

Part II. List of Other Arthropod Pheromones and Allomones

Update: February 21, 2026

(C) Other Compounds

These semiochemicals are divided into the following four groups and listed in ascending order of carbon chain length or ring size.

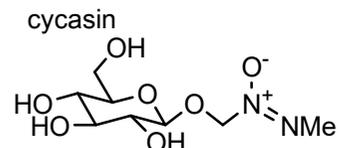
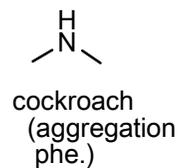
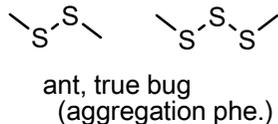
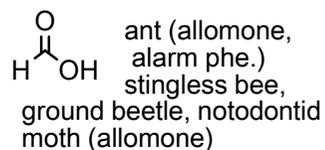
[C-1]	Other: Acyclic compounds	i – xxiv (537 compounds)
[C-2]	Other: True alkaloids	i – xiv (248 compounds)
[C-3]	Other: Aromatic compounds	i – x (175 compounds)
[C-4]	Other: Ring compounds	i – v (102 compounds)

See the database, <https://lepipheromone.sakura.ne.jp/mepdb.html>, for more information, such as the IUPAC names, arthropod species names, and research publications

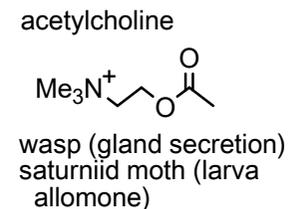
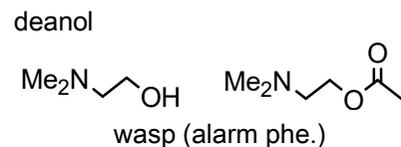
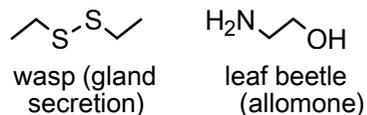
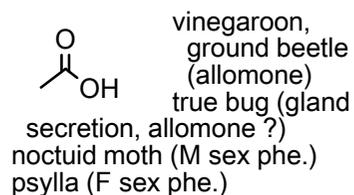
Lepidopteran female sex pheromones and male attractants are listed in **Part I**. Other arthropod pheromones and allomones are listed in **Part II**, which is composed of **(A)** terpenoid compounds without alkaloids, **(B)** non-terpene methyl-branched compounds, and **(C)** other compounds including terpene alkaloids.

[C-1] Other: Acyclic comp. (i)

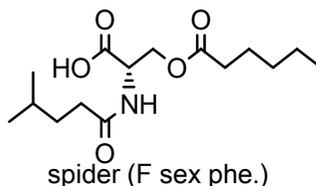
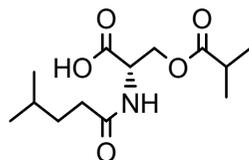
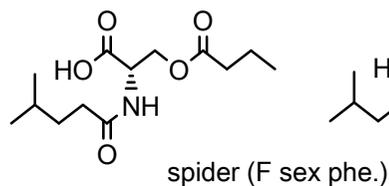
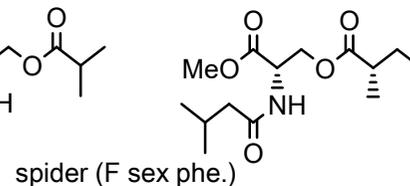
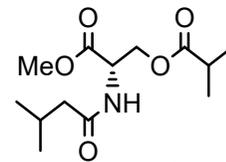
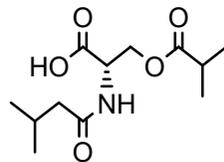
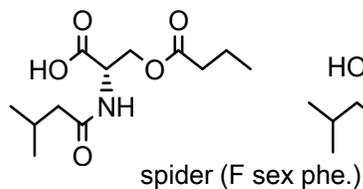
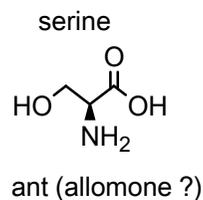
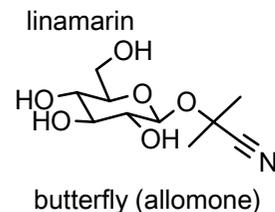
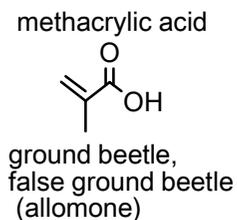
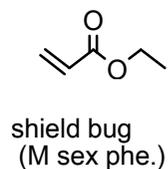
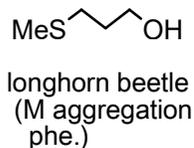
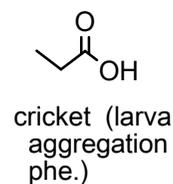
C1 chain



C2 chain

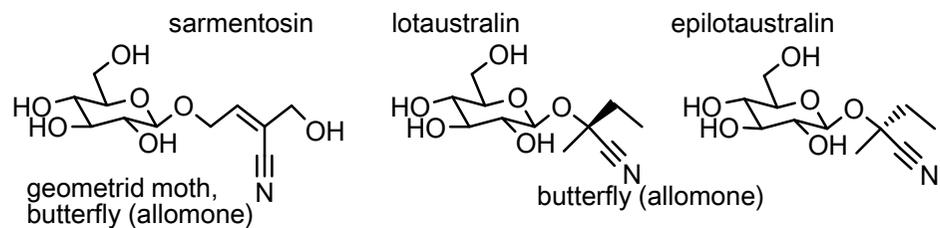
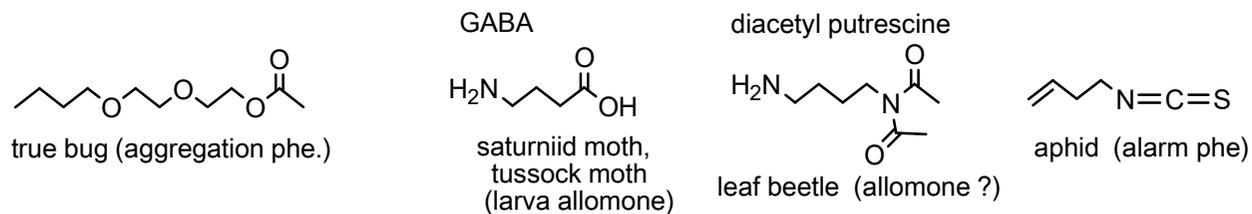
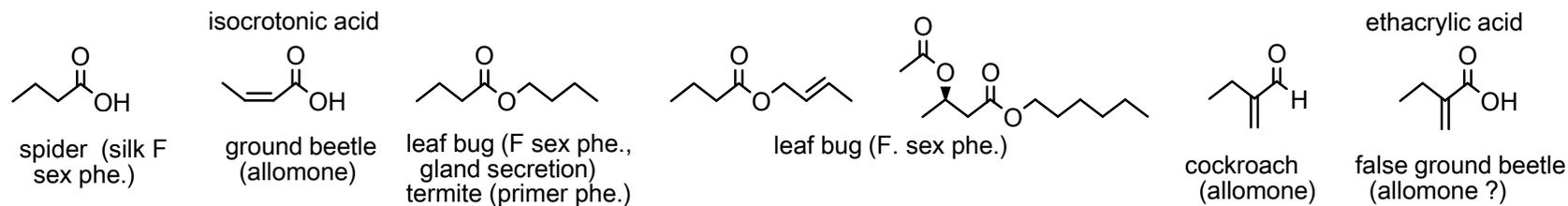
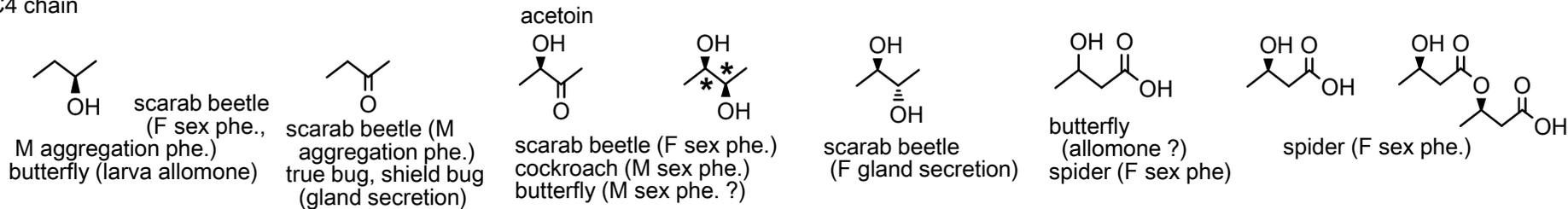


C3 chain



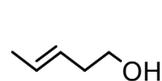
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C4 chain

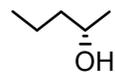


[C-1] Other: Acyclic comp. (iii)

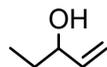
C5 chain



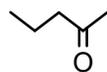
bark beetle
(F aggregation phe. ?)



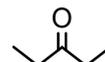
wasp
(alarm phe.)
assassin bug
(sex phe. ?)



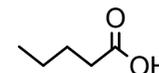
butterfly (larva
allomone)



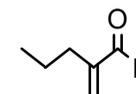
ground beetle,
darkling beetle
(allomone ?)



scarab beetle (M
aggregation phe.)
assassin bug (alarm phe.)
butterfly (larva allomone)

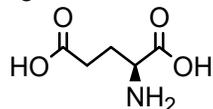


grasshopper
(F. sex phe.)

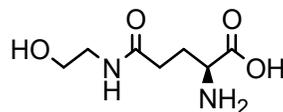


cockroach
(allomone)

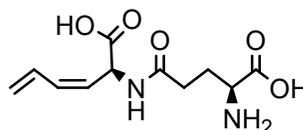
glutamic acid



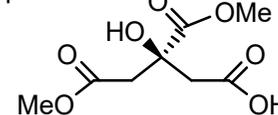
fruit fly (marking phe.)



leaf beetle (allomone)

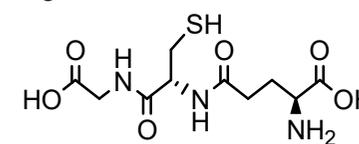


cupilure



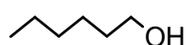
spider (F sex phe.)

glutathione

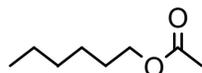


fruit fly (marking phe.)

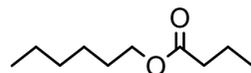
C6 chain



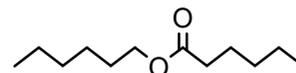
ambrosia beetle
(aggregation phe.)



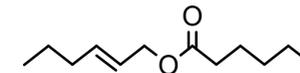
true bug (allomone ?,
gland secretion)
leaf bug (F sex phe.)



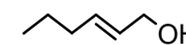
true bug (gland secretion)
leaf bug (F sex phe.,
M anti-sex phe., alarm
phe., allomone)



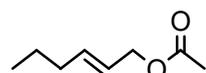
true bug (gland secretion)
leaf bug (gland secretion,
F sex phe.)



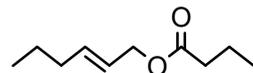
leaf bug (gland secretion,
alarm phe., F sex phe.)



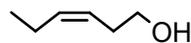
shield bug (allomone)
leaf bug (F sex phe.)
stink bug (M
aggregation phe.)



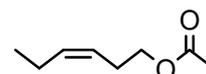
giant water bug, eed
bug (gland secretion)
stink bug, true bug
(allomone)
leaf bug (F sex phe.)



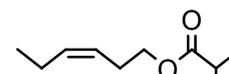
leaf bug (F sex phe.,
M anti-sex phe.,
alarm phe., allomone)



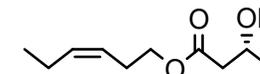
leaf beetle
(gland secretion)



leaf bug
(F sex phe.)



leaf beetle (allomone)
butterfly (M sex phe. ?)

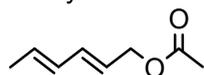


wasp
(M marking phe.)

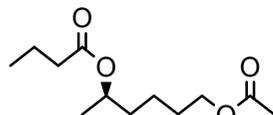
[C-1] Other: Acyclic comp. (iv)

C6 chain

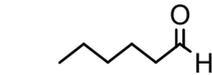
sorbyl acetate



seed bug
(aggregation phe.)

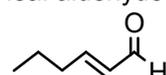


leaf bug (F sex phe.)

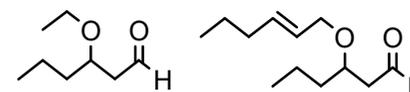


darkling beetle (gland secretion), true bug, shield bug (alarm phe. gland secretion), flesh fly (M sex phe.)

leaf aldehyde

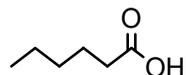


stink bug (alarm phe., aggregation phe., allomone), lace bug, ant (alarm phe.), true bug (aggregation phe. alarm phe.), giant shield bug, rove beetle (allomone)

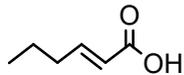


cockroach (allomone)

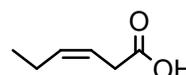
caproic acid



termite (trail phe., allomone), click beetle (F sex phe.), ant (trail phe.), wasp (sex phe.), assassin bug (aggregation phe.), spider (F silk sex phe.)

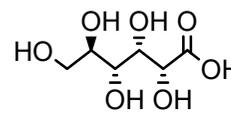


stink bug (gland secretion)

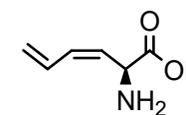


butterfly (M sex phe. ?)

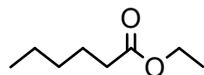
gluconic acid



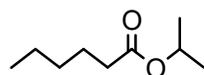
cockroach (allomone ?)



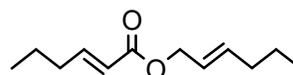
leaf beetle (allomone)



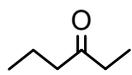
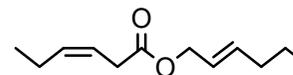
fruit fly (M sex phe.)



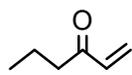
assassin bug (queen phe.)



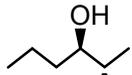
broad-headed bug (M aggregation phe.)



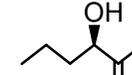
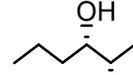
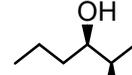
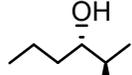
parasitoid wasp (aggregation phe.)



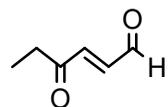
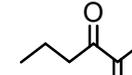
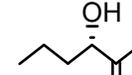
butterfly (gland secretion)



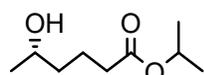
longhorn beetle (M sex or aggregation phe.)



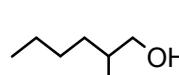
longhorn beetle (M sex or aggregation phe.)



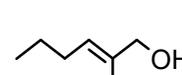
lace bug, stink bug (alarm phe.), leaf bug (F sex phe.), water boatman, giant shield bug, true bug, broad-headed bug, stink bug, rove beetle (allomone)



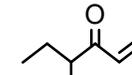
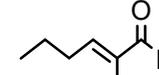
fruit fly (M sex phe.)



butterfly (M sex phe. ?)



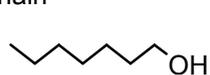
ant (gland secretion)



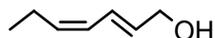
millipede (allomone)

[C-1] Other: Acyclic comp. (v)

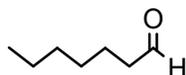
C7 chain



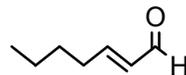
bark beetle (F aggregation phe.)
fruit fly (M sex phe.)



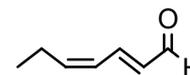
leaf beetle (aggregation phe.)



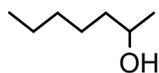
assassin bug (M sex phe.)



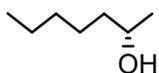
stink bug (gland secretion)



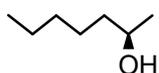
leaf beetle (aggregation phe.)



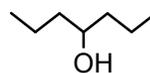
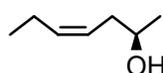
bee, wasp (alarm phe.)



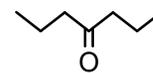
caddis fly (F sex phe.)



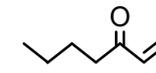
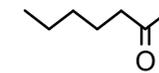
eriocraniid moth (F sex phe.)



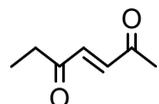
ant (gland secretion)



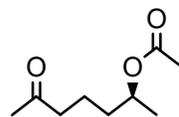
honey bee, ant, ground beetle, bumblebee (alarm phe.)
caddis fly (F sex phe.)



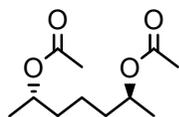
harvestman (allomone ?)



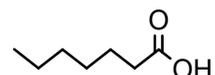
stingless bee (allomone)



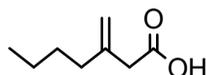
gall midge (F sex phe.)



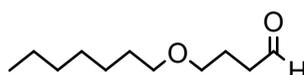
enanthic acid



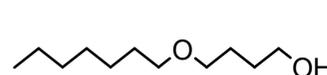
ant (trail phe. ?)



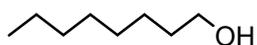
seed beetle (F sex phe.)



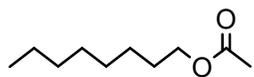
longhorn beetle (M aggregation phe.)



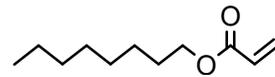
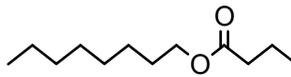
C8 chain



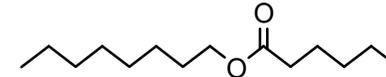
true bug (gland secretion)
leaf bug (F sex phe.)



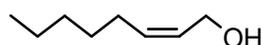
leaf bug (F sex phe.)



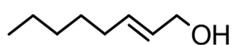
parasitoid wasp (F sex phe.)



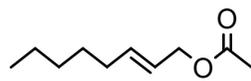
leaf bug (F sex phe.)



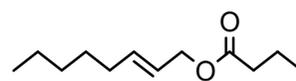
grasshopper (M sex phe. ?)



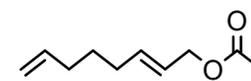
broad-headed bug (gland secretion)



seed bug (F sex phe, aggregation phe.)
leaf bug (F sex phe.)
stink bug (allomone)



leaf bug (F sex phe.)



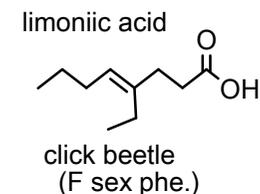
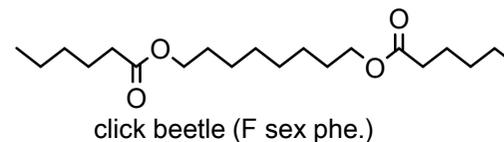
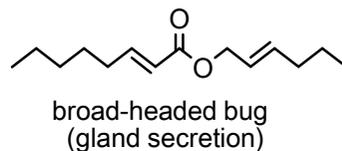
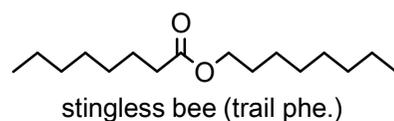
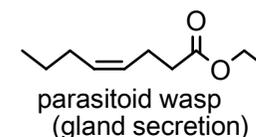
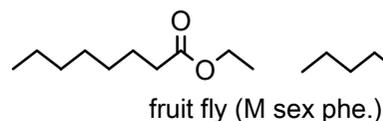
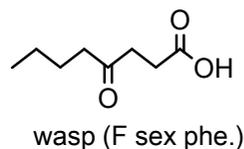
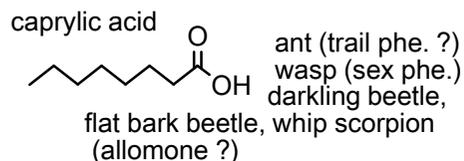
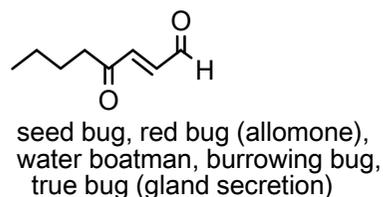
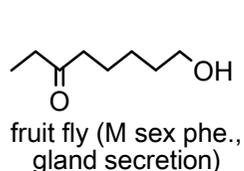
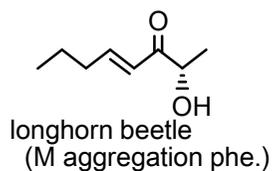
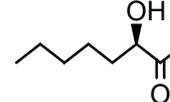
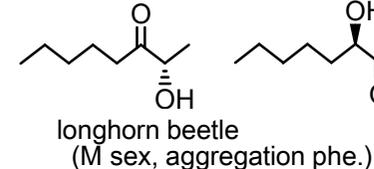
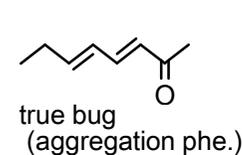
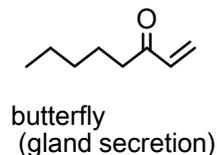
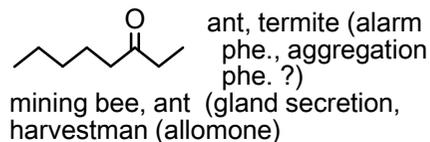
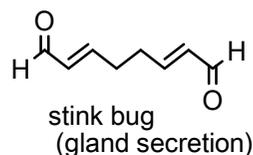
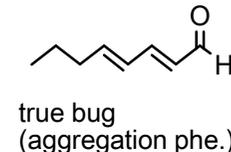
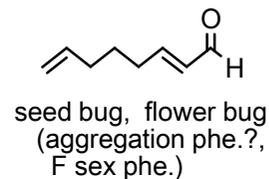
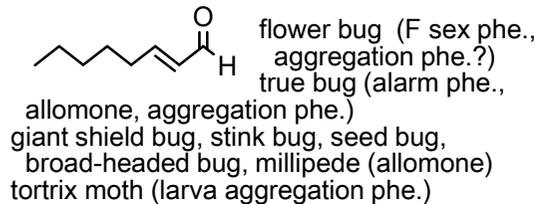
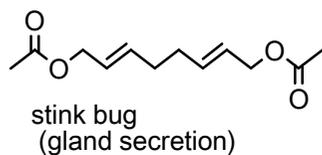
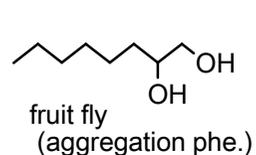
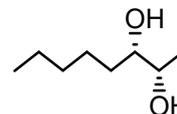
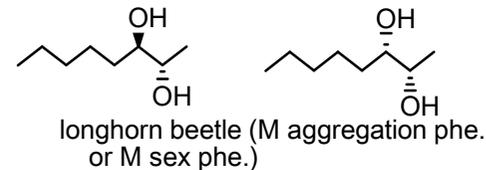
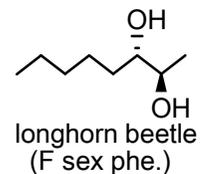
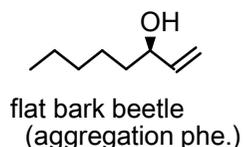
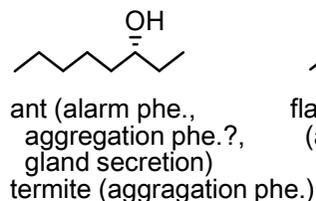
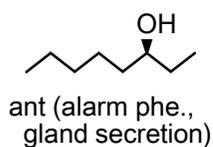
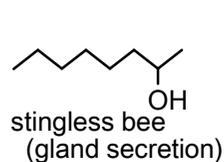
seed bug (aggregation phe.?)



seed bug (sex phe.?)

