

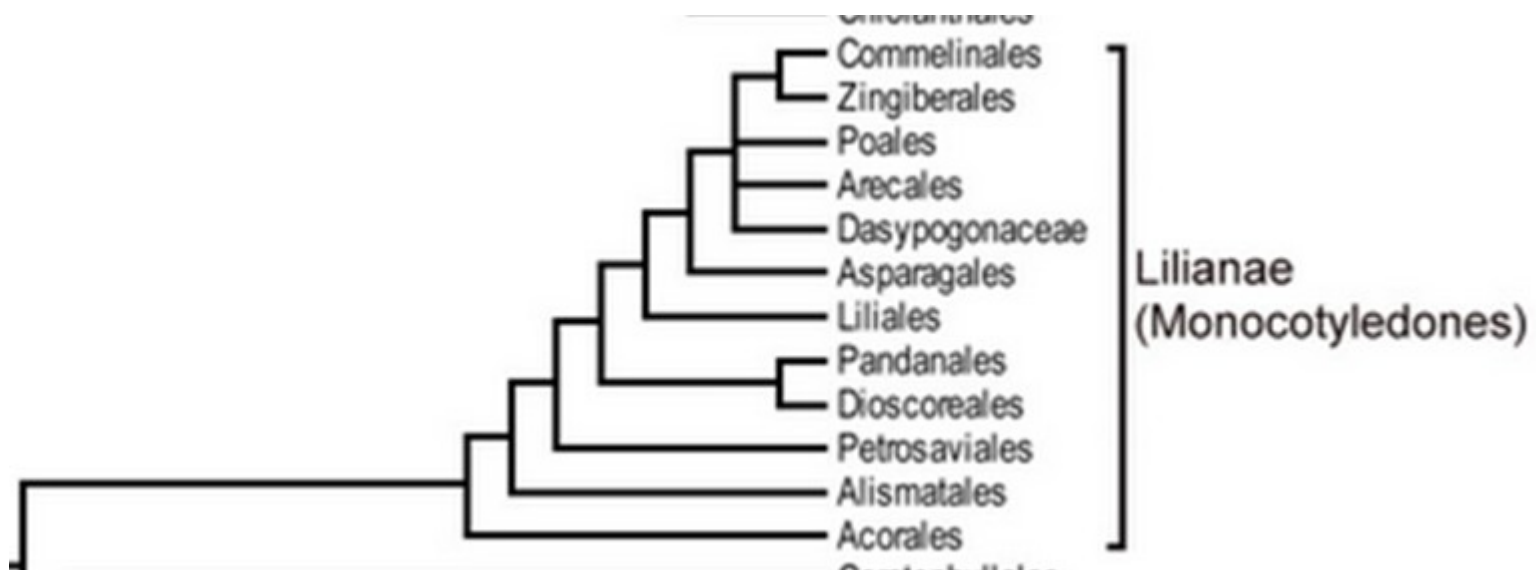
**CORSO DI BOTANICA SISTEMATICA**

# **LEZIONE 19**

**MONOCOTILEDONI**

**Parte seconda:**

**liliodi**

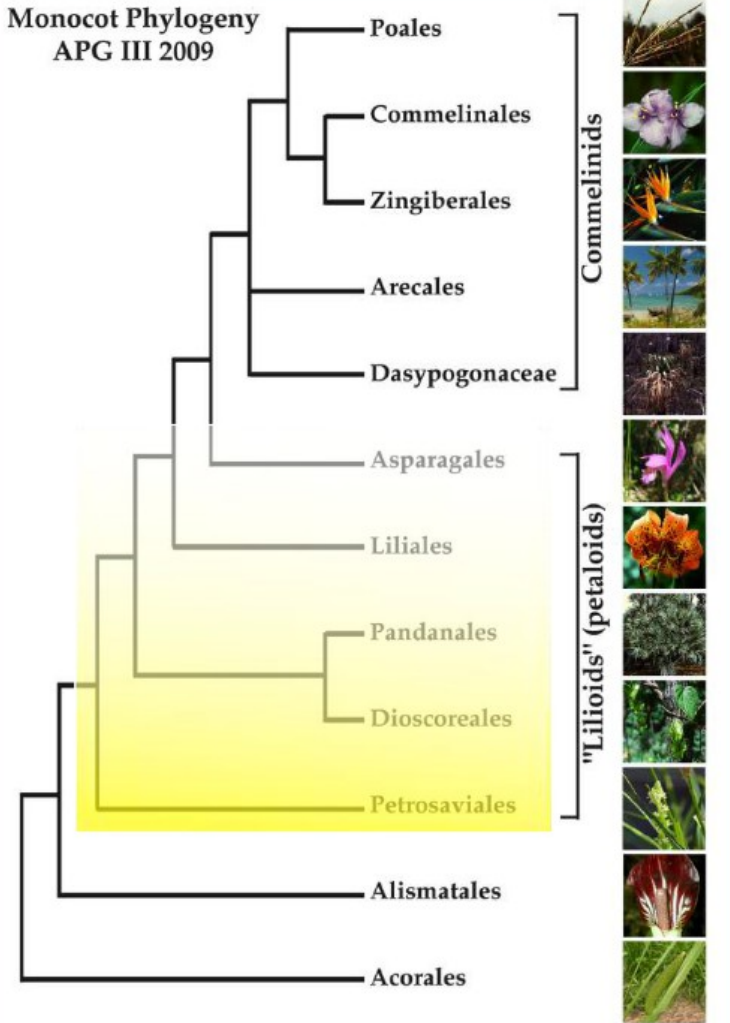


# Lilioids - petaloid monocots

## 4 main groups:

- Acorales - sister to all monocots
- Alismatids
  - inc. Aroids - jack in the pulpit
- “Lilioids” (lilies, orchids, yams)
  - grade, non-monophyletic
  - petaloid
- Commelinids
  - Arecales – palms
  - Commelinales – spiderwort
  - Zingiberales – banana
  - Poales
    - pineapple
    - grasses & sedges

