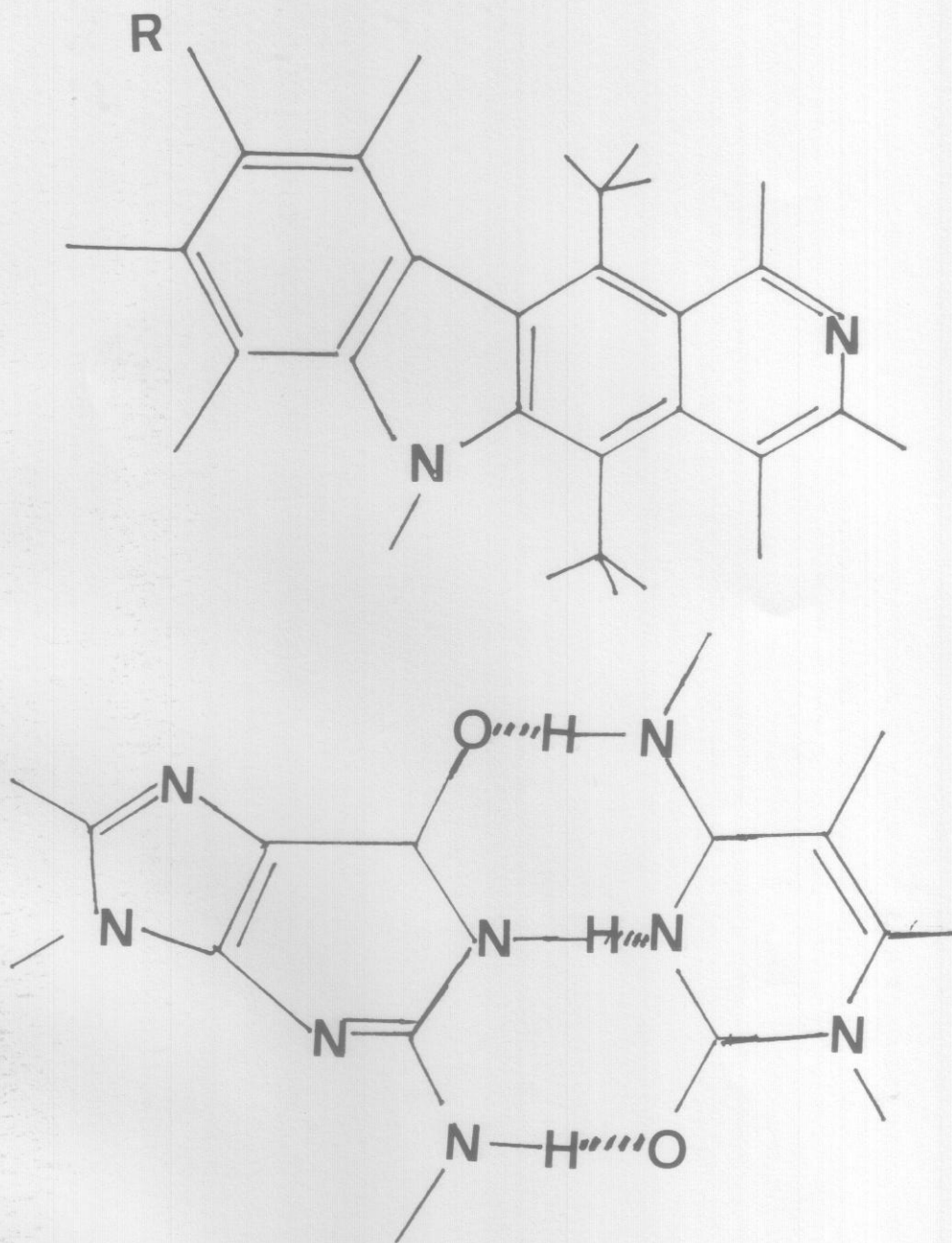
METHOXY 9 ELLIPTICINE



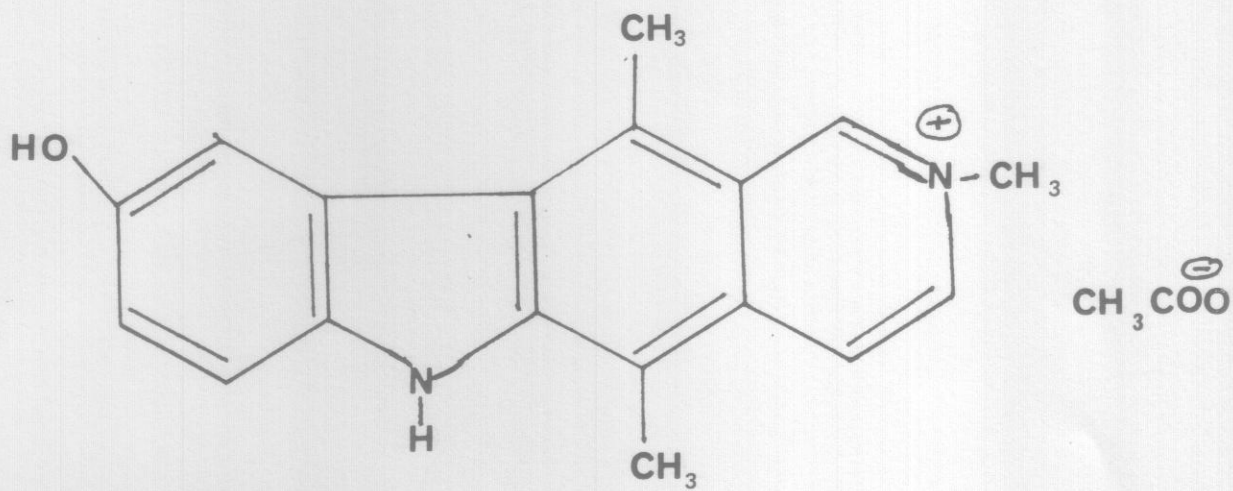
OLIVACINE



CELIPTIUM

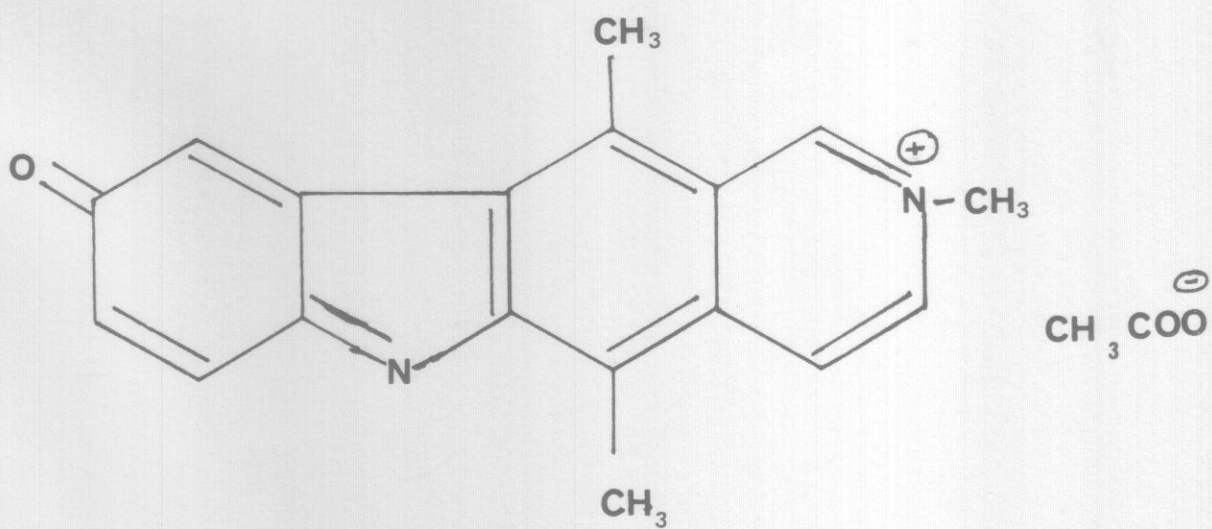


COMPARAISON DE LA DIMENSION DU NOYAU PYRIDOCARBAZOLE (PREMIER DESSIN) ET D'UNE PAIRE DE BASES DE L'A. D. N.