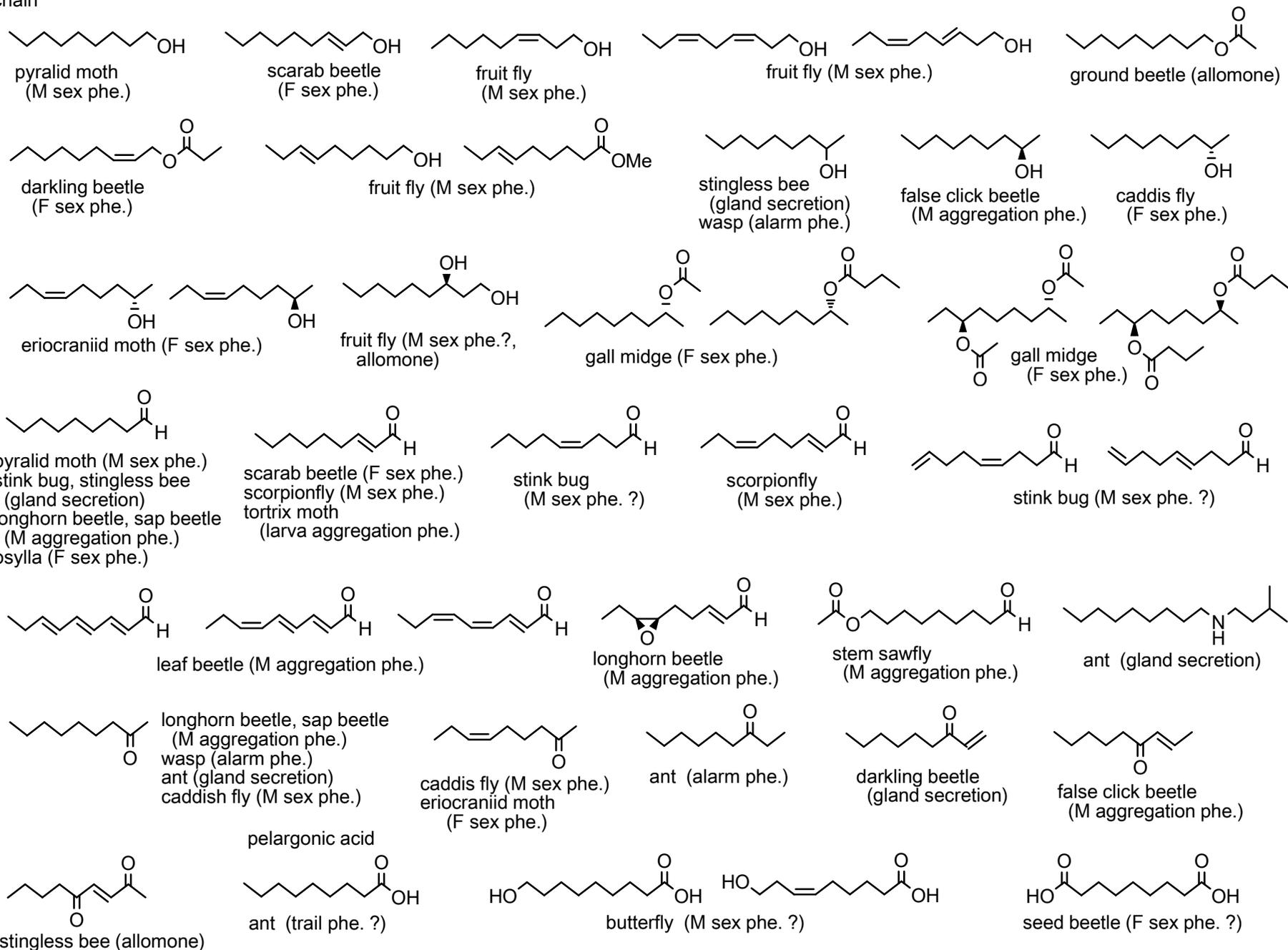
[C-1] Other: Acyclic comp. (vi)

C8 chain



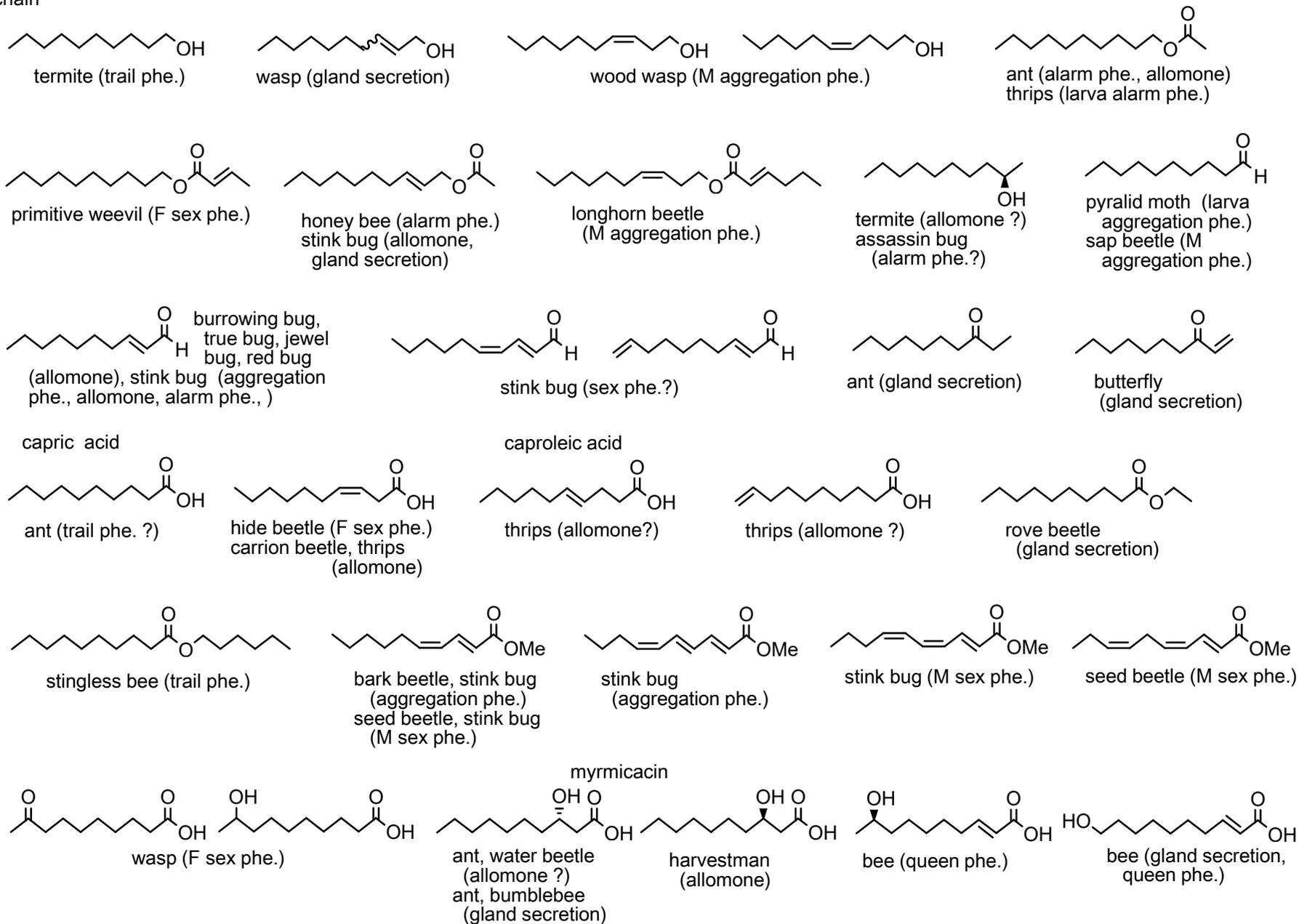
[C-1] Other: Acyclic comp. (vii)

C9 chain



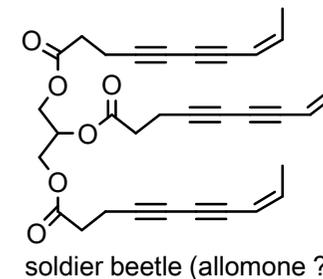
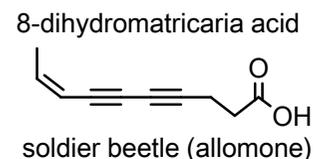
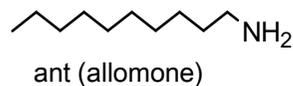
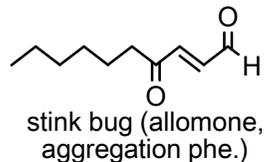
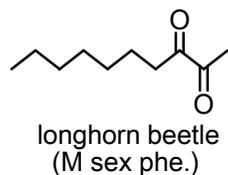
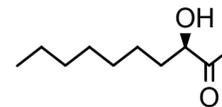
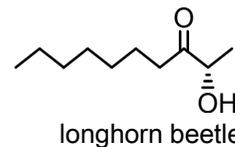
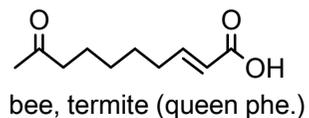
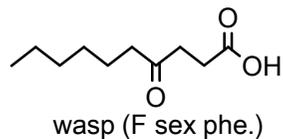
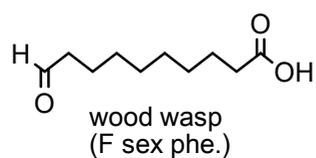
[C-1] Other: Acyclic comp. (viii)

C10 chain

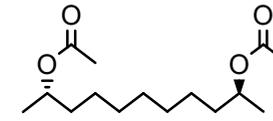
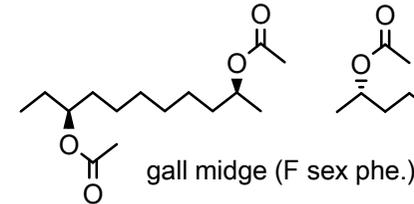
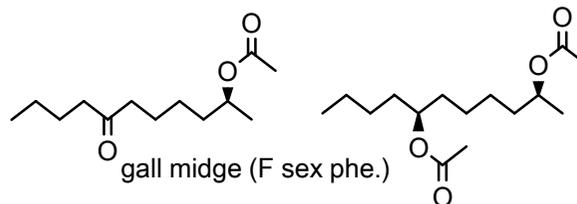
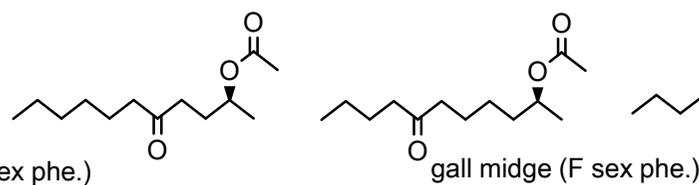
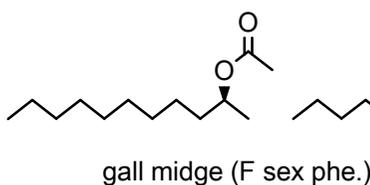
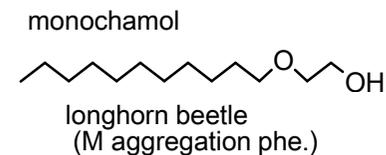
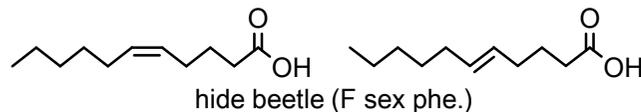
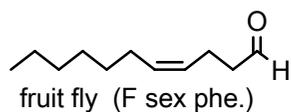
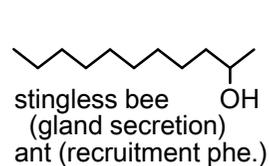
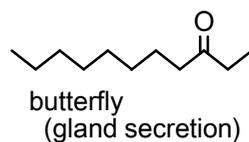
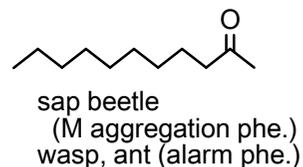
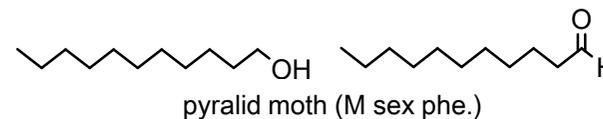
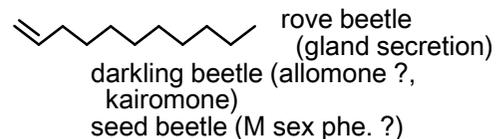
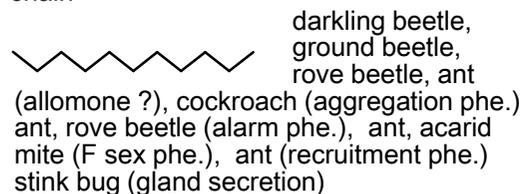


[C-1] Other: Acyclic comp. (ix)

C10 chain

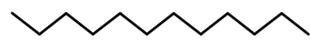


C11 chain

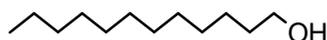


[C-1] Other: Acyclic comp. (x)

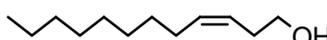
C12 chain



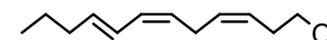
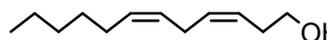
ant (gland secretion)



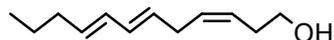
termite (trail phe.)



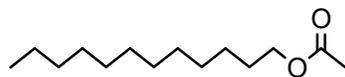
termite (trail phe.)



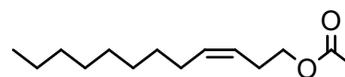
termite (trail phe., F sex phe.)



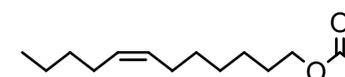
termite (trail phe.)



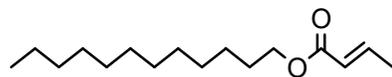
ant (secretion, alarm phe., allomone)
click beetle (F sex phe.), thrips (larva
alarm phe., larva aggregation phe.)



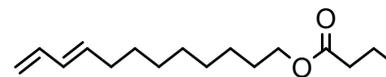
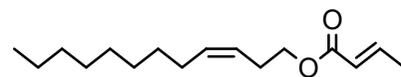
darkling beetle (M sex phe.)



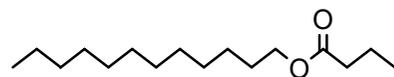
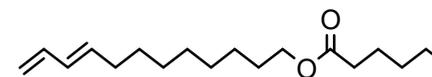
noctuid moth (M sex phe. ?)



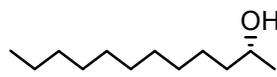
primitive weevil (F sex phe.)



click beetle (F sex phe.)



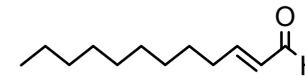
longhorned bee
(M gland secretion)



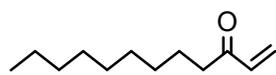
ant (trail phe.)



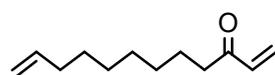
rove beetle (aphrodisiac phe..
allomone), parasitoid wasp
(M aggregation phe.)



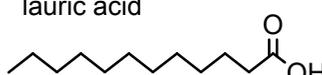
millipede (allomone ?)



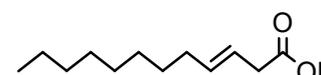
sweat bee (gland secretion)



lauric acid



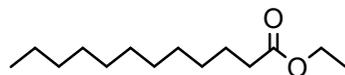
ant (trail phe. ?)
sand fly (oviposition phe.)



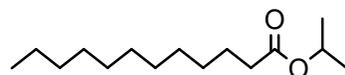
thrips (gland secretion)



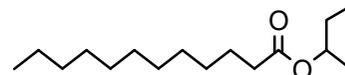
ant (gland secretion)



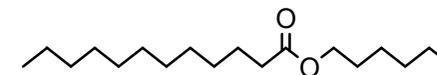
cuckoo bee (allomone ?)
fruit fly (M sex phe.)
bark beetle (aggregation phe.)



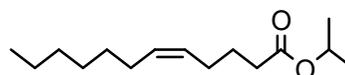
rove beetle (gland secretion)
hide beetle, auger beetle
(M aggregation phe. ?)



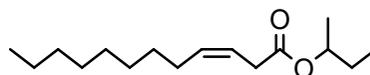
auger beetle
(M aggregation phe.)



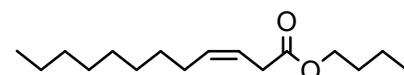
millipede (allomone ?)



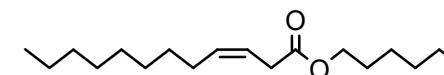
hide beetle (M gland secretion)



rove beetle (gland secretion)

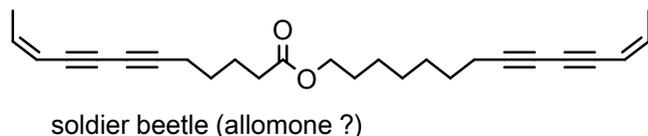


butterfly (gland secretion)



[C-1] Other: Acyclic comp. (xi)

C12 chain



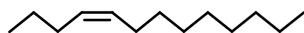
C13 chain



ant (gland secretion, F sex phe., alarm phe. allomone)
burrowing bug, jewel bug, stink bug (gland secretion) darkling beetle, rove beetle, true bug, red bug (allomone)



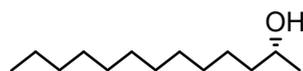
green lacewing, stink bug (allomone ?)
darkling beetle (M sex phe.)



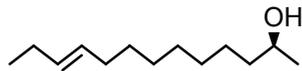
ant (F sex phe., gland secretion)
rove beetle (allomone, aphrodisiac phe.)
stink bug (allomone ?)



green lacewing (gland secretion)



ant (trail phe.)



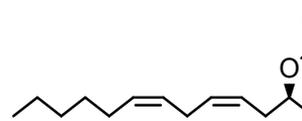
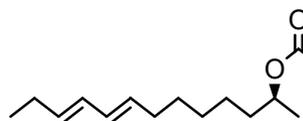
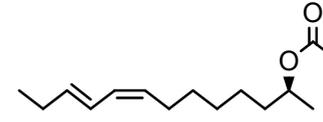
gall midge (F sex phe.)



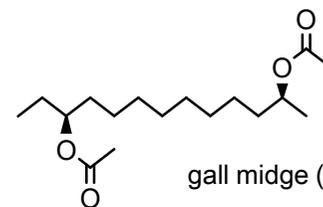
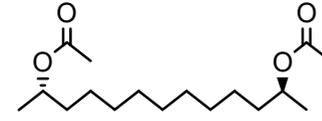
gall midge (F sex phe.)
fruit fly (M aggregation phe.)



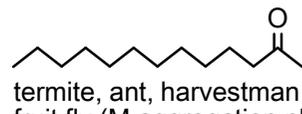
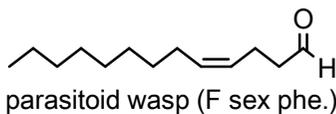
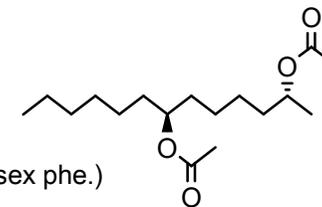
gall midge (F sex phe.)



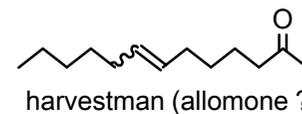
gall midge (F sex phe.)



gall midge (F sex phe.)

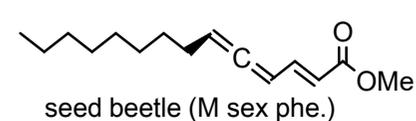
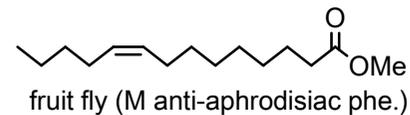
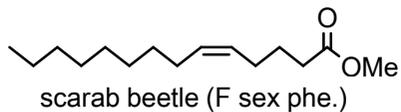
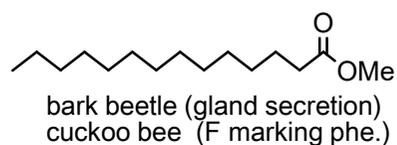
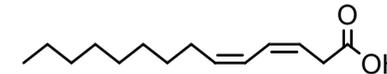
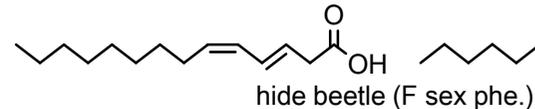
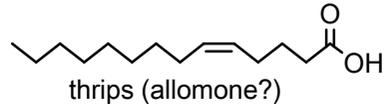
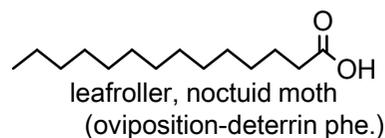
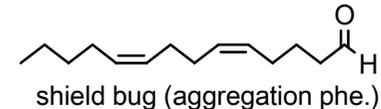
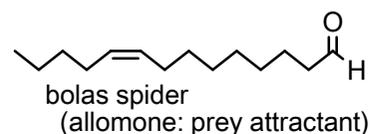
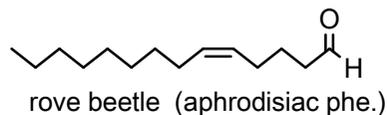
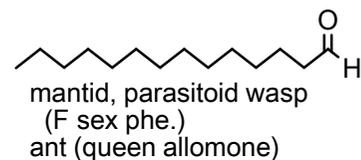
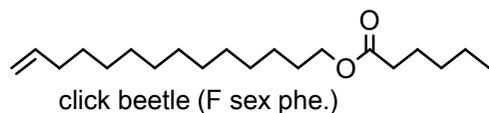
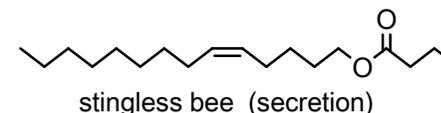
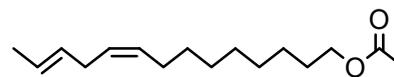
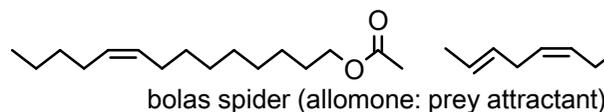
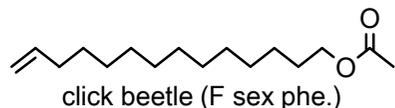
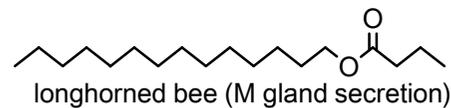
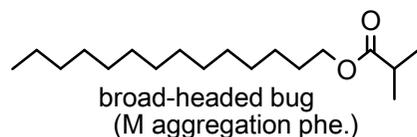
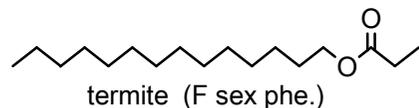
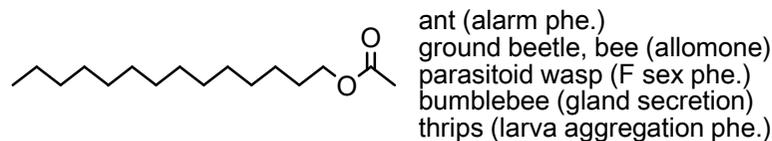
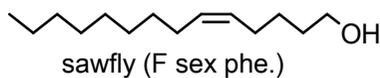
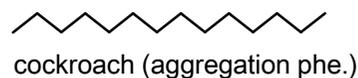


wasp (marking phe. ?)
caddis fly (F sex phe. ?)
termite, ant, harvestman (allomone ?)
fruit fly (M aggregation phe.), ant (secretion)



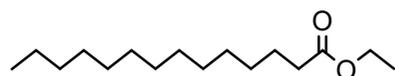
[C-1] Other: Acyclic comp. (xii)

C14 chain

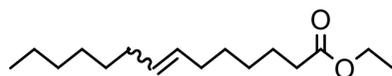


[C-1] Other: Acyclic comp. (xiii)

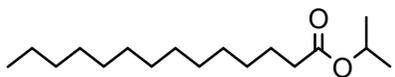
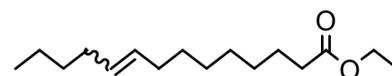
C14 chain



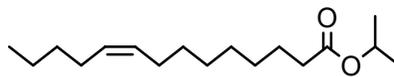
cuckoo bee (allomone ?)
wasp (marking phe. ?)
fruit fly (M sex phe.)



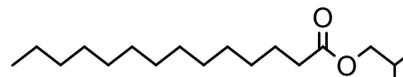
bumblebee (M marking phe. ?)



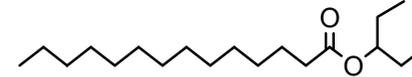
wasp (marking phe. ?)
hide beetle (M aggregation phe. ?)



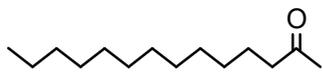
hide beetle (M aggregation phe. ?)



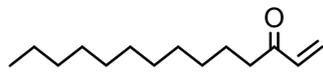
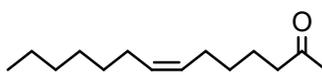
fruit fly (F gland secretion)



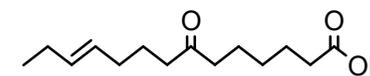
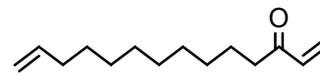
auger beetle
(M aggregation phe.)



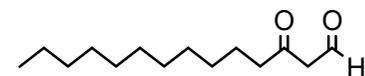
scarab beetle (F sex phe.)