Monocot Phylogeny  
APG III 2009



## Monocotiledoni basali

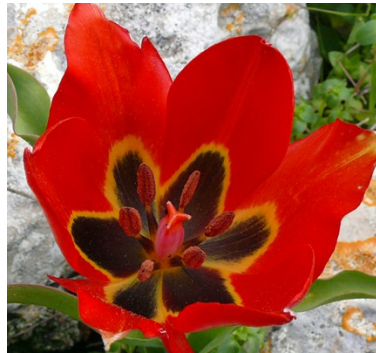


Impoll. Acquatica



Impoll. Da ditteri

## Monocotiledoni lilioidi



Impollinazione da imenotteri

## Monocotiledoni Commelinoidi



Impollinazione da parte del vento



# LILIALES - ASPARAGALES

Fiori a simmetria raggiata su base 3

Liliaceae in senso ampio: 3+3 tepali, 3+3 stami, ovario supero di 3 carpelli

Amaryllidaceae: 3+3 tepali, 3+3 stami, ovario infero di 3 carpelli

Iridaceae: 3+3 tepali, 3 stami, ovario infero di 3 carpelli

Liliaceae s.l.

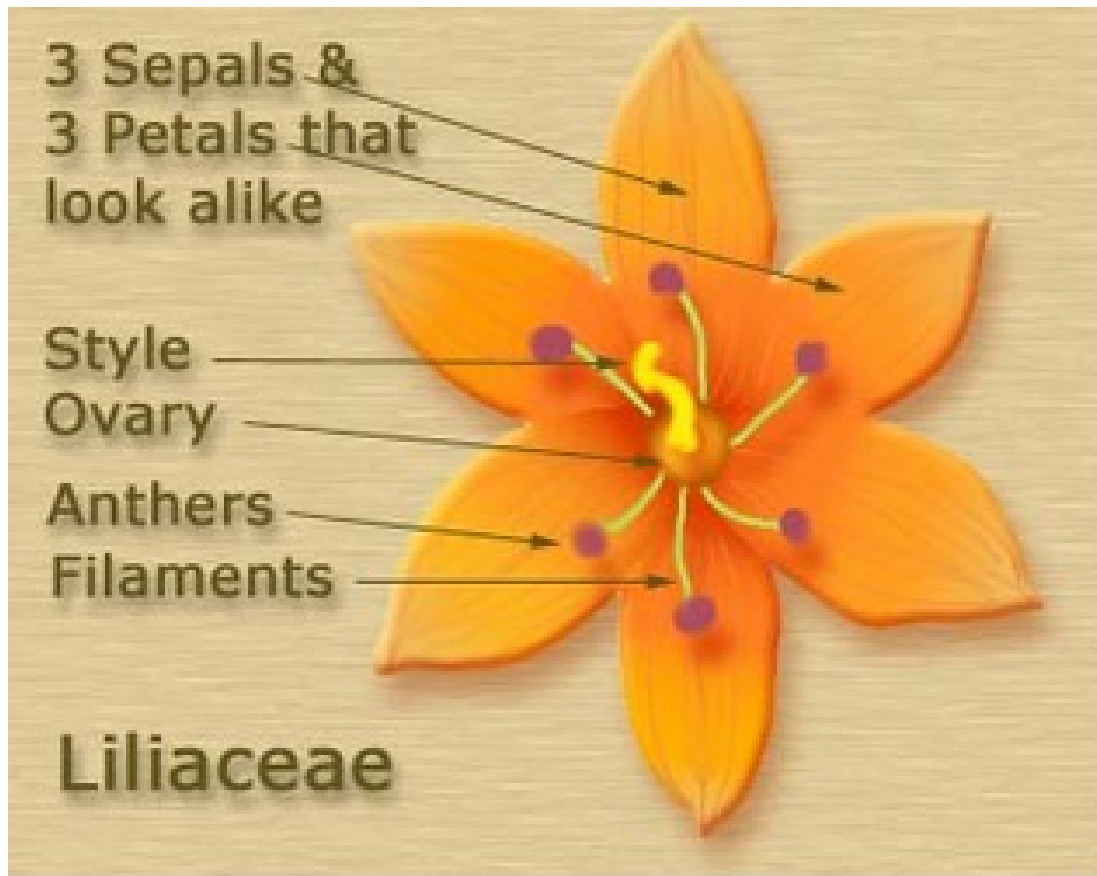
$$\oplus \text{♀ } P_{3+3} A_{3+3} G_{(3)}$$

Amaryllidaceae

$$\oplus \text{♂ } \overline{P_{(3+3)}} A_{3+3} G_{(3)}$$

Iridaceae

$$\oplus \text{♂ } P_{3+3} A_3 G_{(3)}$$



### ANGIOSPERME MONOCOTILEDONI

Ripasso: fiore basale di liliacea e sua trasformazione nelle Orchidaceae

# Lilioids - petaloid monocots



The lilioid monocots represent five orders and contain most of the showy monocots such as lilies, tulips, blue flags, and orchids

Majority are defined by 6 features:

6. **Capsule/berry**: fruit a 3-parted capsule or berry





Liliaceae in senso ampio: 3+3 tepali, 3+3 stami, ovario supero di 3 carpelli

**Liliaceae s.str.**

**Asparagaceae**

**Colchicaceae**

**Xanthorrhoeaceae**





*Erythronium dens-canis* L.  
LILIACEAE



*Fritillaria montana* Hoppe ex W.D.J.Koch  
LILIACEAE



*Gagea fragifera* (Vill.) Ehr.Bayer & G.Lópe  
LILIACEAE



*Gagea lutea* (L.) Ker Gawl.  
LILIACEAE



*Gagea minima* (L.) Ker Gawl.  
LILIACEAE



*Gagea pratensis* (Pers.) Dumort.  
LILIACEAE



*Gagea pusilla* (F.W.Schmidt) Sweet  
LILIACEAE



*Gagea serotina* (L.) Ker Gawl.  
LILIACEAE



*Gagea spathacea* (Hayne) Salisb.  
LILIACEAE



*Gagea villosa* (M.Bieb.) Sweet  
LILIACEAE



*Lilium bulbiferum* L. subsp. *bulbiferum*  
LILIACEAE



*Lilium carniolicum* Bernh. ex W.D.J.Koch  
LILIACEAE

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## Liliaceae s.str.