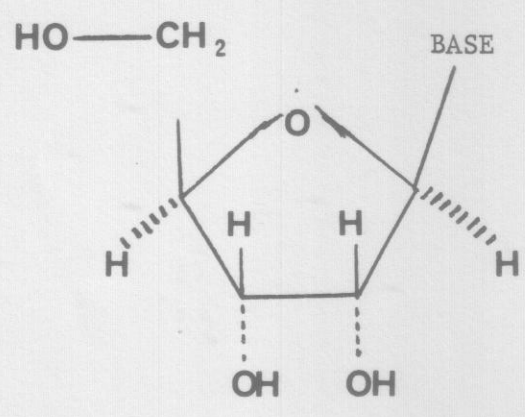


CELIPTIUM

OXYDATION BIOLOGIQUE

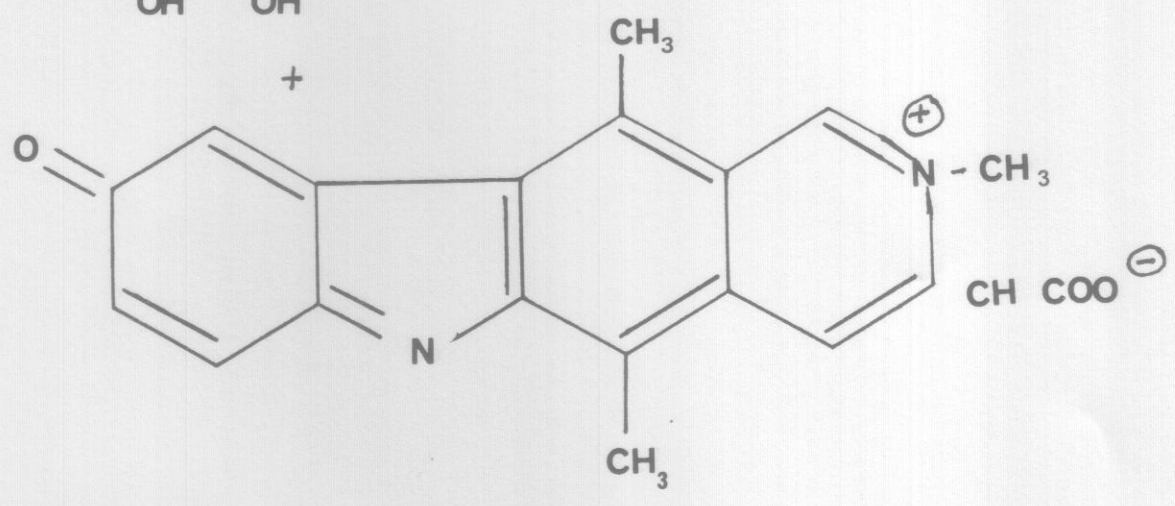


DERIVE IMINOQUINONIQUE

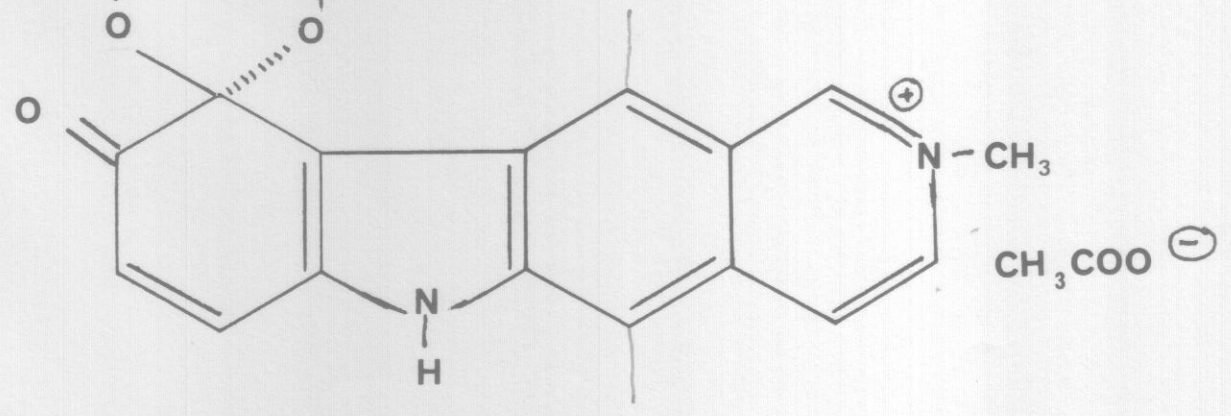
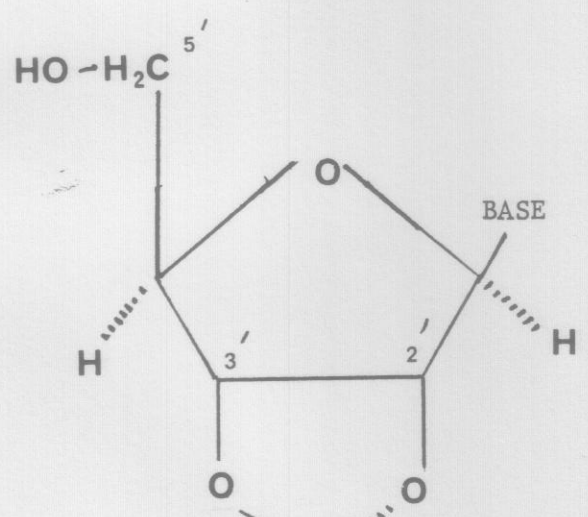


BASE = ADENINE
GUANINE
CYTOSINE
URACILE

RIBONUCLEOSIDE

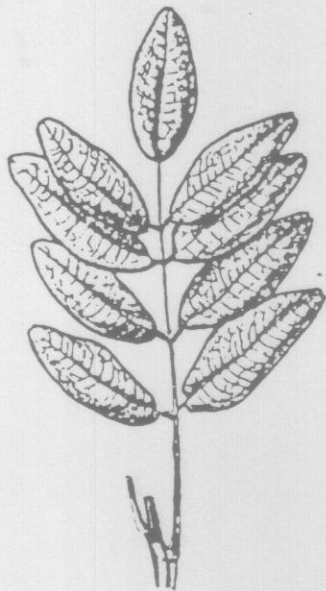


CAR LIAISON CONVALENTE
REVERSIBLE



DROGUES À ALCALOÏDES DÉRIVÉS
DE L'IMIDAZOLE

LE JABORANDI : *Pilocarpus jaborandi* Holmes Rutacées

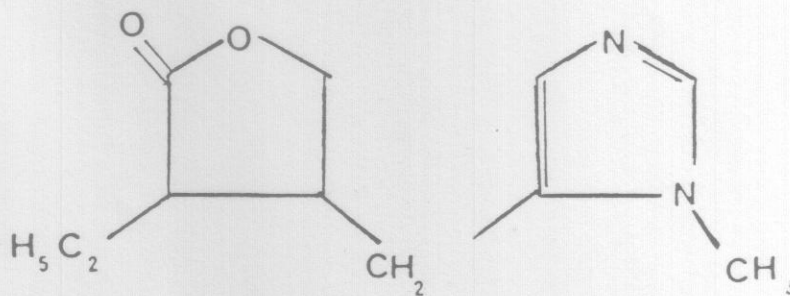


Feuille composée



Foliole

ALCALOIDE

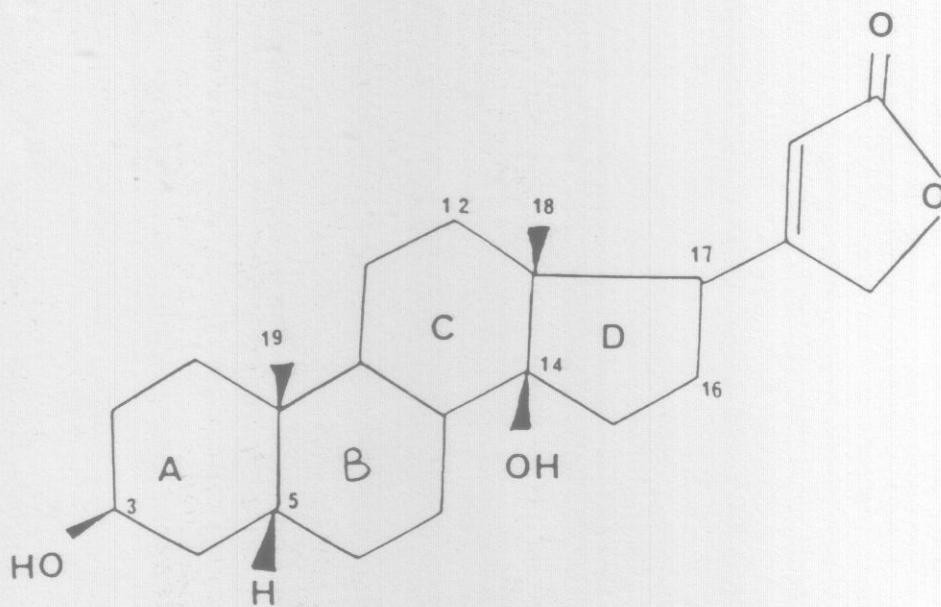


La pilocarpine

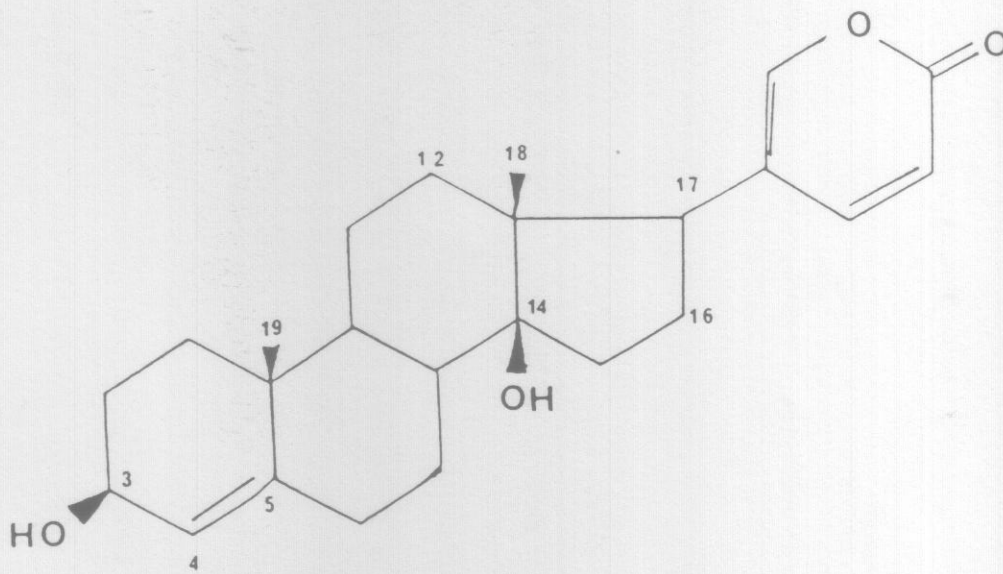
DROGUES A HETEROSIDES

DROGUES À HÉTÉROSIDES CARDIOTONIQUES

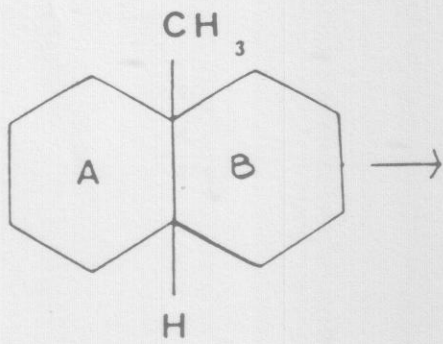
GENERALITES



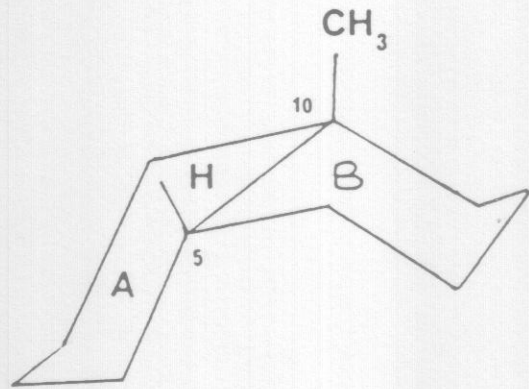
un cardénolide
(Digitoxigénine)



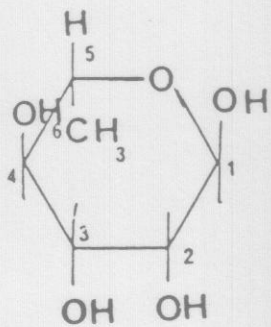
un bufanolide
(Scillarénine)



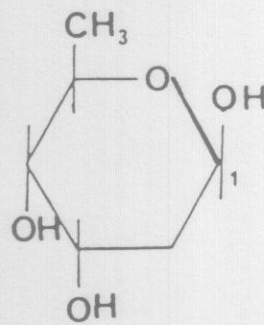
A et B cis



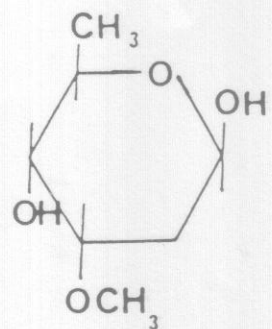
Activité cardiotonique (+++)



Méthyl-6-pentose
(rhamnose)