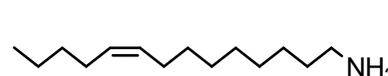
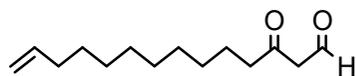
termite (allomone)



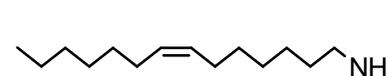
butterfly (M sex phe. ?)



termite (allomone)

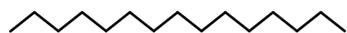


ant (allomone ?)

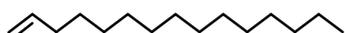


[C-1] Other: Acyclic comp. (xiv)

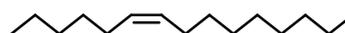
C15 chain



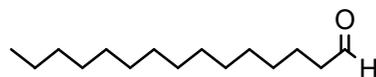
true bug, small carpenter bee
(allomone ?), wasp (F sex phe.)
ant (gland secretion)



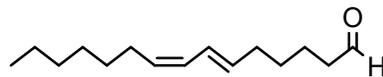
darkling beetle (allomone)



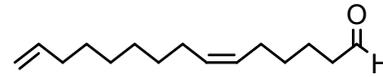
acarid mite (alarm phe.)



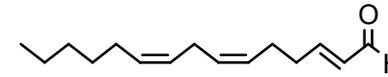
mantid (F sex phe.)



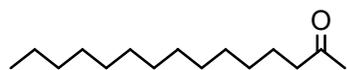
longhorn beetle (M aggregation phe.)



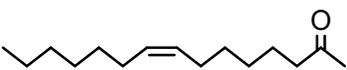
webspinning sawfly (F sex phe.)



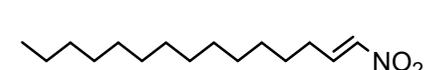
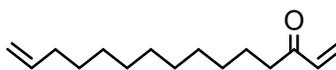
longhorn beetle (aggregation phe.)



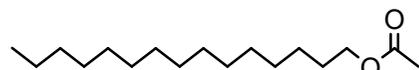
wasp (marking phe.?, trail phe.?)
fruit fly (M aggregation phe.)
darkling beetle (allomone ?)
ant, cuckoo bee (gland secretion)



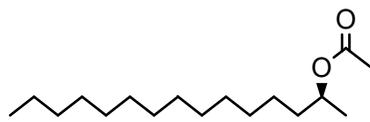
termite (allomone)



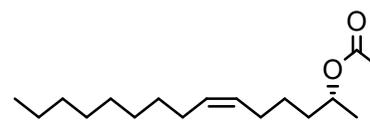
termite (allomone)



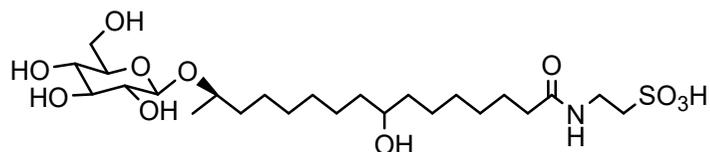
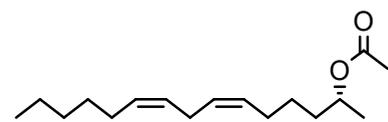
scarab beetle (aggregation phe.)



fruit fly (M aggregation phe.)



gall midge (F sex phe.)



fruit fly (marking phe.)

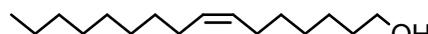
C16 chain



acrolepiid moth (M sex phe.)



bumblebee (M marking phe. ?)
noctuid moth (M gland secretion)

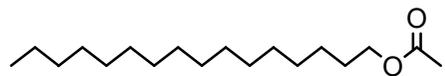


scarab beetle (F sex phe.)

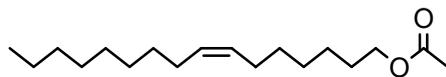
palmitoleyl alcohol



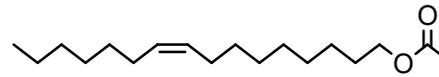
bumblebee (M marking phe. ?)
seed beetle, bark beetle, darkling
beetles (gland secretion)



ground beetle, millipede (allomone)
cuckoo bee (marking phe. ?)
noctuid moth, bumblebee (gland
secretion), spider (F sex phe.)



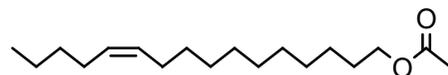
bumblebee (M marking phe. ?)



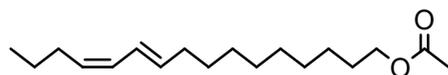
millipede (allomone ?)
thrips (gland secretion)

[C-1] Other: Acyclic comp. (xv)

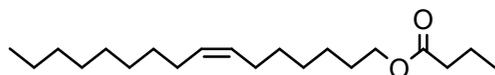
C16 chain



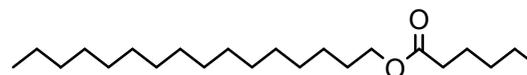
parasitoid wasp (F sex phe.)



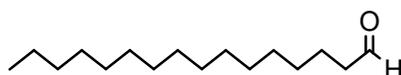
weevil (M aggregation phe.)



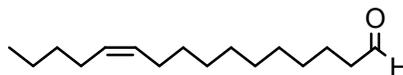
stingless bee (secretion)



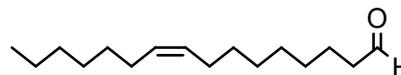
sweat bee (gland secretion)



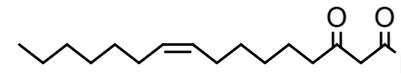
wasp (M marking phe. ?)



bolas spider
(allomone: prey attractant)

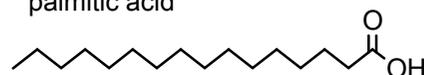


ant (trail phe., aggregation phe.)
parasitoid wasp (F sex phe.)



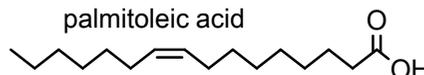
termite (allomone)

palmitic acid



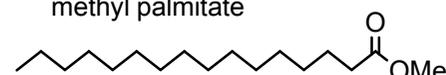
leafroller moth (M-to-M inhibitory phe.,
oviposition-deter. phe.), noctuid moth, grass moth
(oviposition-deter. phe.), termite (aggregation phe.)
longhorned bee (F gland secretion)

palmitoleic acid



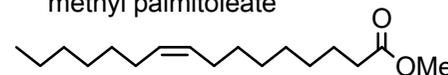
wasp (marking phe. ?)
leafroller moth, grass moth
(oviposition-deter. phe.)
termite (aggregation phe.)

methyl palmitate

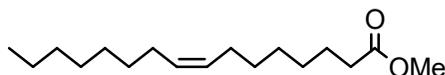


cuckoo bee (F marking phe.)
wasp (F allomone)
tineid moth (M aggregation phe.)
fruit fly (marking phe. ?)

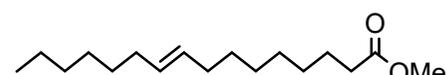
methyl palmitoleate



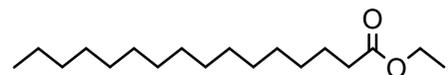
tineid moth (M aggregation phe.)
tsetse fly (F sex phe.)



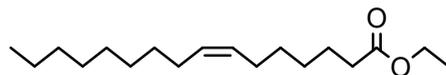
stink bug (M sex phe.)



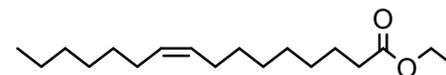
fruit fly (marking phe. ?)



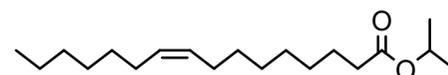
hide beetle (aggregation phe.)
bark beetle, plasterer bee (gland
secretion), cuckoo bee (allomone ?)



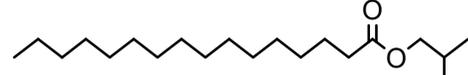
wasp (M marking phe. ?)



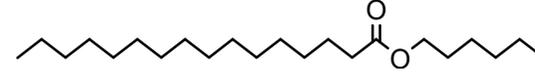
parasitoid wasp (F sex phe.)



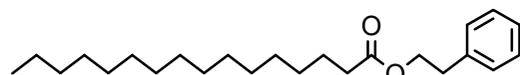
rove beetle (M aggregation phe.)



fruit fly (F gland secretion)



butterfly (M aphrodisiac phe.)

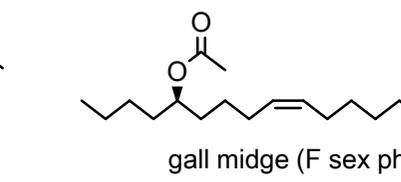
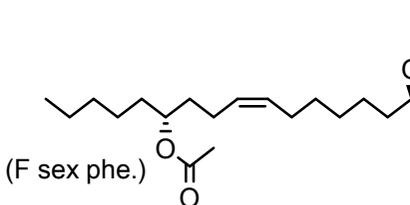
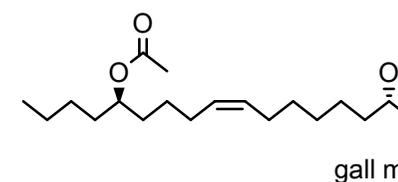
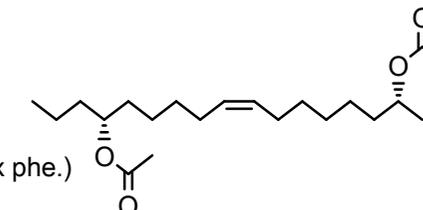
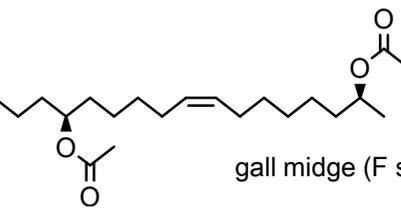
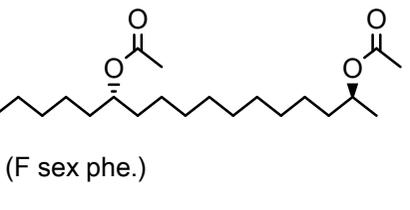
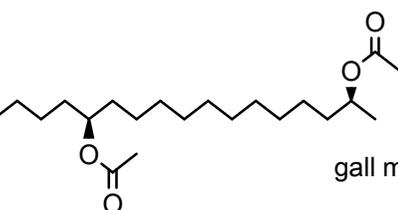
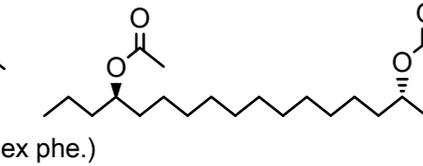
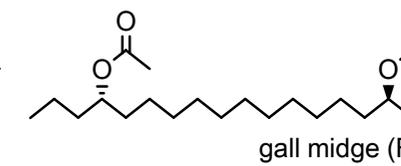
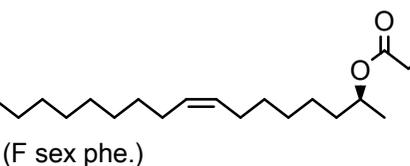
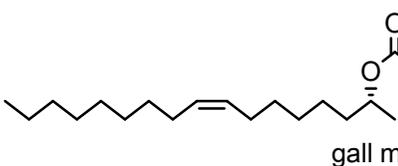
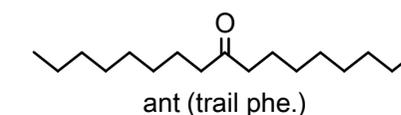
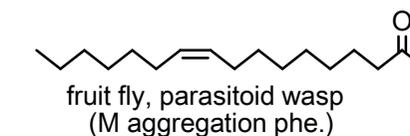
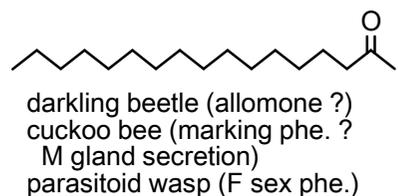
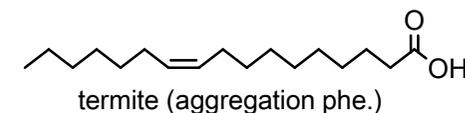
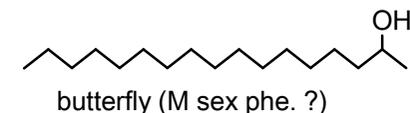
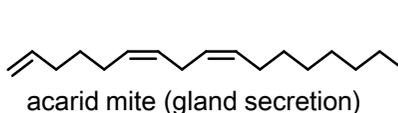
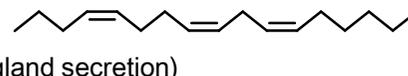
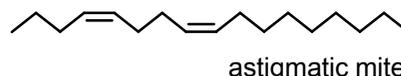
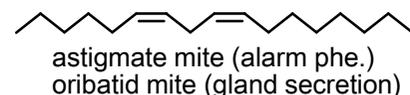
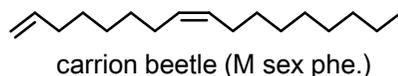
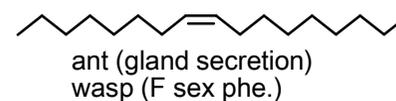
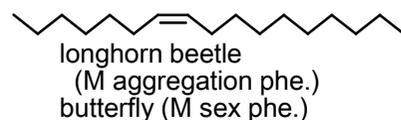
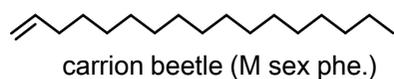
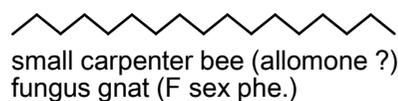


butterfly (M sex phe. ?)



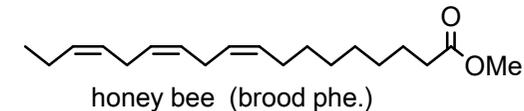
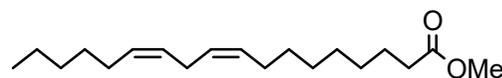
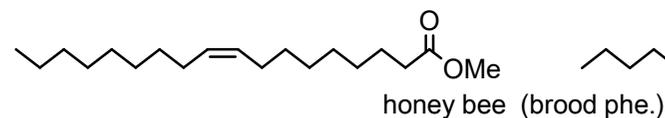
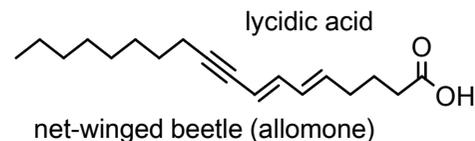
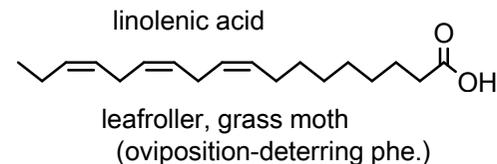
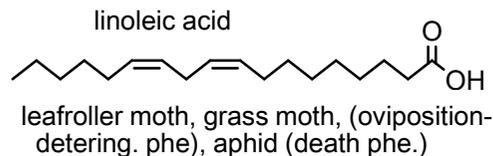
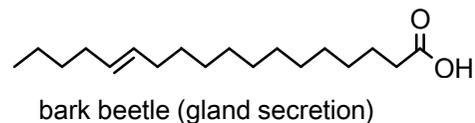
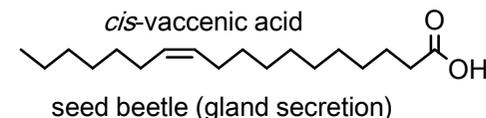
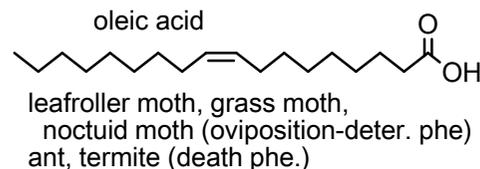
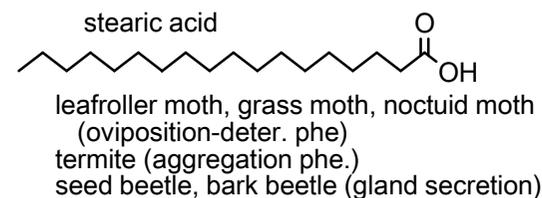
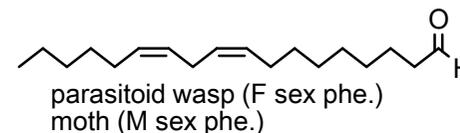
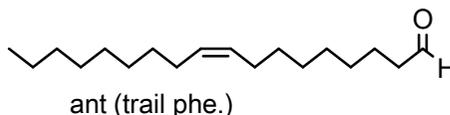
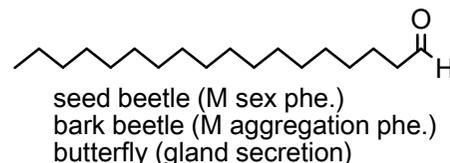
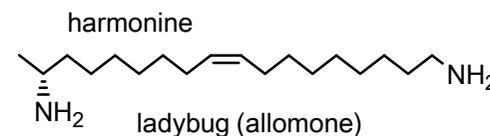
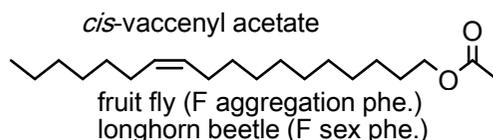
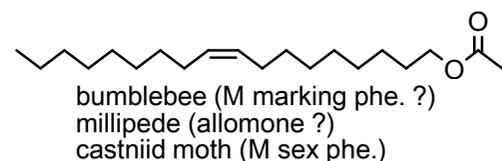
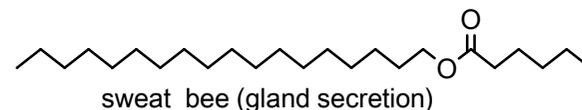
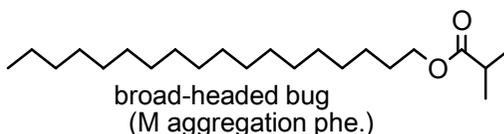
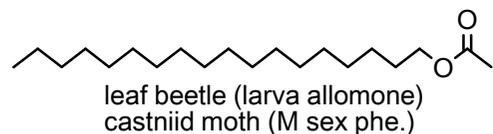
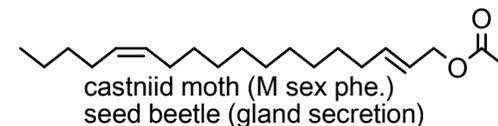
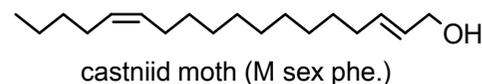
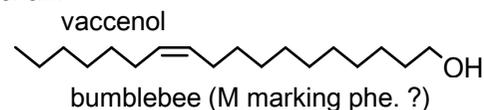
[C-1] Other: Acyclic comp. (xvi)

C17 chain



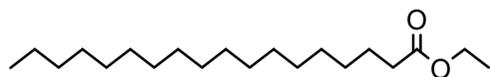
[C-1] Other: Acyclic comp. (xvii)

C18 chain



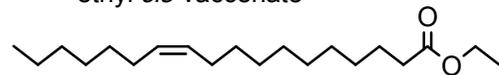
[C-1] Other: Acyclic comp. (xviii)

C18 chain

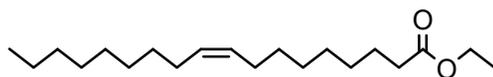


plasterer bee (gland secretion)

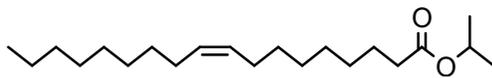
ethyl *cis*-vaccenate



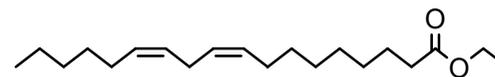
fruit fly (F gland secretion)



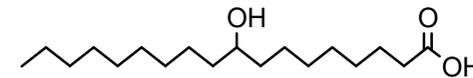
hide beetle (aggregation phe.)
cuckoo bee (M sex phe. ?)



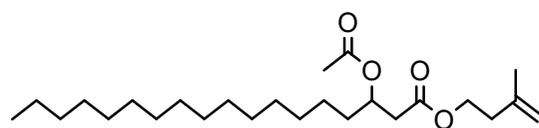
carpenter bee (M gland secretion)



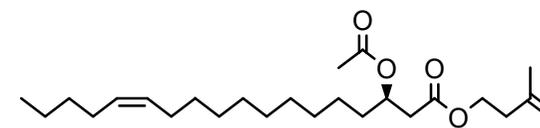
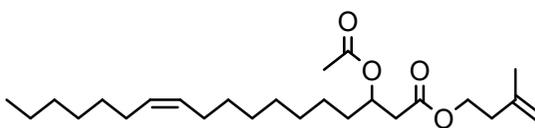
hide beetle (aggregation phe.)



butterfly (M sex phe. ?)

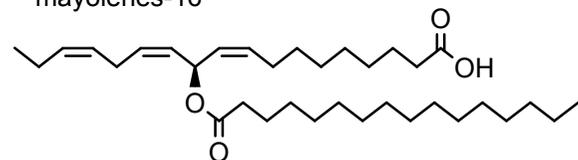


butterfly (M gland secretion)

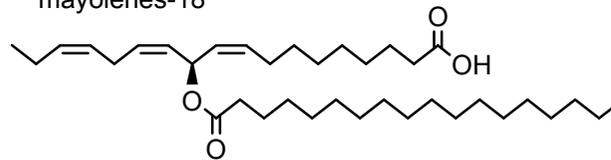


butterfly (M gland secretion)

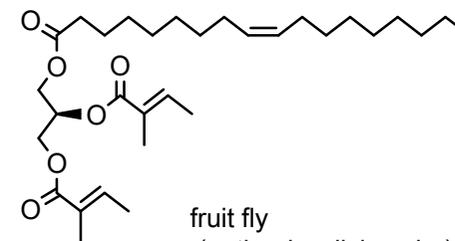
mayolenes-16



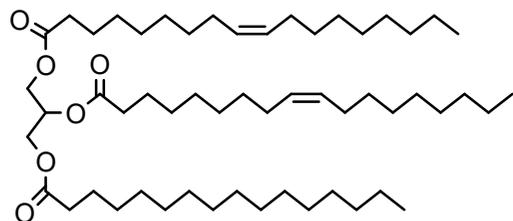
mayolenes-18



butterfly (larva allomone)

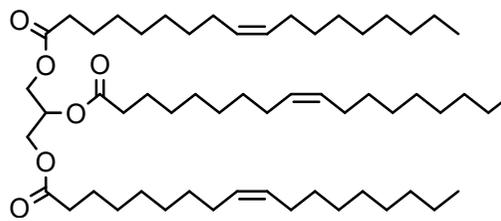


fruit fly
(anti-aphrodisiac phe)



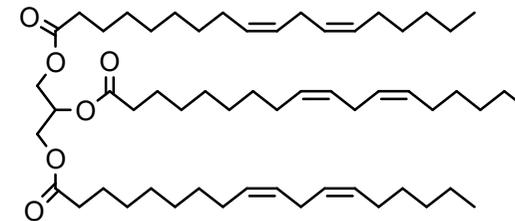
honey bee (brood phe.)

triolein



ant (brood phe.)

trilinolein



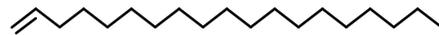
termite (F sex phe. ?)

[C-1] Other: Acyclic comp. (xix)

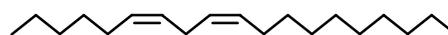
C19 chain



ant (marking phe.)
thrips (gland secretion)



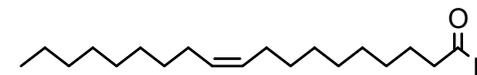
carrion beetle (M sex phe. ?)



mite (alarm phe.?)



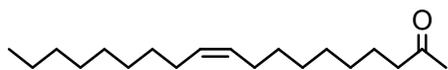
ant (gland secretion)



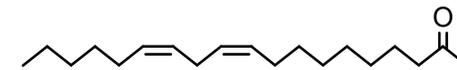
sawfly (F sex phe.)



seed beetle (F sex phe.)



darkling beetle (allomone ?)
wasp (M marking phe.)



termite (trail phe.)

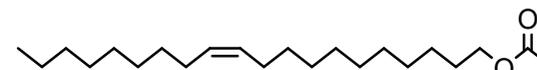
C20 chain



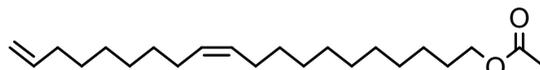
longhorned bee
(F gland secretion)



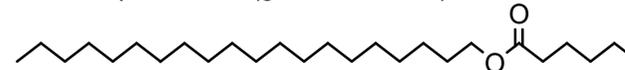
honey bee (worker alarm phe.)
wasp (M marking phe.)
carpenter bee (gland secretion)



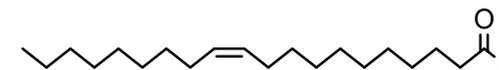
leaf beetle (larva allomone)
fruit fly (M aggregation phe.)