*Agave americana* L. subsp. *americana*  
 ASPARAGACEAE



*Anthericum ramosum* L.  
 ASPARAGACEAE



*Asparagus acutifolius* L.  
 ASPARAGACEAE



*Asparagus maritimus* (L.) Mill.  
 ASPARAGACEAE



*Asparagus officinalis* L. subsp.  
*officinalis*  
 ASPARAGACEAE



*Asparagus tenuifolius* Lam.  
 ASPARAGACEAE



*Bellevalia romana* (L.) Sweet  
 ASPARAGACEAE



*Chouardia litardierei* (Breistr.) Speta  
 ASPARAGACEAE



*Convallaria majalis* L.  
 ASPARAGACEAE



*Hosta venusta* F.Maek.



*Hyacinthoides hispanica* (Mill.)  
 Rothm.  
 ASPARAGACEAE



*Hyacinthoides non-scripta* (L.) Chouard ex  
 Rothm.  
 ASPARAGACEAE

# Asparagaceae



*Loncomelos pyrenaicus* (L.) L.D.Hrouda subsp.  
*sphaerocarpus* (A.Kern.) Holub  
ASPARAGACEAE



*Maianthemum bifolium* (L.)  
F.W.Schmidt  
ASPARAGACEAE



*Muscari armeniacum* Leichtlin ex Baker  
ASPARAGACEAE



*Muscari botryoides* (L.) Mill. subsp. *botryoides*  
ASPARAGACEAE



*Muscari comosum* (L.) Mill.  
ASPARAGACEAE



*Muscari kernerii* (Marches.) Soldano  
ASPARAGACEAE



*Muscari neglectum* Guss. ex Ten.  
ASPARAGACEAE



*Muscari tenuiflorum* Tausch  
ASPARAGACEAE



*Ophiopogon japonicus* (L.f.) Ker Gawl.  
ASPARAGACEAE



*Ornithogalum comosum* L.  
ASPARAGACEAE



*Ornithogalum divergens* Boreau  
ASPARAGACEAE



*Ornithogalum kochii* Parl. subsp. *kochii*  
ASPARAGACEAE

# Asparagaceae



ASPARAGACEAE



*Polygonatum multiflorum* (L.) All.  
ASPARAGACEAE

ASPARAGACEAE



*Polygonatum odoratum* (Mill.) Druce  
ASPARAGACEAE

ASPARAGACEAE



*Polygonatum verticillatum* (L.) All.  
ASPARAGACEAE



*Prospero autumnale* (L.) Speta  
ASPARAGACEAE



*Ruscus aculeatus* L.  
ASPARAGACEAE



*Ruscus hypoglossum* L.  
ASPARAGACEAE



*Scilla bifolia* L.  
ASPARAGACEAE



*Streptopus amplexifolius* (L.) DC.  
ASPARAGACEAE



*Yucca aloifolia* L.  
ASPARAGACEAE

# Asparagaceae





*Ruscus aculeatus*: cladodi



Nomi accettati / Accepted names



*Asparagus acutifolius* L.



*Asparagus aethiopicus* L.



*Asparagus albus* L.



*Asparagus aphyllus* L.



*Asparagus asparagoides* (L.) Druce



*Asparagus falcatus* L.



*Asparagus horridus* L.



*Asparagus maritimus* (L.) Mill.



*Asparagus officinalis* L. subsp. *officinalis*



*Asparagus setaceus* (Kunth) Jessop



*Asparagus tenuifolius* Lam.

# Asparagus





Colchicaceae: *Colchicum*





*Asphodeline lutea* (L.) Rchb.  
XANTHORRHOEACEAE



*Asphodelus albus* Mill. subsp. *subalpinus* Nyman  
XANTHORRHOEACEAE



*Asphodelus fistulosus* L.  
XANTHORRHOEACEAE



*Hemerocallis fulva* (L.) L.  
XANTHORRHOEACEAE



*Hemerocallis lilioasphodelus* L.  
XANTHORRHOEACEAE

# Xanthorroaceae

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Liliaceae s.l.