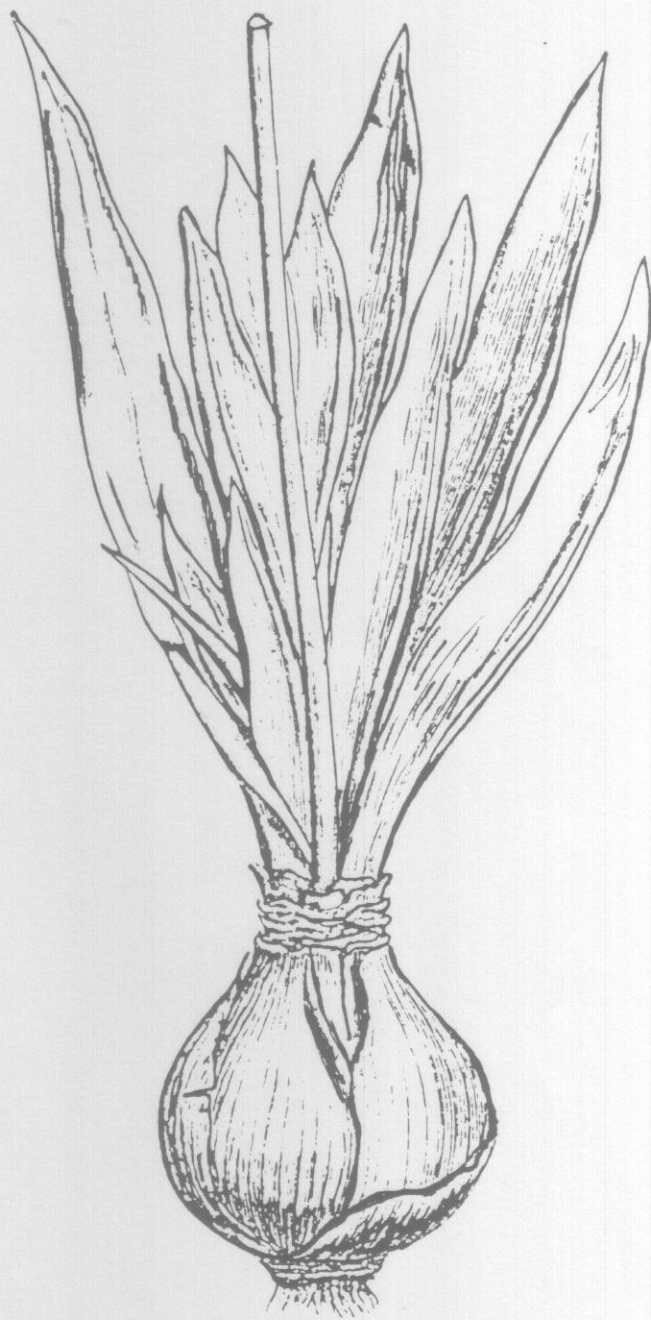


D Digitoxose



D cymarose

LA SCILLE : *Urginea scilla* Steinh. = *Scilla maritima* L. Liliacées

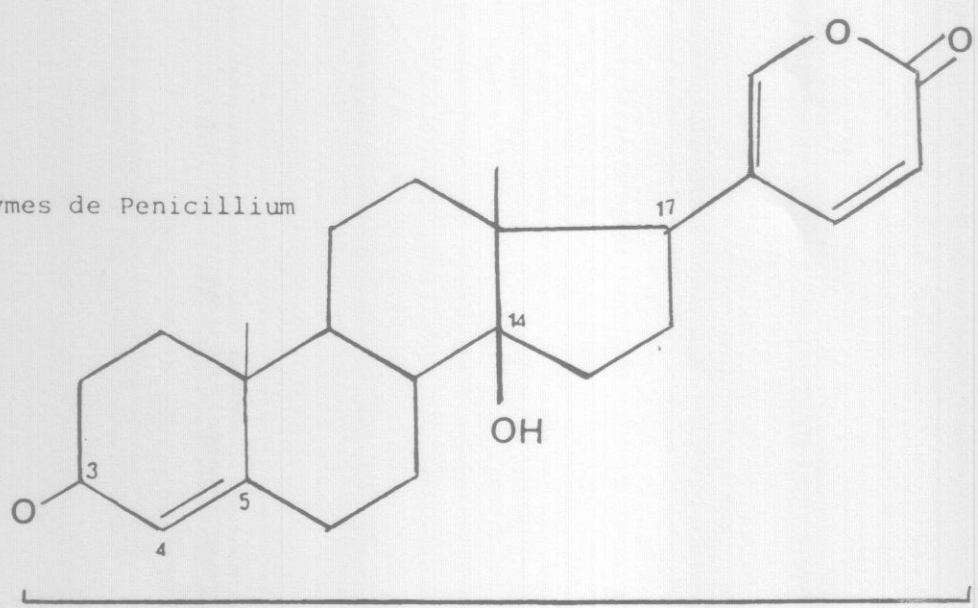


enzymes de Penicillium

Scillarinasase

α glucosidase

glucose-glucose-rhamnose -



Scillarénine

Proscillaridine A

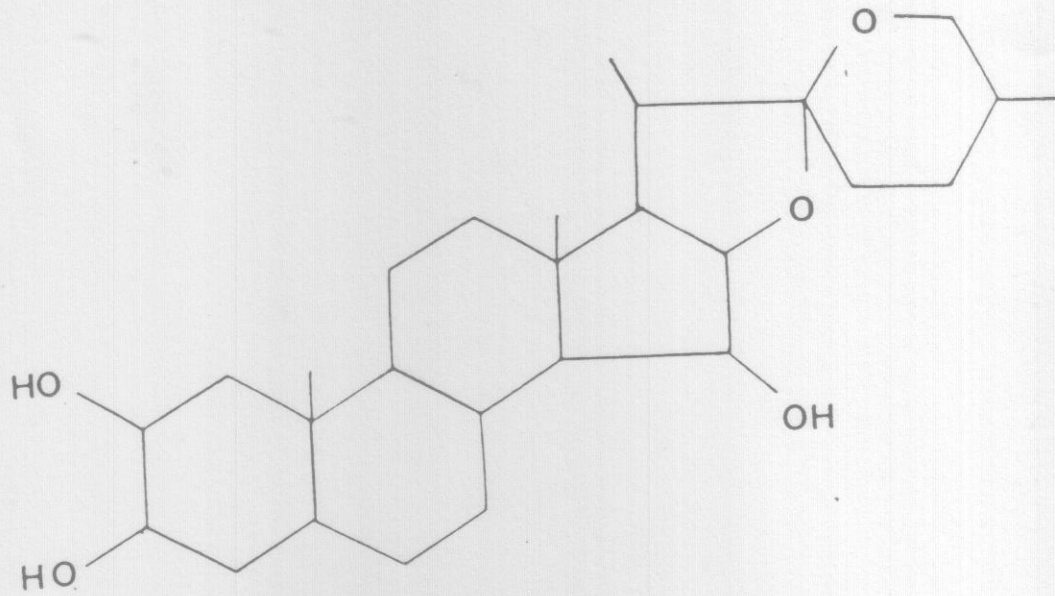
Scillarène A

LA DIGITALE POURPRE : *Digitalis purpurea* L. Scrophulariacées

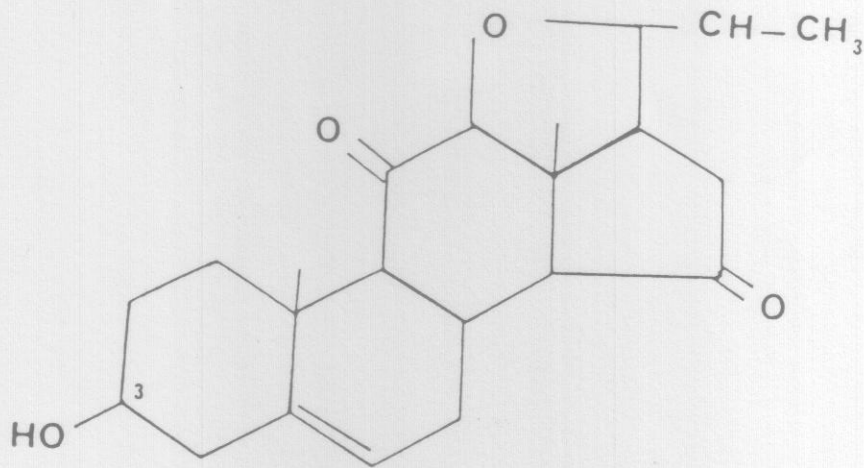


HETEROSIDES DE LA DIGITALE

- Hétérosides non cardénolides

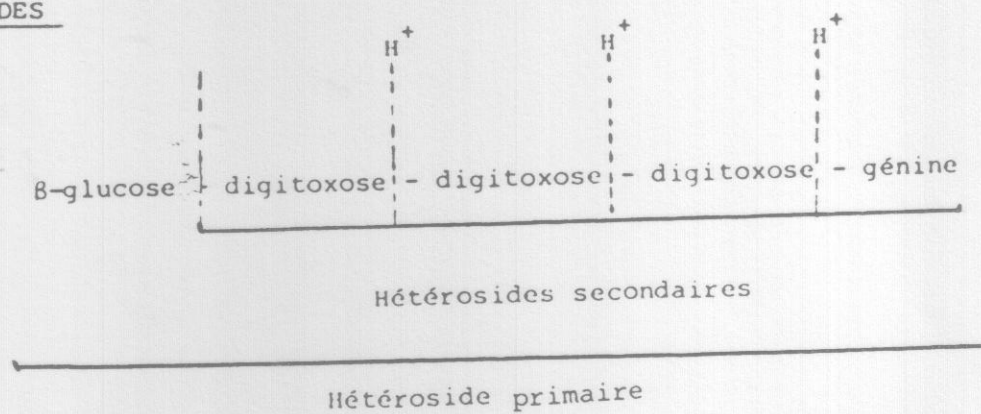


Digitogénine
(génine du digitonoside)

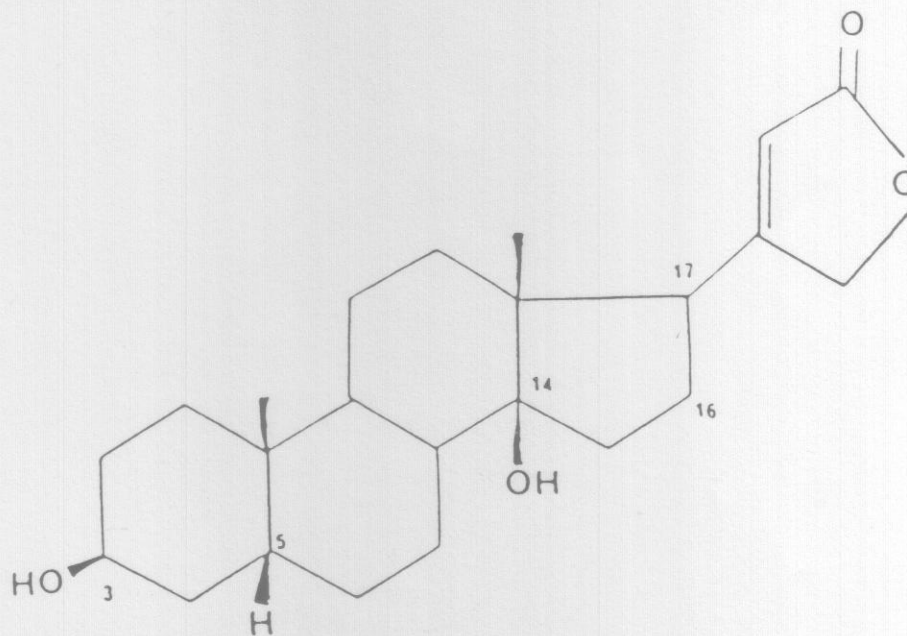


Diginigénine
(génine du diginoside)