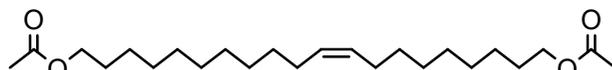
thrips (allomone)



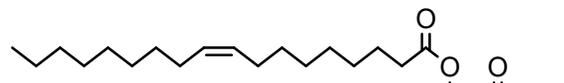
sweat bee (gland secretion)



ant (trail phe.)

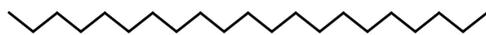


orchid bee (gland secretion)

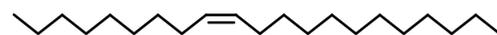


pyralid moth (larva trail phe.)

C21 chain



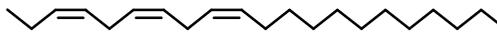
termite (primer phe.)



fruit fly (M aggregation phe.)



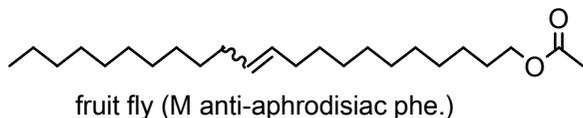
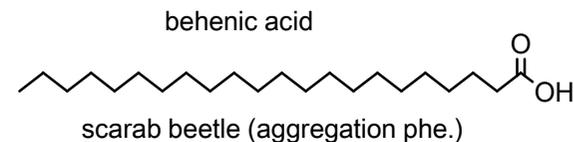
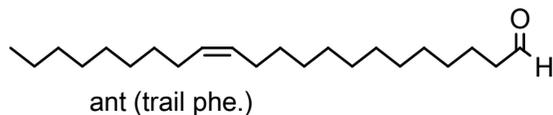
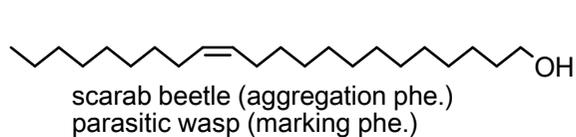
rove beetle, plasterer bee (F sex phe.)



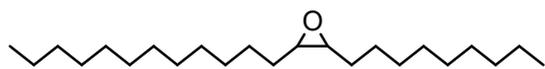
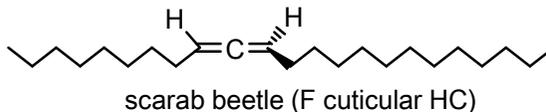
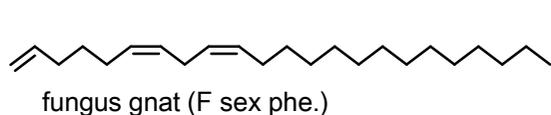
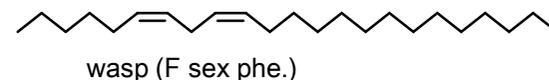
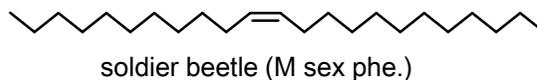
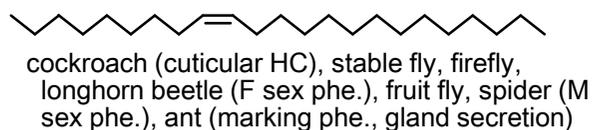
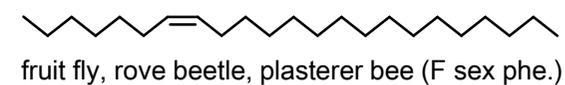
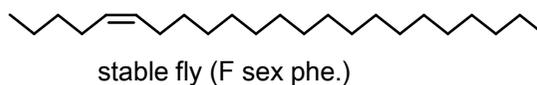
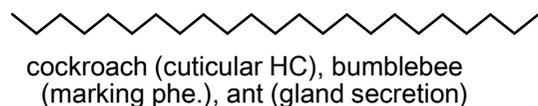
erebid moth (M sex phe.)

[C-1] Other: Acyclic comp. (xx)

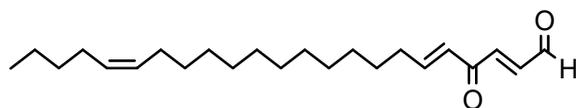
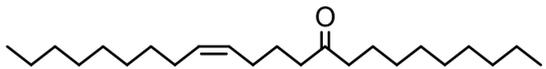
C22 chain



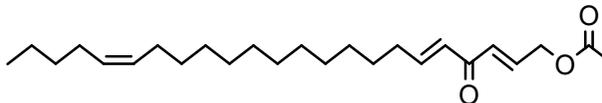
C23 chain



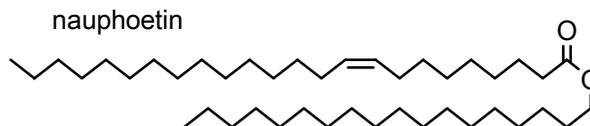
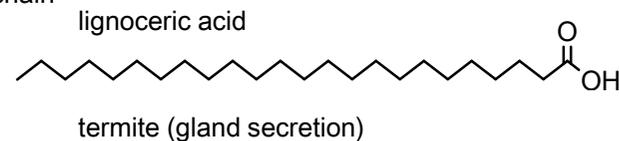
stable fly (F sex phe.)



ant (allomone)



C24 chain

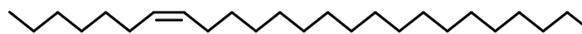


[C-1] Other: Acyclic comp. (xxi)

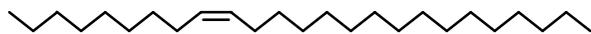
C25 chain



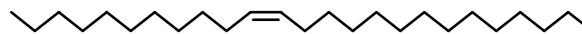
cuckoo bee (gland secretion)



longhorn beetle, plasterer bee (F sex phe.)



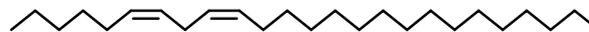
fly, longhorn beetle, mining bee, leaf bug
(F sex phe.), wasp (brood phe.)



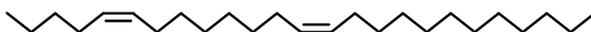
fruit fly (F sex phe.)



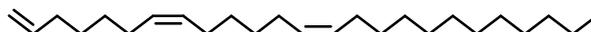
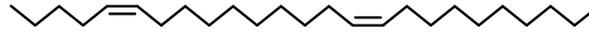
ladybug (oviposition-deterring phe.)



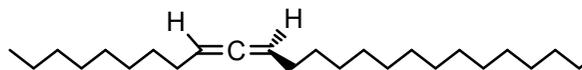
wasp (F sex phe.)



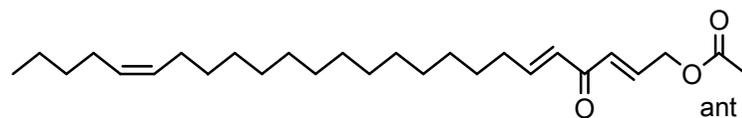
fruit fly (F sex phe.)



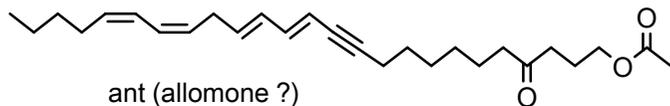
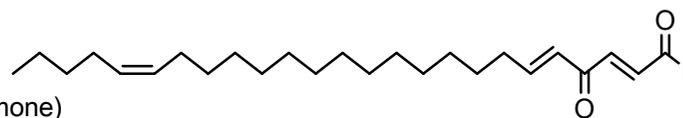
stable fly (M sex phe. ?)



scarab beetle (F cuticular HC)



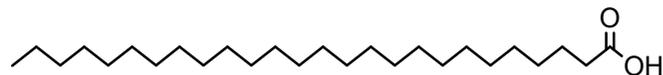
ant (allomone)



ant (allomone ?)

[C-1] Other: Acyclic comp. (xxii)

C26 chain

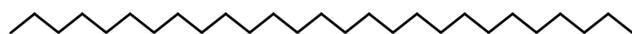


termite (gland secretion)

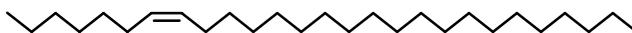


scale (wax)

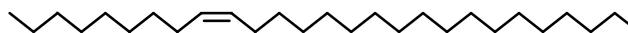
C27 chain



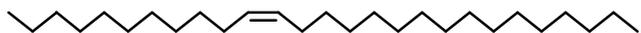
longhorn beetle (F sex phe.)



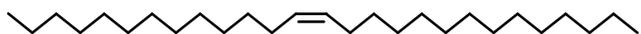
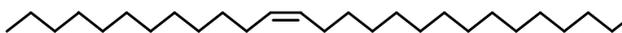
longhorn beetle, wood wasp (F sex phe.)



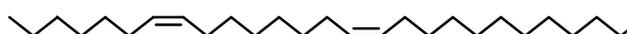
termite (allomone ?), stable fly (M sex phe. ?)
stable fly, longhorn beetle, mining bee (F sex phe.)



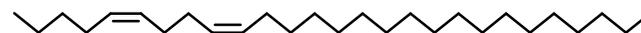
mining bee (F sex phe.)



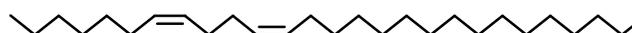
stable fly (M sex phe.)



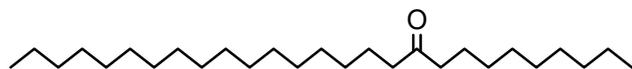
fruit fly (F sex phe.)



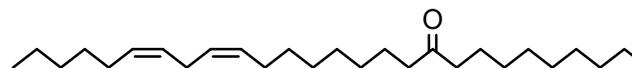
fruit fly (F sex phe.)



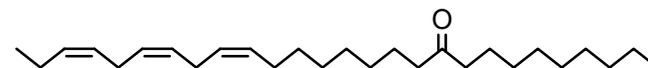
parasitoid wasp (F sex phe.)



longhorn beetle (F sex phe.)

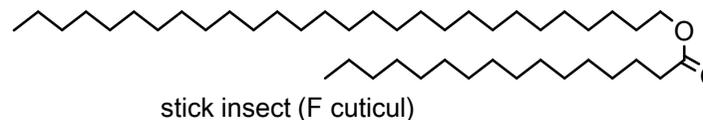
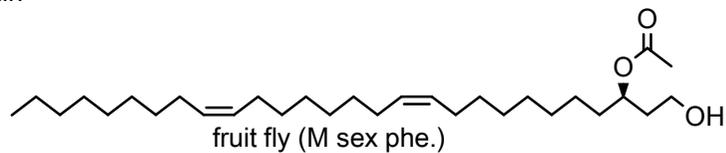


longhorn beetle (F sex phe.)

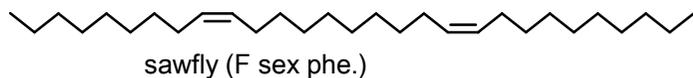
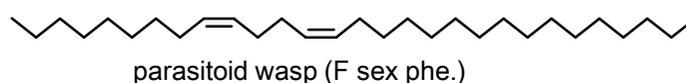
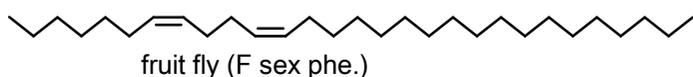
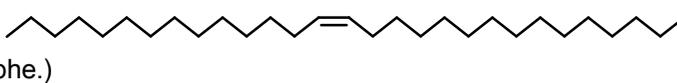
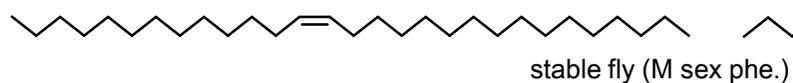
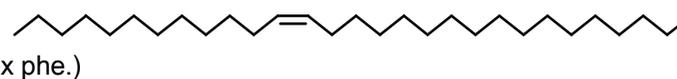
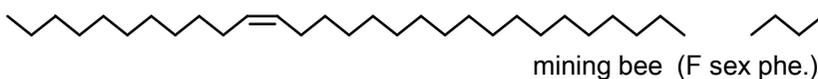
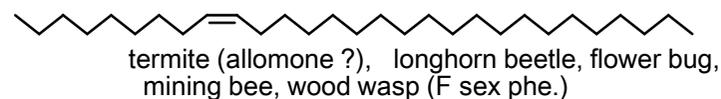
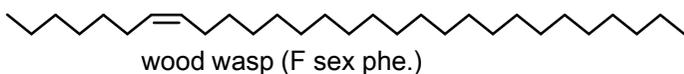
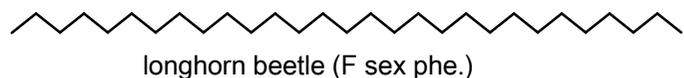


[C-1] Other: Acyclic comp. (xxiii)

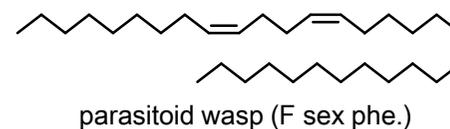
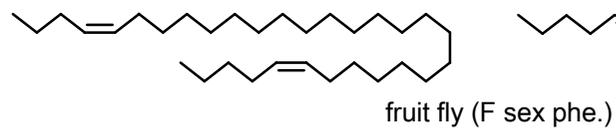
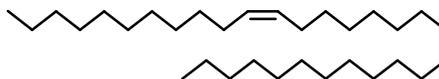
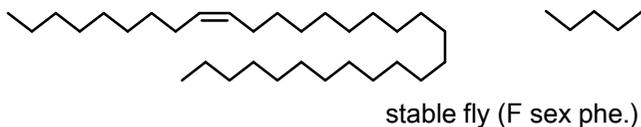
C28 chain



C29 chain

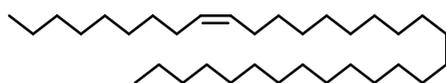


C31 chain

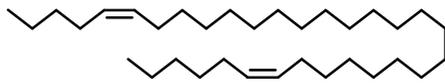


[C-1] Other: Acyclic comp. (xxiv)

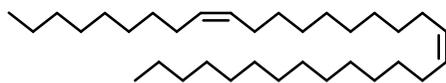
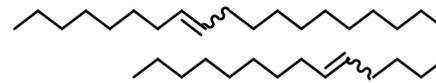
C33 chain



stable fly (F sex phe.)



fruit fly (F sex phe.)



sawfly (F sex phe.)

C34 chain

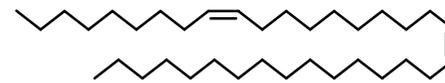


leaf beetle (sex phe. ?)

C35 chain

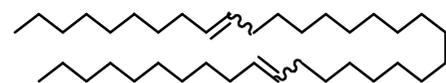


fruit fly (F sex phe.)



sawfly (F sex phe.)

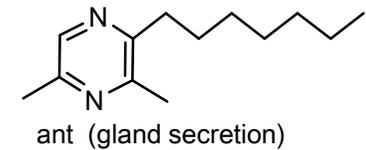
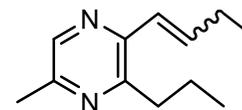
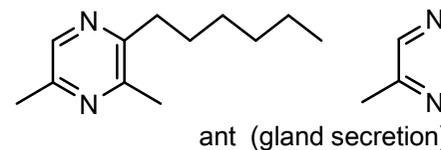
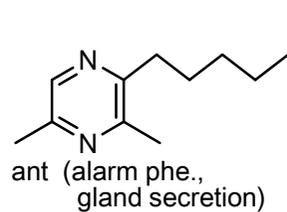
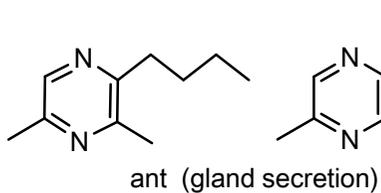
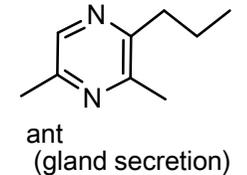
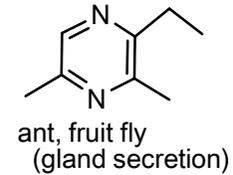
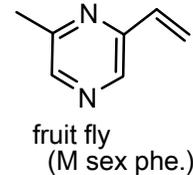
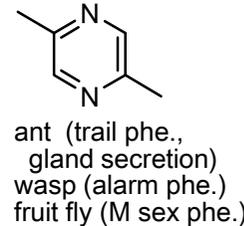
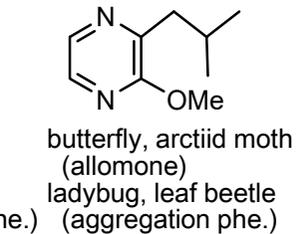
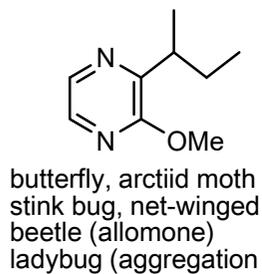
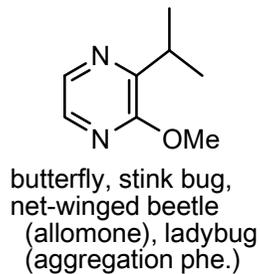
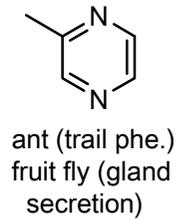
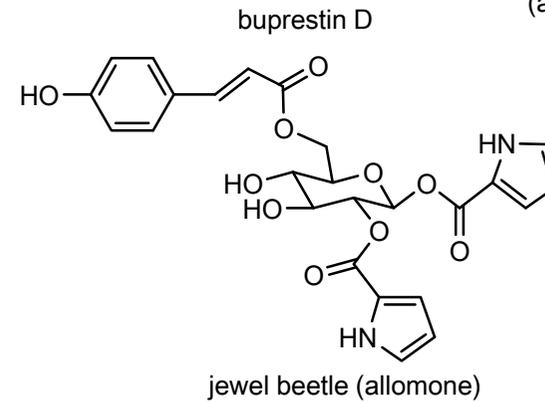
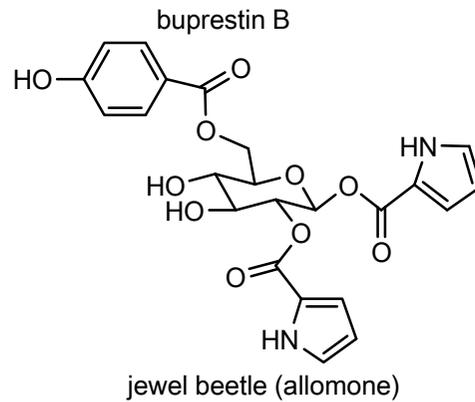
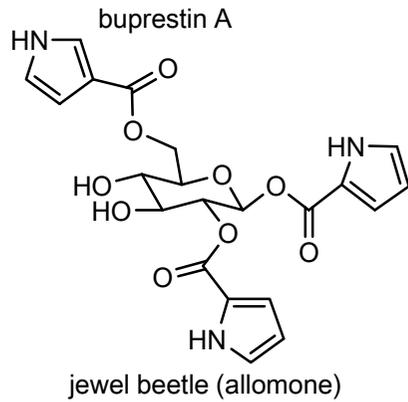
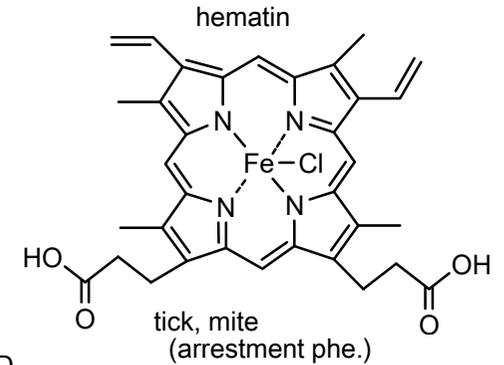
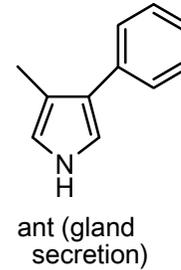
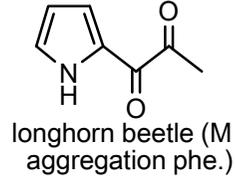
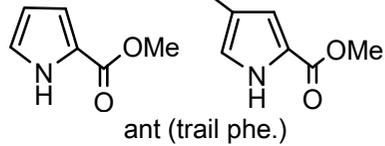
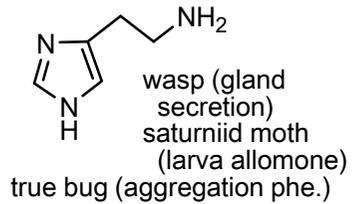
C37 chain



fruit fly (F sex phe.)

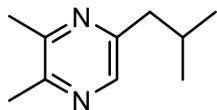
[C-2] Other: True alkaloids (i)

Aromatic comp.
histamine

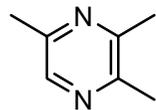


[C-2] Other: True alkaloids (ii)

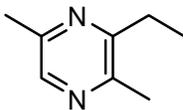
Aromatic comp.



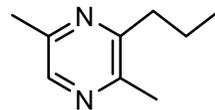
ant (trail phe.)



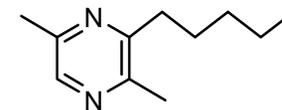
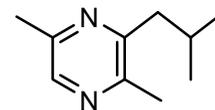
ant (trail phe.,
gland secretion)
fruit fly (M sex phe.,
gland secretion)



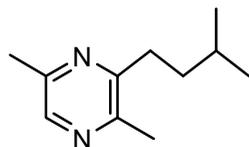
ant (trail phe.,
alarm phe.)



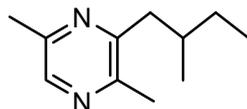
ant (gland secretion)



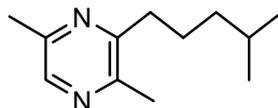
ant (gland secretion)



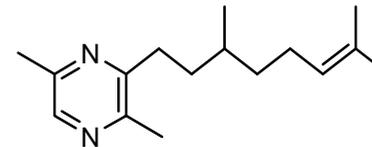
ant (alarm phe., gland
secretion, allomone)
flower wasp (F sex phe.)
wasp (marking phe.)
leaf insect (allomone)



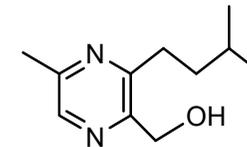
ant (alarm phe.,
gland secretion)
leaf insect (allomone)



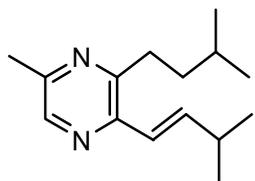
ant (gland secretion)



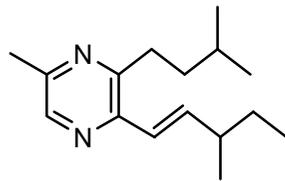
ant (alarm phe.)



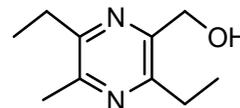
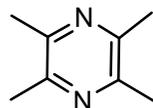
flower wasp
(F sex phe.)



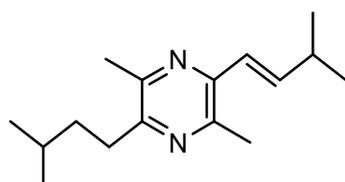
ant (gland secretion)



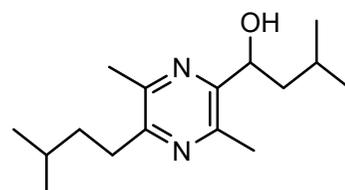
fruit fly (M sex phe.,
gland secretion)



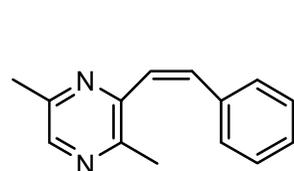
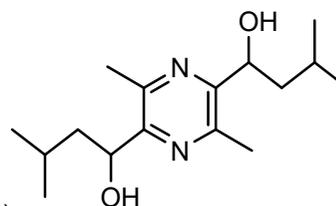
flower wasp
(F sex phe.)