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Amaryllidaceae

$\oplus \text{ } \text{♂} \overline{P_{(3+3)}} A_{3+3} G_{(3)}$

Iridaceae

$\oplus \text{ } \text{♂}^* P_{3+3} A_3 G_{(3)}$



Amaryllidaceae: 3+3 tepali, 3+3 stami, ovario infero di 3 carpelli





*Allium victorialis* L.  
AMARYLLIDACEAE



*Allium vineale* L.  
AMARYLLIDACEAE



*Galanthus elwesii* Hook.f. subsp.  
*elwesii*  
AMARYLLIDACEAE



*Galanthus nivalis* L.  
AMARYLLIDACEAE



*Ipheion uniflorum* (Lindl.) Raf.  
AMARYLLIDACEAE



*Leucojum aestivum* L. subsp.  
*aestivum*  
AMARYLLIDACEAE



*Leucojum vernum* L.  
AMARYLLIDACEAE



*Narcissus jonquilla* L. subsp. *jonquilla*  
AMARYLLIDACEAE



*Narcissus poeticus* L.  
AMARYLLIDACEAE



*Narcissus pseudonarcissus* L. subsp.  
*pseudonarcissus*  
AMARYLLIDACEAE

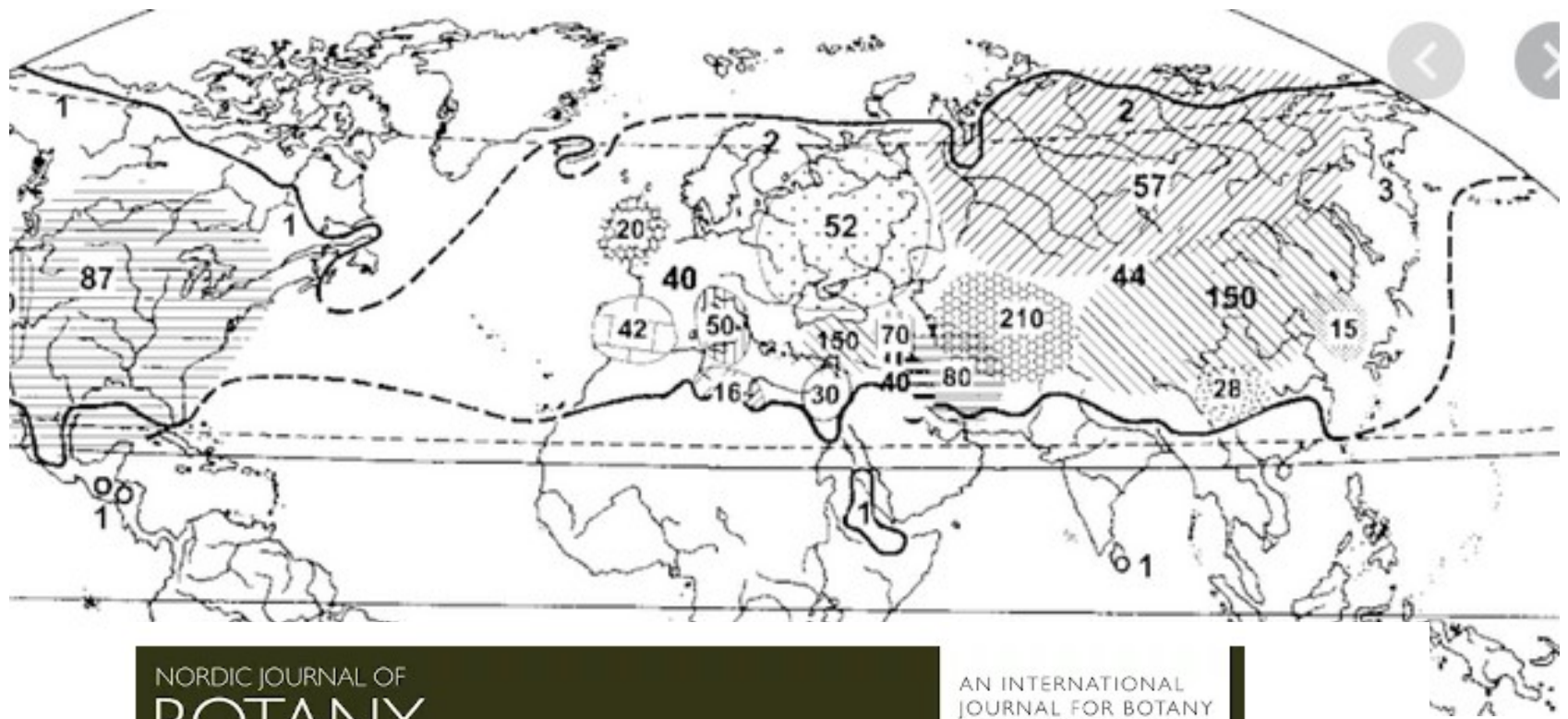


*Narcissus tazetta* L.  
AMARYLLIDACEAE



*Narcissus x incomparabilis* Mill.  
AMARYLLIDACEAE

# Amaryllidaceae



NORDIC JOURNAL OF  
**BOTANY**

AN INTERNATIONAL  
JOURNAL FOR BOTANY  
AND MYCOLOGY

## Quantitative phytogeography of the genus *Allium* in Siberia and Mongolia

Nikolai Friesen, Gloria Bolognini, Pier Luigi Nimis







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Iridaceae

$\oplus \text{ } \text{♂} P_{3+3} A_3 G_{(3)}$

# Asparagales: \*Iridaceae - iris

CA 3 CO 3 A 3  $\overline{\overline{G}}$  (3)

Tepals 6, the 3 inner (petals) forming the “flags or standards”

The 3 outer (sepals) forming the “falls” with nectar guides

The 3 stamens are positioned under the 3 **petal-like styles**



*Iris virginica* - Blue flag, iris

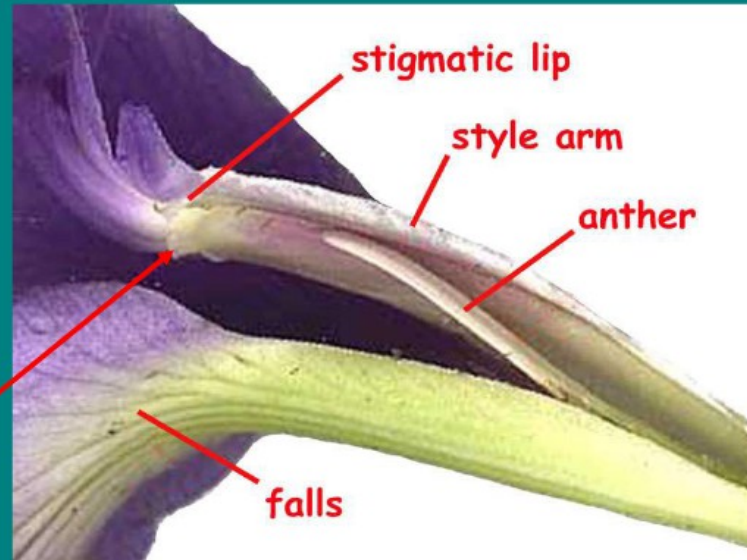
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CA 3 CO 3 A 3  $\overline{G}$  (3)