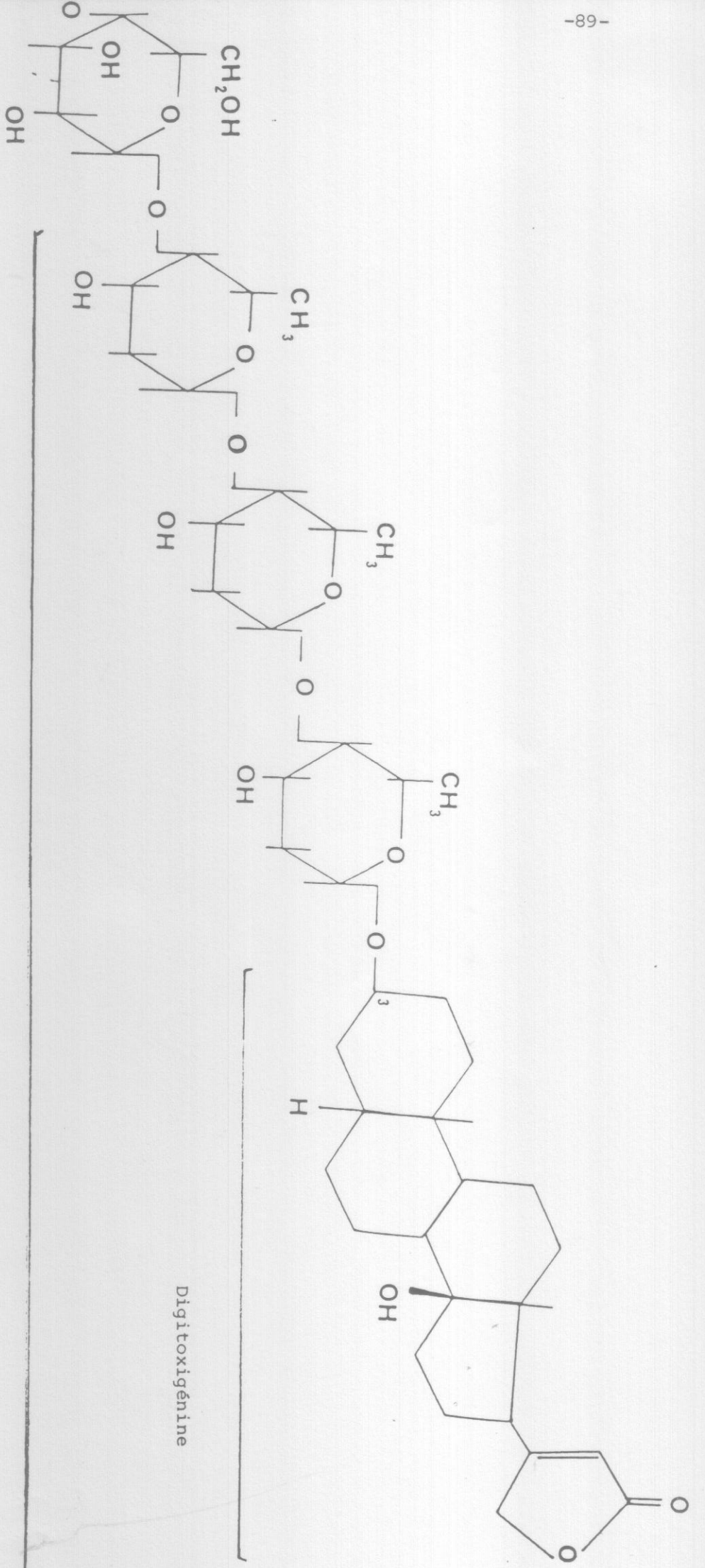
CARDENOLIDES



- Groupe A



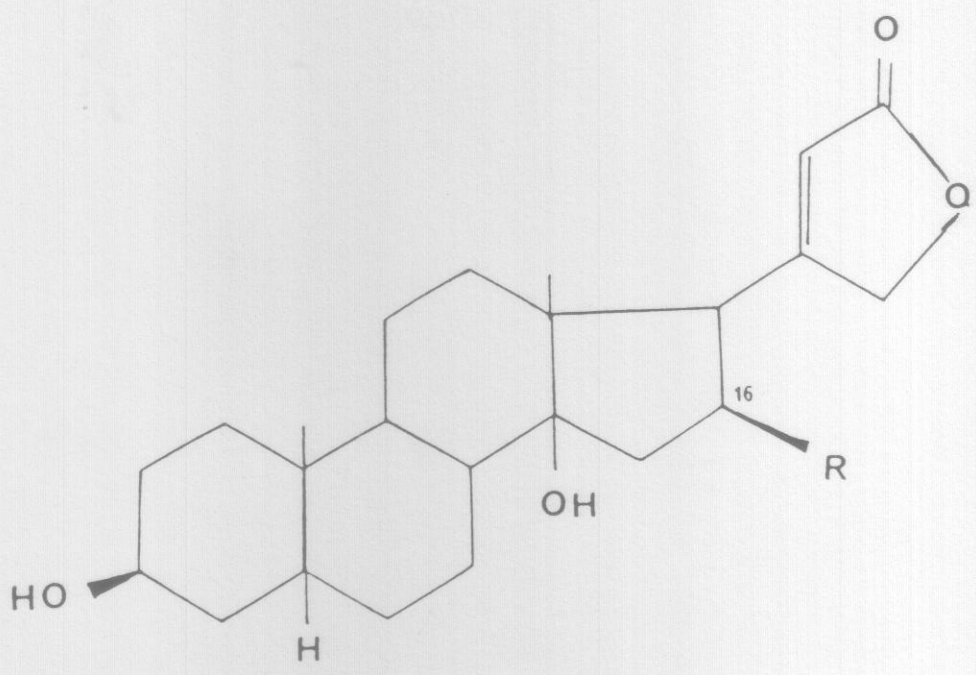
Digitoxigénine



Digitaline = Digitotoxoside = Digitoxine

Purpurea glucoside A.

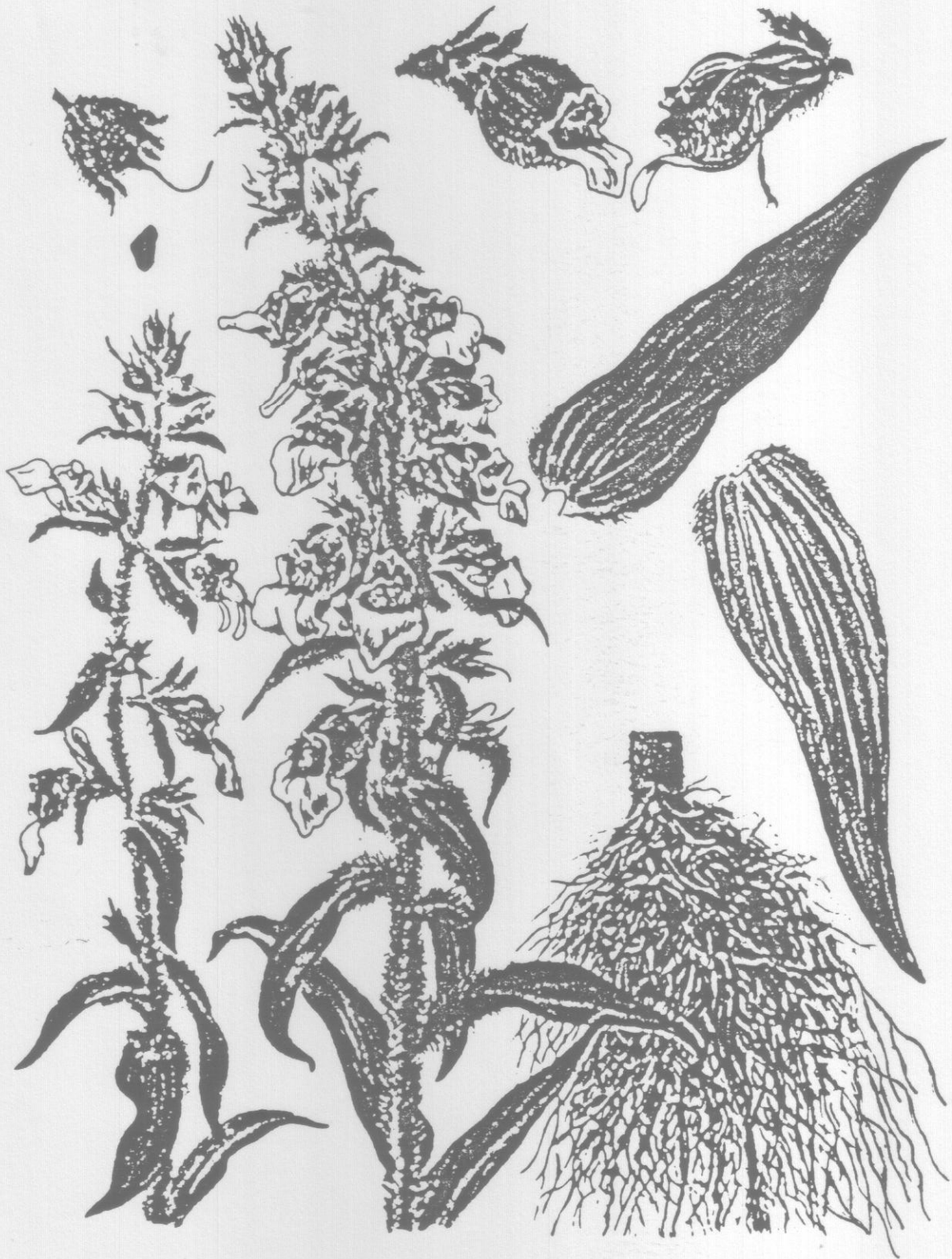
- Groupe B



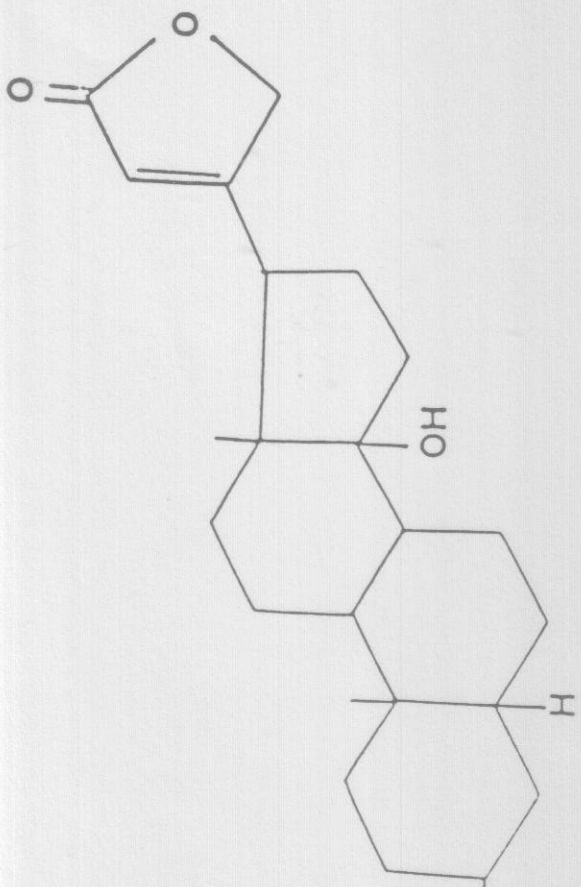
R = OH --> gitoxigénine
Groupe B₁

R = $\begin{array}{c} \text{O}-\text{C}-\text{H} \\ || \\ \text{O} \end{array}$ --> gitaloxigénine
Groupe B₂