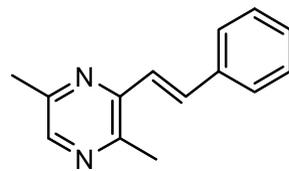
ant (gland secretion)



ant (gland secretion)



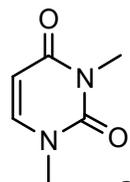
ant (gland secretion)



[C-2] Other: True alkaloids (iii)

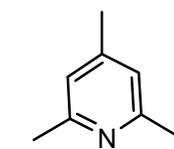
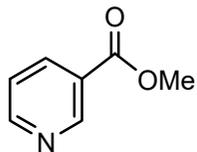
Aromatic comp.

N,N-dimethyluracil

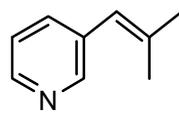


ant (trail phe.)

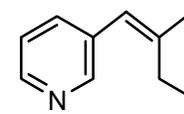
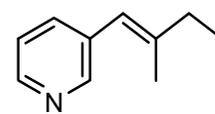
methyl nicotinate



ladybug, tsetse fly
(aggregation phe.)

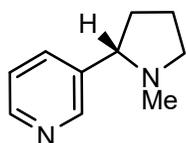


rove beetle (allomone)



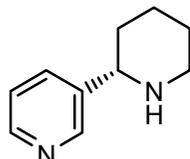
rove beetle
(allomone)

nicotine



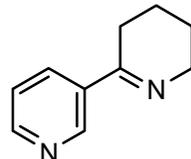
harvestman
(allomone?)

anabasine

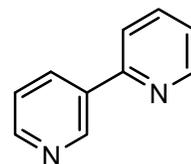


ant (gland secretion, allomone, trail phe.)

anabaseine

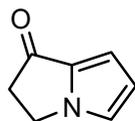


harvestman (allomone?)



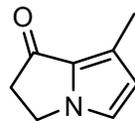
ant (gland secretion)

nordanaidone

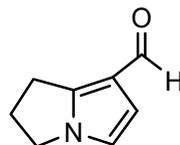


butterfly (M sex phe.)

danaidone

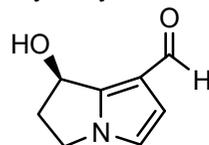


danaidal

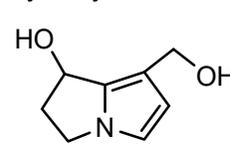


butterfly, arctiid moth (M sex phe.?)

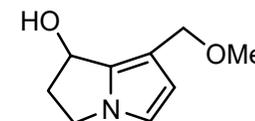
hydroxydanaidal



hydroxydanaidol

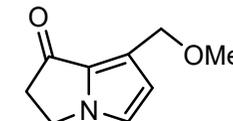


9-*O*-methyl-
hydroxydanaidol

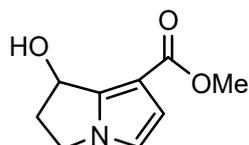


butterfly (M sex phe.?)

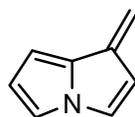
9-methoxydanaidon



methyl hydroxydanaidoate



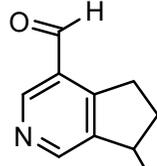
butterfly (M sex phe.?)



actinidine

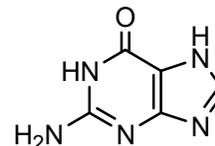
ant (alarm phe.)
parasitoid wasp,
rove beetle, tick insect
(allomone)

boschniakine

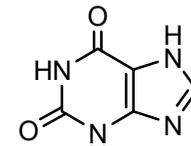


stick insect
(allomone?)

guanine

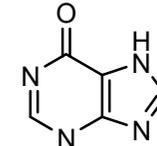


xanthine

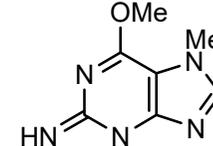


tick (arrestment phe.)

hypoxanthine



himantarine

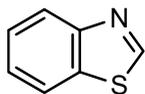


centipede
(galand secretion)

[C-2] Other: True alkaloids (iv)

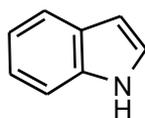
Aromatic comp.

benzothiazole



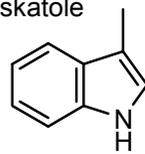
pleasing fungus beetle (allomone)
butterfly (gland secretion)

indol



butterfly (M sex phe. ?)
ant (trail phe.)
pleasing fungus beetle,
caddis fly (allomone)

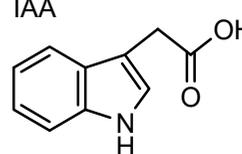
skatole



ant, wasp (alarm phe.)
green lacewing (gland secretion)

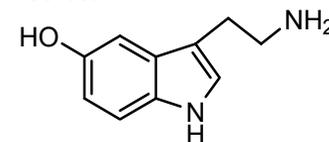
green lacewing,
stingless bee,
wasp, caddis fly,
pleasing fungus beetle (allomone)

IAA

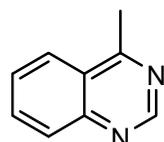


water beetle (allomone ?)

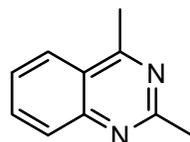
serotonin



wasp, scorpion, spider (venom secretion)

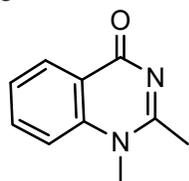


assassin bug (aggregation phe.)
parasitoid wasp (M sex phe.)



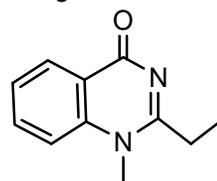
assassin bug (aggregation phe.)

glomerin



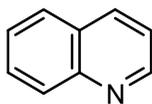
millipede (allomone)

homoglomerin

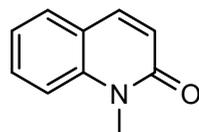


scarab beetle (F sex phe.)

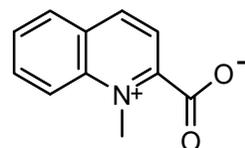
quinoline



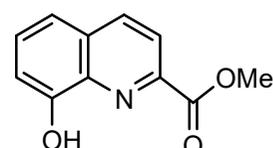
walking stick (allomone)



net-winged beetle (allomone ?)

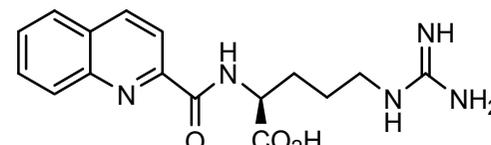


firefly (allomone)



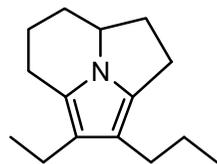
water beetle (allomone)

N α -quinaldyl-L-arginine



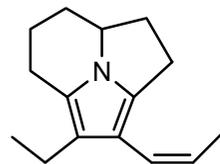
ladybug (allomone)

myrmicarin 217

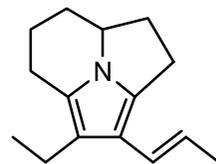


ant (allomone)

myrmicarin 215A

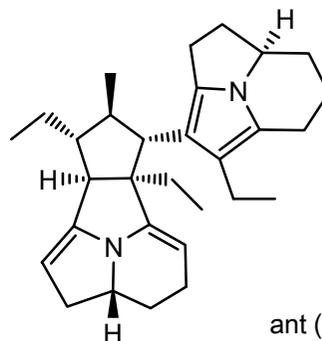


myrmicarin 215B



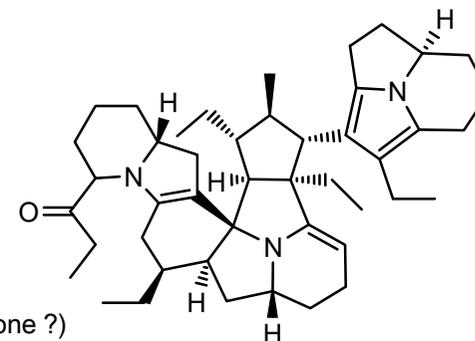
ant (allomone)

myrmicarin 430A



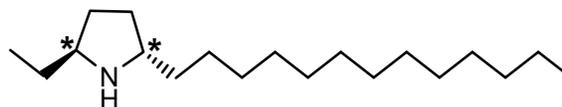
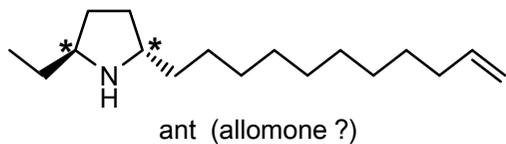
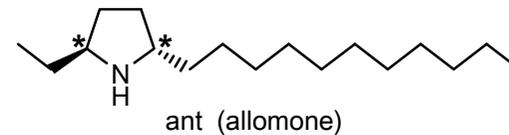
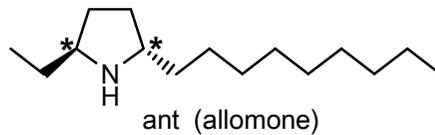
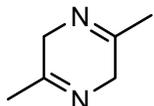
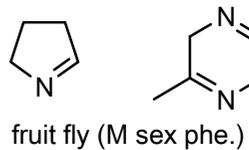
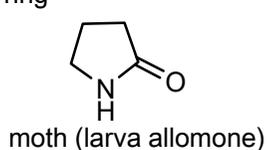
ant (allomone ?)

myrmicarin 663

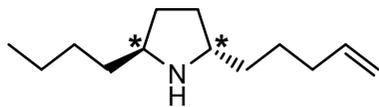
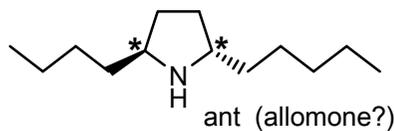
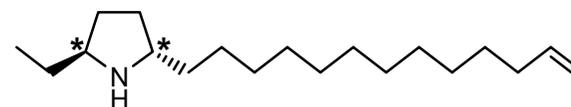


[C-2] Other: True alkaloids (v)

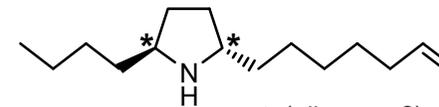
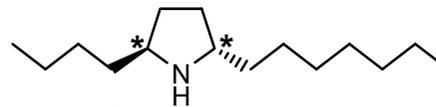
C4 ring



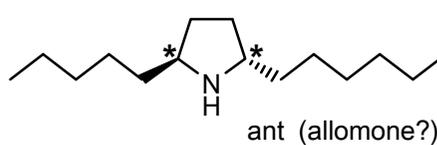
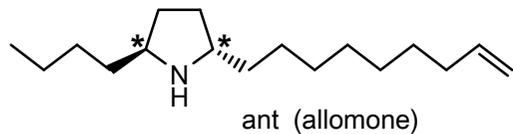
ant (allomone)



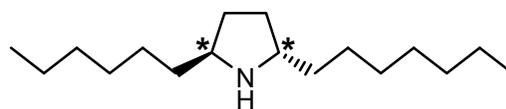
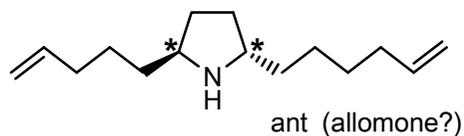
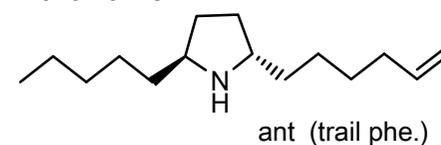
ant (allomone?)



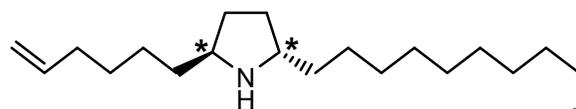
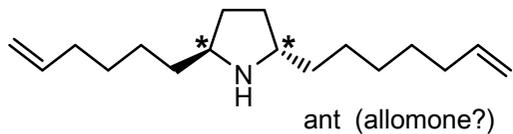
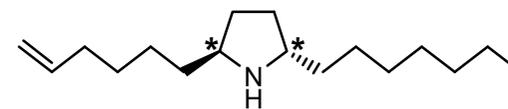
ant (allomone?)



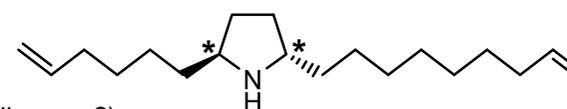
monomorine III



ant (allomone?)

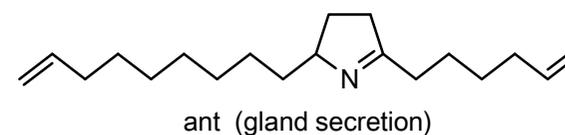
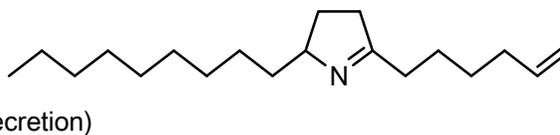
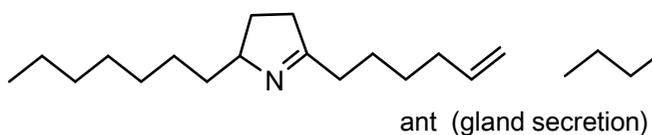
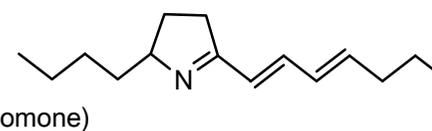
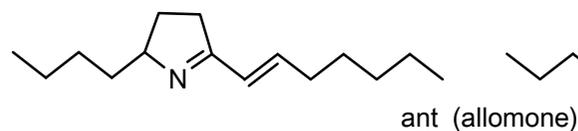
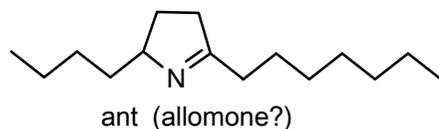
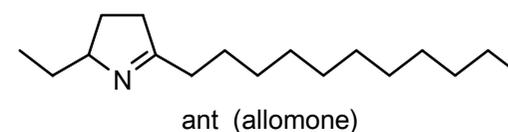
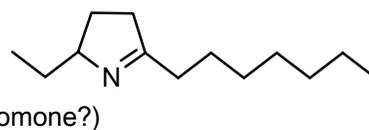
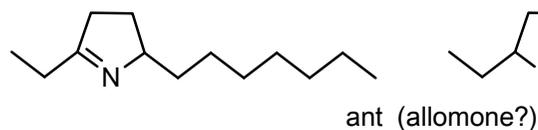
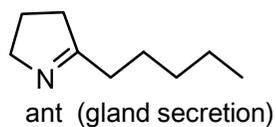
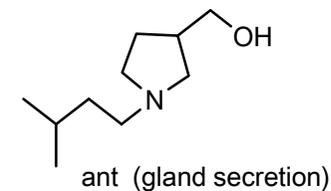
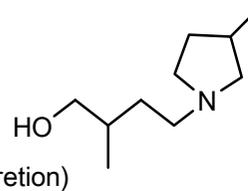
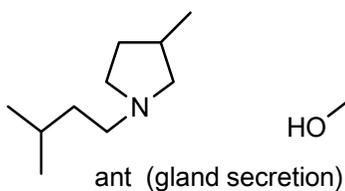
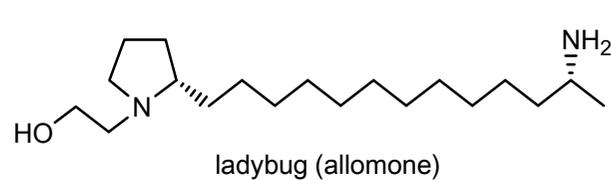
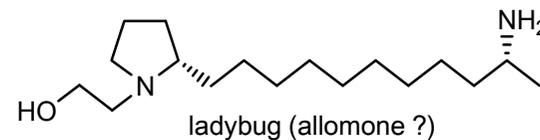
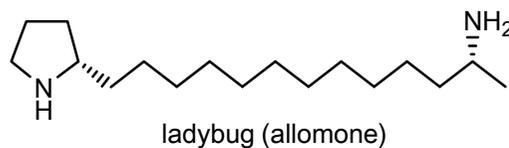
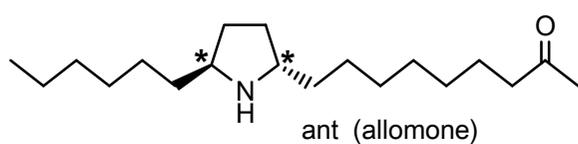


ant (allomone?)

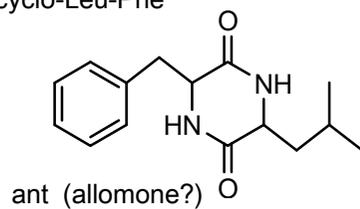


[C-2] Other: True alkaloids (vi)

C4 ring

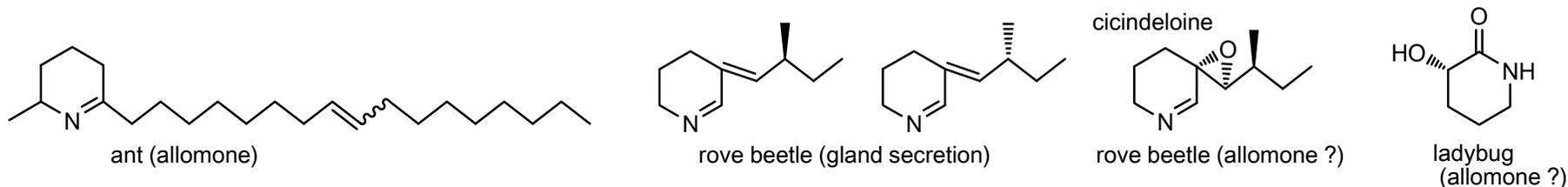
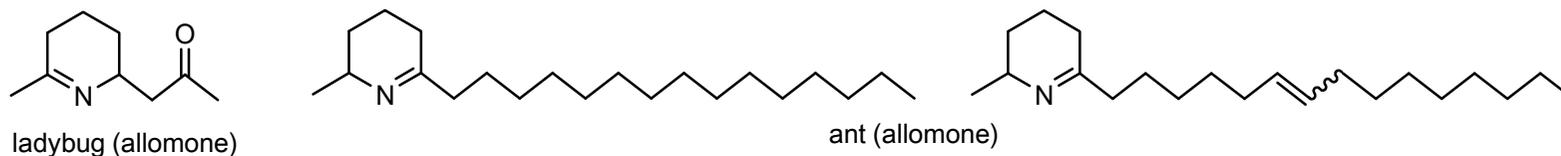
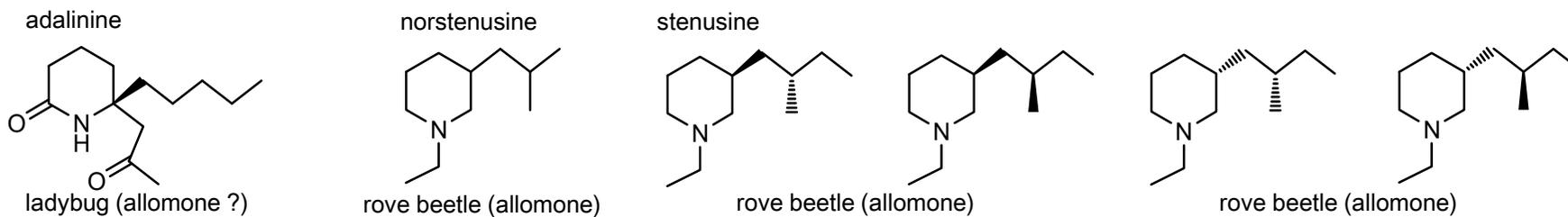
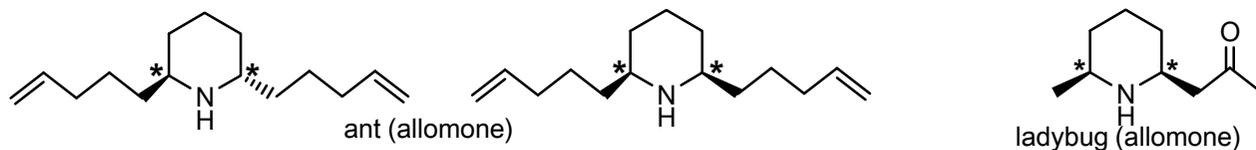
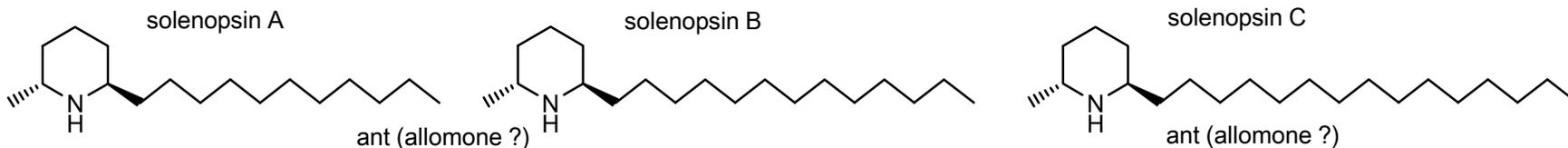
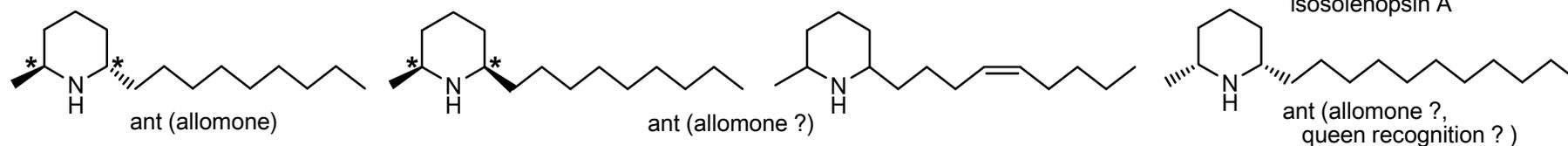


cyclo-Leu-Phe



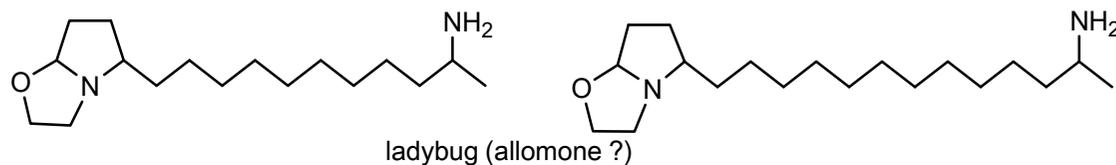
[C-2] Other: True alkaloids (vii)

C5 ring

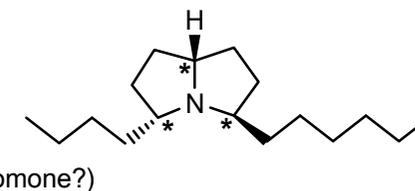
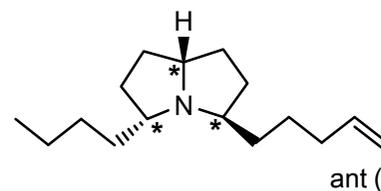
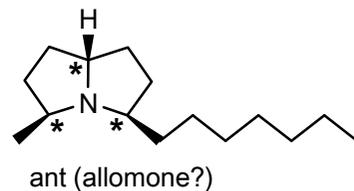
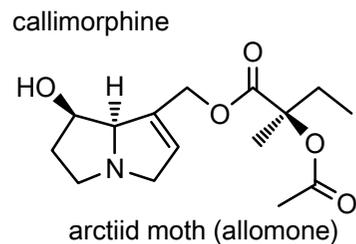
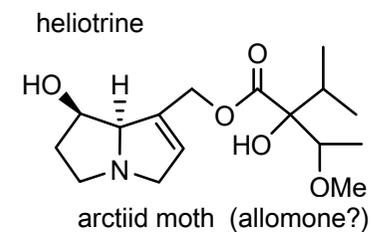
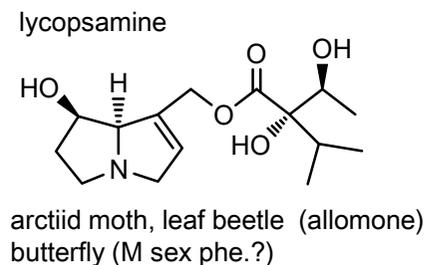
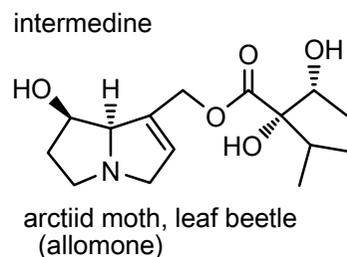
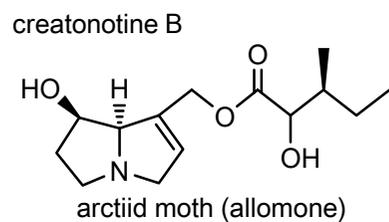
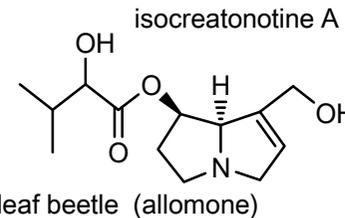
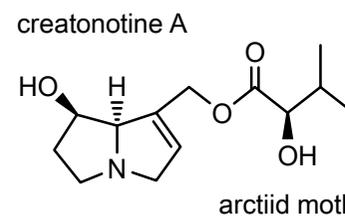
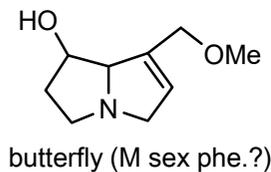
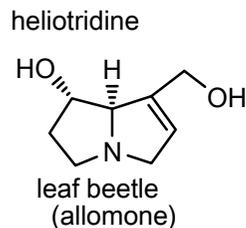
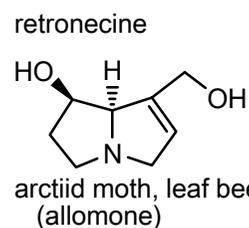
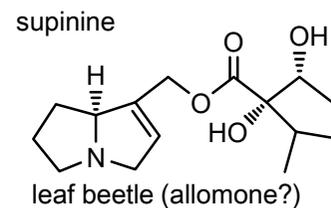
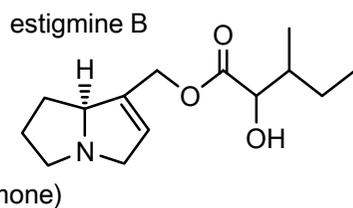
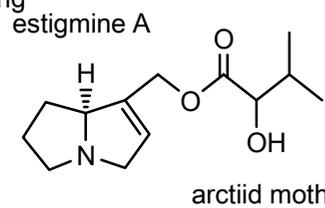


[C-2] Other: True alkaloids (viii)

C6 ring

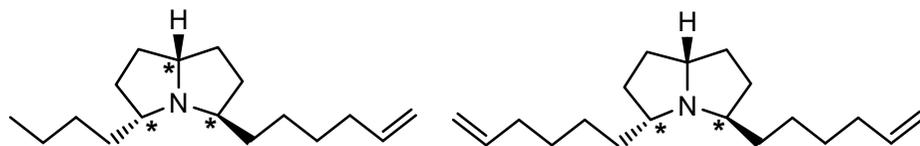


C7 ring

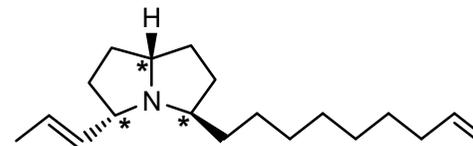


[C-2] Other: True alkaloids (ix)

C7 ring

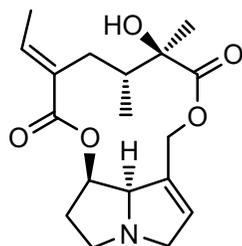


ant (allomone?)