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*Iris virginica* - Blue flag, iris





Iridaceae: 3+3 tepali, 3 stami, ovario infero di 3 carpelli





IRIS 10 06 12  
IRIDACEE



IRIS 10 04 07  
IRIDACEE



IRIS 10 04 12  
IRIDACEE



IRIS 10 04 12  
IRIDACEE



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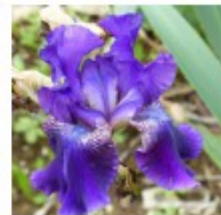
IRIS 10 04 12  
IRIDACEE



IRIS 10 04 12  
IRIDACEE



IRIS 10 04 12  
IRIDACEE



IRIS 10 04 12  
IRIDACEE

# Iris 'Agua Fresca'

Famiglia / Family: IRIDACEAE

Nomi italiani / Italian names: Iris cultivar 'Agua Fresca' (Italia)



Nomenclatura delle cultivar – *Iris* ‘**Agua Fresca**’



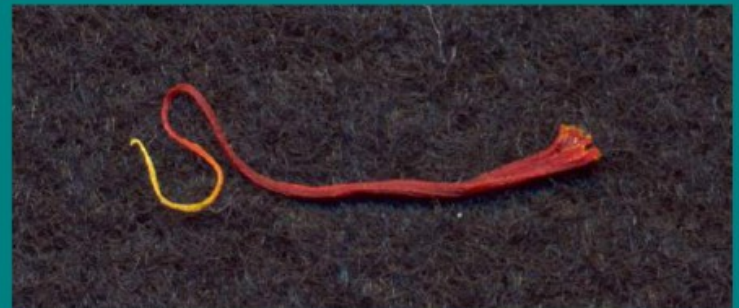


Iridaceae: 3+3 tepali, 3 stami, ovario infero di 3 carpelli

# Asparagales: \*Iridaceae - iris



The dried styles of *C. sativus* yields the expensive **saffron**



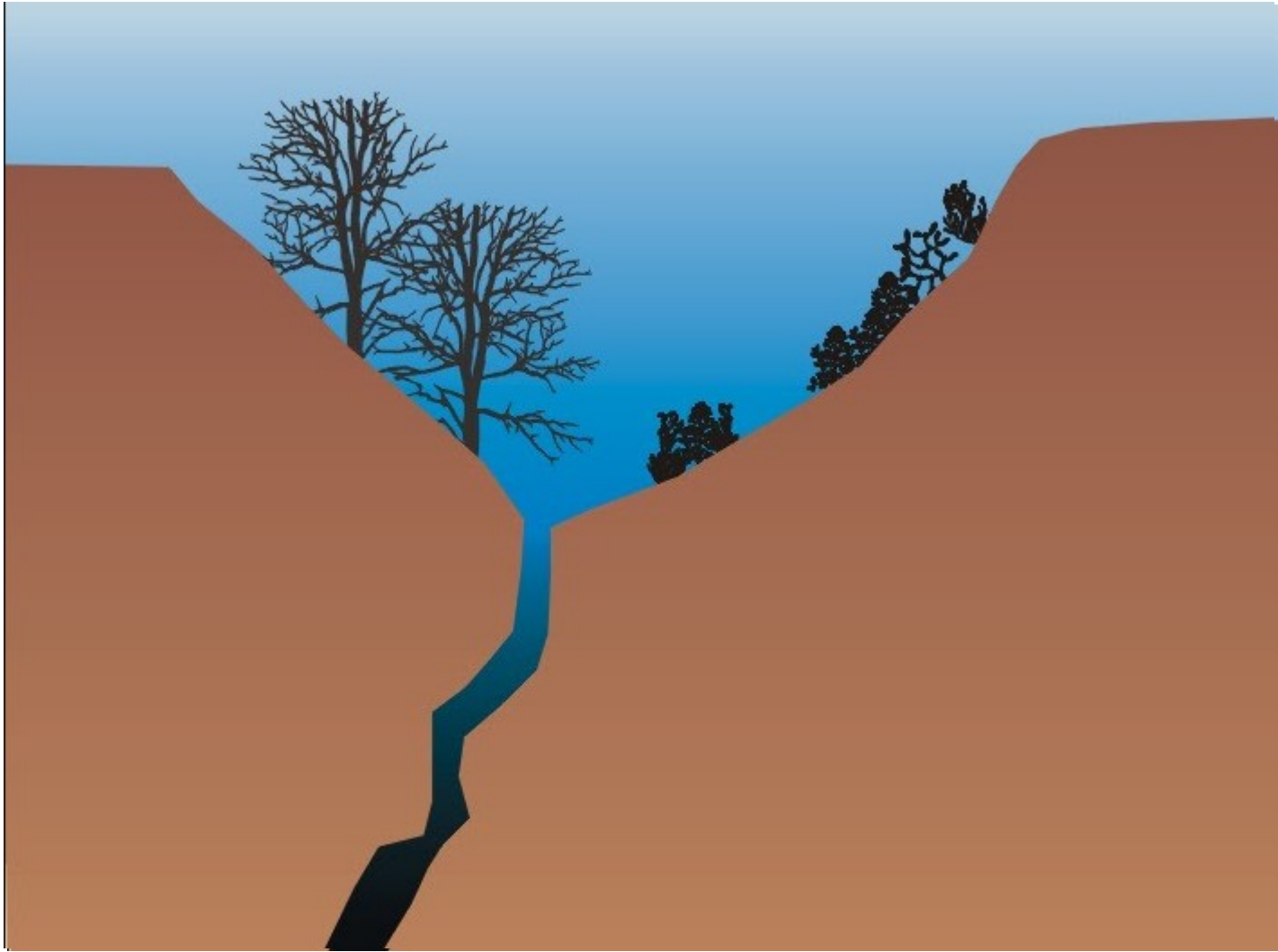






Piccola parentesi:

**Le onde di fioritura nei boschi decidui europei**







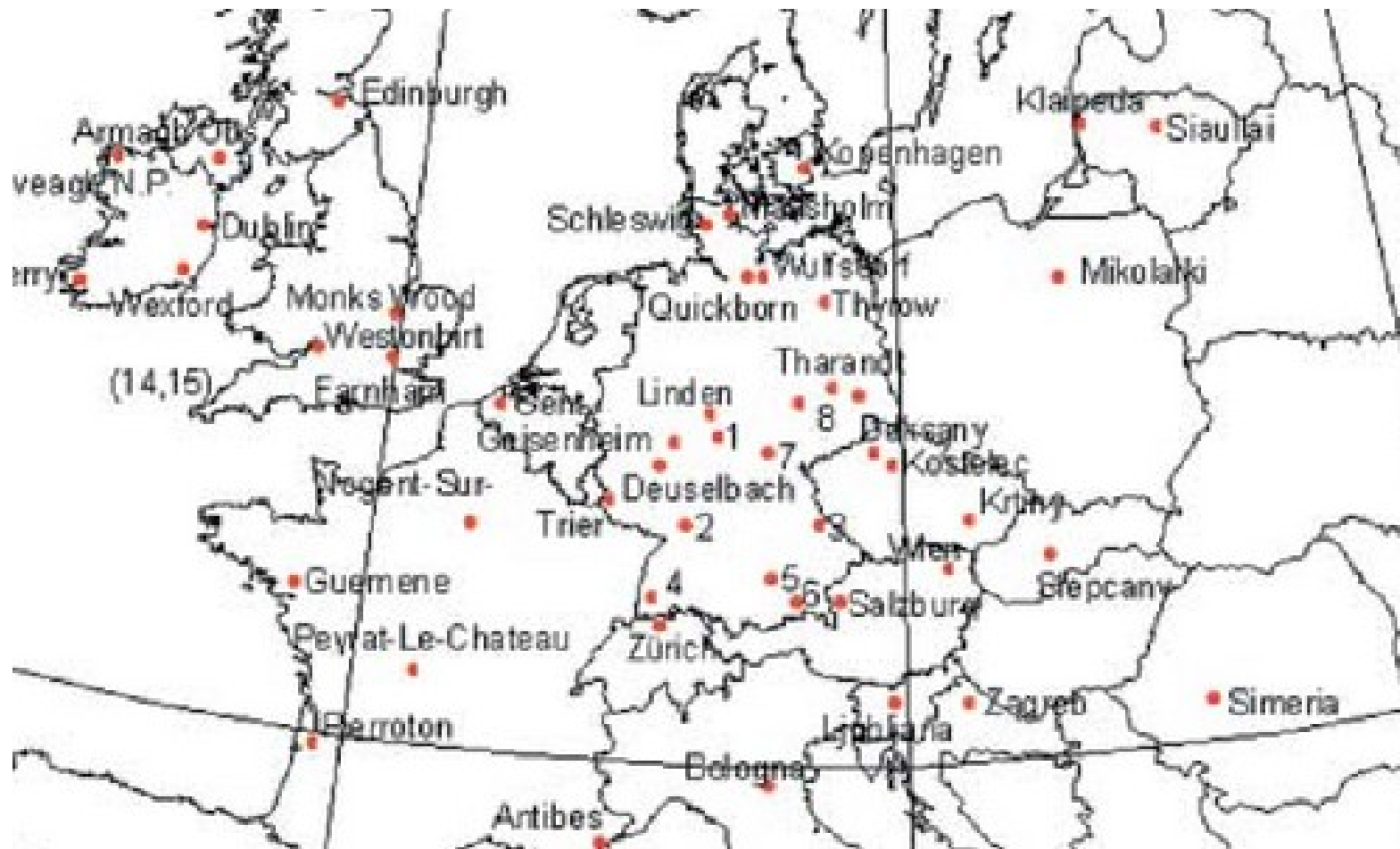


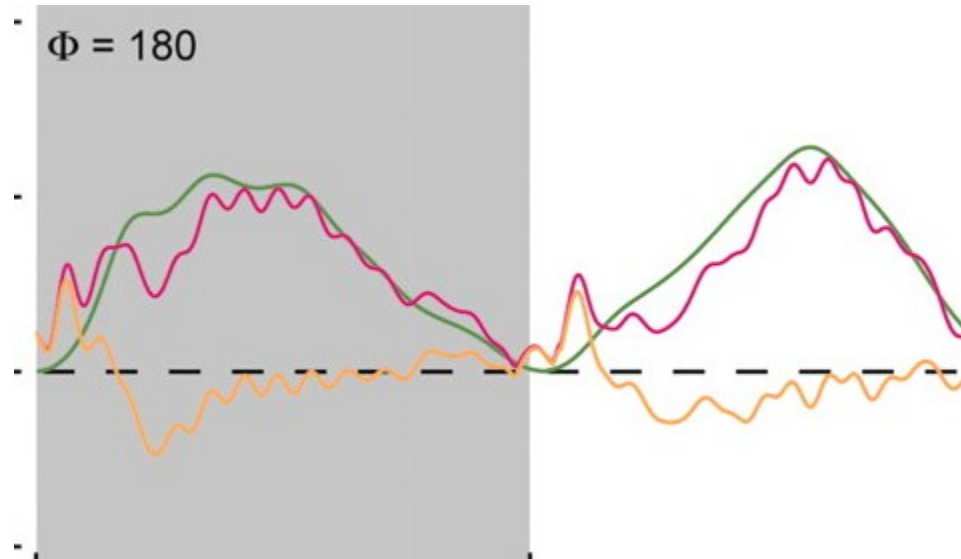












Nimis·P.L·(1977)¶

**Die·Frühlingsblüte·im·Buchenwald·in·**

**Beziehung·zur·Hummelbestäubung·**

In: Tuexen·R·(Hrsg.):·Vegetation·und·Fauna·

Ber.Symp.IVV·Rinteln·1976,·209-218·Vaduz.¶





Ackerhummer



Steinhummel



Gartenhummer



Dunkle Erdhummer



Waldhummer



Helle Erdhummer



Heidehummer



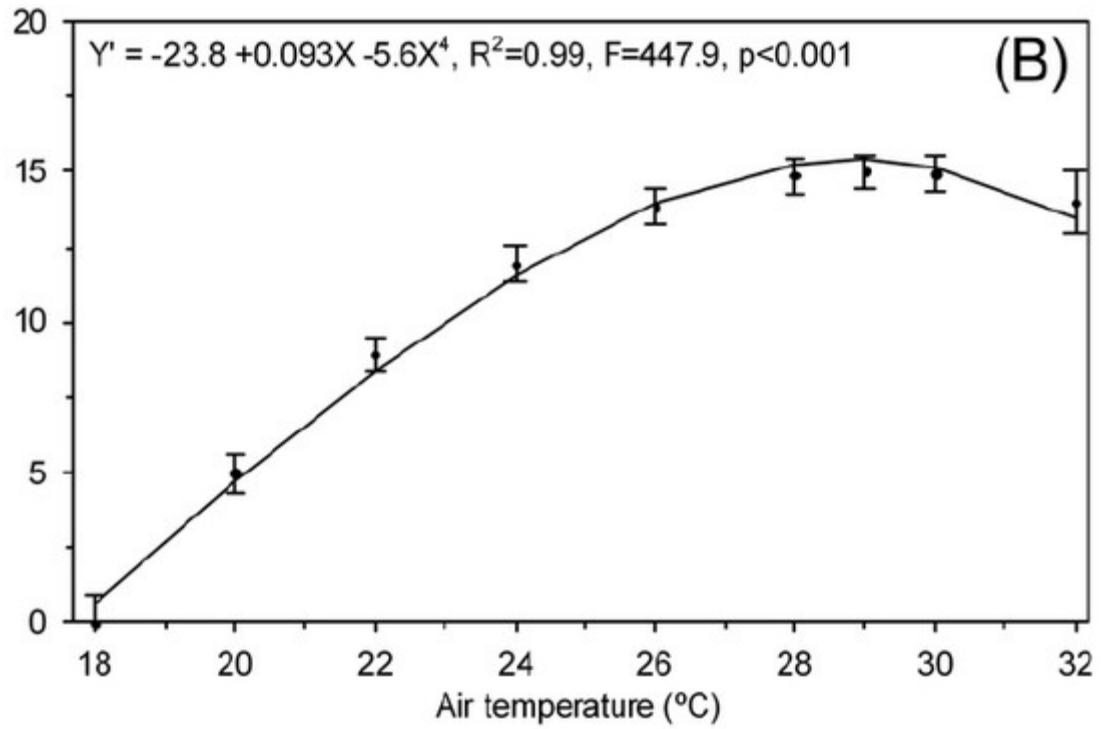