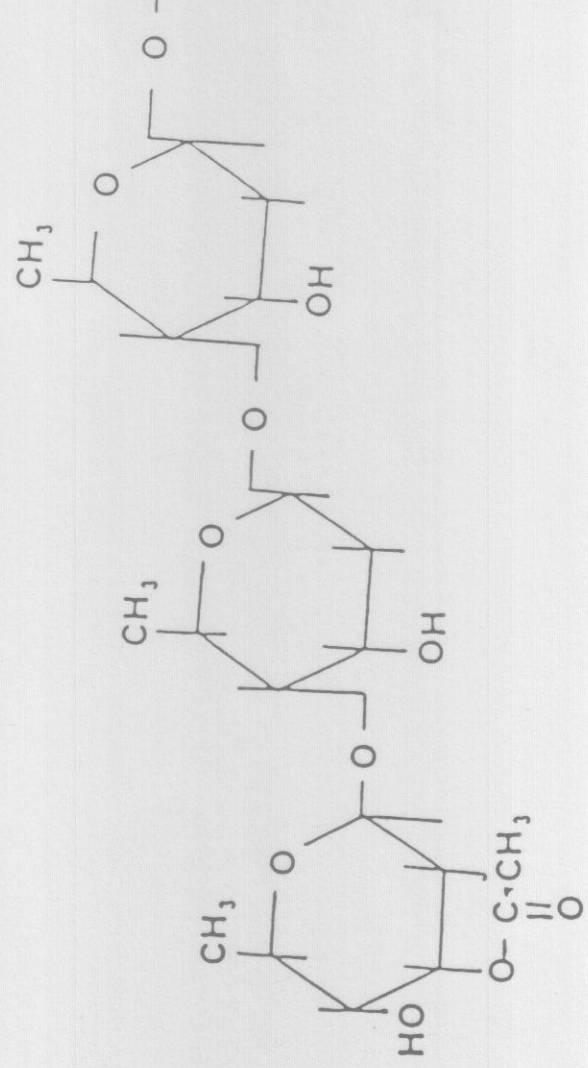
LA DIGITALE LAINEUSE : *Digitalis lanata* Ehr. Scrophulariacées



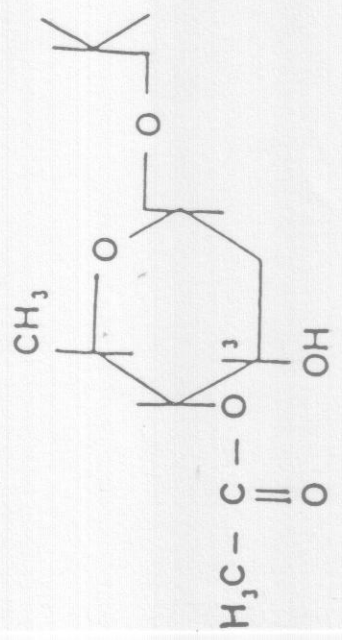
Digitalis lanata



α acétyl digitoxoside

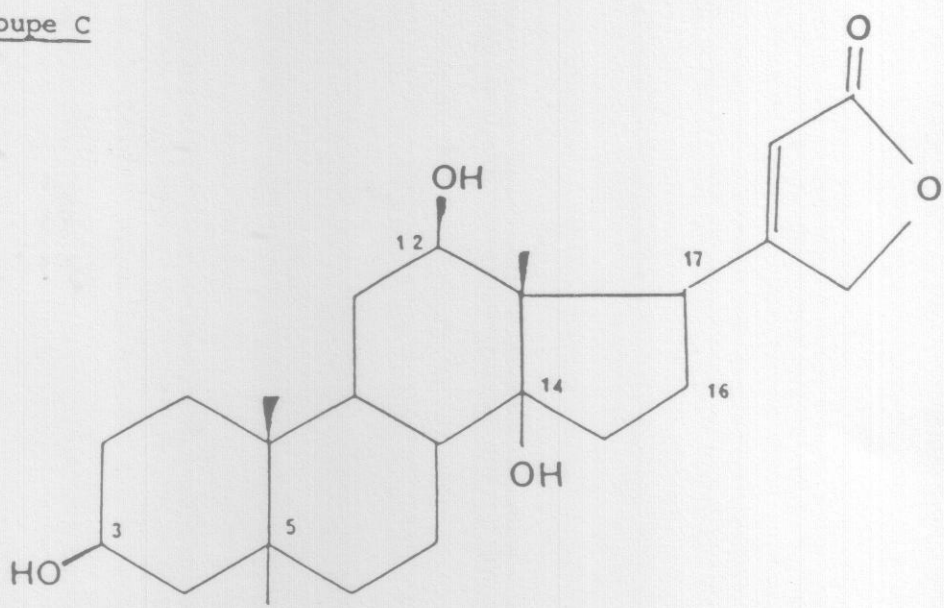


β acétyl digitoxoside



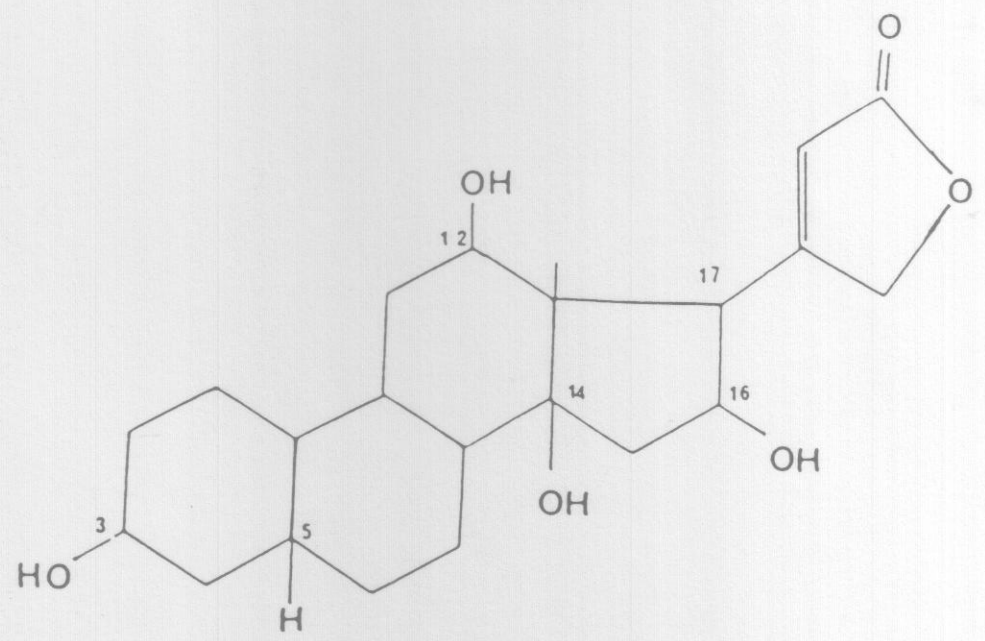
$\text{H}_3\text{C}-\text{C}(=\text{O})-\text{O}-\text{K}$

- Groupe C



Digoxigénine

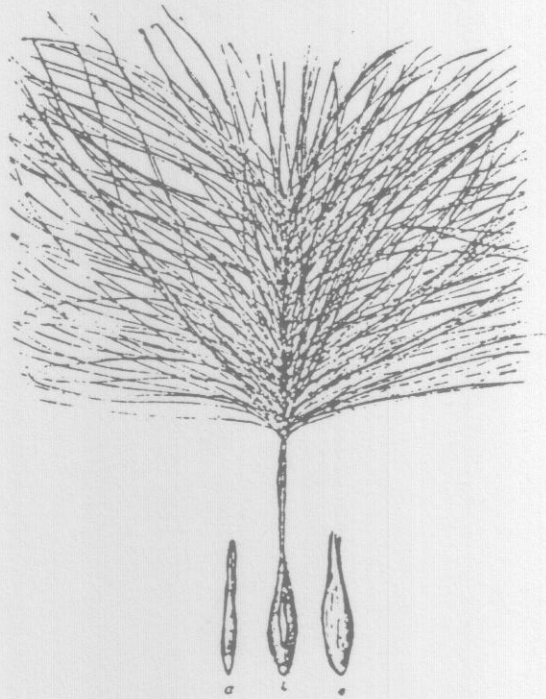
- Groupe D



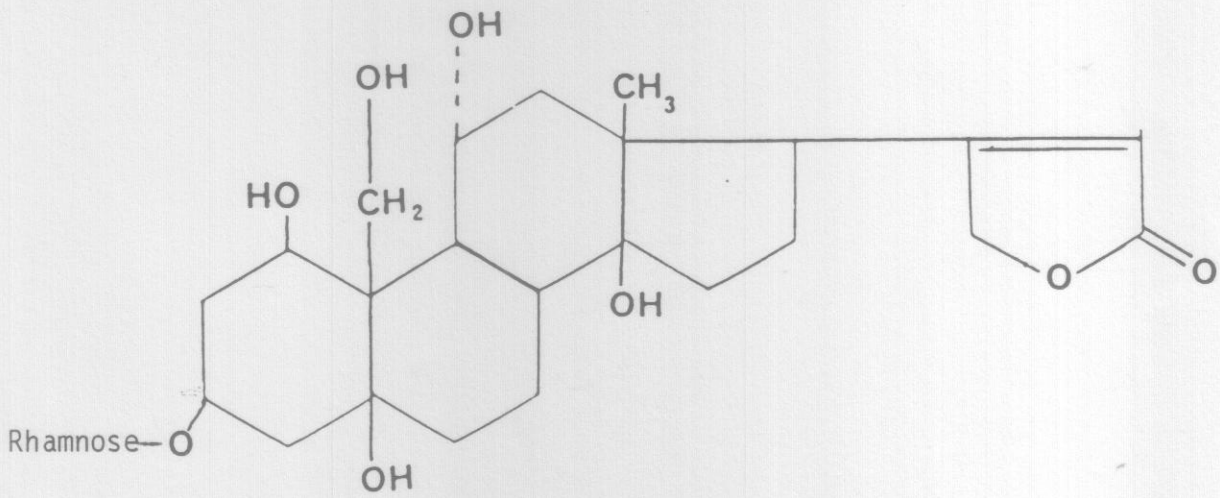
Diginatigénine

LES STROPHANTUS

Strophantus divers APOCYNACEES



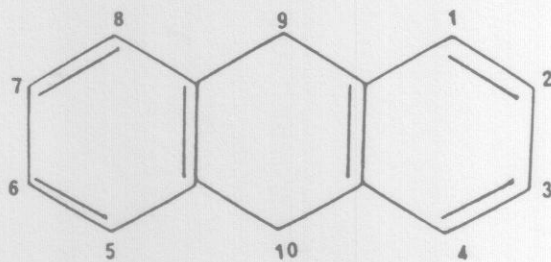
Graines de *Strophantus gratus* Baill.