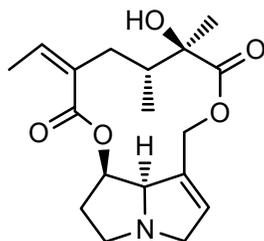
ant (allomone?)
arctiid moth (allomone)

integerrimine



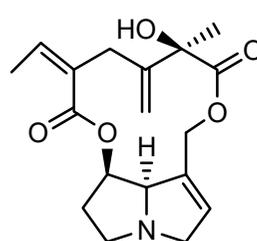
Arctiinae moth (allomone ?)

senecionine

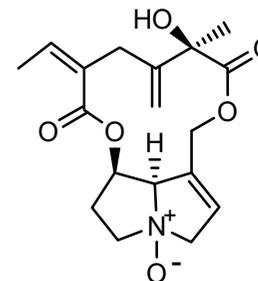


Arctiinae moth, butterfly (allomone ?)

seneciophylline

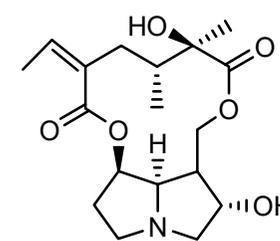


seneciophylline *N*-oxide



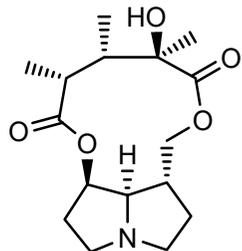
leaf beetle (allomone ?)

rosmarinine



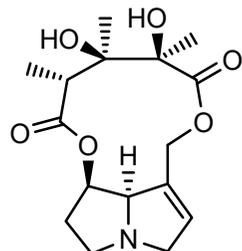
butterfly (allomone ?)

retusine



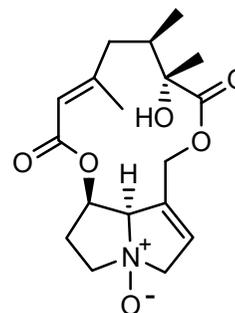
grasshopper
(allomone ?)

monocrotaline



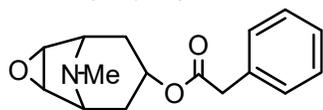
grasshopper, butterfly
(allomone ?)

doronine *N*-oxide



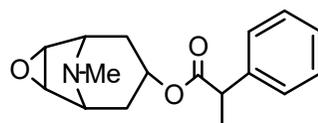
leaf beetle (allomone ?)

3-phenylacetoxy-
6,7-epoxytropine



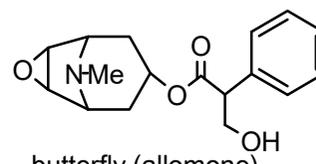
treehopper (allomone ?)

dihydroaposcopamine



butterfly (allomone)

scopolamine



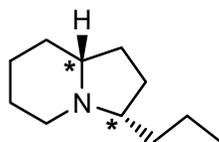
butterfly (allomone)
treehopper (allomone ?)

[C-2] Other: True alkaloids (x)

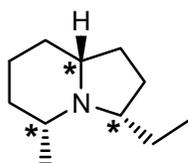
C8 ring
polyzonimine



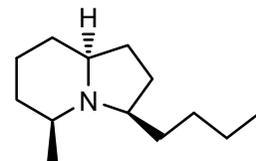
millipede (allomone)



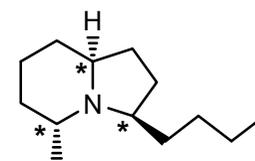
ant (allomone ?)



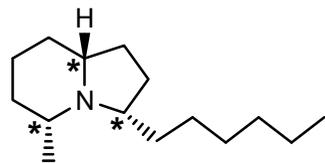
monomorine I



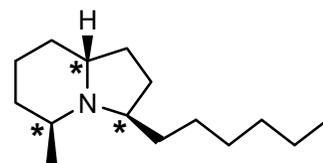
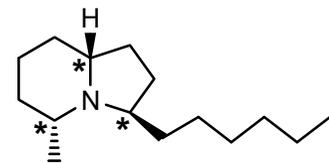
ant (trail phe. allomone ?)



ant (allomone ?)

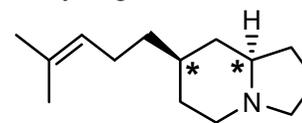


ant (allomone ?)



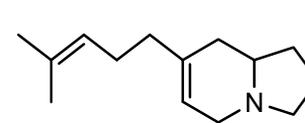
ant (allomone ?)

hydrogosodesmine

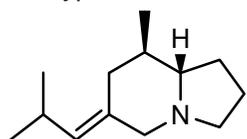


millipede (allomone)

gosodesmine

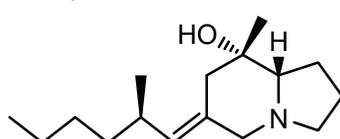


8-deoxypumiliotoxin 193H

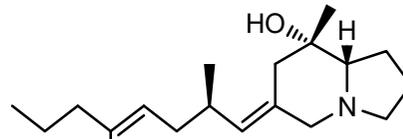


oribatid mite (allomone ?)

pumiliotoxin 251D

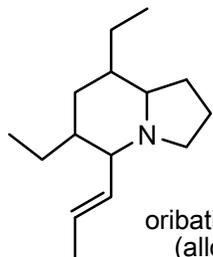


pumiliotoxin 291G



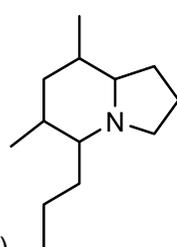
oribatid mite (allomone ?)

indolizidine 223A

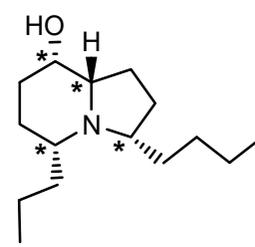
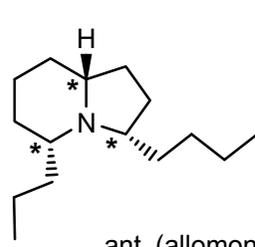


oribatid mite (allomone ?)

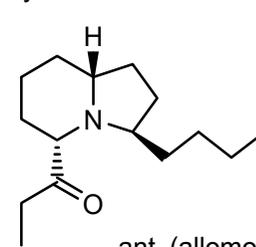
indolizidine 195G



ant (allomone ?)

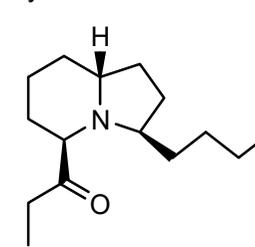


myrmicarin 237A

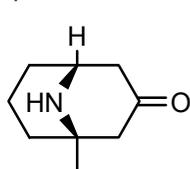


ant (allomone ?)

myrmicarin 237B

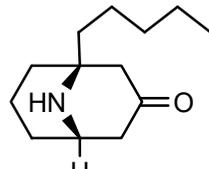


euphococcinine

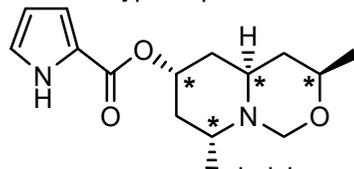


ladybug (allomone)

adaline



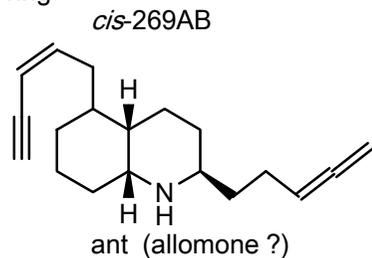
hyperaspine



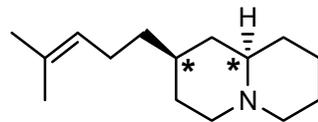
ladybug (allomone ?)

[C-2] Other: True alkaloids (xi)

C9 ring

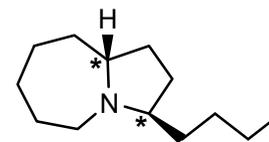
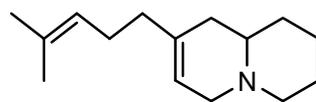


homo-hydrogosodesmine



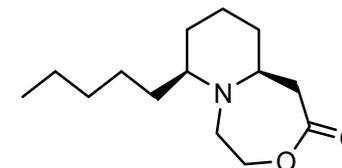
millipede (allomone)

homo-gosodesmine



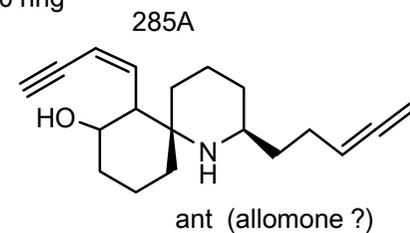
ant (allomone ?)

calvine

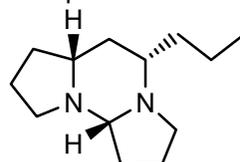


ladybug (allomone ?)

C10 ring

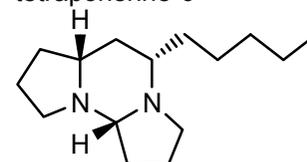


tetraponerine-2

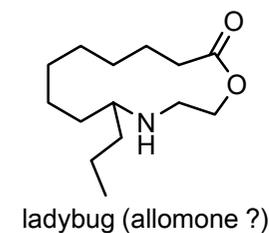
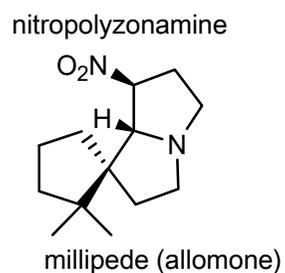
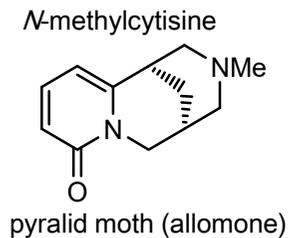
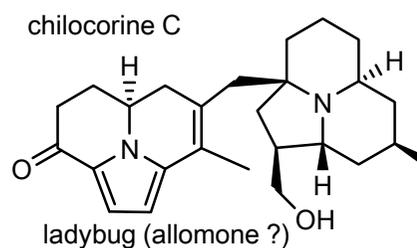
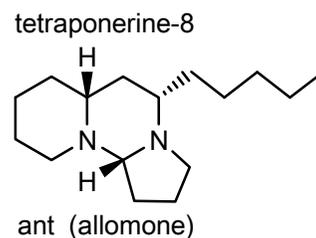
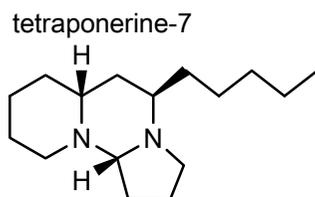
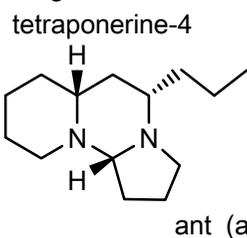


ant (allomone)

tetraponerine-6



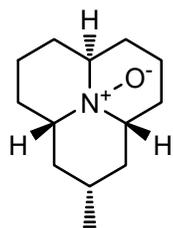
C11 ring



[C-2] Other: True alkaloids (xii)

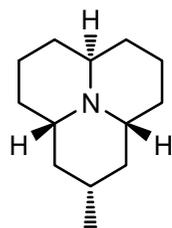
C12 ring

coccinelline



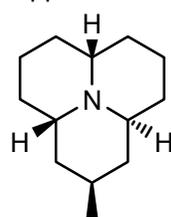
ladybug
(allomone)

precoccinelline 193C



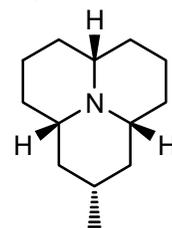
ladybug, soldier
beetle, oribotriiid
mite (allomone)

hippodamine



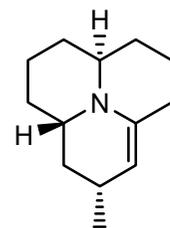
ladybug, soldier
beetle, (allomone ?)

myrrhine



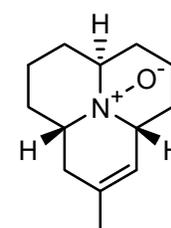
ladybug
(allomone)

propyleine



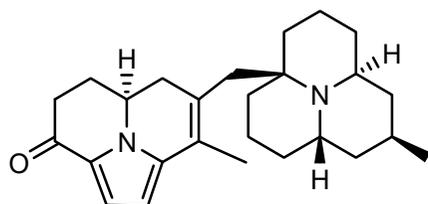
ladybug, soldier
beetle, (allomone)

2-dehydrococcinelline



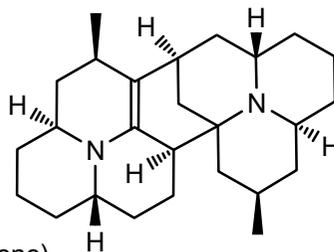
ladybug
(allomone)

exochomine

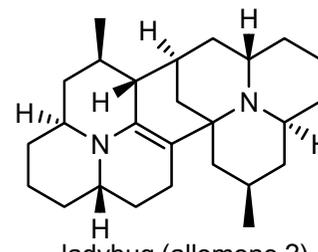


ladybug (allomone)

psylloborine A

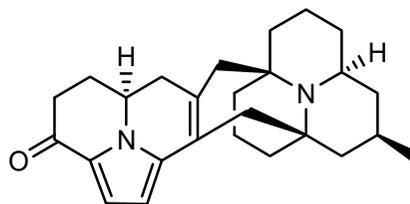


isopsylloborine A



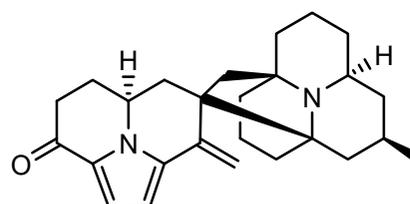
ladybug (allomone ?)

chilocorine A



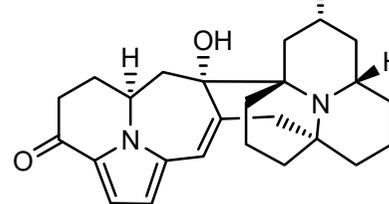
ladybug (allomone ?)

chilocorine B



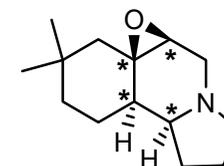
ladybug (allomone)

chilocorine D



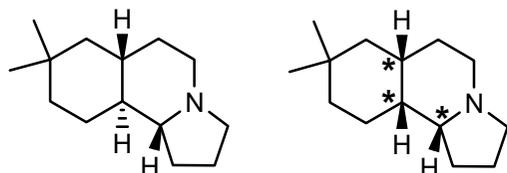
ladybug (allomone ?)

buzonamine



millipede (allomone)

deoxybuzonamine

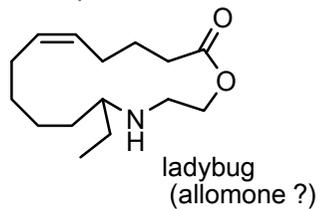


millipede (allomone)

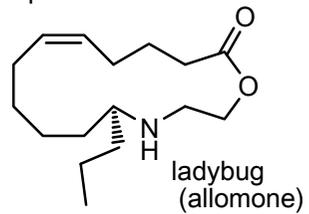
[C-2] Other: True alkaloids (xiii)

C13 ring

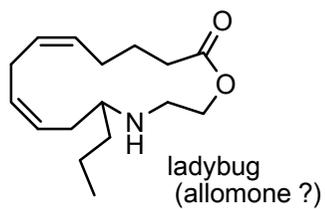
norepilachnene



epilachnene

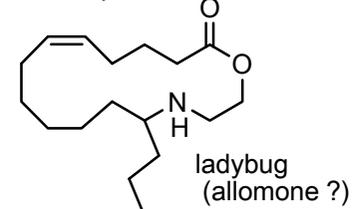


epilachnadiene



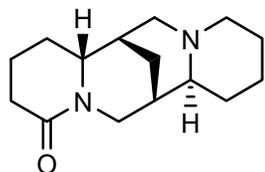
C14 ring

homoepilachnene

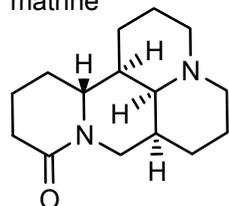


C15 ring

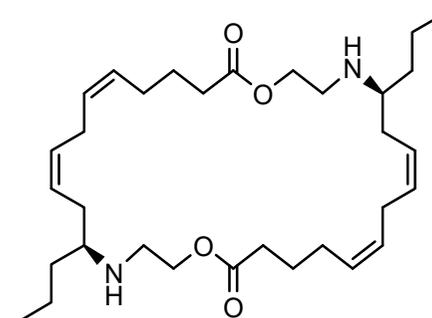
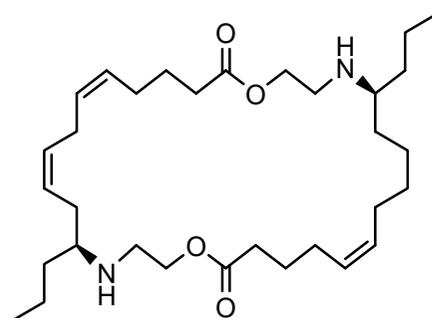
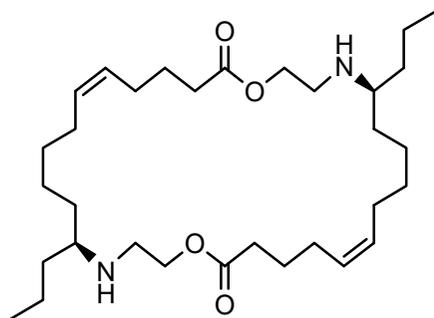
lupanine



matrine

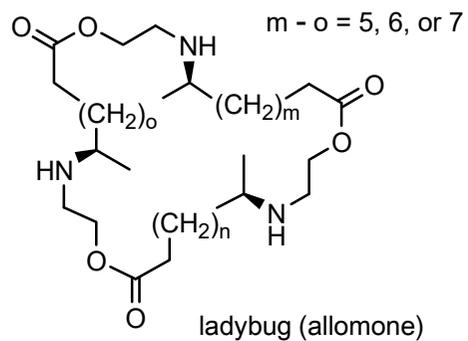


C26 ring

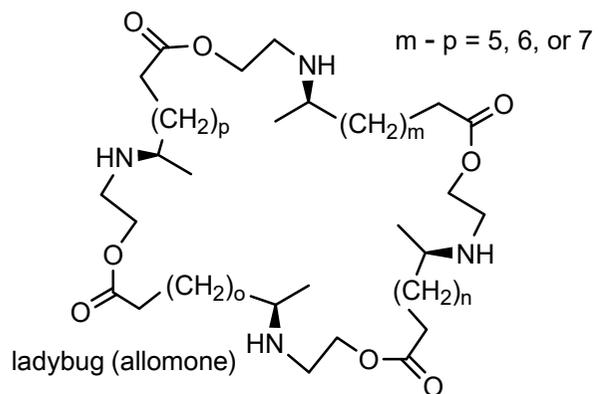


[C-2] Other: True alkaloids (xiv)

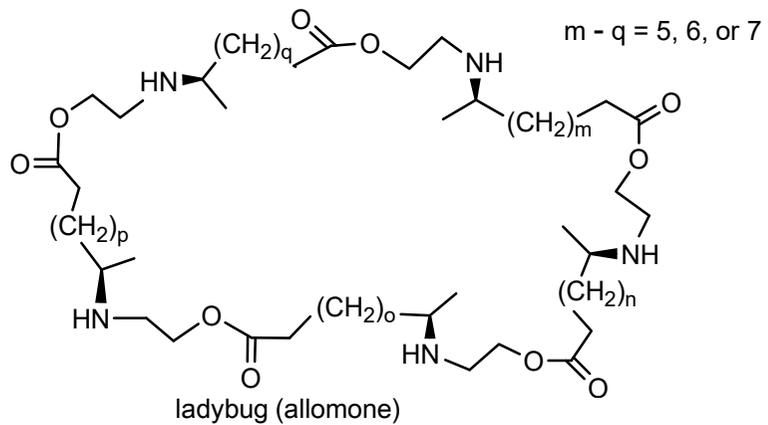
C30 – C36 ring



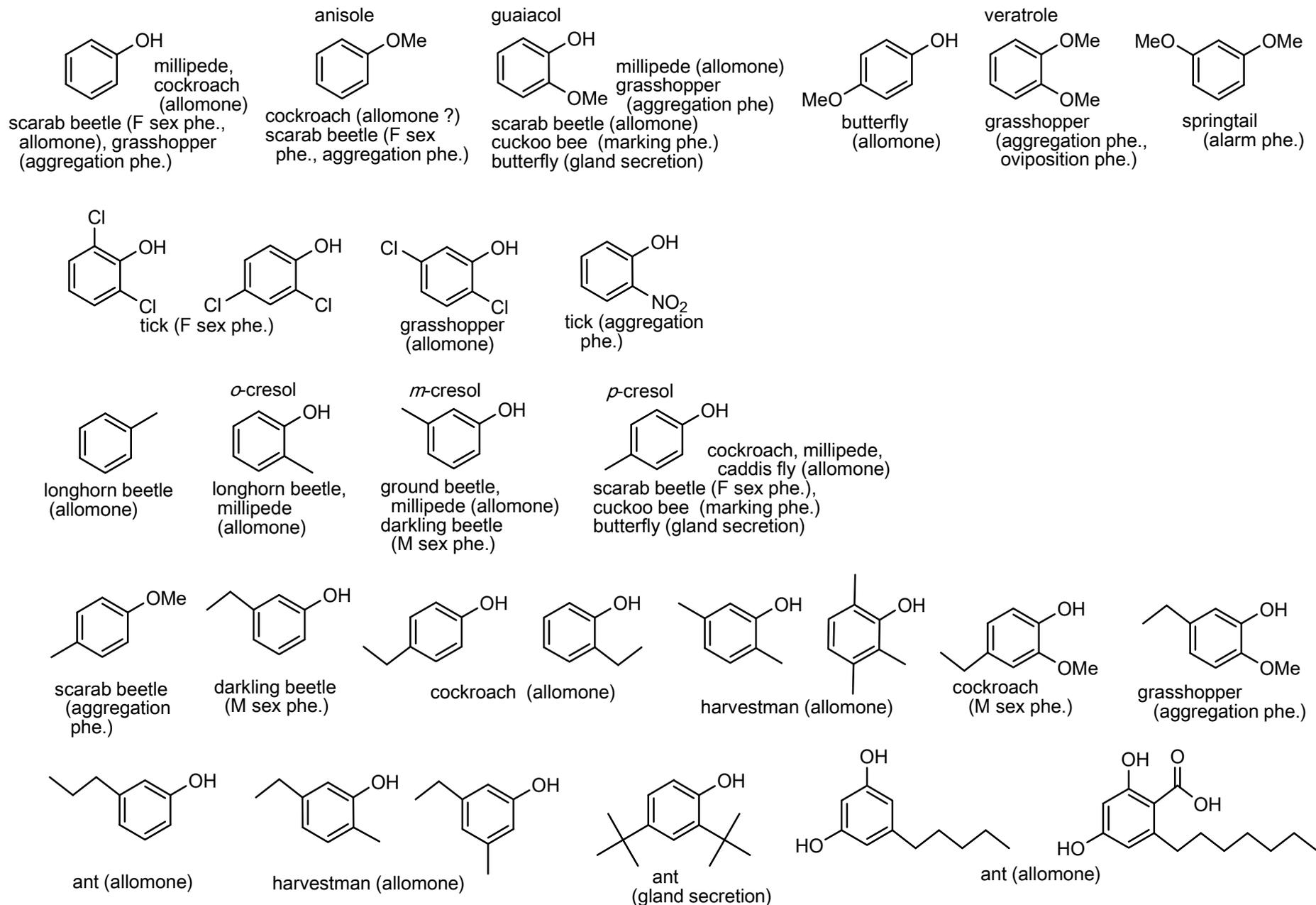
C40 – C48 ring



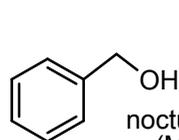
C50 – C60 ring



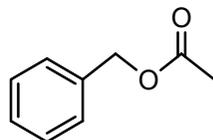
[C-3] Other: Aromatic comp. (i)



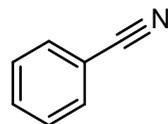
[C-3] Other: Aromatic comp. (ii)



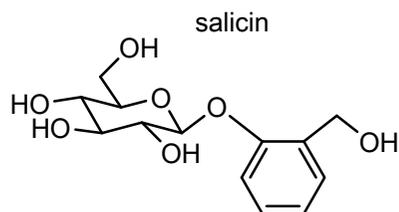
noctuid moth, grasshopper
(M sex phe.)
true bug, stink bug (M sex phe.,
aggregation phe., gland secretion)



honey bee
(alarm phe.)