Feld-Kuckuckshummel



Baumhummer

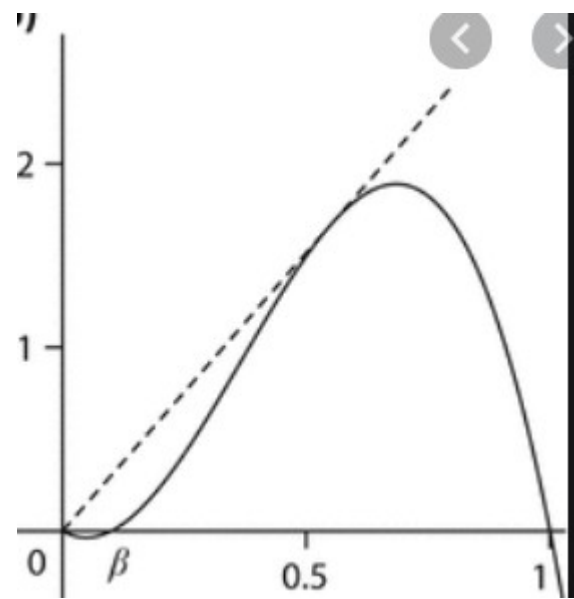


Wiesenhummer









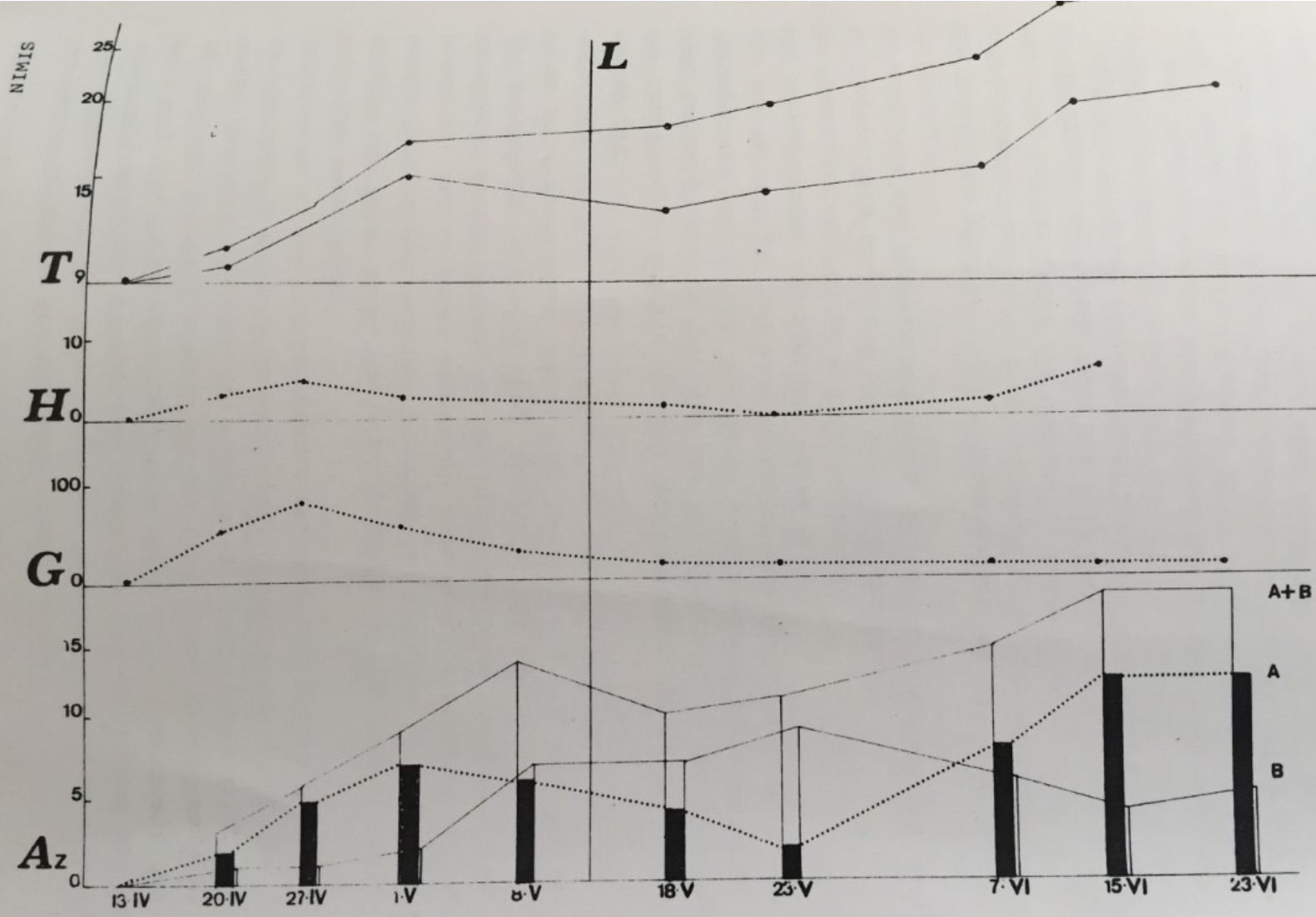


Fig. 1 T = Verlauf der Temperatur innerhalb und außerhalb des Waldes  
 H = Frequenz der im Walde anwesenden Hummeln (zwischen 13 und 15 Uhr)  
 G = Prozent der Geophyten aus der Gesamtzahl der im Wald blühenden  
 Az = Zahl der im Unterwuchs blühenden Pflanzen  
 (A) von Hummeln bestäubte Arten





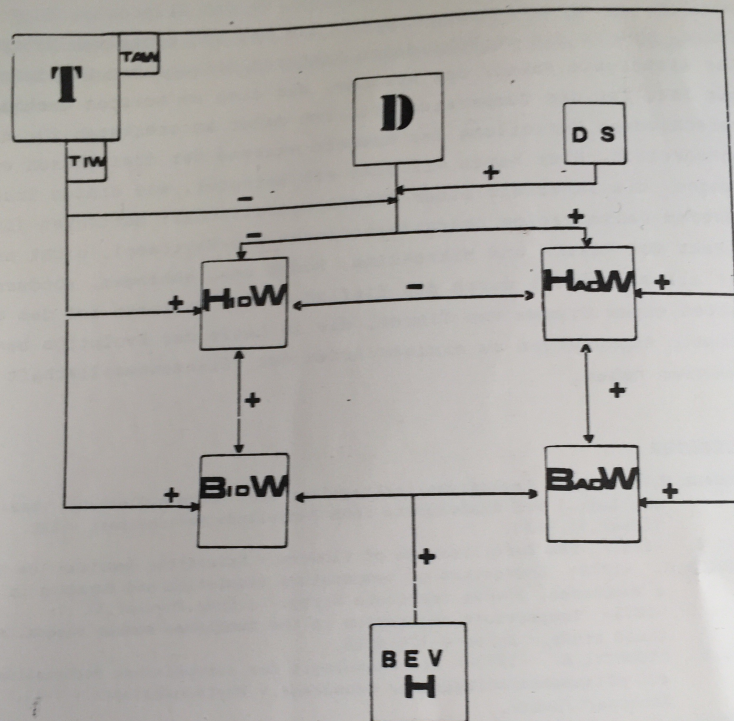


Fig.2. T = Temperatur

TAW = T außerhalb des Waldes

TIW = T innerhalb des Waldes

D = Temperatur-Unterschied zwischen Wald und Lichtungen

HidW = Zahl der im Wald tätigen Hummeln

HadW = Zahl der außerhalb des Waldes tätigen Hummeln

BidW = Zahl der im Wald blühenden Arten der Gruppe A

BadW = Zahl der außerhalb des Waldes blühenden Arten der Gruppe A

BEVH = Gesamtzahl der in der Gegend tätigen Hummeln

die ja der Energie-Ersparnis für die außerhalb des Waldes flie-