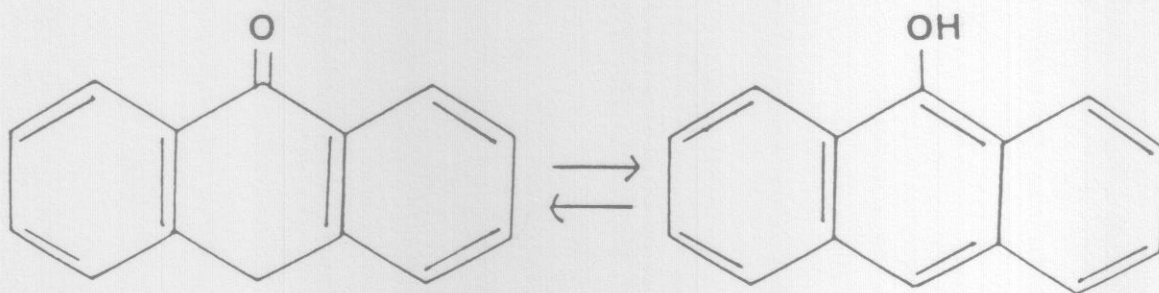
Ouabaine

LES DROGUES À ANTHRAQUINONES

GENERALITES

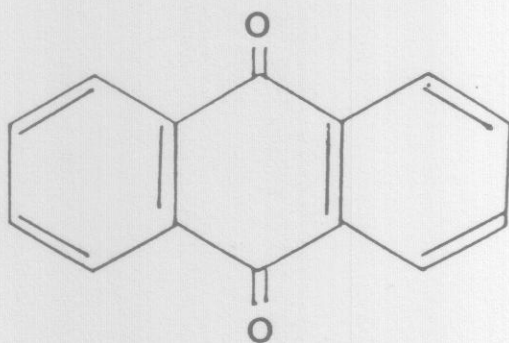


Anthracène

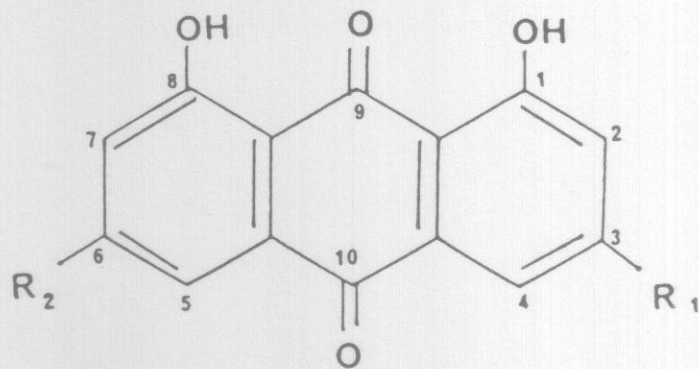


Anthrone

Anthranol

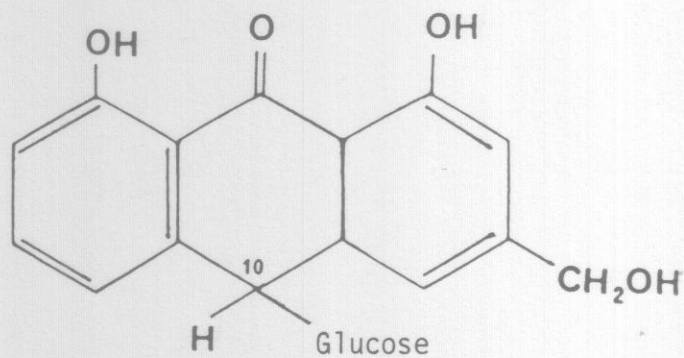
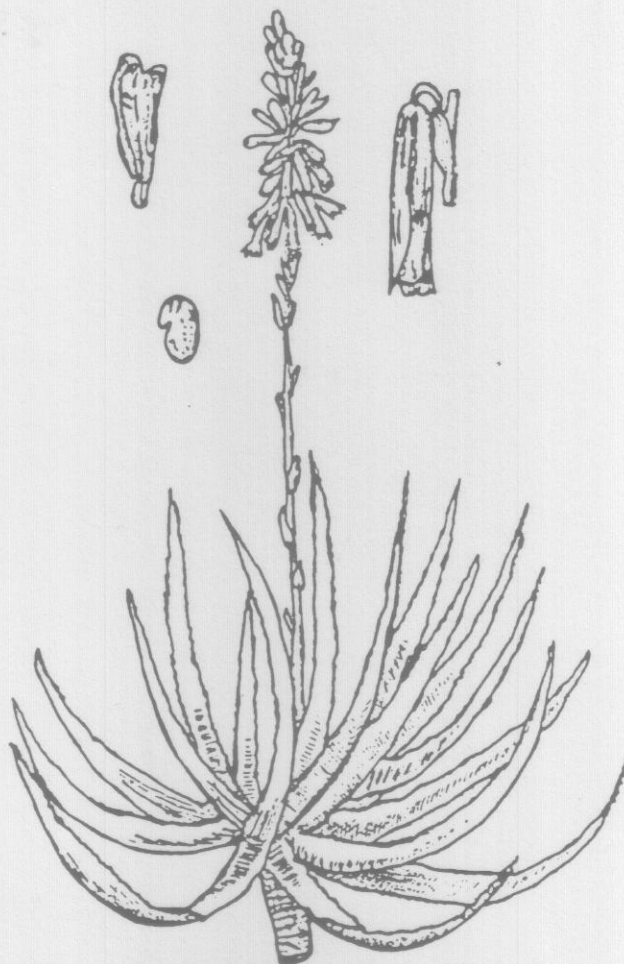


Anthraquinone



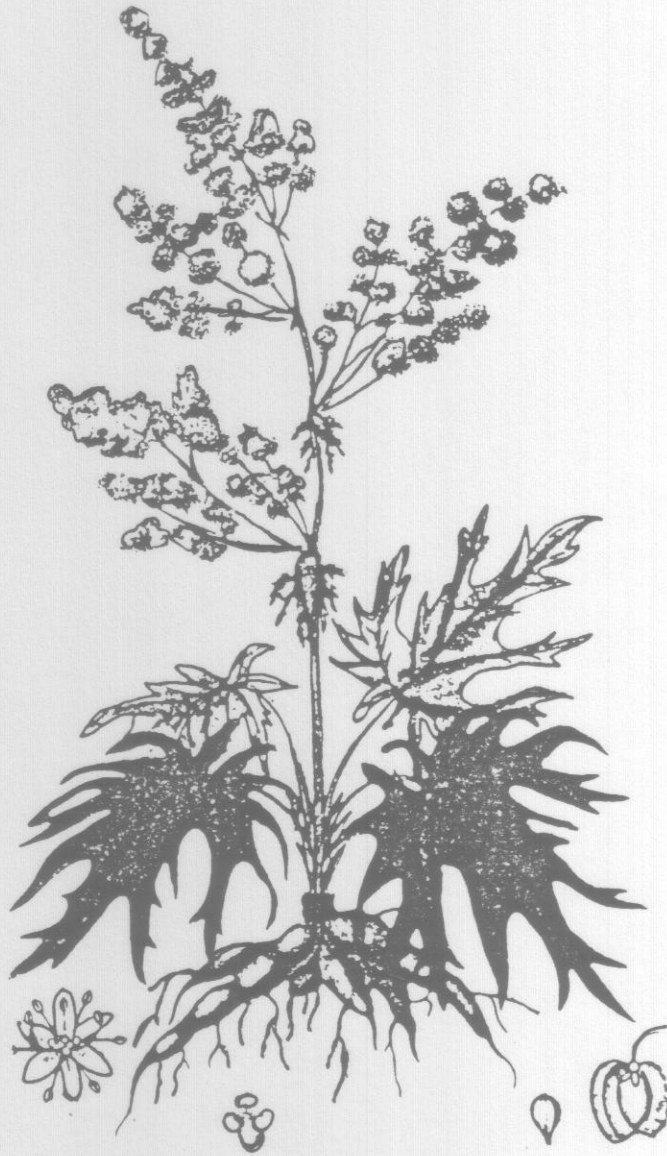
	R ₂	R ₁
Chrysophanol →	- H	- CH ₃
Aloeemodol →	- H	- CH ₂ OH
Rhéine →	- H	- COOH
Emodol →	-OH	- CH ₃
Rheocrhysidine →	-OCH ₃	- CH ₃

L'ALOES *Aloe ferox* Miller - *Aloe vera* L. Liliacées



Barbaloinés A et B

LA RHUBARBE DE CHINE *Rheum officinale* Baill. Polygonacées
Rheum palmatum L.

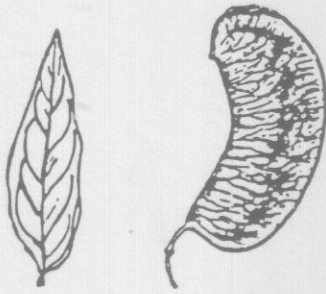


Rheum palmatum L. var. *tanguticum* Maxim.

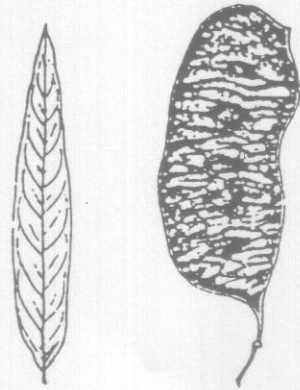
LES SENES OFFICINAUX



Cassia acutifolia Del.