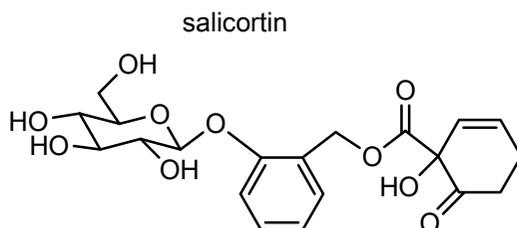


saturniid moth
(larva allomone)

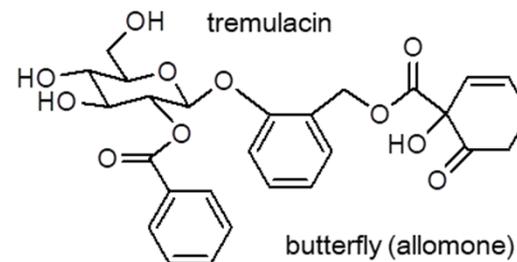


salicin

butterfly (allomone)

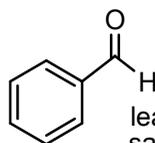


salicortin



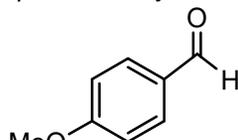
tremulacin

butterfly (allomone)



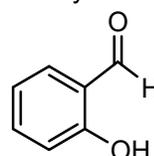
leaf beetle, tiger beetle,
saturniid moth, millipede,
sawfly, centipede (allomone), bee (alarm
phe.), assassin bug, noctuid moth (M
sex phe.), noctuid moth (oviposition-
detering phe.), stink bug, grasshopper
(M aggregation phe.)

p-anisaldehyde

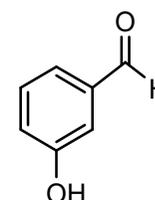


cockroach (allomone ?)
green lacewing
(M aggregation phe.?)

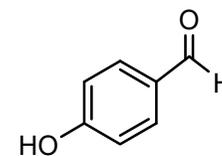
salicylaldehyde



ground beetle, leaf beetle,
creeping water bug, cuckoo
bee, butterfly (allomone)

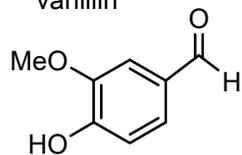


creeping water bug
(allomone)
ant (gland secretion)

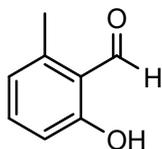


water bug
(gland secretion)
water beetle, creeping
water bug (allomone)

vanillin

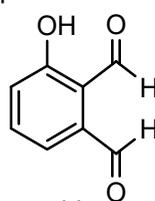


shield bug, pyralid moth,
butterfly (M sex phe.)
cuckoo bee (marking phe.)



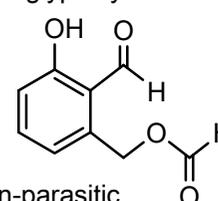
mite (alarm phe., F sex phe.)
oribatid mite (alarm phe., allomone)

γ -acaridial

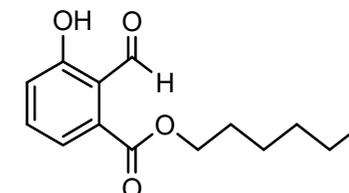


acarid mite, oribatid
mite (F sex phe.)

rhizoglyphinyl formate

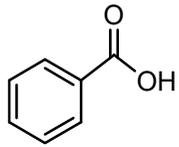


non-parasitic
mite, oribatid mite
(gland secretion)



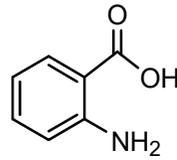
acarid mite (allomone ?)

[C-3] Other: Aromatic comp. (iii)

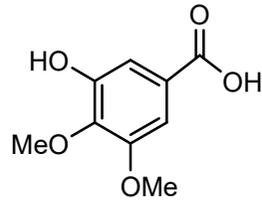


water beetle
(allomone ?)
ant (allomone ?,
gland secretion)

anthranilic acid

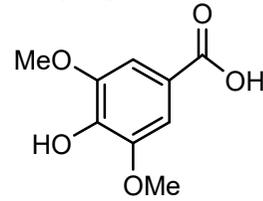


scarab beetle
(F sex phe.)



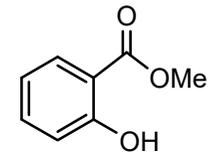
springtail (allomone)

syringic acid

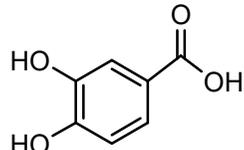


water bug (gland secretion)
creeping water bug, water
beetle (allomone)
bee (queen phe.)

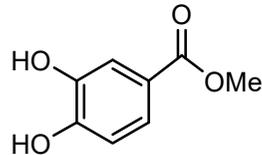
methyl salicylate



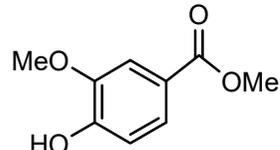
tick (aggregation phe.)
butterfly (allomone,
M anti-aphrodisiac phe.)
dung beetle (allomone)
ant (M aggregation phe. ?)



darkling beetle
(cuticle)

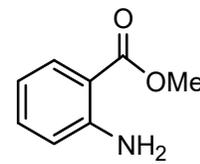


water beetle
(allomone ?)

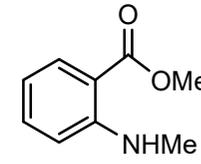


butterfly (M sex
phe. ?)

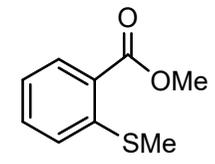
methyl anthranilate



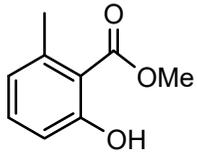
ant (alarm phe. trail phe.,
M aggregation phe. ?)



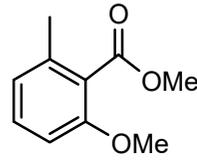
millipede
(allomone)



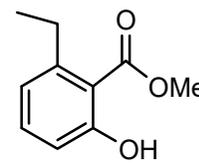
scarab beetle
(F sex phe.)



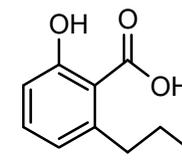
ant (primer phe., alarm phe.,
trail phe., queen sex phe.,
allomone, M aggregation phe.)
parasitoid wasp (F sex phe.)
ground beetle, darkling beetle
(allomone)



ant (trail phe.)

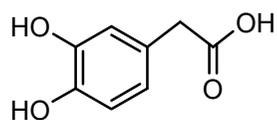


darkling beetle
(allomone)

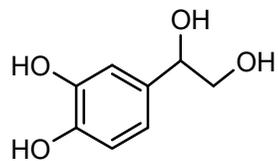


ant (allomone)

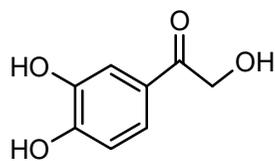
[C-3] Other: Aromatic comp. (iv)



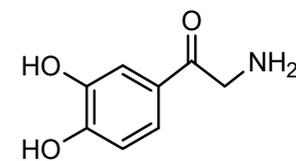
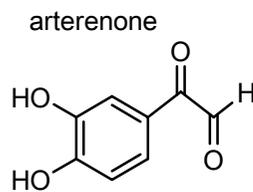
grasshopper, auger beetle, bark beetle (cuticle)



grasshopper (cuticle)

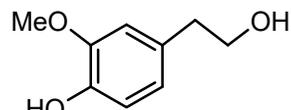


grasshopper, cicada (cuticle)



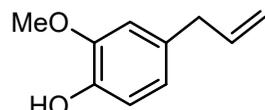
grasshopper, crane fly, blowfly, saturniid, butterfly, cockroach (cuticle)

homovanillyl alcohol

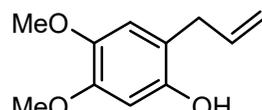


bee (queen phe.)
butterfly (M sex phe. ?)

eugenol

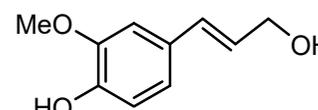


noctuid moth (oviposition-detering phe.)
fairy wasp (F sex phe.)

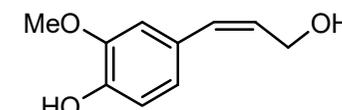


fruit fly (M sex phe., allomone)

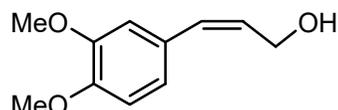
coniferyl alcohol



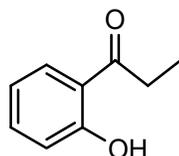
bee (queen phe.)
fruit fly (M sex phe., M allomone)



fruit fly (M sex phe.)

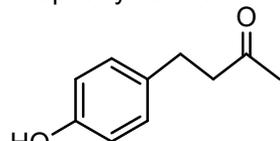


fruit fly (M sex phe.)



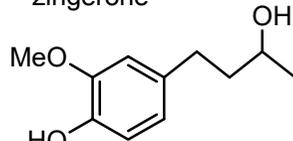
sap beetle (F sex phe.?)

raspberry ketone



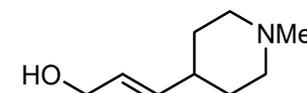
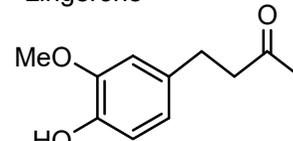
fruit fly (M sex phe.)

zingerone



fruit fly (M sex phe.)

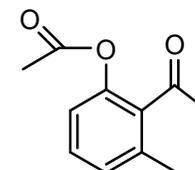
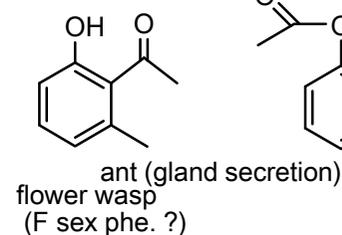
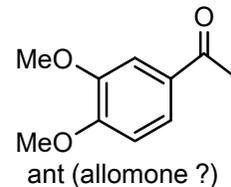
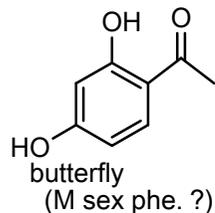
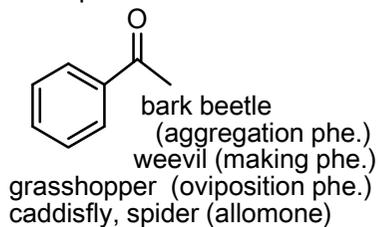
zingerone



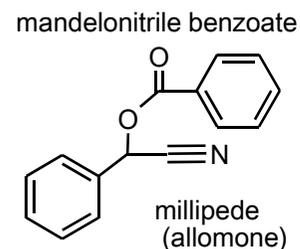
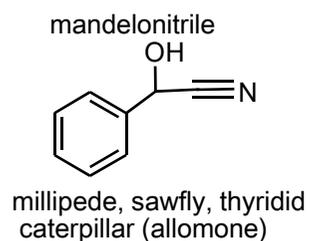
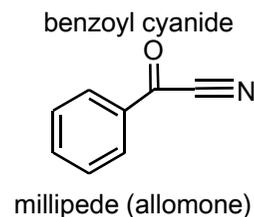
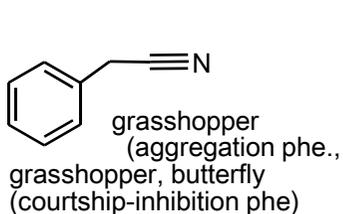
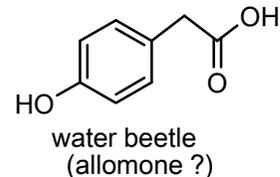
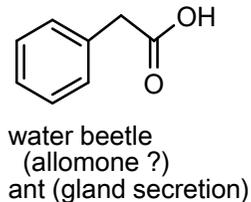
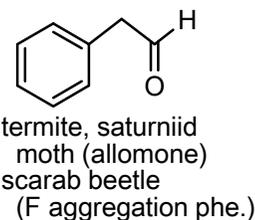
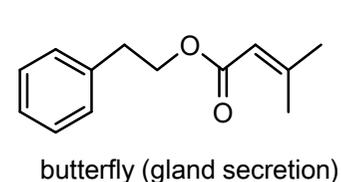
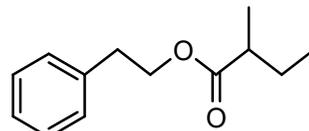
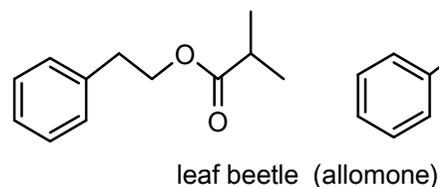
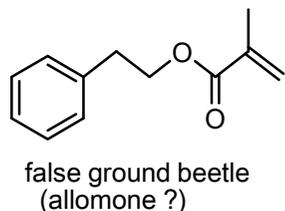
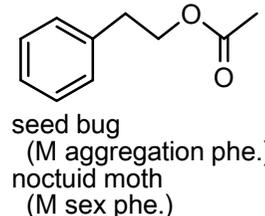
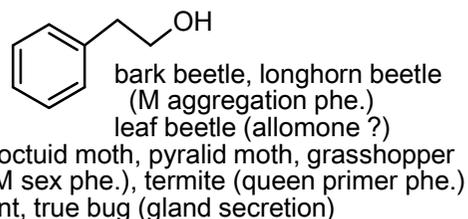
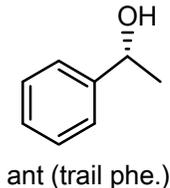
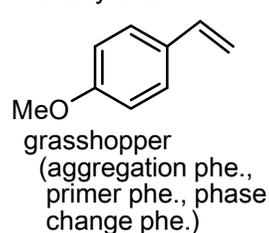
sap beetle (F sex phe.?)

[C-3] Other: Aromatic comp. (v)

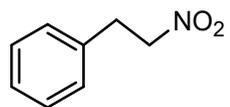
acetophenone



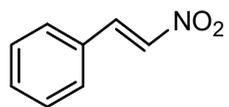
4-vinylanisole



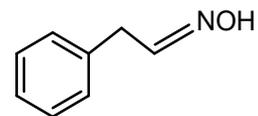
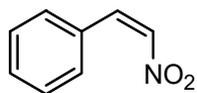
[C-3] Other: Aromatic comp. (vi)



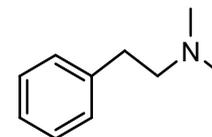
butterfly
(gland secretion)



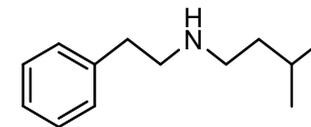
millipede (allomone)



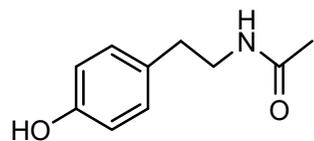
ant (gland secretion)



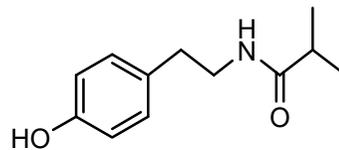
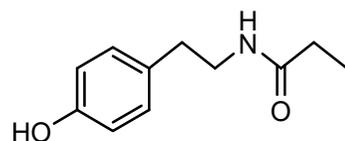
harvestman
(allomone ?)



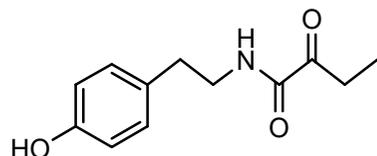
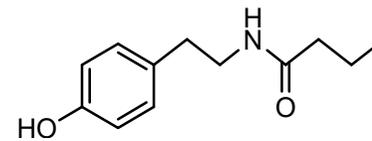
ant (trail phe.)



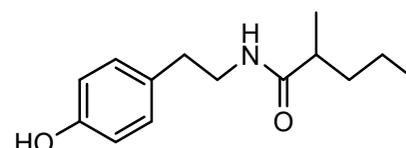
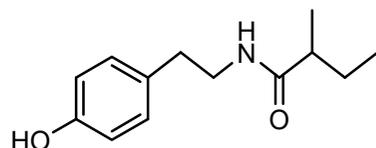
ant (M sex phe. ?)



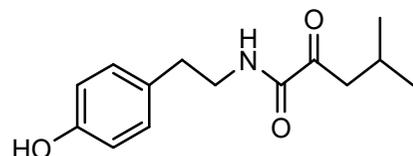
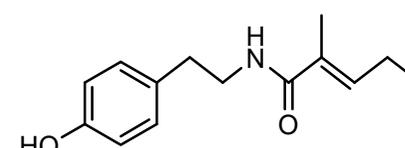
ant (M sex phe. ?)



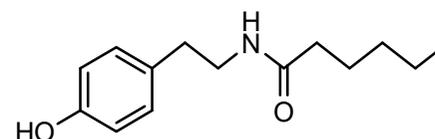
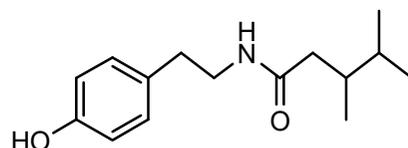
ant (M sex phe. ?)



ant (M sex phe. ?)

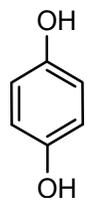


ant (M sex phe. ?)

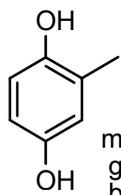


ant (M sex phe. ?)

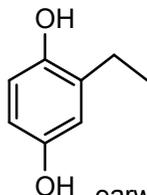
[C-3] Other: Aromatic comp. (viii)



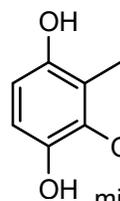
grasshopper,
ground beetle
(allomone)
scarab beetle
(F sex phe.)
termite (phago-
stimulating phe.)
water beetle (gland secretion)



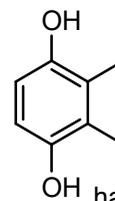
millipede,
ground
beetle, rove
beetle (allomone)



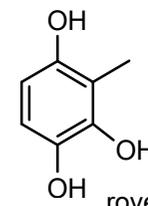
earwig
(allomone)



millipede
(allomone)

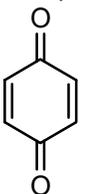


harvestman
(allomone)

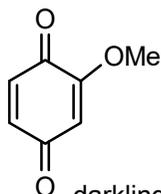


rove beetle
(allomone)

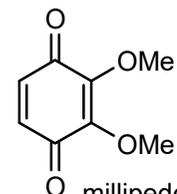
benzoquinone



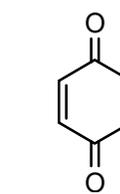
ground beetle,
darkling beetle,
cockroach, termite,
harvestman, millipede
(allomone), termite,
cockroach (alarm phe.)
scarab beetle (F sex phe.)



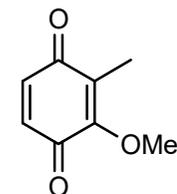
darkling beetle
(allomone)



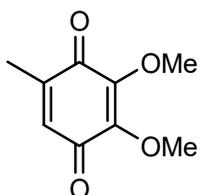
millipede
(allomone)



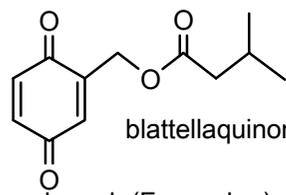
toluquinone
ground beetle,
darkling beetle,
rove beetle,
termite, earwig,
cockroach, millipede (allomone)



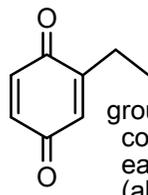
millipede,
darkling
beetle,
rove beetle (allomone)



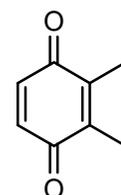
millipede (allomone)



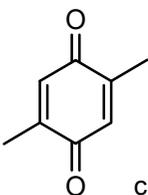
blattellaquinone
cockroach (F sex phe.)



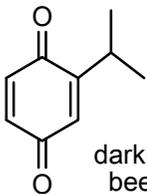
ground beetle,
cockroach,
earwig, millipede
(allomone)
darkling beetle (M sex phe.)



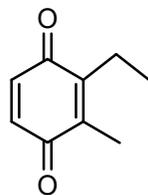
ground beetle,
darkling beetle,
cockroach,
harvestman, earwig (allomone)



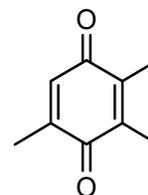
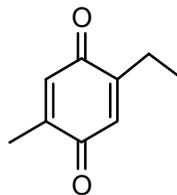
cockroach
(allomone, alarm phe.)



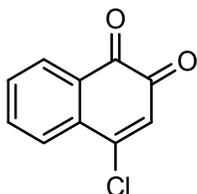
darkling
beetle
(allomone)



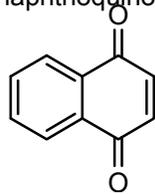
harvestman (allomone)



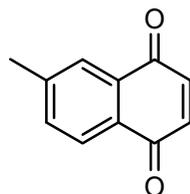
naphthoquinone



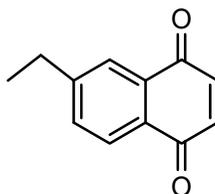
harvestman
(allomone ?)