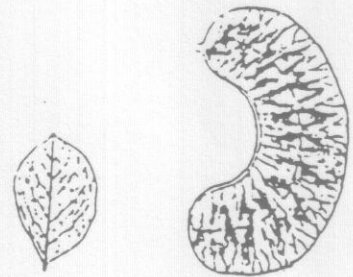
Cassia acutifolia Del.
Feuille Fruit



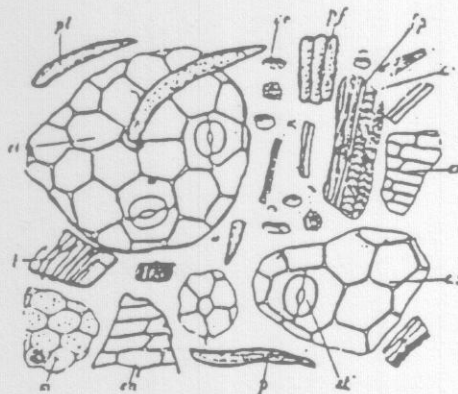
Cassia angustifolia Vahl.
Feuille Fruit



Cassia obovata Col

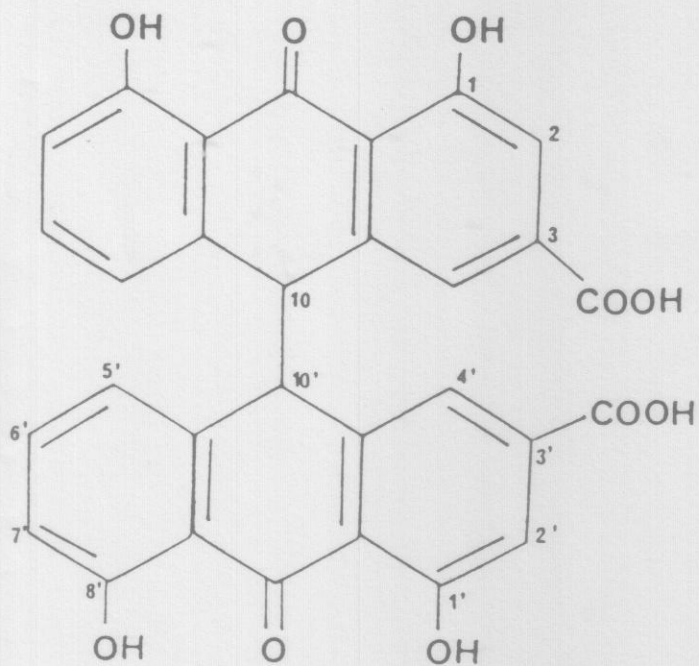


Cassia obovata Col.
Feuille Fruit

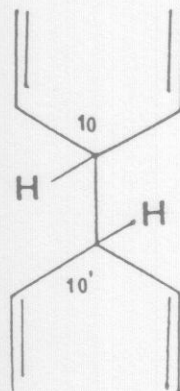


poudre de feuilles de Séné
es:épiderme supérieur - ci, épiderme inférieur
en:épiderme neural, pt:poils testeurs, l:liber,
m:mésophylle, p:cellules en palissade, f:fibres

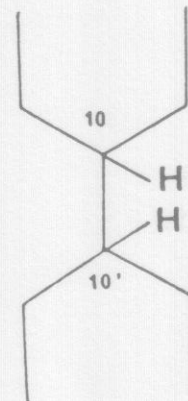
HETEROSIDES DES SENES



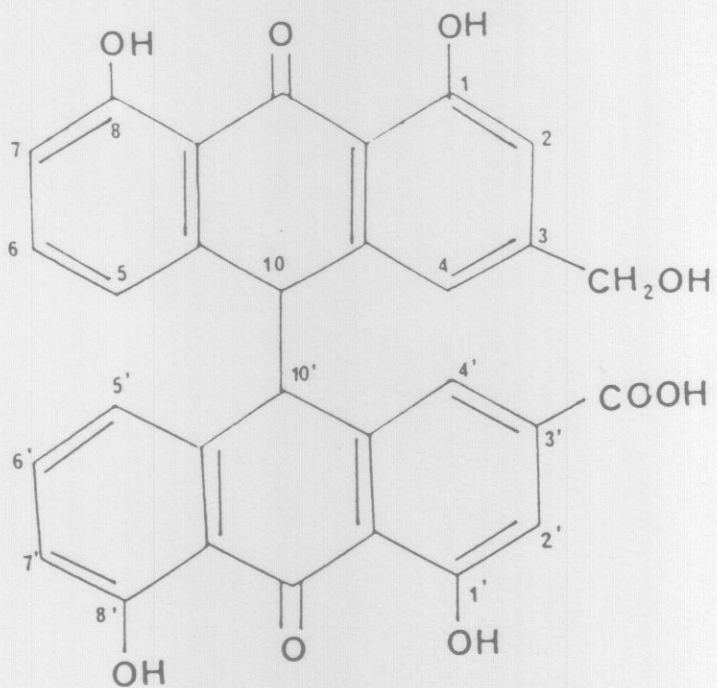
Sennidines A et B



A
(trans)



B
(cis)



Sennosides C et D

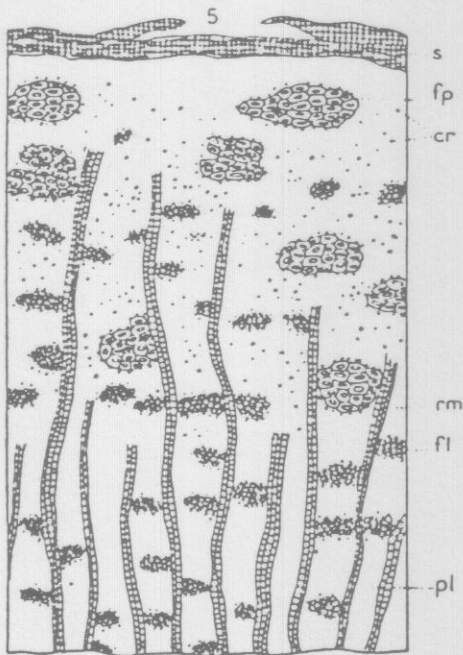
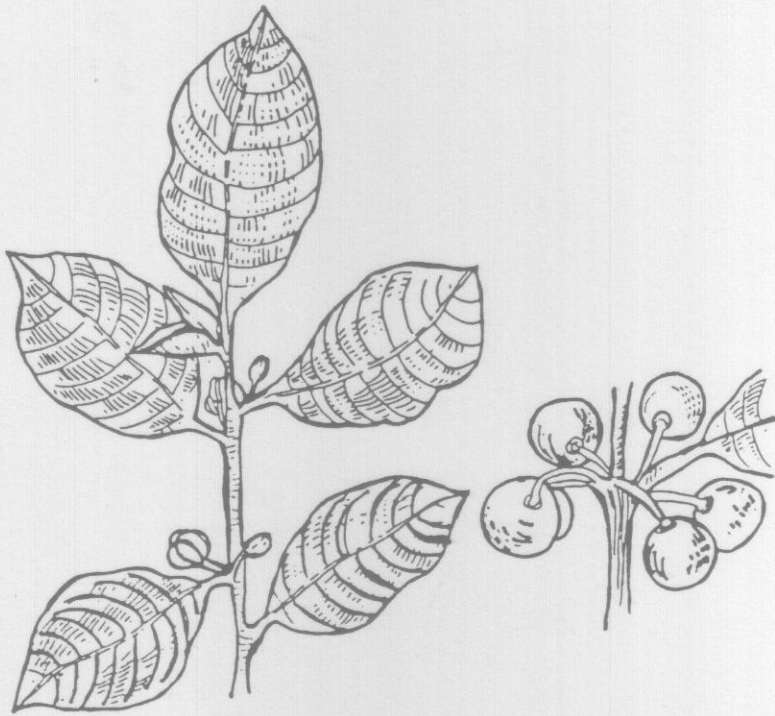
Sennosides A et B

{ un glucose en 8
{ un glucose en 8'

Sennosides C et D

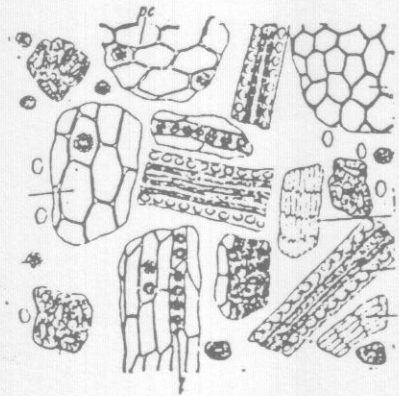
{ un glucose en 8
{ un glucose en 8'

LE CASCARA *Rhamnus purshiana* D.C. Rhamnacées



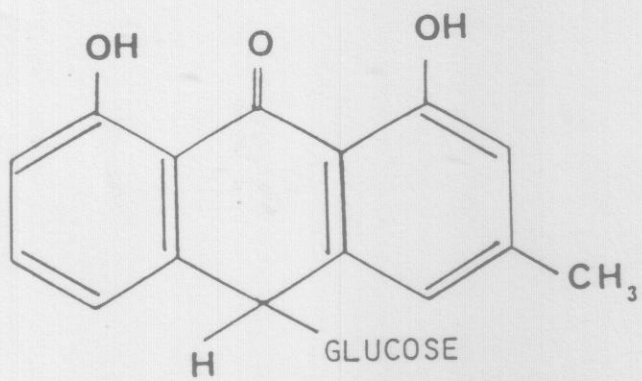
PLANCHE

Coupe d'écorce de Cascara

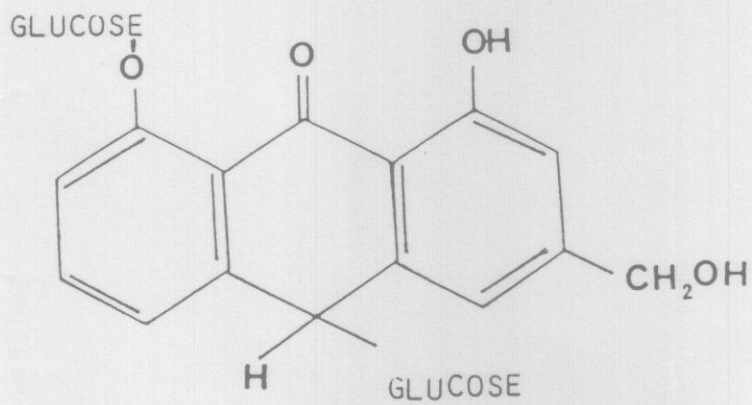


Poudre d'écorce de Cascara

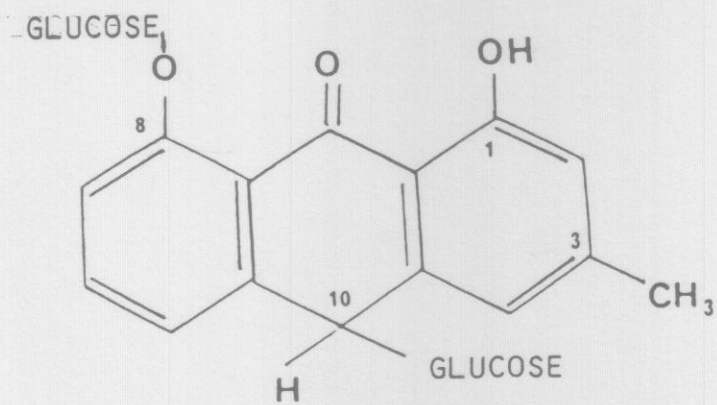
HETEROSIDES DU CASCARA



Chrysaloine A et B



Cascarosides A et B

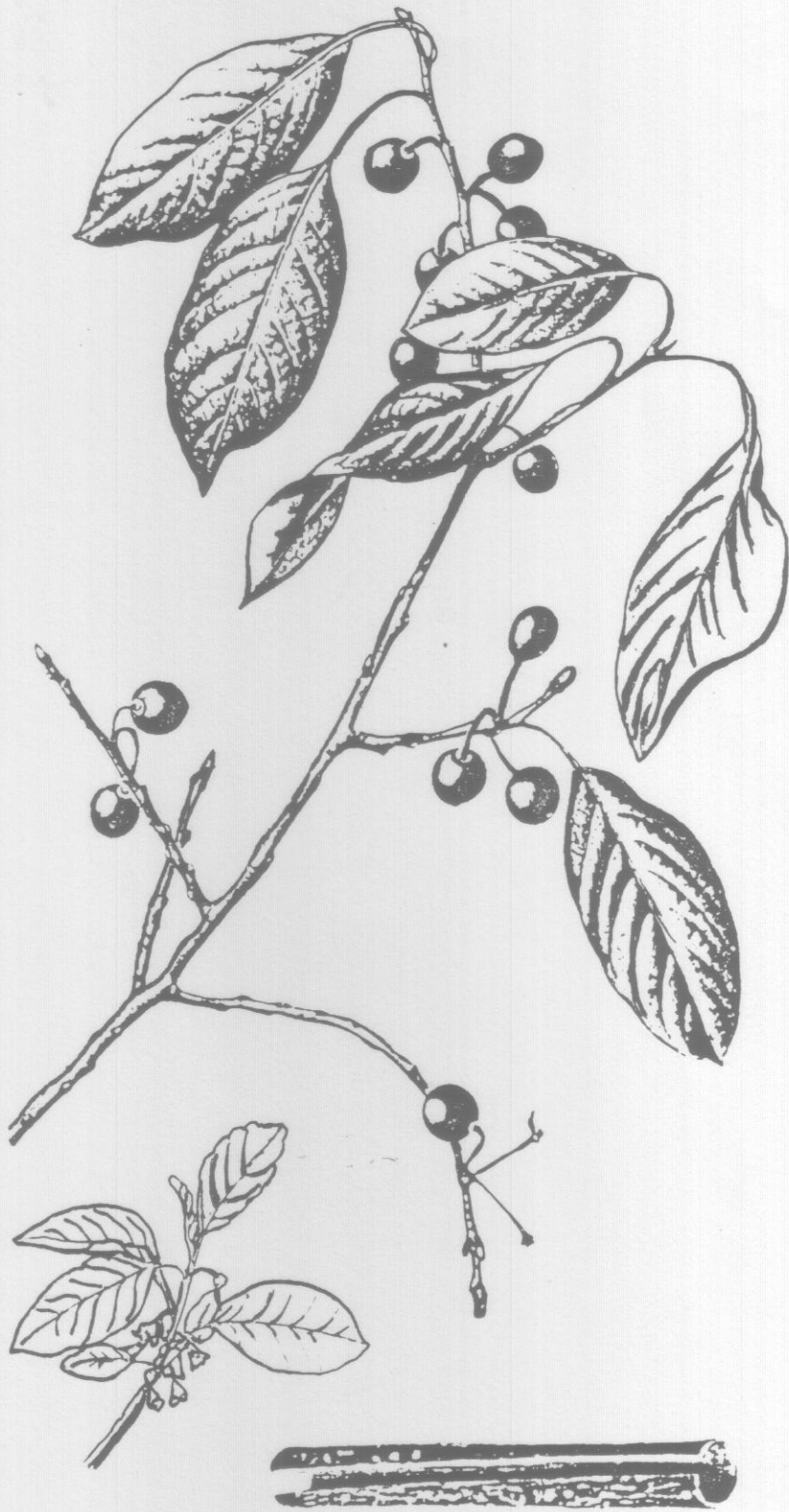


Cascarosides C et D

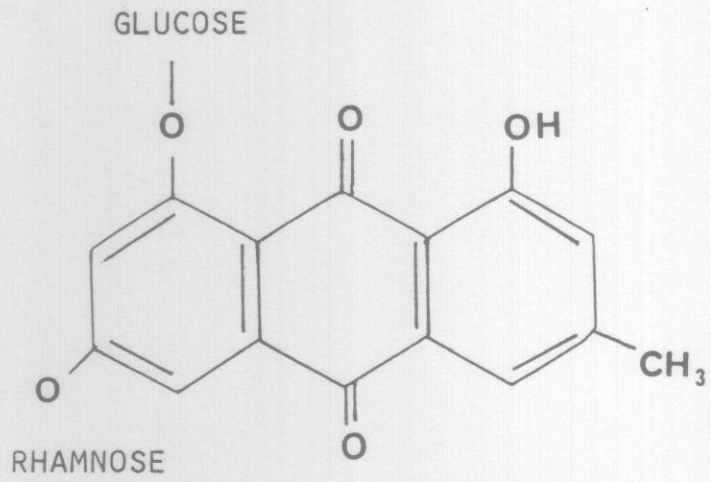
LA BOURDAINE

Rhamnus frangula L.

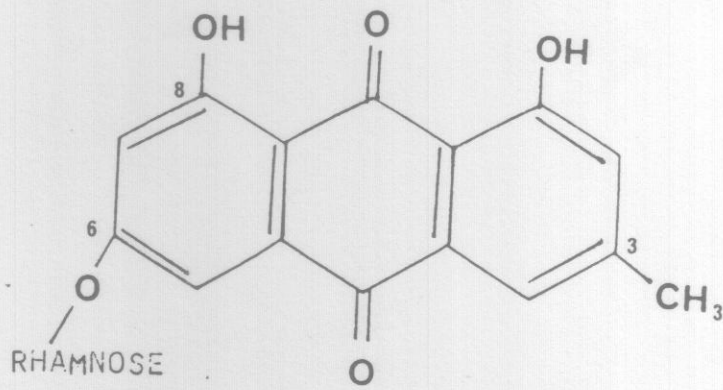
Rhamnacées



HETEROSIDES DE LA BOURDAINE

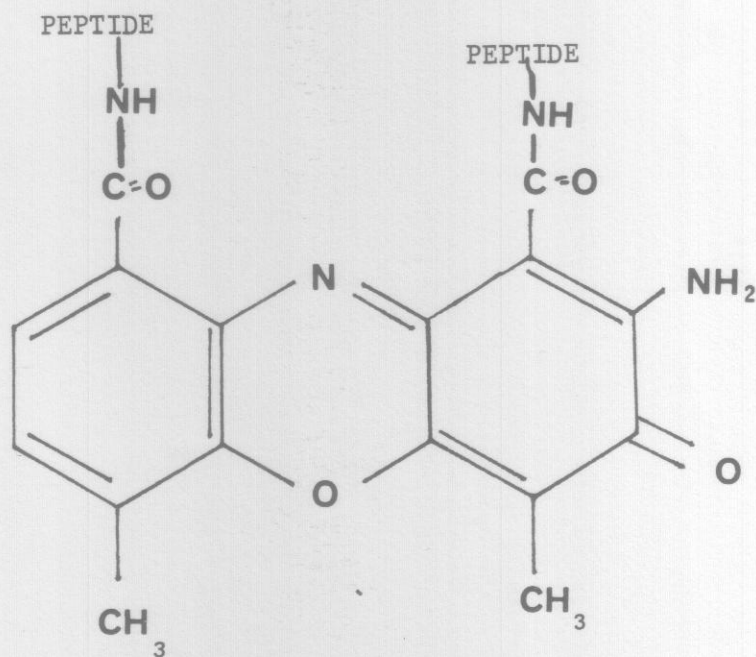
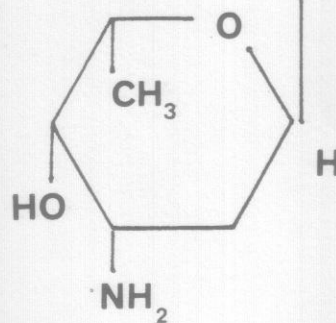
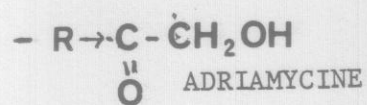
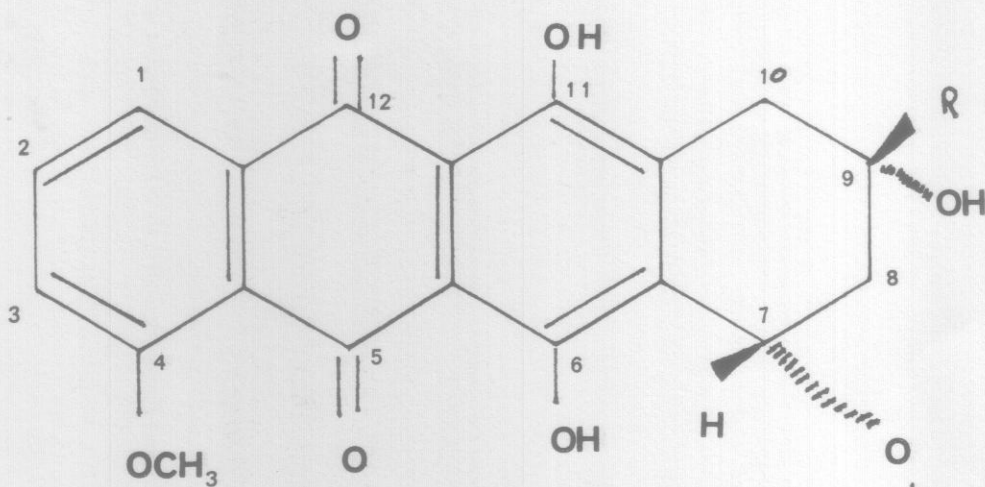


Glucofranguloside A



Franguloside A

ANTIBIOTIQUES



ACTINOMYCINE D

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