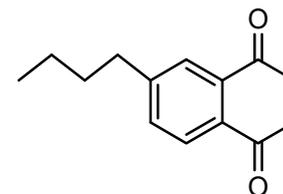
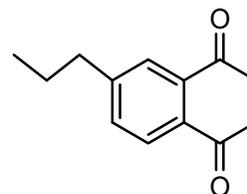
firefly, harvestman
(allomone)



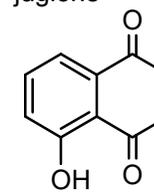
harvestman, darkling
beetle, (allomone)



darkling beetle (allomone)



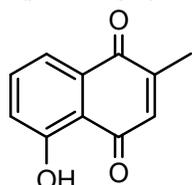
juglone



leaf beetle, thrips
(allomone)

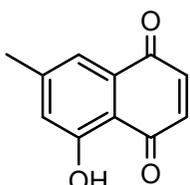
[C-3] Other: Aromatic comp. (ix)

2-methyljuglone
(plumbagin)

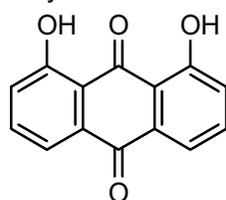


thrips (allomone), mite (gland secretion)

7-methyljuglone

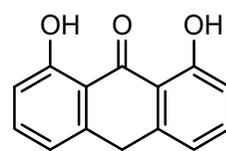


chryszazin

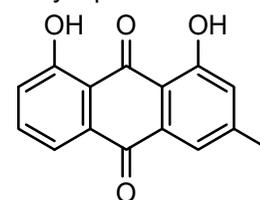


leaf beetle (allomone)

dithranol

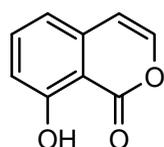
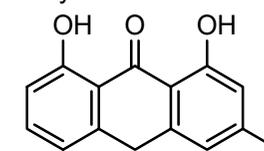


chrysophanol

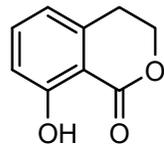


leaf beetle, aphid (allomone)

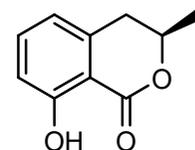
chrysarobin



darkling beetle (allomone)

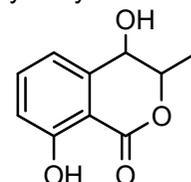


mellein

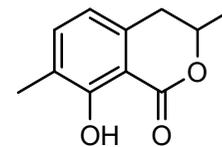


ant (M sex phe. ?, trail phe.
allomone, gland secretion)
termite, thrips (allomone)
moth (M sex phe.)

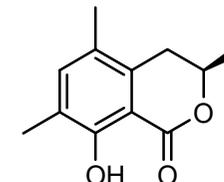
hydroxymellein



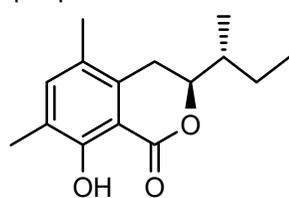
ant (gland secretion)



ant (trail phe.)

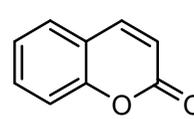


periplanotide E



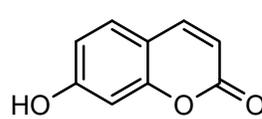
cockroach
(aggregation phe.)

coumarin

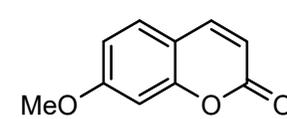


ermine moth (allomone ?)

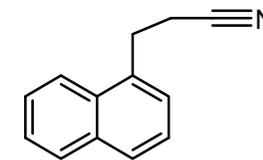
umbelliferone



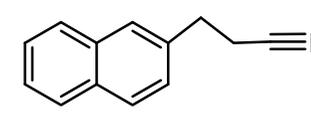
herniarin



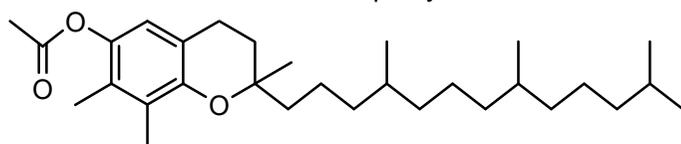
ermine moth (allomone ?)



grasshopper (M sex phe. ?)

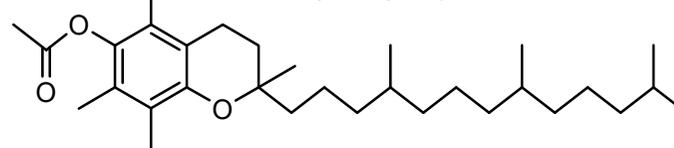


α -tocopheryl acetate

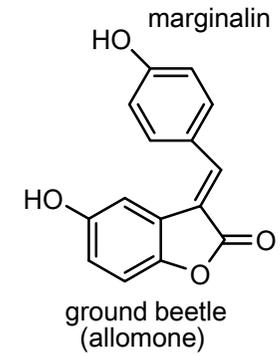
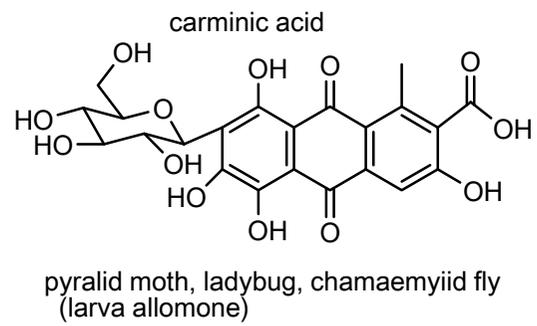
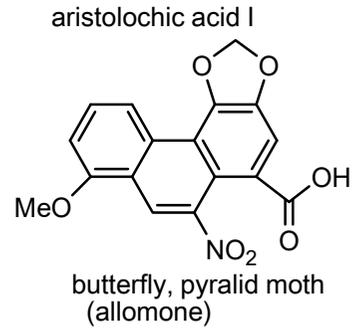
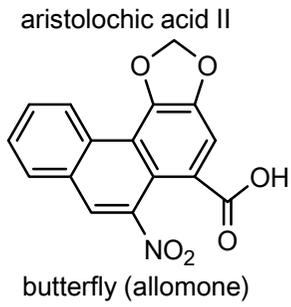


ladybug (allomone ?)

γ -tocopheryl acetate

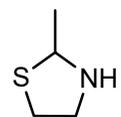


[C-3] Other: Aromatic comp. (x)

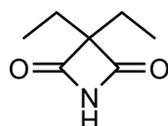


[C-4] Other: Ring comp. (i)

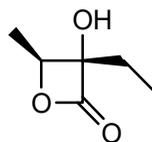
C3 ring



cockroach
(M sex phe.)

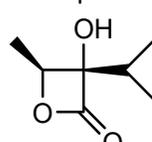


scarab beetle
(F sex phe.?)

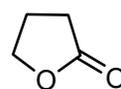


butterfly (M sex phe.)

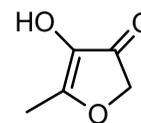
viridifloric β -lactone



C4 ring

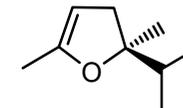
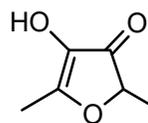


burrowing bug
(gland secretion)



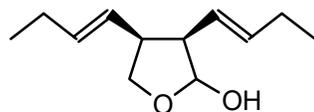
cockroach (M sex phe.)

furaneol

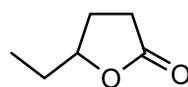


ship-timber beetle
(F sex phe.?)

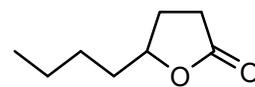
biprorulure



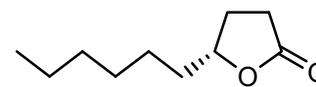
stink bug (M sex phe.)



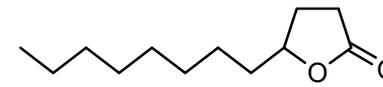
hide beetle
(F sex phe.)



parasitoid wasp, honey
bee (gland secretion)

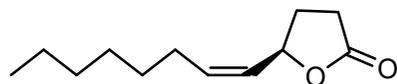


scarab beetle (M sex phe.,
M aggregation phe.)
rove beetle, thrips (allomone)
butterfly (M scent secretion)



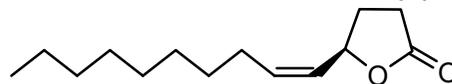
rove beetle (allomone?)
parasitoid wasp (gland secretion)

buibuilactone

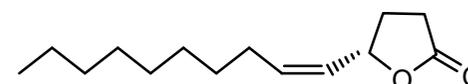


scarab beetle (F sex phe.)

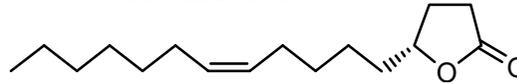
japonilure



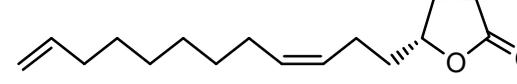
scarab beetle (F sex phe.)



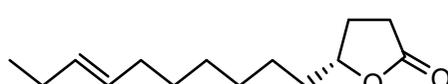
desmolactone



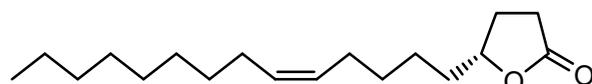
longhorn beetle (F sex phe.)



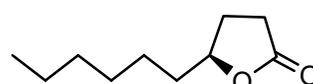
scarab beetle (F sex phe.)



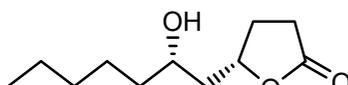
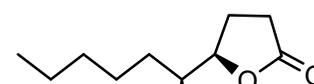
parasitoid wasp (M aggregation phe.)



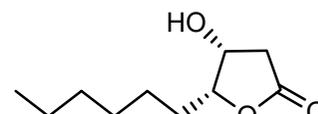
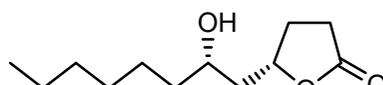
ant (secretion), stem sawfly (F sex phe.)



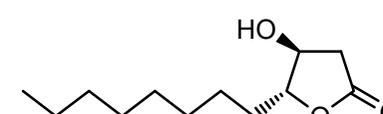
parasitoid wasp (M sex phe.)



butterfly (M sex phe.)



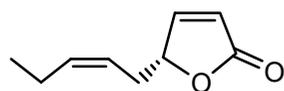
fruit fly (M sex phe.?)



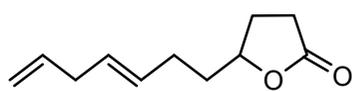
harvestman (allomone)

[C-4] Other: Ring comp. (ii)

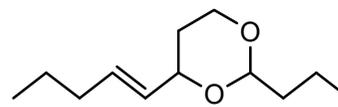
C4 ring



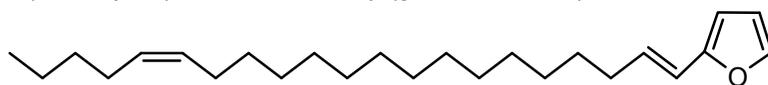
pyralid moth (M sex phe.)



fruit fly (gland secretion)



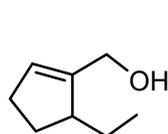
cockroach (allomone ?)



ant (allomone ?)

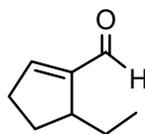
C5 ring

phoracanthol

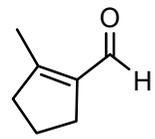


longhorn beetle (allomone?)

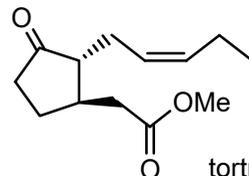
phoracanthal



ant (gland secretion)

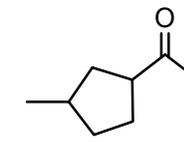
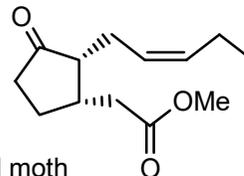


methyl jasmonate

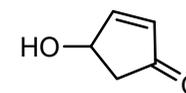


torricid moth (M sex phe.)

methyl epijasmonate

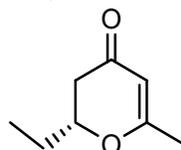


stick insect (allomone ?)

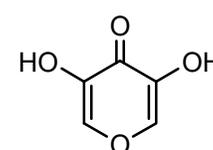
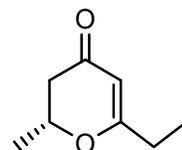


butterfly (secretion)

hepialone

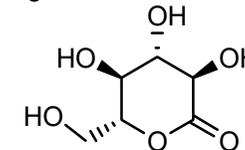


swift moth (M sex phe.)

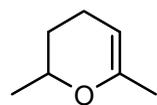


shield bug (M sex phe.)

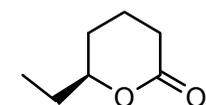
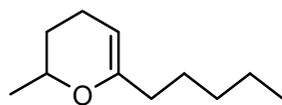
gluconolactone



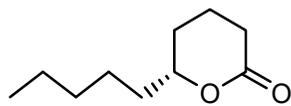
cockroach (allomone ?)



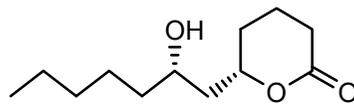
bee (cephalic secretion)



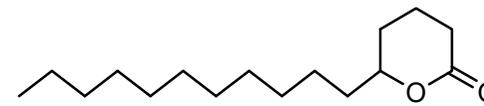
fruit fly (M sex phe.)



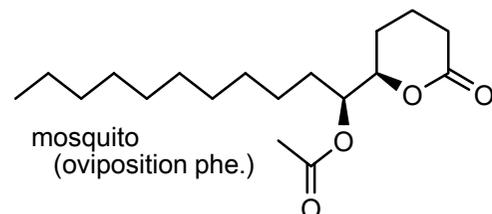
butterfly (M sex phe. ?)



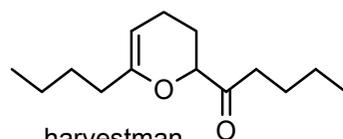
butterfly (M sex phe.)



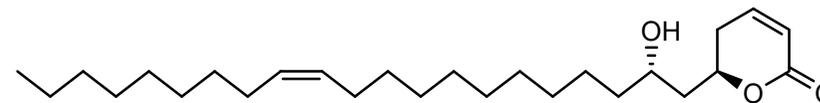
wasp (queen primer phe.)



mosquito (oviposition phe.)



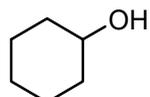
harvestman (allomone ?)



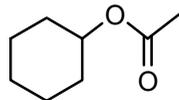
ant (gland secretion)

[C-4] Other: Ring comp. (iii)

C6 ring

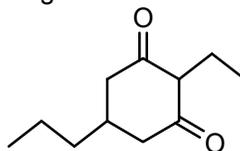


grasshopper
(aggregation phe.)

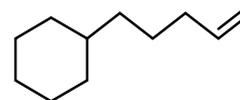


butterfly (F sex phe. ?)

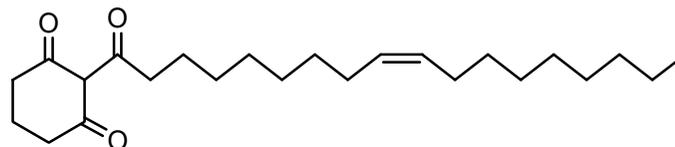
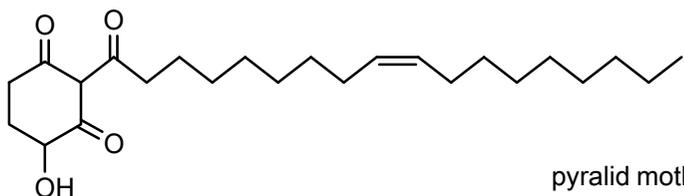
chiloglottone



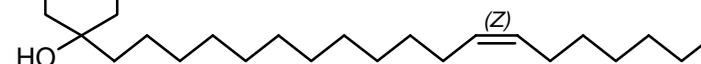
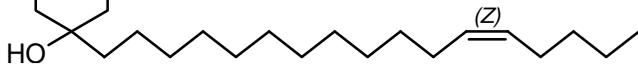
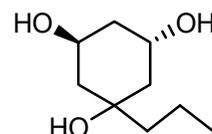
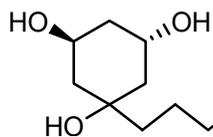
solitary wasp (F sex phe.)



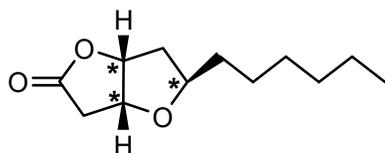
sap beetle (anti-
aphrodisiac phe. ?)



pyralid moth (larva trail phe.)

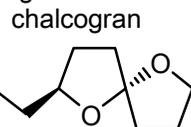


ant (gland secretion)

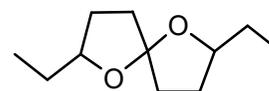


parasitoid wasp (gland secretion)

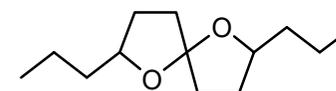
C7 ring



bark beetle
(aggregation phe.)

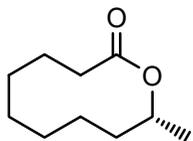


mining bee (gland secretion)



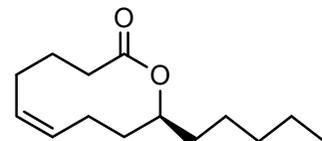
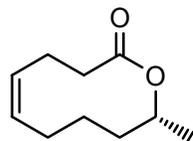
C9 ring

phoracantholide I



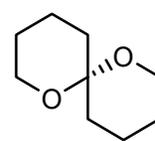
longhorn beetle (allomone ?)

phoracantholide J

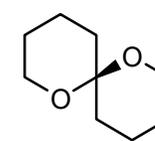
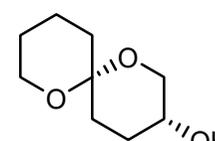


termite (queen recognition ?)

olean



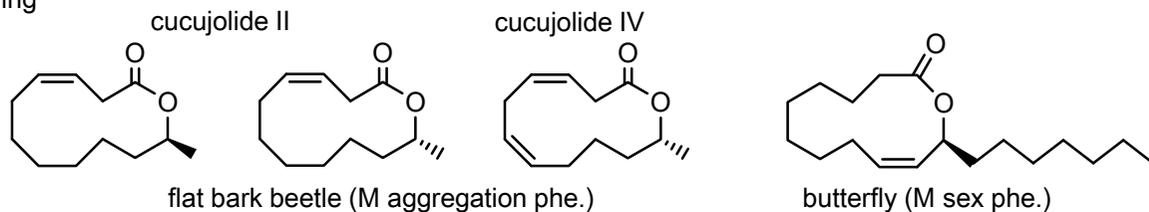
fruit fly (F sex phe.)



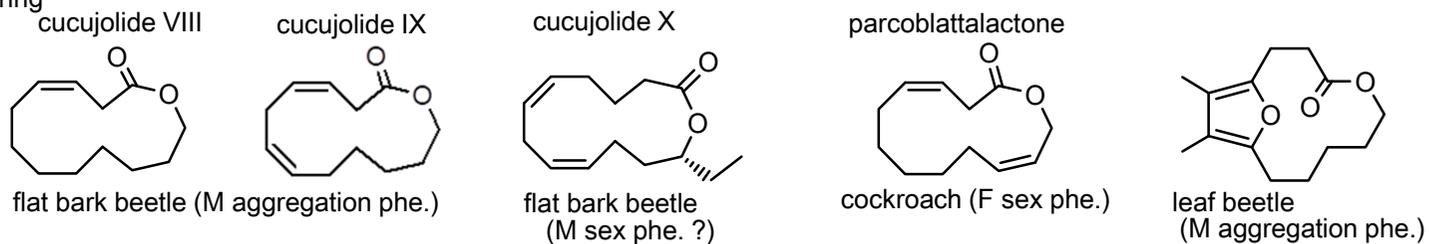
fruit fly
(F sex phe.)

[C-4] Other: Ring comp. (iv)

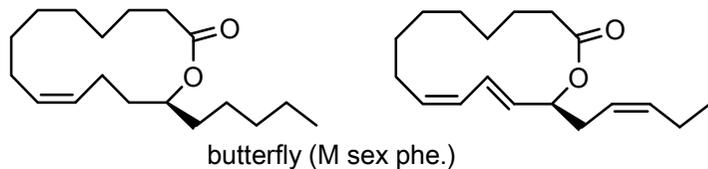
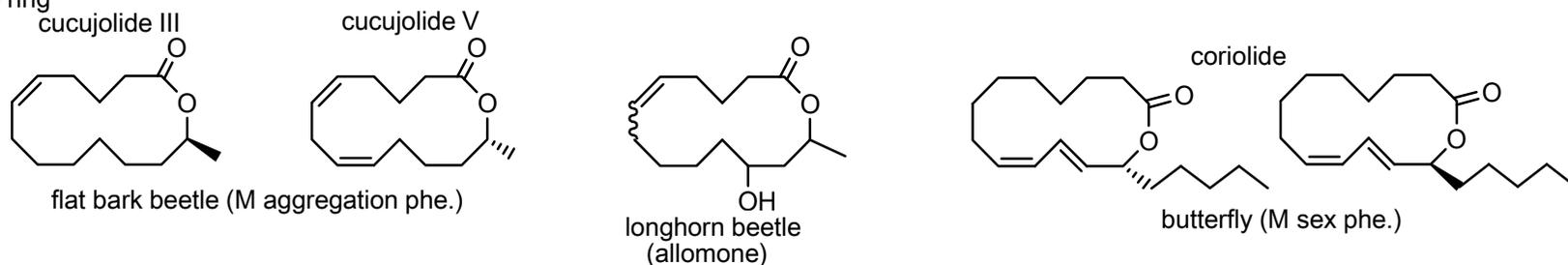
C11 ring



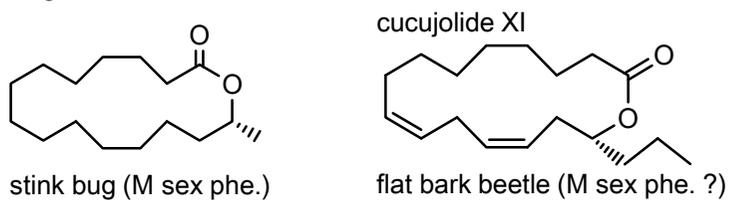
C12 ring



C13 ring

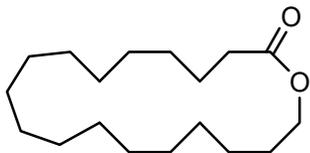


C15 ring



[C-4] Other: Ring comp. (v)

C18 ring

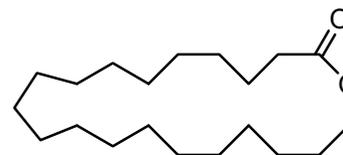


sweat bee (gland secretion,
F sex phe., queen phe.)



wasp (trail phe. ?)

C20 ring

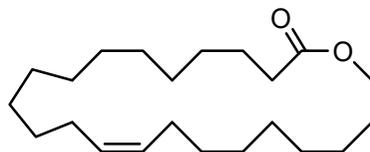


sweat bee (gland secretion,
F sex phe., queen phe.)
mining bee, plasterer bee
(gland secretion)

C22 ring

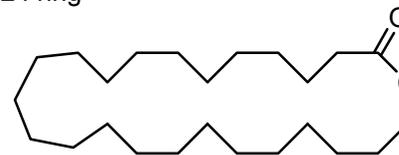


sweat bee (gland secretion,
F sex phe., queen phe.)
plasterer bee (gland secretion)



sweat bee (gland secretion)

C24 ring



sweat bee (gland secretion,
F sex phe.)
plasterer bee (gland secretion)
termite (allomone ?)

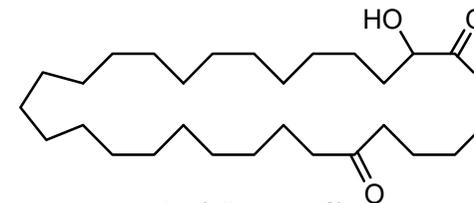
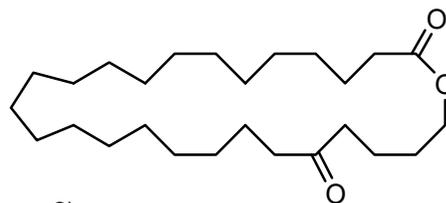


termite (allomone ?)

C26 ring



termite (allomone ?)



termite (allomone ?)

C28 ring



termite (allomone ?)

